



## **Farmer's Constraints for Vegetables Marketing in Bangladesh**

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### **Authors' contributions**

*This work was carried out in collaboration with all authors. Authors RI, MSA and MMA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MJM managed the analyses of the study. Author SAS managed the literature searches and supervised and edited the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Agricultural produce of vegetable growers is often lost after production due to many marketing challenges which make it difficult for vegetable growers to explore full market potentials and these also reduce incentives of participation in formal (commercial) or high-value markets. The aim of the study was thus to index and analysis factors (constraints) affecting marketing of major vegetables from growers perspective. Data were collected from 113 vegetable growers, Pearson's correlation co-efficient (r) was used to determine the relationship between the selected socio-economic characteristics of the vegetable growers and their extent of marketing constraints faced. With regard to constraints, majority (68.1%) of the respondents faced medium constraints, while 16.9% and 15% of them had low and high marketing constraints, respectively. Among eleven

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characteristics, growers' training received knowledge on vegetable marketing and availability of marketing information showed significant and negative relationship with their extent of marketing constraints faced. While age, education, family member, vegetable cultivation experience, annual family income, credit availability, extension contact did not show any significant relationship with their extent of marketing constraints. Results showed that lack of access to storage facilities was ranked the most prominent constraint followed by presence of middle man, lack of market information, inadequate access roads and lack of access to credit availability and high perishability of produce. Therefore development of better infrastructure in the form of storage facilities and availability of marketing information are vital for commercialization of vegetables.

*Keywords: Farmers; constraints; vegetable marketing.*

## 1. INTRODUCTION

Bangladesh is one of the pioneer countries in term of vegetable production in the South Asia. Vegetables production is profitable and the future performance of the sector will largely determine how successful the country is in diversifying its agricultural production and achieving higher agricultural growth rates [1]. Successful commercial fresh vegetable production is a demanding task that requires a combination of production and marketing skills from the growers. For instance, the perishability of fresh vegetables leads to fewer storage opportunities compared to other agronomic crops [2,3]. As a result, growers are compelled to accept the market price close to, or during, their harvesting period. Furthermore, traditional risk mitigation options (i.e., future markets) do not exist for fresh vegetables. Thus, growers are more vulnerable to market fluctuations. Growers need to operate in a changing market environment with greater demand for more varieties and quality [4,5]. If the vegetable produced does not meet the required standards, then the grower has to sell at a lower price or not at all. Crop production has increased by two to three times in the last few economic years. But it is evident that without an efficient agricultural marketing system, high crop production cannot be sustained for a long time [6,7]. When the farmers do not get the fair price for their products they must be lost their interest to continue farming as for financial crisis. Vegetables, as high value crops, often require an intensive input regime, necessitating large labor input in planting and harvesting [8]. Agricultural marketing is an essential tool to uninterrupted, adequate and timely supply of agricultural products, inputs and services to target groups, including producers, consumers and intermediaries and agricultural marketing is not just a means of distributing agricultural product but also a way of stimulating new forms of production [9,10]. Farmers are compelled to sell

their products at the harvest time when the prices are minimal resulting in a very low return for their produced products [11]. Ultimately, the farmers who produce and bear the risks associated with the crop production are deprived of the major benefits of their products. Therefore, identifying the constraints on the expansion of vegetables production and marketing are important, since the supply of vegetables is quite irregular in most Asian countries, including Bangladesh [12,13,14]. It is reported that due to various constraints farmers are not getting expected benefit from their investment [15,16]. Moreover, constraints vary from one farmer to another due to influence of various factors. It implies increased market transactions since farmers participate in the process to capture gains from specialization [17,18]. Similarly, increasing capital intensity in production and processing leads to growth in the agribusiness sector. As a result, the number of agro processing, distribution and farm-input provision companies increases. In most cases, solutions to existing constraints in the vegetable marketing requires use of available information and application of available efforts at the appropriate scale and also trying as much as possible to increase the efforts to be more effective [19,20]. Also, overcoming the socio economic constraints is essential to achieving the goal of reducing marketing constraints.

This is why the following objectives were framed out in order to provide an appropriate track to the research work: to determine and describe characteristics of vegetable growers, to determine the constraints faced by the farmers in vegetable marketing, to explore relationship between each of the selected characteristics of the growers and their extent of vegetable marketing constraints and to index the constraints faced by the growers in vegetable marketing.

