

# Problems & Prospects of Litchi Production & Marketing in Bihar, with Special Reference to Muzaffarpur District

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## Abstract

Litchi (*Litchi chinensis*) is a delicious fruit of excellent taste, flavour and quality. Botanically it belongs to Sapindaceae family. The translucent, flavoured aril or edible flesh of the litchi is popular as a table fruit in India, while in China and Japan it is preferred in dried or canned state. It is known that litchi is the famous fruit not only in Bihar but also across the country. Despite the fact that the litchi is one of the finest fruits and has a growing demand in national and international markets, productivity continues to be low and a gap exists between potential and existing yield. Litchi occupies an important place in the Horticulture landscape of Bihar owing to its geographic confinement and the magnitude of its share to the overall production in the country. The soil and the climatic conditions of north Bihar (almost 27 districts of the state) favour high yields with quality fruits of litchi. According to IL & FS Cluster Survey (2010), about 80.00 % of litchi produced in the state is marketed out of the state. Major markets are Delhi, Lucknow, Kanpur, Varanasi, Mumbai, Chandigarh, Kolkata and Bangalore. Around 30 MT of fresh produce is also exported from the state to Nepal, UAE etc; which accounts for only 18.00 % of the total volume of litchi exported out of the country.

**Keywords:** Litchi, Processed Litchi Products, Post-Harvest Management, GI Tag, Shahi Litchi, Domestic Market.

## Introduction

Litchi (*Litchi chinensis*) is a delicious fruit of excellent taste, flavour and quality. Botanically it belongs to Sapindaceae family. The translucent, flavoured aril or edible flesh of the litchi is popular as a table fruit in India, while in China and Japan it is preferred in dried or canned state. It is known that litchi is the famous fruit not only in Bihar but also across the country. The shahi litchi of muzaffarpur has GI tag, which makes it more specific. It is a rich source of Vitamin C along with B complex Vitamin. Its origin is from Southern China. India is third largest producer of litchi in the World after China, Taiwan. In India, states like Bihar, Jharkhand, Chhattisgarh, Orissa, Punjab and Haryana, Uttarakhand, Assam, Tripura and West Bengal are major producer of litchi. Bihar is the largest litchi producer state of India. It produces around 45 per cent of total litchi production of country.

## Review of Literature

Sushil Kumar Purbey, Sanjay Kumar Singh and Alemwati Pongener, International Journal of Bio-resource and Stress Management, "Management of Light for Quality Production of Litchi" October 2019. This paper deals with the quality production of fruits is an astonishingly complex process that depends on a wide variety of factors viz. weather, soil, insect-pests and diseases, and orchard management) and their interaction effects.

S. K. Purbey, Alemwati Pongener, Evening Stone Marboh, and Narayan Lal, Current Journal of Applied Science and Technology, ISSN: 2457-1024, 2019.

"Advances in Packaging of Litchi Fruit to Maintain the Quality". This paper deals with the most important aspect that is post-harvest management and other relevant issues like packaging and others. Postharvest interventions therefore become indispensable to preserve litchi fruit quality for longer duration. One among such

interventions is packaging that directly influences transpiration losses and respiratory metabolism in litchi fruit. We all know that packaging plays the all-important roles of containment, protection, convenience, and communication. Previously, gunny bags, bamboo basket, wooden boxes were used for packaging, but are now being rapidly replaced by corrugated fibre board (CFB) boxes for the versatility they bring. Modified atmosphere packaging (MAP) of litchi in combination with postharvest treatments.

Ms Seema Chandel, Marketing and Export Potential of Litchi: A Case Study of District Kangra, Himachal Pradesh, The Indian Economic Journal, January 28, 2019. This paper had objectives to find the litchi production, global perspective of litchi, marketing system and potential for export of litchi. This article was very helpful in understanding the dynamics of litchi production, marketing, and export.

