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Spices and Jute Cultivation: Strategy for Poverty Alleviation in Char Land of Sirajganj District

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Abstract—*Spices + Jute + Fallow may be promising cropping pattern in char land. The benefit cost ratio (BCR) is a relative measure which is used to determine benefit per unit cost and helps farmers in decision making activities. A study was conducted in four upzilas viz. Kazipur, Sirajganj sadar, Belkuchi and Chouhali of Sirajganj district during 2017, to compare the cost and revenue of different spices and jute crops, using benefit cost ratio. Ten farmers of each upzila were randomly selected and primary data were collected through structural questionnaire. The data about different spices and jute, and their cost of returns were collected in farmers' field. The collected data were sorted, scrutinized and analyzed to achieve the study goal. Results revealed that the total cost of production in Chili, Onion, Garlic, Deshi and Tossa Jute was 202068, 137526, 162608, 145350 and 166,844 Tk./ha, respectively. Gross return of Chili, Onion, Garlic, Deshi and Tossa Jute was 340560, 276800, 326160, 149500 and 263200 Tk./ha, respectively. The BCR of Chili, Onion, Garlic, Deshi and Tossa Jute was1.69, 2.01, 2.01, 1.03 and 1.58, respectively. Among the spices, onion and garlic give higher BCR and Tossa Jute gives higher returns than Deshi Jute. Jute is eco-friendly, flood risk crop and needs no irrigation. Women of char dwellers may involve in crop cultivation and post harvest process.*

Keyword*: Chili, Onion, Garlic, Jute, Cost, Return, BCR.*

1. INTRODUCTION

Chili, Onion and Garlic are important spices in tropical and subtropical countries. These spices have high economic value for food, pharmacy, herbal remedy and agro-based industries. Different agro-industrial company have been established based on source of spices raw materials and their processing activities. Most of the spices are high value crop and get more returns of any other field crops. Spices gave almost 2-3 times higher net returns than other crops (Islam *et al*., 2011). It contains richest sources of anti-oxidant, vitamins which protect the cancer (Kannan *et al*., 2016). Moreover, aqueous extract of garlic reduces bad cholesterol from blood (August, 1977). Garlic acts as natural pesticides for controlling pests (Gosh and Abduahiman, 1985). In Bangladesh, north bangle (Rangpur, Bogra, Sirajganj and Pabna) is the major chili growing area, Pabna is the onion and Natore is the garlic growing area. Chili, Onion and Garlic occupied 92169 ha, 169613 ha and 57051 ha area, respectively; production is 122848 t, 1704402 t and 345725 t, respectively, followed by yield 1.33 t/ha, 10.05 t/ha and 6.06 t/ha, respectively (BBS, 2016). Production of Chili, Onion and Garlic are increasing day by day in Bangladesh (Islam *et al*., 2011; Haque *et al*., 2013). However, Jute is more profitable crop for the same time cultivates than other crops (Molla *et al*., 2015).

The soils of the char land are mostly sandy with poor water holding capacity having poor nutrient status. The nutrients *viz*. N, P, K, Zn, S and B were found below the critical level for crop production (Karim, 2016). The legume crops and jute can add naturally organic matter to soil during crop cultivation through leaf defoliation and root decomposition in the end of soil nutrient status enriches (Anon., 1996). Jute cultivation in char land could improve their soil nutrient status. However, jute cultivation has been drastically reduced due to labor shortage and market price of fiber in char land. Jute covered 672615 hector area, production 1363820 t and yield 2.03t/ha (BBS, 2016). The crop could be contributed huge employment, income generation, char livelihood, poverty alleviation and higher contribution to GDP (JDPC, 2006).

In Bangladesh, the char land occupied 0.82 million ha area covering Rangpur, Bogra, Sirajganj, Jamalpur, Mymensingh and Noakhali as well (Ahmed *et al*., 1987). The Sirajganj district contains 44000 ha char land inhabited four upzilas *viz*. Kazipur, Sirajganj sadar, Belkuch and Chouhali (Karim *et al*., 2017). The populations are living in char land their main occupation is agriculture. Boro rice is grown in low land, however, medium and high land are grown various crops *viz*. Chili, Onion, Garlic, Coriander, Mustard, Potato, Sweet potato, Pulses, Sesame, Joar, China, Kaon, Jute, Maize, Vegetables and Banana etc. These crops are cultivated round the year in char land of Sirajganj district and followed different cropping patterns. Spices –Jute - Fallow is one of most the important cropping pattern in this district (Table 1).

