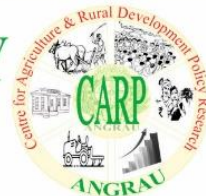




ACHRAYA N G RANGA AGRICULTURAL UNIVERSITY

Lam, GUNTUR - 522034.



Crop Outlook Reports of Andhra Pradesh

MAIZE

(January to December, 2022)



Centre for Agriculture & Rural Development Policy Research (CARP)

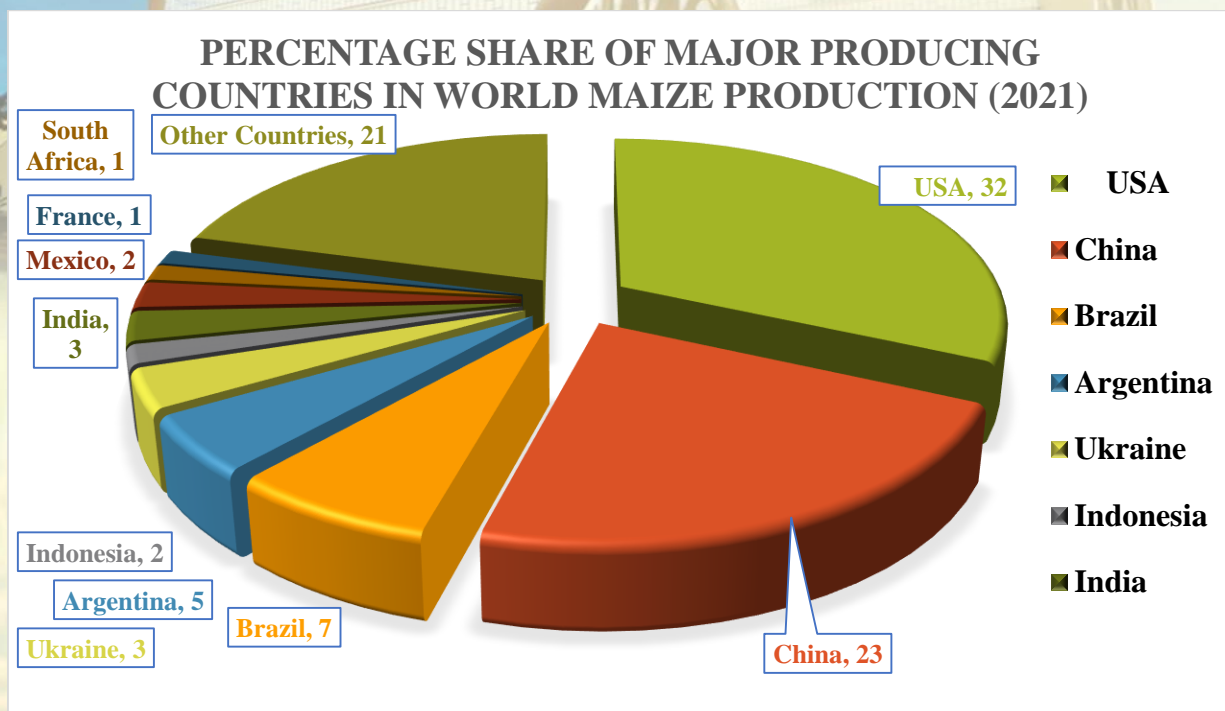
ANGRAU, Lam, Guntur - 522 034.

ANGRAU Crop Outlook Reports of Andhra Pradesh

MAIZE – January to December 2022

Globally, Maize is known as queen of cereals because of its highest genetic yield potential among the cereals. Every part of the maize plant has economic value (the grain, leaves, stalk, tassel, and cob) and all are used to produce a large variety of food and non-food products. It is the most versatile crop and is grown in more than 166 countries across the globe, including tropical, subtropical and temperate regions, from sea level to 3000 m above mean sea level. It is cultivated in nearly 205 m ha with a production of 1210 m tonnes and productivity of 5878 kg/ha all over the world, having wider diversity of soil, climate, biodiversity and management practices (FAOSTAT 2021). India produced 33.62 million tonnes in an area of 10.04 million hectares in 2021-22, whereas in kharif 2022-23, maize production was 23.10 million tonnes (1st advance estimates) in an area of 9.68 million hectares (agricoop.nic). United States of America (USA) is the largest producer of maize contributing 32 per cent of the global production and is regarded as the driver of the US economy (Figure 1). In Andhra Pradesh, maize was cultivated in an area of 3.42 lakh ha with a production and productivity of 20.49 lakh tonnes and 5991 kg/ha respectively contributing 6.09 per cent to total country's production (des.ap.gov.in, 2021-22). According to 1st advance estimates during 2022-23, maize was grown in 1.21 lakh hectares with a production of 5.08 lakh tonnes and productivity was 4195 kg/ha.

