

## AGRO-ECONOMIC PERFORMANCE OF SEED POTATO PRODUCTION UNDER CONTRACT FARMING IN BANGLADESH

Moniruzzaman<sup>1\*</sup> MS Hoq<sup>2</sup> MK Islam<sup>1</sup> J Jasmin<sup>3</sup> and MM Khanam<sup>3</sup>

### Address

<sup>1</sup>Senior Scientific Officer and <sup>2</sup>Scientific Officer Agril. Econ. Division <sup>1</sup>Senior Scientific Officer, HRC BARI, Gazipur <sup>3</sup>Research Associate, Food Security Project, AED, BARI and FTI, Project, BAU.

### Correspondence\*

[monirecon44@yahoo.com](mailto:monirecon44@yahoo.com)

Accepted by 15 March 2015

### Abstract

Potato is a very popular tuber as well as vegetable crop in Bangladesh, but quality seeds are scares for its production. BADC produce quality seed potatoes under contract farming and distribute them to the producers, yet evidence is lacking. The study measured the relative profitability and resource use efficiency of seed potato production under contract growing system. The study used data from 90 contract growers and 90 non-contact growers in three districts namely Rajshahi, Rangpur and Thakurgoan using pre-tested interview schedule during 2011. The study revealed that there was significant difference between the cost of potato seed cultivation under contract and non-contract growers. The yield of potato seed under contract growing system was significantly higher than that of non-contract growing system. The gross return (Tk.380,360 or \$4876), gross margin (Tk.247,411 or \$3172) and net return (Tk.212,165 or \$2720) were significantly higher for contract growers compared to the non-contract growers. The benefit-cost ratio was also higher under contract farms (2.27) compared to that in non-contract farms (2.04). Functional analysis revealed that farmers were not found efficient in allocating inputs for seed potato production. Higher price of quality seed, lack of storage facilities, lack of technical knowledge, infestation of insects and diseases, and lack of capital were the common problems of both contract and non-contract farmers.

**Key word: Profitability, Resource use efficiency, Contract farmers, Seed potato**

### Introduction

Potato is one of the important and popular vegetable as well as cash crop in Bangladesh. The demand of potato is increasing day by day due to increase in population and its diversified uses. The Bangladesh Agricultural Research Institute (BARI) has released 34 improved varieties of potato which has good yield potential and tolerant to insect-pests and diseases (BARI, 2005). These varieties have been disseminated to the farmers through Bangladesh Agricultural Development Cooperation (BADC), BARI, NGOs, and private companies. In Bangladesh potato is grown in an area of 8,31,748 ha and approximately 1,50,000 MT of seed potatoes are needed for the purpose (Banglapedia, 2001).

Potato farmers generally use those tubers keeping for their own consumption as seed which results in poor yield. The demand for seed potatoes in the country is also partially meet through imports. Usually, two types of seed potatoes are imported by the government, one known as foundation or basic seed, and the other is certified seed. BADC, a public organization, plays a major role in supplying the seeds of various crops including potato throughout the country. It has been able to replace imported seed (3000 tones in 1979 and 100 tones in 1997) by locally produced seed stocks (Banglapedia, 2001). Recently BADC is trying to produce virus free seed potato by using sprout cutting and stem cutting from *E-class* seed (Rahman and Akanda, 2009). It also follows a standard method of producing quality seeds for farmers which involved

pre-foundation seed, foundation seed, certified seed-I, and certified seed-II (Mahmud *et. al.*, 2009). BADC distributes certified seeds to the growers produced locally from the imported foundation seeds in their own farms or in the lands of farmers on contract basis. Imported seeds are also sold to the growers through local BADC offices.

BADC is working for seed potato production and extension under contact growing system especially in Rajshahi, Rangpur and Thakurgoan district of Bangladesh. They normally give inputs for potato seed producing farmers through Bank loan and after harvesting seed potato they take the value of the given inputs for the distribution cost of those inputs. They give potato seeds (Grade-A 1600 kg/ha and Grade-B 1800 kg/ha), Urea (296 kg/ha), TSP (198 kg/ha), MP (296 kg/ha), Gypsum (80 kg/ha), Boron (10 kg/ha), Zinc (15 kg/ha) and Tk. 7000 in cash for buying pesticides to the farmers (BADC, 2008). After giving those inputs, they keep monitor the process of seed potato cultivation time to time and also give advice to the farmers. After harvesting of products, concerned farmers give 10.87 t/ha seed potatoes to BADC.

