

Trend Analysis of Area under production and Productivity of Maize in India

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Abstract:

Maize is one of the most important cereal crop of the world and contributes to food security in most of the developing countries. In India maize is emerging as third most important crop after rice and wheat. Its importance lies in the fact that it is not only used for human food and animal feed but at the same time it is also widely used for corn starch industry. Corn oils production baby corns etc. This paper analysis the trends of area under production and productivity of maize in India. This study was based secondary Sources of Data. Computed Compound Growth Rate of time series data on area, production and productivity for Maize in India. The growth rate for area production and yield was positive in India. State-wise analysis shows that area, production and yield was positive and significant Rajasthan is 1st place occupying 1110.8 thousand hectare area, production is 729.6 mt in 2016-17, highest production in the state is Madhya Pradesh. Karnataka is 6th place occupying 618.0 thousand hectares area, production is 1244.0 mt in the year 2016-17. District wise Area production and productivity shows Bagalkote district occupying first place Area 178.48 hectares production 708 MT followed by Davanagere Haveri, Ballary.

Key words: Agriculture, Area, Production, Maize,

Introduction

Maize is a one of the most important cereal crop in the world agricultural economy both as food for man and feed for animal. It is a miracle crop having high yield potential, Maize crop is utilized in many ways like other grain crop. Over 85% of maize produced in the country consumed as human food. There is no cereal on the earth which has so immense potentiality and that is why it called "Queen of cereals". Maize is the only cereal which can be grown throughout the year in all seasons of Kharif, Rabi. The importance of corn is due to its wide diversity of uses. It is used both as food for human and feed for animal. It is also fractionated by either dry into food and industrial ingredients. Food grain production in India has almost reached a plateau with annual growth rate 2.72 percent during 2016s which is almost equal to the annual growth rates of population. Among the cereals grown in India, maize ranks as one of the most important though of contribution to the total food grains production in the country is merely 5 percent. In India maize was grown traditionally as a staple food domesticated primarily for home consumption. The production of coarse grain has been almost stagnant as their cultivation is not under rain fed conditions resulting in low yields. Maize in India, contributes nearly 9% in the

national food basket and more than Rs.100 billion to the agricultural GDP at current prices apart from the generating employment to over 100 million man days at the farm and downstream agricultural and industrial sectors. In addition to staple food for human being and quality feed for animals, Maize serves as a basic raw material as an ingredient to thousands of industrial products that includes starch.

Maize is the third important cereal crop after rice and wheat in terms of area currently 49 percent of maize output is used as poultry feed 12 percent as Animal feed 25 percent as food 13 percent in starch and other industries and 1 percent as seed. Andhra Pradesh, Karnataka, and Maharashtra are the major Maize producing states liquid glucose, dextrose monohydrate, any drops dextrose, Surbiton, corn glue to name a few. In India, the prime source of starch is maize and the textile industry is for long the largest buyer of maize starch in India. In India, maize is a Kharif crop with harvest and arrivals due only from October onwards. Kharif contributes over 80 percent of the entire maize output. Bulk of the maize produced in the country goes for production of poultry feed. It is estimated that the demand for maize from the poultry industry would rise by about 6 percent about Delhi account for over 50 per cent of the total maize acreage in the country increasing demand from poultry sector is likely to substantially hike maize consumption to go over 30 million tonnes by 2020. The current level of maize yield in the country (2.17 MT /HA) is far behind the global average of 5 MT /Ha and there is huge scope of improvement in yield by improving the adoption of hybrids. Particularly in traditional maize growing regions. With the growing demand from feed and starch sector, the overall demand for maize is likely to grow at a brisk pace

Review of literature

Vishal kuma, G. T. Patle D. R. Singh Rajshree Chand (2017). Their Article entitled on Trend of Area, Production and Productivity of Major Cereal Crops in Context of Food Security: Sikkim, India. This study was conducted to examine growth trends in area, production and productivity of major cereal crops in Sikkim, India over the period 2003-2016. The data used for the study were collected from the annual reports of Food Security & Agriculture Development Department, Government of Sikkim. The trend detection in the time series of area, production and productivity would be helpful to make the future plans and to take the appropriate decisions to safeguard the situation for the sustainability in food production and future food security. Drastic reduction was observed in the production and area of cultivation of major cereal crops in Sikkim. Shifting of farmer's focus toward the horticultural and plantation crops may be the main cause for negative trend in the production of major cereal crops. Correlation and correlation-based measures (e.g., the coefficient of determination) have been widely used to evaluate the goodness-of-fit of linear, exponential and logarithmic model for observing trend in the production, productivity and area under the cultivation of major cereal crops and Sen's slope methods were used for the trend analysis. In the study, most of the cereal crops showed negative trends in the production and area under

the cultivation excluding maize and buckwheat. Sikkim's agricultural economy has undergone a structural transformation and subsistence crops like wheat, barley and other major crops switched on to more remunerative crops like horticultural and plantation crops.