Figure 1: Percentage share of major maize producing countries in during 2021



Source: fao.org/faostat/en

Maize is the third most important cereal crop in India after rice and wheat and is grown in a wide range of environments, extending from extreme semi-arid to sub-humid and humid regions (which predominantly occupies 82 per cent of the area under cultivation in the kharif season). It accounts for around 10 per cent of total food grain production in the country. In addition to staple food for human being and quality feed for animals, maize serves as a basic raw material to thousands of industrial products that includes starch, oil, protein, alcoholic beverages, food sweeteners, pharmaceutical, cosmetic, film, textile, gum, package, paper industries *etc.* To sum up, the Indian maize sector has several opportunities in all its sub-sectors like seed, non-seed inputs, farm mechanization, processed foods, industrial products, market-related infrastructure, storage, processing *etc.* It has also enormous potential to provide food security, feed security, nutritional security and enhanced income to maize growers. Maize qualifies as potential crop for doubling farmer's income. Maize is less water demanding and gives higher yield per hectare. By growing maize farmers save 90 per cent of water, 70 per cent of power compared to paddy farming.

Table 1: Indian exports and imports of maize between 2010-11 to 2020-21

Years	Export		Import	
	Qty (000' Tonnes)	Value (Rs. Crore)	Qty (000' Tonnes)	Value (Rs. Crore)
2010-11	3010.42	3359.46	16.31	40.01
2015-16	697.95	1162.01	181.77	291.77
2016-17	566.35	1030.13	83.22	162.46
2017-18	705.51	1228.46	30.70	102.06
2018-19	1051.86	1872.51	86.03	183.38
2019-20	370.07	1019.29	458.51	843.20
2020-21 (April-September)	922.66	1376.83	16.38	47.61

Source: indiastat.com

Argentina and Brazil have emerged as major exporting nations of maize in 2019. India has exported 370 thousand tonnes of maize having the worth of Rs. 1,019.29 crores/ 142.76 USD Millions in 2019-20 (Table 1). The major export destinations of Indian maize (2019-20) are Nepal, Bangladesh, Myanmar, Pakistan and Bhutan. India was a net importer of maize till late 1980s, as production growth in the country was not enough to meet the growing demand from poultry and other sectors. In 2019-20, 458.51 thousand tonnes worth of Rs 843 crores of maize was imported by India in which 41 per cent of maize is imported from Myanmar followed by Ukraine (34 %) and Singapore (9 %).

Indian maize has become non-competitive in the international market due to relatively weak international prices. India has witnessed a jump in maize exports from 2007 and found comparative advantage till 2014. The global prices had come down in 2014-15 which led to fall in subsequent external demand having pushed local prices to lower than MSP, while in 2015-16 the shortage in domestic production pushed prices above international markets, thus making maize exports non-viable in 2015 and 2016 and again the export started increasing and reached 0.92million tonnes in 2020-21.

Table 2: Balance sheet of Indian maize during 2020-21 to 2022-23 (million tonnes)

Particulars	2020-21	2021-22	2022-23*
Opening Stocks	3.41	2.31	3.02
Production	24.51	32.9	29.9
Imports	0.02	0.29	0.25
Total Supply	27.94	35.52	33.13
Export	3.47	3.40	1.72
Domestic Consumption	22.52	29.10	29.5
Total demand	25.98	32.50	31.22
Ending Stock	2.31	3.02	1.91

Source: agriwatch.com, F-Forecast

As per some private sources, the data given is compiled in Table 2 & 3. The year 2022-23 started with an opening stock of 3.02 million tonnes and total availability goes up to 33.13 million tonnes. The total annual demand including exports of 31.22 million tonnes. The ending stocks are expected to be 1.91 million tonnes in 2022-23.

