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Maize Marketing in Bihar

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Abstract

Maize is the queen of cereal and the third largest grain crop in India. As of now, it is cultivated in an area of about 9 million hectare, has an annual production of 23 million metric tons and an average national productivity of 2.57 metric tons per hectare. It is grown across wide range of environments, extending from extreme semi-arid to sub-humid and humid regions. In recent years, significant changes have occurred in maize utilization besides the production, due to increasing commercial orientation and rising demand for diversified end users. Past strategy did not explicitly recognize the need to raise farmers' income, particularly when there is dynamic market and diversified use. This is true in case of maize crop in Bihar. Marketing of maize outside the state and high transportation cost have largely affected the farmer's income out of its marketing, which has become 43 million metric tons production by 2025.

Key Word- *annual production, national productivity, environments, utilization besides, farmers' income, transportation cost*

Background

Maize *(Zea mays L.)* is the third largest grain crop in India, after rice and wheat. It is cultivated in an area of about 9 million hectare, has an annual production of 23 million metric tons and an average national productivity of 2.57 metric tons per hectare. In recent years, the maize area, production and productivity have shown steady upward trends. It is grown across wide range of environments, extending from extreme semi-arid to sub-humid and humid regions. About 59 per cent of total production is used as feed, while the remaining is used as industrial raw material (17%), food (10%), exports (10%) and other purposes (4%). Because of its diverse usage in the feed industry and food sectors, it is considered as an internationally important commodity driving world agriculture.

Madhya Pradesh, Bihar Rajasthan and Uttar Pradesh are traditional maize growing areas whereas Karnataka and Andhra Pradesh non-traditional maize areas. It is predominantly a kharif season crop but in past few years, rabi maize has gained a significant place in total maize production in India. In recent years, significant changes have occurred in maize utilization besides the production, due to increasing commercial orientation and rising demand for diversified end users. Past strategy did not explicitly recognize the need to raise farmers' income, particularly when there is dynamic market of different produce. This is true in case of maize crop in Bihar. Marketing of maize outside the state and high transportation cost have largely affected the farmer's income out of its marketing, which had resulted to its further commercialization and doubling the production by 2025 but which has become 43 million metric tons production. Since the crop has backward and forward linkages with the poultry feeds, starch and other industries,

thus, it has been undertaken with following objectives.

Growth Trends of Maize in the State

Maize is also the third largest cereals in the state. It contributes nearly 21.3 per cent to total cereals' production, preceded by rice (45.6%) and wheat 33.1%). It is cultivated in all the 38 districts of the state in varying areas but the state's *'Maize Road'* covers 11 districts falling on north of the river Ganges and both the sides of Koshi, Gandak and Bagmati rivers. It occupied nearly 75.3 per cent of the state's total maize area and produced 79.5 per cent of the state's total maize production during the year 2016-17. It is to be noted that Bihar has been awarded with **Krishi Karman Award** for maize production in 2016-17. During 2000-01 to 2016-17 the Maize area expanded from 620.5 thousand hectare to 720.9 thousand hectare, indicating 16.18 per cent increase. During the period, the AAGR was 0.98 per cent and CAGR 0.94 per cent. Similarly, the production touched to 3845.7 thousand MT from 1497.3 thousand MT, registering significant increase of 156.8 percent during the same period. The AAGR and CAGR were 7.47 per cent and 5.71 percent respectively. The yield rates increased from 2413 kg/ha to 5335 kg/ha indicating 121 percent increase over the two periods. AAGR and CAGR of yield rates were 6.39 per cent and 4.78 percent respectively. The season wise CAGR of maize production was 6.86 per cent for kharif, 9.52 percent for rabi, 4.87 per cent for summer and for annual 7.55 per cent during 2007-08 to 2016-17. Similarly, the season wise CAGR of maize yield rate was 7.79 percent for kharif, 6.46 per cent for rabi, 4.06 percent for summer and 6.57 percent for annual during the same period. The analysis further reveals that maize area is gradually spreading to new areas and to some extend also replacing wheat, banana and a few millet crops. Substantial enhancement of yield rate had remained instrumental for significant increase in the level of production. Moreover, with rich water resources, the production and yield rate have touched a new height particularly in maize-road districts which, in turn increased the participation of national players and a few multinationals. This have led to a structural change in maize ecosystem in the state.

