

## **Mango Cultivation in Murshidabad District of West Bengal: Problems and Prospects**

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### **Abstract:**

*Murshidabad, a backward district of West Bengal occupies an important place in India especially for the production of quality mangoes. The mango cultivation scenario of the district suffers from some definite problems which probably results into scrapping of Agri-Export Zone status in 2019. The present study attempts to explore the problems and prospects of mango cultivation of Murshidabad district through a comprehensive survey based research work.*

**Keywords:** *Mango varieties, Agri Export Zone, Mango cultivation, Mango growers.*

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### **I. Introduction**

Mango, known as the “King of fruits” is most important tropical and sub-tropical fruits of the world. The fruit is popular with the masses due to its high nutrition value, richness in variety, delicious taste and excellent flavour. The fruit has great use value. Raw fruits are used for preparing various traditional products like Amchur, pickle, Murabba, jam, chutney, sharbat etc. Good quality mango varieties are used for squash. Its starch is used for confectionary industry. Mango also has medicinal use as well. The ripe fruit has fattening, diuretic and laxative properties. It also helps to increase digestive capacity. Mango is produced in almost 90 countries of the world and consumed by more than 150 countries over the world. In the last 30 years, the mango production has been doubled worldwide (Rekhapriyadharshini, 2015) which itself reinforce its importance as a commercial crop.

In India, mango is cultivated as a major horticulture fruit in some concentrated part of the country. It has great role in generating rural employment and earning foreign exchange. Murshidabad is famous for its quality mango production not only in the state of West Bengal but in the country as well. Thus mango has special economic significance for the development of the economy of a backward district like Murshidabad. Accordingly, the district was earmarked for Agri-Export Zone under EXIM Policy in 2001 but the status was scrapped in 2019. Naturally, a question arises as to why such status was scrapped. A survey based research to explore the problems faced by the mango cultivators of the district has become very important and imperative at this point of time.

### **II. Literature Review**

Literature on mango cultivation in Murshidabad district is very limited. Nevertheless, this study is indebted to some of the following reports, articles, research papers etc., from which this study has tried to accumulate valuable inputs or information.

The Occasional Paper of Banerjee, G.D. (2011) dealt with the various financial and accounting concepts of mango production like cost of the production, value to the growers, loss in the process of production, marketing cost and the amount realizable from sale of that production. A comparative study of cost and realizable price for different variety of mangoes has been done which is very useful in analysis of commercial mango production in different parts of the country. The paper also critically analyses the economic value of different mango processed food like Jam, Jelly etc. with manufacturing process of mango pulp.

Patil, B.N. and Nirban, A.J. (2011) showed the actual scenario of export of mangoes from India to different countries. They analyse the reasons of low productivity of Maharashtra in spite of having highest area under mango cultivation.

Kavitha, (2013) discussed the need for finance in mango cultivation as well as the growing importance of horticulture in India. She placed special emphasis on implication of Good Agricultural Practices (GAP) in mango cultivation process.

Rosalin, M.A. and Vinayagamoorthy, A. (2014), described precisely the process of mango marketing after maturity of the fruit. They mainly analysed the problems and perceptions of intermediaries in marketing of mangoes of the district of Salem, Tamilnadu.

RekhaPriyadarshini, (2015) analysed, India's mango export scenario. She suggested for adoption of better post harvest techniques and certification techniques to increase the Indian mango exports to great extent.

Sarkar et al., (2018) conducted a similar kind of study on Nadia district of West Bengal where they have used rank of the problems (related to the mango farming in the study area) on the basis of the responses from the sample growers to know the ground reality of mango farming of that region.

Saha, R. and Bhowmik, G. (2020), described issues and challenges in cultivation of mangoes in Malda District (highest mango producing and exporting district in the state of West Bengal). The survey based study evaluated the perception of different stakeholders associated with mango farming and its export. The study emphasized on necessity of increasing efficiency in marketing channel, expanding international market beyond Bangladesh, restricting the use of cheap harmful Carcinogenic chemicals like Calcium Carbide, etc.

### III. Research Gap

The above literature review revealed that the existing literature is not sufficient to express the nature and dimensions of the problems faced by mango cultivators in general and mango cultivation scenario in particular especially in Murshidabad district. Therefore, the need for a comprehensive survey-based study as mentioned in the last line of section 1 has become relevant and need of the hour. Accordingly, the present work attempt to explore the problems of the persons directly involved in mango cultivation in the Murshidabad district.

### IV. Objectives of the Study

Objectives of the study may be summarized as under:-

- I. To know the views and perceptions of the growers<sup>1</sup> for identification of the problem involved in mango production in Murshidabad district;
- II. To analyse the problems and suggesting necessary measures; and
- III. To assess the performance of the district as a potential mango producing district in the state;

### V. Methodology of the Study

The present study is descriptive as well as explorative in nature. It describes present mango cultivation scenario along with interconnected issues for Murshidabad district. It uses production related secondary data of Murshidabad, West Bengal and India from 2008-09 to 2017-18 to evaluate the scope of the mango economy of the district. Alongside, it aims at analysing various issues relating to the mango growers of the district. A questionnaire based survey was conducted on 6 blocks (account for 23% of total number of blocks) of Murshidabad district in the year 2018-19. These blocks are - Farakka (FRK), Murshidabad-Jiaganj (MSDJ), Lalgola (LGL); Bhagowangola-1 (BGL1), Suti-2 (SUT 2) and Raghunathganj-2(RGNJ 2). Blocks were purposively chosen as they collectively occupy more than 50% of the area and production of the district. Thirty (30) mango growers were selected randomly from each of the blocks on the basis of the list supplied by the block level horticulture officials. Total 180 (=30×6)mango growers responded from the 6 blocks on different issues related to the production, available variety, quality, marketing channel, export and related problems and solutions. All the growers were directly associated with the mango growing either in the form of mango farmer (cultivate own orchard) or mango orchard owner (gives out lease) or took lease of mango orchard or engage in any combinations of the said activities.

