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Socio-Economic Profile, Market Awareness, Profitability and Plant Protection Knowledge of Mango Growerin India: Case Study

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ABSTRACT: Mango is the main product of India. It is developed in 2.51 million ha region and creation is around 18.43 million tons (Horticultural Statistics at a Glance 2015). Neighborhood information, investment and better focusing likewise specialist are basic building up a drawn-out obligation to mango post collect administration in India. It tends to be featured that the greater part of the cultivators fell in ignorant however information was found to have a critical relationship with finances. Exploration should be coordinated towards showing other significant social, monetary and preparing factors that have a significant job on information on cultivators. Preparing and fabricating mindfulness among ranchers about bug elements and pesticide utilization could lessen the number of splashes significant. This training would decrease the poisonous heap of pesticides in mango which will be eco-accommodating and less hurtful to wellbeing other than lessening considerable information cost. Major problems are restricted Numbers of Certified Farms, absence of cold chain framework, just a single USDA, certified Gamma Radiation Facility out of the Mango creation region, non-accessibility of Air freight space, costly Air Transportation. With these problems, Indian farmers do not get the best price for their products.

Keywords: Socio-Economic Profile, Market Awareness, Profitability, Plant Protection, Mango and India.

INTRODUCTION

Mango (*Mangifera indica* L.) is known as the king of fruits. It belongs to the family Anacardiaceae and genus Mangifera. It is a good source of vital nutrients like vitamins such as A, B, C, niacin, etc. and minerals including calcium (Ca), potassium (K), iron (Fe), etc. The fruit contains moisture (81%), fat (0.4%), proteins (0.6%), fibers (0.8%) and carbohydrate (17%). Mango (*Mangifera indica* L.) is the national fruit of India having a great cultural, socio-economic and religious significance since ancient times. Owing to its origin in Indo-Burma (Myanmar), possessing the delicious fruit quality with richness in vitamins and minerals, accessibility to common man, liking by the masses and coverage of large area under cultivation ranging from the near coastal areas to the Himalayan foothills, mango has been assigned the status of the "king of the fruits". In the year 2010, the largest share of land devoted to mango cultivation was in India i.e., about 46.75 percent, of mango producing countries of the world (i.e., 4946.36 thousand ha). The total production of mango in the world in the year 2010 was 37124.74 thousand tons with 40.48 percent of Indian shares (Yadav and Pandey, 2016).

In India, the annual rate of growth of net value added of agro-industries at constant prices increased from 5.15% during the pre-reform period (1985–1990) to 8.3% during the post-reform period (1991–96) (Gandhi *et al.*, 2001). With the launch of the National Horticulture Mission by the central government in 2005–06, there was a spurt in area and production of fruits and vegetables from 11.8 million hectares in 2004-05 to 16 million hectares in 2015-16 (Horticulture Statistics, Government of India, 2017). However, despite these

developments, the horticulture sector has not performed well in export markets and the share of fruits and vegetables in total exports has fallen steadily from 28 percent in 2009-10 to 14 percent in 2015-16 (APEDA, 2017).

Table 1: Area, production and productivity of mango in the world.

Country	Area (ha)	Production (tons)	Productivity (tons/ha)	% Age share in world total production
India	2312.30	15026.70	6.50	40.48
China	465.337	4351.29	9.35	11.72
Thailand	311.048	2550.60	8.20	6.87
Pakistan	173.7	1845.50	10.62	4.97
Mexico	174.97	1632.65	9.33	4.40
Indonesia	131.674	1287.29	9.78	3.47
Brazil	75.111	1188.91	15.83	3.20
Bangladesh	170.8	1047.85	6.13	2.82
Philippines	189.437	825.68	4.36	2.22
Nigeria	114.9	790.20	6.88	2.13
Other Countries	827.04	6578.07	7.95	17.72
World	4946.314	37124.74	7.51	

Source: FAO

Table 2: Area, production and productivity of mango between 2002 to 2017 in India.

