

## PROFITABILITY AND ADOPTION STATUS OF BARI LALSHAK-1 IN SELECTED AREAS OF BANGLADESH

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### ABSTRACT

The study was conducted in Jessore, Rangpur and Kushtia districts during 2007-2008 to know the profitability and adoption status of BARI Lalshak-1. The average yield of vegetable and seed were found 4746 and 261 kg/ha respectively. Gross return was found Tk 34,277 /ha. The cost of production was Tk 17,016 and Tk. 10,493 per hectare for total cost and cash cost basis respectively. As a result, the gross margin was calculated Tk. 17,261 and Tk. 23,784 per hectare respectively for total cost and cash cost basis. Benefit cost ratio were 2.01 and 3.27 as well as returns to labour were Tk. 157 and Tk 410 per man-day for both the cost basis. Therefore it was profitable crop to the farmers. The average adoption status was found 43%. Unavailable seed in the market and low market price of vegetables were found major problem in production of BARI Lalshak-1

*Key words:* Lalshak, Adoption, vegetables, profit

### INTRODUCTION

In Bangladesh, more than 60 types of indigenous and exotic origin vegetables are grown. Farmers are producing lot of vegetables but still it is found that per capita consumption of vegetables in Bangladesh is only 53 gm/day which is far below from the daily requirement of 200 gm/head (Rashid. M. M. 1999). Today the attempts are moving towards the utilization of more vegetables to improve diets, save the environment and ultimately promote the welfare of human being. AVRDC plan was to evaluate the nutritional value and their potentials to diversity productions a part of it's strategic plan to focus on vegetable for poverty alleviation and healthy diets. It is fact that leafy vegetables are rich source of vegetable and minerals.

Amaranth is one of the leafy vegetables often relied upon as a cheap and affordable source of protein and vitamins to combat the menace of malnutrition. Amaranth is considered as one of the most important green leafy vegetables of the tropics, because it provides minerals and vitamins (especially vitamin A) in the diets of many developing countries. Red amaranth is the most important vegetable for it's nutritional value. It is full of protein 5.3 g, fat 0.1 g, starch 5g, calcium 350 mg, iron 10 gm, carotene 7800 mg, vitamin A 0.07 mg, vitamin B 0.24 mg, vitamin C 27 mg per 100 gm weight of red amaranth (Rahman, 1982). However, Horticultural research center of BARI has developed some varieties of leafy vegetables, which have been disseminated in the farmers' fields through different agencies. Among the leafy vegetables, BARI Lalshak-1 is one of them which released in the year 1996. It can be grown through the year. Farmers are replacing local varieties with improve varieties of vegetables. But still it's economic profitability and adoption status have not been evaluated. These should be evaluated for the improvement of the vegetable production. The objectives of the study were

1. To examine the socio-economic characters of the BARI Lalshak-1 producer;

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2. To estimate the profitability of the BARI Lalshak-1 production;
3. To analyze the adoption status of BARI Lalshak-1 in the farmers fields and
4. To identify the problems of it's production.

## MATERIALS AND METHODS

The study was conducted in Sadar upazilla of Jessore district, Pirganj upazilla of Rangpur district and Sadar upazilla of Kushtia district where farmers were extensively cultivated BARI Lalshak-1. A total of 75 farmers taking 25 from each area were selected purposively for the study. The data were collected by survey method with the help of pre-designed and pre-tested interview schedules by the field investigators in collaboration with local field staff under direct supervision of the researchers. Tabular method of analysis was followed to achieve the objectives.

## RESULTS AND DISCUSSION

### **Age, education and profession of the sampled farmers**

Average of the sampled farmers of the study areas were 41 years and it was highest in (43 years) Rangpur and lowest (39 years) in Jessore. Age of sampled farmers was classified in to three groups that were up to 30 years, above 30 years to 50 years and above 50 years (Pandey, 1989). The first, second and third groups were defined young middle and old age group respectively. In all age groups, first, second and third groups were found 19%, 69% and 12% respectively (Table 1).

On an average, 25% farmers were found illiterate and 75% were literate in which 43% were in primary level, 23% were in secondary level, and 14% were in above secondary level. The literary rate of Kushtia was higher (84%) than that of Jessore (68%) and Rangpur (72%) (Table 1).

Majority of the sample farmers profession were agriculture (90%) followed by business (6%) and others (4%). Other professions were included fisherman and day labour etc. The experience in agriculture and vegetable production of sampled farmers were found 22 and 14 years respectively. It was observed that 41% of the sampled farmers received training and 59% farmers did not receive any training (Table 1).