**Table 1: Profile of Questions in the Questionnaire**

Focused Area	Dichotomous Questions	Multiple Answers Questions (MAQ) (Number of alternatives)				Open Ended	Total
		III	IV	V	VII		
Production Related (P)	1	1	1	-	1	2	6
Marketing & Export (M&E)	9	-	-	2	-	-	11
P+M&E (both)	-	-	-	-	-	1	1

<sup>1</sup> Mango farmers includes persons directly involve in mango cultivation or mango orchard owner who gives mango orchard on lease (lessor) or the lessee who takes lease of mango orchard.

Total	10	5	3	18
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Source: Authors' analysis from the Questionnaire.

At first, a pilot survey was conducted in the Murshidabad-Jiaganj (MSDJ)Block and based on the feedback a structured questionnaire was developed to collect the perception of selected respondents. The questionnaire mainly focused on two aspects –mango production and marketing and export exposure of the growers. The profile of the questions is presented in Table 1.Internal Reliability of the questionnaire has been tested by using Gutman Split-Half Reliability Test. The Gutman Split-Half Reliability coefficient is 0.81 which is considered to be good for the nature of the questionnaire and study.

Apart from the mango growers in different blocks, the officers of the district horticulture department, mango merchants were also consulted to conceptualize the opportunities and challenges of mango cultivation of the district. Some general statistical tools like Mean, Standard Deviation (S.D), Coefficient of Variation (COV), Correlation and related Regression Equation along with necessary tables and charts have been used for analysis of data. The Durbin Watson (D/W) test statistic has been used to detect the autocorrelation in the residuals from the regression analysis. In this case the D/W test statistic value was found as 2.09. D/W test statistic value was very close to 2.0 and it confirms that the regression analysis is free from autocorrelation problem. Compound Annual Growth Rate (CAGR) has been used to analyse the time series data related to area, production and productivity.

## VI. Present Mango Cultivation Scenario of Murshidabad District

Murshidabad is basically an agrarian district. Apart from agricultural richness, the district is famous for its quality mangoes as well. More than 85 varieties of mangoes are grown in the district of which 33 are commercially important. Most of them are famous for their taste and quality (Banerjee, 2011). Mango culture of the district was fostered by Nawab Nizams of Subey Bengal.

**Table 2: Block Wise Area and Mango Production (2017)**

Subdivision	Block	Area (ha.)	Production (MT)	Subdivision	Block	Area (ha.)	Production (MT)
Jangipur	Farakka	1257	9830.99		Kandi	145	1134.04
	Raghunathganj1	1032	8071.27		Khargram	134	1048.01
	Raghunathganj2	1205	9424.3	Lalbagh	Bhagawangola1	1188	9291.34
	Sagardighi	355	276.45		Bhagawangola2	548	4285.98
	Samsherganj	537	4199.87		Lalgola	3350	26200.35
	Suti1	847	6624.38		Murshidabadjiaganj	2029	15868.8
	Suti-2	2542	19880.98		Nabagram	260	2033.46
Sadar	Beldanga1	468	3660.22	Domkal	Domkal	798	6241.15
	Beldanga2	395	3089.29		Jalangi	462	4822.77
	Baharampur	967	7562.9		Raninagar1	286	2221.16
	Hariharpara	663	6410.43		Raninagar2	469	3668.04
	Nowda	910	7117.11	Total	21095	164902.9	
Kandi	Bharatpur1	80	625.68	District	Average	811.35	6342.42
	Bharatpur2	70	547.47		S.D	786.98	6212.37
	Burwan	98	766.45		COV (%)	96.99	97.95

Source: Office of the Deputy Director of Horticulture, Murshidabad

Mango is cultivated in almost every block of Murshidabad. Block wise production data of mango has been presented in Table 2.It is evident from the Table 2 that Jangipur and Lalbag subdivisions are the mango producing hub of the district followed by Sadar sub-division. Lalgola (Lalbag subdivision) is the highest mango producing block followed by Suti 2 block of Jangipur subdivision.

**Table 3: Area, Production and Productivity of Mango of India, West Bengal and Murshidabad during 2008-09 to 2017-18**

Area – 000<sup>3</sup> ha.  
Production – 000<sup>3</sup> MT  
Productivity - MT/ha

