

GROWTH OF PRODUCTION AND PRODUCTIVITY OF MAJOR FRUITS IN JHARKHAND

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Abstract- In addition to supplying food, nutrition, and financial stability, fruits also produce greater returns per unit area, which is essential for Indian agriculture as well as Jharkhand agriculture. Fruits also have a better productivity, a quicker maturation cycle, a high value and a bigger earning potential, all of which contribute to improved livelihoods. According to the Department of Agriculture & Farmers Welfare, India produced 102080 thousand MT of fruits in 2019-20 and 103027 thousand MT in 2020-21 (3rd Advance Estimates). But Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand and the Directorate of Agriculture, GOJ Jharkhand produced 1141.5 thousand MT in 2019-20 and 1196.3 thousand MT in 2020-21. The area and production of fruits in Jharkhand has consistently increased since 2016-17. In 2016-17, fruits were grown in 100.8 thousand hectares of land. This area has increased to 103.4 thousand hectares in 2017-18 and then decreased to 102.1 thousand hectares in 2020-21. In 2016-17, 1048.0 thousand MT of fruits were produced to 1196.3 thousand MT in 2020-21. This paper has been attempted to analyse the growth of production and productivity of major fruits in Jharkhand and to comparative study the growth of cultivable area, production and productivity of major fruits between India and Jharkhand.

Keywords: Major fruits, Area, Production, Productivity and Growth

INTRODUCTION

The horticulture sector encompasses a wide range of crops e.g., fruit crops, vegetable crops, ornamental crops etc. India's diverse temperature and soil make it an ideal place to cultivate a broad variety of horticulture crops. Within agriculture, it is the area with the fastest growth. It aids in reducing poverty, ensuring nutritional security, providing farmers with the opportunity to enhance their income, and supporting several agro-based enterprises that create a significant number of jobs. After the green revolution in the middle of the 1960s, it became obvious that horticulture, which is well adapted to India's terrain and agro climatic, is the best choice. India has emerged as the world's top producer of fruits and fruits as well as cashew, mango, and banana. Horticulture's transition from rural to commercial production is the most important development of the past ten years and this new environment has spurred private sector investment in production system management. Micro irrigation, precision farming, greenhouse production and enhanced post-harvest management, among other technical advancements, have had a significant influence on development over the past ten years, but many problems have sprung up in the process. As a plentiful and affordable source of vitamins and minerals, fruits play a significant role in the diet of Indian consumers, the majority of whom are vegetarians out of choice or access issues. This steady fast vegetarianism, together with increased per capita wealth, is causing fruit consumption to increase quickly. Increasing fruit demand is thought to benefit small holder farmers in India, who make up the majority of the country's agricultural sector. Fruits cultivation requires a lot of labour and smallholders have access to a lot of labour. This gives small holders a particular edge in the production of fruits. Also, because most fruits have short harvest cycles, they offer returns throughout the year. Not with standing these benefits, there are still a number of challenges for small holders when it comes to growing fruits. Because of the significant output losses brought on by pests, there are significant dangers to productivity.

REVIEW OF LITERATURE

Surabhi Mittal (2007), Both local demand and a sizable amount of export demand from other countries stimulate the growth of horticultural crops in the country. Economic viability, particularly the fruits and vegetable products, has been a major driver of the shift in cropping patterns in India during the past 1.5 decades in favour of horticulture.

Suprakash-Pan, (2013), Such horticulture practices play a significant role in a developing economy by supplying food, nutrition, and economic security. More crucially, they also produce greater returns per unit space and time. Vegetable output, productivity, and area have all increased gradually in West Bengal. According to a demand-supply study, all districts will be able to produce more veggies than are needed.

Dangi, B.P. (2021), in the hazaribag, Dumka and Ranchi districts of Jharkhand on agricultural and horticultural productions, marketed surplus, different channels, price variation and margins have been explained.

Dangi, B.P. (2023), have examined horticulture production in Jharkhand undergone many changes since 2000. Many factors during study period different crops observed different impact on area under production, total production and productivity as well as growth rate. A significant changing is observed in case of high value crops. The farmers prefer high value crops through adoption of improved technology.

