

Impact of Frontline Demonstrations on Jute

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ABSTRACT

In order to increase production and productivity of jute by adopting improved production technologies, several frontline demonstrations (FLDs) on jute with package technologies were conducted by Central Research Institute for jute and Allied Fibres (CRIJAF), Barrackpore West Bengal. A study on impact of the demonstrations on the farmers' behaviour was conducted. Results of the study revealed that demonstrated technologies increased the fibre yield of jute by 4.45 q ha⁻¹ over the farmer's practice (25.10 q ha⁻¹), the post-demonstration yield was 29.55 q ha⁻¹ as the farmers adopted many components of the technology package that were used in demonstrations. Economic surplus from increased production of jute fibre by about 4.45 q ha⁻¹ provided additional Rs. 5570 ha⁻¹ to the farmers. The results further indicated that additional income that accrued due to increased harvest of jute by adopting improved practices was utilized by the farmers by increasing expenditure by about 50 per cent, on food, health care of the family members, education of children, and purchase of farm implements or essentials or essential items including attending social and entertainment programmes. Impact of the demonstrated technologies to increase fibre yield of jute by contact farmers up to 3 q ha⁻¹ in nearby villages within radius to three to seven km distance from the adopted villages was also found. A definite impact of the FLDs was thus observed.

Jute is an important fibre cash crop mainly cultivated by small and marginal farmers of West Bengal (W.B.). West Bengal is a major jute growing state in India contributing about 80 per cent national production of jute (Saha and Hazra, 2008). About 60 per cent of the raw jute in the world is produced in India. Biodegradability and Non-pollutant of jute fibre, which are nature friendly characteristics in the wake of global warming promoting cultivation of jute is prime importance to maximize the benefits. Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore (W.B.) has been instrumental for improving the production and productivity of jute and allied fibres in India since more than fifty years.

Demonstrations is one of the most powerful extension tool in communication of new ideas, methods and techniques in agricultural development. It helps to convince the farmers faster than any other method through the process of processing, hearing, learning by doing and experiencing things. It indicates a process of learning, motivates and encourages one to change his

habit, customs, traditions and practices and thereby helps in building up a progressive attitude (Pathak, 1999). Several frontline demonstrations (FLDs) on jute with package technologies were conducted over years by CRIJAF in different locations of West Bengal. It was, therefore, felt essential to assess the impact of the demonstrations and accordingly this study was conducted.

METHODOLOGY

The study was conducted in eight villages adopted by CRIJAF where the FLDs on jute with package technologies were conducted on the farmers' fields during 1996 to 2005. Data of the year 2006 were collected, which was the post demonstration period. The demonstrations were conducted with five high yielding jute (*Corchorus olitorius*) varieties viz., JRO-524, JRO-8432, JRO-66, JRO-128 and S-19. Since 2003, JRO-524E (rice necrosis virus inoculated seeds of JRO-524) with recommendation of N:20, P₂O₅:10, K₂O:10 kg ha⁻¹ fertilizer dose with use of plant protection chemicals was also introduced. Sowing was done in the month of April-May, while harvesting in

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the month of August. Fertilizer schedule was N: 60, P₂O₅:30, K₂O:30 kg ha⁻¹ for all the varieties except for JRO-524E. Need-based plant protection chemicals were used to control the insect-pests. Farmers were changed within the same villages after certain intervals for conducting the demonstrations on their lands. One hundred twenty (120) beneficiary farmers, 15 from each villages viz., *Devok, Koirapur, Masunda, Iswarigacha, Geedha* and *Teghoria* of North 24 Paragas district and Kamarkundu-I and II villages of Hoogly district of West Bengal, those who were well responsive and maintain records of cultivation, were selected for this study. They were categorized in three stages, viz., pre-demonstration, during demonstration and non-demonstration (after withdrawal from FLD) for the purpose of evaluating impact of demonstration in socio-cultural and economical context. It was emphasized on assessment of the impact of FLDs on the farmers in terms of knowledge gain, change in attitude by observing yield differences, seed exchange, if any, component-wise adoption of the technologies, spread of technology, change in economic status and utilization of additional income. The data were collected through personal interviews, group discussion and empirical observations with the help of pre-tested semi-structured interview schedule and field records of frontline

demonstration plots. The data were analyzed with frequencies and percentage basis.

