Identifying Profitable Urban Markets for Vegetables from Rural Areas: A study in the Northern Part of Bangladesh

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Abstract

This study identifies profitable markets through analyzing net margins/incomes received by farmers in a study in the northern part of Bangladesh. It shows that markets used by farmers depended upon scale of operation. Landless and small farmers were mostly confined to the primary markets and to a limited extent, the secondary markets but medium and large farmers used secondary and also terminal markets and their net margins were higher than those of the landless and small farmers. Net margins/incomes increased for all farmers compared to the past through using profitable markets. The construction of the Jamuna Bridge helped farmers and traders to interlink trading activities up to the capital city and increased the number of buyers in the primary and secondary markets. Marketing flow increased from rural to urban markets, raising farmers' incomes and contributing to farm development in the rural areas.

Keywords: marketing, new channels, net margins, Bangladesh

I Introduction

Identification of profitable markets by farmers is of great importance in realising high product prices. The northern part of Bangladesh has abundant crop resources including rice, maize, fruits, vegetables, etc. but in the past, lack of good marketing networks including transportation from rural to urban markets were major barriers to getting good product prices. Farmers and traders faced difficulties transporting products from this part to the eastern part or terminal market of the capital city Dhaka. The Jamuna River was the principal barrier in transportation to Dhaka or other distant markets. The farmers/traders used to spend 8/9 hours or even one or more days waiting on the eastern bank (Nagarbari) of the Jamuna River with loaded trucks, which caused vegetables to rot and affected prices. Usually, farmers sold their products in the nearest markets at lower prices. But after construction of the 4.8 km braided Jamuna Bridge in 1998, farmers could sell produce in the local and distant markets. There was also a greater number of middlemen and traders from outside areas, resulting in an increasing demand for produce. As a result, the northern agriculture has become a part of a wider market. Changes in the marketing network with increasing product prices altered farmers` economic situations and vegetables now form a major share of their income. Farmers` incomes are as varied as their land resources. For this study farmers were classified as follows: landless (0-0.49 acres), small (0.50-2.49 acres), medium (2.50-7.49 acres) and large (7.50 acres and above). Generally, landless and small farmers

have fewer resources than medium and large farmers.

Studies had been conducted on profitable markets and related issues in the study areas. Adhikary et. al (2001) undertook a study on production of various crops, gross margins, identifying transported goods, etc. in the whole northern part from a selected sample of farmers. The study showed increased farmer's margins, calculated by the differences between retail and farm gate prices. In that study, village based marketing networks, transportation costs, identification of profitable markets through net margins or net incomes received by farmers had not been considered. Therefore, this study attempts to identify the profitable markets through analysing net margins and net incomes received by farmers from case studies on vegetables covering different marketing arrangements.

II Methodology

The study was conducted in the Bogra District in the northern part of Bangladesh covering four villages under Amrool Union—Demazani, Poranbari, Jhalopara, and Kundoish. The study area is 16 km from Bogra District headquarters, 8 km from a business center Sherpur Upazila; 90 km from the Jamuna Bridge, and 215 km from the capital city Dhaka. The data were collected in August-September 2003 and compared to data for 1998. A total of 79 farmers, comprising 10 landless, 38 small, 24 medium and 7 large farmers, were interviewed in four selected villages using structured questionnaires. Several case studies were also conducted with farmers. Here, one case study on cultivation and marketing of potato has been analysed for different farmers comparing the years 2003 and 1998. The other study was on cucumbers in 2003. Each case study covers four farmers taking one each from landless (LL), small (SF), medium (MF) and large (LF) farmers highlighting production, marketing, net margins, income, etc. Besides, focus and open discussion were followed among the farmers/traders.

III Findings and Discussion

During the period from 1998 to 2003 a remarkable change in the northern part of Bangladesh was the construction of the Jamuna Bridge, which influenced the marketing of vegetables in terms of markets, buyers, selling quantities, means of transports and costs, net margins and net incomes, etc. These have been analysed below. Findings have been reported in three areas —the first on marketing of main vegetables by all the farmers, the second and third on production and marketing of potatoes and cucumbers respectively.

Part 1

(1) Marketing of Vegetables

1.1 Marketing Network for Vegetables

1.1.1 Markets and Selling of Vegetables by Different Farmers

In Bangladesh, a group of villages constitute a Union and Unions form an Upazila or District. Generally, markets surround or are near to these units and can be classified into three types—Primary, Secondary and Terminal. **Primary markets** are the principal centres for exchanging crops in the rural areas. They include Demazani and Noimail markets under Union level, usually held twice a week. The study villages surround Demazani within distances of 0.5—1 km. Noimail is a major roadside market, situated on both sides of the Dhaka-Bogra highway, where farmers and traders gather from surrounding Unions, Upazilas and other Distant markets. Demazani is 2.5 km from Noimail. **Secondary Markets** serve as wholesale outlets and also operate as assembly centers, and are a distribution mechanism from rural to urban centres. They includes Sherpur and Foteh Ali markets under Sherpur Upazila and Bogra District respectively. A **Terminal Market** is the major contact point between rural and

urban markets and includes the market Kawran Bazaar of the capital city Dhaka. Here, products are assembled from inside or outside of Dhaka, which are subsequently distributed to various retail markets. Figure 1 shows the markets Noimail, Sherpur and Kawran Bazaar that lie in one direction with Kawran Bazaar reached by crossing the Jamuna River; District market Foteh Ali is in the opposite direction.

