

Commercial Bean Farming under Different Farm Categories and its Impacts on Livelihoods of Farmers in Ishwardi Upazila of Pabna District

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Abstract *The study was designed to evaluate the profitability of commercial bean farming and its impact on livelihood improvement of the small, medium and large farmers in Ishwardi Upazila of Pabna District. Data were collected from stratified randomly selected 60 commercial bean farmers from three villages of Ishwardi Upazila. The evaluation shows that commercial bean farming is highly profitable for small, medium and large farmers and observes positive impact on livelihood improvement of all categories of farmers. Per hectare net return (profit) from commercial bean farming for small, medium, large and all sampled farmers were Tk 356077, Tk 347403, Tk 343156 and Tk 351007, respectively. It was also found that all kinds of livelihood assets of the selected farmers increased significantly through commercial bean farming. The availability of high quality HYV seeds, affordable labour saving technology and extension services are required to sustain commercial bean farming. It is also suggested that, apart from local and national market, positive steps should be taken to explore export markets so that the farmers can have more benefits from commercial bean farming. A fair price of bean for farmers can be ensured for improving livelihood status of all categories of farmers.*

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1. Introduction

Agriculture is the recognized driving force of the economy of Bangladesh. It has an area of 1,47,570 square kilometers (km²) and a population of nearly 152.90 million with the density of about 964 person per km². The population growth rate is 1.34 percent per annum. Per capita income is about US \$1520 and people have a life expectancy of 69 years (BER 2012). There is no alternative to developing the agriculture sector for alleviation of poverty by attaining accelerated economic growth, since the provision of food security, improvement of living standard and employment opportunity of the huge population of the country are directly linked to the development of agriculture. Now-a-days, food security is the burning question in Bangladesh. Vegetables are highly nutritious food and commercial production of vegetables can play an important role to meet the extra demand for vegetables and food security.

At present, total rice cropped area is 78.83 percent. The remainder 21.17 percent of the total cropped area is occupied by other non-rice crops, which include vegetables, wheat, sugarcane, cotton, spices and condiments (BBS 2011). Monoculture of rice for prolonged periods has led to a number of serious physical and biological problems. Continuous rice cultivation has also nutritional impact. Rice monoculture dominates the cropping system in Bangladesh. Consequently, a large percentage of people of Bangladesh are suffering from severe malnutrition. If enough vegetables are not provided to the people, they will suffer from nutritional deficiency to a great extent. According to dieticians, daily requirement of vegetables is 75 - 125 gm of green leafy vegetables, 85 gm of other vegetables, and 85 gm of roots and tubers with other food. Because of increased health consciousness, the well off people of Bangladesh now prefer to take more vegetables than what they consumed in the past. Because of favorable climatic condition and soil, a good number of vegetables are grown round the year. There is a great need for vegetable cultivation in view of the increase in income and employment of the people. Commercial production of vegetables is getting momentum and small, medium and large farmers with proper technical knowledge and skill are increasingly coming forward to undertake this venture. The production of vegetables has therefore been gradually increasing in Bangladesh. In 2010/11, the highest 101516 thousand tonnes of vegetables were produced in the country (BBS 2011).

Beans are important vegetables of world agriculture and are an essential part of a balanced diet in many countries. Bean has been used throughout the world for thousands of years. They come in hundreds of shapes, sizes and colors, are

versatile and amazingly convenient because they can be dried and stored for years. Bean is the perfect food for a fat-restricted diet. It contains no cholesterol, and they can help lower your cholesterol level because they are one of the richest sources of fiber. Bean contains at least 20 percent protein and is high in carbohydrate, which provides long lasting energy. Adding bean to daily meals ensures total nutrition, and with wide selection of beans one should be able to find the right flavor for oneself.

Commercial bean production is gaining continuous popularity and recognition by the farm households because of the impact of increased production of crops on socioeconomic upliftment of the producers. In 2010/11 total bean producing area was 17311.74 hectare and 94756 tonnes of bean was produced (BBS 2011). Commercial bean farming is getting importance as a way of investing lesser amount of capital but earning maximum income with more participation of women in production activities. The study has therefore been designed to assess the profitability of commercial bean farming and its impact on livelihood improvement of the farmers, to identify problems associated with bean farming, and formulate appropriate policy strategies for popularizing bean production as an alternative source of income for majority people of Bangladesh.