Table 3: Consumption Breakup of maize in India (million tonnes)

Consumption Breakup	2021-22	2022-23
Poultry & cattle Feed	14.18	18.84
Starch & brewery	4.71	6.28
Human Consumption	1.90	2.39
Seed	0.27	0.30
Shortage & Wastage	0.98	1.50
Storage & Moisture Loss	0.71	0.60
Total Domestic Consumption	22.75	29.9

Source: agriwatch.com F: Forecast

Maize consumption in India can broadly be divided into three categories viz. feed, food and Industrial non-food products (mainly starch). The most important use and demand driver of maize is poultry and cattle feed which accounts 62 per cent of total maize consumption and nearly 8 per cent of maize for human consumption. The major consumption states in India are Karnataka, Andhra Pradesh, Punjab, Gujarat, Haryana, Telangana, Tamil Nadu, Bihar, and West Bengal. There are many drivers of maize demand in India, the most important being (1) growing demand from poultry sector, consuming more than half of the domestic production; (2) growing urbanization, leading to increased demand for processed foods like corn flakes, bakery products,

etc., (3) growing organised dairy sector, requiring more of fine cereals or maize-based concentrates; and (4) rising international price due to diversion of maize grain towards biofuel production.

Table 4: Area and production of major maize producing states of India (Area(A) - lakh ha, production(P) -lakh tonnes)

States	1950-51		1990-91		2000-01		2010-2011		2020-21		2021-22	
	A	P	A	P	A	P	A	P	A	P	A	P*
Madhya Pradesh	3.62	1.12	8.77	12.37	8.40	12.18	8.31	10.52	14.6	34.80	15.15	37.13
Karnataka	0.10	0.05	2.52	6.37	6.69	21.36	12.88	44.44	16.80	51.80	14.73	45.54
Maharashtra	0.30	0.13	1.09	1.35	3.30	3.03	8.91	26.02	11.50	34.40	12.08	36.24
Bihar	5.66	3.12	6.65	10.38	6.21	14.97	6.46	14.40	6.50	22.20	9.79	33.55
Rajasthan	3.11	0.94	9.84	13.03	9.71	10.16	11.43	20.53	10.00	22.70	8.38	19.12
Uttar Pradesh	8.34	6.51	10.85	14.32	9.08	14.753	7.54	11.14	7.70	18.00	7.83	18.25
Andhra Pradesh	1.38	0.38	3.09	6.46	5.28	15.81	7.44	39.53	3.00	19.50	3.42	20.49
India	31.59	17.29	59.04	89.62	66.11	120.43	85.53	217.26	98.60	315.10	100.83	336.20

*Source: indiastat.com.*provisional figures, yet to be published (coarse cereals production excludes paddy and wheat) (Andhra Pradesh figures from Final Advance Estimates, 2021-22)*

In the country, more than three-fourths of the maize is grown in Madhya Pradesh, Karnataka, Maharashtra, Rajasthan, Bihar, Uttar Pradesh, and Andhra Pradesh (Table 4). Maize cultivation is done in two production environments namely traditional maize growing areas (Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh) and non-traditional maize areas, (Karnataka and Andhra Pradesh). In traditional areas, the crop is primarily grown as a subsistence crop to meet food needs. In contrast, maize in the non-traditional areas is grown for commercial purposes i.e., mainly to meet the feed requirements of the booming poultry sector. Since 1990s, a regional shift in maize production has taken place in India in big way, as southern states emerged as the largest maize-producing states, while maize area started decreasing in the traditional major maize-growing states.

Table 5: Area and production of major maize growing districts of Andhra Pradesh (2020-21).

Districts	Area (000'ha)		Production (000'tonnes)		Yield (Kg/ha)
	2020-21	Position	2020-21	Position	2020-21
Srikakulam	35	5	150	5	4347
Vizianagaram	41	3	225	4	3797
West Godavari	38	4	335	2	8799
Guntur	41	2	393	1	9614
Kurnool	59	1	238	3	4026
Other districts	87		443		-
Andhra Pradesh	301		1784		5918

Source: apagrisnet.gov.in

From Table 5, it is clear that, the highest maize yield was observed in Guntur district in 2020-21. In terms of maize production, the major districts were Guntur (3.93 lakh tonnes), West Godavari (3.35 lakh tonnes), Kurnool (2.38 lakh tonnes), Vizianagaram (2.25 lakh tonnes) and Srikakulam (1.50 lakh tonnes).

Table 6: Growth parameters of maize before and after bifurcation of Andhra Pradesh.