### **Land use patterns**

The average net cultivated area was found 1.14 ha/farm and it was highest in Rangpur and lowest in Jessore. Total owned land was also found 1.12 ha/farm. Vegetable area of the sampled farmers were found 0.24 ha/farm in which 0.10 ha/farm were BARI Lalshak-1 area (10% of own cultivable land). Land ownership of the sampled farmers was higher in Rangpur followed by Kushtia and Jessore on all the categories with slight variation in vegetable and BARI Lalshak-1 area (Table 2).

### **Input use**

In producing BARI Lalshak-1, inputs were human labour, animal power, power tiller seed, cow dung, fertilizer, insecticide and irrigation. Human labour was involved in land preparation, sowing, thinning, weeding, spraying, irrigation, harvesting, threshing the seed. On an average, human labour were required 176 man-days/ha in which 116 man-days/ha were family supplied and 60 man-days/ha were hired. The farmers of Rangpur used higher (212 man-day/ha) labour than that of Jessore (127 man-day/ha) and Kushtia (189 man-day/ha) due to more labour involved in seed production (Table 3).

Table 1. Age, education, profession of the sample farmers of the study areas

Items	Jessore	Rangpur	Kushtia	All areas
1. Farmers age (year)	39	43	40	41
2. Age group (%)				
Young age (up to 30 years)	28	4	24	19
Middle age (above 30-50 years)	60	88	60	69
Old age (above 50 years)	12	8	16	12
3. Education (%)				
Illiterate	32	28	16	25
Primary	36	28	64	43
Secondary	24	24	20	23
Above secondary	8	20		14
4. Profession				
Agriculture	86	91	93	90
Business	10	5	4	6
Others	4	4	3	4
5. Experience in agriculture (years)	21	22	22	22
6. Experience in vegetable production (years)	15	15	13	14
7. Training (%)				
Receiver	36	40	48	41
Non-receiver	64	60	52	59

Table 2. Land ownership of sample farmers of the study areas

Land category	Jessore	Rangpur	Kushtia	All areas
Own cultivable area	0.52	1.35	1.15	1.00
Homestead	0.07	0.10	0.09	0.08
Rented in	0.12	0.14	0.12	0.13
Mortgaged in	0.09	0.04	0.12	0.08
Rented out	0.03	0.05	0.03	0.03
Mortgaged out	0.04	0.03	0.07	0.05
Fellow	0.02	0	0.04	0.02
Others	0.04	0.04	0.02	0.03
Net cultivated area	0.68	1.45	1.3	1.14
Total own area	0.62	1.48	1.26	1.12
Vegetable area	0.24	0.28	0.22	0.24
BARI Lalshak-1	0.1 (19%)	0.15 (11%)	0.05 (4%)	0.10 (10%)

Note: Bracketed figure represents the percentage of own cultivated area

Table 3. Input use for the cultivation of BARI Lalshak-1

Items	Jessore	Rangpur	Kushtia	All areas
Human labour (Man-day/ha):				
Family	88	128	133	116
Hired	39	84	56	60
Total	127	212	189	176
Animal power (Pair-day/ha):				
Family	10	26	0	12
Hired	20	8	0	9
Total	31	34	0	21
Seed (kg/ha):				
Owned	0.51	1.03	2.10	1.21
Purchased	3.02	3.41	3.38	3.27
Total	3.53	4.44	5.47	4.48
Cowdung (kg/ha):				
Owned	2550	270	1061	1293
Purchased	747	16	1848	870
Total	3297	286	2908	2164
Fertilizer (kg/ha):				
Urea	92	158	186	146
TSP	77	111	82	90
MP	19	76	60	52

Farmers used both animal power and power tiller for land preparation. The average number of animal power were used 21 pair-day/ha out of which 12 pair-day/ha family supplied and 9 pair-day/ha were hired. In Kushtia, farmers used power tiller instead of animal power for land preparation. The average seed rate was 4.48 kg/ha while it was 3.53, 4.44 and 5.47 kg/ha for Jessore, Rangpur and Kushtia respectively.

