OBSTACLES FACED BY FARMERS IN GETTING FERTILIZER: STUDY BASED ON SOME SELECTED AREA

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***This is to certify that the thesis entitled*, "OBSTACLES FACED BY FARMERS IN GETTING FERTILIZER: STUDY BASED ON SOME SELECTED AREA"** *submitted to the Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of MASTER OF AGRIBUSINESS AND MARKETING, embodies the result of a piece of bona fide study work carried out by Md. Shahadat Hossen, Registration No. 11-04578 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been availed of during the course of this investigation has duly been acknowledged.

Dated:
Place: Dhaka, Bangladesh

Dr. Md. Wahidul Habib
Supervisor


DEDICATED
TO
MY BELOVED PARENTS

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The Author

OBSTACLES FACED BY FARMERS IN GETTING FERTILIZER: STUDY BASED ON SOME SELECTED AREA

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ABSTRACT

In order to investigate the problems of farmer towards getting fertilizer a study was conducted in Muktagacha upazilla under Mymensingh district during January 2019 to June 2019 .There only the small scale farmers in total respondents were randomly selected for interviews. This study is conducted with the direct interview to the farmers. Farmers are selected randomly by the preference of their Age, land ownership, cultivation crops, amount of fertilizer they need, how they purchased fertilizer etc. Some discussion with the local dealers is conducted to know the marketing activities of fertilizer. Most of the cases farmers are ready to answer the questions but in some matters (Income, actual production) the tried to hide something or ambiguous. Under this study it is clear that when farmers have no much money on that time they need fertilizer and when they have money on that time there is no use of fertilizer also they have no so much market information. Government subsidy is good enough but they did not get fertilizer on credit so With all other supports management of farmers need and availability can reduce the problem.

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ABBREVIATIONS AND ACRONYMS

AS	Ammonium sulphate
BADC	Bangladesh Agricultural Development Corporation
BCIC	Bangladesh Chemical Industries Corporation
BFA	Bangladesh Fertilizer Association
DAE	Department of Agricultural Extension
DAP	Di-ammonium Phosphate
DO	Direct Order
DFSMC	District Fertilizer and Seed Monitoring Committee
FAO	Food and Agriculture Organization
FDI	Fertilizer Distribution Improvement
GoB	Government of Bangladesh
GDP	Gross Domestic Product
HYV	High Yielding Varieties
IFDC	International Fertilizer Development Center
IFA	International Fertilizer Association
KSS	Krishi Samabaya Samity
MoA	Ministry of Agriculture
MoF	Ministry of Finance
MoP	Muriats of Potash
MT	Metric Ton
NFDCC	National Fertilizer Distribution Coordination Committee
NMS	New Marketing System
OMS	Old Marketing System
PDP	Primary Distribution Point
PSI	Private Sector Importer
PSU	Primary Sampling Unit
SAAO	Sub-Assistant Agriculture Officer
SSP	Single Super Phosphate
TCCA	Thana Central Cooperative Association
TSC	Thana Sales Center
TSP	Triple Super Phosphate
UAO	Upazila Agriculture officer
UCCA	Upazila Central Cooperative Association
UFSMC	Upazila Fertilizer and Seed Monitoring Committee
UNO	Upazila Nirbahi Officer

CHAPTER I

INTRODUCTION

1.1 Background of the study

The consumption of chemical fertilizer in Bangladesh since its introduction in 1951-52 has steadily increased as the country has been modernizing its agriculture for attaining autarky in food grain production thereby ensuring food security and improving nutritional status. The total food grain production (rice, wheat and maize) rose from 28.88 million ton in 2005-06 to 34.83 million ton in 2011-12. BBS (2016). Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics, Statics Division, Ministry of Planning, Government of the People's Republic of Bangladesh., Dhaka. At present the total food grain production is 36.37 million ton. Now there is hardly any crop that does not use fertilizer. The major chemical fertilizers used are: Urea, TSP (Triple Super Phosphate), SSP (Single Super Phosphate), DAP (Diammonium Phosphate), MP (Muriate of Potash), Ammonium Sulfate (AS), Zinc Sulfate, Gypsum, NPKS (Nitrogen-Phosphorous- Potassium-Sulfur containing mixture) etc. Fertilizer consumption (% of fertilizer Production) in Bangladesh was 121.21 as of 2002 and 469.37 in 2014. Urea constitutes about 67 percent of all the fertilizers consumed while Zinc Sulfate and Gypsum are micro-nutrients and they constitute only 3.07 percent of the total fertilizer consumption. BCIC (2001)

The natural Gas Fertilizer Factory (NGFF) at Fenchugonj which was commissioned in 1961 was the first Urea fertilizer complex in the country based on indigenous natural gas as feedstock and fuel. Thereafter, six more natural gas based urea fertilizer complex have come on-stream. The commercial production of TSP begun in 1973 at TSP Complex in Chittagong with imported raw materials (Sulfur and Phosphate Rock). Bangladesh does not have any potash fertilizer production facility. Gypsum is a by-product of TSP complex while producing Phosphoric Acid. Zinc sulfate is produced by small operators using waste zinc as raw material. The commercial production of ammonium sulfate begun in 1969 and it is specifically used in tea plants.(Pradhan, 1992)

The agriculture is still an important segment of the country's economy though the contribution of broad agriculture sector in 2017-18 GDP was 14.23%. GDP growth rate increased from 2.97% to 4.19% in 2107-18. Bangladesh Economic Review, Finance Division, Ministry of Finance, GOB, 2018. About 52 percent of the total labor forces of the country are engaged in Agriculture. To feed the growing population of Bangladesh increased Agriculture production especially staple cereal rice is a must. In 2017 the Agricultural irrigated land (% of total agricultural land) was 51.62%.BBS, Statistical Year Book of Bangladesh, Bangladesh Bureau of Statistics, 2017. The Department of Agriculture Extension (DAE) claims that the current cropping intensity is 190%.

In the last decade, hardly a year passed without complaints from the farmers about the low availability of fertilizer during the critical period of rice production. Often farmers' agitation against administration became the headline of the newspapers. Sometimes angry farmers were found to be engaged in clashes with law enforcement forces resulting in loss of lives. Beyond the casualties, another implication of the so-called fertilizer shortage was our failure to reach the targeted volume of rice domestically produced. Thus, the issue of fertilizer availability remains important for the policy makers who are concerned about food security which hinges on the domestic rice production. Fertilizer is a crucial input to maintaining productivity growth required to meet food security and poverty reduction objectives set forth in national budget. Direct involvement of the administration in the fertilizer distribution process reflects its sensitivity toward the issue. Despite the administration's claim that adequate fertilizer was available. Farmers dissatisfied with the existing fertilizer distribution network, often complained that dealers had met only a small fraction of their fertilizer demand. When the administration said supply was adequate, it meant there was enough supply to meet demand at the administered price. Had it been true then the administration could have operated through market rather than the dealer's network. Use of the network implied fertilizer shortage at the administered price. Since the administered price of fertilizer (especially price of urea) was set to a very low level, border crossing of fertilizer was also highly likely. Thus, a key challenge is determining the level of fertilizer subsidy which is most likely to assist farmers realize the full potential of available technologies and production practices while also reaching the twin goals of food security and poverty alleviation. One crucial step

toward meeting the challenge is to estimate the total fertilizer demand for the agricultural sector. To the best of our knowledge, there has not been any systematic nationally representative study to estimate the demand for fertilizer. Often the administration sets its fertilizer policy based on fertilizer requirements. But fertilizer demand and fertilizer requirement are fundamentally two different concepts. FAO(2009).