Joanne L. Slavin, Beate Lloyd (2012) Fruits and vegetables are universally promoted as healthy. The Dietary Guidelines for Americans 2010 recommend you make one-half of your plate fruits and vegetables. Myplate.gov also supports that one-half the plate should be fruits and vegetables. Fruits and vegetables include a diverse group of plant foods that vary greatly in content of energy and nutrients. Additionally, fruits and vegetables supply dietary fiber, and fiber intake is linked to lower incidence of cardiovascular disease and obesity. Fruits and vegetables also supply vitamins and minerals to the diet and are sources of

phytochemicals that function as antioxidants, phytoestrogens, and antiinflammatory agents and through other protective mechanisms. In this review, we describe the existing dietary guidance on intake of fruits and vegetables. We also review attempts to characterize fruits and vegetables into groups based on similar chemical structures and functions. Differences among fruits and vegetables in nutrient composition are detailed. We summarize the epidemiological and clinical studies on the health benefits of fruits and vegetables. Finally, we discuss the role of fiber in fruits and vegetables in disease prevention.

Anuja Bhargva & Atul Bansal (2021), In agriculture science, automation increases the quality, economic growth and productivity of the country. The export market and quality evaluation are affected by assorting of fruits and vegetables. The crucial sensory characteristic of fruits and vegetables is appearance that impacts their market value, the consumer's preference and choice. Although, the sorting and grading can be done by human but it is inconsistent, time consuming, variable, subjective, onerous, expensive and easily influenced by surrounding. Hence, an astute fruit grading system is needed. In recent years, various algorithms for sorting and grading are done by various researchers using computer vision. This paper presents a detailed overview of various methods i.e. preprocessing, segmentation, feature extraction, classification which addressed fruits and vegetables quality based on color, texture, size, shape and defects. In this paper, a critical comparison of different algorithm proposed by researchers for quality inspection of fruits and vegetables has been carried out.

Aditya Bahtiya & Dr. Neeraj (2023), Indian horticulture sector has been growing at a phenomenal pace, surpassing the crop sector and presently its production is around 307 million tonnes consisting of fruits (about 100 million tonnes) and vegetables (about 207 million tonnes). India is also the second larger producer of fruit and vegetables in the world after China. Fruit and vegetables are an elemental part of cuisines and play a vital role in providing fresh nutrition and healthy food to consumers of all ages around the world. These are highly perishable and have a very short life resulting in 20-30 percent post-harvest losses due to a lack of proper harvesting, processing and poor cold chain and storage facilities. Value addition is the easiest way to reduce these losses. The aim of doubling the farmers income cannot be fulfilled without the efficient post-harvest management of agri-horti crops. Processing and value addition not only help in minimizing the wastes but it will also create ample opportunities for employment and add several income avenues. Advances in processing technologies of fruit and vegetables will help to curb post-harvest losses and results in giving a boost to the food processing industries. This book chapter proposes to show the status of the processing industries, the need for processing, government initiatives, modern technologies, challenges, technological impact and alternatives for product development. The future tasks involve interdisciplinary and cross-border collaboration and the fruit and vegetables production and processing needs are global but their application will require different approaches in different regions.

Abebe Assefa Gobena (2018), Horticultural crops provide an abundant and inexpensive source of energy, body-building nutrients, vitamins and minerals. This review paper was aimed to recognize opportunities, constraints and potentials in Ethiopia for production of horticultural crops. Major opportunities and potentials existing in the country for production of horticultural were reviewed and described. Policies and incentives by the government to attract both foreign and domestic investors engaged in horticulture production were found to be attractive. Ethiopia has a comparative advantage in production of horticultural commodities on account its favorable climate, proximity to European and Middle Eastern markets and cheap labor. Low cost, disciplined and trainable Labor force and the size of its domestic market and the numerous river basins affording great potential for irrigation. The status of horticulture production including indigenous one and consumption in the country yet need further improvement. Recently, despite of the ups and downs observed, the demand for horticultural crops especially for export is increasing. In general, the drawback to this sector in Ethiopia mainly include social and cultural habits of the population like cereal based food habit, dietary preferences for meat and other animal products, and distaste for vegetable crops, lack of consumer awareness, economic reasons of the local consumers, absence of nutrition intervention programmed using horticulture. However, due to perishable nature and biological nature of horticulture production process, horticulture productions are risky investment activities. The constraints of horticultural production including vegetables production could be categorized in to farmer related, institutional, natural and infrastructure related factors. The review of literatures, we can summarized that horticultural crop production in country have great potential and opportunity with the great demands in export as well as domestic consumption and plays crucial role in the Ethiopia economy but countries not using all the potential and opportunities from this sector , so that further understanding about Horticultural crops production and its important for the domestic use and export earnings , should be give attentions on new technology adoption and all stakeholder like farmer ,researcher, investor and government to the sector give emphasis to this sector.

