

Study of paddy seeds supply chain analysis by private sector in Samastipur district of Bihar, India

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Abstract

The study was undertaken for analysis the challenges and opportunities associated for paddy seed supply chain of private seed sector in Samastipur district of Bihar. Supply chain management of paddy seed by six seed companies i.e., Messina Beej Private Limited, Mahyco, Bayer, Syngenta, JK Agri Genetics and Nuziveedu Seeds were analyzed. The study is based on the primary and secondary data. The 25 seed vendors and 100 farmers from different locations of Samastipur district of Bihar were selected in randomized manner. The 12 factors concerned with seed vendors and 31 factors associated with farmers regarding seed supply chain management were considered. There is need of enhancement about seed production centre, storage facility for seeds and development of proper transportation facility in Samastipur district for timely availability of paddy seeds in this district. The farmers of Samastipur district of Bihar prefer to cultivate paddy varieties, NK5251 of Syngenta, Arize 6444 of Bayer MRP 5491 of Mahyco, JKRH 2609 of JK Agri Genetics, NP 360 Moti of Nuziveedu Seeds and Messina Basmati of Messina Beej Private Limited. Messina Beej Private Limited has best opportunities to spread its seed marketing in Samastipur district.

Keywords: Bihar, Company, Management, Samastipur, Seed, Supply

1. INTRODUCTION

Paddy (*Oryza Sativa* L.) (2n=24), belonging to the family Graminae and subfamily Orazoidea, is the principal staple food for more than 50% of the

world's population and occupies one-fifth of the total land area covered under cereals [1]. India ranks second (21.6%) worldwide, next to China (28.8%) [2]. Scope of paddy crop production to meet the demand for paddy to feed the burgeoning population basically depends on effective and sustainable utilization of genetic resources, cultivation of selected improved varieties and hybrid varieties according to climatic conditions and availability of cultivation facilities. Seed is the critical determinant of agricultural production on which depends the performance and efficacy of other inputs. Quality seeds appropriate to different agro-climatic conditions and in sufficient quantity at affordable paddy, on time availability are required to raise productivity.

Bihar is the state of India, with its beautiful natural resources of fertile soil, abundant water, varied climate and rich cultural and historical heritage is one of the most fascinating states of India. Principal food crops of Bihar are paddy, wheat, maize and pulses. Though endowed with good soil, adequate rainfall and good ground water availability, but Bihar has not get realized its full agricultural potential. Due to high consumption, Bihar has become a net borrower to meet the seed demands. Seeds like Paddy and Wheat are sourced from other states such as Uttarakhand, Telangana and West Bengal. So, it is need for private seed sector for improvement of supply chain of paddy seeds in Bihar for production of more amount of paddy. In order to increase the sale & expand the market, it is necessary to analyze the socio-economic background of farmers in the area and pinpoint consumer preference among different brands &

attributes to make the experience beneficial for the company as well as the annual growth of paddy yield.

It is also necessary to know the loop- whole related with supply chain of paddy seeds in Bihar. The Samastipur, district of north Bihar are important paddy cultivation area due to its Agro-climatic conditions and soil fertility as well as availability of water resources. Keeping all above into consideration, the present investigation was performed to know the challenges and opportunities of paddy seed supply chain of private seed company in Samastipur district of Bihar, India.

2. MATERIALS AND METHODS

The study was conducted in Samastipur district of Bihar for a view of supply chain management of paddy seed by six seed companies i.e., Messina Beej Private Limited, Mahyco, Bayer, Syngenta, JK Agri Genetics and Nuziveedu Seeds.

The study is based on the primary and secondary data. Primary data were collected in year 2023 from the seed vendors and farmers using questionnaire in close interaction. The primary data were collected in randomized manner from selected sample of seed vendors & farmers through personal interviews. The 25 seed vendors and 100 farmers from different locations of Samastipur, district of Bihar were selected in randomized manner. The 12 factors concerned with seed vendors and 31 factors associated with farmers regarding seed supply chain management were considered. Secondary data were collected from the literature available with the public and private seed producers and distributors. The primary data were tabulated, classified, quantified and statistically analyzed.

