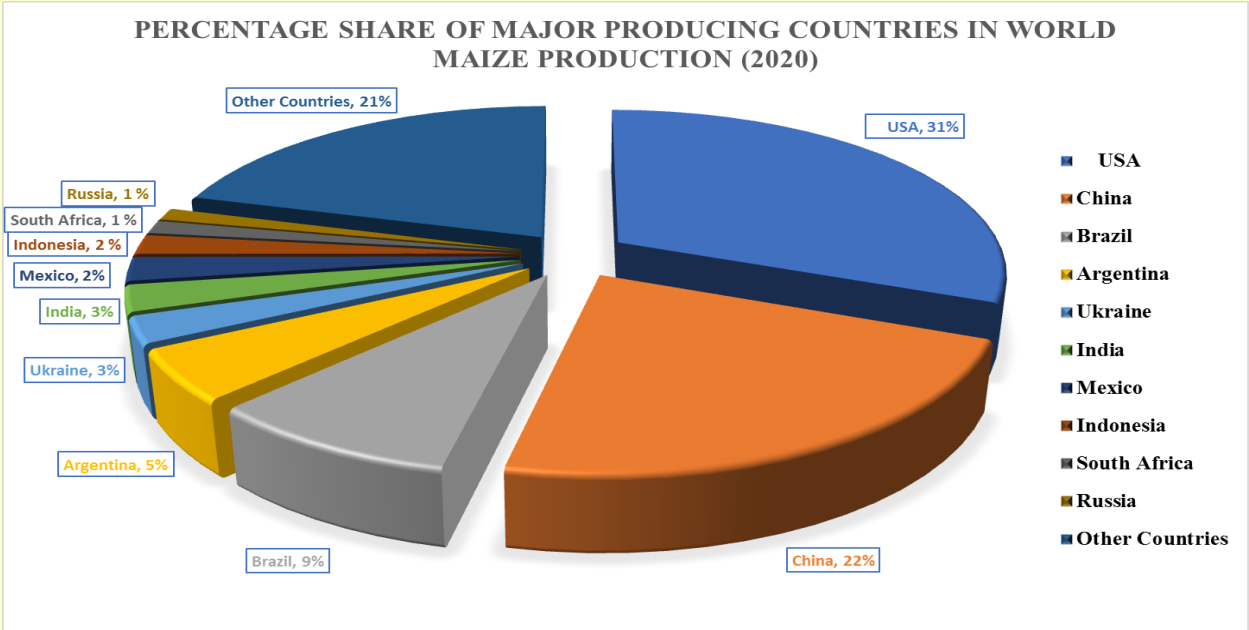
ANGRAU Crop Outlook Reports of Andhra Pradesh

MAIZE – January to December 2021

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 201 m ha with a production of 1162 m tonnes and productivity of 5754.7 kg/ha all over the world, having wider diversity of soil, climate, biodiversity and management practices (FAOSTAT 2020). India produced 31.51 million tonnes in an area of 9.9 million hectares in 2020-21, whereas in kharif 2021-22, maize production was 21.24 million tonnes (1st advance estimates) in an area of 8.15 million hectares (agricoop.nic). United States of America (USA) is the largest producer of maize contributing 30 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 3.01 lakh ha with a production and productivity of 17.84 lakh tonnes and 5918 kg/ha respectively contributing 5.66per cent to total country's production (des.ap.gov.in, 2020-21).According to 2nd advance estimates during 2021-22, maize was grown in 3.05 lakh hectares with a production of 18.62 lakh tonnes and productivity was 6105 kg/ha.