Objective of the Study

- To analyse the growth of production and productivity of major fruits in Jharkhand.
- To comparative study the growth of cultivable area, production and productivity of major fruits between India and Jharkhand.

Data and Methodology

The secondary data has been used, obtained from the department of agriculture and farmer welfare, Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand and Directorate of Agriculture, GOJ and Economic Survey of Jharkhand, has been used to understand the growth of cultivable area, production and productivity of major fruits in Jharkhand.

Result and Discussion

Because to their short growing seasons, high yields, nutritional value, economic viability, and capacity to create both on- and off-farm jobs, fruits are essential components of Indian agriculture and nutritional safety. growing per capita income, health awareness, urbanisation, an increase in the number of working women, farmers switching to high-value fruits due to higher profits, a favorable income elasticity of demand and the annual growth rate for fruits are other key factors supporting the growth of fruits in the nation. India's diverse climate ensures availability of all varieties of fruits. According to the Department of Agriculture & Farmers Welfare,

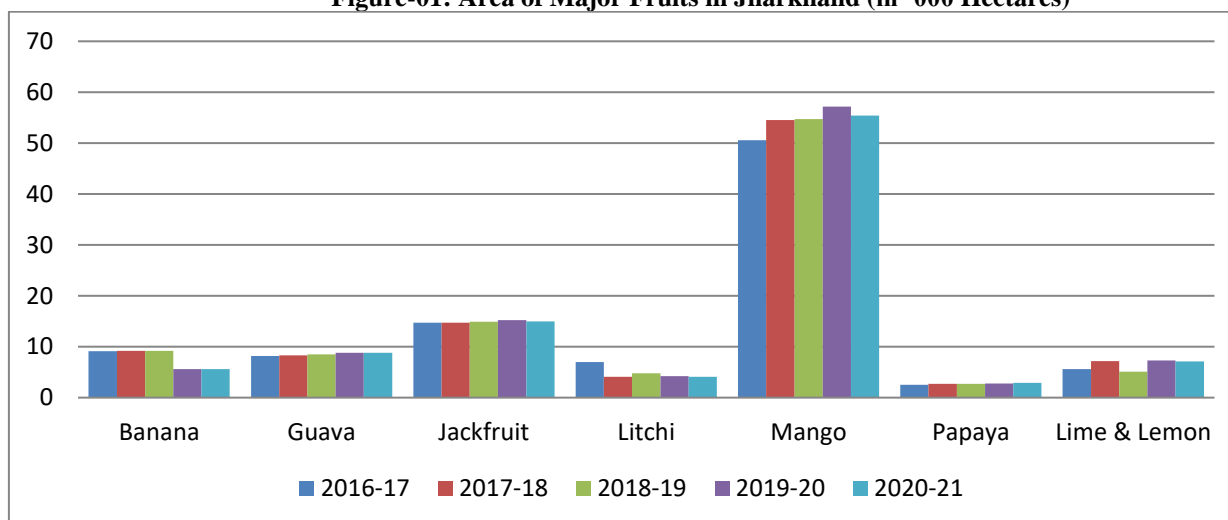
India produced 102080 thousand MT of fruits in 2019-20 and 103027 thousand MT in 2020-21 (3rd Advance Estimates). But Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand and the Directorate of Agriculture, GOJ Jharkhand produced 1141.5 thousand MT in 2019-20 and 1196.3 thousand MT IN 2020-21. The area and production of fruits in Jharkhand has consistently increased since 2016-17. In 2016-17, fruits were grown in 100.8 thousand hectares of land. This area has increased to 103.4 thousand hectares in 2017-18 and then decreased to 102.1 thousand hectares in 2020-21. In 2016-17, 1048.0 thousand MT of fruits were produced to 1196.3 thousand MT in 2020-21. Productivity of fruits slightly increased 10.4 kg/hectare (in 2016-17) to 11.7 kg/hectare (in 2020-21) in Jharkhand and 14.6 kg/hectare (in 2016-17) to 14.9 kg/hectare (in 2020-21) in India. Fruits are a great source of vitamins, including niacin, riboflavin, Thiamine and many vitamins. In addition to proteins and carbs, they also include minerals like calcium and iron. The major fruits planted are apple, banana, custard apple, grapes, guava, jackfruit, litchi, mango, papaya, pomegranate and watermelon in India and banana, guava, jackfruit, litchi, mango, papaya and lime & lemon in the state of Jharkhand.

