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An economic analysis of production and marketing of maize in Allahabad district of Uttar Pradesh

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Abstract
An attempt has been made in this study to examine the economics of production and marketing of maize in Chaka block of Allahabad. The specific objectives of the study were: work out the growth rate in area, production and productivity of maize, find out the cost and returns of maize on different categories of selected farmers, work out the cost and returns of maize on different categories, examine the market table surplus and disposal pattern of maize and find out the constraints in production and marketing of maize and suggest suitable measures to overcome them.
The present study was conducted in Chaka block in Allahabad district of Uttar Pradesh state. Fifty farmers were selected randomly. The primary data were collected for the year 2017.The growth rate of area, production and productivity of Uttar Pradesh state and Allahabad district was worked out by using compound growth rate. To calculate the cost of cultivation, marketable surplus and disposable pattern of maize simple mean and average method was used. The major findings of this study revealed that the average holding size of the sampled household was 2.01 hectares and average illiteracy percentage was 52.5 percent. Overall on an average cropping intensity was found 112.62 percent. The major crops grown by the farmers were rice and maize in kharif and vegetables in rabi season. On an average the total irrigated area of sampled household was found 56.22 percent and the maximum irrigated area comes under tubewell 0.67 hectares (59.29 percent). Allahabad district have also shows the positive growth rate of area and production. On an average cost of cultivation per hectare of maize was found Rs. 18410.45 and cost of production per quintal was Rs. 325.46 of main product and Rs. 19.53 of by product.

Keywords: economics, cost, returns and growth rate

1. Introduction
Maize is one of the most important cereal crops after rice. Maize has many assets for its wide distribution: its husk give protection from birds and rain can be harvested over a long period since it can be left dried in the field until harvesting is convenient, can be stored long, provide numerous useful food products and frequently preferred to sorghum and other millets. Infect it is the main cereal crop for monsoon season in areas. It is grown both for grain and forage. Maize is a major source of starch. Cornstarch (maize flour) is a major ingredient in home cooking and in many industrialized food products. Maize is also a major source of cooking oil (corn oil) and of maize gluten. Maize starch can be hydrolyzed and enzymatic ally treated to produce syrups, particularly high fructose corn syrup, a sweetener; and also fermented and distilled to produce grain alcohol. Grain alcohol from maize is traditionally the source of bourbon whiskey. Maize is sometimes used as the starch source for beer. It is also nutritive for adults of different ages. The green straw is suitable for making silage. Maize is widely cultivated throughout the world, and a greater weight of maize is produced each year than any other grain. Worldwide production was 817 million tonnes in 2009—more than rice (678 million tonnes) or wheat (682 million tonnes). In 2009, over 159 million hectares of maize were planted worldwide, with a yield of over 5 tonnes per hectare. Maize is one of the most important cereals of the world. In terms of world area. India stands next to USA, Brazil, China and Mexico, where as in production it ranks eleventh. In India, maize is grown in an area of 7.7 M ha with a production around 15.1 Mt and productivity 2.0 t/ha it ranks next to rice, wheat, sorghum and pearl millet. Though consumed all over the country, it is the staple food in hilly and sub mountain tracts of northern India. As a fodder and grain crop. It is extensively grown in Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar and Karnataka.

2. Objectives of the study
1 To work out the growth rate of area, production and productivity of maize in Surguja districts of Chhattisgarh.
2 To work out the cost and returns of maize on different categories of selected farmers.
3 To examine the marketetable surplus and disposal pattern of maize.
4 To find out the constraints in production and marketing of maize and suggest suitable measures to overcome them.

3. Materials and Methods

3.1 Description of the study area

The present study was conducted in Allahabad district of Uttar Pradesh during 2017.

3.1.1 Selection of the study district: The study was conducted in Allahabad district of Uttar Pradesh state. Allahabad district was purposively selected for the study as it is the major agricultural district in the state and there are 20 blocks in Allahabad district in total.

3.1.2 Selection of Block: List of all block were obtained from district headquarter, Chaka block was selected purposively for the study. This block has 49 panchayats and 97 villages in total.

3.1.3 Selection of villages: In the third stage six villages were selected randomly for the study. Names of the villages are Chak Hiranand, Baswar, Chak, Barika, Mohabatganj Uparhar and Sandwa Kalan.

3.1.4 Selection of Respondents: In the fourth stage, maize respondents from each of the six chosen village were selected randomly. Thus, a total of 50 respondents were selected for collecting the required information for the study.

4. Results and Discussions

The present chapter is going to present the results and discussion for various objectives. The chapter is arranged in sub-sections according to the objectives of the study. 4.1. The costs and returns of Maize crop in different size groups are described in sub-section 4.2 while the cost of productions per quintal of Maize crop in different size group is described in sub-section 4.3. Estimate of the marketing costs and margins of various levels of marketing channels is described in section 4.4. Section 4.5 deals about the producer's share in consumer's rupees in different marketing channels of selected crops.