Particulars	Before Bifurcation		After Bifurcation					
	2010-11		2015-16		2021-22		2022-23*	
	AP	India	AP	India	AP	India	AP	India
Area (in 000'ha)								
Maize	744	8,553	233	8,806	342	10083	121	9647
Total cereals& Millets	5868	100,270	2636	98,306	2906	101864	1766	92347
% Share	12.68	8.53	8.84	8.96	11.76	9.89	6.85	10.44
Production (in 000' tonnes)								
Maize	3,953	21,726	1,411	22,567	2049	33620	508	23100
Total cereals& Millets	18,874	226,241	13,100	235,218	14912	288030	8219	141550
% Share	20.94	9.60	10.77	9.59	13.74	11.67	6.18	16.31
Yield in Kg/Hectare								
Maize	5317	2540	6068	2563	5991	3334	4195	2394

Source: agricoop.nic.in; des.ap.gov.in

*1st advance estimates of India and AP.

In combined Andhra Pradesh most of the area under maize is in Telangana region and after bifurcation the area under Andhra Pradesh has decreased (Table 6). The contribution of maize production to total cereals and millets in Andhra Pradesh was 20.94 per cent before bifurcation and now the contribution has decreased to 13.74 per cent as the area under maize was declined.

Table 7: Cost-return structure of Maize in Krishna Zone 2021-22 (Rs./ha)

S NO	Particulars	Maize
1	Labour costs (Rs/ha)	26923(28.92)
2	Material costs(Rs/ha)	27306(29.33)
3	Variable costs(Rs/ha)	54703(58.75)
4	Fixed costs(Rs/ha)	29939(32.16)
5	Total cost(Rs/ha)	93106(100)
6	Yield (Qtl/ha)	80
7	Price (Rs./qtl)	1900
8	Gross returns (Rs/ha)	151959
9	Net returns (Rs/ha)	58853
10	Gross Margin (Rs/ha)	97256

11	Return on rupee BCR	1.63
12	Return on variable costs	2.78
13	Cost of Production (Rs./qtl)	1164

Source: Survey Data, Figures in the parentheses indicate the per cent of the item to the total cost, BCR – Benefit Cost Ratio, VC – Variable Costs

The cost-return structure of maize in Krishna Zone (Guntur, Prakasam and Krishna districts) of Andhra Pradesh for the year 2021-22 is presented in Table 7. Total cost in cultivation of maize crop was Rs. 93106 out of which 58.75 % accounts for variable costs and 32.16 % accounts for fixed costs. Cost of Production of maize was Rs. 1164/quintal. Gross margin implies the returns over variable cost which is pertained to owner farmers and net returns implies returns over the total costs which is pertained to tenant owners. Gross margin and net returns were Rs. 97256 per ha and Rs. 58853 per ha respectively. Return on rupee BCR was 1.63 which is concerned to tenant farmers and return on variable costs was 2.78 which is related to owner farmers.

Maize Price Outlook:

Seasonal indices measure the monthly per cent deviation from the average arrivals and prices during 2022. Modal prices of maize in Kurnool market were taken for calculating seasonal indices.

Table 8: Seasonal indices of arrivals and prices of maize in Kurnool market (2022)

Months	Arrivals	Price
January	155.11	92.21
February	105.66	91.46
March	110.30	100.06
April	148.04	108.61
May	138.42	100.86
June	52.52	102.04
July	15.30	101.45
August	5.23	98.03
September	25.14	98.09
October	107.63	94.13
November	265.51	102.31
December	71.14	110.75

Source: Data obtained from AMC Kurnool

The results in Table 8 show that the arrivals were highest in the month of November & January and prices were highest in the month of December & April. As arrivals lower than expected, Maize prices traded higher in the local markets in December 2022. However, prices

started to fluctuate in a range-bound pattern about the time when discussions regarding export restrictions started.

Table 9: Market prices vis-à-vis MSP of Maize in major producing states in Kharif