The fertilizer demand is often referred to as a "derived" demand because it is determined to a large extent by the final demand for the crop produced. In general, the demand for fertilizer depends on (1) the price of the crops , (2) the price of fertilizer, (3) prices of other inputs that substitute for or complement fertilizer, and (4) the parameters of the production technology. Fertilizer requirement, often referred to as potential demand, is experts' assessment of fertilizer need based on the information of total amount of land available for certain crops, land quality and other agro-ecological conditions. There is often a significant gap between the two because farmers' knowledge of or experience with fertilizers may lead him/her to perceive the yield response and profitability as substantially lower than that perceived by experts and extension personnel. Thus, the estimation of fertilizer demand is necessary to provide a comprehensive overview of the technical, economic, and policy issues of relevance to fertilizer policy design and implementation in Bangladesh. Kafiluddin and Islam (2008).

1.2 Description of The Study

The description of the study area is important because it provide a brief, clear and unambiguous description of the study area to identify the farmer‘s level of living and the salient features of the area. The description of the study area includes location, area and population, educational and occupational status, physical features and economic condition, transportation, communication and marketing facilities. This information is essential for better understanding of the facts and findings of the research and for the selection of a representative sample.

1.2.1 Location

The Study is Organized In Mymensing District Under Muktagachha Upazilla. Muktagacha is located at 24.7583°N 90.2667°E. It has 64044 households and total area 314.71 km².

1.2.2 Area and population

According to the 2011 Bangladesh census, Muktagachha had a population of 415,473. Males constituted 49.74% of the population and females 50.26%. Muslims formed 95.30% of the population, Hindus 4.52%, Christians 0.17% and others 0.02%. Muktagachha had a literacy rate of 43.5% for the population 7 years and above. Most of the people depend on Agricultural for their dailies.

1.3 Rationale of the study

For meeting the existing demand of food in a over populated country Agriculture must need to become specialized and by this way we go beyond our previous traditional farming system. For high yielding varieties and more production we need sufficient fertilizer. We did not face lot of problems about the scarcity of fertilizer but the problem we face is distribution and problems of farmers why they are not always in receiving fertilizer on time. Under this study it would be shown why farmers are not taking fertilizer on time and what the problems they faced everyday.

1.4 Objective of the study

The study aimed at achieving three objectives, as follows:

1. To identify the problems of farmers getting fertilizer.
2. To evaluate the fertilizer marketing system.
3. To suggest modifications of existing fertilizer policies to mitigate the constraints.

1.5 Assumptions of the Study

An assumption is the supposition that an apparent fact or principle is true in the light of available evidence. There had the following assumptions in mind while undertaking this study:

i. The respondents included in the sample of the study were able to provide their opinions and were competent enough to satisfy the queries.

ii. The information furnished by the respondents was reliable.

iii. The fertilizer use gap between recommended and farmer's dose practices for major farming system included in the study were known to the respondents.

iv. The collected data from the respondents were free from bias.

v. Views and opinions furnished by the respondents included in the sample were the representative views and opinions of the whole population of the area concerned.

1.6 Limitation of the Study

Some problems are faced while collecting the data and formulating the study. These are given below

1. The first limitation of this study was the shortage of time. The primary data and other necessary information were collected within a short period of time and hence could not cover wider area.

2. Education of the respondents was a pre-requisite factor for having accurate data. Since most of the respondents were not well educated they were suspicious of outsiders and therefore, they were likely to be less co- operative.

3. Some respondents did not keep any written records of the farming activities. Therefore, the researcher had to depend upon their memory.

4. The findings of the study were based on the data of some selected areas of Mymensingh district in Bangladesh. Therefore, the study may not be representative of the whole Bangladesh.

5. Since the respondents remained busy at their work, they were not always available at home. For this, frequent visits were made to get information from them.

6. Respondents from all categories were often unable to recall the exact information, say, income, sales volume, cost, total production etc. Reliability of data therefore, posed some confuting.

7. In most of the cases they think the problem is normal in their daily life

8. Farmers are not habituated in this type of discussion

CHAPTER II

REVIEW OF LITERATURE

Various reports and publications that related to fertilizer use and management were studied (Karim, 2009; Shah et al., 2008; Kafiluddin and Islam, 2008; Mandal, 2008 and BARC, 2000). These reports and publications have provided some background information.

The analysis of the demand for fertilizer use does not have much precedence. Two main related articles can be mentioned here.

Coady (1995) focused on the variation in the level of chemical fertilizer applied, in particular to high yielding variety of wheat. The double hurdle model used to explain the variation.

Shah *et al.* (2008) Outlook for fertilizer consumption and food production in Bangladesh.

Fertilizer input across farms incorporates the process by which 'zeros' are generated, in particular differentiating between households who do not apply because of 'lack of accesses and those who do not apply out of choice.

Khaleque (2009) Fertilizer a big bother for Bangladesh where he shown Bangladesh did not have any potash fertilizer production facility. Gypsum is a by-product of TSP complex while producing Phosphoric Acid. Zinc sulfate is produced by small operators using waste zinc as raw material. The commercial production of ammonium sulfate begun in 1969 and it is specifically used in tea plants

Croppenstedt *et al.* (2003) estimate a double hurdle fertilizer adoption model for Ethiopia. It is found that credit is a major supply side constraint, suggesting that household cash resources are generally insufficient to cover fertilizer purchases. On the demand side, household size, formal education of the farmer and the value-to-cost ratio has the largest impact on adoption and intensity of fertilizer use. The results underline the importance of increasing the availability of credit, developing labor markets, and reducing the procurement, marketing and distribution costs of fertilizer.

Abedin *el al.* (1999) examined the fertilizer supply and the fertilizing behavior of farmers in Boro season

Quasem (1978) in an ease study concluded that (1) fertilizer use was mainly dependent on the crops rown their productivity (2) farm size did not have much effect on the use of fertilizers even under unfavorable tenurial system because of crisis of land.

Kaaya *et al.* (1999) found that most of the respondents used Urea, TSP.MP among the chemical fertilizers .But sometimes in absence of TSP farmers used SSP as phosphatie fertilizer. 1 lie highest proportion of the farmers used organic matter in T. Aman (HYV) which was followed by wheal, jute and HYV Potato.

There has been number of studies on fertilizer use in Africa. One of those studies, Minot et.al. (2000) used a Heckman model to identify the determinants of fertilizer use. The study finds that fertilizer use is closely related to crop mix and access to inputs on credit, but not to household income. In Malawi and Benin, the two countries which are focus of the study, farmers growing cash crops are three times as likely to fertilize their maize fields as other farmers. In Benin, 88 percent of the fertilizer purchased by farmers is bought on credit through the integrated cotton marketing system managed by the parastatal sonapra. However, almost one third of this fertilizer is diverted to maize and other crops. In Malawi,

Tobacco is the most important cash crop among smallholders, but less than half the tobacco growers are able to purchase fertilizers on credit. Maize accounts for about 60 percent of the fertilizer use, compared to less than a third for tobacco. This difference in the tradability of the main crop being fertilized helps explain some of the difference in performance. In Benin, fertilizer use was stimulated by the 1994 devaluation of the CFA franc, while in Malawi real depreciation of the currency has reduced the profitability of fertilizer. There have not been not many studies on the determinants of fertilizer use have been done in Bangladesh. One of those studies might be Parikh (1990) test four hypotheses in the context of Bangladesh fertilizer demand using to bit estimation on farm survey data of 457 farms. The hypotheses tested are: (1) Are fertilizers and labor complements or substitutes in Bangladesh? (2) Does the size of holding have any significant impact on consumption per acre? (3) Are fertilizers and manures substitutes or complements? (4) Do prices play a dominant role? The study

concludes that fertilizers and family labor are complements with non-price definition while fertilizers and hired labor are substitutes with price definition. The price elasticity of fertilizer demand ranges from -0.66 to -0.97 using various models.