Ayalew and I. Sekar (2016). This study was aimed at investigating trends, instability, and regional variations of maize production in major producing states of India. Compounded Annual Growth Rate (CAGR), Cuddy Della Valley Index (CDVI), and decomposition analysis were used to examine the data ranging from 1980 to 1981 and 2011 to 2012. The study revealed that area under maize in India has increased from 5.89 to 9.19 Mha and production has increased from 6.49 to 21 Mt between the period TE 1981 to 1982 and TE 2011 to 2012. Such increase in production of maize has been possible mainly due to increase in yield from 1,100 to 2,279 kg/ha. For all India, area has expanded at 1.88% per annum between 1982 to 1983 and 2011 to 2012, while yield increased at a rate of 2.28% per annum during the same period. As a result, production of maize has risen by 4.2% per annum. The area expansion of maize was the highest in Maharashtra (9.19%) followed by Karnataka (7.98%). Production increase of maize was also the highest in Maharashtra (12.24%), which is followed by Karnataka (8.48%) and Andhra Pradesh (8.68%). The growth of yield in Andhra Pradesh was the highest (3.99%) followed by Maharashtra (2.80%). The study witnessed that maize is in the winning ground in India at country level more specifically in the states of Andhra Pradesh, Bihar*, Gujarat, MP*, Rajasthan, and Uttar Pradesh* as increase in yield coupled with decline in instability. The decline in instability and increase in yield in these states might be due to the adoption of modern varieties of maize as also evidenced from the decomposition analysis where yield effect was observed to be the major driver of growth in maize production. More over the expansion of maize in the high potential areas might also bring about increase in yield in the country

Methodology: This study was based secondary Sources of Data. Computed Compound Growth Rate of time series data on area, production and productivity for Maize in India. The time series data on the production, area and productivity of the Maize were collected from different sources namely Annual Reports, Food Security & Agriculture Development Department, of India and Karnataka.

Objectives:

- To Analyse the Trends in Area under production and productivity of Maize in India and Karnataka

Analysis of the Paper

In India during the last decade maize has witnessed rapid production and productivity growth. This is mainly attributed to the emergence of commercial irrigated farming systems in certain regions of the country especially south India. Rain fed agriculture in India occupies 67% of the net sown area, contributing 44% of food grains and supporting 40% of the population.

Table1: Are, Production and Yield of Maize in India

Year	Area	Production	Yield
2001-01	31.59	1.73	547
2001-02	44.07	4.08	926
2002-03	58.52	7.49	1279
2003-04	60.05	7.00	1159
2004-05	57.97	6.64	1146
2005-06	59.04	8.96	1518
2006-07	59.79	9.53	1595
2007-08	62.60	10.77	1720
2008-09	63.21	10.82	1711
2009-10	62.04	11.15	1795
2010-11	64.22	11.51	1785
2011-12	65.57	12.07	1841
2012-13	66.00	13.30	1956
2013-14	57.00	10.57	1854
2014-15	62.25	13.25	2015
2015-16	64.00	12.35	1905
2016-17	66.71	14.14	2250
2017-18	Na		
2018-19	Na		
2019-20	9569 (T. Ha)	28766 (TMT)	3.0 MT
2020-21	9700 (T. Ha)	30250 (TMT)	3.1 M T

Note:Area Million Hectare: Output Million tonnes: Yield Kg /hectare

Source: Director of maize research (DMR) report

According to the above table maize production India is increasing years by years. The increase in the maize production in terms of area , output and yield indicate that maize is becoming one of the prominent agro produces in India.