Year	India			West Bengal			Murshidabad		
	Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
2008-09	2309	12750	5.5	85.97	548.92	6.38	16.58	140	8.44
2009-10	2312.3	15026.7	6.5	88.14	578	6.56	17.8	55	3.09
2010-11	2297	15188	6.6	89.53	620.17	6.93	17.86	55.2	3.09
2011-12	2378.1	16196.4	6.8	90.94	661.53	7.3	18.5	55	2.97
2012-13	2500	18002.4	7.2	92.5	735	7.9	19	54.8	2.88
2013-14	2516	18431.3	7.3	93.5	430.71	4.6	19.4	30	1.55
2014-15	2163.5	18527	8.5	95.43	799.65	8.4	20.5	93.5	4.56
2015-16	2208.6	18642.5	8.4	96.74	693.39	7.2	20.94	156.08	7.45
2016-17	2212	19506	8.8	97.93	836.07	8.5	21.95	165	7.52
2017-18	2258	21822	9.66	103.3	918.35	8.9	22.05	176.4	8
<b>Average</b>	<b>2315.5</b>	<b>17409.23</b>	<b>7.53</b>	<b>93.4</b>	<b>682.18</b>	<b>7.27</b>	<b>19.46</b>	<b>98.1</b>	<b>4.96</b>
<b>S.D</b>	<b>118.84</b>	<b>2620.97</b>	<b>1.27</b>	<b>5.15</b>	<b>146.17</b>	<b>1.26</b>	<b>1.85</b>	<b>55.59</b>	<b>2.61</b>
<b>COV(%)</b>	<b>5.13</b>	<b>15.06</b>	<b>16.92</b>	<b>5.51</b>	<b>21.43</b>	<b>17.39</b>	<b>9.53</b>	<b>56.67</b>	<b>52.62</b>
<b>CAGR(%)</b>	<b>-0.22</b>	<b>5.52</b>	<b>5.79</b>	<b>1.9</b>	<b>5.3</b>	<b>3.4</b>	<b>2.89</b>	<b>2.33</b>	<b>-0.53</b>

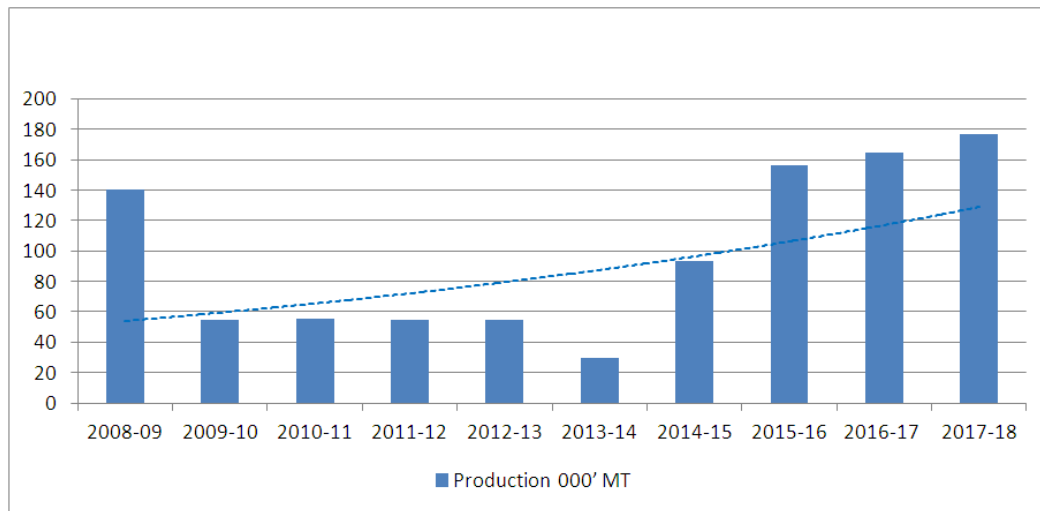
Source: Compiled and calculated from Horticultural Statistics at a Glance 2018, APEDA, District Horticulture Office, Murshidabad and <https://mangifera.res.in/>

The district was declared 'Agri Export Zone for Mango in West Bengal' with Malda under the Exim Policy of 2001. Malda and Murshidabad together produce 50% to 65% of the state's total production of Mango. It is evident from the Table 3 that during the period 2008-09 to 2017-18 Murshidabad alone produces on an average 14.38% ( $98.1/682.18 \times 100\%$ ) of state's total mango production (varies only for 'On Year' – 'Off Year' factor<sup>2</sup>) and occupies 2<sup>nd</sup> position in the state, after Malda district.

Area under mango cultivation in the district has shown a steady growth for the above mentioned period. Table 3 clearly envisages that fact and CAGR (2.89 %) for the mango cultivated area is quite higher than the state as well as the country. But the performance in the field of production and productivity is not satisfactory as CAGR (2.33% and -0.53% respectively) in both the cases is much lower than the state and country for the period 2008-09 to 2017-18. Average productivity of mango (4.96 MT/ha) of the district is also very low compared to the country's overall productivity of 7.53 MT/ha. On the other hand higher percentage of Co-efficient of Variation (COV) of the district in production (56.67%) and productivity (52.62%) indicates the higher level of variation compared to the same of the state and country as a whole.

<sup>2</sup>Generally, production of mango for a particular year depends on the production of the last year. Usually huge production of one year is followed by the low production of the immediate next year or vice versa. This phenomenon is known as 'On Year' - 'Off Year' factor.