#### **Objectives of Study**

This study is aimed to analyse the problems and prospects of litchi production and its marketing in Bihar. This paper aims to find the major problems, which are being faced by litchi growers, contractors, and traders. Thereafter we also discuss the solution for those problems and the prospects of litchi production in Bihar as well as in Muzaffarpur. This study will further help the researcher in finding problems as well as solution for the existing problems.

#### **Methodology**

This paper is based on primary data as well as secondary data. Qualitative data is primary which we have collected from the growers, contractors, and traders. All the quantitative data, which I have used in this paper, is taken from secondary sources. The nature of this paper is diagnostic.

#### **Problems in Litchi Production in Bihar**

Litchi is one of the finest fruits and has a growing demand in national as well as in international markets. Productivity of litchi continues to be low, specifically in last 5 years we have seen a continuously declining trend. There is a gap exists between potential and current productivity. The ratio in productivity between the best-managed orchards and national productivity ranges between 2 to 4 times at different locations. The probable reasons for low productivity as well as low production of litchi in Bihar are the following:-

1. Less-availability of suitable superior cultivars' sampling,
2. Traditional production methods,
3. Poor technological and pre harvest handling system.
4. Poor post-harvest management.

Post-harvest management is in very poor and in very primitive stage in Bihar. No proper trend

labours are available for plucking of ripen fruits, there is no proper shade facility is available at most of the orchard, no cooling and washing and treatment facility is available at most of the place.

The shortage of genuine and diversified cultivar planting material litchi are also the a remarkable problem. No The low female/male flower ratio, premature fruit drop, and fruit cracking due to non-scientific water and nutrient management also add to low productivity and production of poor quality fruits.

Litchi growers faces the problem of uncertainty in flowering of plants, adverse weather, and due to lack of proper training and workshop they are not in a position to look after their orchard in better way. Their tendency is risk avoider. Due to risk avoiding tendency they sell their orchard to contractors.

Contractors also faces several issues in litchi production. They do not get a proper lease of 5 years to 10 years. Instead of long lease farmers prefer to lease out their orchard for lesser period. This is the major constraint which the traders faces. Due to short and temporary nature of lease they are not in a position to invest in orchard for the long period gain. If weather is favourable they earn profit but if they face adverse weather they have to bear huge loss. They have to pay around 50 percent of money to orchard owner in advance. They play gamble in this business. There is not insurance and credit facility for contractors.

Traders also face some very pertinent problem. They purchase produce from contractors or local traders to sell these produces to outside market. Due to lack of poor post-harvest management, lack of logistic facility and marketing chain they have to bear high cost in transportation and marketing of this product.

#### **Current Area, Production, and Productivity of Litchi in Bihar as well as in Muzaffarpur**

Litchi has an important place in the Horticulture produce of Bihar. Its agro climatic zone is very fertile for this produce. The soil and the climatic conditions of north Bihar favourable for high productivity with quality fruits of litchi. During the last twelve years (2005-06 to 2016-17), the area under total fruits was around 28.40 thousand hectares, which is about 5.50 to 6.00 % of net sown area. Litchi is the third largest fruit next to Mango and Banana in terms of area and production. It occupies about 10-11 % of total fruits' area and around 6.00 % of total fruit production. During 2016-17, in Bihar, the total production of litchi was 198.60 thousand MT from the area of 32.20 thousand hectare.

Table:-1

Litchi production in Bihar &Muzaffarpur						
Year	BIHAR			MUZAFFARPUR		
	Area (000' Ha)	Production (000' Mt)	Productivity (Mt/Ha)	Area (000' Ha)	Production (000' Mt)	Productivity (Mt/Ha)
2005-06	28.40	200.10	7.04	NA	NA	NA
2006-07	28.80	211.90	7.36	7.15	55.82	7.80
2007-08	29.80	223.20	7.49	7.20	56.00	7.78
2008-09	30.40	228.00	7.50	7.22	54.32	7.52
2009-10	30.60	215.13	7.03	7.24	52.93	7.31
2010-11	31.06	226.90	7.30	7.28	53.87	7.40
2011-12	31.09	236.40	7.60	7.37	57.54	7.80
2012-13	38.15	233.87	6.13	7.30	58.98	8.07
2013-14	30.24	234.29	7.74	7.30	58.90	8.06
2014-15	32.20	197.70	6.13	7.89	40.52	5.13
2015-16	32.10	198.00	6.16	7.9	40.50	5.12
2016-17	32.20	198.60	6.17	NA	NA	NA

Source:- Economic Survey of Bihar, NHB data sets.