In another related study, Islam and Islam (2002) analyze factors demand for modern rice technology adoption in Second-Generation Green Revolution. A considerable progress in

development and adoption of modern rice technology was observed in the country due to advent of 1st, 2nd and 3rd generation rice cultivation. Only seed and fertilizers were found to have elastic demand. The price elasticity's of land, labor and insecticides had positive coefficient. This could be due to scarcity of land and rational use of these inputs as marginal productivity of these inputs would be higher than their marginal costs. The complementary relationships of land-fertilizer, animal-seed-labor and fertilizer-insecticide pairs characterize the intensive inputs use in the third-generation modern rice technology. Considerable higher degree of substitutions was observed for animal-labor and land-labor pairs which indicate that, modern rice technology in Second-Generation Green Revolution could be labor intensive for the small farm holders.

IFDC (1982) Third Evaluation of the Bangladesh New Marketing System: A Report on the Fertilizer New Marketing System (NMS) in Bangladesh.

Hossain *et al.* (2009) Fertilizer Marketing and Distribution System in Bangladesh. Ministry of Agriculture (MoA), Government of Bangladesh, Dhaka. In the study how fertilizer move from production level to farmer level is clearly remarked.

Foster *et al.* (1995) Special Study of the Fertilizer Situation in Bangladesh: with an Emphasis on Urea. In his he shown that urea has great impact on production.

John H. (1995). The Bangladesh Fertilizer Market: An Appraisal of Market Conditions, Policy Related Issues, and Constraints, Recommendations for Improvement, and Establishment of a Management Information System for Fertilizer

Abdullah, Abu. (1996) Shown the urea market in Bangladesh and the overall crisis of urea fertilizer.

BIDS (Bangladesh Institute of Development Studies), (1984). Based on Impact of the New System of Distribution of Fertilizer and Irrigation Machines in Bangladesh.

CHAPTER III

MATERIALS AND METHODS

Suitable approaches and tools were followed to achieve the objectives of the study. Data were collected in three ways:

- Primary data from direct questionnaire to the farmers
- Review of relevant journal and report
- Consultation of documents and reports

3.1 Primary data from direct questionnaire to the farmers

The questionnaire is designed to find out the problems regarding the farmers to take the fertilizer. The respondents are selected of different farmer in the village in Muktagacha upazila under Myminsingh district. The interview are conducted about 136 farmers in different village such as Mohistara, Bonbangla, Sonargaon, Bondhogualia, Bilsingla, Ram vhadrapur, jhanka, katkai, Roghunathpur, Mondolshen, Horipur.The interview are conducted with some interval from January to June 2019 . Upazila Agricultural officer also helped in collecting the relevant information.

3.2 Review of relevant journal and report

For the Introduction, Review of literature and for the related information different journals, reports, International publications help to building the thesis paper. Different statistical analysis, statistical information also help to build up a concrete structure. Some important best report have been studied for better understanding the study.

Various reports and publications that related to fertilizer use and management were studied (Karim, 2009; Shah et al., 2008;

Kafiluddin and Islam, 2008; Mandal, 2008 and BARC, 2000). These reports and publications have provided some background information.

Abedin *el al.* (1999) examined the fertilizer supply and the fertilizing behavior of farmers in Boro season Shamsul Alam, *et.al.* (2007) found that on an average sub-dealers purchased 80% from dealers

Shah, A.L., Rahman, M. S. and Aziz, M. A. 2008. Outlook for fertilizer consumption and food production in Bangladesh. Bangladesh J. Agric. Environ. (Special issue) 4: 9- 26.

3.3 Consultation of documents and reports

Some policy documents, National Agriculture Policy (NAP), Fertilizer Control Order (FCO), National Food and Nutrition Policy (NFNP), National Food Policy (NFP) and New Agricultural Extension Policy (NAEP) were consulted.

3.4 About survey

The respondents are selected of different farmer in the village in Muktagacha upazila under Mymensingh district. The interview are conducted about 136 farmers in different village such as Mohistara, Bonbangla, Sonargaon, Bondhogualia, Bilsingla, Ram vhadrapur, jhanka, katkai, Roghunathpur, Mondolshen, Horipur. There with all other occupations agriculture is the main occupation and rice cultivation was very intense in these study areas. The household survey included the farmers who were directly involved in rice production activities. A total of 136 farmers consisting of 46 marginal category (<0.5 ha land), 45 small category (0.5-1.0 ha land) and 45 medium category (1.0-2.5 ha land) farmers over the villages . A structured questionnaire was used for this survey. Simple and direct questions, and some scales whenever needed, were used in the interview schedule. Data of fertilizer use and farmers' characteristics, along with farmers' response to the constraints of accessibility to fertilizers were collected. Characteristics of farmers such as age, education, farm size, family size, farming experience, annual income, training experience, communication exposure, and use of organic fertilizers by the farmers were collected.

3.5 Statistical analysis

Mean data from questionnaire interview were subjected for conducting the analysis. Descriptions of the Farmer was done for all farmers under study using interviews. Descriptive statistics, Maximum value, minimum value, was estimated using SPSS computer program. Cranach's Alpha test, Extraction Method: Principal Component Analys also Rotation Method: Varimax with Kaiser Normalization are shown in the analysis.

3.6 Data description

After completion of the household survey, the data were compiled, tabulated and analyzed. Qualitative data were converted to quantitative data by means of suitable scoring wherever required. Correlation analysis was performed for exploring relationship of farmers fertilizer use with their characteristics.

3.4.1 Age distribution

Table 3.4.1 Age distribution of the respondent

Age	No. of respondent	Percentage(%)
20-29	48	35.3
30-39	77	56.6
40-50	6	4.4
50<	5	3.7
Total	136	100

Source: Field survey, 2019.

Among 136 respondent the age between (20-30) is 48 and the percentage is35.3% and the age between (30-40) is 77 and the percentage is 56.6%. Also from the chart we can see that 4.4% respondent lies between the age of (40-50), and the age above 50 lies 3.7% where 5 respondents were. The demographic characteristics shows that people in the age between (30-40) are largely involve in agriculture.

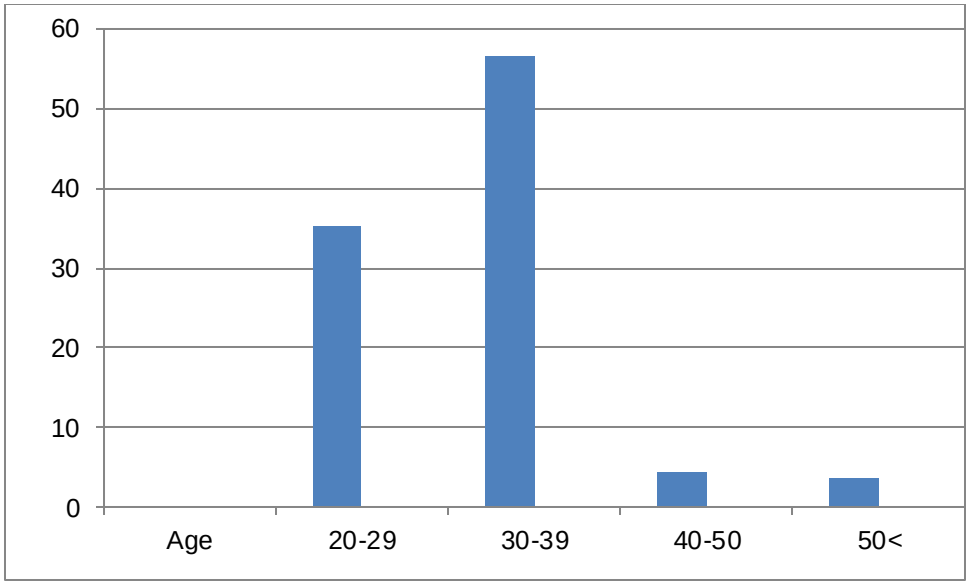


Figure: 3.4.1 Age distribution of the respondent

3.4.2 Educational background

Table : 3.4.2 Educational background of the respondent

Status	No. of respondent	Percentage(%)
No read or write	75	55.1
Read only	51	37.5
Read and write only	7	5.1
Class 5 to 9	3	2.2
Total	136	100

Source: Field survey, 2019

From the respondent educational background we can see that most of the people in our country those who are involve in agriculture have little or no education. In the study About 55.1% respondent have no educational background and about 37.5% respondent can read only. The respondent who can read and write only is about 5.1% but the most significant things is that only 2.2% respondent have quality education.

