



**SURVEY REPORT OF FARMERS ON VALUE
CHAIN ANALYSIS IN MANDYA DISTRICT OF
KARNATAKA**



Submitted by

**Hindustan Insecticides Limited (HIL)
A Government of India Enterprise
Scope Complex, 2nd Floor, Core-6
7, Lodhi Road, New Delhi-110003**

PREFACE

Papaya (Carica papaya) has attained an appreciable position among the fruits in considerations with health benefits as besides being a good source of minerals and vitamins it improves digestive system of human beings in complementation with the pancreatic secretions. In India total cropped area under papaya is 0.126 m. ha and a production of 5.51 million tons which is highest in the world. The average productivity of papaya in the country is 43.7 tons per ha. India contributes about 42.6% of world's papaya productions. This production is followed by Brazil at the 2nd position much lagged behind to a production of total 1.6 million tons. Only 0.08% of the total domestic production is exported and rest (99.92%) all is consumed within the country. India exports papaya mainly to Bahrain, Kuwait, Qatar, Saudi Arabia, UAE and Netherland. Among the papaya producing states of the country Karnataka ranks 3rd and accounts for 10.5% of total production of the country. The state produces 0.44 million tons of papaya from an area of 0.006 million ha with a productivity of 71.9 tons/ha. Major papaya growing belts of the state are Shimoga, Chitradurga, Mysore, Belgaon, Hassan, Bellary, Bedar, Bangalore. To an extent of 0.06 lakh tons of papaya is being traded in organized markets with average price as low as Rs 5.44/Kg. The principal markets of papaya are Delhi and Mumbai and other important domestic markets are Jaipur, Bangalore, Chennai, Kolkata and Hyderabad. This is to emphasize that no incentive to increase production will attract the farmers without improving marketing systems. Formation, execution and establishment of Farmer Producer Organizations (FPOs) as per guidelines contained in Small Farmers Agribusiness Consortium (SFAC) have to be done. This part rests with the major responsibility of the Mission for Integrated Development of Horticulture (MIDH). FPOs would be major organization to streamline marketing system and enable the papaya growers. to fetch the optimum price of their produce. The technology adoption gaps in papaya as per result of the study conducted of Gulbarga district of Karnataka state during 2013 indicated that 41.33% of the respondents belonged to medium technology gap category followed by 32% and 26.67% high and low gap category respectively. Higher gap in adoption of technology observed regarding control of diseases. The fruit being perishable in nature poses problem in marketing. Development of infrastructure facilities for transport to primary market and standardization of packing techniques are aspects which need special attention. Processing facilities also need to be created in the major producing states for value addition. Varieties in cultivation in Karnataka are Coorg Honey Dew, Coorg Green, Pusa Delicious and Pusa Nanha.

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Introduction

Papaya (Carica Papaya) is native to tropical America, from Southern Mexico through the Andes of South America. It was spread to the south by Indians, and throughout the Caribbean with Spanish exploration. The Spanish also carried it to Europe and the Pacific Islands. By the mid 17th century, papaya was distributed pan tropically.

Papaya is an evergreen, tree-like herb, 2-10 m tall, usually unbranched, although sometimes branched due to injury, containing white latex in all parts. Stem cylindrical, 10-30 cm in diameter, hollow with prominent leaf scars and spongy-fibrous tissue has an extensive rooting system. Leaves spirally arranged, clustered near apex of trunk; petiole up to 1 m long, hollow, greenish or purplish-green; lamina orbicular, 25-75 cm in diameter, palmate, deeply 7-lobed, glabrous, prominently veined; lobes deeply and broadly toothed. Flowers tiny, yellow, funnel-shaped, solitary or clustered in the leaf axils, of 3 types; female flowers 3-5 cm long, large functional pistil, no stamens, ovoid-shaped ovary; male flowers on long hanging panicles, with 10 stamens in 2 rows, gynoecium absent except for a pistillode; hermaphrodite flowers larger than males, 5-carpellate ovary; occurrence depends on the season or age of the tree. Fruits large, cylindrical, with fleshy orange pulp, hollow berry, thin yellowish skin when ripe, varied. Fruits formed from female flowers are oblong, spherical, pear-shaped; from hermaphrodite flowers, long, obovoid or pyriform. Seeds numerous, small, black, round, covered with gelatinous aril. Small latex vessels extend throughout the tree and are particularly abundant in fruit that has reached full size but has not yet begun to ripen.

Papaya comes into fruiting within 5 months and live for 4-5 years. Usually male and female flowers are on different trees, but some flowers are bisexual. Pollinating agents include various insects such as larger bees (Xylocarpa, Trigona), honeybees, long-tongued sphinx moths (Sphingidae), humming-bird moths (Macroglossa) and wind. With open (uncontrolled) pollination, a cultivar may lose its identity in a few generations.

Papaya grows satisfactorily in a wide range of areas from the equatorial tropics to temperate latitudes. However, it must be grown in warm, sunny sites sheltered from wind; preferably below 1500 m. Strong winds are detrimental, particularly on soils that cannot make up for large transpiration loss. Papaya is not frost hardy; exposure to frost or cold wind usually results in leaf damage and subsequent death of the tree. Roots are very sensitive to water logging, and even short periods of flooding can kill the plant. A range of well-drained soils with pH 5.5-7.0; poor drainage predisposes plants to soil borne diseases, must be provided irrigation in dry seasons hot, rainy, tropical lowlands,

temperatures 70-90° F; intolerant of freezing; high wind also causes damage by fruit loss, leaf damage or uprooting.

Ripe papaya is a favourite breakfast and dessert fruit that is available year-round. It can be used to make fruits salads, refreshing drinks, jam, jelly, marmalade, candies and crystallized fruit. Green fruit is pickled or cooked as vegetable or as a substitute for applesauce. About 60% of the ripe fruit is edible. The approximate content per 100 g edible portion is water 86.6 g, protein 0.5 g, fat 0.3 g, carbohydrates 12.1 g, fibre 0.7 g, ash 0.5 g, potassium 204 mg, calcium 34 mg, phosphorus 11 mg, iron 1 mg, sodium 3 mg, vitamin A 450 mg, vitamin C 74 mg, thiamine 0.03 mg, niacin 0.5 mg, and riboflavin 0.04 mg. The energy value is 200 kj/100 g. Major sugars are sucrose (48.3%), glucose (29.8%) and fructose (21.9%).

In some countries, papaya is grown in sizeable plantations for the extraction of papain, a proteolytic enzyme present in the latex, collected mainly from green fruit. Papain has varied uses in beverage, food and pharmaceutical industries: in chill-proofing beer, tenderizing meat, drug preparations for digestive ailments and treatment of gangrenous wounds. It is also used in bathing hides, degumming silk and softening wool. The latex yield can be about 70-130 kg of papain/ha per year.

Carapine, an alkaloid present in papaya, can be used as a heart depressant, amoebicide and diuretic. The fruit and juice are eaten for gastrointestinal ailments; a fresh leaf poultice is used to treat sores. The fresh root with sugarcane alcohol can be taken orally or as a massage to soothe rheumatism. A flower decoction is taken orally for coughs, bronchitis, asthma and chest colds. In some countries, the seeds are used as an abortifacient and vermifuge.

Health benefits of Papaya concisely read as under;

- Papaya is a tropical fruit high in vit C and A alongwith fiber and healthy plant compounds. It also contains an enzyme called papain, used to tenderize meat.
- Papaya has powerful antioxidant effects. This may reduce oxidative stress and lower the risk of several diseases.
- Early researches suggest that the antioxidants in papaya may reduce cancer risk and perhaps even slow the progression of cancer.
- Chronic inflammation is at the root of many desires. Papayas are very high in carotenoids that can reduce inflammation.
- Papaya has been shown to improve constipation and other symptoms of irritable bowel syndrome. The seeds and other parts have also been used to treat ulcers.

- The powerful antioxidants in papaya can help your skin recover from sun damage and may defend against wrinkling.
- Papaya is rich in fibre, vit C and antioxidants which prevent cholesterol buildup.
- Papaya helps in weight loss as it is higher digestive and low caloric fruit.
- Papaya boosts immunity.
- Great for eyes as it is rich in vit A.
- Protects against arthritis as it is anti-inflammatory alongwith vit C.
- Reduces risk of Age Related Macular Degeneration (ARMD) as Xeaxanthin present is papaya filters out blue light rays.

Papaya leaf juice benefits as;

- Treats dengue fever – increases platelets count.
- Treats malarial fever - through acetogenin compound found in papaya leaf.
- Heals liver diseases, jaundice and liver cirrhosis.
- Work wonders for diabetes as it regulates insulin production.
- Relieves from menstrual pain.
- Being rich in vit A & C boosts skin health.
- Promotes hair health, prevent baldness and thinning of hairs, used as anti-dandruff also.