Figure 1 Routes of the Markets from the Villages

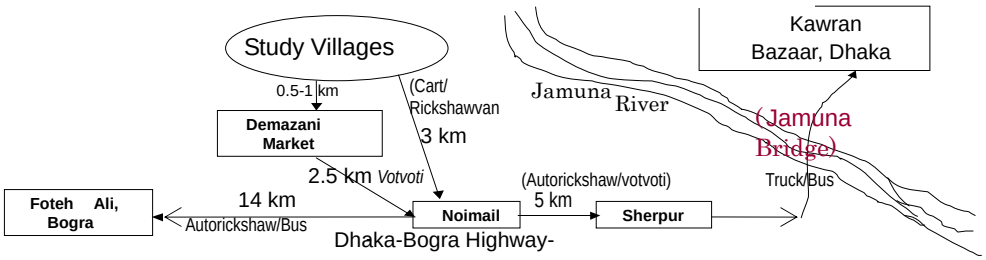


Table 1 shows the selling weights and vegetables prices for different markets. Sale volumes in Noimail, Foteh Ali and Kawran Bazaar were higher in 2003 than in 1998. They increased from a total of 48.02 to 141.78 metric tons (mt), from 3.90 to 33.20 mt and from 1.83 to 39.01 mt respectively. Volume increased 2.95, 8.51 and 21.32 times respectively compared to 1998 because of greater demands due to increasing number of buyers, easier access from nearer and distant markets and improved communication. Especially, Foteh Ali and Kawran Bazaar became more important from daily demand by Bogra town and capital city residents and the opportunities in Kawran Bazaar after the construction of the Jamuna Bridge. The opposite was observed in Sherpur market where volume fell from 66.96 to 40.58 mt. In the case of selling prices, average price was the highest (Tk 10.83/kg) in Kawran Bazaar. In 2003, price differential increased more (from Tk 5.24 to 6.32/kg) in Noimail than in Sherpur market (from Tk 6.12 to 6.88/kg) and the share of the total prices was the highest in Noimail (43.8%), followed by Kawran Bazaar (20.7%), Sherpur (14%), Foteh Ali (12.9%) and Demazani (8.7%), but it was reduced from 51.8% to 14% in Sherpur. So, here Noimail was mostly operated by the farmers and Kawran Bazaar and Foteh Ali also got especial importance to farmers.

Table I Distribution of selling weights and prices of vegetables by different markets and farmers

	Farmers	Demazani				Noimail				Sherpur				Foteh Ali				Kawran Bazaar				Total	
		Wt (mt)	Price (Tk)	%	Avg Prc	Wt (mt)	Price (Tk)	%	Avg Prc	Wt (mt)	Price (Tk)	%	Avg Prc	Wt (mt)	Price (Tk)	%	Avg Prc	Wt (mt)	Price (Tk)	%	Avg Prc	Wt (mt)	Price (Tk)
The Year 1998	LL	1.72	7809	26.3	4.54	2.58	13210	44.5	5.12	1.43	8652	29.2	6.05	-	-	-	-	-	-	-	-	5.73	29670
	SF	8.22	38141	17	4.64	16.44	85159	38	5.18	15.64	95404	42.6	6.1	0.8	5120	2.3	6.4	-	-	-	-	41.1	223824
	MF	7.51	33945	10.2	4.52	18.75	99750	30	5.32	29.03	177664	53.3	6.12	1.5	9750	2.9	6.5	1.83	11913	3.6	6.51	58.62	333022
	LF	2.65	12084	5.9	4.56	10.25	53505	26.2	5.22	20.86	128289	62.8	6.15	1.6	10560	5.2	6.6	-	-	0	-	35.36	204438
	Total	20.1	91979	11.6	4.58	48.02	251624	31.8	5.24	66.96	410008	51.8	6.12	3.9	25430	3.2	6.52	1.83	11913	1.5	6.51	140.81	790954
The Year 2003	LL	2.1	11760	16.4	5.6	7.34	45508	63.6	6.2	2.07	14233	19.9	6.87	-	-	-	-	-	-	-	-	11.51	71501
	SF	17.7	97958	16.1	5.55	56.85	355313	58.3	6.25	11.62	79713	13.1	6.86	6.5	51025	8.4	7.85	2.4	25392	4.2	10.58	95.02	609400
	MF	8.5	47770	6.5	5.62	42.09	269376	36.4	6.4	14.8	102120	13.8	6.9	15.9	125610	17	7.9	18.2	194740	26.3	10.7	99.49	739616
	LF	3.67	20479	3.3	5.58	35.5	225425	36.1	6.35	13.09	90059	14.4	6.88	10.8	86400	13.8	8	18.41	202510	32.4	11	81.47	624873
	Total	31.9	177966	8.7	5.58	141.8	895622	43.8	6.32	41.58	286126	14	6.88	33.2	263035	12.9	7.92	39.01	422642	20.7	10.83	287.49	2045390

