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PRODUCTIVITY AND PROFITABILITY OF LOCAL CULTIVAR OF BRINJAL AND CHILLI IN CHATTOGRAM DISTRICT

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Abstract

The study was carried out in nine villages covering 110 farmers of *Potha Begun* and *Halda Morich* under Hathazari Upazila in Chattogram district to examine the productivity, profitability and perceptions to those cultivars. Results revealed that farmers used excessive fertilizer doses in both crops. The yield was recorded at 43.62 tons/ha for *Potha Begun* where the harvested yield loss was estimated at 7.29% due to infestation of pests and diseases. The yield of *Halda Morich* was found to be 7.94 tons/ha as green Chilli and 1.98 tons/ha as dried Chilli. The per kilogram average farm-gate price of *Potha Begun* was Tk.30.19, green Chilli Tk.42.8, and dried Chilli Tk.310.88. The gross margin was calculated Tk.848468 for *Potha Begun* and Tk.294628 for dried Chilli, and Tk.18,850 for green Chilli. The BCR was found to be 2.81 for *Potha Begun* and 1.92 for dried Chilli. The per kg cost of production was calculated Tk.15.32 for *Potha Begun*, Tk.45.63 for green Chilli, and Tk.182.9 for dried Chilli. Regular training of farmers on fertilizer and pest and disease management will increase its productivity.

Keywords: Local cultivar's, Brinjal, Chilli, Productivity, Profitability, Chattogram.

1. Introduction

Brinjal is one of the most important vegetables in Bangladesh. It has all kinds of nutritional values. It is a combination of Vitamin A, C, E, and Iron. It is also a powerful antioxidant. Having a lot of iron, it helps to eliminate anemia. Vitamin A provides nutrition to the eyes and works against all eye diseases. Brinjal also contains a lot of calcium and magnesium which is very beneficial for teeth and bones, a lot of dietary fiber which helps in digestion of food and helps in relieving constipation. Brinjal is good for those who have high levels of bad cholesterol in their blood. However, for those who have arthritis, or asthma and allergies, there are some restrictions on purple.

Brinjal is cultivated in 34973 hectares of land in Bangladesh producing 530610 metric tons of fresh brinjal (BBS, 2020). Brinjal is cultivated in 5983 hectares of land in Chittagong division which is 17.1 percent of the total land under brinjal cultivation of the country. On the other hand, the total brinjal production in

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Chittagong division is 46016 metric tons which is 0.86 percent of the total brinjal production in the country. There are 180 types of brinjal cultivars in the country. From these cultivators, scientists collect and develop new varieties through selection process. In many cases hybridization is also required. Bangladesh Agricultural Research Institute (BARI) has so far developed 22 high yielding varieties of brinjal including 4 Bt brinjals.

The local cultivar of brinjal called Potha Begun is very popular in Hathazari. Its price is higher than other brinjals available in the locality due to its higher demand. The production potential of Potha Begun is also high which leads higher farm income. The price of Potha begun in the market varied from Tk.40/kg to about more than Tk.100/kg with an average price is about Tk.70/kg. This is undoubtedly a potentially lucrative cash crop. Such a profitable crop should be brought into the mainstream of research. The yield of this cultivar is close to the yield of brinjal variety developed by BARI. There is a research need to develop improved management practices of this brinjal cultivar. The study will provide necessary information for carry out such research.

On the other hand, Chilli is one of the most important spice crops in Bangladesh, has many nutritional values. Green chillies are rich in antioxidants and protect against fever, cold and cough etc., and increase immunity. According to doctors, there is use of raw pepper as medicine for many ailments. Raw peppers contain adequate amounts of vitamin A and C. Raw peppers lower blood cholesterol, protect the gums and hair, and help keep bones, teeth, and mucous membranes healthy. And among the favorite food, many Bengalis can think of fried dried chillies or red chillies. Vitamin E in chillies works to reduce pain. The phytonutrients in red chilli work to prevent colon cancer and breast cancer. As red chillies contain sufficient amount of vitamin A, it also helps in increasing eyesight.