3. RESULTS

3.1 SEED VENDORS RESPONSE

The seed vendors response about twelve different factors associated with seed marketing and storage of Samastipur district is mentioned in Table 1. The 72% seed vendors have storage facility for seeds, but remaining 28 % seed vendors have no storage facility of seeds. The 80% seed vendors has proper transportation facility for seeds and remaining 20% seed vendors face troubles related with transportation facility of seeds. The 28% seed vendors of this district has problems for timely supply of seeds from seed company whereas the 72% seed vendors get timely delivery of paddy seeds from seeds company. The 32% seed vendors suffers

the delay delivery of seeds and storage problems due to climatic constrains but 68% seed vendors has no effect of climatic constrains. The 40% seed vendors has supply chain problem due to distant location of seed production centre, whereas 60% seed vendors get easily seeds. The 48% of seed vendors transports there seeds by trucks and 52% seed vendors are able to carry seeds by train.

3.2 FARMERS RESPONSE

The farmers response about thirty-one different factors associated with farmers for supply chain of paddy seed of Samastipur district is mentioned in Table 2. The 15% marginal farmers, 33% small farmers, 30% semi-medium farmer, 16% medium farmers and 06% large farmers of Samastipur district were participated in this survey. This district farmers uses paddy seeds of Messina Beej Private Limited, Mahyco, Bayer, Syngenta, JK Agri Genetics and Nuziveedu Seeds by 23.68%, 19.41%, 14.80%, 15.46%, 13.82% and 12.83% respectively. The 44% farmers of this district obtain information about seed variety of paddy from newspapers, 38% from friends, 7% by TV channels and 11% from online platforms. The 26% farmers has constrains related with timely supply of seeds, 46% farmers has problem to use good seeds due to its high cost, 17% farmers has issues related with seed quality, 13% farmers has no choice to select the seeds as per requirement of their soil in Samastipur district. The 94% farmers of this district are aware about benefits of hybrid paddy seeds, whereas the 6% farmers have no proper knowledge about hybrid paddy varieties. The only 35% farmers of this district have knowledge about different paddy varieties, but 65% farmers are not aware about different paddy varieties. The 90% farmers of this district purchase paddy seeds from local vendors and only 10% farmers purchase paddy seeds by online marketing. The 45% farmers are needed training for hybrid paddy cultivation, but 55% farmers have no need of such training. In this district only 20% farmers are trained for paddy cultivation by Seed Company, whereas 80% farmers are untouched by such training programme. Only 10% farmers field are regularly visited by company persons of seed company and get required suggestions from seed company persons, but 90% farmers field are not monitored by seed company persons in this district.

3.3 MARKET SHARE OF SEED COMPANIES

The seeds of six seeds companies i.e., Messina Beej Private Limited, Mahyco, Bayer, Syngenta, JK Agri Genetics and Nuziveedu Seeds is marketed in Samastipur district. The highest sell of Messina Beej Private Limited paddy seeds (23.69%) were observed followed by Mahyco (19.41%), Syngenta (15.48%), Bayer (14.80%), JK Agri Genetics (13.82%) and Nuziveedu Seeds (12.83%). The highest market shares 11.20% for paddy variety NK5251 of Syngenta seed company was observed in this district (Table: 4.3). The paddy variety Arize 6444 of Bayer MRP 5491 of Mahyco, JKRH 2609 of JK Agri Genetics, NP 360 Moti of Nuziveedu Seeds and Messina Basmati of Messina Beej Private Limited has important market share in Samastipur district (Table: 3).

4. DISCUSSION

The more than 50% of seed vendors of Samastipur district have proper facility for, storage facility for seeds, proper transportation facility, timely delivery of paddy seeds from seeds company, very less climatic issues related with seed supply chain. So it provides seed companies to select as seed production and distribution hub to this district. The enhanced seed storage facility and proper transportation facility to seed vendors will enhance the opportunities for timely availability of seeds to farmers in this district. There are most of the seed vendors of Samastipur district are able to utilize the transportation of seeds by trains, which causes easy delivery of seeds and reduces in the seed cost, because most of the seed vendors are able to utilize proper seed transportation facility. The good transportation facility of paddy seeds in Samstipur by train and trucks makes it a good seed distribution centre.