**Chart 1: Trend of Mango Production in Murshidabad (2008-09 to 2017-18)**



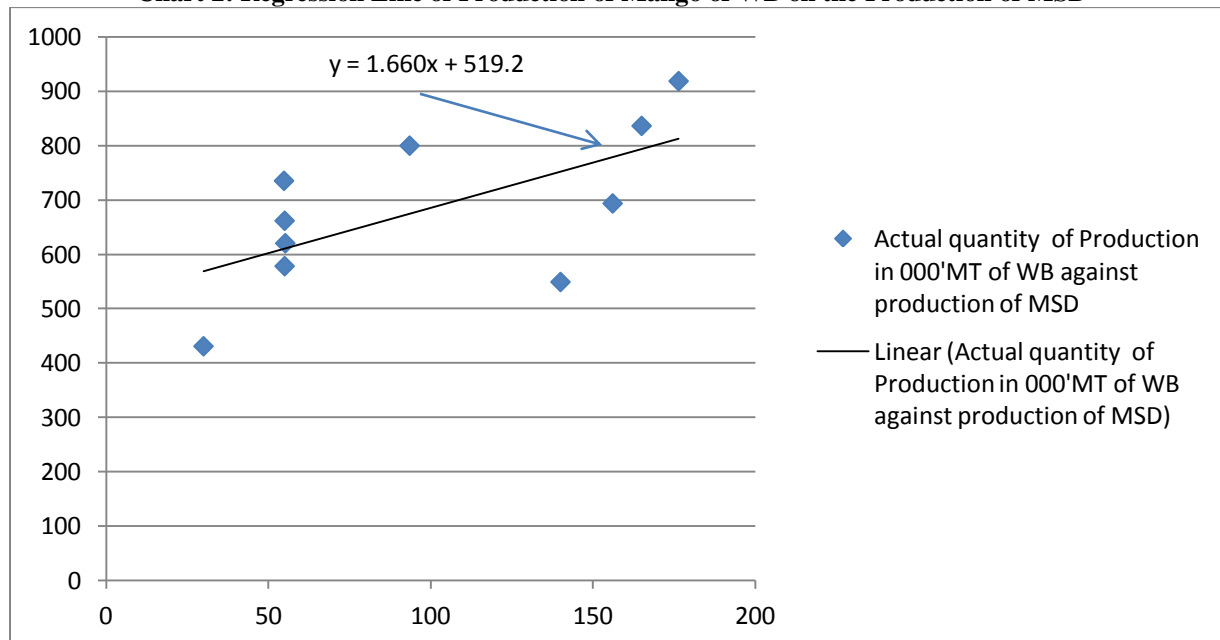
Source: Horticultural Statistics at a Glance 2018, District Horticulture Office, Murshidabad.

Interestingly, the volume of production of mangoes during the period (2008-09 to 2017-18) has shown an increasing trend (Chart 1). A close look at Table 3 and Chart 1 revealed that during the period 2013-14 to 2017-18 there is a sharp increase in annual volume of production and it seem that the district has been able to overcome the issue of ‘On Year’ – ‘Off Year’ factor in the recent times. Moreover, mango productivity of the district is also showing an increasing trend during the period 2013-14 to 2017-18 (Table 3).

It is well known that mango production in West Bengal (WB) is mainly dependent on Malda and Murshidabad(MSD).To know the impact and magnitude of mango production of Murshidabad on state’s (WB’s) total mango production Pearson's correlation of coefficient ( $r_p$ ) has been used. Assuming production of Murshidabad as independent variable and production of WB as dependent variable, the ' $r_p$ ' has been found to be  $-r_{p(MSD\&WB)} : 0.6316$ .

The result clearly shows that for the period 2008-09 to 2017-18, there exists moderate to high positive correlation between the total annual production of Murshidabad and WB. The correlation between total production quantity of Murshidabad and WB may be better represented with the help of the following Regression equation and graph-

**Chart 2: Regression Line of Production of Mango of WB on the Production of MSD**



Source: Compiled and calculated from Horticultural Statistics at a Glance 2018, APEDA, District Horticulture Office, Murshidabad.

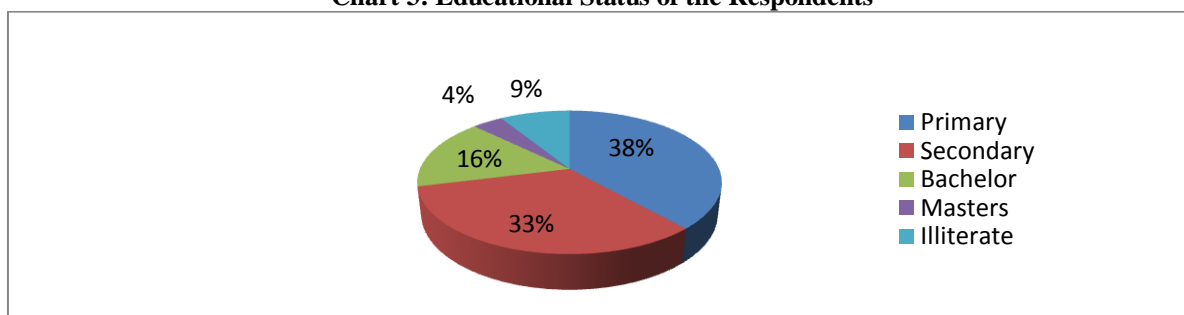
Among the several mango varieties commercially six varieties namely Himsagar (local name Sadullah), Fazli, Langra, Amrapali, Rani and Bombai are popular to the sample growers. Himsagar is the most popular variety favoured by 21.94% of the total responses by the respondents. Cultivation of Himsagar variety is more or less equally distributed among the sample blocks as reported by the respondents.