RESULTS AND DISCUSSION

Frontline demonstration are effective educational tool in introducing various new technologies to the farmers and its adoption by building confidence on the basis of the results obtained on their fields. The demonstrations could convince the farmers of the respective localities that high crop yield is within their reach by adopting feasible package of practices. An impact assessment of the FLDs were made and the results have been placed initiating with the fibre yields of juts, which earned the monetary benefits.

Effect of improved jute cultivation on fibre yield of jute

Farmers' economical condition is much dependable on their agricultural production. High productivity of their crops resulted in more benefits in case of cash crop, which has influence on their socio-personal status. Quantity of fibre production has a major role to play in its profitability. The fibre yield production status of the beneficiary farmers was analyzed. The results are presented in Table 1.

Table 1. Impact of frontline demonstration on fibre yield obtained by the participatory farmers during 1996-2006

S.No.	Village	Fibre yield (q ha ⁻¹)			Additional	
		Pre-Demonstration	Demonstration	Post-Demonstration	Average yield increase over pre-demonstration stage (4-2)	monetary gain (Rs.ha ⁻¹)*
	1	2	3	4	5	6
1.	Koirapur	24.78	26.37	27.99	+3.21	4013
2.	Devok	24.61	30.00	29.52	+4.91	6138
3.	Iswarigachia	27.45	29.83	31.25	+3.80	4750
4.	Teghoria	25.41	29.34	30.58	+5.17	6463
5.	Masunda	25.95	28.72	30.17	+4.22	5275
6.	Geedah	25.16	28.45	29.29	+4.13	5163
7.	Kamarkandu-1	23.91	26.12	28.34	+4.84	6713
8.	Kamarkandu-II	23.91	27.33	29.28	+5.37	6713
	Mean	25.10	28.27	29.55	+4.45	5570

*Average market price of jute fibre during 2005 and 2006 was Rs. 1250 per quintal.

On an average the fibre of jute obtained by the farmers was 25.10 q ha⁻¹ before adoption for demonstration. The demonstrated yield of jute obtained by the farmers during adoption was 28.27 q ha⁻¹, which was

enhanced or maintained by the farmers after withdrawal from the demonstrations (29.55 q ha⁻¹). The fibre yield increased during post-demonstrated period was by 4.45 q ha⁻¹ over the period of interval. This was possible due to

adoption of the demonstrated technologies with implementation to timely management practices as mentioned in Table 2. Fibre yield and cost of cultivation (input cost) were found to be independent of size of farm. The post-demonstration period falls mostly under the year 2005 and 2006 in which the market price of the jute fibre was higher as compared to other years with an average of Rs. 1250 per quintal. The increase fibre yield during the post-demonstration period at *Kamarkandu-II* and *Tegharia* villages was quite more. It may be due to application of limited irrigations to the crop during dry spells and heavy textured soil, which retained moisture for longer time. Though, jute is a rainfed crop, water stress situation occurs at times at critical growth period resulting in lower fibre yield. Therefore, life saving irrigations was essential during the same period, wherever possible.

It was observed that the farmers were keeping about 10 per cent of good quality fibre at home for their own use. It was utilized to prepare hand made diversified products by the women and preparation of thin ropes of different farm and non-farm uses. However, they didn't bother for fibre quality because of non-availability of grading system in the market.

Economics surplus

Increased production of jute fibre by about 4.45 q

Table 2. Practice-wise adoption of jute production technology

S.No.	Technology	Adoption		
		Pre-demonstration	Demonstration	Post-demonstration
1.	Variety	JRO-632 & JRO-524	JRO-524, JRO-8432, JRO-66 JRO-128 and JRO-524E	JRO-524
2.	Seed rate (Kg ha ⁻¹)	7.5	Broadcasting=6.00 Line sowing-4.5	6.49
3.	Sowing method	Broadcasting	Broadcasting and Line sowing	Broadcasting
4.	Weeding	Manual	Manual	Manual
5.	Fertilizer application FYM (q ha ⁻¹)	-----	-----	19.17
	Nitrogen (Kg ha ⁻¹)	34.08	60	56.11
	P ₂ O ₅ (Kg ha ⁻¹)	16.63	30	29.63
	K ₂ O (Kg ha ⁻¹)	16.52	30	31.53
6.	Plant protection	2 times	Need-based	Need-based
7.	Retting	Traditional	Traditional	Traditional