## 2. MATERIALS AND METHODS

### 2.1 Sampling

The study was conducted at Raynagar union of Shibganjupazila under Bogura district. Out of twelve unions, Raynagar union was purposively selected because of higher vegetables production. Thereafter, three villages namely, Pareaschili, Tepagari and Binnapara were selected randomly from 11 villages of this union. Three separate lists of vegetable growers of the selected three villages were prepared by the researcher himself with the help of the Sub-Assistant Agriculture Officer (SAAO) of Upazila Agriculture Office (UAO), Shibganj. The list comprised a total of 547 vegetable growers from which 147 farm family heads from Pareachli village, 213 from Tepagari village and 187 from Binniapara village under the union of Raynagar which constituted the population of the study. By using the Yamane's (1967) formula, the sample size was determined 113 for this study. Separate sample sizes of each of the villages were determined proportionately. Sample was drawn from the population by using proportionate random sampling method. A reserve list of 11 vegetable farmers was also prepared by using 10 percent of the sample size so that the respondent of this list could be used for interview if the respondents included in the original sample were not available at the time of conduction of interview. The distribution of the population sample and number of respondent in the reserve list are given.

### 2.2 Measurement of Predicted Variable

Constraints faced by the vegetable grower in marketing was the main focus and marketing constraints of vegetable grower were measured on the basis of twenty two constraints. Each of the sample vegetable farmers was asked to indicate the degree of constraints faced by him / her against each of 22 selected constraints. The alternative a response were 'very high', 'high', 'medium', 'low' and 'not at all' constraints. The score of 4, 3, 2, 1 and 0 were assigned to these alternative responses respectively. Finally, marketing constraints score of a respondent was determined summing up the weights of his / her responses to all the twenty two statements. Thus, marketing constraint face score of the respondent was ranged from zero (0) to 88, where '0' indicating no constraints of vegetable growers and highest '88' indicating very high constraints of vegetable growers.

Attempts were made to compare the constraints by using Constraints Faced index (CFI) with the following formula:

$$CFI = C_{vh} \times 4 + C_h \times 3 + C_m \times 2 + C_l \times 1 + C_0 \times 0$$

Where, CFI= Constraint Faced Index

$C_{vh}$  = No. of vegetable growers faced very high constraints

$C_h$  = No. of vegetable growers faced high constraints

$C_m$  = No. of vegetable growers faced medium constraints

$C_l$  = No. of vegetable growers faced low constraints

$C_0$  = No. of vegetable growers faced no constraints

Thus, the possible CFI of constraints items could range from 0–452, where '0' indicating no constraints and '452' indicating very high constraints. To compare the severity of the constraints, rank order was made by the descending order of the CFI.

### 2.3 Statistical Analysis

Data collected from the respondents were analyzed and interpreted in accordance with the objectives of the study. The analysis of data was performed using statistical treatment with SPSS (Statistical Package for Social Science) computer program, version 20. The statistical measures such as range, mean, standard deviation, percentage, rank order were used for describing both the independent and dependent variables. Initially, Pearson Product Moment correlation was run to determine the relationship between the selected characteristics of the vegetable grower with their marketing constraints. Five percent (0.05) level of probability was used as the basis for rejection of a null hypothesis throughout the study. Co-efficient values significant at 0.05 level is indicated by one asterisk (\*) and that at 0.01 level by two asterisks (\*\*). For determining severity of the constraints, rank order was made based on the descending order of the Constraint Faced Index (CFI).

## 3. RESULTS AND DISCUSSION

### 3.1 Characteristics of the Vegetable Growers

This section deals with the selected characteristics of vegetable growers which were assumed to be associated with the constraints