Many farmers in Bangladesh make a living by producing only chilli. Bangladesh Agricultural Research Institute (BARI) has so far developed four high yielding varieties of pepper. All those varieties are being cultivated along with the local cultivars of the country. However, extensive expansion of varieties is required. Chilli was planted in a area of 96804 hectare during 2018-19, with a total production of 149473 metric tons (BBS, 2020). Of this, 19535 metric tons was produced in 16695 hectare of land in Chittagong Division which is 17.2 percent and 13 percent of the total area and production respectively. The national average yield of chilli is 1.544 tons/ha. Average yield of chilli in Chattogram is 1.65 ton/ha which is slightly higher than the national average yield.

Locals have named it Halda Chili because it is widely cultivated in the Halda river basin of Hathazari Upazila in Chattogram. It is also known as Hathazari chilli. The distinct features of this chilli is that it is less salty, the taste increases when the curry is cooked, it has a sweet taste, the color of the curry is reddish and attractive, disease infestation is less, yield is higher, the demand is higher and therefore the

price is higher. This chilli is mostly sold by the farmers as dried chilli. These chillies can be stored in polythene bags at normal temperature for 2/3 years. Due to these reasons, the farmers are more interested in cultivating this chilli.

It is widely cultivated in Mandakini, Chipatli, Nangalmora, Gumanmardan, Garduara, Mohammadpur, Alampur, Chandrapur and Charia of Hathazari Upazila. It is known that about one thousand farmers in the upazila cultivate this chilli in 250 hectares of land every season. Despite the high quality of this chilli, it has not yet been recognized as an improved variety by any research institute. This is undoubtedly a potentially lucrative high-value cash crop. Such a lucrative crop should be brought into the mainstream of research. Giving it more advanced management through research will increase productivity. This will increase the income of the farmer manifold. There is a research need to develop improve management practices of this chilli cultivar. The study will provide necessary information for carry out such research.

The specific objectives of the study were to estimate the input use, productivity, and profitability of brinjal and chilli cultivars; to know the farmers and consumers perceptions for cultivating those cultivars; and to derive policy implications.

2. Materials and Methods

Selection of study areas: A multi-stage sampling technique was followed to select the study area. In the first stage, the Chattogram district was selected purposively to address the local cultivars scenario in the district. In the second stage, one Upazilas were selected purposively as there one wide area of local Chilli and Brinjal cultivation. In the third stage, nine villages were selected purposively from the Upazila for data collection. Based on the availability of local cultivars, specific locations were selected in consultation with Upazila Agriculture Officer (UAO), Sub-Assistant Agriculture Officer (SAAO), local progressive farmers, and local leaders in the respective area. Five villages namely Alipur, Pacchim Dewan Nagor, Maddom Pahartoli, Chandrapur and Maddom Mirer Khil were selected purposively from Hathazari Upazilas for local cultivar of brinjal (*Potha Begun*). On the other hand, four villages namely Dakkin Naggolmora, Uttar Mekhol, Mojafforpur, Chipatali, and Kazirkhil were purposively selected from the same Upazila for the local cultivar of Chilli (*Halda Morich*).

Sampling techniques: There is no safe general rule as to how large sample size must be for the use of normal approximation in computing the confidence limit (Cochran, 1999). When the population size is known and the researchers are careful of the heterogeneity problem, any number (equal to or) greater than the statistically large sample (of 30 sample units) may be appropriate (Freund and Williams (1983). A proportionate random sampling technique was adopted for selecting the sample size for each crop. In this process, a sampling frame was constructed by 100 growers for each crop. After that, the proportionate sampling was done equally for the two crops.

By applying this technique, due to resource limitations, a total of 110 sample households were selected for the study. Uddin et al. (2010) followed the same sampling procedures for their study.

Data collection procedure: Both primary and secondary data were used in this study. Secondary data and information were collected through reviewing related literature, relevant documents/reports, BBS, and the internet. Primary data were collected from sample households using a semi-structured questionnaire. Five experienced Sub-Assistant Agriculture Officers and Scientific Assistants from each location were engaged for data collection. Before starting data collection, a discussion meeting on the questionnaire was held among data collectors. The data collection period was from March to May 2021. Researcher himself monitored the data collection and cross-checked the collected data at the field level.