Seed potato production through contract growing system is one of the important ways to increase seed production in the country. It also reduces the number of intermediaries from seed marketing channel. BADC along with some other organizations working on it for increasing seed potato production. Unfortunately, data and information regarding seed potato production are scarce in Bangladesh. The findings of this study will

be useful to the researchers and policy makers in formulating research design and policies for further development of the crop. With this view in mind, the present study was undertaken with the following objectives.

**Objectives**

- To find out the socioeconomic characteristics of the seed potato producers;
- To compare the costs and returns of seed potato production under contract and non-contract farming;
- To estimate the resource use efficiency of seed potato production under contact and non-contract farming system; and
- To know the problems of seed potato production and suggest some policy guidelines for improving this system.

**Methodology**

The study was conducted in three seed potato growing districts namely Thakurgoan, Rangpur and Rajshahi districts of Bangladesh. A total of 90 contract growers, taking 30 from each district were selected randomly and interviewed for the study. Besides, 90 non-contract growers taking 30 from each district were also selected as control farmer to compare the costs and return of seed potato production under contract and non-contract farming. Data were collected by survey method with the help of pre-designed and pre-tested interview schedule during the *Rabi* season in 2011. The collected data were mostly analyzed by tabular methods to fulfill the objectives set for the study.

**Functional Analysis**

The production of seed potato is likely to be influenced by different factors, such as human labour, seed, chemical fertilizer, insecticide, irrigation, etc. The following Cobb-Douglas type revenue function was used to estimate the parameters. The functional form of the Cobb- Douglas regression equation was as follows:

$$Y = AX_1^{b_1} X_2^{b_2} \dots X_n^{b_n} e^{u_i}$$

The revenue function was converted to logarithmic form so that it could be solved by least square method, i. e.

$$\ln Y = \ln a + b_1 \ln X_1 + \dots + b_n \ln X_n + e^{u_i}$$

The empirical revenue function was the following:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + U_i$$

Where, Y = Total return (Tk/ha)

X<sub>1</sub> = Cost of human labour (Tk/ha)

X<sub>2</sub> = Cost of seed (Tk/ha)

X<sub>3</sub> = Cost of cowdung (Tk/ha)

X<sub>4</sub> = Cost of urea (Tk/ha)

X<sub>5</sub> = Cost of TSP (Tk/ha)

X<sub>6</sub> = Cost of MoP (Tk/ha)

X<sub>7</sub> = Cost of gypsum (Tk/ha)

a = constant value

b<sub>1</sub>, b<sub>2</sub>, b<sub>3</sub> ..... b<sub>7</sub> = Co-efficients of the respective variables to be estimated.

U<sub>i</sub> = Error term.

The efficiency of inputs used in seed potato production

was measured by the following equation:  $\frac{MVP_x}{MFC_x} = 1$

Where, MVP<sub>x</sub> is the marginal value product of x input and MFC<sub>x</sub> is the marginal factor cost of x input. When the ratio of MVP and MFC is equal to unity indicates that the resource is efficiently used. When, the ratio is more than unity implying the resource is under utilized. In that case, there is ample opportunity to increase total production by increasing the use of specific input in the production process keeping other resources constant. When, the ratio is less than unity implying the resource is over used. In that case, it is possible to reduce production cost remains total production unchanged by decreasing the use of specific input.

**Results and Discussion**

*Socio-economic profile of sampled farmers*

The socio-economic characteristics of the farmers often influence their production decision. In this study, socio-economic characteristics of the farmers include age, educational status, occupation, experience in crops cultivation, and farm size. It was evident from Table-1 that average age of the contract and non-contract growers were 41 and 40 years respectively. Highest percentage of the contract and non-contract growers had secondary level of education. On an average, 86% of the contract growers were educated, while it was 90% for non-contract growers. Agriculture was the main occupation for most of the contract (79%) and non-contract (68%) growers. Average farming experience was 17 years for both contract and non-contract growers in all the areas. On an average, 51% of the contract growers received training, while it was 13% for non-contract growers. Average farm size of contract and non-contract growers was 1.98 and 1.97 hectares respectively.

*Land holdings*

The average total cultivated land of the contract and non-contract growers were 1.85 and 1.8 hectares respectively. The area devoted to seed potato production for the contract and non-contract growers were 0.66 and 0.24 hectare which is about 35% and 13% of the total cultivated land respectively.