Table 3.6 State wise Area and Production of Maize in India

Sl No	State	Area in 000 Hectares		Production in 000 Tonnes	
		Area	% to total Area	Production	% to total production
1	India	7322.3	7.32	1492.9	14.92
2	Karnataka	618.0	8.4	1244.0	8.33
3	AP	721.0	12.92	2477.0	16.59
4	UP	947.2	12.94	1318.5	8.83
5	Bihar	606.5	8.28	1439.9	9.65
6	MP	901.3	12.30	1835.6	12.45
7	Rajasthan	1110.8	15.17	729.6	4.88
8	HP	298.5	4.08	532.6	3.57
9	J & K	321.2	4.39	757.3	5.07
10	Maharashtra	384.8	5.26	831.9	5.57
11	Gujarat	484.5	6.62	459.0	3.07
12	Punjab	154.0	2.10	350.1	2.05

Source: Agriculture Centre for monitoring Indian economy

The above table depicts that the state wise area, production of maize. In 2016-17 and percentage stood 5th in terms of area with 618.0 lakh hectares (8.44) and 6th in terms of production with 1244.0 lakh tonnes.

Area Yield and production trend in Karnataka

Maize a Kharif crops, is perhaps the only coarse grain in India whose production and yield has shown a steady growth in the past decades years

Table 3.2 Area Production yield of Maize in Karnataka

Year	Area (hectares)	Production (tonnes)	Yield kg hectares
2007-08	94.3	11.7	124
2008-09	85.0	9.0	106
2009-10	84.8	10.7	126

2010-11	92.4	14.5	157
2011-12	91.6	15.2	166
2012-13	88.5	15	174
2013-14	95.6	16.7	175
2014-15	95.8	16.9	178
2015-16	97.6	17.5	186
2016-17	98.2	18.2	195

Maize Source: Directorate of economics and statistics

Area under maize cultivation was around 94.3 thousand hectares in the year 2007-08 increased 98.2 hectare in the year 2014-15. It was reduced 84.8 thousand hectares in 2009-10 shows in above Table.

Tables 3.1: Area, Production and Yield of Maize in Major districts of Karnataka (2016-17)

District	Area	Production	Yield
Bagalkot	178.48	708.00	41.39
Belgaum	104.54	258.81	26.06
Davangere	168.47	508.85	28.35
Haveri	120.61	324.85	28.47
Bellary	81.73	225.80	29.80
Shimoga	54.22	193.72	19.42
Chitradurga	64.72	119.72	19.47
Hassan	33.76	115.16	35.90
Dharwad	66.88	117.18	37.90
Chikkballapur	32.30	106.96	34.90
Raichur	45.06	118.90	45.90
Bijapur	38.06	126.96	58.98
Chikmagalur	32.08	107.80	37.57
Bidar	36.47	91.00	25.08
Kolar	38.60	91.68	25.70
Hassan	30.03	88.97	26.00
Karnataka State	932.91	2632.44	29.70

Unit: Area in (000 Hectares), Production in Metric Tonnes, Yield in at /hectare

Source: www.indiastat.com

The above shows that area and production trend in year wise, the 2007-08 to 2016-17 productivity, maize has proved a lot in 106 kg per hectare yield in 2016-17 195 kg per hectare. Though this data is average yield some of the plantations produce 100-1500 kg per hectare regularly.

Findings

- The growth rate for area production and yield was positive in India
- State-wise analysis shows that area, production and yield was positive and significant Rajasthan is 1st place occupying 1110.8 thousand hectare area, production is 729.6 mt in 2016-17, highest production in the state is Madhya Pradesh. Karnataka is 6th place occupying 618.0 thousand hectares area, production is 1244.0 mt in the year 2016-17.
- District wise Area production and productivity shows Bagalkote district occupying first place Area 178.48 hectares production 708 MT followed by Davanagere Haveri, Ballary.

Conclusion:

The demand for maize is increasing for various usages different types of food, livestock feed, poultry feed, beverages, starch, etc. The change in production trend has brought a change in its pattern also. The expansion in area and production has been accompanied by regional shift in the country since early-1990s from the traditional maize growing belt of indo genetic plan region (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) to the central and southern plateau region (Andhra Pradesh Karnataka and of late, Maharashtra and Tamil Nadu) Currently two states Andhra Pradesh and Karnataka 35 percent of the total maize production in India. Thus with the cultivation of maize crop the added nutrients value is increasing in the human diet significantly for a healthy growth of our country's economy. The Karnataka state average area under maize cultivation in during 2016-17.

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