

Tulaipanji – A precious scented rice land race of North Bengal, India

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ABSTRACT

Tulaipanji is an indigenous aromatic rice landrace grown mainly in Raiganj sub-division of Uttar Dinajpur and small pockets of Dakshin Dinajpur district of West Bengal, India. Farmers cultivate it organically with no/low inputs in the jute cultivated fields after harvesting the crop. A study has been conducted with major objectives to find out the problems and prospects of cultivation of *Tulaipanji*, to restore the quality and aroma besides developing a suitable market chain. It is revealed that realized price of *Tulaipanji* is very low considering its quality and aroma. Malpractice through adulteration by mixing the similar type of non-aromatic rice causes the deterioration of the market value and demand of *Tulaipanji*. Emphasis is to be given on development of suitable 'marketing channel' and 'branding' the variety. More extensive researches and extension works are highly required for productivity enhancement, including marketing and processing of *Tulaipanji*. System of Rice Intensification (SRI) is to be adopted for cultivation to augment the productivity. Aggregation of produce by forming producer's groups of *Tulaipanji* and development marketing channels need to be emphasized. Self Help Groups can act as the promoting institution for marketing as well as branding. Researches for maintaining genetic purity, incorporation of genetic traits of this wonder variety which is free from any pest and disease infestation and possibility of expansion of area particularly in Uttar Dinajpur and Dakshin Dinajpur district are to be conducted in future.

Key words: North Bengal, Rice Landrace, Scented Rice, *Tulaipanji*.

Introduction

Besides long-grain Basmati variety, India abounds with hundreds of indigenous short/medium grain cultivars and landraces, grown in pockets over different states of the country. They possess strong aroma, good taste, excellent cooking quality and commend good price in domestic market. The farmers generally grow these aromatic landraces in their native areas mainly for their own use.

The state of West Bengal has precious wealth of genetic diversity in aromatic rice (Singh *et al.*, 2000; Shobharani and Krishnaiah, 2001). Among them, *Tulaipanji*, a medium-grained, fragrant cultivar is

very popular in domestic market for their quality features and potentiality for International trade.

Tulaipanji is a one of the oldest indigenous aromatic rice landraces adapted in a small pocket of Uttar Dinajpur district of West Bengal, India and is generally cultivated with no or low inputs by the farmers of two Dinajpur districts of West Bengal (Sen and Sarkar, 2010). It is mainly concentrated in Raiganj block and sporadically cultivated in Hemtabad, Kaliaganj and Itahar blocks of Uttar Dinajpur and in Balurghat, Kumarganj and Kushmandi blocks of Dakshin Dinajpur district. A survey conducted by Department of Agriculture, Government of West Bengal reveals that more than

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3,000 farmers are involved in production of *Tulaipanji* in Raiganj Block only. The produce has much demand in six districts of North Bengal and adjoining states, namely, Bihar, Assam, Sikkim and Bhutan (Anonymous, 2007).

It is medium-long slender grain with an average length 5.5 mm, length/breadth ratio 3.4 and elongation ratio 1.6. Cooked rice is tasty, good in texture, bright in appearance, non-sticky and friable due to high amylose content (28.3%). It also contains 7.3% protein and comparable quality parameters like 77.1% hulling, 65% milling, 54.2% head rice recovery and alkali value at 4.0 (Sen, 2008). The climatic conditions during *Tulaipanji* growing season (*Kharif*) in Uttar Dinajpur are characterized by temperature 24°C - 30°C and 1,700 mm rainfall and those during crop maturity are 18°C - 29°C and 7 mm rainfall.

Liberalisation of the farm sector has caused significant changes in cropping patterns across various districts of West Bengal for competition to grasp the market not only by the neighbouring countries but also by the other regions/states of the country. In Uttar Dinajpur district, imported paddy resulted in lower prices for even high quality local paddy such as *Tulaipanji* (Anonymous, 2008).

