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Production of vegetables on pond dike: utilization of fallow lands

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Abstract: The field study was conducted in Mymensingh, Tangail and Gazipur districts under the working areas of Rural Enterprise for Alleviating Poverty (REAP) Project during the period from April-December 2010 to proper utilization of pond dikes, increase income and change the livelihood status of the poor farmers by cultivating high value vegetables. The results of the study showed significant different among the farmers. F4 had maximum cost of production (BDT 3140) and F14 had minimum (BDT 470). F18 cultivated papaya and he got the highest yield per hectare, which was 95507 Kg. F4 made highest profit (583%) and F16 made lowest profit (136%).
Key words: Vegetables, pond dike and fallow lands.

Introduction

Vegetables are considered as one of the most important groups of food crops due to their high nutritive value, relatively higher yield and higher return. Current vegetable production in Bangladesh is considerably below domestic demand. Whereas, vegetable production is around 1.8 million MT, demand is estimated to be 10 million MT. This demand-supply gap is likely to expand with the increase of population and increase in per capita income (Katalyst: Vegetables).

With an average national per capita consumption of 23 g of leafy vegetables, 89 g of non-leafy vegetables and 14 g of fruit, the average Bangladeshi eats a total of 126 g of fruit and vegetables daily. This is far below the minimum daily consumption of 400 g of vegetables and fruit recommended by FAO and the World Health Organization (WHO).

This big gap is the main reason for widespread malnutrition. Cultivable land is a scarce resource in densely populated Bangladesh, which is mostly employed for production of rice and other field crops. Vegetables occupy 16% of the total cultivated land area of Bangladesh (BBS, 2006). Besides, our cultivable land is decreasing day by day as compensation to our extreme population. That is why, it is very difficult for us to produce more vegetables from the existing lands but we have huge amount of fallow lands like pond dikes, land levees, roadsides, homestead etc. which have great potentiality to produce crops. If we can bring these lands under vegetables cultivation, huge amount of vegetables will be produced every year. Moreover, poor farmers will be able to increase their income and change their livelihood status by selling the vegetables in the market after meeting up their family requirements (Bouis, 2000). Considering the above information the present study was conducted to proper utilization of pond dikes and change the livelihood status of the poor farmers by cultivating high value vegetables on the fallow lands.

Materials and Methods

The field study was conducted during the period from April-December 2010 in Mymensingh, Tangail and Gazipur districts under the working areas of Rural Enterprise for Alleviating Poverty (REAP) Project. REAP is an integrated aquaculture-agriculture project implemented by Winrock International with the objectives to reduce poverty, increase income and employment among rural farmers through the introduction of high value prawn-carp aquaculture and horticulture in 11 upazilas of Mymensingh, Tangail and Gazipur districts. For this study, 20 farmers were selected who must have pond with suitable dike for vegetables cultivation. Before starting the study, the selected farmers were trained on improved production and management practices of vegetables in fallow lands. The vegetables ridge gourd, bitter gourd, bottle gourd, snake gourd, wax gourd, papaya and country bean were selected on the basis of soil and climatic condition and farmers demand. Most of the inputs were provided by the Project and farmers provided only cow dung as input material and bamboos for preparation of trellis. Cultivation was done on the pond dike following pit method. Pit to pit distance was 1.5-2.00 m and pit size was 45 cm × 45 cm × 45 cm. Fertilizer was applied for the vine crops at the rate of Cow Dung 24,700 kg/ha, Urea 124 kg/ha, Triple Super Phosphate (TSP) 173 kg/ha, Muriate of Potash (MOP) 124 kg/ha, Boron 37 kg/ha, Gypsum 37 kg/ha and Zinc 37 kg/ha. During land preparation the whole quantity of Cow Dung, TSP, Boron, Gypsum and Zinc were applied in the pit and kept it for 7 days in order to decompose all the materials. After 7 days all the materials were mixed well, clods were broken and the grass and other debris were removed and finally the seeds were sown in the pit. 3 seeds were sown per pit. At the age 15 days, keeping 1 healthy seedling remaining 2 were removed from the pit for getting vigorous and healthy plant. Urea and TSP were applied in two equal installments at 25 days after seed sowing. Pesticides were applied depending on pest and disease attack. After 20 days of seed sowing, trellis were prepared using bamboo, rope, plastic thread etc. All the cultural practices were carried out uniformly. Mature fruits at the edible stage were harvested and sold in the market. Data of different parameters such as number of pit, number of plant, input cost, yield per plant, selling price, income, net profit etc. were recorded and analyzed.