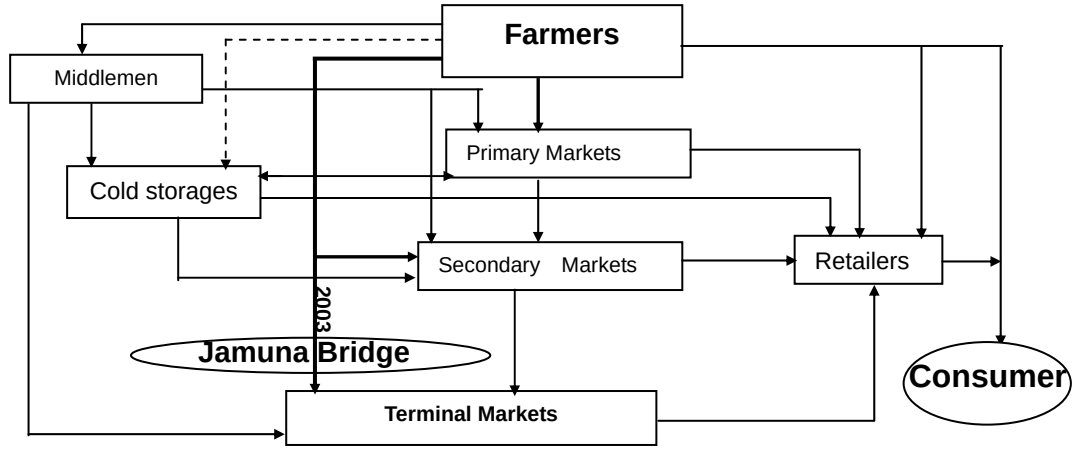
Note: calculated only main vegetables, Multiple selling in the markets and Price in Tk= Bangladesh Currency (Taka), mt=Metric ton, % calculated on total prices as farmers (Row wise). LL-Landless, SF-Small Farmers, MF-Medium Farmers and LF-Large Framers. Source: Field Survey 2003.

1.1.2 Marketing Channels for Vegetables

Table I shows that farmers sold a large quantity of vegetables (287.49 mt) in 2003. This paper mainly focuses on marketing channels for vegetables. Figure 2 denotes different channels observed in this regard. Table I shows that marketing flows were increasing remarkably in Noimail (primary), Foteh Ali (secondary) and Kawran Bazaar (terminal). New channels in 2003 were: (i)

Farmers—wholesalers (terminal)—retailers—consumers, followed by farmers directly, (ii) Farmers—middlemen/traders/wholesalers (primary/secondary)— wholesalers (terminal) —retailers—consumers, followed by local and outside buyers. It was found that outside buyers came from the terminal and other distant markets to purchase produce directly in the primary/secondary markets or from the farmers, for sale at Kawran Bazaar. Local buyers also followed the same path. Now vegetables can be transported easily to Dhaka city in only four hours without wasting time and farmers/traders take this opportunity to enhance trading activities. Previously, it was a rare case. The Jamuna Bridge played an important role in creating new channels for marketing of vegetables from the study area, and of course, it had increased farmers` interest in vegetable production.

Figure 2 Marketing Channels for Vegetables



Note: ----------→ represents weak and ⟶ strong linkages. Source: Field Survey, 2003.

1.1.3 The Transport Modes for Vegetables

All the roads from villages to Demazani market are muddy/lateral, so transport in the rainy season is difficult. Generally, bullock cart and rickshaw van are used and sometimes *votvoti* (locally made engine driven van) in the dry season. The road between the Demazani and the Noimail market is partially covered by bricks and asphalt. *Votvoti* is employed from Demazani to Sherpur and generally autorickshaw/bus connect Noimail and Foteh Ali. Bus/truck run from Noimail to the terminal market Kawran Bazaar. All farmers except the landless used cart, rickshawvan, autorickshaw, *votvoti*, bus/truck for transport of vegetables to the markets. Landless farmers used family labour for transport to near markets.

The study found that transport modes had been gradually changing from manual to engine driven in 2003 connecting Union with Upazila, District and distant markets.

(2) Transport Costs from the Study Area to Local and Outside Markets

2.1 Local Transport Costs

Table II shows transport modes and their corresponding costs in 1998 and 2003. It indicates unit carrying costs were incremental with the increasing distance to the markets. Engine driven transport (*votvoti*, autorickshaw, bus) were cost effective and less time consuming in communicating primary and secondary markets than the traditional rickshaw van, cart or hired labour.

2.2 Transport Costs from the Study Area to the Terminal Market

Nine (11%) farmers sold vegetables directly to Kawran Bazaar, Dhaka in 2003. Generally, one truck carries 3,000 kg vegetables from Noimail. Total cost per truck was Tk 6,900, which includes Tk 3,000 for rent, Tk 1,500 for unauthorized subscription (toll) taken by musclemen/others in the streets/markets, Tk 750 for toll at the bridge gate, Tk 1,350 for truck loading-unloading and Tk

300 for packaging and others, a total cost of Tk 2.30/kg. In 1998, the costs of rent, subscription, ferry fare, loading-unloading and others were Tk 3,500, Tk 2,100, Tk 1,100, Tk 1,200 and Tk 330 respectively, orTk 2.74/kg, higher than the cost of Tk 2.30/kg in 2003. The cost was lower in 2003 because of a smaller toll rate at the Jamuna Bridge and reduced unauthorized subscription. It was compulsory to pay the subscription to the musclemen on both banks of the Jamuna River (Aricha and Nagarbari).