The penetration of all six seed companies i.e., Messina Beej Private Limited, Mahyco, Bayer, Syngenta, JK Agri Genetics and Nuziveedu Seeds in seed market of Samastipur district is about similar, whereas maximum seed market share was reported for Messina Beej Private Limited and minimum for Nuziveedu Seeds. The report of this investigation indicates about highly competitive marketing situation for all seed companies in this district. The paddy seeds of Messina Beej Private Limited has more acceptance in this district, which provides good

opportunities to Messina Beej Private Limited for marketing of its seeds. Most of the farmers of this district get information regarding paddy seed varieties by friends and newspapers. So it is needed for seed companies to more advertise the varieties of paddy seeds by news papers and in farmers groups. The cost of seed and availability of varieties as per requirement of soil are important issues related with farmers in this district. The seed companies should reduce the cost of seeds or to provide subsidiary on seeds. The seed companies should also distribute its paddy seeds in this district according to soil and choice of farmers requirements. The most of the farmers of this district are aware about benefits of hybrid seeds which provides better opportunities for marketing the hybrid seeds by seed companies in this district. There are many farmers have knowledge about varieties of paddy, therefore it is required to trained such farmers about modern cultivation packages and practices in this district. Most of the farmers of this district purchase seeds by local seed vendors, but many farmers also purchase by online platforms, it indicates that more emphasis should be provided to seed vendors regarding availability and distribution of paddy seeds along with development of awareness and promotions of farmers for online shopping of seeds. Most of the farmer's field of this district is not regularly visited by advisors of seed companies. By providing the good consultancy services and training programmes to farmers will enhance the marketing facility to seed companies.

The paddy varieties NK5251 of Syngenta, Arize 6444 of Bayer MRP 5491 of Mahyco, JKRH 2609 of JK Agri Genetics, NP 360 Moti of Nuziveedu Seeds and Messina Basmati of Messina Beej Private Limited are mostly preferred by farmers of this district for cultivation.

The observations of this study suggest the good market opportunities of these varieties in this district. More promotion of these paddy varieties will enhance the sell rate of these paddy varieties and to develop a good marketing opportunity for seed companies in this district. These findings are more less in agreement with the earlier reports of such type of study in different locations of India and abroad [3], [4], [5], [6], [7] [8], [9], [10].

Table 1: Vendors survey for multiple factors related with seed supply

Sl. No	Factors	Seed Vendors response (%)	Sl. No	Factors	Seed Vendors response (%)
1	Availability of proper storage facility	72	7	Effect of Climatic Constrains	32
2	Not availability of proper storage facility	28	8	Not effect of Climatic Constrains	68
3	Proper transportation facility	80	9	Constrains related with distance of seed production centre present	40
4	No proper transportation facility	20	10	Constrains related with distance of seed production centre absent	60
5	Supply issues from company are remain	28	11	Transportation of seeds by trucks	48
6	No supply issues from company are remain	72	12	Transportation of seeds by trains	52

Table 2: Farmers survey for multiple factors related with paddy seed supply

Sl. No	Factors	Farmers response (%)	Sl. No	Factors	Farmers response (%)
1	Marginal farmer	15.00	17	Constrain for Cost of seed	46.00
2	Small farmer	33.00	18	Constrain for Quality of seed	17.00
3	Semi-Medium farmer	30.00	19	Constrain for Seed variety as per soil	13.00
4	Medium farmer	16.00	20	Knowledge about benefits of hybrid paddy varieties	94.00
5	Large farmer	06.00	21	No knowledge about benefits of hybrid paddy varieties	06.00
6	Messina Beej Private Limited	23.68	22	Knowledge of different paddy seed varieties	35.00
7	Mahyco	19.41	23	No knowledge of different paddy seed varieties	65.00
8	Bayer	14.80	24	Paddy seeds are purchased by local vendors	90.00
9	Syngenta	15.46	25	Paddy seeds are purchased by online platforms	10.00
10	JK Agri Genetics	13.82	26	Need training program for hybrid paddy cultivation	45.00
11	Nuziveedu Seeds	12.83	27	No need training program for hybrid paddy cultivation	55.00
12	Information of paddy variety obtained by News papers	44.00	28	Seed company provide training for cultivation	20.00
13	Information of paddy variety obtained by Friends	38.00	29	Seed company does not provide training for cultivation	80.00
14	Information of paddy variety obtained by TV channels	07.00	30	Company person perform field visit	10.00
15	Information of paddy variety obtained by Online platforms	11.00	31	Company person does not perform field visit	90.00
16	Constrain related with timely supply	24.00			