Results and Discussion

Most of the farmers were selected from Mymensingh for cultivating vegetables on the pond dike. Out of 20 farmers 11 were from Mymensingh and out of the 11 farmers 2 cultivated ridge gourd, 2 bitter gourd, 3 bottle gourd, 1 snake gourd, 1 papaya, 1 country bean and 1 farmer cultivated wax gourd. From Tangail, 7 farmers were selected and out of them 1 cultivated wax gourd, 2 bottle gourd, 1 ridge gourd, 1 country bean and 2 farmers cultivated papaya. From Gazipur, 1 farmer cultivated bitter gourd and 1 farmer cultivated country bean on their pond dike. Average pond dike area of the farmers was 2.90 decimal and the range was 1 to 8 decimal. F4 had highest pond dike area and it was 8 decimal. F14 and F16 each

had lowest pond dike area, which is 1 decimal. Average number of pit per farmer was 29.40 and the range was 10 to 80. F4 had highest number of pits, which were 80 and F14 and F16 each had the lowest number of pits, which were 10 of each. The range of plant number per farmer was 16 to 144. F4 had the highest number of plant (144) and F14 had the lowest number of plant (16). Average yield per plant varied from crop to crop and farmer to

Table 1. Yield performance of selected vegetables

Farmer	Growing region	Name of vegetable	Area (decimal)	No. of pit	No. of plant	Average yield/plant (kg)	Total yield (kg/ha)
F1	Mymensingh	Ridge gourd	3	30	45	11	39,108
F2	Mymensingh	Bitter gourd	4	40	64	3	11,980
F3	Mymensingh	Ridge gourd	2	15	21	7	24,371
F4	Mymensingh	Bottle gourd	8	80	144	15	64,776
F5	Mymensingh	Snake gourd	2	15	24	9	36,062
F6	Mymensingh	Papaya	3	30	30	22	53,599
F7	Mymensingh	Bottle gourd	5	50	100	9	46,140
F8	Mymensingh	Bottle gourd	3	30	60	9	43,637
F9	Mymensingh	Bitter gourd	3	30	60	2	10,374
F10	Mymensingh	Country Bean	2	20	40	5	23,589
F11	Mymensingh	Wax gourd	6	60	102	6	42,402
F12	Tangail	Wax gourd	4	40	53	7	40,385
F13	Tangail	Bottle gourd	2	15	22	14	48,741
F14	Tangail	Ridge gourd	1	10	16	11	43,225
F15	Tangail	Country Bean	2	20	26	5	16,673
F16	Tangail	Bottle gourd	1	10	22	5	24,700
F17	Tangail	Papaya	3	30	30	27	67,678
F18	Tangail	Papaya	2	23	23	25	95,507
F19	Gazipur	Bitter gourd	2	20	40	3	13,832
F20	Gazipur	Country Bean	2	20	40	4	18,278
Mean			2.90	29.40	48.08	9.90	36,596

F= Farmer

Table 2. Area wise cost of production, income and net profit of 20 farmers

Farmer	Area (decimal)	Cost of production (BDT)					Income (BDT)	Net profit	
		Land preparation*	Seed	Trellis	Pesticide	Total		(BDT)	(%)
F1	3	320	120	600	300	1,340	7,540	6,200	463
F2	4	420	260	450	100	1,230	3,744	2,514	204
F3	2	160	120	300	200	780	3,540	2,760	354
F4	8	840	400	1,400	500	3,140	21,452	18,312	583
F5	2	160	60	300	100	620	3,254	2,634	425
F6	3	320	360	0	200	880	4,230	3,350	381
F7	5	520	240	750	200	1,710	6,894	5,184	303
F8	3	320	160	450	150	1,080	3,295	2,215	205
F9	3	320	200	400	200	1,120	2,960	1,840	164
F10	2	210	30	300	100	640	3,758	3,118	487
F11	6	620	100	900	200	1,820	7,210	5,390	296
F12	4	420	100	600	100	1,220	5,415	4,195	344
F13	2	160	160	300	100	720	3,245	2,525	351
F14	1	110	60	200	100	470	2,163	1,693	360
F15	2	210	30	300	100	640	3,045	2,405	376
F16	1	110	80	200	100	490	1,156	666	136
F17	3	320	360	0	200	880	4,652	3,772	429
F18	2	160	240	0	200	600	3,280	2,680	447
F19	2	210	140	300	200	850	2,675	1,825	215
F20	2	210	30	380	100	720	4,235	3,515	488
Mean	2.90	306	163	407	173	1,048	4,887	3,840	367