Papaya Production Scenario in India in relation to Global Production

India is the largest producer of papaya, contributing 42% of world production from 30% of the global area under papaya cultivation as per an FAO report for 2012. Papaya production in India during last fifty years can be divided into two phases: pre-World Trade Organization (WTO) until the early 1990s with predominantly dioecious cultivars when the country followed Nigeria, Mexico, Brazil and Indonesia and post-WTO after the mid-1990s when India became the world's largest papaya producer. Major changes in papaya cultivation occurred in the post-WTO period with the adoption of a gynodioecious cultivar 'Red Lady' which produced good quality, marketable fruits under moderate PRSV-P (*Papaya ringspot virus-P*) incidence. Cultivation improved with good agricultural practices, robust domestic demand and adequate seed supply. The area under papaya cultivation was 1.9% of the total area under fruit cultivation and its production was 6.6% of India's total fruit crops in 2012-2013. Papaya gave the highest per unit area yield (41 t ha⁻¹) among fruit crops. The area under papaya cultivation in India and its production grew at a compound annual growth rate (CAGR) of 6.2 and 7.1%, respectively, during last five decades. Yield of papaya increased five times from

7.7 t ha⁻¹ in 1985 to 40.1 t ha⁻¹ in 2013 at a CAGR of 6.8%. Presently, major papaya production comes from Southern and Western India. The most common channel of papaya marketing was “producer-agent-wholesaler-retailer-consumer.” Despite being the world's largest producer, India exported only meagre quantities of papaya. Future expansion of papaya cultivation is likely to succeed in the areas having congenial climate and less PRSV-P pressure. Considering the industry's growth rate of the last twenty years, its production is likely to reach 5.2 million t in 2020 and 6.8 million t in 2030. However, India's dependence on one cultivar is risky. Concerted efforts are required to provide more cultivar options to the farmers.

Papayas are grown in around 60 countries, with the bulk of production occurring in developing economies. Table 1 shows production figures over the last decade. The global production of papaya was 10.5 million tonnes during 2009- 10, which is estimated to increase to 12.5 million tonnes during 2012- 13. This growth in production has been accompanied by an increase in productivity from 14 tonnes to 26 tonnes per hectare. India is the largest producer of papaya fruit, having increased its share in world production to 37 per cent in 2009-10. The other major papaya producing countries are Brazil, which accounts for 17.1 per cent of the world's harvest, followed by Indonesia with 7.3 per cent, Nigeria with 7.2 per cent and Mexico at 6.7 per cent.

Table 1
Top 5 Papaya Producing Countries in the World

Countries	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
India	2,147,200	1,692,100	2,535,100	2,139,300	2,482,100	2,909,000	3,629,000	3,911,600	4,713,800
Brazil	1,597,700	1,714,590	1,612,350	1,573,820	1,897,640	1,811,540	1,890,290	1,792,590	1,871,300
Indonesia	605,194	626,745	732,611	548,657	643,451	621,524	717,899	772,844	695,214
Nigeria	755,000	803,275	859,359	755,500	759,000	765,000	688,782	763,619	703,800
Mexico	876,150	955,694	787,663	709,477	798,589	919,425	638,237	707,347	616,215

Source : [3]

Table 2
Top 5 Papaya Exporting Countries in the World

Countries	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Mexico	68,558	74,814	96,525	83,159	94,891	101,306	90,316	134,960	120,635
Brazil	28,541	39,492	35,930	38,757	32,475	32,267	29,968	27,554	25,562
Belize	11,307	16,886	28,751	28,635	34,475	33,341	28,967	27,152	30,137
Malaysia	60,892	71,473	58,149	42,008	50,545	26,938	24,168	24,301	25,686
India	3452	3550	3475	6434	10,344	10,880	13,834	17,573	15,435

Source : [3]

Trends in the global exports of papaya

Globally, papaya exports went up over the period from 2002-03 to 2010-11, although the growth was somewhat erratic. Total exports in 2009-10 were about 268,476 mt. and the estimated value was \$197.2 million. Although the quantity traded internationally has been consistently increasing, it still represents only a small share—less than 3 per cent of the global production of papaya. The performance of three exporting countries, Mexico, Brazil, and Belize, is shown in Table II. These dominated the papaya export market in the world during the period 2002-03 to 2010-11. During that period, Mexico was the leading papaya exporter, contributing about 41 per cent of the world's papaya trade, while Brazil and Belize accounted for about 11 per cent of the trade. Other major papaya exporting countries include Malaysia, India and the United States. India's relatively small export volumes go to UAE, Netherlands, Saudi Arabia, USA, Germany, Britain and Bahrain. India exported 17,925 mt. of papaya during 2009-10 [3].

Indian agriculture goes back thousands of years. At present, in terms of agricultural production, the country holds the second position in the world. In India, the major papaya producing state is Andhra Pradesh, which contributes around 38 per cent of the country's produce. Its annual output is 1.5 mt, with a yield of 80 tons per hectare. It is followed by Gujarat, which produced 832,000 tons in 2009-10, followed by Karnataka, West Bengal, Chhattisgarh, Madhya Pradesh, Assam, Kerala and Tamil Nadu. Of these, the top four states alone accounted for 79 per cent of the total papaya production in 2009-10. Among these fruit-growing states, papaya occupies a special place. Like banana, it is available throughout the year and is very easy to cultivate. It produces the highest income per unit area, next to banana. An the area under papaya cultivation in India is 133 thousand ha and its production is 5639 thousand MT with a productivity of 42.3 thousand MT/ha. Among be total fruit production in India papaya contributes 6.3% share. Among be papaya producing states of the country Karnataka ranked 3rd in producing papaya in the country and accounts for 10.5% of the total papaya production. The state produces 0.44 m. MT of papaya from an area of 0.006 m. ha with productivity of 71.9 MT/ha. Major papaya producing belts in the state are Shimoga, Chitradurga, Mysore, Belgaum and Hassan. 0.06 lakh MT of papaya has been traded in organized markets with average price of Rs. 5.44 /kg[4,5]

[3] Dr. M. ThamaraiKannan C. Sengottuvel (2012), Market Survey, Facts for You, Dr M. ThamaraiKannan is associate professor, Department of Commerce, Sri Vasavi College, while C. Sengottuvel is assistant professor, Department of Commerce CA, Nandha Arts and Science College, Erode.

Major problems in papaya production

The various problems faced by Indian farmers while cultivating papaya are:

1. Low productivity due to the traditional cultivation practices of local varieties
2. Problems of plant diseases, particularly threat from a new kind of pest called 'mealy bug', papaya mosaic virus and papaya ringspot virus.
3. Lack of awareness on post-harvest handling and marketing
4. Non-availability of high-yield varieties of papaya fruit
5. Ineffective and inefficient promotional activities

Measures needed

1. In order to improve productivity, it is essential to introduce high-yielding varieties and adopt modern technologies in production methods; take remedial measures to control crop diseases; introduce environment-friendly methods; and provide good training programmes to farmers on recommended pre- and postharvest treatments.
2. Set up better cold storage facilities to improve marketing efficiency
3. Promote not only papaya but also its value-added products
4. Develop blended papaya leather to enhance the fruit's commercial value and provide a diversified product range in the market
5. Convert the papaya fruit into juices, blended beverages, jam, jelly, fruit bars and candy
6. Institute national awards for excellent performance, particularly for small farmers who have demonstrated very high productivity over a period of time

[4] Indian Horticulture Data Base 2014

[5] Indian Horticulture Data Base 2010-11

National Horticulture Board, Ministry of Agriculture, Govt. of India.

Profile of Mandya District

Mandya District is one of the most agriculturally prosperous districts in Karnataka. With the advent of irrigation from the K.R. Sagar reservoir (During 1930's), there was substantially marked transformation in cropping pattern, composition of crops, better grown yield level, ultimately leading to better economic conditions of the people.

The total geographical area of the district is 4,98,244 Hectares, out of which 2,48,825 Hectares forms the sown area. More than half of the total land area in the district is put to agricultural use. The total irrigated area is 1,16,901 Hectares out of which around 88,000 hectares is being irrigated by K.R.Sagar and around 16,000 by Hemavathi reservoir. The rest of the land is irrigated by other sources like tanks, wells and borewells.

Statistics on Agriculture in Mandya

Crops and Climate:

The major crops of the district are ragi (85,467 ha.), rice (79,892 ha.), sugarcane (30,630 ha.) , pulses (predominantly horse gram and to some extent tur, cowpea, green gram, black gram, avare) and oilseeds (mainly groundnut and sesame).

Agriculture is the main activity in the district. It is dependant on rainfall, river, well and tank irrigation. Other major agricultural crops are Jowar, Maize and Horse gram.

The details of food crops grown area wise, and taluk wise and the details of production are as follows:

In the district, the major commercial crops are sugarcane sunflower and groundnut.