2. Research Methods

Data Source

For easy accessibility, time and resources constraints, Ishwardi Upazila of Pabna District was selected purposively for data collection. It may be noted here that commercial bean farming is very popular among the farmers in this Upazila. In fact, three villages namely, Betbaria, Muladuli and Shekhpara of Ishwardi Upazila were selected for conducting the field survey, since these villages were famous for commercial bean farming. Here a reasonable size of sample was taken into account to satisfy the objectives of the study. Primary data on commercial bean farming was collected from 60 farmers by using face to face interview from three different villages with the head of each sample household. Secondary data were gathered from different handouts, research reports and various publications to fulfill the objectives of the study. A stratified random sampling technique was followed in the study. Stratification was done on the basis of category of farm size. Here 25 small and 20 medium farmers were taken considering approximately 15.00 percent from two categories of farmers and 15 large farmers were taken purposively because of the number of large farmers were very few. Then almost equal numbers of farmers were taken from each village in each category of farmers.

Analytical Technique

Data was analyzed by using activity budgets, descriptive statistics and frequency distribution tables. Activity budget and descriptive statistics such as mean, median, percent were used to analyze the profitability of commercial bean farming. Frequency distribution tables and percent were used to analyze the impact of commercial bean farming on livelihoods of selected farmers before and after situation.

Gross return: Gross return was calculated by multiplying the total volume of output of an enterprise by the average price in the harvesting period (Dillon and Hardaker, 1993). It consisted of the sum of the volume of main product and by-product. The following equation was used to calculate gross return.

$$GR = Q_m P_m$$

Where:

GR = Gross return from bean (Tk/ha);

Q_m = Quantity of bean (kg/ha);

P_m = Average price of bean (Tk/kg); and

Net return: Per hectare net return was determined by subtracting per hectare total cost (variable cost and fixed cost) of production from per hectare total return.

To determine the net return of commercial bean production, the following

$$\pi = GR - \sum_{i=1} (P_{xi} X_i) - TFC$$

equation was used in the present study.

Where:

π = Net return (Tk/ha);

GR = Gross return from bean (Tk/ha);

P_{xi} = Per unit price of i^{th} inputs used for producing commercial bean (Tk)

X_i = Quantity of the i^{th} inputs used for producing per hectare commercial bean (kg)

TFC = Total fixed cost involved in producing commercial bean (Tk); and

i = 1, 2, 3, n (number of inputs)

3. Results and Discussion

Profitability of Commercial Bean Farming

Unless otherwise indicated, we assume that farmers purchase inputs and sell output (i.e., bean) in perfectly competitive market. It is also assumed that farmers want to maximize net returns or profits from variable inputs since emphasis is given in this study on commercial bean production. Total gross returns minus gross costs give profit (or net return).

Major Costs of Commercial Bean Farming

The major costs involved in producing commercial bean of all categories of farmers are shown in Table 1. The costs of hired labour per hectare in producing the commercial bean in cases of small, medium, large and all sampled farmers were Tk 34000, Tk 88000, Tk 125000 and Tk 82500, respectively which were 16.03, 38.96, 53.94 and 37.31 percent of total gross costs of production. The costs of family supplied labour in cases of small, medium, large and all sampled farmers were Tk 100000, Tk 52000, Tk 17500 and Tk 56500, respectively, which were 47.15, 23.02, 7.55 and 25.55 percent of total gross costs of production. This indicates that large farmers supplied only a negligible number of family labour (i.e., 7.55 percent) for producing commercial bean. Nevertheless, Table 1 clearly shows that all categories of farmers had to spend the highest amount of money as human labour costs for commercial bean farming.

