

**VALUE CHAIN STUDY ON MANGO
IN RAYAGADA DISTRICT OF ODISHA
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Submitted by

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Introduction:

There is target of 4% increase in GDP from agriculture and allied sector. One of the strategies to achieve this growth rate has been a policy to encourage a diversification towards higher value crops and livestock. This segment of agriculture is perishable in nature and therefore needs a very different approach than has been the case in food grains. It must be recognized that development of this high value segment of agriculture will be possible only when it is pursued as a demand led strategy. Closely link to modern logistics, processing and organized retailing, all as a part of one integrated agriculture system in the form of value chain. The dietary transition from food grains to high value commodities such as foods, vegetables and livestock products are already observed and are being followed by rising demands for processed and semi-processed food products. The role of government policy is to create an enabling environment for private entrepreneurs to enter this agriculture system, coordinate the sourcing of their supplies from the farmers and deliver them to consumer in processed and fresh form. This requires high degree of coordination all along the value chain and only then the risks are minimized and benefits accrue to farmers, which encourages them to produce more. In this context we were asked to study mango value chain, recognizing the high value of the output of fruit and their contribution to farm income.

Study of Mango value chain in Rayagada district:

The Mango (*Mangifera indica*) is an important fruit crop of Odisha as it occupies 60% of fruit cultivation area of the state. But the productivity of mango is 5.68 t/ha, as compared to national productivity of 8.65 t/ha. The low productivity can be attributed to local varieties and improper of package of practices viz. fertilizer and water management. The following case study provides an overview of investigation, the key findings and possible avenues for future market development.

Study Area:

The Mango value chain study was undertaken in Rayagada district of Odisha. This district is 390 km away from state capital Bhubaneswar. It is located at latitude 19° 09' N and longitude 83° 27' E. Rayagada district is bounded by Gajapati district to the

Objective:

- i. To observe the players of mango value chain in Rayagada district of Odisha.
- ii. To assess the availability of inputs for mango production.
- iii. To study the varieties of mango available in Rayagada district and their productivity.
- iv. To understand the market for Rayagada mango.
- v. To quantify the post harvest value addition status and opportunities in mango.
- vi. To identify the constraints and opportunities in mango value chain of the district.
- vii. To find out possible initiatives that can help mango value.

Approach and methodology :

The baseline information relating to mango plantations were collected from Directorate of Horticulture, Govt. of Odisha. The technical inputs with respect to mango value chain were collected from Agribusiness management department of OUAT and ICAR-CHES, Bhubaneswar. The available secondary data were collected from Odisha Agricultural Statistics 2015-16 and office of the DDH, Rayagada.

For this purpose a field tour was conducted to Rayagada district of Odisha during 20-22 February 2018. The team visited the farmers field of eleven sites covering Kashipur, Bisamacuttack, Muniguda and Rayagada blocks of the district. The overall eleven farmers were interviewed mainly one to one basis but some in groups of two or more. The abstract of the survey conducted is given in Annexure-I. The team also visited the mango hot water treatment unit located at Bhakuraguda farm. The team also visited the marketing yard of Rayagada district and collected information. They also discussed with officials of Deputy Director of Horticulture, Rayagada on all aspects of mango value chain in the district.

Input supply and production :

The district of Rayagada having six private nurseries with production capacity of 3 lakh quality planting material of mango grafts. They are namely (i) Bondey Purusotam Nursery, Bankambo, Rayagada, (ii) Jayaguru Nursery, Baliguda;

Rayagada, (iii) Harapriya Nursery, Silagaon, Rayagada, (iv) Maa Majhigouri Nursery, Chandragiri, Rayagada, (v) Gupteswar Nursery, Renga, Rayagada, (vi) Laxmi Progeny Orchard, Fakira, Rayagada. Besides these Govt. Horticulture Nurseries at Bissamcuttack, Gunupur, Chingudijhar and Rayagada produced 1,20,000 grafts annually. Hence, there is sufficient availability of QPM for plantation in Rayagada district.

As regard to availability of major fertilizers, it is confirmed that these are available. The plant protection chemical required during mango cultivation are also available in different block headquarter of the district. The production of different mango varieties in different clusters of the district is given in Annexure-II.