Figure 1: Percentage share of major maize producing countries in during 2020



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 2014-15 to 2020-21 (million tonnes)

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21 (F)
Opening Stocks	1.5	2.4	1.2	1.8	4.72	8.05	14.26
Production	24.4	22.6	26	28.7	27.72	28.7	24.51
Imports	-	0.2	0.1	0.03	0.09	0.5	0.02
Total Supply	**25.9**	**25.2**	**27.3**	**30.53**	**32.53**	**37.25**	**38.79**
Export	1	0.7	0.6	0.71	1.05	0.37	0.92
Domestic Consumption	22.5	23.3	24.9	25.1	23.43	22.62	22.52
Total demand	**23.5**	**24**	**25.5**	**25.81**	**24.48**	**22.99**	**23.44**
Ending Stock	**2.4**	**1.2**	**1.8**	**4.72**	**8.05**	**14.26**	**15.35**

Source: agriwatch.com, F-Forecast

As per some private sources, the data given is compiled in Table 2 & 3. The year 2020-21 started with an opening stock of 14.26million tonnes and total availability goes up to 38.79million tonnes. The total annual demand including exportsof 23.44million tonnes. The ending stocks are expected to be 15.35 million tonnesin 2020-21.

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

Consumption Breakup	2019-20	2020-21 (F)
Poultry & cattle Feed	14.27	14.05
Starch & brewery	4.66	4.66
Human Consumption	1.85	1.86
Seed	0.27	0.27
Shortage & Wastage	1.02	0.99
Storage & Moisture Loss	0.56	0.72
Total Domestic Consumption	22.62	22.55

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 63 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		Total coarse cereals production (2020-21)*	share of maize production to coarse cereals(2020-21
	A	P	A	P	A	P	A	P	A	P*		
Andhra Pradesh	1.38	0.38	3.09	6.46	5.28	15.81	7.44	39.53	3.01	17.84	23.30	76.57
Bihar	5.66	3.12	6.65	10.38	6.21	14.97	6.46	14.40	9.26	27.55	27.60	99.80
Karnataka	0.10	0.05	2.52	6.37	6.69	21.36	12.88	44.44	14.67	43.88	66.82	65.67
Madhya Pradesh	3.62	1.12	8.77	12.37	8.40	12.18	8.31	10.52	15.38	44.57	58.39	76.34
Maharashtra	0.30	0.13	1.09	1.35	3.30	3.03	8.91	26.02	11.09	19.30	39.57	48.77
Rajasthan	3.11	0.94	9.84	13.03	9.71	10.16	11.43	20.53	9.34	12.66	69.38	18.24
Uttar Pradesh	8.34	6.51	10.85	14.32	9.08	14.753	7.54	11.14	7.58	17.59	46.39	37.93
India	**31.59**	**17.29**	**59.04**	**89.62**	**66.11**	**120.43**	**85.53**	**217.26**	**99.00**	**315.10**	**465.60**	**67.67**

*Source: indiastat.com.*provisional figures, yet to be published (coarse cereals production excludes paddy and wheat) (Andhra Pradesh figures from Final Advance Estimates, 2020-21)*

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 production contributes 78.61% with respect to coarse cereals production in Andhra Pradesh. 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 purposesi.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 (2019-20).

Districts	Area (000'ha)		Production (000'tonnes)		Yield (Kg/ha)
	2019-20	Position	2019-20	Position	2019-20
Srikakulam	41	4	261	3	6391
Vizianagaram	38	5	245	4	6471

West Godavari	48	2	440	2	9108
Guntur	48	1	503	1	10455
Kurnool	45	3	237	5	5297
Other districts	81		435		-
Andhra Pradesh	**301**		**2121**		**7055**

Source: apagrisnet.gov.in

From Table 5 it is clear that, the highest maize yield was observed in Guntur districtin 2019-20. In terms of maize production, the major districts were Guntur (5.03 lakh tonnes), West Godavari (4.40 lakh tonnes), Srikakulam (2.61 lakh tonnes), Vizianagaram (2.45 lakh tonnes) and Kurnool (2.37 lakh tonnes).

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

Particulars	Before Bifurcation		After Bifurcation					
	2010-11		2015-16		2020-21		2021-22*	
	AP	India	AP	India	AP	India	AP	India
Area (in 000'ha)								
Maize	744	8,553	233	8,806	301	9965	305	8152
Total cereals& Millets	5868	100,270	2636	98,306	3061	97444	2906	59288
% Share	12.68	8.53	8.84	8.96	9.83	10.23	10.49	13.74
Production (in 000' tonnes)								
Maize	3,953	21,726	1,411	22,567	1784	31510	1862	21240
Total cereals& Millets	18,874	226,241	13,100	235,218	15573	282930	15827	153810
% Share	20.94	9.60	10.77	9.59	11.45	11.14	11.76	13.80
Yield in Kg/Hectare								
Maize	5317	2540	6068	2563	5918	3162	6105	2606

Source: agricoop.nic.in; des.ap.gov.in
**1st advance estimates of India and 2nd advance estimates of 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 Pradeshwas 20.94 per cent before bifurcation and now the contribution has decreased to 11.76 per cent as the area under maize was declined.