Status of Food Processing Industries in the State

Till August, 2024 there were 896 food processing units in the state and out of it 833 (92.96%) were operational. Although the range of products of the agro-based industries in Bihar is quite wide, it is the cereal based industries (rice, wheat and maize), which dominate the sector. These industries have created 48,404 employments in the sector. Maize give unique position to the state in national maize market with most of the maize processing units, particular in north India, depended highly on maize from the state for a significant period of time. With the state productivity (5335 kg/ha), much higher than national productivity (2509 kg/ha) level, and area under cultivation is expected to rise, the availability of good quality maize offers significant opportunities for entrepreneurs in the state. However, the level of processing in the state is presently quite insignificant. There is, thus, a large opportunities for maize processing units, which can be set up for making wide range of products like; starch, corn oil, corn flakes, corn flour, poultry feed etc. At present, there are 93 micro, medium and large maize processing units in the state. Out of it, 23 units have been benefited under the financial assistance program of the state department of food processing under IL & FS cluster. The Bihar Industrial Policy, 2025 has placed high importance on agro-based industries. Under the policy, food processing sector has been included as one of the ten priority sector.

Supply Chains of Maize Marketing

The volume of net marketed surplus of maize was 106.05 quintal (90.22%) against the production of 117.54 qtls on overall average farm size of 2.84 acres. Among the farms, the net marketed surplus on average large farms (4.90 acres) was highest at 190.52 qtls (94.82%) followed by medium (91.54%), small (85.54%) and marginal (85.20%) farms. It is revealed that unlike other agricultural produce the net marketed of maize is quite high mainly due to low family consumption and other needs of the produce at the farmers' level.

As regards the supply chains, which are routes through which the produce moves from the point of production to the point of consumption; the intermediaries also varies. Some common marketing channels for marketing of maize in the study area are as below:

I. Farmer → Village Trader → Commission Agent → Wholesaler → Maize Processor
II. Farmer → Village Trader → Commission Agent → Wholesaler → Maize Stocker
III. Farmer → Commission Agent → Railway Point Maize Trading → Maize Processor
IV. Farmer → Mandies → Trader → Maize Processor
V. Farmer → Mandies → Trader → Maize Stocker
VI. Farmer → JEEVIKA → AAPCLtd. → NEML accredited Warehouse → Institutional Buyers/Stock and Sell at Premium

The overall maize sold through different channels during the reference period was highest in channel-II by 44.04 per cent (9339.9 qtls) followed by channel-V (17.27%) for 3664 qtls, channel-IV (13.78%) for 2923.7 quintals, channel – VI (12.47%) for 2645 quintals, channel – III (10.64%) for 2255.7 quintals and channel – I (1.8%) for 382 quintals.

The absolute value of marketing costs and margins varies across channels. It is apparent from the analysis that in channel – VI, the overall average producer's share in consumer's rupee was 78.28 per cent, followed by channel-II (77.20%), channel –V (71.29%), channel-IV (65.45%), channel - I (64.39%) and channel-III (64.38%). For measuring the marketing efficiency in maize, three alternate methods were also worked out. The conventional method (E) suggests that second channel was more efficient than other channels but price received by the producer in this channel was the lowest. In *Shepherd's method,* marketing margins were not included as a part of marketing cost and this also suggests that the second channel was more efficient than other channels. This however ignores price received by the producer. The limitations of both these methods are considered in the modified method suggested by Acharya. According to *Acharya's method* (MME), the channel - VI was the most efficient of all channels.

Among the production constraints, as perceived by the sample households were costlier of maize seeds than any other crops' seeds (38.5%) followed by pecking-up of the seeds by rats, termites and birds (37.5%), problem of drying of rabi maize (36.5%), shortage of labour due to migration as result of liquor ban in the state and subsidized grains at PDS (33.5%), lack of proper irrigation facilities (30.5%) and destruction of the crop by blue bulls and boars (27.5%).