It is observed that out of 11528 ha of mango plantation area of the district, the Kashipur block has 5000 ha of mango plantation. The different varieties of mango plants are Amrapalli, Dasherri, Banganpalli, Langra, Totapuri. Out of these varieties about 85% is of Amrapalli and rest 15% comprised of other varieties. The productivity of mango varies from 5.4 to 6.3 t/ha.

Constraints:

- The majority of planting materials are of Amrapalli variety which is mainly used for table purpose and not suitable for processing.
- The water soluble fertilizers are not readily available.
- The recommended dose of fertilizers are normally not applied to plants on annual basis.
- Also plant protection measures are not taken properly.
- The mangoes of Rayagada district ripen later as compared to other districts.
- The mangoes are affected by white flies and anthracnose, which reduces the shelf life of fruit.

Marketing :

During field visit and interaction with mango growers it was concluded that the mango growers of Rayagada district mostly sell their products i.e. ripe mangoes to the

traders and retailers at the farm gate itself at the rate of Rs.15-20/kg except farmers of Kasipur block. The farmers of Kasipur block are organised through HARPAL (Horticulture and Agriculture Related Panchayats Association for Livelihood) for marketing their products at Raipur, Bilaspur , Bhubaneswar and Delhi after proper packaging in 5 kg cartoons.

- The Odisha livelihood mission (OLM) during FY 2017-18 has procured and marketed 3000 T of mangoes at Delhi and Raipur.
- An FPO organization called HARPAL is active in Kashipur block of Rayagada. The HARPAL is also facilitating marketing of mango at Raipur, Bilaspur, Delhi and Bhubaneswar.
- Last year Integrated Tribal Development Agency (ITDA) also facilitated for opening of a temporary markets for mango in ITDA premises.
- The average price on wholesale market in Rayagada was approximately Rs.15/- per kg whereas the final retail price at Rayagada could reach as high as Rs.20/- per kg.
- There is no reliable data on the no. of retailers available.
- However, a number of interview sources have identified that there is significant growth in market size of mango and consumer demand is also increasing.

Constraints:

- There is no permanent market yard for mango in the district.
- The farmers are not aware of market price of mango on daily basis and hence selling as per offer price of middleman or traders.
- Except Kasipur block, the farmers of other blocks are not organized for packaging and marketing of mango.

Processing :

There is no opportunity for processing of mango in Rayagada district. First of all majority varieties mango viz. Amrapalli, Dusheri are not suitable for processing. The varieties of mango suitable for processing viz. Totapuri, Kesar, Alphonso etc. are not available in plenty. As regard to post harvest operation, only hot water treatment facility exists at Bhakurguda farm which was installed by IARI, New Delhi. The hot

water treatment of mangoes of Rayagada is essential to prevent deteriorating effect of whitefly & anthracnose and to extend shelf life of mango. But due to lack of proper linkage, this facility has not been utilized by the mango growers till date. Hence, a workable modus operandi should be finalized for efficient utilization of this facility so that farmers can be benefitted.

Constraints :

- The processing facility for mango pulp does not exist in the district.
- The majority of mango varieties produced are not suitable for processing.
- The hot water treatment facility installed in Govt. farm at Bhakurguda is not utilized properly by farmers at present.

Conclusion :

- i. The mango plantation area growing at a faster rate in Rayagada district of Odisha at a rate of 3000 ha per annum due to favourable climate, soil and Govt. sponsored schemes.
- ii. Two Govt.schemes viz. MIDH and MGNREGS are running in the district and mango orchards are being established at faster rate.
- iii. The quality planting materials of mango grafts are available in the district due to presence of six nos. of private nurseries and three nos. Govt. nurseries, but major variety is Amrapalli.
- iv. The mango plantations are mostly under organic based, as very little or no chemical fertilizers are being used.
- v. The majority of mango varieties produced is marketable as ripe mango and there is no scope for processing due to variety incompatibility.
- vi. The majority of mango growers do not apply fertilizers as per recommended dose rather grow on organically.
- vii. Due to late ripening of mango in Rayagada districts, fruits are subjected to white fly and anthracnose.
- viii. For which hot water treatment plant has been established at Bhakurguda within Govt. Horticulture Farm.