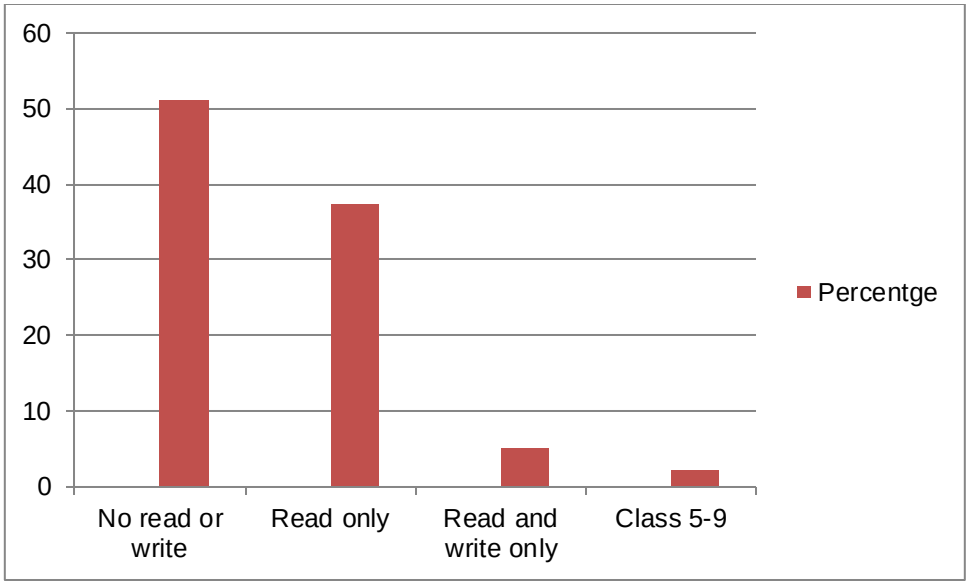


Figure : 3.4.2 Educational background of the respondent

3.4.3 Income status

Table : 3.4.3 Income status of the respondent

Income (Tk)	No. of respondent	Percentage(%)
>10000	94	69.1
10000-20000	23	16.9
21000-30000	9	6.6
31000-50000	8	5.9
50000<	2	1.5
Total	136	100

Source: Field survey, 2019

From the survey we can that the people which income is less than 10 thousands are lies in 94 respondent which cover 69.1% and the people which income is between (10-20) thousand is 16.9%. 6.6% people in the study which income is (20-30) thousands. The people which income is (30-40) thousands is only 5.9% and the most important think is that only 2 respondent, the percentage is 1.5% which income is

above 50 thousands. Their poor income hamper their taking decision. Income is the fact which affect the farmer taking fertilizer.

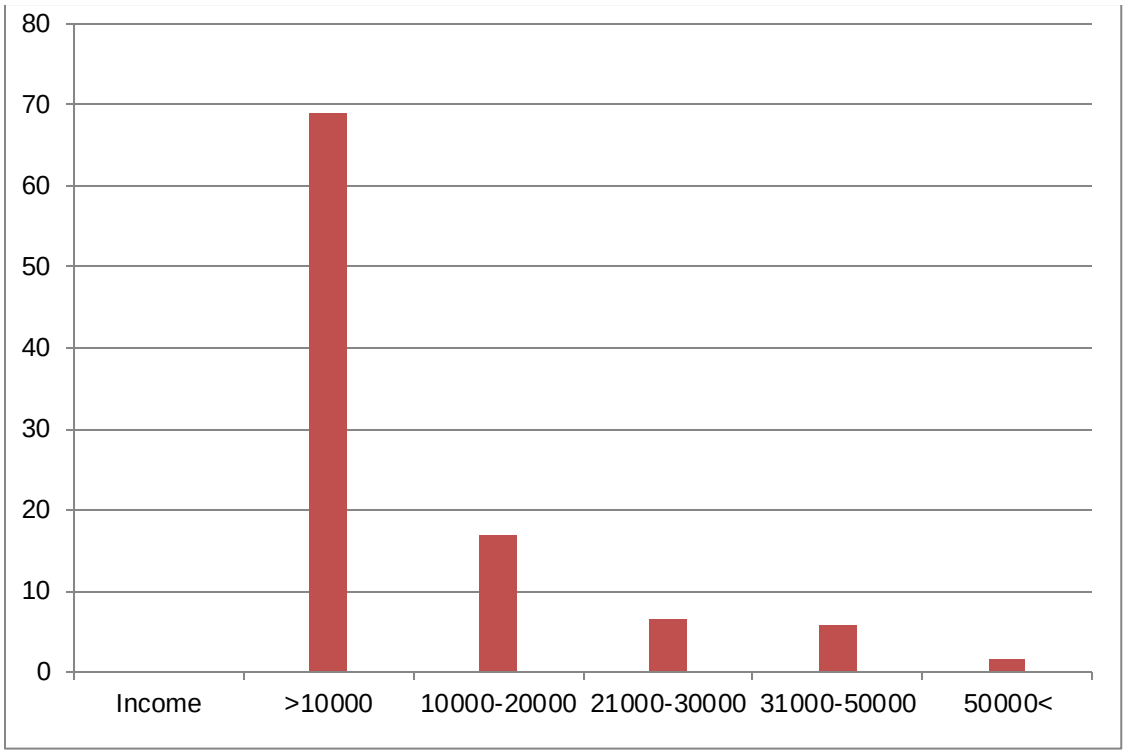


Figure : 3.4.3 Income status of the respondent

CHAPTER IV

RESULT AND DISCUSSION

4.1 Frequency

Table 4.1.1 : Age distribution

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-29 years	48	35.3	35.3	35.3
	30-39 years	77	56.6	56.6	91.9
	40-50 years	6	4.4	4.4	96.3
	50 years above	5	3.7	3.7	100.0
	Total	136	100.0	100.0	

Source : Field survey, 2019

Among 136 respondent the age between (20-30) is 48 and the percentage is 35.3% and the age between (30-40) is 77 and the percentage is 56.6%. Also from the chart we can see that 4.4% respondent lies between the age of (40-50), and the age above 50 lies 3.7% where were 5 respondent. The demographic characteristics shows that people in the age between (30-40) are largely involve in agriculture.

Table 4.1.2: Educational Background

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No read or write	75	55.1	55.1	55.1
	Read only	51	37.5	37.5	92.6
	Read and write only	7	5.1	5.1	97.8
	Class 5-9	3	2.2	2.2	100.0
	Total	136	100.0	100.0	

Source: Field survey, 2019

From the respondent educational background we can see that most of the people in our country those who are involve in agriculture have little or no education. In the study About 55.1% respondent have no educational background and about 37.5% respondent can read only. The respondent who can read and write only is about 5.1% but the most significant things is that only 2.2% respondent have quality education.

Table 4.1.3: Income status

Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10 thousand tk	94	69.1	69.1	69.1
	10-20 thousand tk	23	16.9	16.9	86.0
	21-30 thousand tk	9	6.6	6.6	92.6
	31-50 thousand tk	8	5.9	5.9	98.5
	above 50 thousand tk.	2	1.5	1.5	100.0
	Total	136	100.0	100.0	

Source: Field survey, 2019

From the survey we can that the people which income is less than 10 thousands are lies in 94 respondent which cover 69.1% and the people which income is between (10-20) thousand is 16.9%. 6.6% people in the study which income is (20-30) thousands. The people which income is (30-40) thousands is only 5.9% and the most important think is that only 2 respondent, the percentage is 1.5% which income is above 50 thousands. Their poor income hamper their taking decision. Income is the fact which affect the farmer taking fertilizer.

