

Original Research Article

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Impact of Installation of Maize Extraction Factory on Maize Growers Economy in North Karnataka

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ABSTRACT

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In Haveri district of Karnataka, maize is preferred by the farmers. Hence, the impact of installation of maize extraction factory on maize growers economy has been studied using the randomly selected maize growers and primary data was collected from sample farmers by personal interview method with the help of pre-tested schedule. The data have been analyzed using partial budgeting technique and simple tabular analysis. The results revealed that there was a shift in the cropping pattern of the farmers that before the installation of the factory, the crops like cotton (24.63%), maize (22.07%), onion (5.98%) but after the installation of factory. The crops like maize (38.01%), cotton (16.27%), onion (2.11%) were observed. It shows the area under maize has been increased after the installation of factory. Selling of maize to the starch extraction factory was increases market cost of Rs. 365.44 (Rs. 16/Qtl.) and saved amount of Rs. 1603.37. The total income increased was Rs. 3613.29 by selling maize to the maize starch extraction factory. The factory received huge quantity of maize around 8 lakh Kg per day. Therefore, maize starch extraction factory is not under loss and also beneficial to maize growers of the study area.

Introduction

In India, maize has traditionally been grown as a staple food primarily for home consumption. However, in recent years, as a result of the increasing commercial orientation of the agricultural economy and rising demand for maize on account of diversification in its end uses, maize production scenario has undergone myriad changes. Maize in India at present is used as poultry feed. Poultry industry is heavily dependent on maize, as it forms 50-60 per cent of the input required for broiler feed and

25-35 per cent of the input required for layer feed. Maize is the preferred source of energy in feed when compared with other substitutes due to availability, higher energy and price economics. Poultry feed's share has remained around 45-50 per cent of the total demand for maize in the country over the past 4-5 years. It is used in the form of livestock feed, corn oil, sweeteners, beverages. It is being used for manufacturing industrial products like starch, syrup, alcohol and acids, etc. It is rich source of Starch (60-80 %), protein (8-12%), fat (3-5%), and minerals (1-2%) (Naveenkumar 2011). Hence, it is also used for production of

starch and ethanol. Corn starch (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 enzymatically treated to produce syrups, particularly high fructose corn syrup and 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.

Karnataka state produces around 14.99 per cent of the total maize production in the country. The average area under maize cultivation in the State during 2015-16 was 1.18 million hectares with a production of 3.27 million tonnes. Haveri is the second major maize producing district in the state, accounting for 11.97 percent of the state's production. It is also predominantly grown in Davanagere, Belgavi, and Bellary districts.

In Haveri district of Karnataka, maize is preferred by the farmers. There are many reasons that farmers of the Haveri district growing maize, firstly favorable climatic conditions for its cultivation and can be grown in all the seasons, but the farmers mainly grow during *Kharif* season, under changing climatic conditions maize can be grown under delayed on set of monsoon.

The area of maize in Haveri district was 17.07 thousand hectares with productivity of 2,443 kg per hectare during 2015-16. The production of maize was 39.62 thousand tonnes during 2015-16 contributing 13.99 per cent and 11.97 per cent to area and production of the state, respectively.

Gujarat Ambuja Exports Limited (Starch extraction factory)

Established in 2012. Factory unit is overall 20 acre

Capacity of crushing 750 metric tonnes, quantity received per day is 500-600 tonnes

Factory has 3 storage godowns

It is working for 360 days a year rest 5 days used for maintenance

Price will be fixed based on knowing all the prices of APMC's.

Advantages to the farmers

No packing of produce is needed, which helps in reduction of packing cost, which helps in easy transportation and in easy handling

No Cess is charged from farmers

Correct weighment facility is available

Payment is cleared within 10 days

Factory mainly procure the maize from the farmers of Haveri district

Separate que for both traders and farmers preference is more for farmers it helps in saving the time of the producer

Products

Factory mainly deal with starch extraction (60%) other products like germ powder, derivatives like DMH, DAH, HM etc.

Marketing

Factory trade with both in local and International level.