Table II Transportation costs (Tk/Kg) by different markets and different transports (Cost In Tk/kg)

Farmers	The Year 1998					The Year 2003				
	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar
Hired labour	0.18	0.24				0.2	0.28			
Cart	0.12	0.14				0.14	0.16			
Rickshaw van	0.14	0.16				0.16	0.18			
Votvoti	0.2					0.22				
Auto Rickshaw		0.28					0.3			
Bus		0.3					0.35			
Truck		2.74					2.3			

Note: Costs are calculated as (1) Village to Sherpur: at first upto Demazani by cart/rickshawvan and then by votvoti to Sherpur, (2) Village to Foteh Ali: upto Noimail by cart/rickshawvan then by autorickshaw/Bus to Foteh Ali, (3) Village to Kawran Bazaar: Upto Noimal by cart/rickshawvan then by truck to Foteh Ali, Source: Field Survey 2003

(3) Selling Vegetables

The changes in land use and selling of vegetables are briefly discussed here. It was found that the acreage under double or triple crops had increased substantially in 2003. The cropping intensity rose from 179% to 223%, which was higher than the national average of 174% (BBS, 2001). The area in vegetables had increased from 31.32 to 94.37 acres. Land previously left as fallow or cultivated only on a limited scale, had been used more intensively and the cultivation of high value crops (tomato, eggplant, cucumbers, banana, papaya, etc.) had been expanded under different tenancy arrangements. Table III shows the quantity of main vegetables doubled from 140.83 to 287.48 mt between 1998 and 2003. A number of new vegetables were found to be grown and sold by the farmers. Farmers increased production of cabbage, red amaranth, Indian spinach, radish, tomato, yard long bean, watermelon etc., including cereals like maize; fruits like papaya, guava, banana and various spices. These changes occurred because of higher demand in the near and distant markets as well as quick transport over the Jamuna Bridge and better communication within the Districts.

Table III Changes in Selling Quantities of Vegetables by different farmers

Crops	LL			SF			MF			LF			Total		
	1998 (mt)	2003 (mt)	Change (%)	1998 (mt)	2003 (mt)	Change (%)	1998 (mt)	2003 (mt)	Change (%)	1998 (mt)	2003 (mt)	Change (%)	1998 (mt)	2003 (mt)	Change (%)
Potato	2.26	2.8	23.9	10.8	21.52	99.3	15.62	18.88	20.9	11.5	23.99	108.6	40.18	67.19	67.2
Red Amaranth	0.04	0.09	125	0.13	0.88	576.9	0.21	0.23	9.5	0.13	0.55	323.1	0.51	1.75	243.1
Pumpkin	0.12	0.35	191.7	5.79	13.92	140.4	8	10.81	35.1	2.08	3.83	84.2	16	28.92	80.8
Country Bean	1.06	1.43	34.9	3.84	4.63	20.6	2.36	2.89	22.5	0.96	1.82	89.6	8.22	10.77	30
Bitter gourd	0.23	0.31	34.8	2.3	3.28	42.6	6.05	8.99	48.6	2.39	7.29	205	10.96	19.87	81.3
Radish	0.29	0.38	31	1.11	3.46	211.7	1.28	2.69	110.2	0.36	1.86	416.7	3.04	8.38	175.7
Tomato	0.15	0.32	113.3	0.93	4.9	426.9	0.74	4.46	502.7	0.5	4.15	730	2.32	13.83	496.1
Cucumber	0.74	2.56	245.9	7.54	21.38	183.6	8.4	21.51	156.1	8.18	20.38	149.1	24.86	65.83	164.8
Eggplant	0.26	0.68	161.5	2.94	7.84	166.8	3.81	7.65	100.8	3.62	5.41	49.5	10.62	21.58	103.2
Pointed gourd	0.07	0.15	114.3	2.19	5.62	156.6	4.49	7.6	69.3	0.73	2.57	250.1	7.49	15.93	112.7
Taro	0.51	2.44	378.4	2.25	3.85	71.1	1.97	2.31	17.3	2.03	2.78	37	6.76	11.39	68.5
Watermelon	-	-	-	1.29	3.74	189.9	5.69	11.48	101.8	2.89	6.83	136.3	9.87	22.05	123.4
Total	5.74	11.51	100.5	41.1	95.02	131.2	58.62	99.49	69.7	35.36	81.47	130.4	140.83	287.48	104.1

Source: Field Survey 2003

Part 2

(4) Case Study on Production and Marketing of Potato

This part of the paper reports on potatoes for the different farm categories and discusses quantities sold, different channels and markets, marketing costs and selling prices, net margins and net incomes received by farmers. According to Scott and Bouis (95-96) the potato has evolved from a minor vegetable to the most important vegetable in the diet and an occasional partial substitute for rice. Faostat (2005) reports that production of potatoes has increased in Bangladesh by 118% (3,386,000 mt –1,553,180 mt) in 2003 compared to 1998. Bogra is the 4th largest potato growing area of the country (BBS, 2003).