4.2 Descriptive Statistics Table

4.2.1 : Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I trust the pricing system of them	136	4	5	4.60	.493
Government encourages the use organic or inorganic fertilizer for agricultural production	136	4	5	4.60	.493
It is not easy to take fertilizer in credit	136	4	5	4.60	.493
I intend to updated about the overall pricing system	136	3	5	3.96	.902
I trust about the Government promise of supplying fertilizer	136	3	5	3.96	.902
There have no enough sufficient supply when necessary	136	3	5	3.96	.902
I will recommended others to use technology to access fertilizer pricing information	136	2	5	3.81	1.164
I have the knowledge about the seasonality of production	136	2	5	3.81	1.164
the current channel is comfortable to collect the fertilizer	136	2	5	3.81	1.164
Direct purchasing reduce cost and time	136	2	5	3.62	1.026
Removing the dealer or supplier reduce the price	136	2	5	3.62	1.026
I trust the dealers when they supply	136	2	5	3.62	1.026
The seller or dealer made artificial scarcity	136	2	5	3.62	1.026

Source: Field survey, 2019

Study shows that against the questions I trust the pricing system of them, Government encourages the use organic or inorganic fertilizer for agricultural production and It is easy to take fertilizer in credit to the respondent most of the respondent satisfied with the matter. The mean is 4.6 and the standard deviation is .493 which means the question have significant against the problem.

The mean value is 3.96 and the standard deviation is 0.902 against the questions - There have enough no sufficient supply when necessary, I intend to updated about the overall pricing system and I trust about the Government promise of supplying fertilizer against this question most of the respondent satisfied with the question.

I will recommended others to use technology to access fertilizer pricing information, I have the knowledge about the seasonality of production and the current channel is comfortable to collect the fertilizer against this questions the mean value is 3.81 and the standard deviation is 1.164

Direct purchasing reduce cost and time, Removing the dealer or supplier reduce the price and I trust the dealers when they supply and also The seller or dealer made artificial scarcity against these questions the mean value is 3.62 and the standard deviation is 1.026.

Table 4.2.2 : Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I predict I would use technologyto access fertilizer pricing information	136	1	5	2.98	1.396
I believe government will provide more subsidyand other facilities	136	1	5	2.98	1.396
Fertilizer is available when necessary	136	1	5	2.98	1.396
I will be reliable to use the traditional channels	136	1	3	1.79	.744
Legal/technical infrastructure is sufficient in supply the fertilizer	136	1	3	1.79	.744
Buying a huge amount create a great loss	136	1	3	1.79	.744
I intend to build up relations with Agricultural Extension officer for regular information	136	1	4	1.76	1.156
Getting more credit facilities during cultivation	136	1	4	1.76	1.156
Buying from the local market increase cost	136	1	4	1.76	1.156
Interaction with the Seller or Supplier easyand understandable	136	1	2	1.21	.411
Valid N (listwise)	136				

Source : Field survey, 2019

The mean value is 2.98 and the standard deviation is 1.396 against the questions to the respondent- I predict I would use technology to access fertilizer pricing information, I

believe government will provide more subsidy and other facilities and Fertilizer is available when necessary

I will be reliable to use the traditional channels, Legal/technical infrastructure is sufficient in supply the fertilizer Buying a huge amount create a great loss against the questions the mean value is 1.79 and the standard deviation is 0.744

The mean value is 1.76 and the standard deviation is 1.156 against the questions-I intend to build up relations with Agricultural Extension officer for regular information, getting more credit facilities during cultivation buying from the local market increase cost.

Interaction with the Seller or Supplier easy and understandable against the questions the mean value is 1.21 and the standard deviation is 0.411.

4.3 : Cranach's Alpha test

Internal consistency is typically measured using Cronbach's Alpha (α). Cronbach's Alpha ranges from 0 to 1, with higher values indicating greater internal consistency (and ultimately reliability). Common guidelines for evaluating Cronbach's Alpha are:

- .00 to .69 = Poor
- .70 to .79 = Fair
- .80 to .89 = Good
- .90 to .99 = Excellent/Strong

Reliability Statistics

Cranach's Alpha	N of Items
.769	23

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cranach's Alpha if Item Deleted
Interaction with the Seller or Supplier easy and understandable	71.14	93.514	-.764	.790
It is easy to take fertilizer in credit	67.76	86.541	.090	.771
Fertilizer is available when necessary	69.38	66.621	.836	.715
the current channel is comfortable to collect the fertilizer	68.54	71.939	.725	.731
Buying from the local market increase cost	70.59	94.496	-.366	.806
There have enough sufficient supply when necessary	68.40	81.012	.356	.759
Buying a huge amount create a great loss	70.57	86.662	.028	.775
The seller or dealer made artificial scarcity	68.74	76.892	.537	.747
Government encourages the use organic or inorganic fertilizer for agricultural production	67.76	86.541	.090	.771
I believe government will provide more subsidy and other facilities	69.38	66.621	.836	.715
I have the knowledge about the seasonality of production	68.54	71.939	.725	.731
Getting more credit facilities during cultivation	70.59	94.496	-.366	.806
I trust about the Government promise of supplying fertilizer	68.40	81.012	.356	.759

Table 4.3.1 : Cranach's Alpha test

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cranach's Alpha if Item Deleted
Legal/technical infrastructure is sufficient in supply the fertilizer	70.57	86.662	.028	.775
I trust the dealers when they supply	68.74	76.892	.537	.747
I trust the pricing system of them	67.76	86.541	.090	.771
I predict I would use technology to access fertilizer pricing information	69.38	66.621	.836	.715
I will recommended others to use technology to access fertilizer pricing information	68.54	71.939	.725	.731
I intend to build up relations with Agricultural Extension officer for regular information	70.59	94.496	-.366	.806
I intend to updated about the overall pricing system	68.40	81.012	.356	.759
I will be reliable to use the traditional channels	70.57	86.662	.028	.775
Removing the dealer or supplier reduce the price	68.74	76.892	.537	.747
Direct purchasing reduce cost and time	68.74	76.892	.537	.747

From the analysis the Cranach's Alpha is .769 which means that the result is fair. Against the questions I intend to build up relations with Agricultural Extension officer for regular information, Buying from the local market increase cost and

Getting more credit facilities during cultivation the Cranach's Alpha is .806 which fall between (0.80-0.89) that means the result is good enough.

4.4 Communalities

Communalities indicate the amount of variance in each variable that is accounted for. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. For principal components extraction, this is always equal to 1.0 for correlation analyses.

Extraction communalities are estimates of the variance in each variable accounted for by the components. The communalities in this table are all high, which indicates that the extracted components represent the variables well. If any communalities are very low in a principal components extraction, it may need to extract another component.

Table 4.4.1 : Communalities

Communalities

	Initial	Extraction
Interaction with the Seller or Supplier easy and understandable	1.000	.873
It is not easy to take fertilizer in credit	1.000	1.000
Fertilizer is available when necessary	1.000	.999
the current channel is comfortable to collect the fertilizer	1.000	.994
Buying from the local market increase cost	1.000	.891
There have enough sufficient supply when necessary	1.000	.996
Buying a huge amout creat a great loss	1.000	.928
The seller or dealer made artificial scarcity	1.000	.985
Government encourages the use organic or inorganic fertilizer for agricultural production	1.000	1.000
I believe government will provide more subsidy and other facilites	1.000	.999
I have the knowledge about the seasonality of production	1.000	.994
Getting more credit facilities during cultivation	1.000	.891
I trust about the Government promise of supplying fertilizer	1.000	.996
Legal/technical infrastructure is sufficient in supply the fertilizer	1.000	.928

Communalities

	Initial	Extraction
I trust the dealers when they supply	1.000	.985
I trust the pricing system of them	1.000	1.000
I predict I would use technology to access fertilizer pricing information	1.000	.999
I will recommended others to use technology to access fertilizer pricing information	1.000	.994
I intend to build up relations with Agricultural Extension officer for regular information	1.000	.891
I intend to updated about the overall pricing system	1.000	.996
I will be reliable to use the traditional channels	1.000	.928
Removing the dealer or supplier reduce the price	1.000	.985
Direct purchasing reduce cost and time	1.000	.985

Extraction Method: Principal Component Analysis.