Majority of Geographical area of Mandya district is covered by Cauvery basin and agriculture in the district is classified under agro-climatic zone 6 (Southern dry Zone)

The crop sowing periods are early kharif, late kharif and summer. The average annual rainfall is 700m.m.The district gets bimodal distribution of rainfall. Generally the first peak is during April, May and the second during September, October. The month of June is known for dry spell.

IRRIGATION:

The district is blessed with irrigation from two major reservoirs, Krishnaraj Sagar and Hemavathi. Besides these, there are number of anecut channels. Anecut is a low level barrage constructed across the river. The Cauvery basin is know for extensive system of low level barrages built during the 19th century and early parts of 20th Century. Hemavathi left bank canal is irrigating parts of K.R.Pet, Nagamangala, Pandavapura and Mandya taluks. In all, about 48% of the total area in the district is irrigated from all sources of irrigation

AGRICULTURAL INFRASTRUCTURE

Agriculture Research , Education and Extension

A regional research station of the University of Agriculture, Bangalore is located in Mandya (V.C. Farm) with 600 acres of research farm. Research is carried on all major crops of the district. The Research station has developed and released several high yielding, hybrids and productive packages which are popular not only in the district but also elsewhere in the State.

Mandya has its own Agricultural College with an annual intake of 50 students for the B.Sc. (Agriculture) course. The University has proposed to begin Ph.D. programmes in selected disciplines in agricultural science. The agricultural college in Mandya has produced outstanding B.Sc. (Agriculture) graduates. The College Campus and Research station are both located opposite to each other and the students get valuable inputs from the Agriculture Scientists.

Department of Agriculture in the district carries out the main function of agricultural extension, spread of technology and know-how on agriculture among farmers. Establishment of the R.S.K. (Raitha Samparka Kendra) at Hobli level, is the key element in the restructuring of the activities of the Department. There are 31 R.S.K.s in the district. (1 each in the revenue Hoblies in the district) Farmers visit the R.S.K. both for information on crop production and for purchase of inputs at subsidized rates. From the year 2001-02 R.S.K. is also the sale point for the sale of seeds of Karnataka State Seed Corporation (KSSC). The concept of RSK is highly appreciated by the farmers as both information and inputs are available at the same premises.

Training Infrastructure:

Mandya district is unique in having a renowned training centre - RDTC (Rural Development training Centre). The Centre trains farmers, farm women, under the Women Youth Training Extension Programme (W.Y.T.E.P.). Extension functionaries of the Agriculture Department are also trained. Established in 1952, the centre is getting ready to celebrate its golden jubilee.

Indo-Japan Agriculture Extension Training Centre (I.J.A.E.T.C.), Mandya is the only centre of its kind in the state established with the assistance of Japanese government during 1970's, to organize training programmes both to officers and farmers of Mandya and the rest of the state, on various aspects of rice production.

The Agricultural School at Somanahalli organizes three months' training to farmers, on agriculture and other related fields viz. Animal Husbandry, Horticulture, Watershed Development and Sericulture. Annually three batches are trained with an intake of 24 per batch.

Besides, the Vijaya Bank Self Employment Training Institute, established recently in Mandya by the Lead District Bank (Vijaya Bank) is also providing training support to the farmers of the district.

Infrastructure relating to agricultural inputs

Karnataka State Seeds Corporation is the main supplier of seeds in the District. The Corporation has been organizing certified seed production through their registered seed growers. The seeds so grown are processed in their seed-processing unit in Mandya. Annually the Corporation handles around 15,000 quintals of seeds, predominant being rice. Karnataka Agro Industries Corporation (KAIC), a public sector organization, supplies bulk of the requirement of fertilizer and plant protection chemicals through their outlets (agro Kendra numbering 9 in the District). Besides the KAIC, the Karnataka State Co-Operative and Marketing Federation (KSCMF), a co-operative organization, through a network of 214 Co-operative Societies, also supplies agricultural inputs to farmers. The Rayatha Agricultural Produce Co-operative and Marketing Society (RAPCMS), another co-operative organization, manufactures and supplies agricultural implements which are popular in the District.

Agricultural Credit: - Mandya District is known for a network of healthy co-operative institution which provides timely short, medium and long term loans to farmers. The Vyavasaya Seva Sahakari Sanghas at the village level provide short term crop loans and medium term agricultural development loans to the farmers. These Societies in turn borrow from the District Central Cooperative Society. In all, there are 214 co-operative societies devoted to agricultural credit. Apart from the Cooperative societies commercial banks and regional rural banks (known in Karnataka as Grameena Banks) also provide short term and medium term loans for agriculture development. The Primary Cooperative Agricultural and Rural Banks, one at each Taluk, provide long term finance for agricultural development.

Agro based industries:-

Rice and sugar cane are the main crops, wherein farmers manage to get some marketable surplus. In the District there are 35 Rice mills and 4 Sugar factories. There are 532 Jaggery units which also help in consuming sugar cane produced in the district. The annual production of sugar in the four sugar factories is 26,00,000 metric tonnes and jaggery produced by the Khandasari units is 10,00,000 metric tonnes.

Other service institutions in the Department of Agriculture:

1) Soil Health Centre: Routine Soil Sample analysis for PH salt concentration, organic carbon, P2O 5 and K2O is carried out free of cost in the soil health centre of department located in Mandya. Besides this, on payment of a nominal service charge micronutrients are also analyzed. The micronutrients analyzed are zinc, iron, molybdenum, manganese etc.

2) Bio Control laboratory:- The District has the pride of establishing the parasite laboratory for the production of Trichogramma Egg parasite against sugar cane early shoot borers. In view of environmental hazards caused by chemical insecticides the use of environment friendly bio control agents is becoming increasingly popular. Annually, 16825 Corcyra eggs are produced

and distributed to farmers on a nominal cost of Rs.4 per acre. Farmers from far off districts are also receiving the parasites from our laboratory.

Horticultural Resources

The major fruits grown are Jack fruit, Watermelon, Papaya, Mango and others.

The major vegetables grown are Tomato, Gourd varieties, Brinjal, ladies finger, leaf vegetables and others.

Major Plantation crops are Coconut and Areca nut.

Major livestock resources are Cows, Poultry, Sheep, Goats, Buffaloes and others.

Objectives of Survey

The main objectives of the studies are as follows:-

- ❖ To understand on-farm and off-farm constraints.
- ❖ To identify the factors affecting supply chain of Fruits & Vegetables.
- ❖ Maximize growers gains/income.
- ❖ Minimize processing loses and value addition in supply chain of Fruits & Vegetables.
- ❖ Reducing the number of intermediaries in the supply chain of Fruits & Vegetables.
- ❖ To suggest mitigation strategies for the identified challenges in Supply Chain of Fruits & Vegetables.

Survey Materials and Parameters

A survey with the aforementioned objectives was under taken by us under the directives of Hindustan Insecticides Limited (HIL). The survey was based in Mandya District of Karnataka. Papaya was selected as the commodity for studying value chain analysis in Mandya, Karnataka.

A total of 2704 surveys of farmers were conducted in Mandya District of Karnataka. The distribution is given below.

State	District	Commodity	No. of Farmers Surveyed	No. of Traders Surveyed	Total Surveys
Karnataka	Mandya	Papaya	2704		2704

A total of 15 villages were selected for conducting this survey based on the average number of banana farmers in the villages. Surveyors with marketing and agricultural background and experience were selected for this survey.

Frequency of answer to a particular question in the questionnaire was computed and the percentage of frequency out of persons interrogated were also computed in order to present the result of the survey. Calculation of frequency and percentage as mentioned above was done on all India basis and the results and conclusion are given

Approach and Execution

Approach:

SELECTION CRITERIA ON LOCATION & ROUTE MAPPING



- Identification of the villages in consultation with state horticulture department
- Selection of villages showing substantial banana production
- To collect a survey of different farmers in a village

