



Original Article

Existing Value Chain Assessment of Mungbean Marketing in Selected Areas of Bangladesh

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ARTICLE INFO	ABSTRACT
<p>Article history Received: 18 Jul 2021 Accepted: 09 Oct 2021 Published: 31 Dec 2021</p> <p>Keywords Mungbean, Value chain, Value addition, Constraints of mungbean marketing</p> <p>Correspondence Md. Monjurul Islam ✉: mmislam.rdv@bsmrau.edu.bd</p> <p> OPEN ACCESS</p>	<p>Mungbean is an important indigenous vegetable legume providing protein for the rural and urban poor in South and Southeast Asia. This study was conducted to analyze the value chain, determine the value addition at different levels of value chain of mungbean and identify some constraints of mungbean marketing in Bangladesh. Using a structured questionnaire with face to face interviews, 120 samples were surveyed which were collected from Barisal and Patuakhali district of Bangladesh during the period of 2017-18. The stratified random sampling technique was used in selecting the sample. This study found that the main actors of mungbean marketing were farmer, arathder, wholesaler, retailer and consumer. The study also revealed that mungbean production was found profitable. The study revealed that the cost of mungbean production of a farmer was Tk 2037/maund on full cost basis and Tk. 1395/maund on cash cost basis. The average gross return of a farmer was Tk. 2472/maund and net return was found Tk. 436/maund on full cost basis and Tk. 1078/maund on cash cost basis. Value addition of arathder and wholesaler was Tk 80/maund and Tk 190/maund respectively and value addition of retailer was Tk 410/maund. In the study area farmers and traders mentioned some problems at production and marketing level such as shortage of capital, lack of labour, insecticides, severe attack of insects, dominance of intermediaries, syndicate, lack of adequate market facility etc. So, government should take proper initiative to solve these problems.</p>
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Introduction

Mungbean is widely grown in Bangladesh. It contains 19.5% to 28.5% protein (AVRDC, 1988). Major area of mungbean is replaced by cereals (Abedin, et al., 1991). Mungbean is an annual and cereal crop. Mungbean is cultivated after harvesting of rabi crops such as wheat, mustard, lentil, etc. and it is cultivated in rotation with cereals.

Mungbean is an erect plant which is highly branched and is about 60 to 76 cm tall (Oplinger, et al., 1990). We know that mungbean looks more like a garden bean than like a soya bean plant. The mungbean has been grown in India since ancient times. It is still widely grown in Southeast Asia, Africa, South America and Australia. Mungbean (*Vigna radiata* (L.) Wilczek) is a

pulse crop that is particularly attractive for farmers in South Asia because of its short duration and decent performance under adverse climatic conditions such as heat, drought and salinity (Hanumantha et al., 2016; Farnworth et al., 2021). Mungbean is one of the warm season crops. It requires 90–120 days from planting to maturity (depending on the variety). The optimum temperature range for growth is between 27 °C and 30 °C. This means that the crop is usually grown during summer season.

Mungbean is a popular pulse in the diet because it is easily digestible, free from flatulence and easy to cook. Rich in easily digestible protein (24%), mungbean adds much-needed diversity to the cereal-based diets of the poor (Thirumaran and Seralathan, 1988; Depenbusch et al., 2020). Dekker (2003) analyzed that a value chain

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analysis (VCA) is a useful tool to meet the provision of information for the coordination and optimization of activities across firms in a value chain. A value chain typically consists of inbound distribution or logistics, manufacturing operations, outbound distribution or logistics, marketing and selling, and after-sales service. (De Silva 2011). Mungbean contains vitamin A (94 mg), iron (7.3 mg), calcium (124 mg), zinc (3 mg) and folate (549 mg) per 100 g dry seed. Islam et.al (2012) showed that most of the farmers follow the level of technology adoption for both input use and agronomic practices. Mungbean production was found profitable. Habib et al., (2014) found that the output-input ratios mungbean variety of AZRI-06, NM--1-106 and NM-98 were 3.05, 2.79 and 2.41 with revenue crop day⁻¹ acre⁻¹ of Rs.451, Rs.368 and Rs.318, respectively. The benefit cost ratio (BCR) was 2.22 on full cost basis. (Islam et al., 2011). Nair et al., (2002) found that mungbean is easily digestible free from flatulence, rich in protein and iron. Mutations were induced in two mungbean varieties, K-851 and PS-16 using EMS and gamma rays as mutagens. (Khan and Goyal 2009). Jeung et al., (2011) concluded that the more mungbean powder was added, the more the luminance and hunter's a values of Cheongpomook samples were decreased, but in hunter's a values was reverse. Mungbean sprout is also widely used in East and Southeast Asia. Mungbean cakes are popular in East Asia while a variety of colorful pastries in the shape of fruits and vegetables are common desserts in Thailand. In fact, mungbean porridge, soups and drinks are recommended for sick and convalescent people (He et al., 1988). The value of the welfare generated due to improved mungbean varieties and technologies in Pakistan has been estimated to be around US\$ 20 million (Ali et al., 1997).