It was recorded that the farmers were using jute varieties JRO-632 and JRO-524 before demonstration period. JRO-524, JRO-8432, JRO-66, JRO-128 and JR)-524E were demonstrated to them. However, they continued with the variety JRO-524 and recommended

ha⁻¹ provided advantage to the farmers by about Rs. 5570 per ha (Table 1). Marginal size of land holding of the majority farmers was the most important limiting factor in production of jute. Eventually the monetary benefit was not much visible, if it was not estimated on hectare basis. The monetary gain depends on the market price of the fibres, which was highly fluctuating year to year due to lack regularized market system. It was recorded that a few farmers made money by selling surplus jute sticks at very cheap rate that ranged between Rs. 50 and Rs. 100 per quintal, which was part of economic gain but not a regular income source. Some times, trucks of jute sticks are being taken out from this area, which indicates its commercial importance.

Adoption of demonstrated technologies by the farmers

Implementation of timely package of practices with systematic management mostly lead to achieve higher productivity of agricultural crops provided favourable climate existed. FLDs provide ample opportunity to the participatory farmers for learning by doing of new ideas, methods, and techniques. The impact of the FLDs on the farmers knowledge and attitude change about improved package of practices of jute were assessed and placed in Table 2.

seed rate after withdrawal from the demonstrations. It was found to be more suitable to cultivate in the jute area and yielding better (Chapke *et al.*, 22006a). Non-availability of certified seeds of the demonstrated varieties in local market was the limiting factor for their adoption.

Discontinuation of the line sowing by two row seed drill was due to practical problem in its operation. Regarding fertilizers application, the farmers continued with almost balanced fertilizer use (N:56, P₂O₅: 29, K₂O:31 kg ha⁻¹) after withdrawal from the demonstration, whereas, they use to apply imbalanced fertilizer dose (N:34, P₂O₅:16, K₂O:16 kg ha⁻¹) earlier. However, light fertilizers does was used i.e. (N:28, P₂O₅:11, K₂O:11 kg ha⁻¹) in potato area (Hoogly district) through mixed fertilizer (*Sufala*) and urea, before demonstration period. Need-based used of pesticides for controlling insects and diseases was taken after demonstration, which were neglected or limited up to two times earlier. Since, no technology on weeding and retting were demonstrated during the period under report, farmers followed traditional practices.

The high yielding jute variety (JRO0524) with recommended seed rate @ 6 kg ha⁻¹, almost balanced fertilizer use and timely management practices as indicated in the demonstrated package were resulted in increase of about 4.45 q ha⁻¹ after withdrawal from the demonstrations. The same may be demonstrated in different locations and agroclimatic areas of jute for its wide adoption.

Income utilization pattern of jute farmers

Additional profit in terms of cash received by the farmers from jute fibres was spent in different ways by the farmers. Details of the additional income utilization was investigated and reported in Table 3.

Table 3. Utilization of additional income from jute cultivation

Sl. No.	Human need / Item	Frequency (N=120)	%
1.	Fifty per cent more on food items	99	81
2.	Fifty per cent more on health	97	80
3.	Fifty per cent more on children education	95	79
4.	Purchasing inputs for next crop	91	76
5.	To attend social functions	75	63
6.	Purchase of sprayer or bicycle	50	42
7.	Recreation	44	37

From the data on utilization of additional income (Table 3), it is revealed that the farmers' could spend more upto 50 per cent than earlier on human needs and purchase of essential items. As per their opinion, they spent 50 per cent more money on essential needs such as food (81 per cent), health of the family members (80

per cent) and education of the children (79 per cent). They elaborated that they used to spend Rs. 500 on health, the additional income make them to spend Rs. 750, which was 50 per cent more than earlier. Similarly expenditure was enhanced in case of food and education of the children. No additional expenditure was recorded on purchase of clothes, however, which was being done usually from this money during the time of *pooja* (Goddess/God worship festivals). Most of the farmers utilized the income to purchase the inputs for next crop. i.e. paddy (76 per cent). Sixty three per cent of the farmers could attend social functions better such as marriage functions and birth ceremony. A few of them (42 per cent) could spend on recreation such as, viewing cinema, participation in fairs/*mela* at town or city places, which was not observed in Hoogly district.