Table 1. Socio-economic profile of the sample farmers of the study areas

Characteristics	Rajshahi		Rangpur		Thakurgaon		All areas	
	CG	NCG	CG	NCG	CG	NCG	CG	NCG
1. Farmers age (year)	40	44	41	41	43	39	41	40
2. Education level (%):								
Illiterate	20	10	0	7	23	13	14	10
Primary	27	50	3	20	20	30	17	33
Secondary	37	30	33	50	37	40	36	40
HSC	13	10	27	10	10	7	17	9
Degree and above	3	-	37	13	10	10	17	8
Total	100	100	100	100	100	100	100	100
3. Occupation (%)								
Agriculture	80	97	80	97	77	77	79	68
Agriculture +Business	17	3	20	-	13	13	17	28
Others	3	-		03	10	10	4	4
Total	100	100	100	100	100	100	100	100
4. Farming experience (Year)	18	17	14	16	19	18	17	17
5. Experience in seed potato production (Year)	7	4	4	6	4	4	5	5
6. Experience of contact farming (Year)	7	-	4	-	4	-	5	-
7. Training received (% of farmer)	67	30	40	3	47	37	51	23
8. Farm size (No./farm)	1.37	2.29	2.95	1.24	1.63	2.39	1.98	1.97

Note: CG = Contract growers and NCG = Non-contract growers, Source: Field survey, 2011

Table 2. Structure of land holding of the sampled farms in the study areas

Particulars	Rajshahi		Rangpur		Thakurgaon		All areas	
	CG	NCG	CG	NCG	CG	NCG	CG	NCG
Total cultivated land (ha/farm)	1.25	2.13	2.77	1.10	1.53	2.27	1.85	1.83
Total seed potato area (ha/farm)	0.50	0.25	1.01	0.26	0.46	0.20	0.66	0.24
Survey plot area (ha/farm)	0.17	0.21	1.01	0.16	0.32	0.19	0.50	0.19
Seed potato area as (%) of total cultivated land	40	12	36	24	30	9	35	13

Note: CG= Contract growers and NCG= Non-contact growers. Source: Field survey, 2011

Table 3. Input use pattern in seed potato cultivation under contract and non-contract growing system

Items	CG	NCG	Change (%)	Mean Difference	t-value
Human labour (man days/ha):					
Family	45	45	-	-	0.0984
Hired	139	131	5.74	8*	1.8143
Total	184	180	2.53	4*	1.7131
Seed (kg/ha)					
Grade-A	573	-	-	-	-
Grade-B	1162	-	-	-	-
Total	1735	1818	-4.78	-83***	2.7730
Cowdung (kg/ha)	8208	8157	0.63	51	0.0778
Fertilizers (kg/ha) :					
Urea	305	324	-6.00	19*	-1.559
TSP	243	241	0.82	2	0.147
MoP	321	297	7.28	23.33	1.3349
Gypsum	114	94	17.49	20.00**	2.3949
Zinc	8	9	-4.00	-0.33	-0.5235
Boron	9	7	15.36	1.33***	2.7943
MgSO4	48	24	49.66	24.00***	8.0961

Note: \*\*\*, \*\* and '\*' indicates significant at 1%, 5% and 10% level

Note: CG = Contract growers and NCG = Non-contract growers, Source: Field survey, 2011

Table 4. Comparative cost of cultivating seed potato under contract and non-contract growing system

Cost	CG	NCG	Change (%)	Mean Difference	t-value
A. Variable cost	132949	138800	-4.42	-5851**	-19863
Human labour (hired) (Tk/ha)	26920	24973	7.02	1947*	1.8814
Land preparation cost (Tk/ha)	8433	7021	16.08	1412***	4.7972
Seed (Tk/ha):					
Grade-A	18425	-	-	-	-
Grade-B	34025	-	-	-	-
Total	53339	63817	-21.89	-10478***	-7.0225
Cowdung (Tk/ha)	5527	5414	2.76	113	0.0776
Fertilizers (Tk/ha) :					
Urea	3664	3884	-8.02	-220	-1.3449
TSP	6391	6493	-3.68	-102	-1.1475
MoP	8322	8063	2.33	259	0.9331
Gypsum	656	472	18.04	184***	3.5726
Zinc	942	925	1.64	17	0.0619
Boron	929	751	19.11	178**	2.1195
MgSO <sub>4</sub>	978	637	33.92	341***	5.1014
Insecticides (Tk/ha)	11244	10763	3.41	481*	1.9179
Irrigation (Tk/ha)	4287	4212	-0.70	74	0.2645
Interest on op. capital (Tk/ha)	1316	1374	-4.42	-58	-
B. Fixed Cost (Tk/ha):	35246	35193	0.87	53	-
Family labour	8800	8747	9.74	53	0.0297
Land use cost	26446	26446	-	-	-
C. Total cost (A+B) (Tk/ha)	168195	173056	-2.92	-4861**	-2.1181