The insecticide was also a very important input for bean producing farmers and it became the second highest variable cost in commercial bean farming. The average costs of insecticides per hectare for small, medium, large and all sampled farmers were Tk 33710, Tk 40333, Tk 41072 and Tk 38372, respectively, which were 15.89, 17.86, 17.72 and 17.35 percent of total gross costs of production (Table 1). The cost of fencing items and *Matcha* was another important cost item. The average per hectare costs of fencing items and *Matcha* in producing commercial bean for small, medium, large and all sampled farmers were Tk 8856, Tk 11072, Tk 8253 and Tk 7168, respectively, which shared 4.18, 4.90, 3.56 and 3.24 percent of total gross costs of production. The average costs of seeds were Tk 10346, Tk 7560, Tk 7290 and Tk 8400 for small, medium, large and all sampled farmers, respectively, which shared 4.88, 3.35, 3.15 and 3.80 percent of total gross costs of bean production (Table 1).

The total gross costs per hectare for small, medium, large and all sampled farmers in producing commercial bean were Tk 212110, Tk 225892, Tk 231757 and Tk 221125, respectively (Table 1). Per hectare gross cost was the highest for large farmers and the lowest for small farmers. It is evident from the study that large

farmers spent relatively more amounts for human labour in producing per hectare commercial bean in comparison with other categories of farmers. The small farmers themselves were involved in commercial bean farming. As a consequence, farm management was the most efficient and per hectare costs were the lowest for small farmers.

Gross Returns from Bean Farming

Yield per hectare of commercial bean for small, medium, large and all sampled farmers were 31566 kg, 31850 kg, 31940 kg and 31785 kg, respectively. Per hectare gross return for small, medium, large and all sampled farmers were Tk 568187, Tk 573295, Tk 574914 and Tk 572132, respectively (Table 1). Both the yield and gross return were the highest for large farmers and lowest for small farmers.

Net Returns of Bean Farming

The net return of per hectare commercial bean farming for small, medium, large and all sampled farmers were Tk 356077, Tk 347403, Tk 343156 and Tk 351007, respectively (Table 1). Small farmers earned the highest amount of net return than those of the medium and large farmers because they spent more time, supervised farm activities more intensively and efficiently. On the other hand, large farmers have had very little time to spare for managing bean farming efficiently. As a result, they had to spend relatively higher amount of cost for human labour in per hectare bean production.

Comparative Profitability of Small, Medium and Large Farmers

The summary result of per hectare gross return, gross cost and net return for small, medium, large and all sampled farmers are presented in Figure 1 (also in Table 1). Gross return per hectare was the highest for large farmers and lowest for small farmers and average gross return for all sampled farmers was Tk 572132. Gross cost was relatively higher for large farmers and lower for small farmers and average gross costs for all sampled farmers was Tk 221125. Per hectare net return was the highest for small farmers and the lowest for large farmers and average net return for all sampled farmers was Tk 351007 (Figure 1 and Table 1).

Small farmers, as stated before, spent more time, supervised farm activities more intensively and efficiently. On the other hand, large farmers had very little time to manage and supervise bean farming activities. For that reason gross cost of per hectare bean production was relatively higher and net return was lower for large farmers.

Table 1 : Per Hectare Profitability of Commercial Bean Production of Small, Medium, Large and All Farmers of the Study Area

Items	Return/cost of bean farmers (Tk/ha)			
	Small	Medium	Large	All
A. Gross Returns				
Main product (bean)	568187.0 (100.0)	573295.0 (100.0)	574914.0 (100.0)	572132.0 (100.0)
Total	568187.0 (100.0)	573295.0 (100.0)	574914.0 (100.0)	572132.0 (100.0)
B. Gross Costs				
Power tiller	3200.00 (1.51)	3200.0 (1.42)	3200.0 (1.38)	3200.0 (1.45)
Seeds	10346.0 (4.88)	7560.0 (3.35)	7290.0 (3.15)	8400.0 (3.80)
Hired labour	34000.0 (16.03)	88000.0 (38.96)	125000.0 (53.94)	82500.0 (37.31)
Family labour	100000.0 (47.15)	52000.0 (23.02)	17500.0 (7.55)	56500.0 (25.55)
Urea	3592.0 (1.69)	3347.0 (1.48)	4404.0 (1.90)	3781.0 (1.71)
TSP	4575.0 (2.16)	5024.0 (2.22)	5846.0 (2.52)	5141.0 (2.33)
MOP	1252.0 (0.59)	1535.0 (0.68)	1491.0 (0.64)	1426.0 (0.64)
Gypsum	356.0 (0.17)	301.0 (0.13)	468.0 (0.20)	372.0 (0.17)
Borax	1078.0 (0.52)	1632.0 (0.72)	1722.0 (0.74)	1478.0 (0.67)
Manure	1733.0 (0.82)	2019.0 (0.89)	2097.0 (0.90)	1949.0 (0.88)
Water charge	3233.0 (1.52)	3289.0 (1.46)	6664.0 (2.88)	4395.0 (1.99)
Insecticides	33710.0 (15.89)	40334.0 (17.86)	41072.0 (17.72)	38373.0 (17.35)
Fencing cost	8856.0 (4.18)	11072.0 (4.90)	8253.0 (3.56)	7169.0 (3.24)
Interest on operating capital	6178.0 (2.91)	6579.0 (2.91)	6750.0 (2.91)	6441.0 (2.91)
Total	212110.0 (100.0)	225892.0 (100.0)	231757.0 (100.0)	221125.0 (100.0)
C. Net Return (A-B)	356077.0	347403.0	343156.0	351007.0