Year	Area (1,000 Ha)	% of Total area	Fruit Production(1,000MT)	% of total Fruit production	Productivity (Production/Ha)
2002–03	1,623.4	42.9	12,733	28.2	7.8
2003–04	1,906.7	39.8	11,490	25.2	6.0
2004–05	1,970	39.7	11,830	24.0	6.0
2005–06	2,080.7	39.1	12,663	22.9	6.1
2006–07	2,153.7	39.1	13,734	23.1	6.4
2007–08	2,201.0	37.6	13,997	21.3	6.4
2008–09	2,309.0	37.8	12,750	18.6	5.5
2009–10	2,312.3	36.5	15,027	21.0	6.5
2010–11	2,297.0	36.0	15,188	20.3	6.6
2011–12	2,378.1	35.3	16,196	21.2	6.8
2012–13	2,500	35.8	18,002	22.1	7.2
2013–14	2,516	34.3	18,431	20.7	7.3
2014–15	2,163	34.7	18,527	20.7	8.5
2015-16	2209	35.1	18643	20.7	8.4
2016-17	2263	34.9	19687	21.2	8.7

Source: Indian Horticulture Database 2009, Handbook on Horticulture Statistics 2014, Horticulture Statistics at a Glance 2017, Government of India.

Table 3: Shows the varietal characteristics of commercially grown mangoes.

Variety	Characteristics
Alphonso	This variety is medium in size, ovate oblique in shape and orange-yellow. The pulp is yellow to orange in colour. It is soft, firm and fibreless. It is amid-season variety.
Banganpalli	The flesh is firm to meaty, fibreless. The fruit is large and obliquely oval. The colour of the fruit is golden yellow. Good keeping quality and amid-season variety.
Chausa	Fruitis large, ovate too valoblique in shape and light yellow. It is a late variety.
Dashehri	Fruit size is medium, the shape is oblong to oblong-oblique and the fruit colour is yellow. The pulp is firm and fibreless and a mid-season variety.
Langra	Fruit is of medium size, ovate shape and lettuce green in colour.The lemon-yellow flesh is juicy and flavourful. It is scarcely fibrous, amidseason variety.
Totapuri	Fruit size is medium to large, shape is oblong with necked base and colour is golden yellow. The flesh is cadmium yellow and fibreless, a mid-season variety.
Kesar	Fruits are medium-sized, the flesh is sweet and fibreless. Colour is apricot yellow with red blush, an early-season variety.

A. Recommended Cultivation Practices

Jadhav and Manjunath (2011) sees that 39.33 percent of the mango cultivators had a place with a medium degree of information about the suggested practices of mango development with a mean score of 36.82. While, 34.00 and 26.00 percent of the mango producers had a place with the high and low information levels with mean information on 41.03 and 36.82, individually. Out

of 10 development rehearses for example Water system the board (94.66%) was rank at first to the extent reception moved by the respondents was concerned. The work on Intercropping and weed the executives rank at second (60.33%), trailed by High yielding assortments at rank third (58.83%), Field readiness at rank fourth (51.94%), Recommended dispersing at rank fifth (51.33%), Harvesting and showcasing at rank sixth (44.88%), Transplanting at rank seventh (41.09%), Fertilizer application at rank eighth (35.16%), Plant assurance measures at rank ninth (35%) and Plant development controllers at rank tenth (14.5%), separately.

Table 4: Showing catchment areas of markets of leading mango growing states.