Traditionally, *Tulaipanji* is grown without using any fertilizer in medium to upland condition and preferably in jute harvested field. Low soil fertility and moisture stress generally prevail in the growing field. Sowing as well as transplanting is done under late condition than other *kharif* growing paddy. Inorganic fertilizers are generally not used due to reduction in aroma and other qualitative parameters. The use of organic manures viz., FYM, compost, green manure, etc. and inoculation with *Azotobactor*, *Azospirillum*, blue green algae are promising for or-

ganic production in India (Venkataraman, 1984).

In this context, a study has been conducted under a research project with major objectives to find out the problems and prospects of cultivation of *Tulaipanji*, to restore the quality and aroma besides developing a suitable market chain.

Objectives

The major objectives of the study are as follows:

- To identify the problems and constraints of *Tulaipanji* cultivation
- To suggest suitable technologies for augmentation of productivity
- To identify the present marketing channels and propose a suitable marketing channel
- To identify the gaps related to research and technology
- To suggest a policy to meet up the gaps between research and technology.

Materials and Methods

The base-line survey was conducted for *Tulaipanji* growers in 4 blocks of Uttar Dinajpur district in collaboration with Department of Agriculture, Government of West Bengal. Two types of schedules were used in the survey work, one for aromatic rice farmers and another for extension personnel. Twenty five numbers of aromatic farmers from each of the four blocks and a total of 14 nos. of extension personnel were participated in this survey works.

Farmers' Groups have been formed in total five blocks in two districts, viz., four blocks, namely, Raiganj, Hemtabad, Kaliaganj and Itahar of Uttar Dinajpur district and one block, Balurghat of Dakshin Dinajpur district.

Table 1. Farmers' Group Cultivation of *Tulaipanji* for Kharif season- 2009, 2010 and 2011 under the project

Name of Block (Vill.)	No. of Farmers' Group	No. of Farmers			Total cultivated Land (Bigha)			Total seed distributed (kg)		
		2009	2010	2011	2009	2010	2011	2009	2010	2011
Raiganj (Runia, Bamuha)	1	65	160	240	90	179	405	220	895	2000
Itahar (Bankur, Sripur)	2	24	28	87	45	49	96.25	280	245	485
Hemtabad (Ratibati, Krishnabati, Krishnapur, Patur, Bidisoil),	5	27	111	121	41.6	156.5	166	330	782.5	830
Kaliaganj (Mudafat, Anantapur)	2	27	78	124	66	87	207	130	435	1035
Balurghat (Chingishpur, Amrail, Bangalipur)	1	0	45	63	0	47	107	0	235	535
Grand Total		143	422	635	242.6	518.5	981.25	1215	2592.5	4885

1 Bigha=0.33 Acre

Tulaipanji seed was collected from Block Seed Farms (BSF) of Uttar Dinajpur district and distributed among Farmers' Group for three years after motivating through small group discussions. They had also been trained on advance techniques of cultivation of *Tulaipanji*, nutrient management, organic cultivation, techniques of pests and diseases control etc. Time to time field observations and discussions with the farmers and their groups were also made throughout the period. Front Line Demonstrations (FLD) were also conducted on the effect of organic manures on yield and quality of *Tulaipanji* in the four blocks in the farmer's field.

Results and Discussion

Area, Productivity and Coverage of *Tulaipanji*

The data related to area under cultivation of different types rice has been presented in the Table 2. The table reveals that area under *Tulaipanji* in Raiganj block of Uttar Dinajpur district is highest to the tune of 1720 ha. More than 57 per cent of area under local varieties in this block comes under *Tulaipanji* cultivation. There are scopes of increasing the area under *Tulaipanji* cultivation in all the blocks in the district. Only 6.83 per cent area of total rice in the block of Raiganj is cultivated for *Tulaipanji*. Hemtabad block cultivates *Tulaipanji* in 700 ha. accounting 87.50 per cent area under local rice varieties. This block marketed more than 3 tonnes of *Tulaipanji* rice at very high price in the year of 2011-12 after an interven-

tion of Department Agricultural Marketing, GoWB. Now the farmers are getting higher prices as the Department related Parliamentary Standing Committee on Commerce has recommended Gabindobhog and *Tulaipanji* for export in their 98th report on "Export of Food Grains-Premium Non-Basmati Rice & Wheat (August, 2011 / Sravana, 1933 (saka), Rajya Sabha Secretariat, New Delhi) after a move through this project. So, the intervention is needed to augment the area under *Tulaipanji* in this district.