IDENTIFICATION & TRAINING



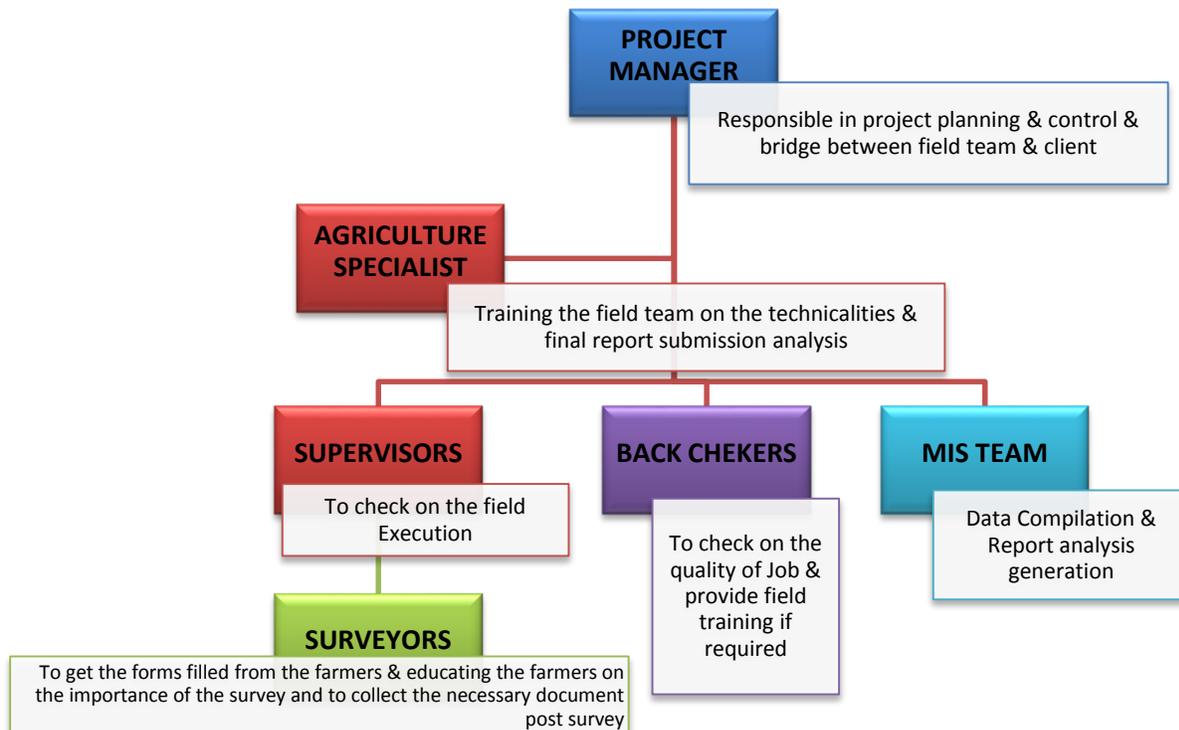
- Identification of local team
- Providing them a day training
- Educating them what is the importance of the questionnaire and how it is to be filled
- Mandates post filling up the survey(complete form filled by the farmer, attestation by the farmer(Signature /thumb impression), ID Proof, Photograph

EXECUTION & MONITORING



- Placement of Supervisors to check the execution of the field team
- Field Monitors/ back checkers on the quality check of the filled forms
- Train the team if additional training is required

Controlling Mechanism:



Detailed Analysis Report

Farmer Profile

Age Profile

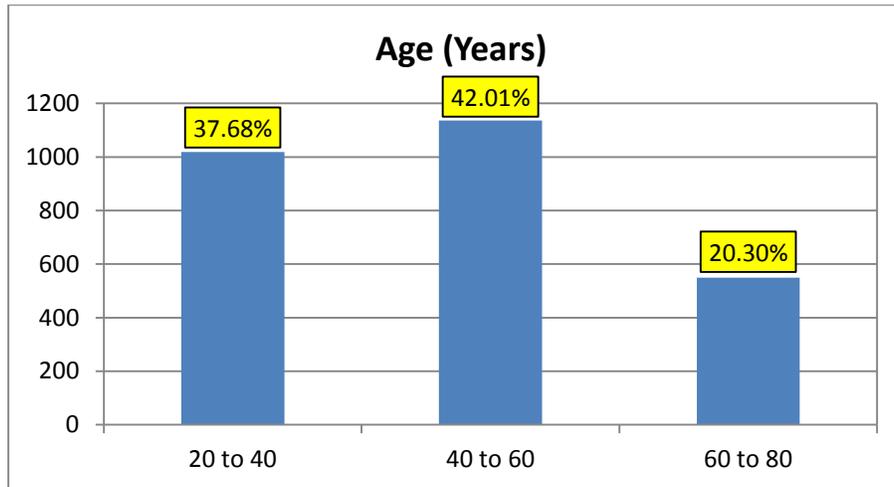


Figure 1: Age Profile of the Farmers surveyed

Age profile of the 2704 farmers surveyed in Mandya district indicated that 37.68% of the farmers engaged in agriculture belonged to age group of 20 - 40 years 42.9% in the age group of 40 to 60 years and 20.3% were the senior citizens engaged in agriculture from an age group of 60 to 80 years. This age distribution and agriculture occupation did not appear to show any definite correspondence, however, middle age group, 40 - 60, showed a greater proportion.

Asset Profile of the Farmers

Asset Profile - Land

Land asset profile of 2704 farmers surveyed in Mandya indicated that 95.7% of the cropped area was owned by the farmers whereas 3.6% of the farmers had taken cropped area in-lease and 0.7% area they leased out.

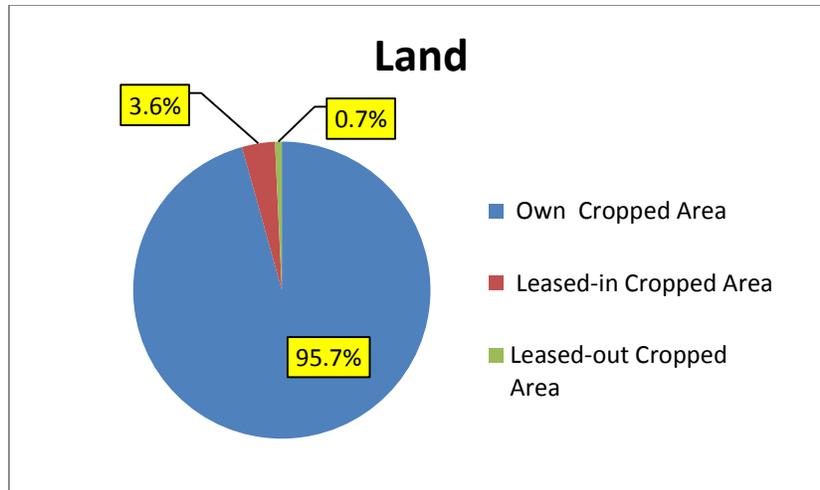


Figure 2: Area profile of surveyed farmers

Land Profile of the Farmers

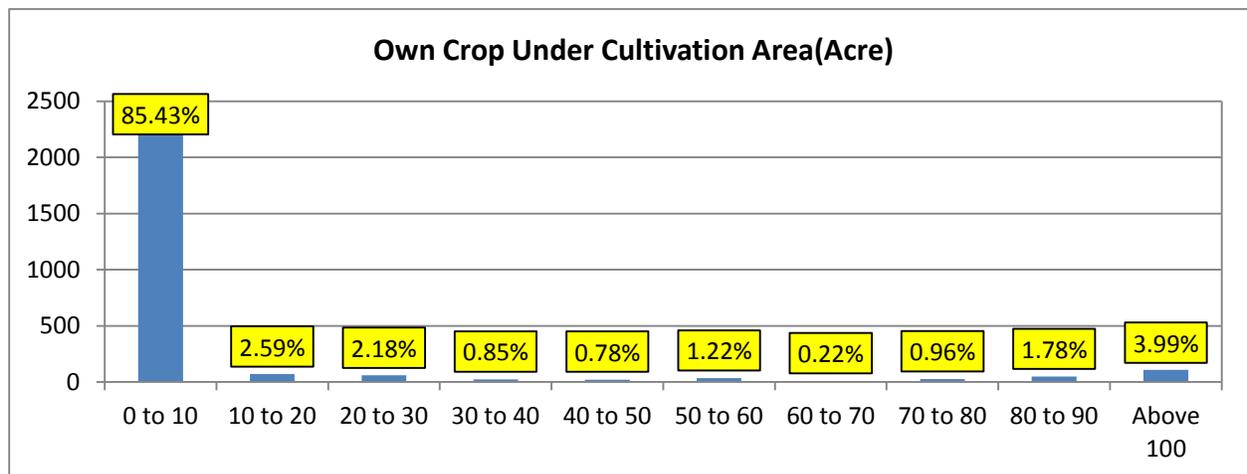


Figure 3: Distribution of farmers under different land holding groups

Information regarding own cropped area under cultivation indicated that 85% of the farmers were having area less than or equal to 10 acres, 2.59% were having 10 to 20 acres land area, 2.18% were having 20 to 30 acres and likewise in decreasing trend of farmers. 3.99% of the farmers, however, showed to have an area above 100 acres.

Regarding leased-in cropped area as the 97 farmers were having leased-in area, it could be evident that 87.63% of those farmers who had leased in area had area of 10 acres or below on lease, 4.12% of farmers had leased-in area of 10 to 20 acres. This is also to note that 3.09% of the farmers were having leased-in area above 100 acres.