Marketing Season 2021-22

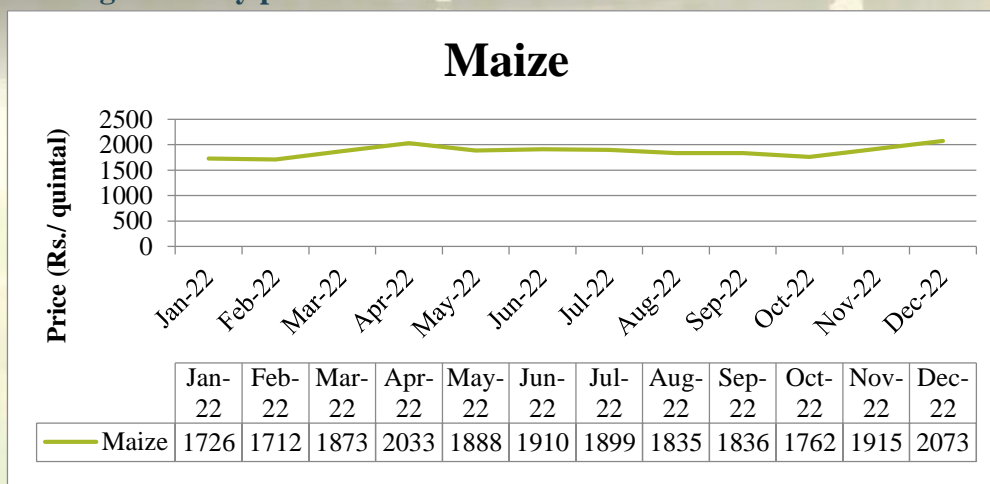
States	No. of days market prices reported	No. of days market prices were above MSP	No. of days market prices were below MSP				Average difference (%) between MSP & market price
			<5%	5%-10%	10%-15%	>15%	
Andhra Pradesh	122	4	25	15	18	60	-14.3
Karnataka	148	30	8	18	76	16	-83
Madhya Pradesh	151	11	24	9	11	96	-15.4
Maharashtra	151	15	21	11	29	75	-12.2
Rajasthan	145	50	9	18	46	22	-5.7
Telangana	137	10	79	28	16	2	-4.2
Uttar Pradesh	151	1	17	99	34	0	-8.2
Gujarat	124	36	24	37	16	11	-4.5
Tamil Nadu	115	26	13	18	35	23	-7.7

Source: 1. AGMARKNET, Directorate of Marketing & Inspection (DMI), Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare

2. Directorate of Economics & Statistics, Ministry of Agriculture and Farmers Welfare

Table 9 shows the number of days when market prices stayed above/below MSP for maize in major maize producing States during the current marketing season. In all the States, market prices were below MSP for most of the days. The average difference between market price and the MSP of maize ranged from (-) 15.4 percent in Madhya Pradesh to (-) 4.2 percent in Telangana.

Figure 2: Average monthly prices of maize in Andhra Pradesh



Source: Data obtained from Andhra Pradesh AMCs

Average monthly prices of maize in Andhra Pradesh showed steady increasing trend. In December average monthly price increased to Rs.2073 (Figure 2). As per the information shared by Agricultural Marketing Intelligence Centre (AMIC), ANGRAU, as on 16th December 2022, 96.47 lakh hectares of maize was sown compared to 92.24 lakh hectares last year in India (agricoop.nic.in) whereas in Andhra Pradesh as on 28th December 2022, 2.19 lakh hectares of maize was sown compared to 1.84 lakh hectares last year (apagrisnet.gov.in). The forecasted global coarse grain production for 2022–2023 is 1.453.6 million tonnes, a decrease of 5.9 million tonnes. Due to the prolonged fighting and record-breaking autumn rainfall, Ukraine's Maize production has drastically decreased, with area and yield declines. This is because the harvest has been delayed in major corn-producing belts. Due to harvest delays, Russia's Maize production falls short of forecasts in the region. Due to Russia-Ukraine war, India can meet the demand of European countries. This is because the cost of transportation from India is cheaper compared to Brazil and Argentina. As per trade sources, the demand from feed industry and starch industry reportedly on the lower side during the past month. This was due to the moisture content in the newly arrived maize. As the poultry sector had maize stock in abundance, their demand for fresh arrivals were comparatively lower. The incessant rains in coastal AP and a few parts in Rayalaseema caused heavy damage to kharif crops particularly paddy, maize, cotton, pulses and millets

Under these circumstances, the AMIC, ANGRAU is here with providing the latest information with regard to the forecast price range of Rs. 1950-2250 per quintal for maize in this rabi marketing / harvesting season 2022-23.

For further details contact :

Dr G Raghunadha Reddy

Principal Scientist (Ag. Economics)

**Head, Centre for Agriculture and Rural Development Policy Research (CARP)
ANGRAU, Lam, GUNTUR – 522 034, AP.**

carp.angrau@gmail.com, Mobile : +91 98483 21232