However, up to now my knowledge there is no study on benefit cost ratio and cost of production of spices and jute cropping patterns in Sirajganj district. The present study was undertaken to determine the benefit cost ratio and cost of production of spices and jute cropping patterns in Sirajganj district.

2. MATERIALS AND METHODS

The study was conducted during 2017 in the Sirajganj district. The Sirajganj district consists of nine upzilas and study area was only four upzilas (Kazipur, Sadar, Belkuchi and Chouhali). Ten farmers of each upzilas were randomly selected and primary data was personally collected from the respondents through structural questionnaire. The data about different spices (Chili, Onion and Garlic) crops and Jute (Deshi and Tossa) and their cost and returns were collected in farmers' level. The collected data were then sorted, scrutinized and analyzed to achieve the goal set for the study. The bi-product price of Onion and Garlic had no contributed, however, Tossa and Deshi Jute had contributed a large amount of price through bi-product selling the young leaf of Deshi Jute fulfill a great demand of vegetables (7500 Tk./ha). Farmer perches their inputs from the local market - the price of Chili (dry chili), Onion (bulb), Garlic (bulb), Deshi and Tossa jute seed @ 300, 50, 120, 120 and 250 Tk./kg, respectively; Urea fertilizer @ 16 Tk/kg, TSP @ 22 Tk/kg, MoP @ 15 Tk/kg. On the other hand, Chili (dry chili), Onion (bulb), Garlic (bulb), Deshi and Tossa Jute fiber sale @ 170, 40, 60, 35 and 40 Tk/kg, respectively, however, stick of jute sale @ 5 Tk/kg in local market. The average, total cost, return etc. were statistically measured to determine the economic performance of spices (Chili, Onion and Garlic) crops and fiber crops (Deshi and Tossa Jute) production. Cobb-Douglas production function model was followed to determine the estimate the contribution of factors to spices and Jute cultivation. All analyses data were presented in tabular form. The benefit cost ratio (BCR) is a relative measure which is used to determine benefit per unit cost. Benefit cost ratio is the proportion of net return (benefit) and total cost of production (Dillon and Hardaker, 1993).

Production Cost (Tk./kg) = (Total Cost of cultivation– Price of by product) ÷ Total Crop Production

Benefit cost ratio = Gross return ÷ Total cost

3. RESULTS AND DISCUSSION

The highest cost was observed in Garlic seed (50000 Tk./ha) and the lowest (741 Tk./ha) in Jute seed purpose (Table 2). Fertilizer requirement was the highest in onion production (19496 Tk./ha) and the lowest in Deshi Jute (4114 Tk./ha). It revealed that onion uptake high amount of nutrients for its growth and development. The pest management was highly needed in Chili cultivation (3000 Tk./ha) compare to least needed for Deshi Jute cultivation (1853 Tk./ha). The highest hire labor cost requirement needed in Chili cultivation (133437 Tk./ha) followed by Tossa Jute (111198 Tk./ha), Deshi Jute (94518 Tk./ha), Onion (66718 Tk./ha) and Garlic (51151 Tk./ha) (Table 2). The total cost of production was the highest in Chili (202068 Tk./ha) followed by Tossa Jute (166844 Tk./ha), Garlic (162607 Tk./ha), Deshi Jute (145350 Tk./ha) and Onion (137526 Tk./ha) (Table 2). The result showed that the highest cost was labor purpose (72% of total cost) in Tossa Jute cultivation followed by Deshi Jute (71% of total cost), Chili (68% of total cost), Onion (52% of total cost) and Garlic (34% of total cost). However, among the spices and Jute crops, the highest cost of production in Garlic (31% of total cost) for seed purpose. Haque *et al*. (2011) reported that total cost of production of Onion was 93517 Tk./ha and Islam *et al*. (2011) also reported that total cost of production of Chili was 155009 Tk./ha, Garlic 218150 Tk./ha. However, Islam *et al*. (2015) stated that total Garlic production was 201000 Tk./ha and Miah and Rashid (2015) found that total cost of production of Chili was 71524 Tk./ha, Onion was 126271 Tk./ha and Jute was 45792 Tk./ha. Molla *et al*. (2015) observed that total cost of production of Jute was 74789 Tk./ha.