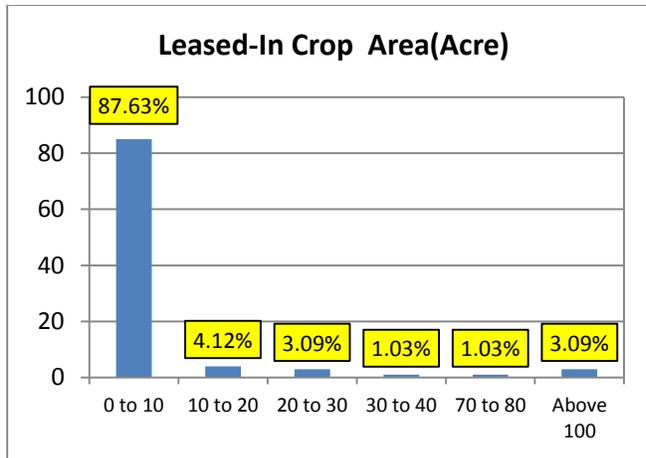


Figure 4: Farmers under different groups of leased-in orchard area

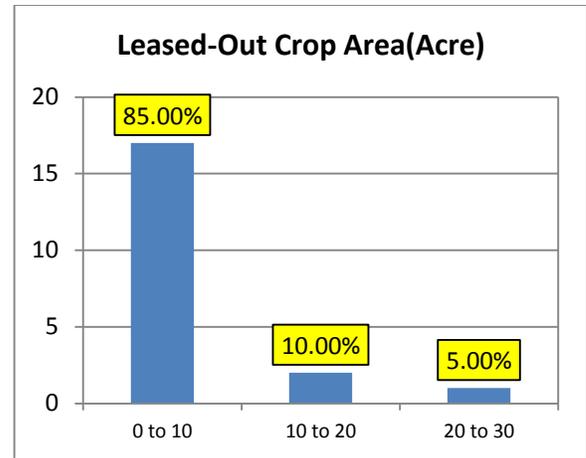


Figure 5: Farmers under different groups of leased out orchard area

Out of 2704 farmers only 20 farmers leased out their land. Out of those farmers 85% farmers leased out 10 acres each or less than that, 10% leased out from 10 to 20 acres each and 5% of the farmers leased out from 20 to 30 acres.

Physical Assets

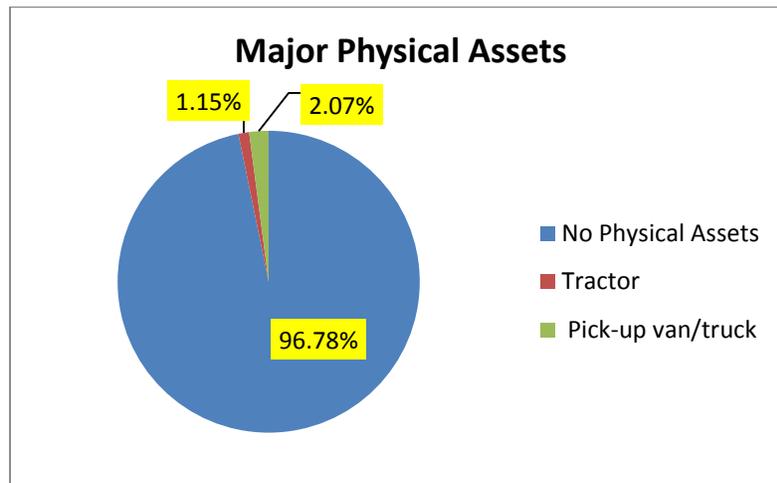


Figure 6 : Physical Assets of the farmers

Data for physical assets indicated that 96.78% of total farmers surveyed did not have any major physical assets, 2.07%, however, were having pick up vans and 1.15% only were having tractors as a major physical asset.

Major Marketing Constraints

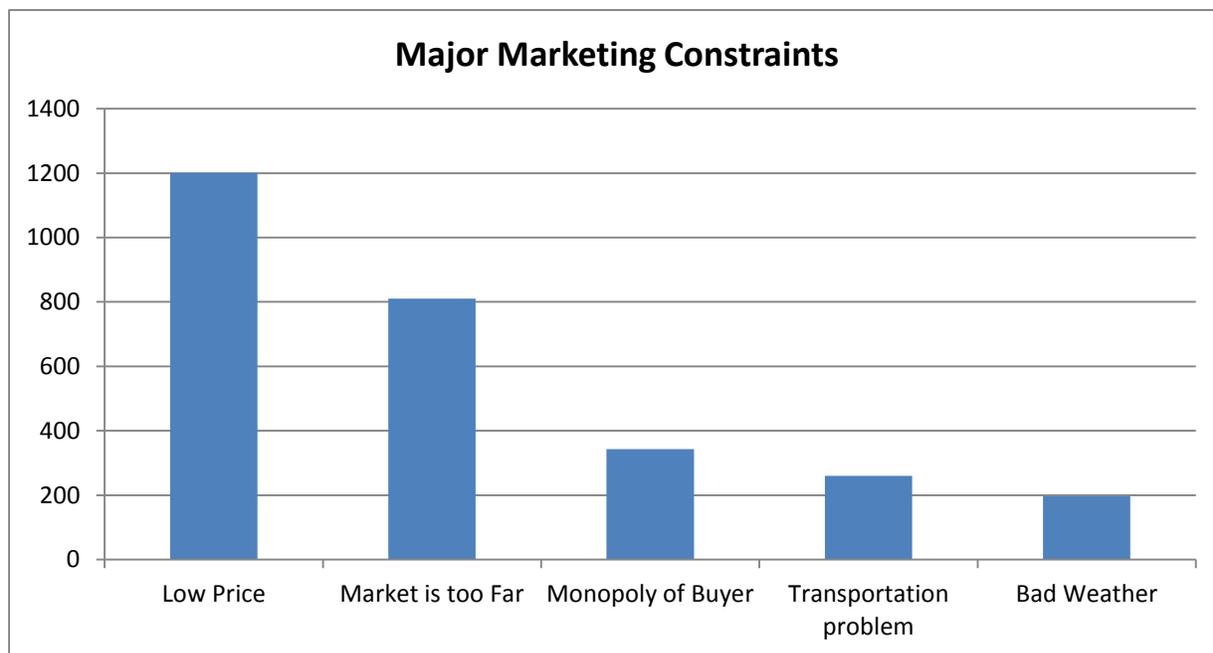


Figure 6: Major Marketing Constraints of Farmers of Mandya

Major marketing constraint was recorded to be low price and it is hardly controllable at farmers' end. Lack of price rate information in distant markets is also important constraint which could be taken care of by setting up information booths and through audio visual aids. Also setup of new markets can be taken into consideration as the market was far for the farmers. Due to low number of buyers there was it was observed that there was a monopoly of buyers. Inadequate, improper and untimely transportation which could be realized problematic in marketing. This is followed by bad weather.

Outcome of Survey on Papaya Production in Mandya district

The survey team reported that only four of the entire farmers (2704) grew papaya that too in a very less area. The inferences may hardly be drawn from such a small sample size. Rather, farmers overwhelmingly grew ragi (Eleusine coracana) which is a nutritious smaller millet and grown in kharif season, in general. On asking during conversation whether they are interested in cultivation of papaya fruit they admitted in affirmative if the purchasers are available they may like to opt for that. Since, they are not cultivating papaya at present, therefore, asking about the production and marketing constraints would be a spurious question. However, one of major marketing constraints what they have conceived is the non-availability of market / buyers.

As per secondary data, various reports exemplified as database of National Horticulture Board, Ministry of Agriculture, Govt. of India have included Mandya as one of the potential growing belts of papaya cultivation in Karnataka, therefore, it appeared to be feasible to say that there is a lot of scope to initiate and intensify papaya cultivation in a mixed cropping pattern under Agro-Horti system. Moreover, sandy loam soil, reasonably warm climate and less water requirement as required for ragi are fairly good for papaya which justifies that intensification of papaya cultivation may be a successful attempt in Mandya. Also a scope of sole cropping always exists in papaya cultivation, however, mixed cropping would be more remunerative. Suggested crop mixtures may be exemplified as ragi + papaya, ragi + Cajanus + papaya, mungbeen + Cajanus + papaya and Cajanus + papaya. Growing of a pulse crop in Agro-Horti system appeared important as it provides an opportunity to enrich soil nitrogen profile while target crop is in the field.

Projected Production Constraints and Remedy thereof

Farmers may likely face following production constraints when they cultivate papaya in their fields as those constraints are prevailing in Karnataka [1].

- Virus attack
- Small land holdings

[1] Hemambara, H. S. and yogesh, M.S. (2014). Production and Marketing Problems of Papaya growers in North Karnataka. IOSR J. Business Management, 16 : PP 20-23.

- Labour intensive
- Water scarcity
- Duplication of seeds
- Power supply
- Technical know-how

In addition to above following constraints conceived may also be taken care of which are expected to be faced by the grower.