Table-01: Area of Major Fruits in Jharkhand (in '000 Hectares)

Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21
Banana	9.1	9.2	9.2	5.6	5.6
Guava	8.2	8.3	8.5	8.8	8.8
Jackfruit	14.7	14.7	14.9	15.2	15.0
Litchi	7.0	4.1	4.8	4.2	4.1
Mango	50.6	54.5	54.7	57.2	55.4
Papaya	2.5	2.7	2.7	2.8	2.9
Lime & Lemon	5.6	7.2	5.1	7.3	7.1
Total (with remaining fruits)	100.8	103.4	103.1	104.3	102.1

Source: Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand
: The Directorate of Agriculture, GOJ

Figure-01: Area of Major Fruits in Jharkhand (in '000 Hectares)



Source: Compiled data

From the table & figure -01, mango has maximum area covered all over the year from 2016-17 to 2020-21. But banana and litchi are two fruits has decreased in 2020-21 from 2016-17 in the state of Jharkhand. Banana 9.1 thousand hectares and litchi 7.0 thousand hectares of the land in the year 2016-17 which decreased to 5.6 thousand hectares and 4.1 thousand hectares in 2020-21. Guava, jackfruits, papaya and lime & lemon of the land increased in the year 2020-21 comparatively 2016-17.

Table-02: Area of Major Fruits in India (in '000 Hectares)

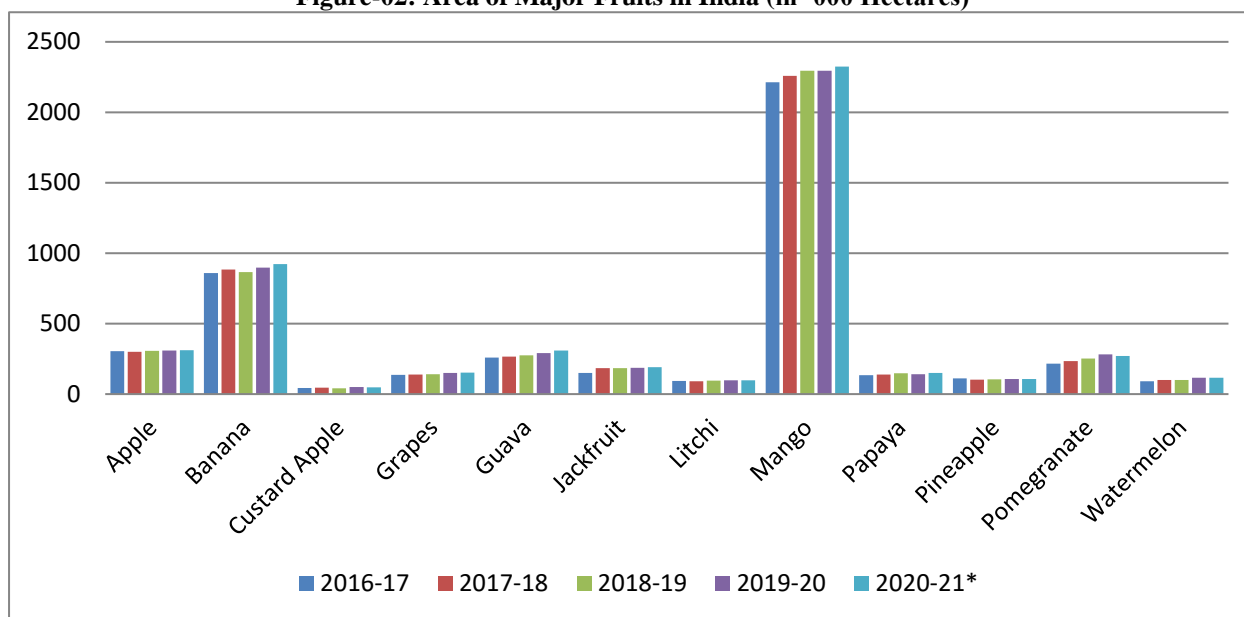
Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21*
Apple	305	301	308	310	312
Banana	860	884	866	897	923
Custard Apple	44	46	40	50	47
Grapes	137	139	140	150	152
Guava	260	265	276	292	310