The marketing constraints, as perceived by the sample households were lack of storage facilities at the village or nearby area (58%) followed by taking 5 kg. of more produce at per quintal of grain due to expected weight loss arising from high moisture content in the grain (53.5%), frequent road snatchings while coming back to home after selling the produce in big mandies/markets (43.5%), harassment by traffic police (40.5%), lack of confidence on outside traders (33.5%) and absence of formal marketing agencies (20.%).

Prominent suggestions to overcome the production constraints were rationalization of maize seeds' prices (49.5%) followed by providing tarpauling (40' X 40') to maize growing farmers for protecting the grains from pre-monsoon rains (30.5%), irrigation facilities (30%), construction of threshing floor (25%), strict vigilance over adulteration of fertilizer (19%), preventing the incidences of destroying the crop from blue bulls & boars (16%) and provision of subsidy on dryer machine (15%).

To overcome the marketing constraints, their suggestions were procurement of maize by formal agencies (35%) followed by check on harassment by traffic police (34.5%), extending storage facilities at village/panchayat level (21%) and check on unfair means adopted by the traders by licensing them (10%).

Stakeholders' Case Studies

While recognizing the immense scope of development in production, marketing and processing of Maize in Bihar, stakeholders views are captured as case studies. These are *JEEViKA in Maize Trading, Maize Procurement by Aaranyak Agri. Producer Company Limited (AAPC Ltd.) with*

JEEVIKA in the study Area, GulabBagh Mandi --- The Maize Hub of India, Trading of Maize at Railway Rake Points and Maize Processors. The insightful discussions with these stakeholders revealed many innovative solutions along with their operational pattern and constraints, which are briefed as follows:

JEEVIKA

It has successfully implemented maize farm value chain interventions in the study area, particularly in Purnea and Katihar districts since 2015-16 through producer group and women farmers producer company (WFPC). The procurement figures for 2015-16 rabi was 1014 MT, 3026 MT for 2016-17 and 13944 MT for 2017-18. Producer groups and higher federations have been highly effective in large scale aggregation and collective marketing of farmers' produce. The intervention eliminated multiple layers of intermediaries and thus, ensured better price realization and also allowed to benefit from off-season price escalation.

AAPC Ltd.

A women farmer producer company, incorporated with the JEEViKA in 2009 aimed to organized farmers into a collective to improve their bargaining strength in the market. In 2015, the company with the support of Techno Serve India (US) and JEEViKA started maize market linkage through the producer groups formed by JEEViKA. After two years of successful intervention, it has scaled-up its achievement to 12595 MT of maize till June, 2017 against the target of 11000 MT. Besides there are many revealed advantages of AAPC Ltd, however, the major challenge is to win the confidence of the farmers.

GulabBagh Mandi (Purnea, Bihar)

It is India's freest grain market and largest maize trading centre, located at Purnea in north-east Bihar. After repealing of BAPMC Act, (1960) in 2006, there is no marketing rules and regulations in the mandi. More than 100 registered traders and a few unregistered traders are engaged in trading of maize in this mandi. About 125 feed companies of eastern India are engaged in maize procurement from the mandi. Out of 10 lakh MT warehouse capacity in Bihar, 5 lakh MT is at Purnea and Gulabbagh itself. Around two million MT of maize is annually traded in this mandi. It is conducted through Adatiyas (Commission Agents) in a manner through *inbound logistics ---- display & inspection ---- auction ---- bagging & weighing ---- payment --- outbound logistic.* From the company's point of view, the key problem is the agent's control over the market, which in turn distorts the price and quality. This creates a range of supply chain issues.

Trading of Maize at Railway Rake Points

Two traders were discussed, who are using *indents* for railway rakes since 2008. About 500 to 600 railway rakes of maize across the 11 rail rake points are exported outside the state. The railway earns about Rs. 65 to 78 lakh per rail rake. About 1.3 to 1.5 million MT maize is annually exported. Major constraints are nine hours of free loading time, recognization of maize and other agricultural commodities by the railways are at par with industrial materials, lack of basic infrastructural facilities at the railway sidings etc. To overcome these problems suggestions include 24 hours of free loading time, shifting of railway rake point from Bhagalpur to Naugachia, fixation of loading & unloading charges, reduction in demurrage charge, provisioning of basic infrastructural facilities at railway sidings etc. These efforts will ultimately enhance the marketing efficiency of maize in the state.