States	Districts (Market)	Blocks
Andhra Pradesh	Warangal	Mongalapalli, Jangaon, Mahbubabad, Kottagudem, Narlappu, Gudur, Zafargarh
	Kurnool	Emmiganuru, Kappagalu, Alur, Adoni, Atmakpur, Pattikonda, Dhone, Koilkuntla, Banganpalli, Allagadda
	Prakasam	Emmiganuru, Kappagalu, Alur, Adoni, Atmakpur, Pattikonda, Dhone, Koilkuntla, Banganpalli, Allagadda
Maharashtra	Ratnagiri	Mandargarh, Dapoli, Khed, Chiplun, Guhagarh, Sangameshwar, Langa, Rajapur, Sangva
	Raigarh	Matheran, Karjat, Khalapur, Pen, Alibagh, Panvel, Uran, Sudhagarh, Poladpur, Mangaon, Mhasla, Mahad, Roha, Murud, Srivardhan
	Sindhudurg	Devgarh, Kankaulli, Malvan, Kudal, Vengurla, Savantvadi
Gujarat	Surat	Mangrol, Umarwada, Nizer, Olpal, Kamrej, Mahuva, Valod, Bardoi, Buhari, Umra, Tadkeshwar
	Valsad	Kadiyan, Zoz, Kikawada, Nimeta, Tundav, Kadachhala, Nasvadi, Kwant, Dabhoi, Karjan, Sinor, Ambadunger, Vadodara, Sankheda,
	Navsari	Gandevi, Jalalpor, Bansda, Ahond, Khanpur, Kariawadi, Satam, Saravani
Uttar Pradesh	Lucknow	Mal, Rahimabad, Bhauli, Itaunja, Mahoma, Nagram, Nigohan, Sisendi, Bijnaur, Utrahthia, Gosainganj, Jugganar, Chanhat, Bani, Alamnagar, Kakori, Bhauli
	Saharanpur	Badshahbagh, Raipur, Muzzafarabad, Kalsia, Behat, Chilkana, Rampur, Sarsawa, Pilkhani, Bhayla, Deoband, Gangoh, Lukhnauti, Nanauta
	Muzaffarnagar	Chausera, Titron, Jalalabad, Bidauli, Shahpur, Banal, Sisanli, Khatauli, Janesh, Mimpur, Kandala.
	Meerut	Mulharia, Tanda, Sakoti, Phalavada, Bashuma, Lawar, Daurala, Marware, Hastinapur, Jani, Kithaur
	Varanasi	Sindhora, Babatpur, Phulpur, Cholapur, Mirzaurad, Samath
Tamil Nadu	Teni	Periyakulam, Andipatti, Uttammapalayam, Bodimayakkanur, Kamban, Megamali, Vadugapatti,
	Dharmapuri	Pennagaram, Harur, Pappireedipatti, Palakkodu, Pochampalli
	Salem	Mettur, Yercaud, Idappadi, Omalpur, Attur, Gangavalli, Sankagiri
	Tirunelveli	Sivagiri, Sankarankovil, Tenkasi, Virakeralampudur, Alangulam, Nangumeri, Radhapuram

B. Socio-economic profile

Educational level. Shakuntala and Chaman (2000), Somvanshi *et al.,* (2016), track down that the elementary school instructive degree of respondents was found up to 13.12 percent, transitional degree of reacted was found up to 11.88 percent, 4.38 percent respondents were found up to the instructive status of graduate and just 02.50 percent respondents were having instructive status up to post alumni and above. Alongside this 1.25 percent of respondents were having unskilled in the examination region. It is demonstrated that the most extreme respondents were instructive status up to secondary school level. Thorat (2003) track down that (48.34 %) of the respondents had finished 'auxiliary' training followed by 'Higher optional' schooling 16.66 percent, 'essential' instruction (13.33 %) and 11.67 percent respondents had pre-essential schooling. While an equivalent number of respondents had finished graduation and post-graduation 5.00 percent. Godse (2010) shows that every one of the respondents was adequately instructed and the greater part of them wascaught upto an optional level. This, thus, may have affected their mentality. Jadav (2005) saw that 39% of mango plantation cultivators were taught up to essential level, while 29.50 percent of them were instructed up to optional school level, 16.50 percent were unskilled, and 15 percent were taught up to higher auxiliary and school level. Mehta and Sonawane (2012) track down that 3.27 percent in the towns studied had finished graduation which could be used to make ace coaches in the separate towns. They can go about as problem-solvers after limit building.