Table 7: Cost-return structure of Maize in Krishna Zone 2020-21 (Rs./ha)

S NO	Particulars	Maize
1	Labour costs (Rs/ha)	23161(34.55)
2	Material costs(Rs/ha)	20466(30.53)
3	Variable costs(Rs/ha)	43627(65.08)
4	Fixed costs(Rs/ha)	23405(34.92)

5	Total cost(Rs/ha)	67032(100)
6	Yield (Qtl/ha)	49.4
7	Price (Rs./qtl)	1434
8	Gross returns (Rs/ha)	70839.6
9	Net returns (Rs/ha)	3807.6
10	Gross Margin (Rs/ha)	27212.6
11	Return on rupee BCR	1.06
12	Return on variable costs	1.62
13	Cost of Production (Rs./qtl)	1356.92

Source: Survey Data,Figures in the parentheses indicate the per cent of the item to the totalcost, 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 2020-21 is presented in Table 7.Total cost in cultivation of maize crop was Rs.67032 out of which 65.08 % accounts for variable costs and 34.92 % accounts for fixed costs.Cost of Production of maize was Rs. 1356.92/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. 27212.60 per ha and Rs. 3807.60 per ha respectively. Return on rupee BCR was 1.06 which is concerned to tenant farmers and return on variable costs was 1.62 which is related to owner farmers.

Maize Price Outlook:

Seasonal indices measure the monthly per cent deviation from the average arrivals and prices from 2015 to 2021. 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 (Agriculture year 2015 to 2021)

Months	Arrivals	Price
June	74.10	111.63
July	17.33	73.60
August	9.13	89.00
September	17.99	78.90
October	150.83	108.26
November	263.67	101.61
December	65.08	98.89
January	45.05	112.81
February	108.24	102.63
March	201.43	103.84
April	132.35	105.62
May	114.80	113.22

Source: Data obtained from AMC Kurnool

The results in Table 8 show that the arrivals were highest in the month of November & March and prices were highest in the month of May & January. As per the information shared by Agricultural Marketing Intelligence Centre (AMIC), ANGRAU, maize cash markets showed steady to narrow range bound trend during the month of August 2021 compared to previous month and Maize cash markets trend during the month of August 2021 was almost similar to corresponding period last year. For the month of September 2021, maize would trade range bound in a narrow zone with a slightly firm bias. Also, reduced or no arrivals accompanied with no near future arrivals of any new Maize crop for coming month, along with lower production estimates as per current situation will provide support to Maize market.

As per the sources upcoming kharif season maize crop has been damaged due to floods in mid M.P. and south U.P due to floods, although exact amount of loss cannot be estimated at present. In the current situation, the Fall Army Warm has attacked maize crop in various district of Punjab and Himachal Pradesh.

Table 9: Market prices vis-à-vis MSP of Maize in major producing states in Kharif Marketing Season 2020-21(Oct 2020 to Feb 2021)

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	85	0	3	0	0	82	-28.6
Karnataka	149	0	0	1	0	148	-28.5
Madhya Pradesh	140	0	0	0	0	140	-33.4
Maharashtra	147	1	0	1	1	144	-29.5
Rajasthan	146	2	3	9	6	126	-23.9
Telangana	110	0	10	5	11	81	-20.0
Uttar Pradesh	151	0	3	43	21	84	-18.3
Gujarat	141	0	2	4	26	109	-18.5
Tamil Nadu	116	3	1	1	1	110	-23.8