- low productivity in the beginning
- threat from mealy bug, papaya ringspot virus – P and papaya mosaic virus (CPMV)
- problems in postharvest handling

Indian council of Agriculture Research and State Agricultural universities have already been entrusted to carry out researches on most of the constraints for example developing varieties resistant to diseases and insects, finding out agronomical packages for higher productivity of papaya and to disseminate a technology to the fruit growers. Duplication of papaya seed is non-scientific practice and it has to be overcome by the growers themselves by purchasing new seed / seedlings. The new seed materials / seedlings may be purchased from a trusted seller / nursery. New seed materials obtained through controlled pollination or its seedling every time is required in papaya planting because papaya is a highly cross pollinated dioecious crop and genetic purity may hardly be maintained by use of uncontrolled papaya seed production. In accordance to same justification and faster propagation tissue culture technology is also required. Any one of the high yielding varieties may be selected out of following varieties as given herewith. These are namely Honey Dew, Coorg Honey Dew, Washington, Pusa Delicious, Pusa Majesty, Pusa Dwarf, Co-1 to Co-7 and Taiwan. This is to mention that a variety 'Red Lady' the seed of which has been introduced from Taiwan has shown a miracle in India, especially, in Tamilnadu [2]. A progressive farmer has been able to earn about Rs. 2,30,000 as a gross income from his 600 trees in 1.5 Years [2]. In another study two farmers one from Maharashtra and another from West Bengal gained net profit of Rs. 5,03,500/ha and Rs. 4,20,000/ ha only respectively by using balanced nutrients [3]. Also in another study a net profit from papaya cultivation from the medium and large farms was obtained to be Rs. 2,47,381/ ha in Bidar district of

[2] S. Rajaratnam, No. 23/14 – Karuppayamal Jhottam, Vellipalayam road, Mettupalayam, Tamilnadu – 641301, Web : edenurserygardens.com, mobile : 09486094670 and 9486094660

Karnataka [4]. Papaya doesn't require much irrigations. An irrigation is required when only drying of the soil surrounding the plant appear to initiate. The initial investment to plant an orchard is only once that too is comparatively less as compared to other crops. Moreover, planting of an orchard comes under Govt. support as per MIDH operational guidelines. The financial support from the Govt. may be utilized to mitigate financial stress which likely hinder in developing of an orchard. Power supply and labour problems are the local ones and have to be overcome at the domestic level.

Projected Marketing Constraints

As per an statement of a progressive papaya grower of Tamilnadu a ready market for produce becomes a big bonus for growers. "Whatever be the crops grown availability of an immediate selling point and a good price from a prompt buyer encourages a farmer to grow more," [3]. The projected marketing constraints of papaya as essenced out from a survey done for North Karnataka state as a secondary data [2] may be read out as under which, probably, may also be applicable to Mandya districts as well in addition to those which are self conceived.

- Markets far away from farms
- Storage problems
- Price fluctuations
- High Commission
- Lack of availability of market information
- Lack of skilled labours for packing

Immediate Solutions to Create a Ready Market

Problem of distant market is very much common problem for fruit growers almost in the entire country. Any of the fruit growers do not like to face the problematic means of transportation on which he does not have a control. This is the reason as to why every grower requires a short distant market. There is a good mandi in Mandya under Karnataka state Agricultural Produce Market Committee (APMC) situated at V.V. Nager, Kollahalli, Mandya - 220792. This mandi, however, is not involved in papaya produce

[3] Biswas, B.C. (2010). Success Stories of Papaya Farmers. Fertilizer Marketing News. 41 : PP. 15-18.

[4] Javedmiyan and Dinesh Kumar (2017). Economics of Papaya in Bidar district of Karnataka. J. Pharmacog. and Phytochem., 6 : 879-88.

marketing, simple reason being there is no production of papaya in the state. In order to initiate papaya production in the state, Govt. has to look into that fruit growers may not get deprived due to non-lifting or say non-selling of their produce. For this Govt. has to take initiative regarding following two points.

- Identification of traders from APMC mandi at Mandya for collecting the farmers produce paying them promptly taking a baseline of wholesale market price available with APMC for Karnataka state, adjusting their commission and fringe expenses occurred in packing and transportation. The production of papaya may lead to generate demand in the area for self consumption and the local market by and by will take an effective and functional shape for marketing of papaya.
- Establishment of liason between traders of Mandya and papaya traders of Bengaluru mandi. Bengaluru mandi under Karnataka state Agricultural Produce Market (APMC) Committee is situated at Mill complex, Binnypet, Agarhar Tank Bond Road, Bengaluru, Karnataka - 560023. The distance of mandi of Mandya and this mandi at Bengaluru is 106 km by road. The papaya produce may also be well transported to that mandi for a total disposal.

Long Term Remedy of Marketing Constraints

The most important means of mitigating several marketing constraints at a time in one stroke is formation and establishment of FPOs and making them functional. A national policy for the promotion of farmer produce organization has already been detailed in Small Farmers Agri Business Consortium (SFAC). The national policy has a vision oriented mission to promote economically viable, democratic and self governing Farmer Producer Organization (FPOs). The mission delivers several functional modes including to provide required assistance and resource – policy action, inputs, technical knowledge, financial resources and infrastructure in order to strengthen these FPOs. SFAC document may be referred for process guidelines for promotion of FPOs. A Farmer Producer Organization (FPO) embodies a set no. of member fruit growers and provides many services which concisely may be given hereunder.

FPO Service Model

The FPO will offer a variety of services to its members as illustrated in the table. It can be noted that it is providing almost end-to-end services to its members, covering almost

all aspects of cultivation (from inputs, technical services to processing and marketing). The FPO will facilitate linkages between farmers, processors, traders and retailers to coordinate supply and demand and to access key business development services such as market information, input supplies, and transport services. Based on the emerging needs, the FPO will keep on adding new services from time to time.

The set of services include Financial, Business and Welfare services. An indicative list of services includes:

Financial Services: The FPO will provide loans for crops, purchase of tractors, pump set, construction of wells, laying of pipelines.

Input Supply Services: The FPO will provide low cost and quality inputs to member farmers. It will supply fertilizers, pesticides, seeds, sprayers, pumpsets, accessories, pipelines.

Procurement and Packaging Services: The FPO will procure agriculture produce from its member farmers; will do the storage, value addition and packaging.

Marketing Services: The FPO will do the direct marketing after procurement of agricultural produce. This will enable members to save in terms of time, transaction costs, weight losses, distress sales, price fluctuations, transportation, quality maintenance etc.

Insurance Services: The FPO will provide various insurance like Crop Insurance, Electric Motors Insurance and Life Insurance.

Technical Services: FPO will promote best practices of farming, maintain marketing information system, diversifying and raising levels of knowledge and skills in agricultural production and post-harvest processing that adds value to products.

Networking Services: Making channels of information (e.g. about product specifications, market prices) and other business accessible to rural producers; facilitating linkages with financial institutions, building linkages of producers, processors, traders and consumers, facilitating linkages with government programmes.

MAJOR FINDINGS OF SURVEY

Major Findings of the Survey

- Out of 2704 farmers surveyed in Mandya district, farmers of age group of 40 to 60 years were found to be in a greater frequency. Age and agriculture occupation did not show a definite correspondence.
 - As for land assets, 96% of the farmers' cropped area was their own and 3% leased in.
 - 85.43% of the farmers were having an area of 10 acres or less than that, meaning thereby, a majority belonged to small farmers group.
 - Regarding physical assets 96.78% were not having any major physical asset, 2.87% showed to have pick up vans and 1.15% each reported to have a tractor.
 - The aforementioned cropped area belonged to under cultivation of ragi (Eleusine coracana).
 - Farmers are ready to cultivate papaya as well, however, they have reservations to opt because of lack of buyers.
 - Source of seedling for an improved exotic variety, Red Lady, maybe procured from a progressive farmer from Tamil Nadu. His nursery has been identified as, "New Rural Industry" under the National Innovation Project of ICAR, New Delhi and is also is a registered member in the Agri Business Incubator model of Tamil Nadu Agricultural University, Coimbatore. The address of the progressive farmer is Mr. S. Rajarathnam, No 23/15- Karuppayamal Jhottam, Vellipalayam road, Mettupalayam, Tamilnadu – 641301, Web : edenurserygardens.com, mobile : 09486094670 and 9486094660
 - A mandi is operative at V. V. Nagar, Kollahalli, Mandya - 220792 under state APMC, but papaya marketing lacks therein.
 - For developing a ready market of papaya following suggestion have been putforth for consideration and execution in the part of Govt.
1. Identification of traders from APMC mandi at Mandya for collecting the farmers produce paying them promptly taking a baseline of wholesale

market price available with APMC for Karnataka state, adjusting their commission and fringe expenses occurred in packing and transportation. The production of papaya may lead to generate demand in the area for self consumption and the local market by and by will take an effective and functional shape for marketing of papaya.