Caste. Khare *et al.* (2001), tracking down that the greatest respondents were had a place with other in reverse class and least respondents were having a place with plan standing/plan clan. Mehta and Sonawane (2012). seen that out of absolute example size most elevated level of mango producers (53.64) had a place

with a general rank class followed by 36.36 and 10.00 percent has a place with other in reverse standing and planned position and timetable clans station classifications individually. According to Kumar *et al.* (2018), information uncovered that the overall standing individual was having predominance in all kind of exercises of the town in light of being more in number. The lower rank class individual didn't meet up on a single stage. Mango advertising resembles a privately-run company for not many Muslim people group individuals in the express that to in Ramanagar region and Srinivasapura region, Majority of the mango cultivators (34%) had a place with the Muslim religion. Around 14 people of the complete examples i.e 28% were in the class of Vokkaliga (Chand *et al.*, 2011). Acharya (2006) saw that 12% of the Sample cultivators having a place with SC/ST and minority classification, with regards to Lingayath and Brahmin people group comprised 10per penny and 6per penny separately. Reddy and Christian comprised 4% each, at last Shetty and Rajasthani was having 2% each separately.

Marital status. Farinde *et al.* (2006), showed that the majority of the mango orchardist 95.00 percent were hitched and staying 05.00 percent of the mango orchardist were unmarried in the examination region.

Occupation. Chandra *et al.* (2020) recorded that 75.00 percent mango orchardist was having their primary control of farming followed by 19.00 percent mango orchardist were having horticulture with enduring while, 17.00 percent mango orchardist having occupied with Subsidiary Occupation.

Size of Family. Mishra *et al.* (2012); Boruah *et al.* (2015); Somvanshi *et al.* (2016), uncovered that out of the complete example size, 70.63 percent respondents were having a place with a medium family size in which 5 to 8 their relatives followed by enormous family size with more than 8 individuals having in their family were 25.00 percent respondents. Just 04.37 percent of respondents were having identified with little family size up to 4 their relative's framework. In the examination region, more than 70.63 percent of respondents were the family size of 5-8 their relatives

Housing pattern. Khare *et al.* (2001), track down that the vast majority of the respondents 65.63 percent were had pucca places of cement and concrete. Just 34.37 percent of respondents were had blended (Kachcha + Pucca) lodging design in the examination region.

3.7. Landholding size. Muhammad *et al*. (2012), Complete example size respondents were having more than one hectare of cultivable land size. Out of the all-out example size, 66.87 percent of respondents have had a place with huge orchardists (above to 04 hectares) landholding classification followed by 21.87 percent respondents have had a place with medium orchardists (02-04 hectare) classification and 09.37 percent respondents were under little producers (01-02 hectare) class. Just 01.88 percent of respondents were under peripheral producers (under 01 hectares) landholding classification. The comparative outcome was additionally announced by Shakuntala and Kumara *et al.* (2016). Chothani (1999) track down that 61.66 percent of the mango cultivators had a medium size of landholding. Staying 30.00 percent and 8.33 had the little and enormous size of landholding, separately. Rajan, (2016) likewise revealed 1.05 ha normal landholding in Malihabad square of Uttar Pradesh dissimilar to in Ratnagiri locale of Maharashtra where Gondkar (2017) detailed larger part of (61.66%) mango cultivators having medium-size landholding and staying 30% and 8.33 percent had the little and enormous size of landholding, individually

Irrigation facilities. 81.25 percent were having a wellspring of the water system with had private cylinder well Electric/Diesel motor followed by 12.50 percent of respondents who were usinga Government tube well for the water system in your mango plantation. Just 06.25 percent of respondents were utilized trench water for the water system in your plantations (Bhosale *et al.*, 2016). Singh, *et al.* (2017), revealed that 84.55% of ranchers have their claimed water system sources (diesel motor and cylinder well). Alongside the 10.00 percent, mango producers use to recruit water system sources like government and private cylinder well. Just 5.45 percent of mango cultivators use normal water system sources like channels, streams and lakes.

