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ECONOMICS OF MAIZE CULTIVATION IN GUNTUR DISTRICT OF ANDHRA PRADESH

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ABSTRACT

Agriculture plays a significant role in India's economic growth. With around 54.6% of the total workforce involved in agriculture and allied sector activities, the sector contributes 17.8% to the country's Gross Value Added (GVA). During 2021-22, in the country's total exports agricultural exports contributed of to the tune of US \$ 50.2 billion with a 20% increase from US \$ 41.3 billion in 2020-21. In FY 2023, it is projected that the Indian agriculture sector will grow at the rate 3.5%. The paper is base on the primary and secondary data, the primary data collected from the 50 sample respondents in the Guntur district of Andhra Pradesh. The data clearly reveals that the gross income for maize crop, the maize crop is one of the major food crops for poultry. The gross income from the maize crop is found to be high in marginal farmers which is Rs.53,200/-, where as it is lowest Rs.44,400/- in large farmers. The table clearly shows that the gross income is increase with the increasing of farm size.



Low gross income may be mainly due to low productivity and less bargaining capacity of farmers. However the gross returns are high from traditional crops. The farm business income for maize cultivation, it is found to be high in marginal farmers which is Rs.23,869/-, where as lowest in semi-medium farmers which is Rs.14,888/-. The family labour income for maize cultivation, it is found to be high in marginal farmers with Rs.17,898/- followed by large with Rs.13,124/-, small Rs.10,699/- and medium farmers which is Rs,8,988/-.. The net income from maize cultivation is found to be high in marginal farmers with Rs.14,615/-followed by medium and large farmers with Rs.10,400, small by Rs.7,975/- and semi-medium farmers with Rs.6,433/-.

KEYWORDS: Maize, Cultivation, farmers, Gross income, net income.

INTRODUCTION

Agriculture plays a significant role in India's economic growth. With around 54.6% of the total workforce involved in agriculture and allied sector activities, the sector contributes 17.8% to the country's Gross Value Added (GVA). During 2021-22, in the country's total exports agricultural exports contributed of to the tune of US \$ 50.2 billion with a 20% increase from US \$ 41.3 billion in 2020-21. In FY 2023, it is projected that the Indian agriculture sector will grow at the rate 3.5%.

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 worldwide, 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.

OBJECTIVE

The main objectives of the paper are to analyse the trend in maize cultivation in India and the cost of cultivation in the Guntur district of Andhra Pradesh.

METHODOLOGY

This paper is based on the primary data and secondary sources. Secondary data on various crops' area, production, and productivity is gathered from the Chief Planning Officer's handbook of statistics, the Guntur district handbook, and the records of other departments involved. 50 farm households are selected through simple random sampling method. Emani village are selected for the study located in Duggirala mandal in Guntur district, Maize crop is cultivated in Rabi season in this area. The data related to 2023 crop year

RESULTS FROM SECONDARY AND PRIMARY SOURCES

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

Years	Exports		Imports	
	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	922.66	1376.83	16.38	47.61

Source: indiastat.com

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: apgrisnet.gov.in

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

States	1950-51		1990-91		2000-01		2010-11		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: apagrisnet.gov.in

COST OF CULTIVATION OF MAIZE CROP

In maize cultivation per acre use of fertilizers is Rs.6,655/-. The intra size group analysis observed from the table-5. It is found to be high in marginal farmers with Rs.7,571/- followed by small with Rs. 6800/-, Rs.6250/- in semi medium and Rs.6,000/- in medium and large farmers. Per acre use of pesticides is Rs.1717/-. And it is clearly observed from the data, it is found to be high in large farmers with Rs.1740/- where as lowest in marginal farmers with Rs.1679/-. Per acre use of hired human labor is found to be high in marginal farmers which is Rs.3868/- followed by medium and large farmers (Rs.3780/-), small (Rs.3525/-) and semi medium farmers (Rs.3365/-). The rental value of owned and value of leased in land is found to be high in marginal farmers which is Rs.5254/- followed by semi medium (Rs.4922/-), small (Rs.4589/-) and Large (4589/-). The per acre use of bullock labor, owned labor and irrigation is found to be high in marginal farmers in maize cultivation. As per the data analyzed above, the use of modern inputs like fertilizers, Tractor, hired labor and rental value of owned land is found to be high in marginal farmers. The expenditure on seeds and bullock labors and irrigation cost is found to be high in small farmers. The expenditure incurred on modern inputs is found to be high by marginal and small farmers when compared to medium and large farmers in the maize cultivation. The total cost of cultivation is found to be high in marginal farmers with Rs.38585/- per

acre followed by small Rs.35225/-, Rs.34367/- by semi medium and Rs.34000/- by medium and large farmers. It is observed that the cost of cultivation per acre is decreasing with increasing the farm size in maize cultivation.