2. Establishment of liason between traders of Mandya and papaya traders of Bengaluru mandi. Bengaluru mandi under Karnataka state Agricultural Produce Market (APMC) Committee is situated at Mill complex, Binnypet, Agarhar Tank Bond Road, Bengaluru, Karnataka - 560023. The distance of mandi of Mandya and this mandi at Bengaluru is 106 km by road. The papaya produce may also be well transported to that mandi for a total disposal.

PROJECTED SUPPORT - RECOMMENDATIONS

Projected Support from Govt. / MIDH

A substantial support is required from Mission for Integrated Development of Horticulture to initiate and fortify papaya cultivation in Mandya distt., Karnataka state and streamline the marketing chain in order to enhance the income of growers. The support category is detailed hereunder.

Sl. No.	Item	Pattern of Support/Assistance
1.	PLANTATION INFRASTRUCTURE DEVELOPMENT	
	<u>1(a). Production of Planting Materials</u>	
	(i) Hi Tech Nursery	Public sector owned Hi-Tech Nursery is required to be established.
	(ii) Small Nursery	Small nurseries in the private sector have to be established. Financial support in terms of credit linked back ended subsidy of cost may be awarded.
	(iii) Setting up New Tissue Culture (TC) units	New Public sector owned Tissue Culture units are required to be established especially to multiply as such a promising material.
	(iv) Strengthening of existing Tissue Culture (TC) units	Already existing Public sector owned TC units if any may be strengthened. In case of private sector owned existing TC units 50% subsidy credit linked back ended to the cost of strengthening may be awarded.
	(v) Hybrid	Promotion/popularization of hybrid, if any, may be done as per MIDH operational guidelines.
	<u>1(b) Establishment of New Orchard (Area expansion – for a maximum area of 4 ha. per beneficiary)</u>	
	(i) Integrated package with drip irrigation	Fruit growers may be awarded financial support for meeting expenditure on planting material, drip irrigation and cost of material for INM / IPM as per Govt. norms.
	(ii) Without integration	Fruit growers unable to afford drip irrigation may be provided finances for meeting expenditure on planting materials and cost incurred for INM / IPM.
	<u>1(c) Creation of Water Resources</u>	

	(i) Community tanks/on farm ponds / on farm water reservoirs with use of plastic / RCC lining	Financial aids may be awarded to passion fruit growers for creating such water resources with plastic / RCC lining or without plastic / RCC linings as the case may be in accordance to the Govt. norms.
	(ii) Water harvesting system for individuals – for storage of water in (20m x 20m x 3m) ponds/tube well/dug wells	Financial assistance is required to be awarded to papaya growers by the Govt. for creating defined water harvesting system as per Govt. norms.
	<u>1(d) Promotion of Integrated Nutrient Management (INM) and Integrated Pest Management (IPM)</u>	
	(i) Promotion of IPM/INM	Financial assistance to passion fruit growers as per area coverage according to Govt. norms may be awarded.
	(ii) Plant Health Clinic	Public sector controlled / or Public private partnership owned clinics may be awarded to Mandya.
	(iii) Bio control lab	At least 01 100% Public sector lab may be established to take care of pests.
	<u>1(e) Organic farming</u>	
	(i) Adoption of organic farming	Financial assistance to passion fruit growers as per Govt. norms may be awarded.
	(ii) Organic Certification	Project based and area based assistance to banana growers is required as per Govt. norms.
	<u>1(f) Horticulture Mechanization</u>	
	(i) Tractor	Papaya growers are required to award financial support in terms of subsidy to purchase a tractor.
	(ii) Land Development tillage	Papaya growers may be awarded financial assistance as per Govt. norms.
	(iii) Plastic mulch laying machine	Passion fruit growers may be awarded financial assistance to purchase the machine.
	(iv) Power Tiller (below 8 BHP)	Financial assistance as per MIDH operational guidelines may be considered.

	(v) Plant protection equipments <ul style="list-style-type: none"> • Manual Sprayer • Knapsack/Foot operated sprayer 	Since large no. of passion fruit growers are small to marginal farmers, therefore, these two types of sprayer would suffice the need for which financial assistance may be awarded as per Govt. norms.
2.	INTEGRATED POST HARVEST MANAGEMENT	
	2(a) <u>Pack Houses</u>	Financial assistance as per MIDH guidelines may be remitted.
	2(b) <u>Precooling unit</u>	Credit linked back ended subsidy as per MIDH norms may be considered.
	2(c) <u>Cold room (staging)</u>	Credit linked back ended subsidy as per MIDH guidelines may be remitted to the beneficiaries.
	2(d) <u>Ripening Chamber</u>	Credit linked back ended subsidy in the capital cost of project as per norms of the Govt. may be awarded to the growers.
	2(e) <u>Technology induction and Modernization</u>	Credit linked back ended subsidy as per MIDH norms may be remitted.
3.	ESTABLISHMENT OF MARKETING INFRASTRUCTURE FOR HORTICULTURE PRODUCE	
	3(a) <u>Rural Marketing/Apni Mandies/Direct markets</u>	Credit linked back ended subsidy in the capital cost of project is required to be awarded for passion fruit growers.
	3(b) <u>Retail Markets/Outlets (environmentally controlled)</u>	Credit linked back ended subsidy in the capital cost is required to be awarded to the passion fruit growers.
4.	MISSION MANAGEMENT	
	4(a) <u>District level exhibition and Kisan Mela</u>	These are required to be organised by the Govt. / SAU sponsored by MIDH collectively both the events in one stroke two times in a year.
	4(b) <u>Information dissemination through publicity, printed literature etc and local adventures</u>	This information dissemination part may be clubbed with the above 4(a).
	4(c) <u>7 Promotion of Farmer Producers Organisation (FPO) / Farmer Interest Groups (FIG) of 15-20 farmers / 20 ha. Growers Association and tie up with financial Institution and Agregators.</u>	As per norms issued by SFAC finances are required to be provided.

Annexure 1: Survey Questionnaire

HINDUSTAN INSECTICIDES LTD
New Delhi-110003

(Farmer Survey Questionnaire)

1. Farmer's Details:

District: _____ Block: _____
 Village: _____ State: _____
 Name of Farmer: _____ Age: _____
 Education: _____ Contact Number: _____
 Category: GENERAL OBC SC ST ID Card Type: _____
 Years of experience in growing crop: _____ Signed any contract with processors/traders: YES NO
 If yes, Name of the processor/trader: _____

2. Assets Profile:

LAND		PHYSICAL ASSETS	
Area under cultivation		Tractor	
Own crop orchard area		Pick-up van/truck	
Leased-in crop orchard area		Others	
Leased-out crop orchard area			

3. Trees and Production under orchard area:

A : Orchard Details		B: Total trees/production	
Type of orchard	Own <input type="checkbox"/> Leased-in <input type="checkbox"/> Share <input type="checkbox"/> Others <input type="checkbox"/>	No. of total trees	
When was orchard planted?		Production in last season (in quintal)	
Total planting cost		Production estimate of current season (in quintal)	
Current Value of orchard			
Variety of crop in orchard			
C: Surveyed trees/production		D: Other trees/production	
No. of trees of surveyed crop		No. of other trees	
Production in last season (in quintal)		Production in last season(in quintal)	
Production estimate of current season (in quintal)		Production estimate of current season (in quintal)	

4. Orchard Maintenance:

Maintenance type	Details	Quantity	Cost
Fencing	Yes <input type="checkbox"/> No <input type="checkbox"/> Specify: _____		
Site preparation	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Ploughing	Manual Yes <input type="checkbox"/> No <input type="checkbox"/>		
	Tractor Yes <input type="checkbox"/> No <input type="checkbox"/>		
No. of sapling			
Type of Fertilizer	Urea <input type="checkbox"/> DAP <input type="checkbox"/> Zinc <input type="checkbox"/> Phosphate <input type="checkbox"/> Organic <input type="checkbox"/> Vermi compost <input type="checkbox"/> Chemical fertilizer <input type="checkbox"/> Others, specify: _____		
Irrigation	Electric Tubewell <input type="checkbox"/> Diesel Tubewell <input type="checkbox"/> Drip <input type="checkbox"/> Sprinkler <input type="checkbox"/> Well <input type="checkbox"/> Others, specify: _____		
Spraying	Chemical <input type="checkbox"/> Non-Chemical <input type="checkbox"/> Others, specify: _____		
Hormone	Yes <input type="checkbox"/> No <input type="checkbox"/> Specify _____		
Labour	Family Labour <input type="checkbox"/> Casual Labour <input type="checkbox"/> Permanent Labour <input type="checkbox"/> Others, specify: _____		