Annual income. The normal family pay of mango cultivators was INR 102,131 for each annum and normal pay per hectare of mango was assessed as INR 54,488 in the Malihabad mango belt. Mehta, B.M. also, Sonawane, M. (2012), pay bunch (up to Rs. 330833) trailed by (12%) respondents had a place with pay between (Rs. 330833 – 726666) and (3%) respondents had a place with (Rs.726666 or more) class of pay bunch individually. Singh and Singh (2017). The greatest number of respondents (85%) was had a place with the pay bunch (up to Rs. 330833) and (70%) of the respondents had a place with medium classification of expansion support. The larger part (58%) of the respondents had a place with 16 to 30 years experience of mango development and (64%) of the respondents had a place with medium classification of accomplishment inspiration and (78.50%) of the respondents had a place with a medium class of financial inspiration. The greater part (74%) of the respondents had a place with a medium class of advertising and (58%) of the respondents had a place with a medium classification of hazard direction and (60.50%) of the respondents had a place with medium class dynamic example. On income, a normal for every section of land acquired of Rs. 291250.00 that acquired by the producer of mango in the investigation region. Consequently, the mango producers on a normal for every section of land procured during the study, Rs. 87488.00 on overall gain, Rs. 291250.00 on net pay and Rs. 203762.00 on all-out use in the examination region. the chose mango cultivators on a normal for every section of land net pay Rs. 291250.00 and complete use is Rs. 203762.00 in the examination region in this way

they profited input yield proportion of 1:1.42 from mango filling in the investigation region (Rajan, 2016).

C. Plant protection measures

Gondkar *et al.* (2017), seen that the greater part (52.50 %) of the respondents were in middle age bunch, having (65.00 %) auxiliary to the higher optional degree of schooling and medium size of landholding (61.66 %). The greater part of the (57.50 %) of the respondents had 2 to 10.9 ha. of land under mango development, medium size of family (54.16 %), having low to medium degree of pay (79.16 %) and medium degree of involvement with mango development (77.50 %).

Table 5: Distribution and adoption of agriculture practices of integrated pest management.

Sr. No.	Practices	Adoption(N=100)		
		Complete	Partial	No
a.	**Ants**			
1	Prune the mango tree and remove all unnecessary branch es that provide a favorable environment for ants	16 (16.00)	15 (15.00)	69 (69.00)
2	Apply insecticides during heavy infestation	100 (100.00)	--	--
b.	**Fruitfly**			
1	Collect the infested fruits and bury them deep intothe soil to prevent the insect from completing its life cycle	70 (70.00)	16 (16.00)	14 (14.00)
2	Bag the fruits with appropriate bagging materials	--	8 (8.00)	92 (92.00)
3	Use "Rakshak" traps	80 (80.00)	13 (13.00)	7 (7.00)
4	Harvest fruits at the mature green stage since fruit flies Are attracted to them as soon as their surfaces become yellow	42 (42.00)	7 (7.00)	51 (51.00)
c.	**Mango thrips**			
1	Pruneor cut off excess branches to improve Aeration and to allow more light	16 (16.00)	10 (10.00)	74 (74.00)
2	Spray registered insecticides as a finemist	100 (100.00)	--	--
d.	**Mango leaf hopper**			
1	Light trapping before flower induction to reduce Initial leaf hopper population	8 (8.00)	2 (2.00)	90 (90.00)
2	Use of insecticides	100 (100.00)	--	--
3	Avoid excessive application of fungicides to Conserve beneficial fungi that attack the leaf hopper	50 (50.00)	47 (47.00)	3 (3.00)
4	Apply insecticides only when the reareat least Three leaf hoppers perpanicle	67 (67.00)	23 (23.00)	10 (10.00)