Note: (i) Average price of inputs (Tk/kg) under CG and NCG: Seed-30.83 & 35.09; Cowdung-0.68 & 0.65; Urea -12; TSP-26.22 & 27.96; Mp-26.13 & 27.16; and Labour- Tk.193.33/man-day

(ii) \*\*\*, \*\* and \* indicate significant at 1%, 5% and 10% level

Note: CG = Contract growers and NCG = Non-contract growers, Source: Field survey, 2011

#### *Comparative scenario of seed potato cultivation under contract and non-contract growing system*

Contract growers in the study areas received different inputs like seed, urea, TSP, MoP, Gypsum, Boron, Zinc and cash money on credit from BADC. They were also applied additional inputs in their field. Table 3 indicates that the use of human labour was found to be more or less similar for both categories of farmers. Contract growers applied significantly lower amount of urea compared to non-contract growers. Contract growers applied 305 kg/ha of urea, whereas non-contract growers applied 324 kg/ha of urea which was 6% higher than contract growers. On the other hand, contract growers used significantly higher amount of gypsum compared to non-contract growers.

The total cost of seed potato cultivation was Tk. 168195 for contract growers, whereas it was Tk. 173056 for non-contract growers which were significantly higher than contract growers. But the total cost incurred by contract growers was higher than non-contract growers due to the use of higher inputs in Rangpur district (Table 4). The cost of seed under contract growers was significantly lower compared to non-contract growers due to seed potato collect from BADC (Table 4).

The yield of seed potato under contract growers was found to be 21395 kg/ha which was 3.43% higher than non-contract growers due to use higher amount of TSP, MoP, gypsum, Boron and MgSO<sub>4</sub>. As a result, contract growers in the study areas received significantly higher gross return, gross margin and net return than that of non-contract growers which was due to uses of inputs according to recommended doses. The rates of return were 2.29 and 2.04 on total cost basis for contract growers and non-contract growers respectively (Table 5).

#### *Factors of seed potato production and resource use efficiency*

Cobb-Douglas type revenue function was used to examine the contributions of some inputs in seed potato cultivation under contract and non-contract farming. The estimated values of the co-efficients have been presented in Table 6 and 7.

The variables like seed, urea, TSP and MP had significant effect on potato seed production. The co-efficients of seed (X<sub>2</sub>) and TSP (X<sub>5</sub>) are positive and significant at 1% and 5% level, while the co-efficients of urea (X<sub>4</sub>) and MoP (X<sub>6</sub>) are negative and significant at 10% and 5% level respectively. The positive co-efficient of seed and TSP indicated that the production

of seed potato will be increased by 9.1% and 0.63% if the use of seed and TSP are increased by 10% keeping other factors constant. The ratio of MVP and MFC is found to be higher than unity for seed, urea, TSP and MP implies that there is a scope of increasing the production of seed potato by applying more of these inputs, while the ratio are less than unity for human labour and cowdung indicated over use of their inputs. The value of F is significant at 1% level indicated good fit of the model (Table-6).

Table 7 reveals that the co-efficients of human labour ( $X_1$ ), MP ( $X_4$ ) and Gypsum ( $X_7$ ) are positive and significant while the co-efficient of seed ( $X_2$ ) is negative and significant at 10% level in the case of non-contract potato seed production. The value of  $R^2$  is found to be 0.84 implying that 84% of the total variation

in production can be explained by the variables included in the model. F-value is significant at 1% level indicates that variations in the production mainly depends on the variables included in the model. The ratio of MVP and MFC is higher than unity for human labour, seed, MP and Gypsum implies more scope of using these inputs to increase the production potato seed.

#### *Constraints to seed potato production for contract and non-contract Growers*

The constraints to seed potato production in the study areas are presented in Table 8. It was found that constraints varied from location to location. A brief discussion on various problems has been made in the following sections.