Maize is highly demanded by the starch extraction factory (Ambuja) situated near Shiggoan taluk of Haveri district. Maize captured a very good market in Haveri district which showed that it has a vast scope in future. In addition to starch extraction, it also

used for preparation of livestock and poultry feed. A good number of studies (Haque, 2009; Hasan, 2008; Uddin, 2008; Ahmed and Jahan, 2007; Shohag, 2006; Islam, 2006; Mohiuddin, 2003; Hossain *et al.*, 2002; Noveoselov, 2002; Islam, 2001; Haque, 1999; Ashraf and Rahman, 1995; Shahidullah *et al.*, 1995; Rahman, 1995; Hussain *et al.*, 1994; Bakshi, 1990) were conducted on maize production as a whole but a little research conducted on profitability of maize production.

Keeping in view the importance of the maize crop in the farm economy, the present study was under taken to analyze the impact of starch extraction factory on maize grower's economy in Haveri district of Karnataka with the following specific objective to analyze processing and value addition to maize by extraction of starch and other by-products.

Materials and Methods

Haveri was selected for the study as it is a major maize growing district (13.99% of total maize area) of Karnataka. In Karnataka, the area under maize cultivation during 2015-16 was 1.22 million ha and in Haveri district the area was 1,70,696 hectares. A multistage sampling procedure was adopted for selection of taluks, villages and sample farmers. Two taluks of Haveri district namely Hirekerur, and Shiggaov were selected based on location of taluks according to factory. Hirekerur taluk which is located far away from factory and Shiggaov taluk located near to factory and from each taluk, two villages based on highest area under maize were selected. From each village fifteen farmers growing maize were selected randomly and thus, the total sample size was 60. For evaluating the specific objectives of the study primary data was collected from sample farmers by personal interview method with the help of pre-tested schedule. It includes, cropping pattern followed before the installation of factory and

after the installation of factory and economics of installation of maize factory etc.

In order to compute the costs and returns in maize mono-cropping, maize based cropping systems, budgeting technique was employed. Partial budgets are based on the principle that small business changes have effects in one or more of the following areas.

1. Increase in income
2. Reduction or elimination of costs
3. Increase in costs
4. Reduction or elimination of income

The net impact of the above effects will be the positive financial changes minus the negative financial changes. A positive net indicates that farm income will increase due to the change, while a negative net indicates the change will reduce farm income.

Results and Discussion

Shift in the cropping pattern of sample farmers before the installation of the factory and after its installation is presented in Table 1. It was found that there was a shift in the cropping pattern of the farmers to the minor extent but with respect to area under maize, there was a considerable increase in its cultivation. It was observed that before the installation of the factory, out of total gross cropped area, about 65.80 per cent, 33.17 per cent and 0.99 per cent of area was used in *kharif*, *rabi* and summer season, respectively. The crops like cotton (24.63%), maize (22.07%), onion (5.98%), groundnut (5.82%), sunflower (3.09%), soybean (2.35 %), chilli (1.24%) and paddy (0.62%) were grown during *kharif* season. In *rabi* season, the crops like sorghum (14.98%), wheat (6.19%), chickpea (5.20%), safflower (2.72%) and tomato (4.08%) were grown. About 0.99 per cent of area was under the summer crop.

Table.1 Shift in the cropping pattern of sample farmers

Sl. No.	Season	Before the installation of factory			After the installation of factory		
		Crops	Area (acre)	Per cent	Crops	Area (acre)	Per cent
1	Kharif	Maize	1.78	22.07	Maize	4.13	38.01
		Cotton	1.99	24.63	Cotton	1.77	16.27
		Onion	0.48	5.98	Onion	0.23	2.11
		G.nut	0.47	5.82	G.nut	0.2	1.83
		S.flower	0.25	3.09	G.gram	0.03	0.27
		Chilli	0.10	1.24	Chilli	0.12	1.10
		Soybean	0.19	2.35	Soybean	0.33	3.03
		Paddy	0.05	0.62	Paddy	0.11	1.01
		Sub total	5.32	65.80	Sub total	6.92	63.67
2	Rabi	Jowar	1.21	14.98	Jowar	2.33	21.42
		Wheat	0.5	6.19	Wheat	0.43	3.95
		Chickpea	0.42	5.20	Cowpea	0.34	3.12
		Safflower	0.22	2.72	Safflower	-	-
		Tomato	0.33	4.08	Tomato	0.52	4.78
		Sub total	2.68	33.17	Sub total	3.62	33.29
3	Summer	Maize	0.08	1.03	Maize	0.33	3.03
		Sub total	0.08	0.99	Sub total	0.33	3.03
Gross cropped area		8.08	100.00		10.87	100	
Net cropped area		5.32			6.92		
Cropping intensity		151.87			157.05		