Analytical techniques: Descriptive statistics such as mean, standard deviation, percentage were used to analyze the primary data. The mean comparison and significance test were done by One-Way ANOVA using SPSS. In the ANOVA technique, the F-value was used to judge whether there is a significant difference or not among the locations and samples. The productivity was measured by the average yield of both crops and multiplied by average farm-gate price. Profitability of crop production was analyzed based on gross return, gross margin, and benefit-cost ratio. Land use cost was calculated based on the per hectare value of leased land for four months.

Gross return, $GR_{ij} = Y_{ij}P_{ij}$

Where,

GR_{ij}= Gross return (Tk/ha) of j^{th} crop for i^{th} farmer

Y_{ij}= Quantity of j^{th} crop produced (kg/ha)for i^{th} farmer

P_{ij}= Price of j^{th} crops (Tk/kg) received by the i^{th} farmer

Net return= Gross return – Total cost (total variable cost+ total fixed cost)

Gross margin= Gross return- Total variable cost

3. Results and Discussion

Socioeconomic characteristics of respondents

The socioeconomic characteristics of the respondent farmers are presented in Table 1. The average age of the Brinjal and Chili farmers were respectively 40.87 years and 49.84 years indicating that farmers involved in local cultivar production were fairly young. A similar result was obtained by Uddin et al. (2020) who reported an average age of 45.4 years for farmers in Hathazari, Chattogram. One hundred percent of the respondents were male implying a sense of family responsibility. Half of the respondents of Brinjal farmers (50.0%) had the secondary level of education while more than half of the respondents of Chilli farmers (52.0%) had primary level education. This might enhance their adoption

of local cultivars. Kehinde (2005) noted that education was the key to enhancing productivity among farming households as it promotes their understanding of modern technologies.

The major occupation of the respondents was agriculture (100%) in the study areas. Occupations of the respondents may influence the adoption of new technologies. The secondary occupation was reported to be business for Brinjal (42.1%) and Chilli (18.0%) farmers in all locations. The average household size was 6.05 persons for Brinjal, whereas it was 5.61 for Chilli which was higher than that of the national average of 5.0 (BBS, 2018). The mean difference of the household size varied insignificantly among the locations ($F= 1.51$; $p \leq 0.303$) for both crops. The average cultivated land per household was recorded as 0.533 and 0.591 hectares for Brinjal and Chilli, respectively. Nearly 53% of Brinjal farmers and 44% of Chilli farmers were owner-cum-tenant in the study areas (Table 1).

Table 1. Socioeconomic and demographic characteristics of the respondents

Sl. No.	Particulars	Local cultivars	
		Brinjal (*Potha Begun*)	Chilli (*Halda Morich*)
1.	Age of respondents (years)	40.87	49.84
2.	Level of education (%):		
	- Can't read & write	15.8	4.0
	- Primary	28.9	52.0
	- Secondary	50.0	40.0
	- Higher Secondary	5.3	2.0
	- Graduate & above	-	2.0
3.	Occupation (%): (multiple response)		
	- Agriculture	100.0	100.0
	- Business	42.1	18.0
	- Service	26.3	2.0
	- Day labourer	21.1	2.0
4.	Family size (Person/family)	6.05	5.61
5.	Cultivated land (ha/hh):	0.533	0.591
6.	Types of farmers (%):		
	- Owner cultivator	7.90	36.0
	- Tenant	39.5	44.0
	- Owner cum tenant	52.6	20.0

Production related information

Production related information includes plot size, the number of seedling use, spacing maintained, the sources of seedling, treatment use, planting time, the number of spraying, harvesting period, the duration of harvesting, yield ratio in case of Chilli, and the number of other varieties/cultivars grown in the locality (Table 2). Results revealed that the average plot size of the cultivars was 0.078 ha for Brinjal and 0.061 ha for Chilli which was (14.6%) and (10.3%) of the total cultivated land of the