Maize Processors

Two leading maize processors were discussed. About 93 maize processing units of different sizes are involved, and of them 23 have been facilitated by the State Department of Food Processing. Till 2010, apart manufacturing the distribution business was performed by these processors in the form of dealership but in post 2012-13, the *Integration Business Model (IBM)* was adopted by them, wherein manufacturing and consumption both, are doing together. They were of the view that if the maize policy is centered towards the strengthening of production chain, then there will be a great help to the poultry feed industry. Assistance in community based driers to improve the maize quality is the need of the hour, revealed in the discussions.

Recommendations

In Bihar and also in some other states, maize production is gradually shifting from rainy season to winter season (rabi). Besides, its demand and production are increasing more rapidly as compared to other major commodities. Simultaneously, it is estimated that by 2025, India would require 50 million metric tones of maize grain, of which 64 per cent would be required in the feed sector, 30 per cent in the industrial sector, 4 per cent as food and 2 per cent for seed and miscellaneous purposes. Thus, in next 7 to 8 years there is necessity and opportunity for increasing India's maize production by about 40 per cent from the current level of production of approximately 38 MMT (2016-17). To meet such target, some strong policy interventions will be required in the area of production, marketing and processing of maize in general and particularly in Bihar. These interventions may be as follows:

Production

i. Strengthening of production chain (sowing to harvesting) by way of availability of quality seeds at reasonable price, balanced use of nutrients, transplanting maize under late sown conditions etc. are to be taken care of.

ii. To address the issue of low quality maize, there is need to establish a chain of community based dryers at producer level, construction of threshing floors (10,000 sq. feet) at village level, providing tarpaulin (40' x 40') to maize farmers for preventing grains from pre-monsoonal rains etc.

iii. Aflatoxins and storage pests developed due to high moisture at harvesting, the installation of affordable community/metal silos at producer level may be made to save maize grains from pest infestation. This will simultaneously prevent the distress sale of crop at cheaper prices.

iv. Picking-up of grains before sprouting of seeds by pigeon, sparrow, rats, termites, etc may be checked in consultation with the plant protection scientists.

v. Destruction of the crop by blue bulls and boars may be checked with a co- operation of the Forest, Environment and Wildlife Management Department.

Marketing

i. To address the supply chain issues, market linkage model may be promoted or strengthened through farmers' producer company/group/organization. It will minimize the number of market functionaries or intermediaries and enhance the producer's share in consumer's rupee.

ii. The complete production-to-end user value chain needs to be strengthened. Since the price difference between the farmer's realization and the end user is about Rs. 1000 to Rs. 2000 tons of maize production, which can be eliminated by creating the business model of direct purchase by end user/industries without brokers/commission agents.

iii. The logistic for bulk handling system of maize from farm to industrial gate needs to be strengthened through development of hassle free roads (quality of roads and elimination of harassment by traffic personnel) and carriage by railways (24 hours of free loading time, reduction in demurrage charge, fairly developed basic infrastructure at railways sidings, provisioning of piecemeal loadings etc.)

iv. Improvement in market intelligence system and transparency in prices are the need of time.

Processing

i. The level of processing of maize in the state is presently quite insignificant. There is, thus, a large opportunity for maize processing units, which can be set up for making a range of products like; starch, corn oil, corn flakescorn flour, poultry & animal feed, zeinprotien etc. So, there is need to incentivize to maize based processing industries in the state.

ii. Having potential of strong viability for maize processing units in the State Government

should geared-up the process of establishment of at least one mega food park in each of the agro-climatic zones or potentially identified geographical areas. As of now, one mega food park project is being executed at Khagaria (Zone – II) by Pristine Mega food Park Pvt. Ltd. under an agreement with MoFP&I, GoI.

iii. The state may be the *'Maize Processing Hub,'* if the maize policy is centered towards the strengthening of Maize Production Chains, as also suggested by selected maize processors.

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