Jackfruit	150	185	185	187	191
Litchi	93	92	96	97	98
Mango	2212	2258	2296	2294	2325
Papaya	134	138	149	142	150
Pineapple	111	103	104	106	107
Pomegranate	216	234	253	283	271
Watermelon	91	101	100	116	115
Total (with remaining fruits)	6373	6506	6597	6774	6914

Source: Department of Agriculture & Farmers Welfare

* 3rd Advance Estimates

Figure-02: Area of Major Fruits in India (in '000 Hectares)



Source: Compiled data

From the table & figure -02, mango has maximum area covered all over the year from 2016-17 to 2020-21 (3rd AE) and area covered of all fruits in my study have increased but area covered of pineapple is the only fruit has decreased (111 thousand hectares to 107 thousand hectares) in 2020-21 (3rd AE) from 2016-17 in India.

If we compare area covered of total fruits between Jharkhand and India from 2016-17 to 2020-21 then we found that, in 2016-17 area covered of total fruits is 100.8 thousand hectares and 102.1 thousand hectares in 2020-21 under the state of Jharkhand and 6373 thousand hectares in 2016-17 increased 6914 thousand hectares in 2020-21 (3rd AE) under the country of India.

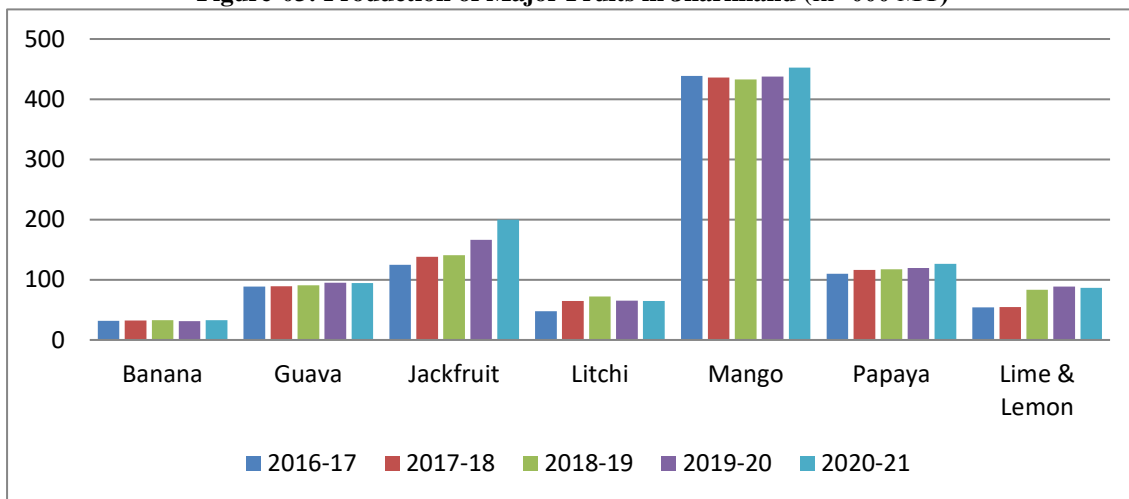
Table-03: Production of Major Fruits in Jharkhand (in '000 MT)

Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21
Banana	31.6	32.1	32.8	31.1	32.9
Guava	88.8	89.3	90.8	95.1	94.7
Jackfruit	124.8	137.9	140.9	166.1	199.7
Litchi	47.8	65.0	72.1	65.4	64.8
Mango	438.5	435.9	432.6	437.4	452.7
Papaya	109.9	116.4	117.2	119.5	126.2
Lime & Lemon	54.0	54.6	83.3	88.6	86.5
Total (with remaining fruits)	1048.0	1070.1	1106.7	1141.5	1196.3

Source: Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand

: The Directorate of Agriculture, GOJ

Figure-03: Production of Major Fruits in Jharkhand (in '000 MT)



Source: Compiled data

From the table & figure -03, mango has maximum produced all over the year from 2016-17 to 2020-21 and area covered of all fruits in my study has also increased in 2020-21 from 2016-17 in the state of Jharkhand.