The highest gross returns obtained from Chili (340560 Tk./ha), followed by Garlic (326160 Tk./ha), Onion (276800 Tk./ha), Tossa Jute (263200 Tk./ha) and Deshi Jute (149500 Tk./ha) (Table 3). However, the highest bi-product price obtained from Tossa Jute stick (112800 Tk./ha), followed by Deshi Jute stick (72500 Tk./ha) and Chili (3960 Tk./ha) and no add bi-product price of Onion and Garlic. It was observed that Jute stick price was so much higher than other bi-product price. It is happened due to stick price of 5 Tk./kg and also add seedling price as vegetables of Deshi Jute. The net returns was the highest in Onion (139274 Tk./ha) and the lowest in Deshi Jute (4150 Tk./ha). Cost of production was the highest in Chili (105.05 TK./kg) and the lowest in Tossa Jute (14.37 Tk./kg). It is happened due to high returns of Tossa Jute stick price. The benefit cost ratio (BCR) value was the highest both in Onion (2.01) and Garlic (2.01) followed by Chili (1.69), Tossa Jute (1.58), and Deshi Jute (1.03) (Table 3). Haque *et al*. (2011) reported that bulb yield of Onion was 9.87 t/ha, total gross returns of Onion was 173004 Tk./ha, net returns 79487 Tk./ha, per kilogram production cost 9 Tk./kg and BCR was 1.85. Islam *et al*. (2011) also reported that yield of Chili was 1.8 t/ha, gross returns of Chili was 324869 Tk./ha, net returns 169860 Tk./kg and BCR was 2.09; yield of Garlic was 4.4 t/ha, gross returns of Garlic 461152 Tk./ha, net returns 243002 Tk./ha and BCR was 2.11. Moreover, Islam *et al*. (2015) stated that yield of Garlic was 8.21 t/ha, gross returns of Garlic production was 369450 Tk./ha, net returns 168450 Tk./ha and BCR was 0.83. Miah and Rashid (2015) found that yield of Chili was 1.95 t/ha, gross returns of Chili was 136157 Tk./ha, net returns 64633 Tk./ha and BCR was 1.90 and yield of Onion was 10.51 t/ha, gross returns of Onion was 17066 Tk./ha, net returns 45795 Tk./ha and BCR was 1.36. They also reported that yield of Jute was 2.05 t/ha, gross returns of Jute was 73643 Tk./ha, net returns 27851 Tk./ha and BCR was

1.61. Molla *et al.* (2015) observed that fiber yield of Jute was 2.3 t/ha, gross returns of Jute was 114664 Tk./ha, net returns 39875 Tk./ha and BCR was 1.53. Islam and Ali (2017) reported that 2004-05 financial year jute was cultivated 3.88 lakh hector of land with production of 10.35 lakh tons fiber and 16.72 lakh tons jute sticks produced. Dey and Haq (2009) reported that groundnut + spices (onion/garlic) + jute + T. Aman cropping pattern is more profitable after than cabbage + tomato + Aus + T. Aman cropping patterns.

4. CONCLUSION

Spices and jute cultivation is profitable for the farmers of char land. Jute is eco-friendly crop and its bi-product can be used as fuel, fencing and industrial purposes. The crop enriches soil organic matter through leaves defoliation. Consequently, spices-jute-fallow is promising cropping pattern for char land and may eliminates poverty in that areas.

REFERENCES

[1] Anonymous. Annual Report, Bangladesh Jute Research Institute Manik. Mia Avenue, Dhaka-1207. Bangladesh, 1996: pp. 274-276.

[2] Bangladesh Buru of Statistics (BBS). Bangladesh Bureau of Statistics, Statistical Year book of Bangladesh, Statistics Division, Ministry of Planning, GOB, 2016.

[3] Dey NC and Haq F. Study of the impact of intensive cropping on the long turn degradation of natural resources in some selected agro-ecological regions of Bangladesh. Center for agri-research and sustainable environment and entrepreneurship development (CASEED), 2009: p. 29.