4.1 General Scenario in Cultivation of Potato

The number of potato cultivators increased from 22 to 25. The numbers of LL, SF, MF and LF were 2, 10, 6 and 4 respectively in 1998; and 2, 12, 6 and 5 respectively in 2003. Their average area increased from 0.27 to 0.38 acres and for large farms (0.43 to 0.64 acres) and medium farms (0.37 to 0.47 acres). This same trend was followed in the case of small (0.18 to 0.26 acres) and landless farmers (0.16 to 0.20 acres). In producing potatoes, production costs included seed, labour, cultivation, irrigation, fertilizers, insecticides, fungicide, harvesting, etc. The costs/kg in 2003 for LL, SF, MF and LF were Tk 3.05, 3.06, 2.98 and 2.96 respectively; and for 1998 were Tk 2.63, 2.64, 2.63 and 2.65 respectively. The average cost for all farms was Tk 3.01/kg in 2003 and Tk 2.64/kg in 1998. Different input prices and changing input quantities altered production costs. Selling volume rose from an average of 1.83 mt to 2.69 mt, between 1998 and 2003, a 47% increase. Large farm yields increased by 108.6% in the same period (Table III).

4.2 Marketing Channels and Selling of Potatoes in Different Markets

Six marketing channels for potatoes were identified in the study area. Channels in the primary and secondary markets were: (i) Farmers–consumers, (ii) Farmers–retailers–consumers, (iii) Farmers–middlemen/traders–retailers–consumers, (iv) Farmers–wholesalers–retailers–consumers; and the channels up to the terminal market were: (v) Farmers–wholesalers–retailers–consumers, followed by farmers selling directly after construction of Jamuna Bridge. (vi) Farmers–middlemen/traders–wholesalers–retailers–consumers, followed by the middlemen/traders from Noimail to Kawran Bazaar (terminal). Farmers had weak links with cool stores for seed and non-seed purposes as this is a risky business with volatile market prices and quality deterioration due to unstable power supply. Few cool stores exist and these are not in the study area but in Bogra District and Sherpur Upazila.

Table IV shows that the quantity of potatoes sold for all except landless in 1998 was highest in Sherpur (52.4% of the total), followed by Noimail and Demazani, but in 2003 the highest was in Noimail (49.2%) followed by the newly added Kawran Bazaar (15.9%), Foteh Ali (14.8%), Sherpur (12.8%) and the lowest in Demazani (7.4%).

Table IV Selling quantities of Potato by different farmers and various markets

Farmers	Demazani		Noimail		Sherpur		Foteh Ali		Kawran Bazaar		Total Sale (Kg)	
	1998	2003	1998	2003	1998	2003	1998	2003	1998	2003	1998	2003
LL	200 (26.7)	500 (27.8)	550 (73.3)	1300 (72.2)	-	-	-	-	-	-	750 (100)	1800 (100)
SF	525 (20.6)	525 (14.5)	775 (30.4)	2350 (64.8)	1250 (49.0)	750 (20.7)	-	-	-	-	2550 (100)	3625 (100)
MF	570 (12.8)	270 (4.8)	1185 (26.6)	2900 (51.2)	2700 (60.6)	792 (14.0)	-	1700 (30.0)	-	-	4455 (100)	5662 (100)
LF	711 (14.9)	-	1445 (30.4)	2100 (32.3)	2600 (54.7)	700 (10.8)	-	900 (13.8)	-	2800 (43.1)	4756 (100)	6500 (100)
Total sale (%)	2006 (16.0)	1295 (7.4)	3955 (31.6)	8650 (49.2)	6550 (52.4)	2242 (12.8)	-	2600 (14.8)	-	2800 (15.9)	12511 (100)	17587 (100)

Note: Upper values in cells are selling quantity in kg and parenthesis indicate percents of the sold quantity

In the case of markets and buyers, landless farmers used only Demazani and Noimail market but concentrated on Noimail selling to consumers. Small farmers extended their markets to Sherpur but also concentrated on Noimail selling to consumers and retailers. Medium and large farmers used the same markets but included Foteh Ali in 2003, where 14.8% of the total potato crop was sold. Their main buyers were retailers and wholesalers. Another remarkable point was that large farmers sold a high share (43.1% of their total) to wholesalers in the Kawran Bazaar.

4.3 Prices in Different Markets and Marketing Costs from the Study Area

Table V shows prices and marketing costs per kg in different markets. Selling prices varied in different markets according to transportation and other costs. The Table indicates that prices and costs increased with distance of the markets from the study area. It was found that Demazani was the cheapest (Tk 3.35/kg) with lowest transportation cost but large farms received the highest price (Tk 11/kg) in Kawran Bazaar spending more on marketing (Tk 2.57/Kg). In transportation to Demazani, marketing cost was lowest for landless farmers who used family labour. Medium farmers had occupied the highest selling prices in Noimail, Sherpur and Foteh Ali in 2003.