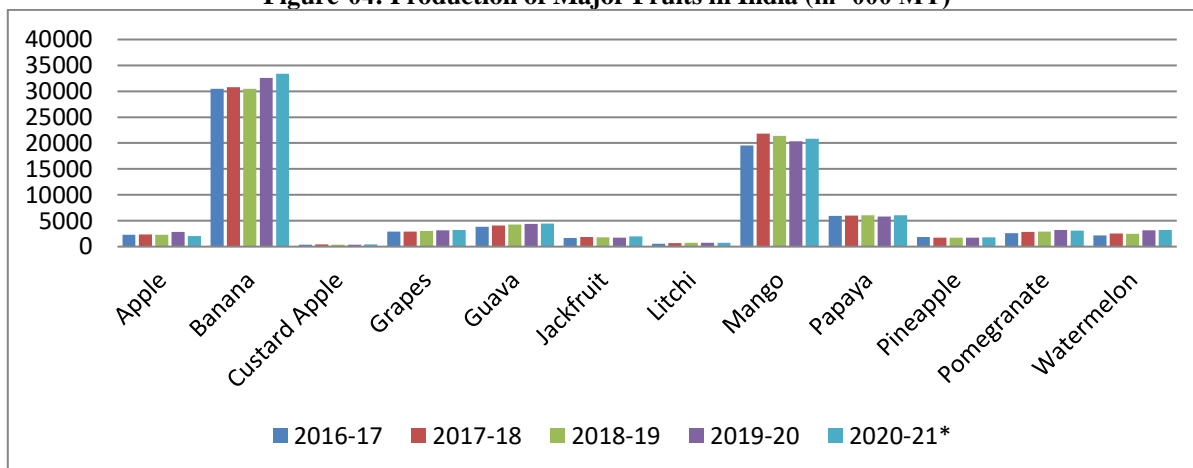
Table-04: Production of Major Fruits in India (in '000 MT)

Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21*
Apple	2265	2327	2316	2814	2057
Banana	30477	30808	30460	32597	33379
Custard Apple	383	401	339	395	403
Grapes	2922	2920	3041	3181	3229
Guava	3826	4054	4253	4361	4469
Jackfruit	1694	1830	1764	1739	1970
Litchi	568	686	721	726	720
Mango	19506	21822	21378	20317	20822
Papaya	5940	5989	6050	5780	6063
Pineapple	1861	1706	1711	1732	1774
Pomegranate	2613	2845	2915	3186	3088
Watermelon	2182	2520	2495	3157	3205
Total (with remaining fruits)	92918	97358	97967	102080	103027

Source: Department of Agriculture & Farmers Welfare

* 3rd Advance Estimates

Figure-04: Production of Major Fruits in India (in '000 MT)



Source: Compiled data

From the table & figure -04, mango has maximum produced all over the year from 2016-17 to 2020-21 (3rd AE) and production all fruits in my study have increased but pineapple is the only fruit production decreased (1861 thousand MT to 1774 thousand MT) in 2020-21 (3rd AE) from 2016-17 in India.

If we compare production of total fruits between Jharkhand and India from 2016-17 to 2020-21 then we found, in 2016-17 production of total fruits is 1048.0 thousand MT and 1196.3 thousand MT in 2020-21 under the state of Jharkhand and 92918 thousand MT in 2016-17 increased 103027 thousand MT in 2020-21 (3rd AE) under the country of India.

Table-05: Productivity of Major Fruits in Jharkhand (in Kg./Hectare)

Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21
Banana	3.5	3.5	3.6	5.6	5.9
Guava	10.8	10.8	10.7	10.8	10.8
Jackfruit	8.5	9.4	9.5	10.9	13.3
Litchi	6.8	15.9	15.0	15.6	15.8
Mango	8.7	8.0	7.9	7.6	8.2
Papaya	44.0	43.1	43.4	42.7	43.5
Lime & Lemon	9.6	7.6	16.3	12.1	12.2
Total (with remaining fruits)	10.4	10.3	10.7	10.9	11.7

Source: Department of Agriculture, Animal Husbandry & Co-operative, Government of Jharkhand
: The Directorate of Agriculture, GOJ