4.5 KMO and Bartlett's Test: The Kaiser-Meyer-Olkin measure of sampling adequacy is a statistic that indicates the proportion of variance in variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with data. If the value is less than 0.50, the results of the factor analysis probably won't be very useful.

Table 4.5.1 :Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.482	54.269	54.269	12.482	54.269	54.269
2	5.548	24.123	78.392	5.548	24.123	78.392
3	4.201	18.266	96.658	4.201	18.266	96.658

The variance explained by the initial solution, extracted components, and rotated components is displayed. This first section of the table shows the Initial Eigenvalues.

The Total column gives the eigenvalue, or amount of variance in the original variables accounted for by each component. The % of Variance column gives the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all of the variables. The Cumulative % column gives the percentage of variance accounted for by the first *n* components. For example, the cumulative percentage for the second component is the sum of the percentage of variance for the first and second components.

For the initial solution, there are as many components as variables, and in a correlations analysis, the sum of the eigenvalues equals the number of components. You have requested that eigenvalues greater than 1 be extracted, so the first three principal components form the extracted solution.

The second section of the table shows the extracted components. They explain nearly 97% of the variability in the original 23 variables, so it can considerably reduce the complexity of the data set by using these components, with only a 3% loss of information.

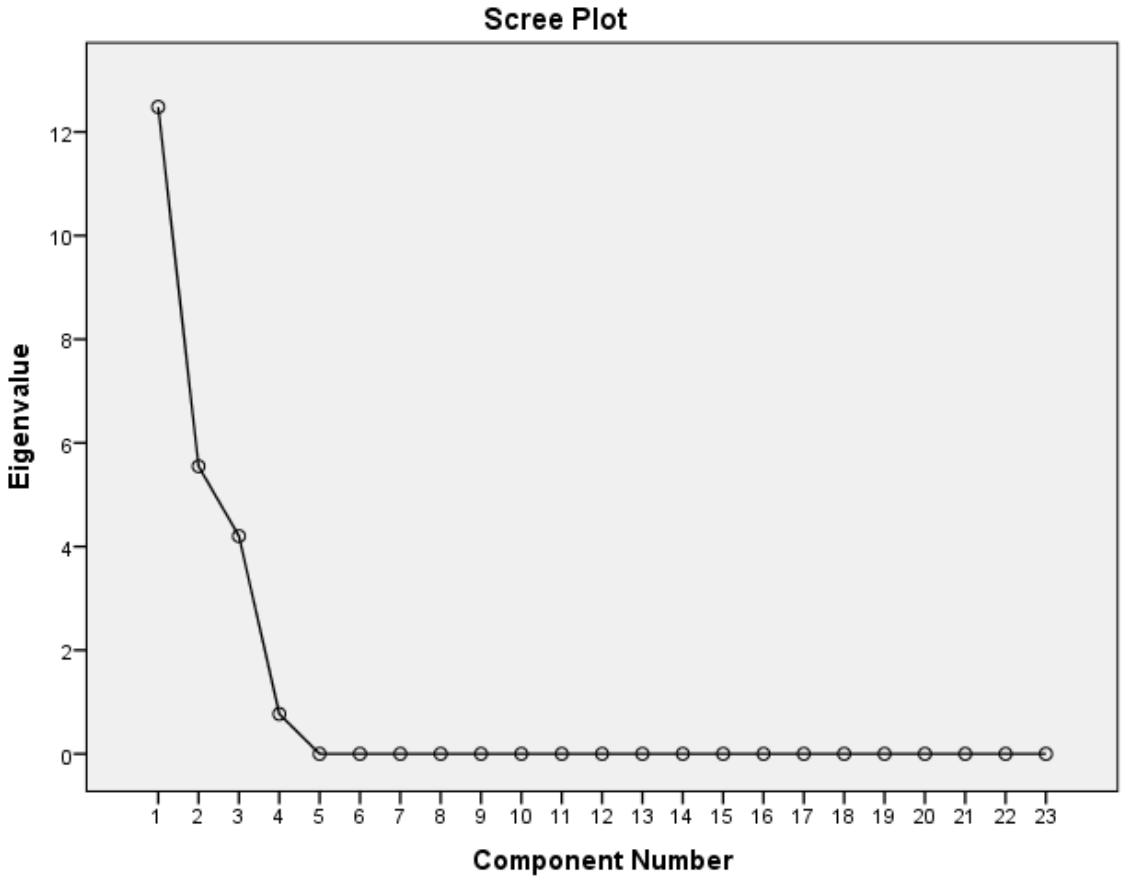


Figure 4.5.1: Component number

The screed plot graphs the eigenvalue against the factor number. It shows that these values in the first two columns of the table immediately above. From the third factor on, we can see that the line is almost flat, meaning the each successive factor is accounting for smaller and smaller amounts of the total variance.

4.6 : Rotated Component Matrix

The rotation maintains the cumulative percentage of variation explained by the extracted components, but that variation is now spread more evenly over the components. The large changes in the individual totals suggest that the rotated component matrix will be easier to interpret than the unrotated matrix.

Table 4.6.1 : Rotated Component Matrix

	Component		
	1	2	3
I will recommended others to use technology to access fertilizer pricing information	**.992**		
the current channel is comfortable to collect the fertilizer	**.992**		
I have the knowledge about the seasonality of production	**.992**		
Direct purchasing reduce cost and time	**.949**		
I trust the dealers when they supply	**.949**		
Removing the dealer or supplier reduce the price	**.949**		
The seller or dealer made artificial scarcity	**.949**		
I believe government will provide more subsidy and other facilites	**.823**		
Fertilizer is available when necessary	**.823**		
I predict I would use technology to access fertilizer pricing information	**.823**		
I intend to build up relations with Agricultural Extention officer for regular informatin			
Buying from the local market increase cost			
Getting more credit facilities during cultivation			

Rotated Component Matrix

	Component		
	1	2	3
I trust the pricing system of them		**.996**	
It is easy to take fertilizer in credit		**.996**	
Government encourages the use organic or inorganic fertilizer for agricultural production		**.996**	
Legal/technical infrastructure is sufficient in supply the fertilizer		**-.785**	
Buying a huge amount create a great loss		**-.785**	
I will be reliable to use the traditional channels		**-.785**	
I intend to updated about the overall pricing system			**.986**
I trust about the Government promise of supplying fertilizer			**.986**
There have enough sufficient supply when necessary			**.986**
Interaction with the Seller or Supplier easy and understandable			**-.641**

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

The result suggested that these factors were mainly responsible for affecting the problems of farmer getting fertilizer in the study area. Therefore, to identify these factors coefficient value and significance level here multiple logistic regression model was done. In this model factors were terms as variable. This model was also helpful to find out the relation between dependent variable and independent variable. Here, dependent variable was the problems of farmer towards getting fertilizer and independent variables were age, education, family size, , middlemen, market price, high input price, credit availability, location of market, market structure, marketing policy, consumer choice, supply and number of growers.

CHAPTER V

FERTILIZER DISTRIBUTION AND MARKETING SYSTEM

5.1 Background

Public policy for agricultural development in Bangladesh consists of a wide array of policy instruments enshrouding almost every aspect of production and distribution. Of late, the set of policies with regard to pricing and distribution of inputs, especially fertilizer has averred a great deal of topical interest. Within this policy purview, undeniably, chemical fertilizers and their judicious use have paramount importance as one of the most strategic and growth generating inputs required for increasing crop production and maintaining food security. But it is necessary to ensure timely supply of fertilizers to match the demand.