respondent, respectively. The use of an appropriate number of the seedling is an important issue for raising the productivity of crops. The average number of seedlings used for Brinjal was 38499. and that for chilli was 87011 per hectare. Most of the seedlings were produced by themselves and some portions were collected from neighbors and relatives. Farmers did not maintain recommended spacing for those cultivars. They planted the seedlings very closely to avoid the risk of seedling mortality. The highest number of respondents of Chilli (62.0%) and Brinjal (55.3%) opined that before plantation of the seedlings in the main fields, the seedlings were treated with fungicides as per the advice of SAAOs in the respective locations. The prevalence of diseases and pests in cultivars is a common phenomenon. Controlling these problems, farmers usually spray different types of insecticides. The frequency of sprayed pesticides was 17.6 times and 3.6 times in Brinjal and Chilli respectively for controlling pests and diseases. The average duration of crops was estimated at 182.4 and 105.4 days for Brinjal and Chilli respectively. It is important to note that 4 varieties/cultivars of Brinjal were grown in the locality. These were: BARI Begun-2, BARI Begun-4, and other two local cultivars. On the other hand, 3 cultivars of Chilli were found to be grown in the study areas. These were Comilla Morich), Hybrid Chilli, and one local cultivar (Table 2).

Table 2. Production related information of the local cultivars of Brinjal and Chilli

Sl. No.	Particulars	Local cultivars	
		Brinjal	Chilli
1.	Average plot size (ha/farm)	0.781	0.612
2.	Use of seedlings (No./plot)	3007 (38499/ha)	5270 (87011/ha)
3.	Spacing maintained:		
	- Plant to plant (Inches)	6.61	6.40
	- Row to row (feet)	2.65	1.70
4.	Sources of seedling (%):		
	- Owned source	92.1	70.0
	- Relatives	-	2.0
	- Neighbors	5.3	28.0
	- Local bazar	2.6	-
5.	Whether the seedlings are treated?		
	-Yes (%)	55.3	62.0
	- No (%)	44.7	58.0
6.	Planting time (Months)	Srabon-Poush	Kartic-Agrahaion
7.	No. of spraying during production	**17.6**	3.6
8.	Duration of harvests (Days)	182.4	105.4
9.	No. of harvest per month	6-7	-
10.	Yield ratio: Ripe Chilli : Dry Chilli	-	4:1
11.	No. of other varieties/cultivars grown	3-4	2-3

Input use in local cultivar production

The rationale and efficient use of input is a prerequisite for enhancing the productivity of crops. Respondent farmers applied cow-dung (as organic fertilizer), chemical fertilizer (i.e. Urea, TSP, MoP & gypsum), and pesticides (Furadan) into the crops. The applied amounts of input were higher than the recommended doses for HYV Brinjal and Chilli (BARI, 2019). Farmers actually used the excessive dose of fertilizers for their ignorance (Table 3).

Table 3. Input use in producing local cultivars of Brinjal and Chilli

Sl. No.	Inputs	Quantity	
		Brinjal	Chilli
1.	Seedling (no./ha)	38499	87011
2.	Cowdung (ton/ha)	13.53	4.61
3.	Urea (kg/ha)	480.16	455.70
4.	TSP (kg/ha)	350.16	301.65
5.	MoP (kg/ha)	333.88	204.41
6.	Zypsum (kg/ha)	156.5	26.06
7.	Furadan (kg/ha)	52.23	-

Production cost of local cultivars

Variable cost: In this study, variable costs included human labour used for land preparation, tractor operation, cost of seedlings, weeding cost, manure & fertilizer cost, insecticide cost, irrigation, and harvesting cost. The study revealed that the total variable cost of local cultivar Brinjal (*Potha Begun*) cultivation was at Tk.468359/ha which was 90.9% of the total cost of production. On the other hand, it was Tk.321067/ha (88.6% of total cost) for Chilli (*Halda Morich*) cultivation.

Fixed cost: The leased value of land was considered as the fixed cost of production. The land-use costs were estimated at Tk.46,638/ha per year for Brinjal and Tk.41,291 for chilli. The percent shares of fixed cost to the total cost of production were estimated at 9.1% for brinjal and 11.4% for chilli.

Total cost: The total cost of production included the variable cost and fixed cost incurred for producing those local cultivars. On average, the total cost of production was estimated at Tk.514997/ha for Brinjal and Tk.362358/ha for Chilli. However, the cost of production per kg of brinjal was Tk.15.32 and Tk.45.63 for green chilli and Tk.182.9 for dried chilli (Table 4).