Sampled farmers in the study areas, used 2164 kg of cowdung per hectare, while the quantities were 3297, 286 and 2908 kg/ha for Jessore, Rangpur and Kushtia farmers respectively. In Rangpur, the use of cowdung was found to be very low due to unavailability of cowdung. The use of Urea, TSP and MP were 146, 90 and 52 kg/ha respectively. The farmers of Kushtia used higher doses of Urea (186 kg/ha) compared to other areas (158 kg/ha in Rangpur and 92 kg/ha in Jessore). In Rangpur area, the farmers used higher doses TSP (111 kg/ha) and MP (76 kg/ha) followed by farmers of Kushtia (82 kg/ha TSP and 60 kg/ha MP), and farmers of Jessore (77 kg/ha TSP and 19 kg/ha MP). The farmers of Jessore used less doses of fertilizer due to more utilization of cowdung (Table 3).

### Cost of production

Cost of production was calculated on total cost and cash cost basis. Cost of production of BARI Lalshak-1 was found Tk 17,016 and Tk 10,493 per hectare for total cost and cash cost basis respectively. The major share in gross cost was human labour (47%) followed by fertilizer (15%) and irrigation (11%). The cost of production of Kushtia was higher than that of Rangpur in both total and cash cost basis due to higher to higher unit price of labour, power tiller and seed (Table 4).

### Return from BARI Lalshak-1 production.

On an average, the yield of vegetables and seed were found 4746 and 261 kg/ha respectively. Farmers in Rangpur cultivated BARI Lalshak-1 as both vegetable (2291 kg/ha) and seed (755 kg/ha) purpose. Their main target was seed production. In Jessore, majority farmers cultivated BARI Lalshak-1 for

vegetable (5714 kg/ha) and some farmers cultivated it for seed (27 kg/ha) production. But in Kushtia all farmers cultivated it only for vegetables (6234 kg/ha) production (Table 5).

Table 4. Cost of production of BARI Lalshak-1

Items	(In Taka)				Percent
	Jessore	Rangpur	Kushtia	All areas	
Human labour					
Family	3727	5269	6631	5209	
Hired	1626	3573	2813	2671	
Total	5353	8842	9445	7880	47
Animal power					
Family	359	1028	0	462	
Hired	811	318	0	376	
Total	1170	1346	0	839	5
Power Tiller	666	158	2619	1148	7
Seed					
Owned	94	103	419	205	
Purchased	597	512	651	586	
Total	691	615	1070	792	5
Cowdung					
Owned	1275	135	530	647	
Purchased	374	8	924	435	
Total	1649	143	1454	1082	6
Fertilizer					
Urea	555	950	1116	874	
TSP	928	1453	1147	1176	
MP	187	705	541	478	
Total	1670	3109	2804	2528	15
Insecticide	522	692	0	405	2
Irrigation	1911	1252	2522	1895	11
Interest on oper. Capital @8%	106	125	160	131	2
Gross cost					
Total cost basis	13739	16281	20074	17016	100
Cash cost basis	8178	9621	12333	10493	

The average gross return was found Tk 34,277 /ha and the farmers from Jessore, Rangpur and Kushtia were Tk 29,933, Tk 39,227 and Tk 33,672 per hectare respectively. The gross return of Rangpur was found higher compare to Jessore and Kushtia area due to higher seed return (Table 5).

As a result, the gross margin was calculated Tk 17,261 and Tk 23,784 per hectare for total cost and cash cost basis respectively. The gross margin was also higher in Rangpur area than that of Jessore and Kushtia area (Table 5). Benefit cost ratio was found 2.01 and 3.27 for total and cash cost basis respectively, which were very remunerative to the farmers. The benefit cost ratio of Rangpur was found higher (2.58 and 8.13) followed by Jessore (2.12 and 4.37) and Kushtia (1.75 and 3.51) on total cost and cash cost basis respectively.

Returns to labour was Tk 157/man-day and Tk 410/man-day for full cost and cash cost basis respectively which was much higher than daily wage rate of Tk 50. Returns to labour in Jessore in total cost basis was higher compare to Rangpur and Kushtia. In cash cost it was found that returns to labour in Kushtia was higher followed by Rangpur and Jessore (Table 5).