From this standpoint, the availability of fertilizer "at the right time, in the right quantity, and at the right place" is considered climacteric to expanding agricultural production. However, availability of fertilizer to farmers may depend, among other things, on the efficient marketing and distribution system. But, in many countries fertilizers are sometimes not available at the time and in quantities and forms required by farmers. It is in the distribution sector, after the fertilizers leave the plant or port that most inefficiency occurs. In the early 1970s, the governments of most Asian countries and particularly of Bangladesh

Were heavily involved in the fertilizer sector. To ostensibly increase agricultural production, governments maintained a virtual monopoly over procurement, distributed through parastatal institutions, established fertilizer subsidy programs, regulated private trade, and controlled input and output prices. A policy reversal, creating competitive fertilizer market began in mid-1980s and almost completed by mid-1990s5. Since then, governments have reduced the role of the public sector and liberalized the fertilizer sector.

The Government of Bangladesh (GoB) has adopted a number of policies regarding price, marketing and distribution of fertilizers and these policies have undergone profound changes during the last four decades. In the early 1960s, when the HYV technology was first introduced, the government supplied fertilizers at highly subsidized prices, procured and distributed them through the public sector bodies. But

since the mid-1970s, the government has been reducing the subsidy on fertilizer, and by 6 December, 1992, the subsidy has been completely eliminated and fertilizer trade was privatized. Such policy shifts during the late 70s, early 80s and till date have had significant impacts on the economy, especially in the

quantum and efficiency of fertilizer use in agriculture. From this viewpoint, the changes in policies have become the subject of deep concern and a great deal of controversy. This chapter takes a historical perspective to trace the path of evolutionary reforms in fertilizer input markets of Bangladesh. It attempts to review the fertilizer marketing and distribution policies adopted at different times by government of Bangladesh. Many recent studies including a comprehensive work done by the International Fertilizer Development Center (IFDC) have addressed this burning issue. This chapter is based on secondary data and reports published by Ministry of Agriculture (MoA), Government of Bangladesh, BADC, BCIC, BBS, Ministry of Finance (MoF) and Bangladesh Fertilizer Association (BFA) supplemented by publications from other sources like FAO, IFPRI, IFA, etc. Kafiluddin *et al.*(2008)

5.2 Fertilizer Distribution System

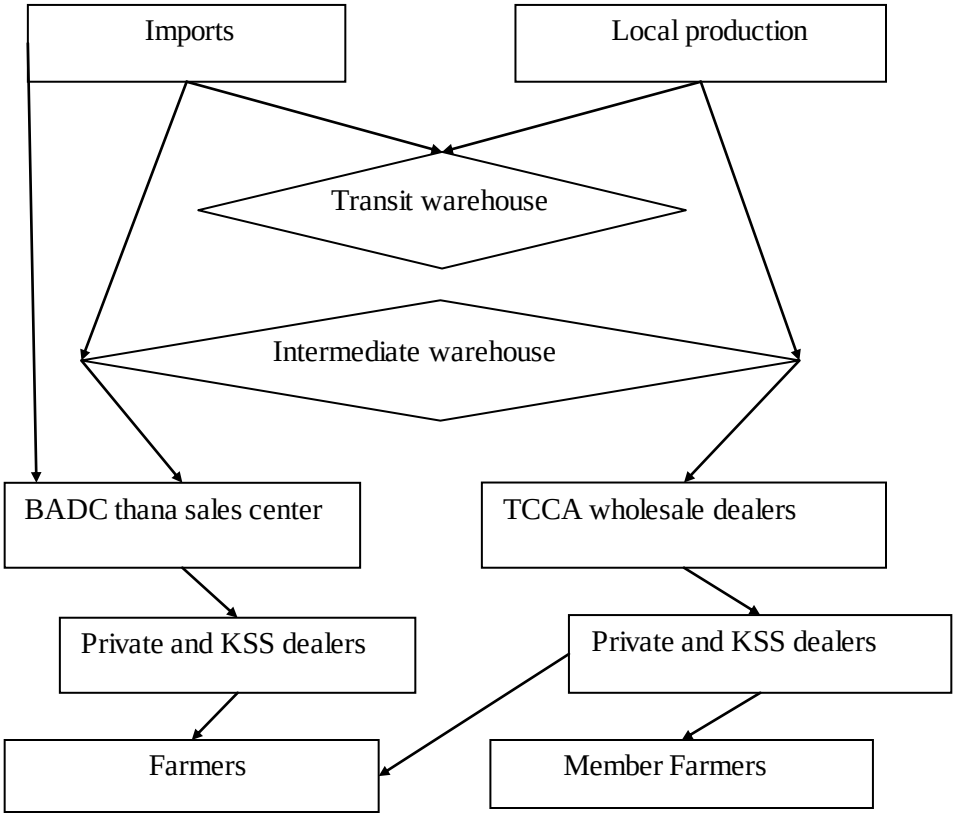
5.2.1 The Old Marketing System (OMS)

In the early 1950s the Department of Agriculture was entrusted to procure, store, distribute and retail sale of fertilizer among farmers. But, inadequate, discordant arrangements and unsatisfactory progress in the programme to manage fertilizer gradually became visible. This lead to the creation of Bangladesh Agricultural Development Corporation (BADC) in 1961. BADC took over the official responsibility of distribution and marketing of program in 1963 and continued till 1978-79 (Kafiluddin, 2008). Government tightly controlled fertilizer distribution. At that time, BADC was solely responsible for all import, procurement, transportation, storage, maintenance of sufficient stock at the godown and sale of fertilizer (except ammonium sulfate) all over the country and started selling fertilizers at highly subsidized prices. BADC, a state entity, had an absolute monopoly in fertilizer procurement, marketing and distribution down to the level of the below that level, it licensed a set number of dealers (usually 15 per union, a unit comprising about 6-12 villages), fixed the retail price, and set the desired commission.

From 1962 to 1978 free trading was almost absent in the fertilizer market and until 1978 BADC sold fertilizers to farmers through its own appointed dealers. Thana Sales Centers (TSCs) were established for the distribution of fertilizers to farmers at highly subsidized prices. The dealers could lift fertilizers from TSCs or godown of the Thana Central Cooperative Associations (TCCAs) where the dealers were registered. BADC dealers were appointed for each union and allowed to sell fertilizer only in a defined

area of operation, and demarcated by distance from a Thana warehouse. Farmers in the area had to purchase fertilizers from the dealer at an administrative price fixed by the government from time to time. Although a neighboring Thana warehouse may have been more accessible, dealers were only allowed to procure fertilizer from specified TSCs/TCCAs, they were registered and had to sell at a fixed price. The retail price was determined by the government. Dealers/TCCAs were paid a commission on the basis of distance from the TSC or TCCA warehouse to the operation center. This commission helped to cover transportation, storage, other incidental costs and profit margins. Dealers were required to maintain registers, which were subject to inspection by BADC officers. The price of fertilizers was supposed to

be uniform throughout the country. The responsibility of procuring fertilizer from both domestic and external sources and reaching it to the level of the lowest administrative unit (Upazila) rested solely with BADC. This distribution network was popularly known as the Old Marketing System (OMS).



Source: BADC

Figure: 5.2.1 Flow chart of BADC fertilizer distribution under the Old Marketing System

5.2.2 Constraints of the Old Marketing System

This public sector system termed as OMS, suffered from excessive bureaucratic control and retarded the initiative of dealers. This arrangement of fertilizer distribution did not function well because of BADCs gross irregularities and also of unnecessary bottlenecks for getting clearance from Thana committee and polices. Following constraints were identified under the

Old Marketing System (OMS):

- Dealer appointments involved a time consuming selection procedure.
- Erratic and uncertain supplies of fertilizer from local production and imports.
- Limited internal transportation and fertilizer storage capacity.
- Low dealer commission.
- Inadequate dealer and farmer incentives.