Agricultural research has often been confused with innovation. Value-chain concepts in agriculture denote an important change in thinking about development and the relationships among producers, traders, processors, and consumers (Nang'ole et.al., 2011). This approach in agricultural development helps identify weak points in the chain and actions to add more value (Raj, S.P. 2011; Devaux et al., 2018). It also provides valuable insights into policy formulation and implementation. (Kaplinsky, 2000). Therefore, mungbean value chain is gaining high value day by day among the farmers and traders. Now it is essential to know the existing value chain assessment of mungbean marketing in the southern region of Bangladesh. Besides, sustainability of any crop cultivation is mainly depends on its economic aspect and value addition but limited study was done on mungbean in this regard. In view of the discussion, the present study finds out the value chain, determine value addition and identify some

constraints of mungbean production and marketing in Bangladesh.

Materials and Methods

Sampling technique

Study area

Two districts (Barisal and Patuakhali) were selected as a study area for the present study. The study was conducted in two upazila (Bakergonj and Dumki) which is under Barisal and Patuakhali district. Study area was selected on the basis of intensity of mungbean production and marketing area.

Sampling procedure

Stratified simple random sampling techniques were followed for the selection of upazila, and market for the collection of data. Then the populations were grouped into different strata like; farmer, arathder, wholesaler, retailer etc. and the simple random sampling technique was used for drawing the desired sample from each strata.

Sample size

From two districts (Barisal and Patuakhali) 120 respondents consisting of 40 farmer and 80 traders were selected as a sample size. In selecting the types of traders a list of intermediaries were prepared with the help of different types of intermediaries or market authorities existing in the market. Then the required amounts of traders were collected from the list for interview. At each district, production and marketing information were collected from 20 farmers, 10 arathdars, 10 wholesalers, and 20 retailers.

Analytical technique

Cost and return analysis

Following profit equation was employed to assess the profitability of mungbean production.

Net return/ Value addition of mungbean producer

$$\Pi = P_m \cdot Q_m - (TVC + TFC)$$

Where, Π = Profit of mungbean producer (Tk/maund)

P_m = Per unit price of mungbean (Tk/Maund)

Q_m = Quantity of mungbean (Maund)

TVC = Total variable cost of mungbean producer (Tk/maund)

TFC = Total fixed cost of mungbean producer (Tk/maund)

Value chain analysis

Value addition by traders

Value Addition = Gross margin – Marketing cost

Gross Margin = Sale price - Purchase price

Results and Discussion

Value chain of mungbean marketing

A value chain consists of all stages of a technical production process as well as of the interaction between these stages. The production process starts from input supply. Then it covers production, processing and marketing and ends with the consumption of a certain product. We know that it is a complex process of a value chain of mungbean marketing. The market supply of mungbean starts from small farmers. This supply does not pass directly from producer to the final consumer. Rather it is separated from the demand of consumers in time, place, form and size of the product. As defined by AMA (1960), marketing is the performance of business activities that direct the flows of goods and services from the producer to consumers. The major market participants identified in mungbean marketing in Bangladesh are producers, local assemblers, wholesalers, brokers and retailers. There are no large scale mungbean producing farms in this region. That means small holder producers are the only suppliers of mungbean. Farm traders are the main buyers of the grain in the country side. Trading is a part time job for the purpose of gaining additional source of income. Assemblers play an important role in the marketing system by pushing up the product from the remote rural surplus markets to the towns, deficit areas and urban centers where the product is demanded. Wholesalers are the central figure in the marketing channel. By definition the wholesalers of the given commodity are involved in wholesale trade, rarely selling directly to consumers. But in mungbean marketing, in the area the job of wholesalers and retailers is mixed up. The mungbean wholesalers get

their supplies from producers, assemblers and from retailers and working with a combination of other grain. The following major channels involved in the mungbean production and marketing.