faced by the vegetable growers in marketing. Different farmers possess different characteristics which are focused by his/her behavior. In this section 11 characteristics have been discussed. The selected characteristics of the farmers were; age, level of education, family size, area under vegetable cultivation, vegetable cultivation experience, annual family income, training received on vegetable cultivation, extension contact, knowledge on vegetable marketing, availability of marketing information and constraints faced by the vegetable growers in marketing. Measuring unit, range, mean and standard deviations of those characteristics of vegetable growers were described in this section. Age of the respondents varied from 21 to 87 years, the average being 44.83 years with the standard deviation of 14.69. According to their age, the respondents were classified into three categories as "young aged", "middle aged" and "old aged". The old aged vegetable growers comprised the highest proportion 36.3% followed by young old aged category 32.7% and the lowest proportion was made by the middle aged category 31.0%. Data also indicates that the old and young aged respondents constitute almost 63.7% of total respondents. The young and middle aged respondents were generally more involved in vegetable cultivation than the old aged. Education level of the respondents ranged from 0-15 in accordance with year of schooling. The average education score of the respondents was 4.12 with a standard deviation of 4.29. On the basis of their level of education, the farmers were classified into six categories. Data shows that respondent under can sign only category constitute the highest proportion 31.0% followed by primary education category 28.3%. On the other hand, the lowest proportion (3.5%) in above higher secondary education category followed by higher secondary education category (6.2%), can't read and write category 15% and secondary education category 15.9%. Education broadens the horizon of outlook of vegetable grower and expands their capability to analyze any situation related to vegetable production and marketing. An educated vegetable grower is likely to be more responsive to the modern facts, ideas, technology and information of vegetable production and marketing. The number of family members of the respondents ranged from 2-10 with an average of 4.47 and standard deviation of 1.49. Based on the family size the respondents were classified into three categories as small, medium and large family. The highest proportion 54.9% of the respondents had small family size consisting up to 4 members, while

40.7% of the respondents belonged to the category of medium family compared to 4.4 of them having large family size. Such findings are quite normal as per the situation of Bangladesh. The trend of nuclear family has been rising in the study area and subsequent the family member becoming smaller than the extended family. Farm size of the respondents ranged from 0.07-2.01 ha with the mean of 0.40 and standard deviation of 0.36. The highest proportion 67.3% of the farmers had small farm compared to 26.5% having marginal farm and only 6.20% had medium farm. The findings indicated that overwhelming majority 93.8% of the farmers had marginal to small farm size. In Bangladesh most of the farmers live on below a subsistence level. This in one of the vital reasons for not adopting improved farming practices in their farm as well as having lower skill on marketing practices. Computed scores of the farmers about experience in vegetable production ranged from 2-35 years with a mean of 13.35 and standard deviation of 5.91. 48.7% of the farmers had medium farming experience, where as 28.3% had long farming experience and 23.9% had short farming experience. Above three fourth (77%) of the farmers had medium to long farming experience. Generally, experience helps to cope up any problematic situation. Therefore, the higher experience might be increased the risk bearing ability of the farmers in vegetable cultivation as well as increase their knowledge and skill on marketing practice. Annual family income of the respondents ranged from 95-903.00 thousand taka. The mean was 199.99 thousand taka and standard deviation was 99.97. The highest proportion 59.3% of the respondents had medium income while 31.9% and 8.8% of the respondents had low and high annual income respectively. The higher income increases the risk taking capacity of the farmers' vegetable production and marketing. Farmers with low income generally invest less in their farms. It is therefore, likely that a considerable portion of farmers may face difficulty in vegetable production and marketing. The score of training exposure on vegetable cultivation of the farmers ranged from 0-3 days. The mean was 0.08 days and standard deviation was 0.48. Three fourth (85%) of the farmers had no training exposure; while only 15% of the farmers had low training exposure. It means that an overwhelming majority (85%) of the farmers had no training exposure. Training develops farmers' knowledge, skill, and attitude in positive manner. However, the findings show interns of training received, respondent status was found unsatisfactory. The