The yield of *Tulaipanji* observed in the farmers field ranges between 1.5 to 2.0 ton per ha. whereas the yield observed in the research field of Regional Research Station (Old Alluvial Zone), Uttar Banga Krishi Viswavidyalaya, Majhian, Patiram, Dakshin Dinajpur is ranging from 1.8 to 2.52 ton per ha. The organic cultivation of *Tulaipanji* is being carried out in the research station by using Farm Yard Manure, Mustard Cake, Neem Cake, Vermicompost etc.

Though there is no secondary data on the total production of *Tulaipanji* but the estimated production *Tulaipanji* would be 5625-7000 tones as paddy.

Tulaipanji-as a crop

Tulaipanji paddy is grown in kharif season. Farmers prefer to grow this paddy during the months of August to November. Some unique features of *Tulaipanji* are: (a) It is highly micro-climate specific and photoperiod sensitive. It is only grown in kharif season by preparing the seed bed in the month of

Table 2. Area of *Tulaipanji*, other Local Varieties and HYV in the blocks of Uttar Dinajpur (Ha.)

Block	Area under <i>Tulaipaji</i>	Local variety	HYV	Total Area	Percentage area of local Var. to total area	Percentage area of <i>Tulaipanji</i> to Local var.	Percentage area of <i>Tulaipanji</i> to total area	Markets of <i>Tulaipanji</i> rice
Raiganj	1720	3005	22160	25165	11.94	57.23	6.83	Kamlabadi, Mohiniganj, Barduari, Maharaja, Bindol, Bhatol
Hemtabad	700	800	13100	13900	6.10	87.50	5.03	Bishnupur, Samaspur, Kamlabadi, Bangalbadi, Hemtabad, Asmanhat
Kaliaganj	710	1600	20000	21600	7.40	44.37	3.28	Bakhon, Kaliaganj Bazar, Khanar Hat, Kamlabadi Hat
Itahar	750	NA	NA	27066	NA	Na	2.77	Durgapur, Patirajpur, Itahar

Source: Department of Agriculture, GoWB

July, transplanted in the month of August and matured in November. (b) It is non-responsive to chemical fertilizer. Most of the grower cultivates the crop after harvest of jute crop and the residual nutrients effect is sufficient for *Tulaipanji* cultivation. Like other aromatic rice, use of excessive fertilizer deteriorates the quality for which it is preferred. (c) The aroma is present in parboiled rice too. Unlike other aromatic rice, mostly *Tulaipanji* is used as parboiled rice, though it is also used as *atap* (non-parboiled). (d) Unlike the other cultivated rice varieties grown the kharif season, the occurrence of pest infestation and disease incidence is negligible.

Problems and Constrains in *Tulaipanji*

The major problems of *Tulaipanji* cultivation in this zone are identified as: (a) **Lower yield and lower price:** Average productivity of *Tulaipanji* is very low as compared to High Yielding Varieties and existing market price is non-remunerative for the growers. (b) **Non existence of distant market:** There is no prominent market for *Tulaipanji* value chain. It is sold mostly in local markets which offer low prices of the produce. (c) **Brand value:** Unlike Basmati, *Tulaipanji* is not yet a popular brand. (d) **Quality issue:** Most times farmers/traders mix other non-aromatic rice with *Tulaipanji* to get more profit.