- ix. The hot water treatment plant needs to be operated on PPP mode for maximum utilization of plant.
- x. There is need of variety diversification for the purpose of processing industry.
- xi. The internal market for mango in the state as well as in the country is set to grow in the coming years due to awareness of people regarding nutrition value of mango and the purchasing power of people has also increased.
- xii. Rural intermediaries in the mango value chain play a key role in facilitating the flow of produce to the markets.
- xiii. The soil and climate of the district Rayagada is suitable for mango production. But, the farmers are using of minimal level of production technologies.
- xiv. The use of chemical fertilizers and pesticides is less than 3% by user farmers.

Short term Recommendation :

- A review workshop should be conducted where key informants and concerned persons in the area will be interacted with each other for better realization of output.
- Organization of co-operatives to focus on mangoes as well as other fresh produce.
- Implement activities to specifically target those with small pieces of land and who are either not producing mangoes at all or are unable to expand the acreage under mango.
- These may be included for upgrading their skill in complementary activities linked to mango production efforts viz. nursery management, graft production, canopy management, spraying, pruning, irrigation mgt etc
- Extension service in form of training programmes should be conducted for mango growers twice in a year.
- New commercial varieties of mango grafts should be encouraged for plantation.
- The block wise strategic crop plan should be made for Rayagada district for ease of marketing and processing of produce in future.

Long term Recommendations :

- There is need of diversification of mango varieties suitable for processing in future.
- Hence there is need of supply of quality planting materials of desired varieties from outside district.
- A permanent marketing yard should be constructed for horticultural produce including mango.
- A web based interface should be created for proper dissemination of information including price for marketing.

List of orchards visited by the team for value chain study on mango

SI No	Name	Address	Crop	Source of water and power	Remark
1.	Hrutasan Jodia	Kumbarvila Block- Kashipur 9438324280	Start : 2014-15 Area : 5 acre i)Amrapalli-300, ii)Mallika- 100 iii)Dasherri-200, iv)Totapuri-50	Tubewell, flow irrigation Electricity	Hot water treatment Problem- mite attack Marketing through Harpal group
2.	Krushna Chandra Mohapatra	Kashipur 9437066630	Area : 60 acre i)Amrapalli-90%, ii)Rest 10% - Dasherri, Banganpalli, Suvaranarekha, Chauras	Borewell, drip irrigation, Electricity	Hot water treatment Marketing through Harpal group Yield- 5000-6000 qntl/year
3.	Sarada Nayak	Chandragiri Block- Kashipur 9437777201	Start : 2005-06 Area : 10 acre Amrapalli,Dasherri,Banganpalli, Langra, Mallika	River lift, flow irrigation, Electricity	45000 mango grafts sold this year Problem- Mango marketing through Harpal group
4.	Baikuntha Jhodia	Siriguda Block- Kashipur 8763831975	Start : 2005-06 Area : 2 acre Amrapalli, Banganpalli, Mallika	Canal, flow irrigation, Electricity	Problem- Rotting marketing through Harpal group Yield- 40 qntl./year
5.	Surya Narayan Behera	Hukumtala Block-Bissamcuttack	Start : 2006-07 Area : 2 acre Amrapalli and Dasherri	Farm pond, flow irrigation, Electricity	Marketing at Farmgate Yield- 30-40 qntl./year
6.	S. Swain	Hukumtala Block-Bissamcuttack	Area : 5 acra Amrapalli, Dasherri, Ratna	Borewell, flow irrigation, Electricity	Marketing at Farmgate Yield- 100 qntl./year
7.	Chinari Kusalia	Hukumtala Block-Bissamcuttack	Start : 2016 Amrapalli, Dasherri, Neelum	Open well, flow irrigation, electricity.	Problem- Dieback
8.	Purandar Mallik	Block- Muniguda	Area : 1 acre Mango	Tubewell, flow irrigation, electricity	Yield : 20 q/acre
9.	Gouranga Rout	Sitarampur Block- Muniguda	Start : 2005-06 Area : 8.75 acre Amrapalli, Dasherri, Bombay green	Riverlift, flow irrigation, electricity	Problem-leafspot Marketing at Farmgate Yield- 50 qntl./year
10.	Chiti Jakesara	Sitarampur Block- Muniguda	Start : 2005-06 Alphonso	Riverlift, flow irrigation, electricity	Problem- fruit test sour
11.	Hansaraj Raghav	Haripur Block- Rayagada	Start : 2006-07 Amrapalli, Dasherri, Kesar, Banganpalli,	Tubewell, flow irrigation, electricity	Marketing at Farmgate Yield - 500 qntl./year