Source: Adapted from Amin (2013).

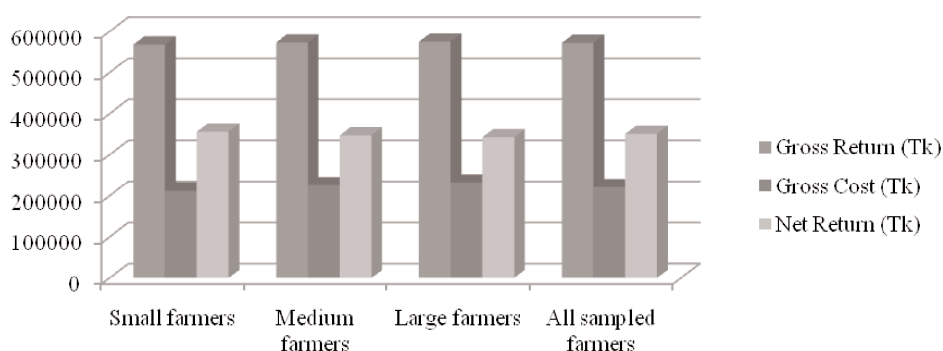
Note: Figures in parentheses indicate percentages of total gross return/gross costs.

4. Impacts of Bean Farming on Livelihoods

Livelihood assets

“A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from

Figure 1 Comparative Profitability of Small, Medium, Large and All Sampled Farmers



stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (DFID 2000). A livelihood is the set of capabilities, assets, and activities that furnish the means for people to meet their basic needs and support their well being. Therefore the SLF (Sustainable Livelihood Framework) identifies five types of assets or capitals upon which livelihoods are built, namely human capital, social capital, natural capital, physical capital and financial capital.

Table 2 shows the improvement of livelihood assets of all categories of selected farmers. Human capital increased 66.40, 65.00, 54.67 and 63.00 percent for small, medium, large and all sampled farmers, respectively. Social capital improvement in the case of small, medium, large and all sampled farmers were 63.33, 66.67, 57.78 and 63.06 percent, respectively. Physical capital increased 43.00, 40.63, 41.67 and 42.50 percent in the case of small, medium, large and all sampled farmers, respectively. Natural capital increased 42.00, 22.22, 15.00 and 28.00 percent in the case of small, medium, large and all sampled farmers, respectively. The corresponding increases in financial capital for small, medium, large and all sampled farmers were 52.00, 61.67, 62.22 and 57.78 percent. Table 2 also reveals that all kinds of livelihood assets for 53.37, 51.24, 46.27 and 50.86 percent of small, medium, large and all sampled farmers, respectively, increased due to commercial bean cultivation in Ishwardi Upazila of Pabna District.