Table.2 Partial budgeting analysis for marketing of maize to the Maize installation factory per acre

DEBIT		CREDIT	
Increases cost (Expenditure)		Decreased cost (Saving)	
Increase in Marketing cost (Rs. 16/Qtl)	Rs. 365.44	a.) Commission involved (4%)	Rs. 1032.37
-	-	b.) Bags cost	Rs. 571
Decreased return		Increased return	
Nil	-	Increase in income due increase in price (Rs.88*22.84Qtl)	Rs. 2009.92
Total (Rs.)	365.44	Total (Rs.)	3613.29
(Credit-Debit) = Rs. 3613.29 – Rs. 365.44 = Rs. 3247.85 (Net gain)			

Table.3 Economics of installation of maize factory

Particulars	Unit	Data	Costs	Returns
1. Total number of working days of a factory in a year	days	235	-	-
A) Quantity of produce received per day	Kg	800000	-	-
a) Price per kg	Rs.	11.30	9040000	-
b) Processing and maintenance cost (Rs. 1 per Kg)	Rs	-	800000	
c) Employee and Labour charge (15 % of a&b)	Rs.	-	1476000	-
d) Total cost per day	Rs.	-	11316000	-
e) Total cost per annum	Rs.	-	2659260000	-
B) a.) Income from starch is 60% of total quantity received per day(at the rate of Rs.17/kg)	Rs.	-	-	8160000
b.) Income from glucose is 30% of the total quantity received per day(at the rate of Rs.27/kg)	Rs.	-	-	6480000
2. Total income per day	Rs.	-	-	14640000
3. Total income per annum	Rs.	-	-	3440400000
4. Net income of maize factory	Rs.			781140000

Gross cropped area and net cropped area was 8.08 acres and 5.32 acres respectively. Cropping intensity of sample farmers was worked out to be 151.87 per cent.

After the installation of factory, out of total gross cropped area, about 63.67 per cent, 33.29 per cent and 3.03 per cent of area was utilized during *kharif*, *rabi* and summer season, respectively. The crops like maize (38.01%), cotton (16.27%), onion (2.11%), groundnut (1.83%), soybean (3.03 %), chilli (1.10%) and red gram (1.01%) were grown during *kharif* season. In *rabi* season, the crops like sorghum (21.42%), wheat (3.95%), cowpea (3.12%), and tomato (4.78%) were grown. About 3.03 per cent of area was under the summer crop and grown maize crop. Gross cropped area and net cropped area was

10.87 acres and 6.92 acres respectively. Cropping intensity of sample farmers was worked out to be 157.05 per cent.

Selling of maize to the factory results different factors like increase in income, expenditure and savings were observed in Table 2. Here, selling of maize to the starch extraction factory was increases market cost of Rs. 365.44 (Rs. 16/Qtl.) and saved amount of Rs. 1603.37 and increase in selling price of maize to the factory leads to increase in income was Rs. 2009.92 (Rs. 88/Qtl.). Therefore, the total income increased was Rs. 3613.29 by selling maize to the maize starch extraction factory. Hence, marketing of maize to the starch extraction factory will increase a net gain of Rs.3247.85 per acre.

Economics of installation of maize factory was presented in Table 3. Total number of working days of a maize starch extraction factory was 235 days in one year. The factory received huge quantity of maize around 8 lakh Kg per day. Total cost of expenditure was Rs. 1,13,16,000 per day and around total income received by starch extraction factory was Rs. 1,46,40,000 per day. Therefore, maize starch extraction factory is not under loss also beneficial to maize growers of the study area. Talathi *et al.*, (2003) in their study on value addition and employment generation in mango processing factories conducted in Ratnagiri and Sindhudurg districts of Maharashtra state observed that, the gross added value was Rs. 1726.39 (152.41 %) in pulp, Rs. 1522.26 (507.42%) in pickle, Rs. 7782.31 (114.87%) in squash and Rs. 161.25 (53.75%) in case of raw slices in brine. Gawas (2002), worked out per quintal cost of processing of dried kokum rind and was observed to be Rs. 2143.91. Out of which, Rs.1232.50 incurred on the procurement of fresh kokum fruits.