*Including cost of manure, fertilizer and labor for pit preparation

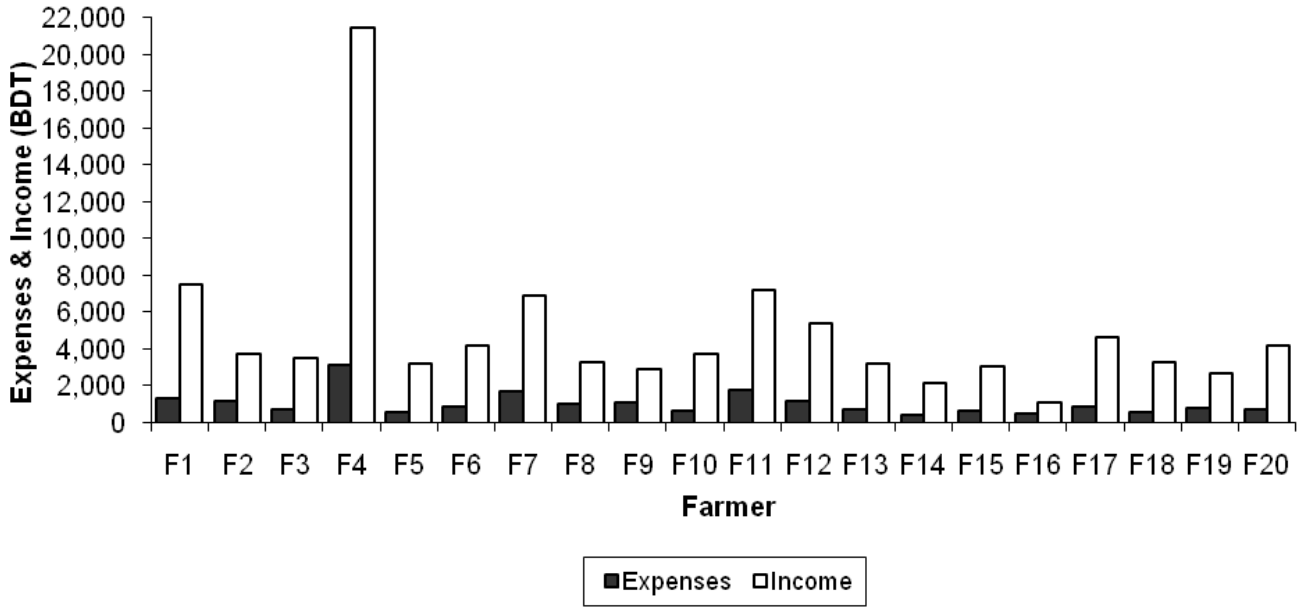

Fig. 1. Expenditure and income of 20 farmers

farmer. F17 cultivated papaya and he had the highest yield per plant (27 Kg). On the other hand, F9 cultivated bitter gourd and he got the lowest yield per plant (2 Kg). Kabir *et al.* (2007) conducted a similar study on pond dike in Mymensingh region and found significant result. Average yield per hectare was found 36,596 Kg. F18 cultivated papaya and he got the highest yield per hectare, which was 95,507 Kg. F9 cultivated bitter gourd and he got yield 10,374 Kg/ha (Table 1, Fig. 1).

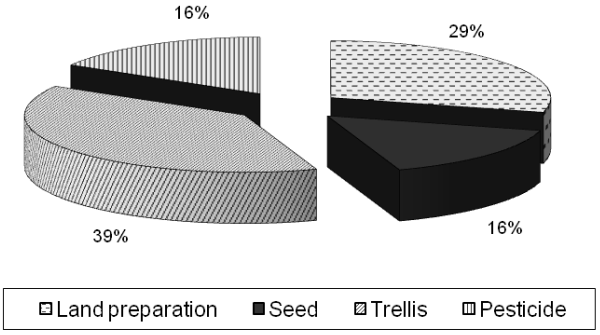

Fig. 2. Cost of production in different heads

Cost of production includes cost of land preparation, manure and fertilizer, seed, trellis preparation and pesticide application for controlling pest and disease are presented in table 2. It was found that F4 had highest cost of production in land preparation, which was BDT 840. F14 and F16 had lowest cost of production in land preparation, which was BDT 110. F4 had the highest cost of production in seed purchasing, which was BDT 400. F10, F15 and F20 each had lowest cost in purchasing seed, which was BDT 30. F4 had the highest cost of production in trellis preparation and it was BDT 1,400. F14 and F16 each had the lowest cost of production in trellis preparation, which was BDT 200. Ruddle and Zhong (1988) observed similar type of result in pond dike vegetables cultivation. But F6, F17 and F18 had no cost of production in trellis preparation because they cultivated papaya on pond dike and had no need to prepare trellis. Pesticide was applied to control different pests and diseases. Highest cost in pesticide purchasing was BTD 500 and lowest was BDT 100. It was found that F4 had maximum cost of production (BDT 3,140) and F14 had minimum (BDT 470). Highest cost of production involved in trellis preparation, which was 39% and lowest in seed purchase, which was 16% (Fig. 2). F4 had highest income and F16 had lowest income. F4 made highest net profit BDT 18,312 and F14 made lowest net profit BDT 1,693 (Table 2). Ali *et al.* (2001) found similar type of result and encouraged more farmers in pond dike vegetables cultivation. F4 made highest profit percent (583%) and F16 made lowest profit percent (136%).

The area under vegetable cultivation in Bangladesh is very small and we can not meet up our daily requirement of vegetables according to our demand. We have huge amount of fallow lands in our country and these are pond dikes, land levees, roadsides, homestead fallow lands etc. We should bring these fallow lands under vegetables cultivation by applying improved production and management technology. From this study it was found that F4 cultivated bottle gourd in 8 decimal of pond dike. His cost of production was BDT 3,140 and net profit was BDT 18,312, which was 583%. Based on the result of the study we should motivate the farmers to proper utilize their fallow land by cultivating different high value vegetables to meet up their nutritional requirement. If the farmers bring their fallow lands by cultivating vegetables they would be able to meet their daily vegetable requirement, increase their income by selling the vegetables and finally, change their livelihood status.

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