Chart:-1

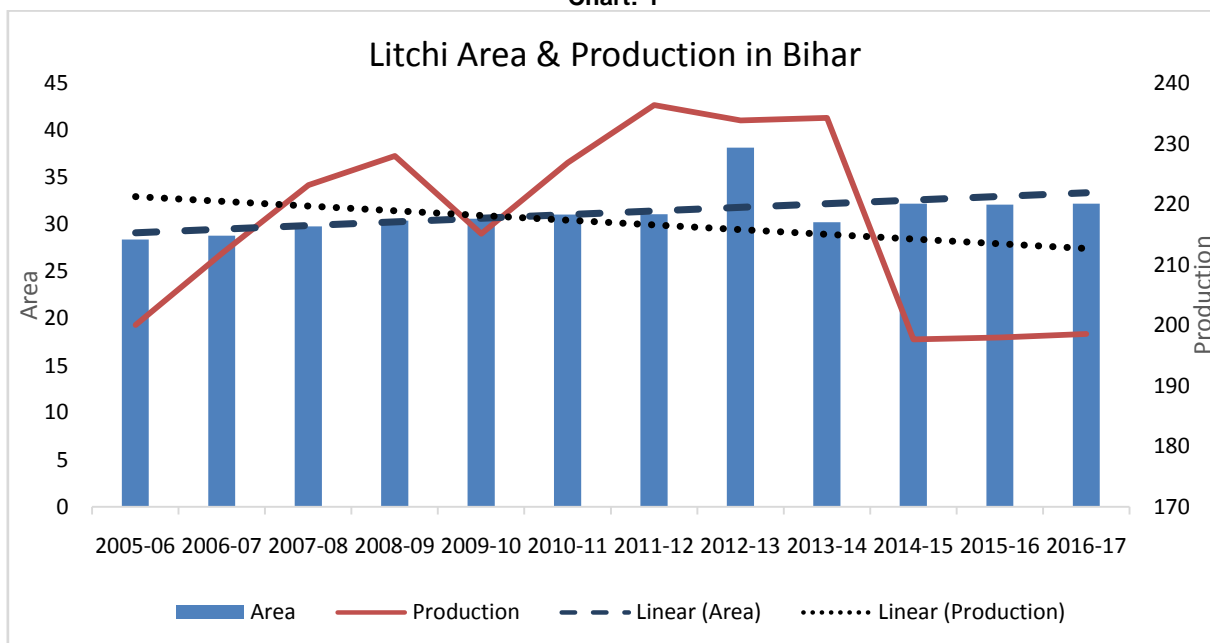
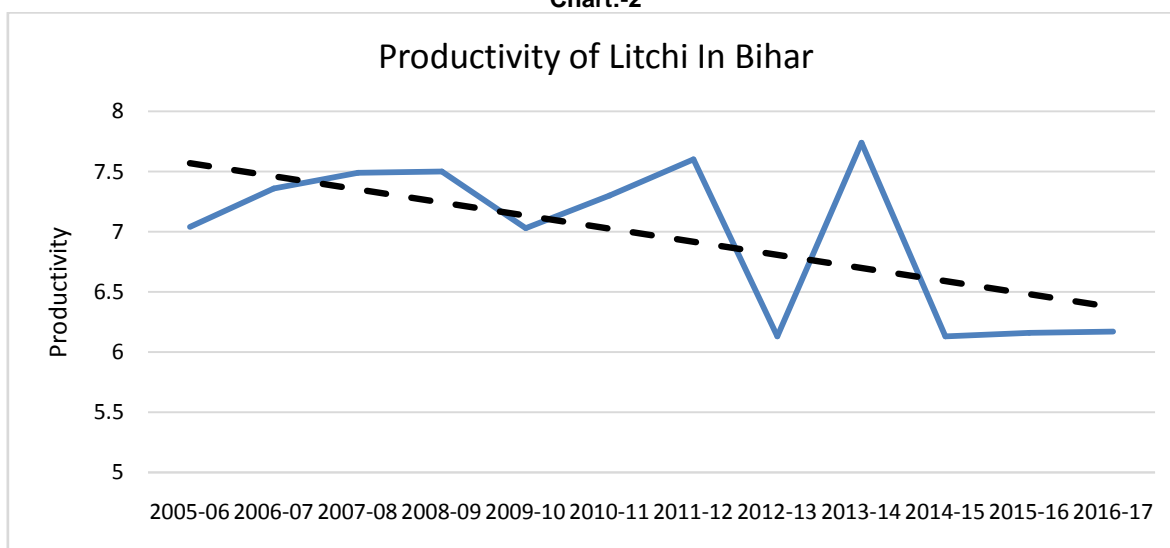