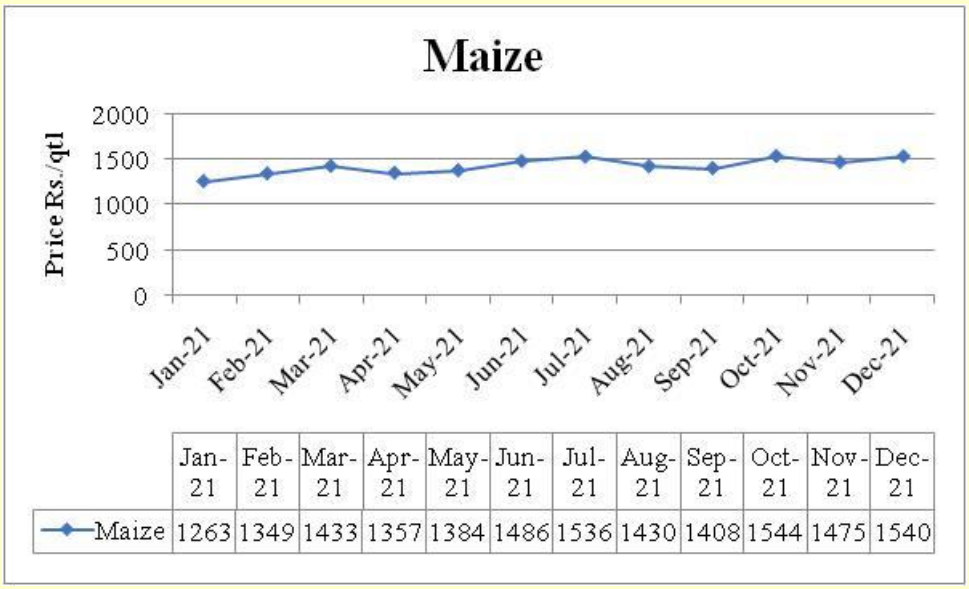
Source: 1. AGMARKNET, Directorate of Marketing & Inspection (DMI), Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare

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. In States of Maharashtra, Rajasthan and Tamil Nadu, market prices stayed above MSP for few days while in rest of the States, market

prices were reported below MSP on all days. The average difference between market price and the MSP of maize ranged from (-) 18.3 percent in Uttar Pradesh to (-) 33.4 percent in Madhya Pradesh.

Figure 2: Average monthly prices of maize in Andhra Pradesh



	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Maize	1263	1349	1433	1357	1384	1486	1536	1430	1408	1544	1475	1540

Source: Data obtained from Andhra Pradesh AMCs

Average monthly prices of maize in Andhra Pradesh showed steady increasing trend. In September average monthly price increased to Rs.1805 (Figure 2). As on 3rd December 2021, 87.69 lakh hectares of maize was sown compared to 86.57 lakh hectares last year in India (agricoop.nic.in) whereas in Andhra Pradesh as on 29th December 2021, 1.84 lakh hectares of maize was sown compared to 1.78 lakh hectares last year (apagrisnet.gov.in). In Andhra Pradesh damaged caused to rabi maize by recent week rainfall was quite severe, out of 0.09 Lakh Hectare area sown till 18th Nov 2021 4,213 hectare area has been lost by 24th Nov 2021 after rains in past weeks. As per the sources 13,000MT of Maize Vessel BLUE LOTUS has completed loading at Vizag port. And 23,100 MT of Maize Vessel AQUALEO has completed loading at Hazira port on 30th August, 2021. Also 25,000MT of Maize Vessel CHARLENE completed loading, at Gangavaram port since 19th August, 2021. With delay in sowing of rabi maize at various major producing states and also increase in demand scenario during coming months, prices of maize are expected to attain a firm bias in coming long term. In view of declining foodgrains reserves in Argentina (world 2nd maize exporting country), government imposes restrictions on exports of Maize. Maize export may not exceed 4.16 crore tonnes in Argentina. Maize exports from European Union are set to reach a record high of 13 lakh tonnes in October 2021, more than triple the average of the last five years.

Under these circumstances, the AMIC, ANGRAU is here with providing the latest information with regard to the forecast price range of Rs. 1750-1900 per quintal for maize in this rabi marketing / harvesting season 2021-22.

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