## VII. Survey Results: Analysis and Interpretation

### 7.1 General Attributes of the Respondents

In this part an attempt has been made to discuss and analyse the general issues related to the persons who are directly involved in the field of mango cultivation (i.e. the 'growers') in the district. In terms of overall literacy, Murshidabad is one of the most backward districts in West Bengal. Nevertheless, the literacy rate among the sample growers (91%) is quite promising. Seventy one percent (71%) of the growers have education up to primary or secondary level.

Chart 3: Educational Status of the Respondents

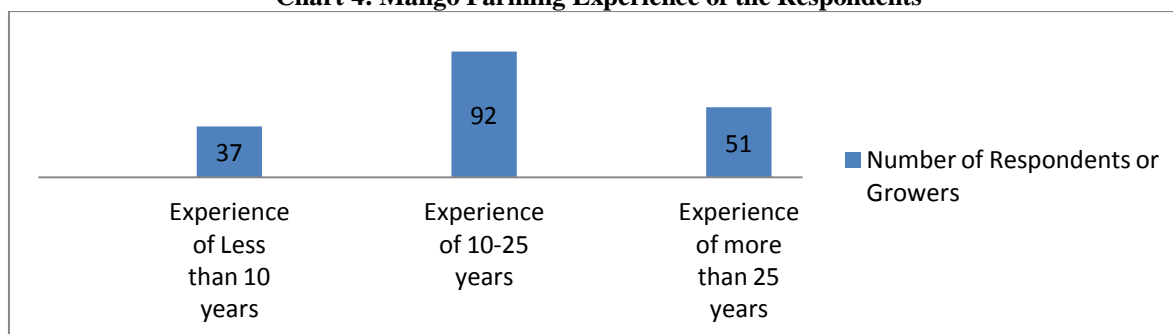


Source: Constructed on the basis of Survey Results

However, the presence of educated respondents among the sample growers is an important factor for any kind of future developmental initiative as they are expected to play an important role on the use of inputs, new technologies, post-harvest management practices, etc.

On the other hand average mango farming experience of the sample mango growers in the district was 19 years and about 28% of the sample growers have experience of more than 25 years. One significant feature is that a major part of the experienced sample growers started their involvement with mango farming at their initial age (between 25 to 35 years).

Chart 4: Mango Farming Experience of the Respondents



Source: Field Survey conducted by the authors.

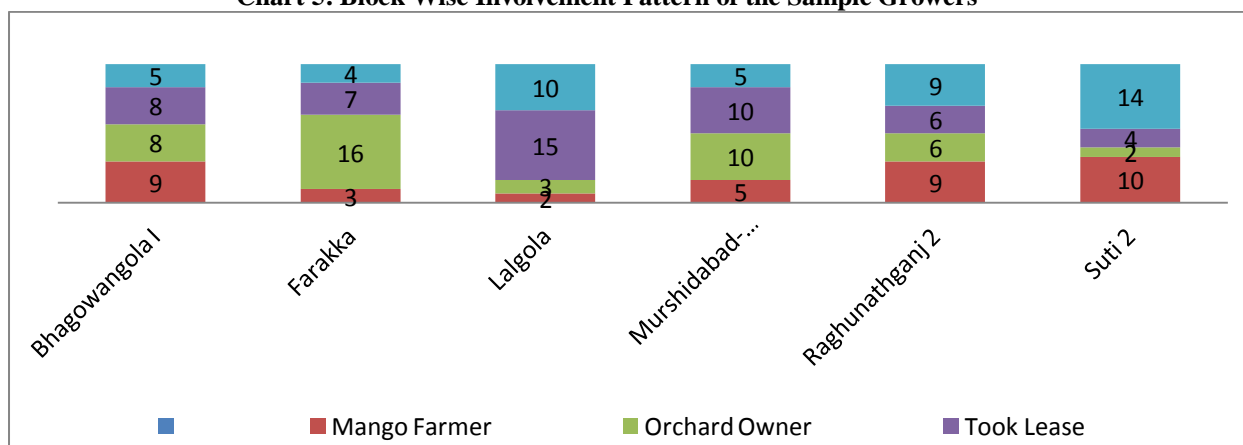
The pattern of the growers' age and experience is encouraging for any kind of future intervention for the purpose of rejuvenation and development of mango cultivation practice of the region. Involvement of male and female members of family in the mango farming process ensures minimization of costs and wastages. It also reduces labour uncertainty. Hence, impact of family involvement in mango farming process has great socio-economic impact. In Murshidabad district as a whole, 49.44% of the respondents ensured about getting family support in mango cultivation process.

### 7.2 Nature of Involvement of the Growers

The distribution of sample growers of the study blocks on the basis of their involvement in mango farming process has been presented in Chart 5. As a whole 1/4<sup>th</sup> of the sample growers (26%) are involved in mixed activities. Only 21% of the sample growers are solely engaged in cultivating their own mango orchard

whereas 53% of them are interested to take or give lease of mango orchard. It also indicates the popularity of lease-out system in the district.

Chart 5: Block Wise Involvement Pattern of the Sample Growers

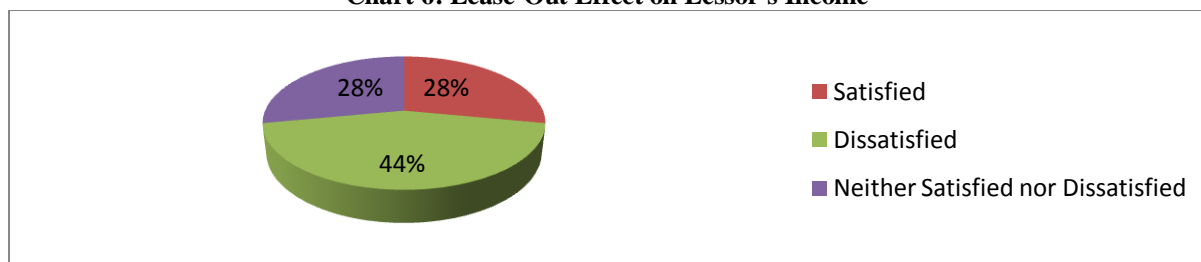


Source: Field Survey conducted by the authors.