Channel i: Producer – consumer

Channel ii: Producer –Retailer– consumer

Channel iii: Producer–Arathder - Wholesaler –Consumer

Channel iv: Producer –Arathder – Wholesaler - Retailer– consumer

Channel v: Producer – Arathder - Retailer – Consumer

Value addition of mungbean marketing

Cost of mungbean production

Costs are the expenses in organizing and carrying out the production process. The cost of production included different cost items like land preparation, seed, pesticides, labour cost in harvesting, interest on operating capital, land use cost, etc. Both cash expenditure and imputed value of family supplied inputs were included in the analysis and are shown in Table 1. It revealed that highest cost was incurred for human labour for harvesting (29%) ,land preparation (24%) and seed cost (3%) when family supplied inputs were valued at market rate. The average cost of production in full cost basis was found to be Tk. 40955/ha, which was found slightly higher in Barisal than Patuakhali due to more cost involvement in land use cost and labour cost in harvesting. In the study area fertilizer and manures was not use in mungbean production.

Table 1. Cost of mungbean cultivation in the study areas

Cost Items	Tk/hectare		
	Patuakhali	Barisal	All
Variable Cost			
Land preparation	10240	9520	9880 (24)
Seed	1300	1170	1235 (3)
Fertilizers	-	-	-
Urea	-	-	-
TSP	-	-	-
MoP	-	-	-
Manures	-	-	-
Pesticides	7200	6796	6998 (17)
Own	2500	1616	2058
Hired	4700	5180	4940
Labour cost in harvesting	11000	13000	12000 (29)
Interest on operating capital (8% for 6 months)	1580	1580	1580 (4)
Fixed Cost			
Land use cost	9024	9500	9262 (23)
Total cost			
Full cost basis	40344	41566	40955 (100)
Cash cost basis	27240	28870	28055

Source: Field survey 2018. Figures in the parentheses are percentage of total cost

Trader marketing cost

The arathders was the commission agents who negotiate the selling function between producers and wholesalers. For performing these functions, they had to incur some costs. The total mungbean marketing cost of arathder was estimated at Tk. 320 per maund (Table 2). Rent and electricity was the highest cost item comprising 35.00 percent of the total marketing cost. The next highest cost item was labour cost which accounted for 31.00 percent of the total marketing cost. The other cost items in descending order were transportation (25.00%), Jute bag/Poly bag (3.00), telephone bill (3.00%), and personal expenses (3.00%).

Wholesaler/Bepari collects mungbean from different mungbean producer or local assembler. The total marketing cost of wholesaler/bepari was estimated Tk 210/maund where rent and electricity were the highest cost item (39.00%) and lowest cost item was market toll, arathder commission, wastage, and personal expenses (2.00%). The retailers generally purchased mungbean from the producer and wholesaler/bepari through arathders and sold to the consumers at different markets. The total marketing cost of retailer was estimated at Tk. 190 per maund.

Table 2. Trader marketing cost

Particulars	Tk/Maund		
	Arathdar	Wholesaler/Bepari	Retailer
Labour cost	100 (31)	50 (24)	40 (21)
Jute Bag/Poly Bag	10 (3)	10 (5)	15 (7)
Transportation	80 (25)	50 (24)	40 (21)
Market toll	-	5 (2)	5 (3)
Rent and electricity	110 (35)	80 (39)	80 (42)
Telephone Bill	10 (3)	-	-
Arathdar commission	-	5 (2)	-
Wastage	-	5 (2)	5 (3)
Personal expenses	10 (3)	5 (2)	5 (3)
Total	320 (100)	210 (100)	190 (100)

Source: Field survey 2018. Figures in the parentheses are percentage of total cost

Net return and value addition analysis of different intermediaries

Table 3 revealed that the sample farmers received, on an average, 805 kg/ha of mungbean, which was lower than national average of 823 kg/ha (BBS, 2019) due to severe infestation of insects. But Islam et al. observed yield 928 kg/ha in 2007. The average gross return from mungbean production was found to be Tk. 49775/ha or Tk 2472/maund and net margin was found Tk. 8820/ha on full cost basis and Tk 21720/ha on cash cost basis or Tk. 436/maund on full cost basis and Tk 1078/maund on cash cost basis. Value addition of different intermediaries is shown in Table 4. We found that mungbean purchase price of arathder was Tk. 2000/maund and sale price was Tk 2400/maund. Thus, gross margin of arathder was Tk. 400 per maund. The total marketing cost of arathder was Tk.320/ 40 kg of mungbean.