4.1 Cost of cultivation

The cost inputs used by cultivators in the cultivation of Maize were calculated for contribution of each input in total costs in all the three different size farm groups (Table 4.1).

Table 1: Factor wise distribution of cost per hectare of Maize in different size farm groups (value in Rs.)

S. No.	Particulars	Small	Medium	Large	Average
1	Haired human labour	942.42 (4.84)	1204.41 (6.44)	1380.0 (7.17)	1175.61 (6.15)
2	Family labour	419.02 (2.15)	-	-	139.87 (0.73)
3	Tractor power	1976.02 (10.10)	1600.00 (8.56)	1402.83 (7.29)	1659.61 (8.68)
4	Cost of seed	1400.00 (7.19)	1680.21 (8.99)	1202.67 (6.25)	1427.62 (7.46)
5	Manures and fertilizers	1140.00 (5.86)	1360.00 (7.28)	2100.21 (10.92)	1533.40 (8.02)
6	Irrigation	1161.12 (5.97)	1569.10 (8.40)	1589.02 (8.26)	1439.74 (7.53)
7	Plant protection	1290.34 (6.63)	1202.33 (6.43)	1009.25 (5.25)	1167.30 (6.10)
8	Interest in working capital	622.04 (3.19)	504.93 (2.70)	469.01 (2.44)	531.99 (2.78)
9	Land revenue	-	-	-	-
10	Depreciation on fixed capital	1942.35 (9.98)	1142.72 (6.11)	692.18 (3.60)	1259.00 (6.58)
11	Rental value of owned land	4002.01 (20.57)	4102.18 (21.96)	5384.33 (28.01)	4496.17 (23.52)
12	Interest on fixed capital	4552.06 (23.40)	4311.4 (23.08)	3991.41 (20.76)	4284.05 (22.41)
	Total cost	19447.98 (100.00)	18677.28 (100.00)	19220.91 (100.00)	19115.34 (100.00)

Note: Figures in parentheses indicate percentage of total.

4.1.1 Cost of concepts

The cost of cultivation of Maize per hectare has been splitted according to cost concepts. Description of cost A1, cost A2, cost B and cost C were as follows:

Table 2: Cost concept of the Maize in different size farm groups. (Rs./ha)

S. No.	Particulars	Farm size			
		Small	Medium	Large	Average
1	Cost A1	19447.98	18077.28	19220.91	19115.34
2	Cost A2	26447.98	25677.28	26220.91	26115.39
3	Cost B	29021.02	28602.98	29011.81	28878.60
4	Cost C	32191.31	31061.28	31902.20	31718.26

Table 4.2 shows that the cost A1, Cost A2, cost B and Cost C was higher in small size groups as compared to medium and large size groups. The average of Cost A1, Cost A2, Cost B and Cost C were worked out to be Rs.19115.34, Rs. 26115.39, Rs.28878.60 and Rs. 31718.26 per hectare respectively on the sample farms. It is noted that rupees 9500 were considered as inputted rental value of owned land for each crop season.

4.1.2 Cost of production of Maize per quintal

The table 4.3 shows that the cost of production of Maize per quintal was higher in small size groups. The average cost of production of Maize per quintal were Rs. 149.31 the cost of production of per quintal of Maize in small, medium and large size groups were Rs. 149.72, Rs. 148.61, Rs. 149.62 respectively.

Table 3: Cost and production of Maize per hectare in different size groups. (Rs./ha)

Size groups	Total yield per hectare (qt.)	Total cost of cultivation /ha	Cost of production / qt.
I	215.00	32191.31	149.72
II	209.00	31061.28	148.61
III	213.22	31902.20	149.62
Average	212.40	31718.26	149.31

4.2.1 Disposable pattern of Maize

The information regarding disposal pattern of the selected Maize growers is shown in table 4.4. The table 4.4 reveals that at the overall level, total quantity of Maize produced per farm was 212.33 quintals of the total produce. One point 11 quintal

(1.11 Qt.) were used only for consumption which was 0.52 percent of total Maize production per farm. Among the different categories of farm the proportion of total consumption was maximum in small size farm (0.21 percent) followed by medium (0.48 percent) and large farm (0.87 percent) sized. The total quantity sold in the market in channel. I and channel II is 211.22 quintal per farm out of 212.33 quintals overall. The share of channel. I is 114.19 quintal produce per farm and channel II is 97.10 quintal produce overall quantity. It is clearly the producers who sell their produce in channel I and channel II.

Table 4: Disposable pattern of Maize (quintal per farm)

S. No.	Form size	Total production	Home consumption	Total quantity sold	Channel I	Channel II
1.	Small	215.00 (100.00)	0.46 (0.21)	214.54 (99.78) {100.00}	108.95 (50.78)	105.59 (49.21)
2.	Medium	209.00 (100.00)	1.02 (0.48)	207.98 (99.51) {100.00}	137.60 (66.16)	70.38 (33.83)
3.	Large	213.22 (100.00)	1.86 (0.87)	211.36 (99.12) {100.00}	96.02 (45.42)	115.34 (54.57)
	Overall	212.33 (100.00)	1.11 (0.52)	211.22 (99.47) {100.00}	114.19 (54.06)	97.10 (45.97)

Note: figures in parenthesis indicate percentage of total production.