5. Problems of Commercial Bean Farming

Multiple problems are faced by individual farmers in conducting commercial bean farming. All these problems are summarized and presented in Table 3. It is evident from the study that commercial bean farming was a bit expensive for all

Table 2 : Improvement of Livelihood Assets

(All are in percentage of respondents' number)

Livelihood assets	Small farmer	Medium farmer	Large	All sampled
Human capital	66.40	65.00	54.67	63.00
Social capital	63.33	66.67	57.78	63.06
Physical capital	43.00	40.63	41.67	42.50
Natural capital	42.00	22.22	15.00	28.00
Financial capital	52.00	61.67	62.22	57.78
Overall	53.37	51.24	46.27	50.86

Source: Adapted from Appendix Tables 1, 2, 3, 4 and 5.

categories of farmers. The selected farmers were economically not quite capable of investing the required amount for producing commercial bean due to shortage of financial capital. Farmers generally complained of inadequate supply of institutional credit in the study area. Since commercial bean farming is a new technique of production for them, they have had insufficient knowledge on scientific method of the bean cultivation. Table 3 shows that on an average 85.0 percent of respondents complained of this problem. At the beginning of the crop season per unit price of bean was quite attractive, but this price varied from one week to another during the whole production period. The volatile price of the bean is, therefore, one of the biggest problems for local commercial farmers. In fact, 83.33 percent of farmers reported about this problem. Shortage of human labour and high wage rate were also some common problems and constraints faced by the farmers in the study area. Lack of good transportation system is another knotty problem for bean growers. If these facilities could be improved the commercial producers could have earned a much higher price from bean farming.

6. Policy Recommendations and Conclusion

Bean production is a highly profitable enterprise and it can generate income earnings and employment opportunity to the rural people of Bangladesh. Some policy recommendations based on the findings and conclusions of the study are presented below:

Table 3 : Major Problems Faced by Commercial Bean Producers

Nature of problem	Percentages of respondent farmers			
	Small	Medium	Large	All
Lack of financial capital	76.00	55.00	26.67	56.67
Inadequate institutional credit	88.00	70.00	53.00	73.33
Lack of knowledge about scientific production techniques	92.00	80.00	80.00	85.00
Shortage of human labour	36.00	60.00	80.00	55.00
High wage rate of labour	80.00	75.00	73.33	76.67
High price of insecticides	72.00	65.00	53.33	65.00
Scarcity of HYV seeds	48.00	65.00	53.33	55.00
Volatile price of bean	96.00	85.00	60.00	83.33
Transportation problem	20.00	30.00	33.33	26.67

Source: Adapted from Amin (2013).

- i. Since commercial bean production is highly profitable, all financial institutions or commercial banks can provide credit at a reasonable rate of interest to the commercial bean producers;
- ii. It is evident from the study that farmers have had very little scientific knowledge about commercial bean cultivation, very short duration training on the method of commercial bean farming should be imparted to the interested local farmers by the extension personnel and/or NGO officials for the greater interest of bean farmers and improving overall livelihood status of the farmers;
- iii. Labour shortage during the production period of bean and high wage rate of labour is one of the biggest problems for the farmer, because commercial bean farming is highly labour intensive. The concerned scientists may pay immediate attention to this problem and cost-effective labour-saving technology could be developed so that per unit cost of bean production could drastically be reduced. Thus, per hectare profit of commercial bean farmers could be increased substantially;

- iv. Since good quality seed plays a significant role on bean yield, both the concerned government and private institutions should ensure availability of good quality HYV of bean seeds at the door steps of farmers at a reasonable per unit price; and
- v. Transportation and communication facilities are not quite conducive for the most efficient marketing in the study area. Policy makers must pay immediate attention to solve this problem of commercial bean farmers.

From the major findings of the study, it can be said that commercial bean farming is highly profitable. Socioeconomic wellbeing of commercial bean growers in the study area is amazing, found to be very well and satisfactory. It can, therefore, be concluded that production of commercial bean is profitable and helpful for improving the livelihood status of all categories of farmers. A considerable scope apparently exists to increase the productivity of commercial bean, therefore income, employment, nutritional status and overall livelihood status of farmers in the study area as well as other potential areas of Bangladesh. It also helps to ameliorate the problem of gender issue by enabling the women to participate in income generating activities and household decision making process in rural areas. The management practices of commercial bean farming in the study area were not found efficient enough. Farmers have least idea about the application of inputs in right time with right doses, especially about insecticides which is very sensitive for yield and human health as well. Consequently, they used either over or under doses of some inputs. Despite this fact, there is ample scope to increase per hectare yield of this potential crop by introducing scientific methods and high yielding variety. Efficient production and cost-effective management training in light of the observed problems, needs, goals and resource base can lead to viable production practices and sustainable income and therefore livelihood improvement from commercial bean production.