Table 5. Comparative profitability of cultivating seed potato under contract and non-contract growing system

Items	CG	NCG	Change (%)	Mean Difference	t-value
Yield (kg/ha):					
Grade-A	3733	-	-	3733	-
Grade-B	7512	-	-	7512	-
<sup>1</sup> Farmer	9955	-	-	9955	-
Total	21395	20663	3.43	732**	2.2292
Price (Tk/kg)	17.7	17.03	1.18	0.72	-
Gross return (Tk/ha)	380360	352480	7.24	27880***	3.9862
Total cost (Tk/ha) :	168195	173056	-2.92	-4861**	-2.1181
Total variable cost	132949	138800	-4.42	-5851**	-1.9862
Total fixed cost	35248	35193	0.87	53	-
Gross margin (Tk/ha) :	247411	213680	13.11	33731***	4.3673
Net return (Tk/ha)	212165	179424	14.77	32741***	4.4121
Rates of return (BCR):					
BCR on variable cost	2.87	2.54	11.00	0.33***	5.0507
BCR on total cost	2.27	2.04	9.79	0.23***	4.3498

Note: \*\*\*, \*\* and \* indicates significant at 1%, 5% and 10% level and CG = Contract growers and NCG = Non-contract growers. <sup>1</sup>Farmer means the rest of seed potatoes after grading.

Table 6. Estimated values of coefficients and related statistics of Cobb-Douglas revenue function for contract growers

Item	Coefficient	t- value	P- value	MVP	MFC	MVP/MFC
Intercept	3.6463***	2.677	0.0137			
Human labour ( $x_1$ )	0.0115	0.2205	0.8274	23.86	193.33	0.1236
Seed ( $x_2$ )	0.910***	8.161	0.0000	199.34	30.83	6.6448
Cowdung ( $x_3$ )	0.0008	0.0416	0.9671	0.039	0.68	0.0486
Urea ( $x_4$ )	-0.0707*	1.7743	0.0898	-89.59	12.00	-7.465
TSP ( $x_5$ )	0.0630**	2.4649	0.02198	98.55	26.22	3.8391
MP ( $x_6$ )	-0.0801**	-2.1231	0.0452	-101.48	26.13	-3.8542
Gypsum ( $x_7$ )	-0.0107	-0.5199	0.6082	-35.65	5.50	-6.4812
$R^2$	0.77					
F- value	15.0074***					
Returns to scale	0.8242					

Note: \*\*\*, \*\* and \* indicate significant at 1%, 5% and 10% level

Table 7. Estimated values of coefficients and related statistics of Cobb-Douglas revenue function for non-contract growers

Item	Coefficient	t- value	P- value	MVP	MFC	MVP/MFC
Intercept	9.0592***	7.0117	0.0000			
Human labour ( $x_1$ )	0.1849**	2.0228	0.0554	371.06	193.33	1.9225
Seed ( $x_2$ )	-0.2756*	-1.9224	0.0675	-53.24	35.09	-1.7748
Cowdung ( $x_3$ )	0.0030	0.0806	0.9364	0.13	0.65	0.1477
Urea ( $x_4$ )	0.0557	0.6979	0.4925	60.64	12.00	5.0537
TSP ( $x_5$ )	0.1387	0.9791	0.3380	200.42	27.96	7.4230
MP ( $x_6$ )	0.2882**	1.9816	0.0601	360.13	27.16	7.4230
Gypsum ( $x_7$ )	0.019**	2.0015	0.0578	324.73	5.00	14.1947
$R^2$	0.84					
F- value	23.5795***					
Returns to scale	0.4149					

Note: \*\*\*, \*\* and \*' indicates significant at 1%, 5% and 10% level

Table 8. Constraints to seed potato cultivation under contract and non-contract growers

Constraints	% response							
	Rajshahi		Rangpur		Thakurgaon		All areas	
	CG	NCG	CG	NCG	CG	NCG	CG	NCG
Higher price of quality seed	87	73	80	70	73	83	80	76
Lack of storage facilities	73	73	80	70	77	77	77	73
Lack of technical knowledge	83	77	73	67	70	73	76	72
Infestation of insects and diseases	67	60	70	57	63	63	67	60
Lack of capital	67	60	57	53	73	63	66	59
Higher price and non- availability of fertilizer in time	60	57	53	63	70	53	61	58
Higher transport cost	40	33	43	40	47	47	43	40

Note: CG= Contract growers and NCG= Non-contact growers. Source: Field survey, 2011

#### *Higher price of quality seed*

Seed potato yield largely depends on quality seed. Contract growers in the study areas used seed potato from BADC and non-contract growers used it from many sources like own source, BADC, NGO's, local market traders, etc. Market traders usually adulterate seed potatoes for making higher profit. BADC provide potato seed with high price. Seed is almost scarce to non-contract farmers. Nonetheless, own seed retained for their own use don't fulfill their requirements. Therefore, most of the contract (80%) and non-contract (76%) growers mentioned higher price of quality seed at planting time as a main problem.