Table 4. Per hectare cost of production of local Brinjal and Chilli cultivars

Sl. No.	Cost items	Cost of production (Tk/ha)			
		Brinjal (*Potha Begun*)		Chilli (*Halda Morich*)	
		Taka	% of total	Taka	% of total
A.	Total Variable Cost	468359	90.9	321067	88.6
1.	Labour cost for land preparation	39629	7.7	19789	5.5
2.	Cost of tractor use	18719	3.6	28390	7.8
3.	Seedlings cost	38499	7.5	43506	12.0
4.	Weeding cost	74877	14.5	50093	13.8
5.	Fertilizer cost				
	Cowdung @ Tk.1.0/kg	13530	2.6	11290	3.1
	Urea @ Tk.17.65/kg	8475	1.6	7298	2.0
	TSP @ Tk. 34.05/kg	11923	2.3	9833	2.7
	MoP @ Tk. 17.88/kg	5969	1.2	5174	1.4
	Gypsum @ Tk. 14.58/kg	2282	0.4	467	0.1
	Furadan @ Tk.150/kg	7835	1.5		
6.	Insecticide cost	54304	10.5	11546	3.2
7.	Irrigation cost	32872	6.4	31942	8.8
8.	Harvesting cost	120773	23.5	75228	20.8
	Sub-total:	429687	83.4	294557	81.3
9.	Interest on operating capital @9%	38672	7.5	26510	7.3
B.	Fixed cost	46638	9.1	41291	11.4
1.	Land used cost	46638	9.1	41291	11.4
C.	Total cost [A+B]	514997	100.0	362358	100.0
	Total cost (Tk/kg)	15.32		45.63 (green) 182.90 (dry)	

Productivity and profitability of local cultivars

The average marketable yield of brinjal was 43.62 tons/ha and the average farm-gate price was Tk.30.19/kg. The gross return, gross margin, and net return were calculated at Tk.1316827 Tk.848468 and Tk.801830 respectively for the local cultivar of brinjal. The BCR of this crop was found to be 2.56 and 2.81 based on total cost and variable cost, respectively. It implies that the production of the crop is highly profitable at the farm level. However, the average cost of production per kilogram of local brinjal was estimated at Tk.15.32. The wastage of brinjal due to diseases and insects infestation alone was 7.29% of the total yield (Table 5).

In the case of the local cultivar chilli, the average yield was found to be 1.981 tons/ha (dried chilli). The total yield of green chilli was estimated by using the conversion factor of dried chilli (1:4). Thus, the yield of green chilli stood at 7.942 tons/ha. The average farm-gate prices of dried chilli and green chilli were Tk.310.8 and Tk.42.8 per kilogram, respectively. In most cases, respondent farmers harvest ripe chillies and sell them after drying. It was opined that a very negligible number of farmers sold green chilli due to meet up their urgent cash

needs. Green chillies are opined not to be good for eating because of their less salty and fleshy nature. The gross return, gross margin, and net return were calculated at Tk.615695, Tk.294628 and Tk.253337, respectively for dried chilli. The BCR of dried chilli was estimated at 1.70 and 1.92 over total cost and variable cost, respectively (Table 5).

Table 5. Productivity and profitability of the local cultivars of Brinjal and Chilli

Sl. No.	Yield and return	Amount (Tk/ha)	
		Brinjal (*Potha Begun*)	Chilli (*HaldaMarich*)
A.	Marketable yield (ton/ha)	43.618	7.942 (Green Chilli) 1.981 (Dry Chilli)
B.	Average farm-gate price (Tk./kg)	30.19	42.8 (Green Chilli) 310.8 (Dry Chilli)
C.	Gross return*	1316827	339917 (Green Chilli) 615695 (Dry Chilli)
D.	Total variable cost	468359	321067
E.	Total fixed cost	46638	41291
F.	Total cost [D+E]	514997	362358
G.	Gross margin[C-D)	848468	18850 (Green Chilli) 294628 (Dry Chilli)
H.	Net return[C-F]	801830	253337 (Dry Chilli)
I.	Benefit-cost ratio (BCR):		
	Total cost basis (C/F)	2.56	1.70 (Dry Chilli) & 0.93 (Green Chilli)
	Variable cost basis (C/D)	2.81	1.92 (Dry Chilli)& 1.05 (Green Chilli)