### 7.3 Analysis of Lease-Out System

Lease holding of mango orchard is a popular agricultural contractual arrangement where owner of the mango orchard (lessor) allows other (lessee) to use the mango orchard for a certain period of time in lieu of the contract price. During the lease period the lessee will be responsible for the condition of the mango orchard and enjoy the price of the produced mango at the end. The sample growers of the district, who have given out their orchard on lease, have mixed experience in respect of their return from lease. About 44% of the lessors are not satisfied with the net income from lease. Only 28% of the lessors are satisfied over the net income issue from lease (Chart 6).

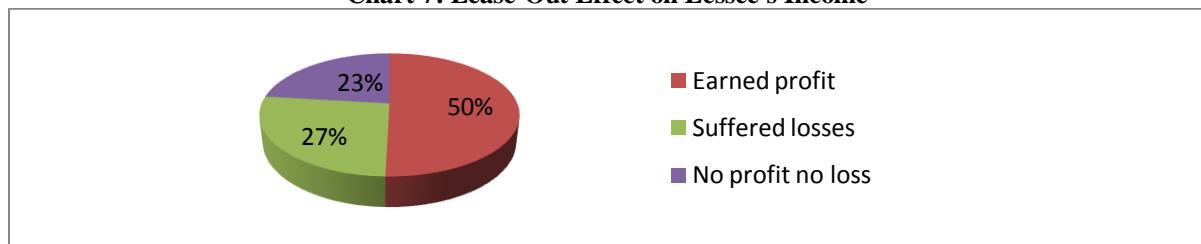
Chart 6: Lease-Out Effect on Lessor's Income



Source: Field Survey conducted by the authors.

On the other hand, the scenario is quite different in case of the lessees. About half of the lessees (50%) confirmed that they have earned profit from lease (Chart 7). 27% of the lessees reported loss from lease whereas 23% of the lessees have experienced neither profit nor loss. Analysing the lease out system of mango orchard, it appears that the lessees are in a better position than that of lessors. However it seems that lessees are interested in it due to economic reasons whereas lessors are involved in the system because of their personal or physical constraints.

Chart 7: Lease-Out Effect on Lessee's Income



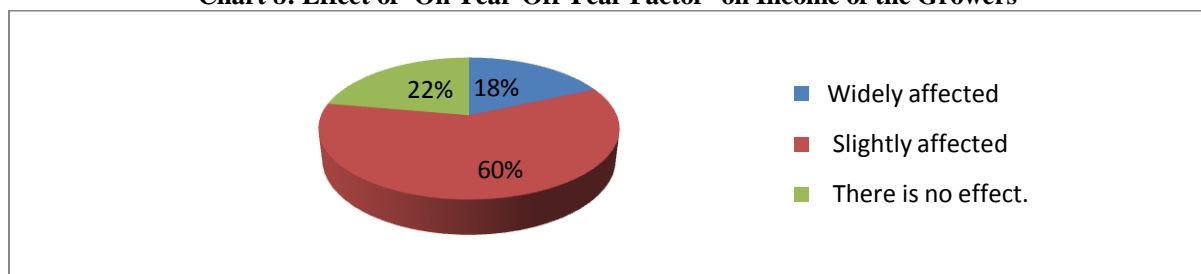
Source: Field Survey conducted by the authors.

Moreover, lease out system of the orchards, does not ensure proper nutrient management of the trees as the lessees used cheaper pesticides and other growth retardant to get maximum production. As a result, general health of the trees is gradually worsening which ultimately affect the quality of production.

#### **7.4 Effect of ‘On Year-Off Year’ Factor on Income of the Respondents**

Most of the sample growers are of the opinion that their income from mango farming slightly affected by the ‘On Year-Off Year factor’. However 82% of the sample growers of the district, have experience of either slightly affected or unaffected income from ‘On Year-Off Year factor’. The effect of ‘On Year-Off Year factor’ on the growers’ income from mango farming of the district may be presented with the help of Chart 8.

**Chart 8: Effect of ‘On Year-Off Year Factor’ on Income of the Growers**



*Source: Constructed on the basis of Survey Results.*

Chart 1, above also supports the same fact as district’s overall production since 2013-14 is showing a rising trend. Thus it can be said that ‘On Year-Off Year factor’ is no more a critical issue to determine the income of the growers.

#### **7.5 Price Recovery of Growers**

Growers’ satisfaction only comes after recovery of their investment. It highly depends on the price of the produced mangoes. The sample growers of the district have unanimously shown their dissatisfaction over the fair return through recovery of price of their produced mangoes. Only 31% (approx) of the sample growers are satisfied on the price recovery aspect of their produced mangoes.