5. Production and Consumption

Variety	Total Production (in Qtl)	Total Sale (in Qtl)	Self Consumption (in Qtl)	Wastage (in Qtl)

6. (i) Crop Marketing

a) Buyer Type:	Consumers <input type="checkbox"/> Small village traders <input type="checkbox"/> Middle man Processor <input type="checkbox"/> Others, specify _____
b) Crop Variety	
c) Total quantity sold (in quintal)	
d) Total value of sale (in rupees)	
e) Where sold	On farm <input type="checkbox"/> Within the village <input type="checkbox"/> Within the block <input type="checkbox"/> Within the district <input type="checkbox"/> Within state <input type="checkbox"/> Outside state <input type="checkbox"/>
f) Distance to selling point (in Km)	Less than 5 kms <input type="checkbox"/> More than 10 kms <input type="checkbox"/> More than 50 kms <input type="checkbox"/> More than 100 kms <input type="checkbox"/>
g) Travel time per visit (in minutes)	
h) Cost of travel (in rupees)	
i) Transport mode	On-foot <input type="checkbox"/> Bullock-cart <input type="checkbox"/> Rickshaw/thela <input type="checkbox"/> Tractor <input type="checkbox"/> Public vehicle/bus <input type="checkbox"/> Private pickup van/Truck <input type="checkbox"/> Others, specify _____
j) Cost of transport (in rupees)	
k) Terms of payment	Cash <input type="checkbox"/> Credit <input type="checkbox"/> Full advance <input type="checkbox"/> Partial advance <input type="checkbox"/> Others, specify _____
l) Types of baskets	Bamboo <input type="checkbox"/> Plastic (recycled) <input type="checkbox"/> Plastic (foodgrade) <input type="checkbox"/> Jute bag <input type="checkbox"/> Metal <input type="checkbox"/> Open bundle <input type="checkbox"/> Others, specific _____
m) Other facilities by the buyer	Orchard maintenance <input type="checkbox"/> Loans <input type="checkbox"/> Any subsidy <input type="checkbox"/> Others, specify _____
n) How is price fixed?	As per mandi price <input type="checkbox"/> Seller decides <input type="checkbox"/> Buyer decides <input type="checkbox"/> Others, specific _____
o) Is there written contract	Yes <input type="checkbox"/> No <input type="checkbox"/>
p) Penalty for violation of contract	Rejection of supply <input type="checkbox"/> Price reduction by x% <input type="checkbox"/> Termination <input type="checkbox"/> Suspension for x period of time <input type="checkbox"/> None <input type="checkbox"/>

(ii) Did you have difficulties selling your Crop name during last Season? Yes No

If yes, reasons for difficulty

Market is too far Monopoly of buyer Buyer stopped buying Price is too low Loss of Production

Bad Quality of production Others, specify _____

(iii) In the Season, have you searched for new crop buyers? Yes No

If Yes, why?

For better price Want a single buyer of larger quantity Want more no. of buyers Want a more reliable buyer

Buyers stopped buying Difficulty in getting payment Others, specify _____

(iv) Do you ever experience delays in getting paid for crop sold (on agreed term)? Yes No

If yes, on average, how many days it takes to get paid after the committed time? _____

(v) How many times in the last season have crop buyers not paid at all? (no. of times) _____

If not paid, what action taken against him

None Stop giving crop Legal action Attachment of buyer's property Community action

Other (specify) _____

7. MEASURES FOR IMPROVING COMPETITIVENESS MARKETS

(i) Whether crop production increased in the last 5 year? Yes No

If yes, how?

New orchard Better Orchard maintenance Integration with trader (exporter) Application of better technical know-how

Don't know Others, specify _____

If yes, why?

Assured market Better price Provisions of better inputs & services Don't know

Others, specify _____

If no, why?

Lack of capital Scarcity of labour Lower prices of litchi Lack of assured market Higher price of input

Decreasing Orchard land Others, specify _____

(ii) Do you plan to expand scale of crop production? Yes No

If yes, how do you plan to do it?

Develop New orchard Better Orchard maintenance Integration with trader (exporter)

Application of better technical know-how Don't know Others, specify _____

If no, why?

Lack of capital Scarcity of labour Lower prices of crop Lack of assured market Higher price of input

Decreasing Orchard land Others, specify _____

8. OPINION OF FARMERS

(i) What is your opinion about current year production?

	Reasons
a) Increase <input type="checkbox"/>	Area <input type="checkbox"/> Technology change <input type="checkbox"/> Weather condition <input type="checkbox"/> Fund availability <input type="checkbox"/> Price <input type="checkbox"/> Government Policy <input type="checkbox"/> Others, Specify _____
b) Decrease <input type="checkbox"/>	Area <input type="checkbox"/> Technology change <input type="checkbox"/> Weather condition <input type="checkbox"/> Fund availability <input type="checkbox"/> Price <input type="checkbox"/> Others, Specify _____
c) Remain unchanged <input type="checkbox"/>	Area <input type="checkbox"/> Technology change <input type="checkbox"/> Weather condition <input type="checkbox"/> Fund availability <input type="checkbox"/> Price <input type="checkbox"/> Others, Specify _____

(ii) What is your opinion about current year price?

	Reasons
a) Increase <input type="checkbox"/>	Demand <input type="checkbox"/> Market <input type="checkbox"/> Production <input type="checkbox"/> Weather condition <input type="checkbox"/> Processors <input type="checkbox"/> Export/Import Policy <input type="checkbox"/> Others, Specify _____
b) Decrease <input type="checkbox"/>	Demand <input type="checkbox"/> Market <input type="checkbox"/> Production <input type="checkbox"/> Weather condition <input type="checkbox"/> Processors <input type="checkbox"/> Export/Import Policy <input type="checkbox"/> Others, Specify _____
c) Remain unchanged <input type="checkbox"/>	Demand <input type="checkbox"/> Market <input type="checkbox"/> Production <input type="checkbox"/> Weather condition <input type="checkbox"/> Processors <input type="checkbox"/> Export/Import Policy <input type="checkbox"/> Others, Specify _____

(iii) Basis for price determination (Please rank)

Variety (Seed/Seedless)		Colour	
Appearance		Size	
Pulp content		Thickness of outer coat/skin	
Ripeness		Any other, specify	

**1-10 (Points to be given)

(iv) Post harvest losses

Reasons for losses	Loss in percentage (Mention only if loss is more than 3%)
Harvesting injury	
De-topping	
Packing loss	
Storage loss	
Transportation loss	
Drying	
Handling loss	

(v) Are you aware of World Trading Organization? Yes No

a. If yes, How it is effecting your farm practices _____

(vi) Are you aware about food safety measurement? Yes No

a. If yes, what measure are being taken by you to improve the quality _____

9. MEASURE TO IMPROVE QUALITY AND SAFETY OF CROP

a) Buying input from a reliable source	Yes <input type="checkbox"/> No <input type="checkbox"/>	b) Using more organic manure or bio-pesticides	Yes <input type="checkbox"/> No <input type="checkbox"/>
c) Replacing chemical pesticides	Yes <input type="checkbox"/> No <input type="checkbox"/>	d) Use of recommended ripening material	Yes <input type="checkbox"/> No <input type="checkbox"/>
e) Maintaining hygiene conditions of the worker	Yes <input type="checkbox"/> No <input type="checkbox"/>	f) Using good packing material	Yes <input type="checkbox"/> No <input type="checkbox"/>
g) Keep produce away from infected material	Yes <input type="checkbox"/> No <input type="checkbox"/>	h) Sorting produce frequently	Yes <input type="checkbox"/> No <input type="checkbox"/>
i) Staggered harvesting	Yes <input type="checkbox"/> No <input type="checkbox"/>	j) Others, specify _____	

10 (i) INDICATE FIVE MAJOR PRODUCTION CONSTRAINTS.

1. [_____]
2. [_____]
3. [_____]
4. [_____]
5. [_____]

10 (ii) INDICATE FIVE MAJOR MARKETING CONSTRAINTS.

1. [_____]
2. [_____]
3. [_____]
4. [_____]
5. [_____]

11. INCOME PROFILE

Activities	For how long (years)	Annual household income in 2015-16 (Rs.)	Annual household income in 2016-17 (Rs.)
a) Production of Surveyed Crop			
b) Dairying			
c) Cultivation			
d) Casual Employment			
e) Regular Employment			
f) Business			
g) Others			

I hereby declare that the above information is provided by me as best of my knowledge.

Signature: _____
(Thumb Impression)

Annexure 2: List of Figures

Figure 1	Age Profile of the Farmers surveyed
Figure 2	Land profile of surveyed farmers
Figure 3	Distribution of farmers under different land holding groups
Figure 4	Farmers under different groups of leased-in orchard area
Figure 5	Farmers under different groups of leased-out orchard area
Figure 6	Asset profile of surveyed farmers
Figure 7	Major marketing constraints