*__Note__: As per Krishi Projokti Hatboi, 2019 the productivity of Brinjal of BARI developed varieties ranges 40-60 ton/ha and Chilli varieties 10.22 ton/ha (Green Chilli) and 2.5-3.0 ton/ha (Dry Chilli)

Farmers' perception for cultivating local cultivars of Brinjal and chilli

Respondent farmers stated various reasons for cultivating local cultivars of brinjal and chilli in the study areas (Table 6). According to the farmer's opinion, the market demand for this brinjal cultivar (*Potha Begun*) is very high because its taste is quite delicious when cooked as a vegetable. The price is higher than the other varieties of Brinjal due to its higher demand. The yield is also relatively good due to the longer harvesting period. The infestations of diseases and insects are medium. The storage capacity of this cultivar is also good. Moreover, farmers can easily produce seedlings from their stored seeds.

In the case of Chilli cultivation, they stated that the market demand is very high because it increases the taste of curry and makes curry very attractive (radish). It is also less hot compared to other varieties of chilli. Again the cultivar is relatively disease-resistant and high-yielder. Moreover, it can be stored for 2-3 years at home condition due to its longer shelf-life. So it can be sold later at a higher price. Many respondent farmers also told that the chilli of this cultivar is heavier than the other

varieties of chilli due to the content of more seeds and thick skin. Some farmers opined that they can easily produce seedlings in the field using their own seeds. For the reasons discussed above, the respondent farmers are cultivating this chilli cultivar (*Halda Marich* or *Hathazar Morich*) in the study areas.

Table 6. Farmers perception for cultivating local cultivars of Brinjal and Chilli

Sl. No.	Causes	% of respondents	
		Brinjal (*Potha Begun*)	Chilli (*Halda Marich*)
1.	Local market demand is very high	94.2	78.0
2.	Price is relatively high in the market	88.3	74.0
3.	Attractive colour after cooking	-	52.0
4.	Enhances the taste of the curry	76.1	76.0
5.	Comparatively high yielder	78.8	74.0
6.	Less diseases infection & pests infestation	66.3	70.0
7.	Easy to produce seedlings from stored seeds	84.2	94.0
8.	Good storability of these cultivars	68.3	89.0
9.	High seed contents make chili heavier	-	14.0

Consumer's perceptions to the local cultivars of brinjal and chilli

The consumers of local brinjal cultivar opined that this Brinjal gives a different taste to the curry. The fruit quality of the brinjal is high due to the medium infestation of insects. The market price of this brinjal is high due to higher market demand. It does not rot easily if kept at room temperature In the case of the local cultivar chilli (*Halda Morich*), more or less similar statements were depicted by the consumers. Most consumers stated that local chilli makes curry attractive and less hot. The fruit quality of the chilli is high due to the medium infestation of insects. The buying price is of this chilli is high due to higher market demand. It is available in the local market. The storage capacity of dried chilli is very high up to 2-3 years at room temperature. The level of consumers' responses regarding this local chilli cultivar is shown in Table 7.

Table7. Level of consumer's perceptions to the local cultivars of Brinjal and Chilli

Sl. No.	Parameters	Brinjal			Chilli		
		Very high	High	Medium	Very high	High	Medium
1.	Buying price	-	√	-	√	-	-
2.	Taste	√	-	-	-	√	-
3.	Colour	-	-	√	√	-	-
4.	Quality of fruits	-	√	-	-	√	-
5.	Infestation by disease & pest	-	-	√	-	-	√
6.	Availability	√	-	-	√	-	-
7.	Storage capacity in room temperature	-	-	√	√	-	-