In conclusion the partial budgeting analysis was used for marketing of maize to the starch extraction factory will increase a net income of Rs.3247.85 per acre. Based on the findings of the investigation there is need to increase the number of maize starch extraction factories. The Scientists need to provide drought resistant and high yielding varieties to the farmers since the area under maize is increasing. Provide subsidy facility to install starch extraction factory so that big farmers may come forward to install maize starch extraction factory.

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References

- Ahmad F and Jahan M A H S. 2007. Maize-pea intercropping as influenced by planting system and row arrangement. *Bangladesh J. Agri. Econ.* 5: 37-41.
- Ashraf M A and Rahman M. 1995. Comparative trial of maize, wheat and barley in stress situation. On-Farm Research Division, BARI, MSFSCIP, KURIGRAM, Research, Research Report. pp.1994-95.
- Bakshi B C. 1990. An economic study of winter maize production in some selected areas of Mymensingh district. MS Thesis, Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.
- Talathi, J.M., S.S. Wadkar and H.K Patil., 2003, Variability in mango exports and export competitiveness. In Abstract on National Seminar on “Mango Challenges in management of production, post-harvest, processing and marketing” organized by Gujarat Agricultural University, Junagadh on 14-15 June, 2003, p. 122.
- Gawas, 2002, Economics of processing of kokum fruits in the western Maharashtra. *Indian J. Agric. Mktg.*, 10 (1): 45-48.
- Islam M M. 2006. Impact of maize production on income and livelihood of farmers: a study in a selected area of Lalmonirhat district. MS Thesis, Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.
- Islam K M N. 2001. Demand projections for poultry feeds, implications for wheat and maize production in Bangladesh, *Bangladesh J. Agri. Econ.* 24:1-19.
- Mohiuddin M. 2003. Efficiency and sustainability of maize cultivation in an area of Bangladesh, MS Thesis, Dept.

- Agri. Econ. BAU, Mymensingh, Bangladesh.
- Naveenkumar DB. Studies on modification and evaluation of power operated maize (*Zea mays* L.) sheller. MTech (Ag Engg) thesis. Univ Agric Sci, Bengaluru, Karnataka. 2011.
- Novoselov S N. 2002. The Use of Maize in Food Industry, Pishchevaya Pronyshlemistp, pp. 64-65.
- Hasan M F. 2008. Economic efficiency and constraints of maize production in the northern region of Bangladesh. *J. Innov. Dev. Strategy*. 2:18-32.
- Haque N. 1999. An economic study of maize and its competitive crops; a study in Sherpurthana of Bogra district. MS Thesis. Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.
- Haque M N. 2009. A comparative economic analysis of hybrid maize Uttaran and 900 M cultivation in an area of SherpurUpazila in Bogra district. MS Thesis. Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.
- Hossain M I, Miah M A M and Akbar M A. 2002. Impact of maize research and extension in Bangladesh. *Bangladesh J. Agri. Econ.* 25:17-33.
- Hussain M S, Islam M N, Rahman M M and Anwar M. M. 1994. Comparative study on hybrid and composite variety of maize in selected areas of Bangladesh. BARI, Joydebpur, Gazipur.
- Rahman M S. 1995. A Comparative yield trial of maize, barley and wheat in stress situation, OFRD, BARI, BARIND Station, Luxmipur, Bhatpara, Rajshahi, Res. Rep. 1994-95.
- Shahidullah M, Rahim M A. and Rahman A K M. 1995. Trial on potato intercropped with maize and khira, OFRD BARI, Agricultural Research Station, Bogra.
- Shohag M S I. 2006. Production and marketing of maize in a selected area of Gaibandha district, MS Thesis, Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.
- Uddin H. 2008. An economic study on maize production under different farm size groups in a selected area of Bangladesh, MS Thesis. Dept. Agri. Econ. BAU, Mymensingh, Bangladesh.

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