Chart:-2



After perusal of table 1 and chart 1, and 2 we have found that in Bihar since 2006-07 Litchi producing area, production and its productivity have seen a minor change. In 2005-06 28.40 thousand Ha. area was under Litchi production which has increased to 32.20 thousand Ha. in 2016-17. It is a 12 % increase in last 12 years. The trend analysis shows that there is slightly increasing trend in area.

In terms of production, it has decreased from 200.20 thousand Mt. in 2005-06 to 198.60 thousand Mt in 2016-17. It is approx. 0.8 per cent decrease in

production in last 12 years. However, it has reached to 236.40 thousand Mt. in 2011-12. Since then there is a decreasing trend in Litchi production. It also reflects in trend analysis of litchi production.

If we look at the productivity trend, it was 7.04 Mt/Ha. in 2005-06, now it has declined to 6.17 Mt/Ha in 2016-17. It is around 12 per cent decrease in productivity in 12 years. However, it has reached to 7.74 Mt/Ha in 2013-14. After that, there is a declining trend in productivity. Productivity trend analysis shows there is drastic decrease in productivity.

Chart:- 3

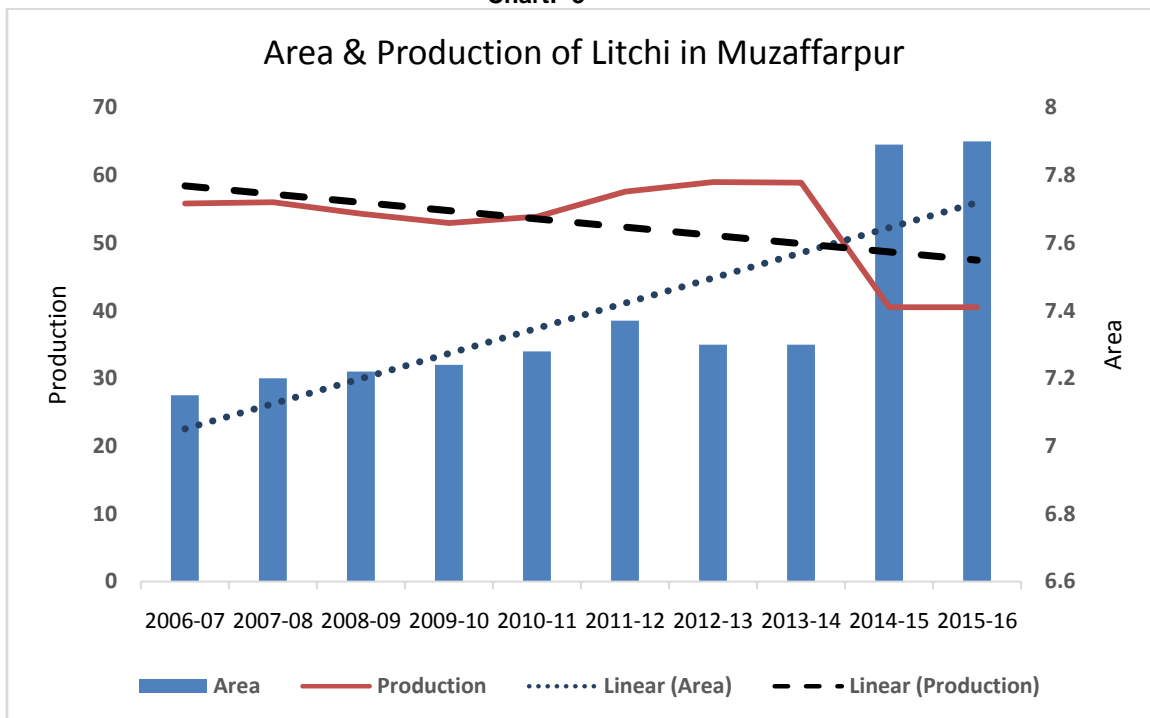
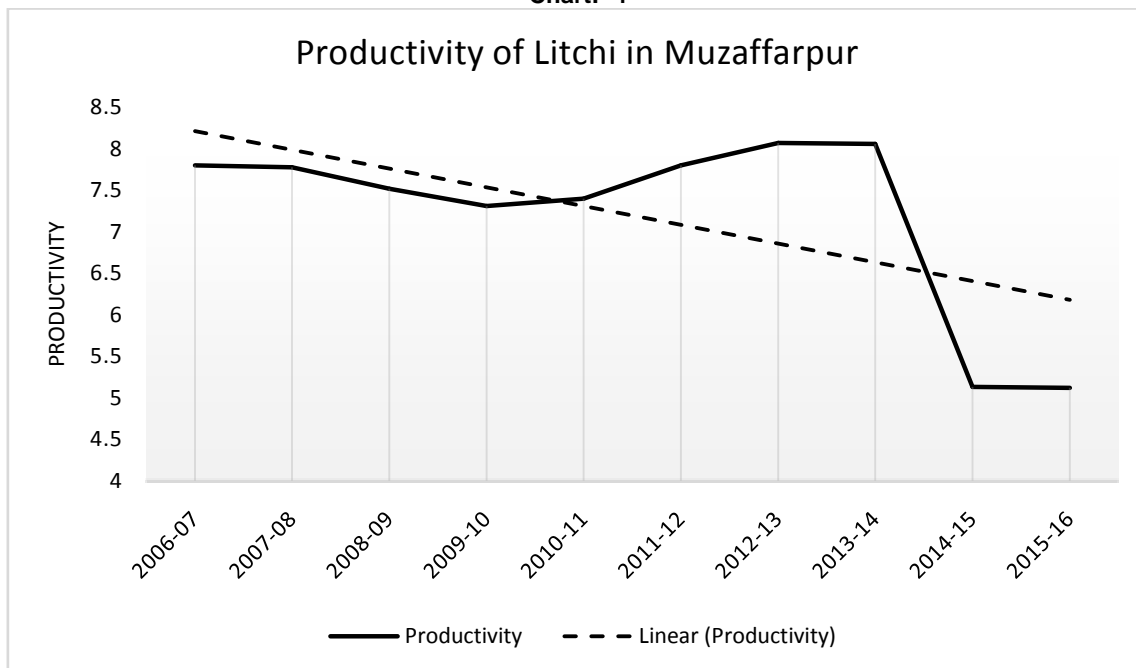


Chart:- 4



After perusal of above table 1 and chart 3, and 4 we have analysed that in Muzaffarpur since 2006-07 Litchi producing area, production and its productivity have seen a major change. In 2006-07 7.15 thousand Ha. area was under Litchi production which has increased to 7.90 thousand Ha. in 2015-16. It is a 10 % increase in last 10 years. The trend analysis shows that there is increasing trend in area.

In terms of production it has decreased from 55.82 thousand Mt. in 2006-07 to 40.50 thousand Mt in 2015-16. It is a 27 % decrease in production in last 10 years. Though it has reached to 58.98 thousand Mt. in 2012-13. Since then there is a decreasing trend in Litchi production. It also reflects in trend analysis of litchi production.