Table V Selling prices and marketing costs by different farmers and corresponding markets (The unit is Tk/kg)

Farmers	The Year 1998				The Year 2003					
	Demazani	Noimail	Sherpur	Averages	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Averages
LL	3.42 (0.10)	4.15 (0.26)	-	3.79 (0.22)	4 (0.10)	5 (0.27)	-	-	-	4.5 (0.22)
SF	3.45 (0.22)	4.1 (0.25)	5 (0.43)	4.18 (0.33)	3.95 (0.24)	5.05 (0.26)	5.6 (0.47)	-	-	4.87 (0.30)
MF	3.4 (0.23)	4 (0.25)	5 (0.44)	4.13 (0.36)	3.8 (0.25)	5.15 (0.26)	5.7 (0.47)	7 (0.57)	-	5.41 (0.39)
LF	3.35 (0.22)	4.1 (0.25)	5.1 (0.43)	4.18 (0.23)	-	5.1 (0.24)	5.65 (0.46)	6.9 (0.58)	11 (2.57)	7.16 (1.32)
Averages (Tk/Kg)	3.41 (0.19)	4.09 (0.25)	5.03 (0.43)	4.07 (0.28)	3.92 (0.20)	5.08 (0.26)	5.65 (0.47)	6.95 (0.58)	11 (2.57)	5.49 (0.56)

Note: Upper values in cells are selling prices/kg and parenthesis indicate marketing costs/kg.Source: Field Survey 2003

4.4 Net Margin Received by the Farmers

Table VI shows net margins per kg received by farmers in different markets. Net margin is the selling price/kg less the costs/kg (production, marketing and others).

It was found that large farms got 138.3% higher net margin (Tk 1.54 to Tk 3.67/kg) in 2003, followed by medium (52.6%), landless (30.6%) and small farms (13.9%). Large and medium farm net margins were higher due to selling more of their output in Foteh Ali and Kawran Bazaar. Large farmers got the highest net margin in kawran Bazaar (Tk 5.47/kg) in 2003 compared to the net margin of Sherpur (Tk 2.02/kg) in 1998. Medium farmers, in 2003, got higher net margins in Noimail, Sherpur and Foteh Ali. Landless got their highest net margin in Demazani (Tk 0.85/kg) in 2003 from good selling price and having no transportation costs, by using family labour. High net margins were received by large and medium farmers for timely selling in the markets according to demand and the ability to use distant markets.

Table VI Net Margin/kg according to different markets by farmers` (Cells are in Tk/kg)

Farmers	The Year 1998				The Year 2003						Changes (%)
	Demazani	Noimail	Sherpur	Averages	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Averages	
LL	0.69	1.26	-	1.11	0.85	1.68	-	-	-	1.45	30.6
SF	0.59	1.21	1.93	1.44	0.65	1.73	2.07	-	-	1.64	13.9
MF	0.54	1.12	1.93	1.54	0.57	1.91	2.25	3.45	-	2.35	52.6
LF	0.48	1.2	2.02	1.54	-	1.9	2.23	3.36	5.47	3.67	138.3
Averages	0.57	1.2	1.96	1.41	0.69	1.8	2.18	3.4	5.47	2.28	61.7

Note: Calculated from data. Source: Field Survey 2003.

4.5 Rate of Net Margins Received by the Farmers

Rate of net margin is defined as the net margin as a percentage of the selling price. Table VII shows that large farmers had the highest net margins, increasing from 34% in 1998 to 46.2% in 2003, followed by medium, small and landless farmers. Among all the markets in 2003, Kawran

Bazaar was the most profitable (49.7%), followed by Foteh Ali (49%), Sherpur, Noimail and Demazani. Rates of net margin in Sherpur were almost the same in this period but Noimail as the nearer market got especial attention from farmers and businessmen, whose rates of net margin increased from 29.3% to 35.5%.

Table VII Rate of net margin according to different markets by farmers` (Rate of Net Margins in %)

Farmers	The Year 1998				The Year 2003					
	Demazani	Noimail	Sherpur	Avg Rate	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Avg Rates
LL	20.2	30.4	-	28	21.3	33.7	-	-	-	30.7
SF	17	29.6	38.6	32.6	16.3	34.2	37	-	-	32.8
MF	16	28.1	38.7	34	15.1	37	39.5	49.2	-	41.1
LF	14.3	29.3	39.6	34	-	37.2	39.5	48.8	49.7	46.2
Avg Rates	16.9	29.3	39	34	17.6	35.5	38.7	49	49.7	37.7

Source: Field Survey 2003

4.6 Farmers` Net Incomes from Potatoes

Table VIII shows net incomes/kg from potato in the same years. Net income is the net margin less the cost of family labour, own transport, etc. Net income/kg was 126.3% higher for large farmers, followed by medium, landless and small farmer. The position of landless was improved by selling produce directly to consumers without any transportation cost to Demazani.