Table 3: Market share of seed company in Samastipur

Sl. No	Seed company name	Paddy Varieties	Market share (%)
1	Messina Beej Private Limited	Messina Basmati	5.26
		Saumya	4.61
		Prabhat	4.61
		Rajeshwari	4.28
		Saryoo 52	2.96
2	Mahyco	Sonali	1.97
		Suruchi MRP-5569	9.54
3	Bayer	MRP 5491	9.87
		Arize 6444	10.20
4	Syngenta	Arize 6129	2.63
		Arize Tej	1.97
		NK5251	11.20
5	JK Agri Genetics	S 7002	4.28
		JKRH 2609	7.24
		JKRH 2354	4.61
6	Nuziveedu Seeds	JK Swarnamoti	1.97
		NP 360 Moti	5.59
		NP 218 Sourabh Gold	3.95
		NP 1024 Moti Gold	3.29

5. CONCLUSION

There are many opportunities of paddy seed marketing is present in this district. The development of proper storage facilities for seed, good transportation system in low cost, subsidized seed price, awareness regarding paddy varieties among farmers, availability of paddy varieties according to the choice of farmers and providing good consultancy services by seed companies will enhance the marketing opportunities of paddy seeds in Samastipur district of Bihar. More promotion of these paddy varieties will enhance the sell rate of these paddy varieties and to develop a good marketing opportunity for seed companies in this district.

6. REFERENCES:

- [1] M. Z. Shamim, H. Manzar, V. K. Sharma, and P. Kumar, "Microsatellite marker based characterization and divergence analysis among rice varieties", *Indian Jour. Biotech.*, vol. 15, no. 2, pp. 182-189, 2016, doi: 10.13140/RG.2.2.33986.99522.
- [2] A.R.Shравanathi, and D. Sahoo, "MarketPotential and Promotional Strategies for VSPL Hybrid Paddy Seeds in Koraput District of Odisha". *Indian Res. J. Ext. Edu.*, vol. 22, no. 5, pp. 230-236, 2023, doi: 10.54986/irjee/2022/oct_dec/230-236.
- [3] Pasutham, and Asawin. "Supply Chain Performance Measurement Framework: Case Studies of Thai Manufacturers". Thesis. Aston University. Thailand, 2012.
- [4] F. Galli, G. Bartolini, L. Brunori, G.Colombo, S. Oriana, Grando, and A. Marescotti, "Sustainability assessment of food supply chains: an application to local and globalbread in Italy", *Agri. Food Economics.*, vol. 3, pp. 21, 2015, doi: 10.1186/s40100-015-0039-0.
- [5] J. S. Chauhan, R., Prasad, S Pal, and P. R. "Choudhury, Seed Systems and Supply Chain of Rice in India", *J. Rice Research*, vol. 10, no. 1, pp. 9-16, 2017.
- [6] S. R. Prasad, J. S. Chauhan, and K. V. Sripathy, "An overview of national and international seed quality assurance systems and strategies for energizing seed production chain of field crops in India", *Indian J. Agri. Sciences*, vol. 87, no. 3, pp. 287-300, 2017, doi: 10.56093/ijas.v87i3.68592.
- [7] R. Dwiastuti, R. Isaskar, N. Tri Wahyu Anisa, A. Aprilia, S. Putri Budi. "Supply chain analysis of rice seeds: Supplier relationship management perspective at Malang regency, East Java, Indonesia", *Int. J. Soci. Loc. Eco.*

- Govern (IJLEG)*. vol. 4, no. 1, pp. 20-25, 2018.
- [8] N. P., Singh, S, Sahoo, and C, Chandra Dev, "Supply Chain of Paddy and Wheat Seeds Production in Tarai Development Corporation and Private Seed Firms of Uttarakhand", *Int. J. Curr. Microbiol. App. Sci*, vol. 10, no. 2, pp. 2701-2710, 2021, doi: 10.20546/ijemas.2021. 1002.298.
- [9] A., Anand, A. J., Stephen, J., Zechariah, Ramchandra and P. Tripathi, "Study on marketing of hybrid paddy seeds in Gaya district of Bihar state", *The Pharma Innovation Journal*, vol. SP-11, no. 7, pp. 287-289, 2022.
- [10] K., Singh, J., Ameesh, Stephen, and J. Zecariah, "Study on marketing of hybrid paddy (VNR 2233) in Balrampur district of Chhattisgarh", *The Pharma Innov. J*, vol. SP-11, no. 12, pp. 88-94, 2022.