observed extension contact scores of vegetable grower ranged from 7-18 against the possible range from 0-28, the mean and standard deviation were 8.63 and 1.49 respectively. According to this score, farmers were classified into three categories: "low extension contact" (up to 7), "medium extension contact" (8-10) and "high extension contact" (above 10). Proportion of 84.1% of the vegetable grower had medium extension contact compared to 9.70% of them having low extension contact. Only 6.2% of the vegetable grower had high contact. Thus, overwhelming majority (93.8%) of the vegetable grower had low to medium extension contact. Extension contact is a very effective and powerful source of receiving information about various new and modern technologies. Knowledge on vegetable marketing of selected vegetables score of the respondents ranged from 16-23 against the possible range of 0-26 having an average of 18.93 and standard deviation of 1.37. On the basis of knowledge scores, the respondents were classified into three categories namely, 'low knowledge', 'medium knowledge' and 'high knowledge'. 66.4% of the respondents felt in high knowledge category followed by 33.6% in medium knowledge category. To perform optimum production and marketing, vegetable growers should have adequate knowledge and skill on different aspects of marketing. The observed score of marketing information of the respondents' vegetable growers ranged from 10-18 against the possible range of 0-28 having the mean of 11.45 and standard deviation of 1.29. Based on their marketing information, the growers were classified into three categories: "low level market information" (up to 9), "medium level of market information" (10-12) and "high level market information" (above 12). The highest portion 85.0% of the vegetable growers were in medium level market information group and only 15% were in high level group. Most of vegetable growers of the study area had medium level of information but it is necessary to have available market information for attaining highest market price. The scores of constraint faced in vegetable marketing of the respondents ranged from 45 to 72 against the possible range of 0 to 88 with an average of 57.61 and standard deviation of 5.44. Among the respondents the highest 68.1% vegetable growers belong to the group of medium level marketing constraints and the lowest 15% in high level marketing constraints followed by low level marketing constraints (16.9%) by the vegetable grower in marketing constraints. Among the growers, most of the

vegetable grower (85%) has low to medium constraints of vegetable marketing. All data are presented in Table 1.

### **3.2 Relationship between Selected Characteristics of the Vegetable Growers and Their Constraints Faced in Vegetable Marketing**

Age, level of education, farm size, vegetable cultivation experience, annual family income and extension contact of the farmers had no significant relationship with their constraints faced on vegetable marketing. The findings indicated that farm size of the farmers had a significant positive relationship with their constraints faced in vegetable marketing. Farmers having big farm size need to work hard to manage their farm efficiently. As a result they might perceived higher constraints in managing their farm. Training received of the farmers had a significant negative relationship with their constraints faced in vegetable marketing. Based on the above findings, it can be summarized that a vegetable grower had more training increased the capabilities to reduce marketing constraints of vegetable grower in Bogura district. Because training received develops the farmers' knowledge, skill, and attitude in positive manner. Although the findings showed that most of the respondent had no training but suggest that training experience might be the most important factor for the respondents to change their knowledge and skill on marketing practices of vegetables. Knowledge on vegetable marketing of the farmers had a significant negative relationship with their constraints faced in vegetable marketing. Based on the above findings, it can be summarized that a vegetable grower had more knowledge increased the capabilities to reduce marketing constraints of vegetable grower in Bogura district. Knowledge makes individuals to become rational and conscious about related field. So, knowledge has significant negative relationship with their constraints faced in vegetable marketing in Bogura district. Availability of marketing information of the farmers had a significant negative relationship with their constraints faced in vegetable marketing. Based on the above findings, it can be summarized that the vegetable grower of this particular area were not in contact of market information. So, they are being deprived to get a good price in the appropriate time. Educated people usually try to keep themselves updated about the marketing information. More marketing information means

greater opportunity to justify the market condition for the best time and place to sell their harvested crops. So, the availability of marketing information has significant negative relationship with their constraints faced in vegetable marketing in Bogura district. Data are presented in Table 2.

**Table 1. Characteristics of the vegetable growers**

Characteristics	Categories	Range	Number	Percent	Mean	STD
Age (years)	Young aged	21 – 87	37	32.7	44.83	14.69
	Middle aged		35	31		
	Old aged		41	36.3		
Level of education (schooling years)	Illiterate	0.0 – 15	17	15	4.12	4.29
	Can sign only		35	31		
	Primary		32	28.3		
	Secondary		18	15.9		
	Higher secondary		7	6.2		
	Above higher secondary		4	3.5		
Family size (number of members)	Small family	2-10	62	54.9	4.47	1.50
	Medium family		46	40.7		
	Large family		5	4.4		
Farm size under vegetable cultivation (hectare)	Marginal farm	07 - 2.01	30	26.5	0.40	0.36
	Small farm		76	67.3		
	Medium farm		7	6.2		
Vegetable cultivation experience (years)	Short farming experience	2 – 35	26	23.0	13.35	5.91
	Medium farming Experience		55	48.7		
	Long farming experience		32	28.3		
Annual family income ('000'BDT)	Low income	95 – 903	36	31.9	199.97	99.97
	Medium income		67	59.3		
	High income		10	8.8		
Training received (Number of days)	No training	0 – 3	96	85.0	.08	.48
	Low training		17	15.0		
Extension contact(Score)	Low extension contact	7 – 18	11	9.7	8.63	1.49
	Medium extension Contact		95	84.1		
	High extension contact		7	6.2		
Knowledge on vegetable marketing (Score)	Medium knowledge	16 – 23	38	33.6	18.93	1.37
	High knowledge		75	66.4		
Availability of marketing information (Score)	Medium level market Information	10 – 18	96	85.0	11.45	1.29
	High level market information		17	15.0		
Constraints faced by the vegetable growers in marketing (Score)	Low level marketing constraints	45 – 72	19	16.9	57.61	5.44
	Medium level marketing constraints		77	68.1		
	High level marketing constraints		17	15.0		
<b>Total</b>			<b>113</b>	<b>100</b>		