Problems of cultivation of brinjal and chilli

In the case of local cultivar Potha Begun (Brinjal), the highest percent (88.8%) of respondents opined that they faced the problems of different pests attack like fruit & shoot borer, mite, sucking pests (Aphid, Trips), whitefly, cutworm, etc. in the brinjal field. In the case of disease prevalence, damping-off disease in the seedling stage, fruit rot, bacterial wilt, fruit rot, leaf rot, and leaf curl was observed in the field moderate to a slightly high level (Table 8). In order to escape from these problems, most of the farmers sprayed pesticides. Additionally, some farmers used sex pheromone traps, lighting traps, cleaning the field, remove the infected plants, and organic fertilizer. In the case of the local cultivar *Halda Morich* (Chilli), about 78.0% of respondents claimed that they faced some pest attacks by fruit borer, cutworm, thrips, Aphid, mite, and whitefly etc. About 64.0% of respondents faced some problems due to disease prevalence in their chilli field (Table 8). Usually, they observed fruit rot, anthracnose, leaf rot, bacterial leaf spot, and leaf curl occurred in the field. They took similar remedial measures as stated in the brinjal cultivar.

Table 8. Problems faced by the respondent farmers during cultivation of local cultivars

Sl. No.	Particulars	% of respondents	
		Brinjal (*Potha Begun*)	Chilli (*HaldaMarich*)
1.	Infection of diseases	72.4	64.0
2.	Infestation of insects-pests	88.8	78.0
3.	Lack of irrigation	34.3	20.0

Table 9. Storage and marketing of local cultivars of Brinjal and Chilli

Sl. No.	Particulars	% of respondents	
		Brinjal (*Potha Begun*)	Chilli (*HaldaMarich*)
1.	Storage:	-	
	Using plastic/GI sheet drum	-	90.0
	Using plastic sac	-	56.0
2.	Marketing:		
	At farmgate level to the *Faria/Bepari*	68.4	87.0
	At local market by carrying themselves	31.6	56.0

Note: Multiple responses, so that not necessarily equal to 100 for each response.

Storage and marketing of brinjal and chilli

About 90.0% of respondents reported that they stored dried chilli in plastic or GI sheet-made drums for getting better prices later. About 56% of framers used plastic sac for storing the dried chilli. In the case of marketing of those cultivars, the highest number of chilli farmers (87.0%) sold their harvested crops at the farm gate to the *Faria* and *Bepari* (local traders) and the rest was sold in the local market. In

the case of brinjal, the farmers sold 68.4% of their brinjal at the farm gate and the rest amount sold at the local market (Table 9).

Policy Intervention for improving the local cultivars

Farmers are getting higher benefits from these local cultivars. So, it is necessary to improve these cultivars for getting sustainable higher income of the farmers. In the short-term, it is essential to develop a package for controlling diseases and pests, provide training on improved management practices for enhancing the productivity of those cultivars including quality seed /seedlings production and need to develop fertilizer management packages since most of the farmers used excessive dose of fertilizers. The nutrition aspect also promulgates to the consumers for creating more demand for these cultivars. In the long-term, a new variety needs to be developed maintaining the original features of those cultivars. Disease and pest management for raising productivity of the cultivars are important issue for the farmers. Both the farmers cultivating brinjal and chilli require training on modern production technology, fertilizer management, etc. The percent of respondent's responses on the research need issues are shown in Table 10.

Table 10. Research needs for the improvements of the local cultivars

Sl. No.	Particulars	% of respondents	
		Brinjal (*Potha Begun*)	Chilli (*HaldaMarich*)
1.	Disease and pest management for raising productivity	94.4	80.0
2.	Provide training on modern production technology	67.5	81.0
3.	Research for enlarging the size of chilli	47.0	60.0
4.	Explore nutritional facts of the chilli	16.3	24.0
5.	Fertilizer management	78.0	58.4

4. Conclusion

It might be concluded that the local brinjal cultivars *Potha Begun* and chilli cultivar *Halda Morich* are very much popular in the region and profitable crops. The farmers of those cultivars face some problems during their cultivation. Most respondent farmers need its improvements for getting the higher financial benefits. There is scope to improve the productivities of studied local cultivars, efficient use of fertilizers, reducing the number of spraying in brinjal, and controlling the infestation of pests and diseases. Researchers can take initiative to develop new varieties keeping the quality of these two cultivars. Before developing new varieties, improved production management technologies including pests and

diseases control, and fertilizer management should be developed and disseminated among the farmers. It is hoped that this potential crop will emerge as a source of income for the farmer through quality research.

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