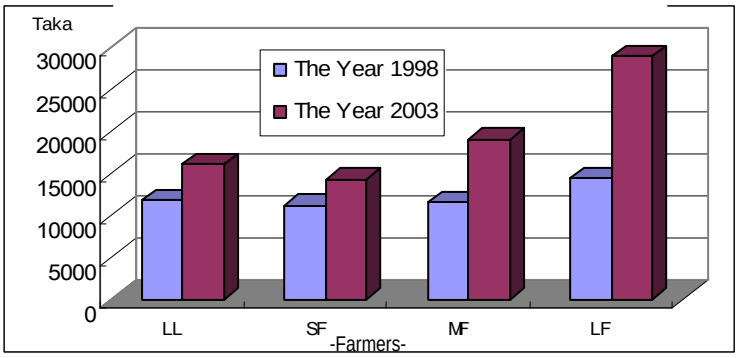
Table VIII Net income (Tk/kg) by different farmers

Farmers	The Year 1998	The Year 2003	Change (%)
LL	1.87	2.22	18.7
SF	1.67	1.97	18.0
MF	1.7	2.52	48.2
LF	1.67	3.78	126.3

Net incomes/acre in 1998 for landless, small, medium and large farmer were Tk 11,708.33, Tk 11,209.87, Tk 11,462.80 and Tk 14,418.62 respectively, and Tk 16,008.00, Tk 14,291.50, Tk 19,038.13 and Tk 28,932.94 respectively in 2003. The percentage increase were 36.7%, 27.5%, 66.1% and 100.7% respectively.

Figure 3 shows the net incomes/acre and obviously large farmer's income had been increased remarkably, followed by medium, landless and small farmers. Medium and large farmers both used Foteh Ali and only large farmers sold to Kawran Bazaar, increasing net income/acre by 100.7%.

Figure 3 Net Income/acre by Different Farmers



Source: Field Survey, 2003

Part 3

(5) Case Study on Cultivation and Marketing of cucumber

Part III is based on cucumbers for the year 2003 to identify the current situation in using markets by different farmers and other related marketing phenomenon, buyers, marketing costs and selling prices, net margins received by farmers, etc. Cucumber has been chosen because production quantity was higher (5.6mt/acre) than the average production (1.7 mt/acre) in the Bogra District (BBS, 2003). Findings will be reported as for potatoes.

5.1 Marketing Channels for Cucumbers

Five marketing channels were identified for cucumbers. Four channels were used by all farmers and the channel to the terminal market was also followed by the large farmer.

Figure 4 Different marketing channels

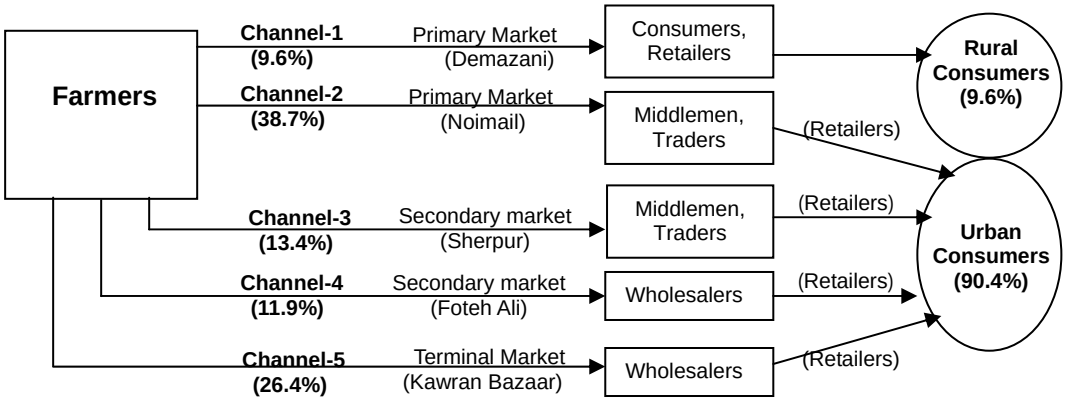


Figure 4 & Table IX shows the largest volume of sales in Noimail (38.7%), followed by Kawran Bazaar (26.4%), Sherpur (13.4%) and Foteh Ali (11.9%) markets. The lowest volume was in the nearer market Demazani (9.6%). Cucumbers were marketed mostly to urban consumers. Landless farmers sold mostly in Noimail (56.6%). All farmers except the large farmer used mostly Noimail market. The large farmer sold 85.7% of his cucumbers to wholesalers in Kawran Bazaar. Small and medium farmers also extended their markets up to Foteh Ali. Landless farmers were concentrated in the nearer markets of Demazani and Noimail. An important point is that there was high demand for cucumbers in the Noimail market for easily accessible roadside sales beside the highway and also Kawran Bazaar got special attention for easy communication through the Jamuna Bridge.

Table IX Selling weights by different markets and farmers

Markets / Farmers	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Total
LL	435 (26.4)	930 (56.6)	280 (17.0)	-	-	1645 (100)
SF	465 (12.2)	1850 (48.7)	835 (22.0)	650 (17.1)	-	3800 (100)
MF	402 (10.1)	1894 (47.5)	714 (17.9)	978 (24.5)	-	3988 (100)
LF	-	600 (14.3)	-	-	3600 (85.7)	4200 (100)
Total	1302	5274	1829	1628	3600	13633
(%)	(9.6)	(38.7)	(13.4)	(11.9)	(26.4)	(100)

Note: The uppervalue in cells indicate weight in kg and Parentheses indicate percents of the weightss. Source: Field Survey, 2003.

5.2 Prices in Different Markets and Transportation Costs from the Study Area.

Table X shows prices and the transportation costs per kg in different markets. Selling prices varied and not every farmer could use all markets. Prices and costs were incremental with distance of the markets from the study area. Demazani market was the cheapest selling price and lowest transportation cost and the highest price (Tk 13/kg) was selling in Kawran Bazaar as were transportation costs (Tk 2.46/Kg).