**Table 2. Co-efficient of correlation showing relationship between selected characteristics of the vegetable growers and constraints faced in vegetable marketing**

Predicted variable	Experimental variable	Computed Value "r"	Tabulated value of "r"	
			At 0.05 level	At 0.01 Level
Constraints faced in vegetable marketing	1. Age	-0.005 <sup>NS</sup>	0.185	0.241
	2. Level of education	-0.041 <sup>NS</sup>		
	3. Family size	0.024 <sup>NS</sup>		
	4. Farm size under vegetable cultivation	0.397**		
	5. Vegetable cultivation experience	-0.017 <sup>NS</sup>		
	6. Annual family income	0.066 <sup>NS</sup>		
	7. Credit availability	0.097 <sup>NS</sup>		
	8. Training received	-0.293**		
	9. Extension contact	0.122 <sup>NS</sup>		
	10. Knowledge on vegetable marketing	-0.247**		
	11. Availability of marketing information	-0.218*		

<sup>NS</sup> Not significant; \* Significant at 0.05 level of probability; \*\* Significant at 0.01 level of probability

**Table 3. Indexing of the marketing constraints of vegetable grower in the locale**

Aspects of constraint	Constraint items	CFI	Rank order
Transport Facility	Lack of pucca roads	407	4
	Road blockade due to land slide, etc.	149	21
	Bulkiness and perishable nature of the Produce	301	12
	Inadequate availability of vehicle for	382	6
	Uneven road condition	204	19
Grading	Lack of machine facilities	164	20
	Undefined standards	330	8
Packing Material	Poor quality	213	17
	unavailability during harvesting time	394	5
Storage of Produce	Inadequate facilities	310	10
	Insufficient space	439	1
	Qualitative losses	259	15
	Inadequate govt. assistance	296	13
Malpractices	Weighing	285	14
	In bidding / auctioning	301	11
	High and undue market charge	366	7
	More number of middleman	429	2
	Arbitrary commission charges	219	16
Market intelligence	Late information	207	18
	Payment in parts	314	9
	Inadequate information	416	3
	Misleading information	127	22

### 3.3 Indexing of the Constraint Faced by the Vegetable Growers

Indexing the twenty two dimensions of marketing constraints of vegetable grower is presented in Table 3. According to Constraint Facing Index (CFI), insufficient space for storage of produce positioned the 1<sup>st</sup> and misleading information of marketing intelligence in the last. Marketing

constraints of vegetable grower in Bangladesh according to descending order through analysis of the received data from respondents are presence of insufficient space for storage of produce, more number of middleman, inadequate market information, inadequate availability of vehicle for each packing, lack of pucca road, unavailability of packing material, high and undue market charge, undefined

standard for grading, payment in parts, inadequate facilities for storage, bulkiness and perishable nature of the produce, auctioning, inadequate govt. assistance, weighing, qualitative losses, arbitrary commission charges, poor quality of packing material, late information of market, lack of machine facilities for grading, road block due to land slide, etc. and misleading information of market. The result showed that the highest constraints among the marketing constraints faced by the vegetable grower was insufficient space for storage. The lowest constraints in vegetable marketing was misleading information about market intelligence. This happened because the respondent use some local technique and most of the respondents had awareness about marketing.

#### 4. CONCLUSION

On the basis of the findings and their logical interpretation, it can be concluded that majority of the vegetable growers faced medium to high constraints regarding all the aspects under study. Insufficient space for storage of produce, effect of middle man, in adequate market information, low transport facilities, lack of knowledge and training were the major ones. So, concerned authorities should take proper steps to minimize the constraints so that the commercial vegetable growers can get expected return from their investment.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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