[4] Dillon JL and Hardaker JB. Farm management research for small farm development. Food and Agriculture Organization of United Nations, Rome, Italy, 1993.

[5] Haque MA, Miah MAM, Hossain MS, Luna AN and Rahman KS. Profitability of garlic (*Alium sativum* L.) cultivation in some selected areas of Bangladesh. Bangladesh J Agril Res, 2013; 38: 589-598.

[6] Haque MA, Miah MAM, Hossain MS, Rahman MS and Moniruzzaman. Profitability of onion cultivation in some selected areas of Bangladesh. Bangladesh J Agril Res, 2011; 36: 427-435.

[7] Islam MA, Alam MR, Maniruzzaman M, Islam MS, Molla MSH, Begum MA, Sarkar D and Karim MR. Evaluation of some advanced garlic lines against premature sprouting under zero tillage mulched condition. Intl J Natur and Soc Sci, 2015; 2: 90-95.

[8] Islam MM and Ali MS. Economic importance of jute in Bangladesh: Production, research achievements and diversification. Intl J of Econ Theory and Appli, 2017; 4: 45-57.

[9] Islam MS, Rahman KMM and Hasan MK. Profitability and resource use efficiency of producing major spices in Bangladesh. Bangladesh J Agric Econ, 2011; 34: 1-13.

[10] Jute Jiversification Promotion Center (JDPC). Jute diversification promotion center, Ministry of Textiles and Jute, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh, 2006.

[11] Karim MA. Char land agriculture in northern Bangladesh. Krishi Gobeshona Foundation, BARC Complex, Farmgate, Dhaka, 2016; pp. 1-19.

[12] Molla MMU, Sabur SA and Begum IA. Financial and economic profitability of jute in Bangladesh: A comparative assessment. The J Agri and Natural Resour Sci, 2015; 2: 295-303.

Table 1: Major Cropping patterns in Sirajganj district

Sl. No.	Cropping pattern	Area (ha)	%
1	Mustard – Boro—T. Aman	40900	22
2	Boro – T. Aman - Fallow	27500	15
3	Mustard – Boro -Fallow	14425	8
4	Boro – Fallow - Fallow	12600	7
5	Boro – Fallow – T. Aman	13500	7
6	Maize – Dhaicha - Fallow	8500	5
7	Mush Kalai – Boro - Fallow	7900	4
8	Spices/Chili- Jute - Fallow	5800	3
9	Kheshari/Musur – Til - Fallow	6200	3
10	Boro – Aus - Fallow	5000	3
11	Wheat – Jute – T, Aman	4800	3
12	Vegetables – Boro -Fallow	3000	2
13	Groundnut – Fallow - Fallow	4000	2
14	Boro – Jute – T. Aman	4500	2
15	Others	23575	14
Total		182200	100

Table 2: Input use and cost (Tk./ha) of different spices and jute crops

Item (Tk./ha)	Chili	Onion	Garlic	Deshi Jute	Tossa Jute
Seed	2224	9884	50000	741	1482
Fertilizer	11453	19496	18187	4114	7190
Pesticides	3000	2224	2224	1853	2224
Labor (Family)	5559	3336	4449	5559	5559
Labor (Hire)	133437	66718	51151	94518	111198
Plowing	14826	9884	9884	19768	19768
Irrigation	11120	7415	7413	0	0
Bank Interest(@ Tk. 9%,4 month)	5449	3569	4300	3797	4423
Land Charge	15000	15000	15000	15000	15000
Total cost	202068	137526	162608	145350	166844
Labor cost (% of Total cost)	68	52	34	71	72

Table 3: Cost and retunes per hector of different spices and jute crops

Item	Chili	Onion	Garlic	Deshi Jute	Tossa Jute
Total Production (kg)	1980	6920	5436	2200	3760
Bi-product production (kg)	1980	0	0	13000	22560
Price of Crop (Tk.)	336600	276800	326160	77000	150400
Price of Bi-product (TK.)	3960	0	0	72500	112800
Gross Returns (Tk.)	340560	276800	326160	149500	263200
Net Returns (Tk.)	138492	139274	163552	4150	96356
Production Cost (Tk./kg)	100.05	19.87	29.91	33.11	14.37
Benefit Cost Ratio (BCR)	1.69	2.01	2.01	1.03	1.58