So value addition of arathder was Tk 80/maund. The value addition of wholesaler and retailer was Tk 190/maund and Tk 410/maund respectively. Here we found that the value addition of retailer was the highest which was Tk 410 per maund because his marketing cost was low and he sold small volume of product. So he earned huge amount of profit per maund.

Constraints of mungbean production

Although mungbean was observed a profitable crop in the study area, but there were found several constraints to its higher production. The constraints are shown in Table 4. Most of the farmers (67%) opined that incidence of diseases as a top ranked problem of mungbean production. Other major constraints were untimely rainfall (58%), and lack of quality seed (46%). Besides, lack of capital, lack of training, lack of labour and lack of suitable land were also opined as the problem of mungbean cultivation.

Table 3. Net return/ value addition of mungbean producer/farmer

Items	% farmers respond		
	Patuakhali	Barisal	All
Total Cost (Tk/ha)			
Full cost basis	40344	41566	40955
Cash cost basis	27240	28870	28055
Total cost (Tk/maund)			
Full cost basis	2035	2038	2037
Cash cost basis	1374	1415	1395
Fixed cost (Tk/ha)	9024	9500	9262
Fixed cost (Tk/maund)	455	466	461
Variable cost (Tk/ha)			
Full cost basis	31320	32066	31693
Cash cost basis	18216	19370	18793
Variable cost (Tk/maund)			
Full cost basis	1580	1572	1576
Cash cost basis	919	949	934
Yield (Kg/ha)	793	816	805
Gross return (Tk/ha)	45443	54107	49775
Gross return (Tk/maund)	2292	2652	2472
Gross margin (Tk/ha)			
Full cost basis	14123	22041	18082
Cash cost basis	27227	34737	30982
Gross margin (Tk/maund)			
Full cost basis	712	1080	896
Cash cost basis	1373	1703	1538
Net return (Tk/ha)			
Full cost basis	5099	12541	8820
Cash cost basis	18203	25237	21720
Net return (Tk/maund)			
Full cost basis	257	614	436
Cash cost basis	918	1237	1078

Gross margin = Gross return – Total variable cost

Net return = Gross return – Total cost

Table 4. Constraints of mungbean production

Items	% farmers respond		
	Patuakhali	Barisal	All
Incidence of diseases	64	70	67
Untimely rainfall	60	56	58
Lack of quality seed	49	43	46
Lack of training	45	35	40
Lack of labour	38	26	32
Lack of capital	22	26	24
Lack of suitable land	20	16	18

Source: Field survey 2018

Constraints of mungbean marketing

We know that there were several problems of mungbean cultivation as well as marketing problem (Table 5). Ninety two percent (92%) respondent opined dominance of intermediaries as a top ranked problem of mungbean marketing, the second highest constraints (78%) opined farmers were syndicate and price differentials between markets, and 75% trader noticed

that lack of adequate market facility was one of the major problems of mungbean marketing. Price differentials between traders (77%), lower price of mungbean (75%), low bargaining power (69%), high transportation cost (68%) and payment on credit (39%) were the constraints of mungbean marketing in the study area.

Table 5. Constraints of mungbean marketing

Items	% farmers and traders respond		
	Patuakhali	Barisal	All
Dominance of intermediaries	95	89	92
Syndicate	76	80	78
Price differentials between markets	80	75	78
Price differentials between traders	75	78	77
Lack of adequate market facility	80	70	75
Lower price of mungbean	80	70	75
Low bargaining power	70	67	69
High transportation cost	71	65	68
Payment on credit	50	28	39

Source: Field survey 2018

Conclusion

Mungbean is an important pulse consumed all over the world, especially in Asian countries and has a long history of usage as traditional medicine. It has been known to be an excellent source of protein, dietary fiber, and minerals. As a result, it becomes a popular functional food in promoting good health. We see that mungbean production in the study areas is profitable and value addition of retailer is higher than other intermediaries. Mungbean farmers received higher return on its investment. If modern variety of seed, timely rainfall, proper training and production technology is available to the farmers, yield and production can be increased which may help to increase their income. And if proper market facility and good governance of intermediaries will ensure then traders value addition will be increased. So, government and other related organization should provide different facilities for increasing value addition.

Author Contributions

Conceptualization, AKM, MAK, NDK, and MMI.; methodology, AKM, MAK, and MSH.; formal analysis, AKM, MAK, MSA, and MSH.; investigation AKM, MSA, MSH, NDK, and MMI.; writing—original draft preparation, AKM, MSH, and MMI.; writing-review and editing, AKM, MSA, MSH, and MMI.; All authors have read and agreed to the published version of the manuscript.

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