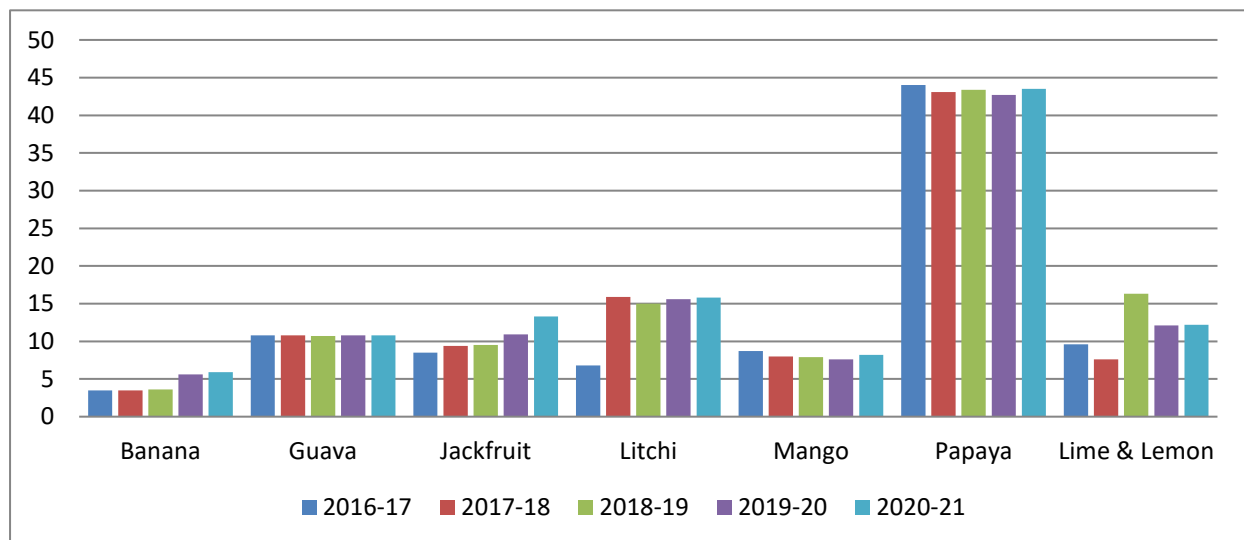


Figure-05: Productivity of Major Fruits in Jharkhand (in Kg./Hectare)

Source: Compiled data

From the table & figure -05, papaya has maximum productivity all over the year from 2016-17 to 2020-21 and productivity of most of the fruits in my study have increased. But productivity of mango and papaya have decreased in 2020-21 in the state of Jharkhand.

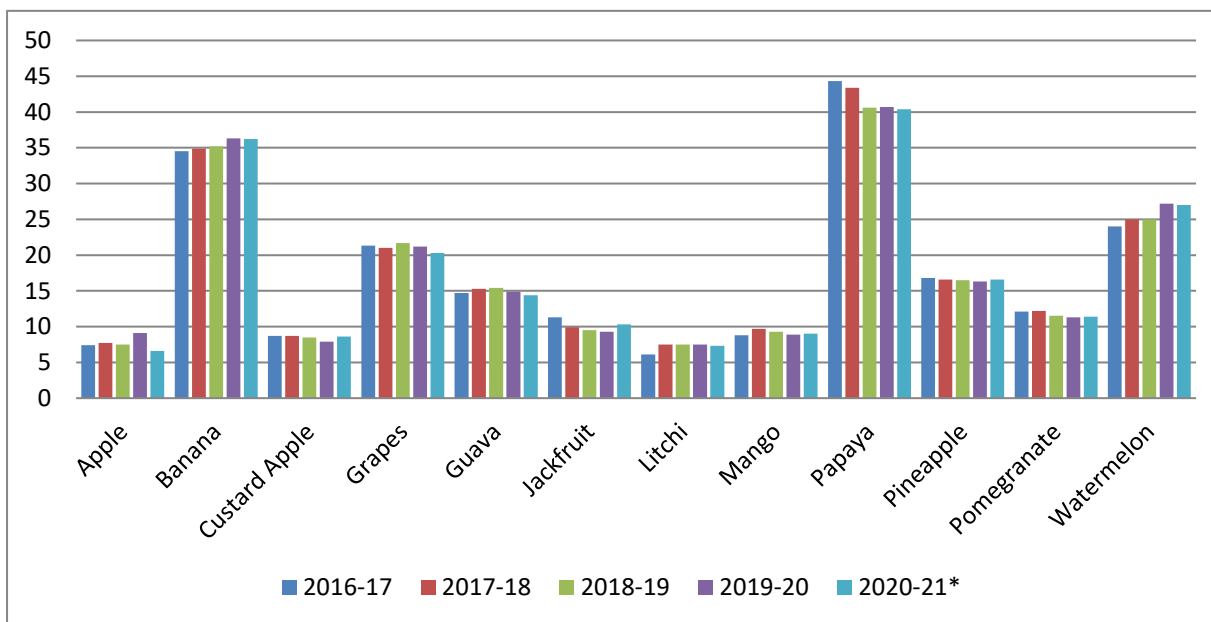
Table-06: Productivity of Major Fruits in India (in Kg./Hectare)