#### **7.6 Growers’ Reach out to Food Processing Industries**

Jangipur Mega Food Park, Murshidabad is one of the 6 mega food parks currently in operation in India (<http://www.jangipurmegafoodpark.com/mega-food-park/>). In spite of that the condition of food processing industry of the district is not satisfactory. Ayesbag Samabay Krishi Unnayan Samity Ltd., M/s Kiran Food Products, M/s Maxol Food Products, M/s Mumpi & Sarbani Food Products are some of the small food processing units in the district. Most of the units except Ayesbag Samabay Krishi Unnayan Samity Ltd., are suffering either from financial problems or lack of scope for modernization and up-gradation. However, only a few number of the sample growers (19 out of 180 or 11%) are aware of the name of any food processing industry in the district (53% in case of Malda ). None of them ever supplied any mango to any of the food processing industry in the district (in case of Malda it is 17%). It carries the significance that despite having such a large mega food park in the district, mango growers are still worried enough to sell their produce. The small food processing units are still languishing due to lack of planning and infrastructure. In other words, the food processing industry of the district has not yet reached out to the mango growers in such a way that future potential of mango based economy in the district can be fostered.

#### **7.7 Export Business**

Unlike Malda, Murshidabad is not a recognized as mango export district of the state. Malda and Murshidabad both were the part of erstwhile “Agri-Export Zone for Mango”. Out of the 180 sample growers from different blocks, not a single grower had any direct experience of mango export. Regarding awareness of Government initiatives towards mango export development, the response of growers showed a dismal environment. About 83% of the growers reported that they did not aware of any mango export development initiative of their region. NGOs and their activities were also not reported by any of the respondents. These phenomena probably better explain the underlying rationale of scrapping of Agri Export Zone status in 2019.

#### **7.8 Mango Marketing Channel**

The survey pointed out several mango marketing channels prevalent in the district. Among them Channel II (Growers/ Gardeners – Aratdars – Retailers – Consumers) is the most popular or common marketing channel used in Murshidabad as shown in Table 4. Seventy five percent responses of the growers were in favour



of this marketing channel. The next important marketing channel is Channel III (Growers / Gardeners – Intermediaries – Consumers) where commission agents or other intermediaries play a vital role in between growers and consumers. About 21% of sample growers recorded their preference for channel III. Activity of the intermediaries has been observed more in the Suti-2 block than other 5 blocks. Only around 3% of the responses revealed the case of direct selling from the farm to the consumers (Channel I). As there is no mango exporter among the sample growers nobody followed Channel IV (Growers/Gardeners – Aratdars – Exporters – Foreign importers – Foreign markets and consumers). Non-existence of Channel IV confirms the case of non-participation of the growers in the export from the district. A few numbers of the sample growers carry mango to the northern part of the state – Assam and Tripura. Respondents also informed that agents from Nadia, North 24 Pargonas and Kolkata usually come just before the season starts and buy the orchards on contract basis (Channel V: Growers – UCTs<sup>3</sup> - Retailers – Consumers etc.).

**Table 4: Mango Marketing Channels: Preference of Sample Growers**

Marketing Channels (With Number)	FRK (NRs)	MSDJ (NRs)	LGL (NRs)	BGL1( NRs)	SUT 2 (NRs)	RGNJ 2 (NRs)	TNRs with%
I. Producers / Gardeners - Consumers	2	0	0	0	3	1	6(3%)
II. Growers / Gardeners-Aratdars-Retailers-Consumers	22	25	29	27	29	26	158 (75%)
III. Growers / Gardeners - Intermediaries - Consumers	6	3	1	8	18	9	45(21%)
IV. Growers / Gardeners-Aratdars-Exporters-Foreign importers- Foreign markets and consumers	0	0	0	0	0	0	0(0%)
V. Other Channel: -	0	2	0	0	0	0	2(1%)
Total	30	30	30	35	50	36	211(100%)

*Source: Field Survey conducted by the authors.*

(Note: NRs-Number of Responses; TNRs- Total Number of Responses)

### 7.9 Major Problems in Mango Cultivation

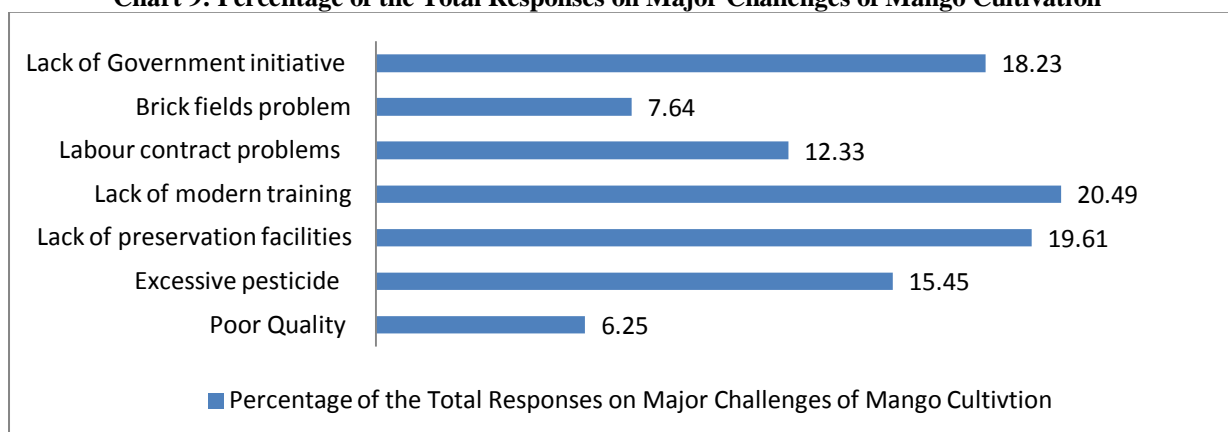
Mango cultivation in the district of Murshidabad suffered from a host of reasons. The survey results indicate the followings:

- ❖ Lack of modern training on the cultivation and marketing is the main problem of the region having 20.49% of the total responses as presented in Chart 9.
- ❖ As mango is a perishable product, it requires good packaging, preservation and treatment facilities. The lack of good packaging, preservation and treatment facilities, therefore, reported to be the second most important problem by the sample growers of the district having 19.63% of total responses in favour of it.
- ❖ Growers expect Government to take initiatives and guide them in different stages from farming procedure to quick marketing of product. Accordingly, Lack of Government initiative is identified to be the third major problem of developing mango cultivation in the district with 18.23% of total responses.
- ❖ Reckless use of synthetic pyrethroids, (Alphamethrin, Deltamethrin, Cypermethrin, Lambda Cyhalothrin, Fenvalerate etc.) primarily due to low cost, abundant availability, knock-down effect to the insects and lack of awareness among the farmers about their harmful effects is the prime cause of degrading the quality of mangoes. Excessive use of these harmful chemicals and pesticides is the common problem of the region and found to be uniformly distributed among the sample blocks. Thus, it is identified as the fourth most important problem by the sample growers.
- ❖ The sample growers mentioned that in recent time labour problem (i.e. lack of availability of skilled labour during pre and post-harvest seasons) emerged as a problem and ranked fifth in the list. Interactions with sample growers revealed that this might be the result of popularity of government sponsored schemes like MGNRAGA, free rationing, electricity, gas connection, subsidised housing and other DBT schemes available to the large section of rural masses (which form the labour force for mango cultivation). As these people are satisfied with minimum living standard, these facilities might have an unintended effect over their hard work physique.
- ❖ Brick-field problem<sup>4</sup> and quality aspect are the other problems rank 6<sup>th</sup> and 7<sup>th</sup> respectively by the respondents.

<sup>3</sup> Many traders from neighbouring states visit mango orchards in the district during the time of flowering and finalise the deal.

<sup>4</sup>Existence and unlawful burning of brickfields in the vicinity of mango orchards (1.6KM radius) resulting in heavy incidence of ‘Black Tip’(greater chances of being rotten once the fruit matures ) of mango.

Chart 9: Percentage of the Total Responses on Major Challenges of Mango Cultivation



Source: Field Survey conducted by the authors.

Officials from the District Horticulture Office and some front line growers have also raised some other issues which could pose problems in mango cultivation. These are:

- ❖ Excessive Wastage during the harvesting time;
- ❖ Slow but steady conversion of mango orchards into Banana field. Murshidabad has become one of the major Banana producing districts of West Bengal as it provides high and consistent income throughout the year. As such, the future of mango cultivation in the district may become uncertain in the days to come;
- ❖ Poor Post harvest management;
- ❖ Black tip problems;
- ❖ Problems of Lease-out system and poor nutrient management;
- ❖ Aging of trees and lack of renovation initiatives;
- ❖ Lack of Co-ordination among different stakeholders in the district;

### VIII. Conclusion and Suggestions

The aforesaid discussion and analysis clearly point out that the mango cultivation environment in the district of Murshidabad has been suffering from some genuine problems like lack of training, modern packaging, preservation, treatment facilities and Government sponsored developmental initiative; reckless use of synthetic pyrethroids; labour problem; steady conversion of mango orchards into banana field for better return; black tip and aging of trees. The interactions with mango cultivators revealed that majority of the growers were unfamiliar with the basic requirements for 'Good Agricultural and Management Practices' (GAP and GMP) like food safety norms, organic farming, eco-friendly waste management and recycling inspite the district had been in the Agri-Export Zone regime for about 19 years (2001-2019). These indicate ineffective implementation of Agri-Export Zone strategies which ultimately results into scrapping of said Agri-Export Zone status in 2019. It is also found that both the proportion of trained growers and average productivity of mango in the district are quite low. The age old lease-out system has an adverse impact on normal nutrition and growth of mango trees. The district has been failed to harness its potentiality largely because of gradual decline in quality of mango, lack of basic infrastructural facilities like transportation, storage, packaging and less effective unorganised marketing channels.

In order to overcome the barriers of mango cultivation and development of mango economy of the district the following suggestions can be offered-

- ❖ Low productivity of the district may be countered by introducing latest high density mango cultivation;
- ❖ As majority of farmers have basic education and rich experience in mango cultivation, any intervention in form of tailor-made training or workshop can be proved fruitful to introduce GAP and GMP among the growers;
- ❖ Post-harvest management of mango in the district needs to be improved by arranging training on the same and encouraging growers to attend the training for better return.
- ❖ Brand value for 'Murshidabad mango' is to be created especially for the 'Sadullah' (Himsagar) variety and prevalent marketing system should be modernized so that it can capture the major share of local as well as distant markets;
- ❖ Reckless use of pesticide and harmful chemicals should be controlled and growers should be encouraged to introduce organic farming;
- ❖ Convention of old lease-out system is required to be modified to ensure proper nutrition of trees;

❖ Government should come forward with a comprehensive plan for developing infrastructure from farm gate to the markets which include good transportation with cold chain facilities (for distant market) and packaging house with preservation facilities, etc.

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