If we look at the productivity trend, it was 7.80 Mt/Ha. in 2006-07, now it has declined to 5.13 Mt/Ha in 2015-16. It is around 34 % decrease in productivity in 10 years. Though it has reached to 8.07 Mt/Ha in 2012-13. After that there is a declining trend in productivity. Productivity trend analysis shows there is drastic decrease in productivity.

If we compare the productivity of Litchi with state we observed that in 2006-07 Bihar's average productivity was 38.80 Mt/Ha at that time productivity of Litchi in Muzaffarpur district was 30.69 Mt/Ha. Further Bihar's productivity increased to 44.12 Mt/Ha. in 2015-16, at that time Muzaffarpur's productivity was 42.26 Mt./Ha. It is clear that the average productivity of Litchi in Muzaffarpur district is less than state average productivity.

#### **Marketing of Litchi in Bihar**

Litchi is temperature sensitive fruit and perishable in nature. Due to this sensitiveness of this produce, its marketing and processing is very fragile in nature.

It is available for very short duration (25 May to 20 June). Its market can be broadly classified into three categories:

1. Local market ( Bihar)
2. National Market (UP, Delhi, Mumbai, etc.)
3. International Market (UAE, Bangladesh, Nepal, Qatar etc.)

According to IL & FS Cluster Survey (2010), about 80.00 % of litchi produced in the state is marketed out of the state. Major markets are Delhi, Lucknow, Kanpur, Varanasi, Mumbai, Chandigarh, Kolkata and Bangalore. Around 30 MT of fresh produce is also exported from the state to Nepal, UAE etc; which accounts for only 18.00 % of the total volume of litchi exported out of the country.

Marketing of fruits is done in different forms. Growers rent their orchards to contractors, who in turn harvest early and sell to local markets. Due to increased numbers of middlemen in marketing channels reduces the share of growers in the price of produce paid by the consumers. Farmers directly sell their produce to the middlemen. The fruit is sold through post-harvest contractor to the wholesale or commission agents, who do harvesting and packing, in addition to transporting the produce to the market. Majority of the litchi is sold through pre harvest contractor and about 10 – 20 % growers undertake self-marketing. In certain cases, the crop is leased out

to pre harvest contractors for 1-3 years. The PHCs negotiate and settle the price with the growers in their own terms and conditions for payment to the growers. Most of the produce is sold through this mode. The PHCs have a clear picture in their mind of the yield potential of the orchard based on whole and performance level of individual trees in the orchard. The price offered on a per tree varies with age category i.e., a tree in its prime bearing stage (10 to 30 years) with an annual yield of 100 kg fetches Rs. 500-1000 per year from pre harvest contract whereas the rate for trees in early bearing period (5 to 10 years) is Rs. 300-500 per tree per year. Harvesting of fruits is done by the contractor. The farmers usually receive 50 % of the settled price in advance just to firming up the deal and the rest is paid at the time of harvest. Harvesting, sorting, packaging are done in the farms by the contractors. Loading the truck (for transport) to distant cities is done at the farm gate itself. The pre-harvest contract system prevailing in the state has an impact on the health and life of the litchi orchards. The pre harvest contract is done at leaf or flowering stage and usually valid only for a year. The owners are responsible for cultural operations except for spray against fruit fly carried out by the contractor. However, the cost incurred on this count is deducted by the contractor from the final settlement. Where the contract is done for 2 – 3 years, contractor is responsible for all operations; he works with short term profit motive in mind and does not take care much to upkeep the orchard. Contractors are not keen on investing in the orchard as they are not sure of continuing the contract during the next term. Most of such orchards belong to absentee landlords and suffer in the long run. Further, if the orchard owner is not present, harvesters may damage the twigs and branches while harvesting, causing harm in the long run. Moreover, the Indian and world markets for litchi are fast expanding. During the Indian litchi season (May to July), good quality of litchi is not available from other parts of the world except from Thailand (May & June) and Israel (July). In spite of these advantages, India has negligible share in the world trade with exports of 160 MT valued of Rs. 1.37 crore during 2018-19. As of now, the major mode of marketing of litchi in India is through inter-state trade. Presently, Muzaffarpur (Bihar) renowned as the litchi district in India has a share of 64.00 % of the litchi trade in the country. The state of the district in litchi trade is expected to touch 1.5 lakh MT by 2020-21. In view of its prominence in Indian litchi trade (in terms of quantity and quality), an analysis of the marketing aspects of Muzaffarpur litchi is depicted in the following section. Local markets of Muzaffarpur include local-hats sales, on farm markets, retailers. Export market opportunities for this produce is limited to neighbor countries, gulf countries due to less shelf-life.