Table 5. Returns from production of BARI Lalshak-1

Items	Jessore	Rangpur	Kushtia	All areas
Yield (kg/ha):				
Vegetable	5714	2291	6234	4746
Seed	27	755	0	261
Gross Return (Tk/ha):				
Return from vegetable	28954	9326	33672	23984
Return from seed	978	29901	0	10293
Total	29933	39227	33672	34277
Gross Cost (Tk/ha):				
Full cost basis	13739	16281	20074	17016
Cash cost basis	8178	9621	12333	10493
Gross Margin (Tk/ha):				
Full cost basis	16194	22946	13598	17261
Cash cost basis	21754	29606	21339	23784
Benefit Cost Ratio (BCR):				
Full cost basis	2.12	2.58	1.75	2.01
Cash cost basis	4.37	8.13	3.51	3.27
Returns to Labour (Tk/man-day):				
Full cost basis	175	160	134	157
Cash cost basis	127	499	605	410

### Adoption status

The percentage of adopter and non-adopter of BARI Lalshak-1 was found 43% and 57% respectively. Most of the non-adopters cultivated “Altapeti” variety. It was observed that the level of adoption was highest in Rangpur (58%) followed by Jessore (53%) and Kushtia (18%). The reason of low adoption in Kushtia was less demonstration of BARI Lalshak-1 (Table 6).

Although the adopters cultivated BARI Lalshak-1, they did not know the name of BARI Lalshak-1 which is released by BARI. 40% of the farmers knew the name of BARI Lalshak-1 and rest of them (60%) did not know it. They knew it as R.M, Dholla of Barisal etc. the adoption status was higher in Rangpur due to the involvement of Grameen Krishi Foundation. (GKF). Adopters got inspiration to cultivate BARI Lalshak-1 from GO and NGO field workers (53%) and neighboring farmers (47%) (Table 6).

Both adopters and non-adopters were asked about the reason of adoption and non-adoption of BARI Lalshak-1. They mentioned more than one answer about the reason. The reasons were more profitable (100%), higher yield compare to other variety (91%), proper utilization of turn around period (83%) and higher yield of seed (54%). Non-adopters were classified in to two groups. First group, some farmers knew the variety and produce it previously and rest of them knew the name but did not cultivate it. Second group, farmers did know the variety name at all. The percentages of first and second group were 19% and 81% respectively. The farmers of first group did not cultivate now due to

Table 6. Adoption status of BARI Lalshak-1

Particulars	Per cent of Respondent			
	Jessore	Rangpur	Kushtia	All areas
<b>Adoption level</b>				
Adopter	53	58	18	43
Non-adopter	47	42	82	57
Total	100	100	100	100
<b>Adopter by variety name</b>				
Known	17	72	32	40
Unknown	83	28	86	60
Total	100	100	100	100
<b>Source of inspiration for adoption</b>				
GO & NGO field worker	32	84	44	53
Neighbourer	68	16	56	47
Total	100	100	100	100

low consumer demand of BARI Lalshak-1 in the market for its less red colour (100%), low market price (95%) and unavailability of seed in the market named as BARI Lalshak-1 (77%). The second group mentioned that they did not know the variety name from anybody as well as saw it in any farmer's field and demonstration fields (Table 7).

#### Problems of BARI Lalshak-1 production

There were many problem in BARI Lalshak-1 production. These were ranked according to the priority. The first ranked problem was unavailability of seed followed by low market price of vegetables, low market demand due to less red colour, high price of seed, lack of good quality of seeds and low price of selling seed (Table 8).

Table 7. Reasons of adoption and non-adoption of BARI Lalshak-1

Reasons	Jessore	Rangpur	Kushtia	All areas
<b>Adopter:</b>				
Higher yield of vegetables	80	94	100	91
More profitable	100	100	100	100
Higher yield of seed	20	87		54
Proper utilization of turn around period	88	84	78	83
<b>Non-adopter:</b>				
i) Knew the variety	12	26	18	19
Low demand in the market	100	100	100	100
Low price of vegetable	95	93	96	95
Unavailable seed in the market	78	69	83	77
ii) Didn't know the variety	88	74	82	81
Didn't hear or see the variety	92	96	94	94

Table 8. Problems of producing BARI Lalshak-1

Problems	Percentage of respondents				Rank
	Jessore	Rangpur	Kushtia	All areas	
Low market demand	88	90	92	90	3
Low price of vegetable	92	96	95	94	2
Low price of selling seed	60	97		79	6
Lack of good quality of seed	76	84	90	83	5
Unavailability of seed	97	98	92	96	1
High price of seed	90	86	89	88	4

### CONCLUSION

BARI Lalshak-1 was found profitable in respect of cost and return and it was very remunerative to the farmers. The average adoption status was found 43% but it was not satisfactory in some district where GO and NGO were not involved. Adoption status would be satisfactory if the seed supply be available in the market as well as demonstration would be continuous to the farmers and ensuring marketing facilities.

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