Cultivation Technology to be adopted

Advance technology of cultivation has been adopted with special emphasis for maintaining the quality and aroma. The major findings are as follows:

- As chemical fertilizers deteriorate the quality and aroma, the emphasis must be given on organic cultivation of *Tulaipanji*. All organic fertilizers, namely, FYM, mustard cake, neem cake and vermicompost were found effective in yield enhancement without hampering the quality and aroma. Mustard cake was found best and obtained an average yield of 2.5-2.8 ton/ha where the average is 1.5-2.0 ton/ha in conventional cultivation.
- The organic fertilizers, especially neem cake was found to reduce incidence of diseases (Brown spot) and pest incidence (leaf roller and dead heart).
- The best period of transplanting of *Tulaipanji* is found 10-20th August.
- SRI and Drum seeder technology can be adopted in *Tulaipanji* cultivation.
- Field Level Demonstration advocates the use of

organic manures for better results.

Markets and Channels Identified

There is no prominent market in the city like Kolkata for *Tulaipanji* value chain. It is sold mostly in local markets which offer very low prices of the produce. The identified marketing channels for this rice are presented diagrammatically (Fig. 1).

Hence, a market chain is being developed through this research project between the "Samasti Krishak Unayan Samity", a federation of the Farmers of Hemtabad block of Uttar Dinajpur district with the Co-Operation of Director of Agricultural Mar-

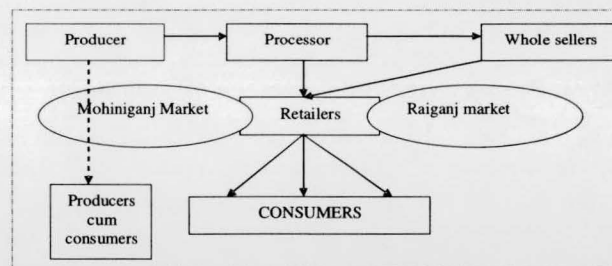


Fig. 1 Conventional Market System at Uttar Dinajpur

keting, Govt. of West Bengal and proposed to be sold under the brand name, "Bengal Aromatic Rice". The proposed model of marketing has been presented in the Fig. 2.

Advantages of *Tulaipanji* cultivation identified over convention cultivated paddy

- As *Tulaipanji* is indigenous scented rice and non responsive to fertilizer, it grows organically and thus its cultivation is environmental friendly.
- It will have great importance in international market, if exploited properly, as *Tulaipanji* is cultivated organically.
- As the transplanting time of *Tulaipanji* is one month late than the other conventional paddy, it is best suited in cropping sequence after jute. Moreover, like jute, it requires medium to upland condition and the residual nutrients effect is sufficient for *Tulaipanji* cultivation.
- It requires low water and can tolerate water stress condition.
- It requires no chemical pesticide as the incidence of diseases and pests is less.
- The input cost of *Tulaipanji* cultivation is low in compare to the conventional paddy (Table 3)
- The market price of *Tulaipanji* is 1.5 to 2 times

more than any other aromatic rice of West Bengal. Even the market value of straw is also more due to its longevity and domestic animals prefer it as fodder.

The cost return analysis exhibits that cost of *Tulaipanji* cultivation is 1.5 times less than the cultivation of other HYV varieties. Further, net return from *Tulaipanji* cultivation is more than that of other rice varieties. Benefit cost ratio also unveils comparatively higher value than other paddy crops.

Research and Technology Gaps

(a) Gaps of research related to production tech-

- nology accompanied with enriched organic manure, bio-pesticide, plant growth promoting organisms, bio-control agent etc.
- (b) Lack of scientific knowledge on post-harvest storage and processing to maintain / improve the product standard.
- (c) No/weak linkage network for disposal of quality produce from farmers' field to market.
- (d) Inadequate database on physical, biochemical and molecular characterization of aromatic landraces along with specific geographical information for protection of genotype.
- (e) Lack of web-based integrated information system for fast dissemination to the stakeholders.