4.2.2 Marketable Surplus

The total quantity produced quantities used at home are shown in table 4.5. The total quantity of Maize produced is estimated as 215 quintal, 209 quintal and 213.22 quintal respectively at small, medium and large farms.

Table 5: Marketable surplus of Maize of sampled households (In quintal/farm)

S. No.	Particulars	Farm size			
		Small	Medium	Large	Average
1	Total quantity produced	215.00 (100.00)	209.00 (100.00)	213.22 (100.00)	212.33 (100.00)
2	Quantity used for home	0.96 (0.21)	1.02 (0.48)	1.86 (0.87)	1.11 (0.52)
3	Marketable surplus	214.54 (99.78)	207.98 (99.51)	211.36 (99.12)	211.22 (99.47)

Note: Figures in parentheses indicate percentage of total quantity produced.

4.2.3 Produce's share in consumer's rupees of Maize.=ol

Table 4.6 show that the price paid by consumers for per quintal of Maize was calculated as Rs. 980.00 in channel I and Rs. 640.00 in channel II producers share in consumer rupees was 32.64 percent in channel I of the Maize as well as the producer's share in consumer rupee in channel II was 45.3 percent.

Table 6: Producers share in Consumers rupee of Maize. (Rs./Qt.)

S. No.	Particulars	Channels			
		I	%	II	%
A.	Retailer 1. marketing cost 2. Net price received	 60.26 279.74	 (6.14) (28.54)	 - -	 - -
B.	Whole saler 1. Marketing cost 2.Net margin	 - -	 - -	 129.26 190.74	 (20.19) (29.8)
C.	Commission agent 1. Marketing cost 2. Net margin	 46.2 273.8	 (4.71) (27.93)	 - -	 - -
D.	Producer 1. Marketing cost 2.Net price received	 25.62 294.38	 (2.61) (30.03)	 46.15 243.85	 (7.2) (38.10)
Producer share in consumer rupee (%)		32.64			
Price paid by consumer		980.00	100.00	640.00	45.3 (100.00)

Note: Figures in parentheses indicate percentage of the price paid by consumer.

4.2.4 Constraints in Maize production

The constraint in Maize production is presented in table 4.7. Major constraints pertaining to cultivation of Maize over problem of disease, insect, pest (81.25 percent) is generally faced by all the farmers.

Table 7: Production problems faced by the Maize growers

S. No.	Problems	Number of respondent	
		Yes	No
1	Problem of diseases/insecticide/pest	65 (81.25)	15 (8.75)
2	Lack of improved varieties	55 (68.75)	25 (31.25)
3	Scarcity of labour during peak season	62 (77.5)	18 (22.5)
4	Lack of micronutrient in soil	48 (60.00)	32 (40.00)
5	Lack of latest technical knowledge about crop	49 (61.25)	31 (38.75)
6	Lack of recommended package of practices	56 (70.00)	24 (30.00)
7	Lack of resources i.e. money equipments	60 (75.00)	20 (25.00)

4.2.5 Constraints in Maize marketing

Marketing constraints are presented in table 4.8. The major constraint in marketing is lack of processing industries based on Maize as well as storage facility in Maize is 100 percent and 93.75 percent respectively. Due to lack of processing unit no crop growers can get more output from these enterprises.

Table 8: Marketing problems faced by the Maize producers

S. No.	Problems	Number of respondent	
		Yes	No
1	Lack of processing industries based on Maize	80 (100.00)	-
2	Lack of storage facility of Maize	75 (93.75)	5 (6.25)
3	Lack of regulated and co-operative market	65 (81.25)	15 (18.75)
4	Fluctuation of prices	61 (76.25)	19 (23.75)
5	Due to high transportation charges	60 (75.00)	20 (25.00)
6	Lack of awareness about market information	39 (48.75)	41 (51.25)
7	Less no. of purchasers available in market	45 (56.25)	35 (43.75)
8	Heavy damage of crop at time of transportation	50 (62.5)	30 (37.5)
9	Not economical transportation due to small quantity of produce	24 (30.00)	56 (70.00)

Note: Figures in parentheses indicate percentage of total respondent

Conclusion

From the findings of the study following conclusion has been derived.

1. Maize is highly labour depended crops.
2. The cost of production per quintal of Maize is maximum in large size groups followed by small and medium size groups.
3. With the increase in the size of farm the decrease in the total yield of Maize was depending on capital and management practices.
4. There is a wide range of storage problem as the production is higher than the demand during the peak period.
5. Cost of marketing is very high.

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