Table X Selling prices and transportation costs (Tk/Kg) by different farmers

Markets / Farmers	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar
LL	5.7 (0.14)	6.68 (0.17)	7.05 (0.37)	-	-
SF	5.75 (0.14)	6.7 (0.17)	7.1 (0.37)	7.8 (0.47)	-
MF	5.72 (0.14)	6.71 (0.17)	7.15 (0.37)	7.85 (0.47)	-
LF	-	6.7 (0.16)	-	-	13.0 (2.46)

Note: Upper value and parenthesis indicate price and transportation costs

5.3 Net Margins Received by Farmers

Table XI shows the net margins received by the farmers in the different markets. The large farmer got the highest net margin (Tk 7.31/kg), followed by medium, small and landless farmers. The large farmer received the highest margin (Tk 7.88/kg) in Kawran Bazaar by selling 85.7% of his cucumbers in this market. The net margin of the landless farmer was the lowest (Tk 3.53/kg) due to production costs and also getting lower price in the nearer markets. The medium farmer got the highest net margin (Tk 2.92/kg) in Demazani, Sherpur (Tk 4.11/kg) and Foteh Ali market (Tk 4.69/kg). The large farmer got the highest margin in Noimail (Tk 3.89/kg) and Kawran Bazaar (Tk 7.88/kg). It is evident that the highest net margins were received by the medium and large farmers for timely selling and using distant markets.

Table XI Net margin (Tk/kg) by different markets and farmers

Farmers	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Averages
LL	2.80	3.75	3.91	-	-	3.53
SF	2.91	3.83	4.02	4.60	-	3.89
MF	2.92	3.88	4.11	4.69	-	4.02
LF	-	3.89	-	-	7.88	7.31
Averages	2.88	3.84	4.02	4.65	7.88	4.69

Table XII shows the large farmer with the highest rate of net margin (60.4%), followed by medium, small and landless farmers. Kawran Bazaar was the most profitable (60.6%) market. The rate of net margin for every farmer was more in Noimail than in Demazani and Sherpur. Excluding the distant markets of Foteh Ali and Kawran Bazaar, farmers gave more attention to the Noimail market.

Table XII Rate of net margins(%) received by different farmers

Farmers	Demazani	Noimail	Sherpur	Foteh Ali	Kawran Bazaar	Total
LL	49.1	56.2	55.5	-	-	54.4
SF	50.6	57.2	56.6	59	-	56.7
MF	51	57.8	57.5	59.7	-	57.7
LF	-	58.1	-	-	60.6	60.4

Table XIII shows that large farmers have the highest net incomes per kg and acre followed by medium, small and landless farmers. Large farmers earned almost twice that of landless and small farmers.

Table XIII Incomes by different farmers (cells are in Tk)

Income	LL	SF	MF	LF
Net Income/kg	3.59	3.91	4.10	7.34
Net Income/acre	20133.94	21953.19	23055.19	40714.29

For potato and cucumber, Kawran Bazaar became profitable markets after construction of the bridge, followed by Foteh Ali, Sherpur, Noimail and Demazani. Nearer Noimail is used more for road side easy access and farmers started to use also District market Foteh Ali as is clear from the figures and Tables. By using profitable markets, farmers` incomes were increased, as production of vegetables had

expanded from farmers` knowledge of cultivating vegetables by modern methods.

V Conclusion

Infrastructure developments which improved access to markets helped farmers to get better prices for their produce. The study found that construction of the Jamuna Bridge played a vital role in creating the channels from the study area to Kawran Bazaar in the terminal market creating convenient communication for carrying goods, reduction of total transportation time, increasing number of buyers and raising demand in the primary and secondary markets. More vegetables have been sold in Noimail, Foteh Ali and Kawran Bazaar (Table 1, 4, 9). Farmers got the highest net margin/kg from Kawran Bazaar, followed by Foteh Ali, Sherpur, Noimail and Demazani. The last three markets are nearer to the study area but Noimail was mostly used by farmers for its easy roadside access. Medium and large farmers produce more vegetables and sell in the local and distant markets but the opposite was observed for landless and small farmers. Large farmers` and medium farmers' incomes had increased from higher prices in using different markets but incomes of the landless and small scale farmers had not benefitted to the same extent, but they were higher than in past years. In marketing both potato and cucumber, large farmers benefitted the most as they used the distant market Kawran Bazaar and also Foteh Ali. Farmers` received different net margins from different markets. Using profitable markets helped farmers in increasing income. Another point is that marketing cost from the study villages up to the Kawran Bazaar had fallen but the opposite result occured in the case of local transportation for under-developed roads.

The study identifies some drawbacks: (i) muddy roads in the rainy season make it difficult to connect villages with markets, leading farmers to sell their produce at low prices; (ii) lack of cold storage facilities for vegetables; (iii) unauthorized subscription during transportation taken by the musclemen raising transportation costs. This study elucidates the necessary measures in these regards, which may strengthen farmers` capabilities to boost crop production and as a result, the agricultural economy will be strengthened which may help alleviate rural poverty.

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