Blockwise and clusterwise information on Mango Value Chain of Rayagada District of Odisha

Sl. No.	Name of block	Area under mango plantation	No. of cluster and name	Varieties	Area under drip irrigation	Productivity variety wise	PHM infrastructures available (Processing unit, pack house, cold storage etc)	Remarks
1.	Bisam Cuttack	870	Bisamcuttack-4 nos. Kurla-5nos. Chatikona-4nos. Paikadakuluguda-4 nos. Dukum-3nos. Sahada-3 nos. Thuapadi-3 nos. Kankubadi- 3nos. Durgi-2nos. Bhatapur-3 nos.	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green		5.8	Pack House	
2.	Chandrapur	230	Dangasorada-2nos. Hanumantapur-2nos. Turiguda- 1no. Budubali-1no.	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green		5.4		
3.	Guduri	280	M. K. Rai-2nos. Madhuban-2 nos. Sanahuma-3 nos. Kodama-2nos. Siriguda-3 nos	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green		5.5	Pack House	
4.	Gunupur	340	Chalkamba-2nos. Titimiri-4 nos. Gothalpadar-3nos. Tolana-4nos. Jaltar-2nos. Jagannathpur-3nos. Morama-3nos. Putusing-2nos	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green		5.9	Pack House	
5.	K. Singhpur	900	Sunakhandi, Seriguma, Sikarpai, Pujariguda, Budaguda, Singari, Poloma	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green, Chekurusalam, Totapuri, Himsagar, Local		5.9	Pack House	
6.	Kashipur	5000	Kasipur, Gorakhpur, Adajhor, Sunger, Taljhari, Mandibisi, Kumbharsila, Maikanch, Podapadi	Banganpalli, Amrapalli , Dasher, Mallika, Langra, Bombay Green, Chekurusalam, Totapuri, Himsagar, Local	131.4 ha	6.3	Cold Storage, Evaporative cool chamber, Pack House	Hot water treatment plant by IIHR.CHESS supplied all inputs and fruit fly trap.

Sl. No.	Name of block	Area under mango plantation	No. of cluster and name	Varieties	Area under drip irrigation	Productivity variety wise	PHM infrastructures available (Processing unit, pack house, cold storage etc)	Remarks
7.	Kolnara	220	Bankili, Therubali, Mukundapur, Suri.	Banganpalli, Amrapalli , Dasherri, Mallika, Langra, Bombay Green		5.8	Pack House	
8.	Muniguda	680	Ambadalo-3nos. Bhairabaguda-3nos. Muniguda-2nos. Munikhola-2nos. Sibapadar-2nos. Telengapadar-3nos. Jagadapur-3nos. Kumudabali-2nos. P. Ranipinda-2nos.	Banganpalli, Amrapalli , Dasherri, Mallika, Langra, Bombay Green		5.8	Pack House	
9.	Padmapur	290	Gudiabandha-2nos. Tembaguda-2nos. Khamapadar-2nos. Derigam-2nos. Padmapur-3nos. Akhusing-1no.	Banganpalli, Amrapalli , Dasherri, Mallika, Langra, Bombay Green		5.8	Pack House	
10.	Ramanguda	320	Bhamini-2nos. Neelamguda-3nos. Gulunti-3nos. Penkam-2nos. G. Gulumund-2nos. Gulumunda-2nos. Parikhiti-3nos.	Banganpalli, Amrapalli , Dasherri, Mallika, Langra, Bombay Green		5.9	Pack House	
11.	Rayagada	500	Kutuli, Kumbhikota, Rayagada, Kereda, H. Seskhal	Banganpalli, Amrapalli , Dasherri, Mallika, Langra, Bombay Green		5.9	Pack House, Cold Storage, Mango Hot Water Treatment & Shorting grading unit (Mango Hub)	
	Total	9630						

Photos of mango value chain study in Rayagada district



Baikuntha Jodia, siriguda, kashipur



Chinari kusalia, hukumtala, Bissamcuttack



Chiti jakesara, sitarampur, muniguda



K. C. Mohapatra, Kashipur



Hrutasan Jodia, hukumvila, kashipur



Purna Jodia, hukumvila, kashipur

Photos of hot water treatment plant of mango at Bhakuruguda, Rayagada



Sorting and grading of mango



Sorting and grading of mango