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Appendix Table 1 Changes in Human Capital
(All are in percentage of respondents' number)

Components	Small farmers (25)			Medium farmers (20)			Large farmers (15)			All sampled farmers (60)		
	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged
Health and sanitation	88.00	12.00	0.00	60.00	10.00	30.00	46.67	26.67	26.67	68.33	25.00	16.67
	(22)	(3)	(0)	(12)	(2)	(6)	(7)	(4)	(4)	(41)	(9)	(10)
Education	92.00	0.00	8.00	90.00	0.00	10.00	80.00	0.00	20.00	88.33	0.00	11.67
	(23)	(0)	(2)	(18)	(0)	(2)	(12)	(0)	(3)	(53)	(0)	(7)
Training	20.00	0.00	80.00	25.00	0.00	75.00	20.00	0.00	80.00	21.67	0.00	78.33
	(5)	(0)	(20)	(5)	(0)	(15)	(3)	(0)	(12)	(13)	(0)	(47)
Knowledge/efficiency	72.00	0.00	28.00	65.00	0.00	35.00	73.33	0.00	26.67	70.00	0.00	30.00
	(18)	(0)	(12)	(13)	(0)	(7)	(11)	(0)	(4)	(42)	(0)	(18)
Access to information	60.00	0.00	40.00	85.00	5.00	10.00	53.33	6.67	40.00	66.67	3.33	30.00
	(15)	(0)	(10)	(17)	(1)	(2)	(8)	(1)	(6)	(40)	(2)	(18)

Note: Figure within the parenthesis indicate respondent numbers
Source: Adapted from Amin (2013).

Appendix Table 2 Changes in Social Capital
(All are in percentage of respondents' number)

Components	Small farmers (25)			Medium farmers (20)			Large farmers (15)			All sampled farmers (60)		
	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged
Involved in social	36.00	12.00	52.00	70.00	5.00	25.00	66.67	6.67	26.67	55.00	8.33	36.67
group/activities	(9)	(3)	(13)	(14)	(1)	(5)	(10)	(1)	(4)	(33)	(5)	(22)
Political	24.00	0.00	76.00	45.00	25.00	30.00	40.00	6.67	53.33	35.00	10.00	55.00
involvement	(6)	(0)	(19)	(9)	(5)	(6)	(6)	(1)	(8)	(21)	(6)	(33)
Self-managerial	88.00	12.00	0.00	75.00	0.00	25.00	66.67	0.00	33.33	78.33	5.00	16.67
capability	(22)	(3)	(0)	(15)	(0)	(5)	(10)	(0)	(5)	(47)	(3)	(10)
Social prestige	80.00	4.00	16.00	55.00	5.00	40.00	33.33	46.67	20.00	60.00	15.00	25.00
Decision making	(20)	(1)	(4)	(11)	(1)	(8)	(5)	(7)	(3)	(36)	9	15
ability	84.00	8.00	8.00	60.00	5.00	35.00	80.00	0.00	20.00	75.00	5.00	20.00
Women	(21)	(2)	(2)	(12)	(1)	(7)	(12)	(0)	(3)	(45)	(3)	(12)
empowerment	68.00	0.00	32.00	95.00	0.00	5.00	60.00	0.00	40.00	75.00	0.00	25.00
	(17)	(0)	(8)	(19)	(0)	(1)	(9)	(0)	(6)	(45)	(0)	(15)

Note: Figures within the parenthesis indicate respondent numbers

Source: Adapted from Amin (2013).

Appendix Table 3 Changes in Physical Capital
(All are in percentage of respondents' number)