Table-5 Per acre cost of Cultivation of Maize

(In rupees)

Inputs	Marginal	Small	Semi-Medium	Medium and Large	Total
Machined labor	1750	1200	1125	1245	1330
Bullock labor	1179	1300	1199	1220	1225
Seeds	1614	1620	1617	1620	1618
Fertilisers	7571	6800	6250	6000	6655
Manure	880	520	700	520	655
Pesticides	1679	1740	1709	1740	1717
Hired labor	3868	3525	3365	3780	3635
Irrigation	1250	1400	1063	875	1147
Transport cost	457	460	459	460	459
Interest on working capital	2324	1856	1745	1746	1918
Depreciation	255	261	258	261	259
Marketing charges	750	900	1000	890	885
Miscellaneous	500	500	500	500	500
Cost A	24077	22082	20990	20857	22002
Leased in land	5254	4589	4922	4589	4839
Cost A1	29331	26671	25912	25446	26840
Rental value of owned land	5429	5300	5364	5300	5348
Interest on fixed capital	543	530	536	530	535
Cost B	35302	32501	31812	31276	32723
Owned labor	3283	2724	2555	2724	2822
Cost C	38585	35225	34367	34000	35544

Source: Primary Data

INCOME FROM MAIZE CULTIVATION

The data on individual crops among the farm size wise gross income is presented also in the Table-6. The data clearly reveals that the gross income for maize crop, the maize crop is one of the major food crops for poultry. The gross income from the maize crop is found to be high in marginal farmers which is Rs.53,200/-, where as it is lowest Rs.44,400/- in large farmers. The table clearly shows that the gross income is increase with the increasing of farm size. Low gross income may be mainly due to low productivity and less bargaining capacity of farmers. However the gross returns are high from traditional crops. The farm business income for maize cultivation, it is found to be high in marginal farmers which is Rs.23,869/-, where as lowest in semi-medium farmers which is Rs.14,888/-. The family labor income for maize cultivation, it is found to be high in marginal farmers with Rs.17,898/- followed by large with Rs.13,124/-, small Rs.10,699/- and medium farmers which is Rs.8,988/- The net income from maize cultivation is found to be high in marginal farmers with Rs.14,615/- followed by medium and large farmers with Rs.10,400, small by Rs.7,975/- and semi-medium farmers with Rs.6,433/-

Table-6 Income from Maize cultivation

Farming Category	Commercial Crops		Traditional Crops	
	Gross income	Farm business income	Family labour income	Net income
Marginal	53200	23869	17898	14615
Small	43200	16529	10699	7975
Semi-Medium	40800	14888	8988	6433
Medium and Large	44400	18954	13124	10400
Total	45400	18560	12677	9856

Source: Primary Data

CONCLUSION

Agriculture plays a significant role in India's economic growth. With around 54.6% of the total workforce involved in agriculture and allied sector activities, the sector contributes 17.8% to the country's Gross Value Added (GVA). During 2021-22, in the country's total exports agricultural exports contributed of to the tune of US \$ 50.2 billion with a 20% increase from US \$ 41.3 billion in 2020-21. In FY 2023, it is projected that the Indian agriculture sector will grow at the rate 3.5%. The paper is base on the primary and secondary data, the primary data collected from the 50 sample respondents in the Guntur district of Andhra Pradesh. The data on individual crops among the farm size wise gross income is presented also in the Table-5.12. The data clearly reveals that the gross income for maize crop, the maize crop is one of the major food crops for poultry. The gross income from the maize crop is found to be high in marginal farmers which is Rs.53,200/-, where as it is lowest Rs.44,400/- in large farmers. The table clearly shows that the gross income is increase with the increasing of farm size. Low gross income may be mainly due to low productivity and less bargaining capacity of farmers. However the gross returns are high from traditional crops. The farm business income for maize cultivation, it is found to be high in marginal farmers which is Rs.23,869/-, where as lowest in semi-medium farmers which is Rs.14,888/-. The family labour income for maize cultivation, it is found to be high in marginal farmers with Rs.17,898/- followed by large with Rs.13,124/-, small Rs.10,699/- and medium farmers which is Rs.8,988/-. The net income from maize cultivation is found to be high in marginal farmers with Rs.14,615/- followed by medium and large farmers with Rs.10,400, small by Rs.7,975/- and semi-medium farmers with Rs.6,433/-. Finally maize cultivation is profitable in rabi season in this area

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