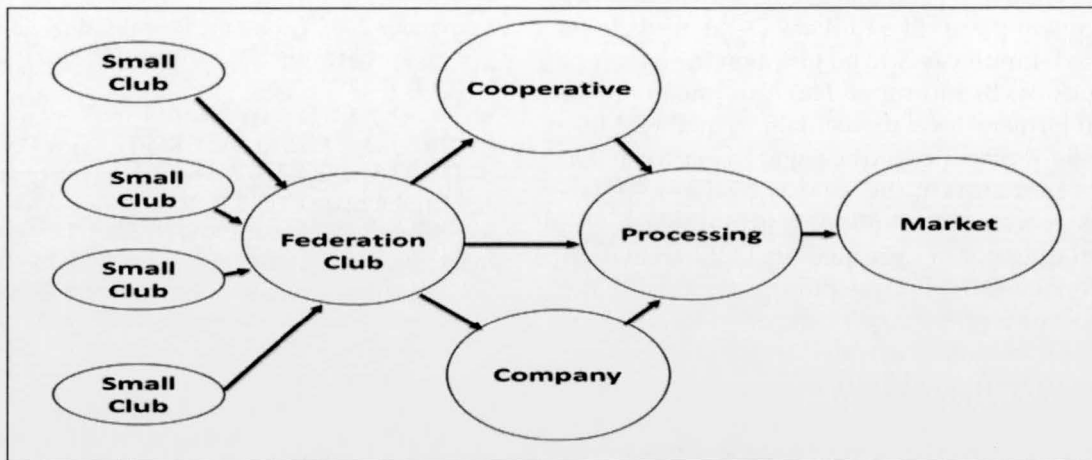


Fig. 2 A proposed Model of a Market Chain

Table 3. Cost of Cultivation of *Tulaipanji* (in 0.33 acre land) over other High Yielding Varieties of paddy during year of 2010

Components	Tulaipanji paddy Cost (Rs)	Other Kharif paddy Cost (Rs)
Cost of preparation of land (Human Labour)	640.00	640.00
Cost of Seed	150.00	200.00
Cost of Irrigation	-	-
Cost of Fertilizers and manure	40	500.00
Application cost of Fertilizers and manure (man-days)	80	160.00
Cost of plant protection chemicals	-	250.00
Cost of application plant protection chemicals (man-days)	-	160.00
Cost of weeding (man-days)	640	640.00
Cost of harvesting, threshing etc. (man-days)	480	480.00
Total cost	Rs. 2030.00	Rs. 3030.00
Yield of paddy	4400.00	4800.00
Straw	720.00	560.00
Sale price	Rs. 5120.00	Rs. 5360.00
Net Return	Rs. 3090.00	Rs. 2330.00
B-C Ratio	2.52	1.76

- (f) Lack of Government policy for commercialization of premium non-Basmati aromatic rice including declaration of Minimum Support Price (MSP) and Minimum Export Price (MEP).

Conclusion

Possible intervention for enhancement of productivity by maintaining the quality of this rice cultivar is required instantaneously. Very little research works have been done to enhance the productivity of *Tulaipanji* as well as on development of the marketing. So, extensive research and extension works are highly recommended on marketing and processing of *Tulaipanji*. More sub-sector studies on *Tulaipanji* are to be conducted and marketing of *Tulaipanji* rice at prominent places like Kolkata, Delhi needs to be promoted. Emphasis is to be given on the export of the produce. Branding of *Tulaipanji* needs to be made at farmers' level to maintain its quality. More producers' groups need to be engaged in production process to maintain the quality and genetic attributes as well as for bulk production which will ensure the supply in large quantity to different markets. Considering all these points specifically, the input cost of fertilizer and pesticide, risks and hazards of pest, disease and water, and organic cultivation, the cultivation of *Tulaipanji* is more profitable than the other *kharif* rice grown in West Bengal. Primary results showed that exhibited yield and aroma of *Tulaipanji* cultivated in Dakshin Dinajpur district is inspiring and at par with Uttar Dinajpur district. Therefore, a policy at government level needs to frame for expansion of the area of cultivation under this aromatic rice in the district of Dakshin Dinajpur.

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