Items	Small farmers (25)			Medium farmers (20)			Large farmers (15)			All sampled farmers (60)		
	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged
Housing	20.00	0.00	80.00	30.00	0.00	70.00	40.00	0.00	60.00	28.33	0.00	71.67
Building	(5)	(0)	(20)	(6)	(0)	(14)	(6)	(0)	(9)	(17)	(0)	(43)
Tin roof	76.00	8.00	16.00	45.00	0.00	55.00	60.00	6.67	33.33	61.67	5.00	33.33
	(19)	(2)	(4)	(9)	(0)	(11)	(9)	(1)	(5)	(37)	(3)	(20)
Agricultural equipments	0.00	0.00	100.00	25.00	10.00	65.00	33.33	20.00	46.67	16.67	8.33	75.00
Bicycle/motorcycle/ motor van	(0)	(0)	(25)	(5)	(2)	(13)	(5)	(3)	(7)	(10)	(5)	(45)
Electricity	68.00	0.00	32.00	40.00	15.00	45.00	46.67	0.00	53.33	53.33	5.00	41.67
	(17)	(0)	(8)	(8)	(3)	(9)	(7)	(0)	(8)	(32)	(3)	(25)
TV/Radio/VCD/ DVD	48.00	0.00	52.00	35.00	0.00	65.00	13.33	0.00	86.67	35.00	0.00	65.00
	(12)	(0)	(13)	(7)	(0)	(13)	(2)	(0)	(13)	(21)	(0)	(39)
Cable network	32.00	0.00	68.00	60.00	0.00	40.00	13.33	0.00	86.66	33.33	0.00	66.67
	(8)	(0)	(17)	(12)	(0)	(8)	(2)	(0)	(13)	(20)	(0)	(40)
Mobile phone	24.00	0.00	76.00	15.00	0.00	85.00	40.00	0.00	60.00	33.33	0.00	66.67
	(6)	(0)	(19)	(3)	(0)	(17)	(6)	(0)	(9)	(20)	(0)	(40)
	76.00	0.00	24.00	75.00	10.00	15.00	86.67	6.67	6.67	78.33	5.00	16.67
	(19)	(0)	(6)	(15)	(2)	(3)	(13)	(1)	(1)	(47)	(3)	(10)

Note: Figures within the parenthesis indicate respondent numbers
Source: Adapted from Amin (2013).

Appendix Table 4 Changes in Natural Capital
(All are in percentage of respondents' number)

Items	Small farmers (25)			Medium farmers (20)			Large farmers (15)			All sampled farmers (60)		
	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged
Cultivable land	40.00	0.00	60.00	30.00	0.00	70.00	40.00	0.00	60.00	36.67	0.00	60.00
(own)	(10)	(0)	(15)	(6)	(0)	(14)	(6)	(0)	(9)	(22)	(0)	(9)
Cultivable land	44.00	0.00	56.00	20.00	0.00	80.00	0.00	0.00	100.00	25.00	0.00	100.00
(leased)	(11)	(0)	(14)	(4)	(0)	(16)	(0)	(0)	(15)	(15)	(0)	(15)
Pond	0.00	16.00	84.00	0.00	15.00	85.00	13.33	20.00	66.67	3.33	16.67	66.67
	(0)	(4)	(21)	(0)	(3)	(17)	(2)	(3)	(10)	(2)	(10)	(10)
Tube-well	84.00	0.00	16.00	40.00	0.00	60.00	6.67	0.00	93.33	50.00	0.00	93.33
water access	(21)	(0)	(4)	(8)	(0)	(12)	(1)	(0)	(14)	(30)	(0)	(14)

Note: Figures within the parenthesis indicate respondent numbers
Source: Adapted from Amin (2013).

Appendix Table 5 Changes in Financial Capital
(All are in percentage of respondents' number)

Items	Small farmers (25)			Medium farmers (20)			Large farmers (15)			All sampled farmers (60)		
	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Decreased	Unchanged
Cash in hand	76.00 (19)	12.00 (3)	12.00 (3)	75.00 (15)	5.00 (1)	20.00 (4)	100.00 (15)	0.00 (0)	0.00 (0)	81.67 (49)	6.67 (4)	11.67 (7)
Savings	40.00 (10)	0.00 (0)	60.00 (15)	45.00 (9)	10.00 (2)	45.00 (9)	40.00 (6)	33.33 (5)	26.67 (4)	41.67 (25)	11.67 (7)	46.67 (28)
Jewelry	40.00 (10)	0.00 (0)	60.00 (15)	65.00 (13)	0.00 (0)	35.00 (7)	46.67 (7)	33.33 (5)	20.00 (3)	50.00 (30)	8.33 (5)	41.67 (25)

Note: Figures within the parenthesis indicate respondent numbers
Source: Adapted from Amin (2013).