D. Marketing

Among the rancher's bunch, 56.7% of the ranchers have a place with the male class. Additionally, 43.3% of the ranchers have a place with the female class (Rosalin and Vinayagamoorthy 2014). Among ranchers bunch 30% ranchers has a place with Alluvial soil class, 28.6% of the ranchers have a place with Sandy topsoil classification, 23.4% of the ranchers has a place with others class and 18% of the respondents have a place with Red soil class (Masood *et al.*, 2011). Among ranchers bunch 13.4% of the ranchers are fixed the value interest and supply power, comparably, 42% of the ranchers are fixed with rivalry powers. 24% of the ranchers are fixed with the size of a mango. At long last, controlled cost fixed the mango cost to 20.6% of the ranchers (Biswas and Kumar 2011). Among ranchers bunch fulfillment in developing and advertising 34.6% of the ranchers have fulfillment in **Storage** climate conditions, 23.4 % of the ranchers have fulfillment in labor support, 18.6% of the ranchers have fulfillment in Credit offices, 13.4% of the ranchers have fulfillment in benefit and 10% of the ranchers have fulfillment in protection (Abdelazim *et al.*, 2011).

E. Imperatives saw in the reception of post-collect administration

Uncovered that the greater part of the ranchers was moderately aged and had a place with general rank, the greater part of the respondents were instructed matric to graduate and 33% of respondents had relatives up to 5. The vast majority of them were occupied with cultivating and almost two-thirds percent of the respondents had yearly pay above Rs. 1 lakh (Kaur *et al.*, 2017). The greater part of the ranchers had a place with a medium to the undeniable degree of financial status (Kumar *et al.*, 2015).

Temperature:	13°C±0.5°C
Relative Humidity:	90–95%.
Storage Period:	3-7 weeks.
Freezing Point:	-1°C.
Mango has a sensitivity to refrigeration, freezing and ethylene exposure.	

SUGGESTIONS

Simultaneously the financial improvement among the rancher has given a space for the genuinely necessary changes and these have assisted the ranchers with taking their choice in developing, advertising and surprisingly the choice towards the fares too. It is surely known that Indian farming is partitioned into different segments like agribusiness products, cultivation items and unified exercises. The cool storeroom will likewise decidedly add to improve mango efficiency.

- Agricultural credits ought to be given on delicate and basic agreements to little ranchers.
- Growers might be instructed about soil status economic situations to improve the benefit of mango natural products.
- The required data sources ought to be made accessible for, ranchers in required sum and at the ideal opportunity.
- Awareness ought to be made among the cultivating through media and expansion administrations concerning logical cultivating of Mango.
- Processing and assembling plants ought to be introduced for simple access of the ranchers. Where the ranchers could either sell their item at beneficial rates or make juices, jams, squashes and so on.

FUTURE THRUST AND CONTRIBUTION OF THIS STUDY

According to these realities, India has a decent and critical potential for expanding the creation, usefulness, and fare of the mango crop. Consequently, India should focus harder on expanding creation with predominant quality, upheld by positive fare advancement arrangements. Also, endeavors must be taken to make new markets and grow the exchange region to other worldwide major existing business sectors. Accordingly, India should focus closer on the selection of good fare advancement procedures need to advance to enhance the exchange region to different nations and to discover new business sectors other than extending the current market in significant bringing in nations.

India's mango is the best in the world due to a lot of variety, tests, and colors. Some important points that they help to popularize Indian mango in the world i.e. Warm Reception of Indian Mangoes in the USA. Anticipated that export should increment. Tasty taste, fragrance, and flavor. The ethnic decision for Indian Mangoes. European Population. Hispanic/Latino Population. Individuals from Tropical and Sub-tropical space of the World.

CONCLUSION

This investigation accentuated that it was vital to instruct mango makers on viewpoints like bug the board, illnesses and trickle water system needs, showcasing and refreshing data on Government approaches. Additionally, guidelines, monetary assets and appropriations to improve ranchers' presentation and decrease middle person mediation are critical. Likewise, the selection of proper gathering to promoting would assist with keeping up the nature of the ideal organic product, which would permit the maker to get better costs and high benefits while decreasing the misfortunes during the collection. Be that as it may, it likewise incorporates the formal and casual business connections between singular ranches. Foundation gives admittance to information and yield markets, admittance to rural administrations going from proceeding with training to counseling, just as including institutional courses of action, like the legitimate and financial frameworks.

Conflict of Interest. The authors decelerated that there is no irreconcilable situation among them.

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