#### *Lack of storage facilities*

Potato is a semi perishable vegetable which needs storage for using it throughout the year. Most the small and medium farmers have to sell their seed potatoes immediately after harvesting with lower price due to lack of access to the local cold storage. Therefore, lack of storage facility was reported to be a problem of contract and non-contract growers in the study areas.

#### *Lack of technical knowledge*

Technical knowledge related to seed potato cultivation is a crucial factor for getting higher yield. It optimize

inputs use, saves production cost and increase yield of seed potato as well as farmers income. Most of contract and non-contract growers in the study areas were suffering from lack of technical knowledge due to lack of training. Therefore, this problem was reported to be one of the major problem of seed potato cultivation.

#### *Higher price and non-availability of fertilizer in time*

Fertilizers are important input for seed potato production. It increases soil fertility and crop yield. Due to its higher price many farmers cannot apply proper doses of fertilizers and get lower yield. That's why, contract and non-contract farmers reported higher price and non-availability of fertilizers in time to be a problem.

#### *Infestation of insects and diseases*

Late blight is one of the important potato diseases. The yield of seed potato is seriously hampered for this disease. More than 60% of the contract and non-contract growers faced this problem during seed potato cultivation.

#### *Lack of capital*

Capital is one of the important factors for seed potato cultivation. Contract and non-contract growers in the study areas have limited access to credit facilities. In

the study areas, 66% of the contract growers and 59% of the non-contract growers faced this problem.

#### *Higher transport cost*

As the communication facilities are not so good in the study areas, all inputs and product are carried with higher cost. As a result, some of the contract and non-contract growers faced this problem during seed potato cultivation.

#### **Conclusions**

Based on the findings of the study, it may be concluded that BADC contracts with interested farmers and provides production inputs for producing potato seed and buys their produces at pre-fixed price. BADC deducts all its dues from output price during purchasing of seed potatoes. There is significant difference in the cost of seed potato production between contract and non-contract growing system. The cost of land preparation, Gypsum, Boron and MgSO<sub>4</sub> for contract growers is significantly higher compared to non-contract growers. On the other hand, the cost of seed for contract growers is significantly lower compared to non-contract growers. The yield of seed potato under contract growers is significantly higher than that of non-contract growers due to proper management of seed potato cultivation. Contract growers in the study areas receive significantly higher gross return, gross margin and net return as compared to the non-contract growers due to the lower cost of seed potato production and the ratio of MVP-MFC is considerably high for fertilizers under contract farming system indicates the scope for increasing the profitability by increases the use of these inputs. Higher price of quality seed and lack of storage facilities are the main problems faced by both contract and non-contract growers in the study areas.

#### **Policy guidelines**

- Contract growing system is one of the ways, which shorten marketing channel and gives farmers production inputs to a reasonable price

and provides a satisfactory price for the produces. So government should take initiative to encourage farmers in producing crops under contract growing system.

- Supplying quality seed to the non-contract growers is very much important for higher production. Therefore, government should encourage private seed companies to come forward for producing quality seed potatoes and distribute them to the interested farmers.
- Hand on training seed potato production should be organized by the government and NGO's to develop technical knowledge of the contract and non-contract growers.
- Establishment of more storage facilities should be provided for ensuring higher production in remote areas.
- Government should ensure credit facilities through both institutional and non-institutional sources for non-contract seed potato growers.

#### **References**

- BARI (Bangladesh Agricultural Research Institute). 2005. Handbook of Agricultural Technology, 3<sup>rd</sup> Edition, Gazipur.
- Banglapedia. 2001. National Encyclopedia of Bangladesh. Asiatic Society of Bangladesh.
- BADC (Bangladesh Agricultural Development Corporation). 2008. Quality Seed Potato Production Technology, Potato Seed Division, BADC, 49/51, Dilkusha Commercial Area, Dhaka-1000.
- Rahman MS and Akanda A M. 2009. Performance of Seed Potato Produced from Sprout Cutting Stem Cutting and Conventional Tuber Against PVY and PLRV. Bangladesh J. Agril. Res.34(4) : 609-622, December, 2009
- Mahmud A A, Akhter Sajeda, Hossain MJ, Bhuiyan MR and Hoque MA. 2009. Effect of Dehaulming on Yield of Seed Potatoes. Bangladesh J. Agril. Res. 34(3) : 443-448, September, 2009