It was observed that the fibre was ready for marketing before *pooja* festival and the sale deeds being utilized by the farmers to purchase cloths and inputs for next crop cultivation during *khariif* season. Marketing of the jute fibre matched with the time of festivals, so this crop has its importance to meet their festive, essential and entertainment needs.

Employment generation

Notably, the farmers engages their family labour as their own resources cultivation of jute. It was reported that ratio of the family and hired labour used in the jute cultivation was 40:60, which was reverse a decade ago. It may be due to the fact that young generation are not much interested to do drugerious farm work rather preferred to do work in non-agricultural sectors. Jute is a labour intensive crop, which consumed 77 per cent cost of human labour along out of total cost of cultivation (Chapke *et.al.*, 2006a). However, jute cultivation provided employment in the form of family labour and saved the labour requirement up to 40 per cent. This draw attention to the need of introduction of mechanizaion in jute cultivation, wherever possible.

Technology dissemination pathway

The increase in fibre yield due to adoption of the improved jute cultivation practices by the beneficiary (adopted) farmers resulted into dissemination of the technologies also at nearby villages in addition to the same village. Technology dissemination flow was found from adopted farmers of the same village to non-adopted farmers of the same and nearby villages within the radius of 3 to 7 km distance. Reason to attract non-adopted farmers of the nearby villages was due to obtaining more fibre yield, which ranged between 2.00 to 3.00 q ha⁻¹

(Table 4). It was the strength of the technology, which enabled to build up confidence among the farmers to boost up adoption of the demonstrated technologies. Thus, three technology dissemination pathways were recorded, which were: (i) from the Institute to adopted farmers and non-adopted farmers of the same village, (ii) from the adopted farmers to non-adopted farmers of the same village, and (iii) from the adopted farmers of the same village to non-adopted farmers of the nearby village.

It shows that farmers have observed the merits and demerits of production potentialities of all the technologies involved, while adopting them on their own fields. The difference in attitudes could also be attributed to the potentiality of FLD, an effective educational tool in the field of Extension. The FLD had very good impact on the farmers with respect to individual crop grown, package of practices followed and the approach of new technology adoption.

Table 4. Jute technologies dissemination through adopted farmers due to FLD impact

Sl.No.	FLD village	No. of contacted farmers	Distance from the village of adopted farmer	Reason of contact (Increased in fibre yield (q ha ⁻¹) than earlier stage)
1.	Koirapur	1 to 4	3 km	2.00
2.	Devok	1 to 4	2 km	3.00
3.	Iswarigachia	2 to 6	3 km	3.00
4.	Teghoria	1 to 4	3 km	2.00
5.	Masunda	2 to 3	4 km	2.00
6.	Geedah	1 to 12	7 km	3.00
7.	Kamarkandu-I	2 to 3	2 km	2.00
8.	Kamarkandu-II	2 to 3	2 km	3.00

CONCLUSION

The results show that the increase in fibre yield during post-demonstration period was by 4.45 q ha⁻¹, which provided advantage to the farmers by about Rs. 5570 per ha. This was possible due to use of high yielding jute variety with recommended seed rate, almost balanced fertilizer use and timely management practices as indicated in the demonstration package. The additional economic return play significant role in small and marginal farmers livelihood by helping them to meet expenditure on their festive needs, purchase of cloths food items and inputs for next crop cultivation. Technology dissemination flow was found adopted farmers of the same village to non-adopted farmers of the same and nearby village within radius of three to seven km distance. The advantage of FLD has been the increased creditibility of the institute as a source of information. The frontline demonstrations on promising technologies of jute need to be multiplied in different locations and agro-climatic areas of jute for its wider adoption. The non-adopted farmers should be included in various Extension programmes on jute to a possible extend.

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