#### **Marketing Problems of Litchi in Bihar**

The processing of litchi needs attention. The produce is generally marketed fresh with negligible processing and value addition. Very few processing facilities and that too are mainly in fruits-- litchi and mangoes are present and operational. Litchi is very

temperature sensitive fruit. It is important to reach the produce to any location with appropriate temperature within 24-36 hours after plucking. It is important in order to maintain its desired colour and flavour. The supply chain from farm to consumers outside the state market is not so efficient to maintain the timings. This is often taken as one of the major bottlenecks in marketing of litchi in Bihar. In addition, the current processing capacity is not adequate to cater to the value added market and prolonging the shelf life of litchi. In fact, fruits' shelf-life is not an issue where it is rapidly consumed at the local level, but in commercial production environments where litchi are to be sent to distant markets or the rate of consumption does not match the supply, appropriate post-harvest management is critical to successful marketing. Litchi and other fruits should be shipped soon after the harvesting, if it is to be sent to distant market.

In study we found the absolute absence of litchi specific cold-storage facility in Bihar as well as in Muzaffarpur. It was observed that litchi is also stored with vegetables specific cold storage. Due to this practice quality of litchi declined when it reached to distant market.

Similarly, even after processing, the products are kept under minimal refrigeration or no refrigeration. Units which are engaged in processing are mainly working on work order basis for larger chains and as such find that the operating margins being thin leave no scope of either technology upgradation or expansion. This study could be studied only two firms in the state which are engaged in producing value added products of litchi like; litchi drink/juice, litchi whole (*Rasagolla*) and litchi squash in the state itself in the brand names of litchika international and suman-vatika.

#### **Prospects of Litchi Production Development**

With increased market base, there is an ample opportunity for increasing the area under litchi as prevailing agro-climatic conditions have not been fully exploited. Extended area under different situations could be exploited for extended harvest. Based on the fruiting behaviour, quality development and area under cultivation, the litchi growing districts could be grouped in a manner to take full advantage of climatic variability. However, to increase production and productivity, concerted efforts would be required for technological support and development of infrastructure. The foothills of the Himalayas free from frost offer good scope for plantation of litchi. Experience has indicated that litchi cultivation can be done up to an altitude of 1,000 m above mean sea level. In these foothills, fruits mature late and ensure the availability of fruits late in the season. Interestingly, the litchi crop in India matures early in comparison to other litchi growing countries and offers better domestic and export markets. Accordingly there is potential for an additional 100,000 hectares to be brought under litchi cultivation. However, to achieve targeted growth in production, strategic planning, including improved production systems and infrastructure for post-harvest management, is needed.

#### **Conclusion**

We have seen that in last 5 years production and productivity trend of litchi has shown a decreasing trend, which is visible by the linear trend analysis of 12 years of area, production, and productivity data. It is a matter of concern for all stakeholders like litchi growers, contractors, traders. There is need of insurance of orchard and the credit facility should be available for the production of litchi. Proper attention is need to be given to the horticulture sector in general and litchi in specific. There is a need of separate horticulture policy for the wellbeing of this sector. Bihar as well as Muzaffarpur district has high potential of growth of litchi produces if it is guided by proper mechanism. There is need to promote litchi based food processing units in the region. Apart from this there is need to develop cold chain and refrigerated van for proper storage and transportation.

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