Fruits/Year	2016-17	2017-18	2018-19	2019-20	2020-21*
Apple	7.4	7.7	7.5	9.1	6.6
Banana	34.5	34.9	35.2	36.3	36.2
Custard Apple	8.7	8.7	8.5	7.9	8.6
Grapes	21.3	21.0	21.7	21.2	20.3
Guava	14.7	15.3	15.4	14.9	14.4
Jackfruit	11.3	9.9	9.5	9.3	10.3
Litchi	6.1	7.5	7.5	7.5	7.3
Mango	8.8	9.7	9.3	8.9	9.0
Papaya	44.3	43.4	40.6	40.7	40.4

Pineapple	16.8	16.6	16.5	16.3	16.6
Pomegranate	12.1	12.2	11.5	11.3	11.4
Watermelon	24.0	25.0	25.0	27.2	27.0
Total (with remaining fruits)	14.6	15.0	14.9	15.1	14.9

Source: Department of Agriculture & Farmers Welfare
* 3rd Advance Estimates

Figure-06: Productivity of Major Fruits in India (in Kg./Hectare)



Source: Compiled data

From the table & figure -06, productivity of papaya has maximum all over the year from 2016-17 to 2020-21 (3rd AE) and productivity of most of the fruits in my study have decreased but productivity of banana, litchi, mango and watermelon have increased in 2020-21 (3rd AE) in India.

If we compare productivity of total fruits between Jharkhand and India from 2016-17 to 2020-21 then we found, in 2016-17 productivity of fruits is 10.4 kg/hectares and 11.7 kg/hectares in 2020-21 under the state of Jharkhand and 14.6 kg/hectares in 2016-17 increased 14.9 kg/hectares in 2020-21 (3rd AE) under the country of India.

CONCLUSION

Fruits being a rich and cheap source of vitamins and minerals, occupy an important place in the food basket of Indian consumers, a majority of whom are vegetarian by either choice or lack of access. India's diverse climate ensures availability of all varieties of fruits. Fruits play a major role in Indian agriculture as well as Jharkhand agriculture by providing food, nutritional and economic security and more importantly, producing higher returns per unit area. In addition, fruits have higher productivity, shorter maturity cycle, are high in value and provide greater income leading to improved livelihoods. In India, major fruits (apple, banana, custard apple, grapes, guava, jackfruit, litchi, mango, papaya, pomegranate and watermelon) cultivable area is increased but only pineapple decreased in 2020-21 from 2016-17. Major fruits production is also increased but only pineapple decreased in 2020-21 from 2016-17. Some fruits productivity increased and some fruits (apple, custard apple, grapes, guava, jackfruit, papaya and pineapple) productivity decreased in India as well as Jharkhand. In the last five years, the maximum expansion in area and the highest growth in output has taken place in mango and papaya. The area for mango cultivation in the state has increased and production has also increased. The area under most of the fruits has increased. India produced 568 thousand MT of litchi in the year 2016-17 which increased 720 thousand MT in 2020-21. Mango was the most produced fruit in Jharkhand in 2020-21, followed by jackfruit and guava. Mango was grown 55.4 thousand hectares followed by jackfruit in 15 thousand hectares in 2020-21.

Fruits are grown, has increased from 6373 thousand hectares (India) and 100.8 thousand hectares (Jharkhand) in 2016-17 to 6914 thousand hectares (India) and 102.1 thousand hectares (Jharkhand) in 2020-21. Although this increase has not been steady but an overall increased area of production is an indicator of the diversification in horticulture as well as agriculture. There has been a steady increase in the production of fruits in Jharkhand since 2016-17. The production of fruits has increased from 92918 thousand MT (India) and 1048.0 thousand MT (Jharkhand) in 2016-17 to 103027 thousand MT (India) and 1196.3 thousand MT (Jharkhand) in 2020-21.

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