Although some relaxation allowed dealers to sell in hats and bazaars and to procure fertilizer from the most convenient BADC warehouses, on the inefficient, expensive, and entirely not conducive to sustainable agricultural growth and development. Whole, the system was cumbersome.

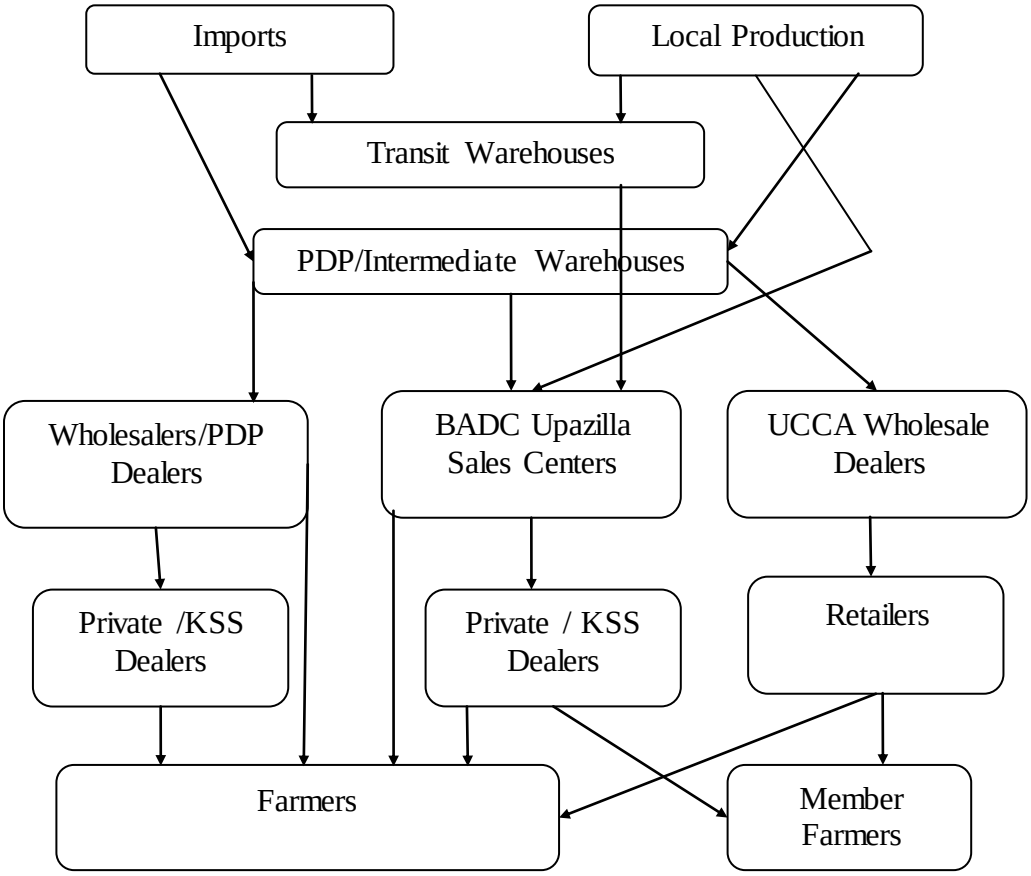
5.2.3 The New Marketing System (NMS)

The pressure for putting in place a transparent and efficient fertilizer marketing system through the intervention of the private sector emanated from the United States Agency for International Development (USAID). Thus, in 1977 and early 1978, the Government of Bangladesh (GoB) and BADC with assistance from USAID (under a contract with IFDC) made the decision to improve the fertilizer distribution system. The purpose was to increase fertilizer use on an equitable basis throughout Bangladesh. It was thought to be achieved through a New Marketing System (NMS) designed to remove supply and dealer constraints. Accordingly, USAID in 1987 agreed to provide a grant to finance fertilizer imports, warehouse construction and technical assistance on the plea that a new marketing system to

be introduced, which would substitute the role of BADC as a wholesaler by a private retailer market with a more open market system. This system known as Fertilizer Distribution Improvement (FDI-1) was launched from December 1st 1978 up to July 1st 1980. In this regard, BADC was the designated implementation unit of the NMS. The major thrust of NMS was to remove marketing and distribution constraints by making BADC more efficient and market-oriented, strengthening the role and effectiveness of private dealers/sector in fertilizer marketing, improve farmers' access to fertilizers and boost up agricultural production Under the new marketing system, BADC still has the monopsony in procurement for Bangladesh and monopoly in distribution of fertilizers to PDP. IFDC. (1982). Third Evaluation of the Bangladesh

New Marketing System: A Report on the Fertilizer New Marketing System (NMS) in Bangladesh, submitted to the Bangladesh Agricultural Development Corporation.

The NMS are schematically presented bel



Source: International Fertilizer Development Center

Figure: 5.2.2 Flow Chart of fertilizer distribution under the New Marketing System

5.3 Fertilizer intermediaries

Factories: The Bangladesh Chemical Industries Corporation (BCIC), a parastatal organization is responsible for fertilizer production and the operation of six urea fertilizer factories, one TSP and one DAP plant in the country . Distribution of BCIC's fertilizer production is made from the factory gate to the appointed dealers at prices determined by the Government. The BCIC's production is uneven, rarely

producing at a rated capacity. Production and import of urea is always controlled by the government and is distributed to the farmers through the 4850 BCIC's appointed dealers at heavily subsidized rates. Moreover, the production of small quantities of TSP, SSP and DAP are also at the government's command.

Importers: Bangladesh imports all of the DAP, MoP and a part of SSP and Gypsum, Zinc, and Ammonium sulphate (AS). Import and marketing of a portion of the TSP, DAP and other fertilizers (MoP, SSP, Gypsum, magnesium sulphate and micronutrients) are controlled by the private sector. The government determines the requirement for different fertilizers for a budget year and then allows importers to meet up the demand. There are 140 importers in Bangladesh. Currently, the importers import DAP and zinc from USA, TSP from China, MoP from CIS, SSP (powder) and Gypsum from India, and AS from Korea according to the annual needs of the country.

Dealers: The fertilizer dealers are usually large, affluent traders. They invest large amounts of capital in their businesses. They have their own warehouses. They either lift their fertilizers from local factories or import them from abroad. In case of urea and TSP, they only collect the Delivery Order (DO) for lifting fertilizer, from factory and sell them to sub dealers. Their activities are concentrated in the local market. In fact, they are the traders who mainly control the fertilizer market. The dealers purchase a fixed portion of the fertilizer from the factories and another portion of fertilizers from the importers.

Sub dealers: The sub-dealers are the smaller traders. Their investment is much smaller than those of the union dealers. They purchase fertilizer mainly from wholesale dealers. Occasionally, they collect fertilizer from the factories or import fertilizer through joint initiatives. Shamsul Alam, *et.al.* (2007) found that on an average sub-dealers purchased 80% from dealers. They sell fertilizer to the farmers at fixed prices.

5.4 Sources and Channels of Fertilizer Distribution

Generally, farmers collect fertilizers from three different sources

1. BCIC appointed fertilizer dealers and their representative (sub-dealer) shops
2. BADC dealers shops
3. Local fertilizer retailer's shops

On the other hand, dealers lift fertilizer from BCIC, BADC and Private Sector Importers (PSI) on the basis of allotment made by the National Fertilizer Distribution Committee (NFDC). Dealers collect their allotted fertilizer from different sources e.g., import points, BCIC fertilizer factories and buffer godown and BADC godown. The distribution channels for both urea and non-urea fertilizers have close resemblance. The BCIC dealers who lift urea fertilizer from factory gate and buffer godown also procure TSP from factory gate and importers' warehouses. To the contrary, the BADC dealers collect non urea fertilizers from BADC godown only. The farmers can buy fertilizer both from dealers (union level) and retailer (ward/village level) shops. The prudent policies regarding fertilizer distribution as pursued by BCIC and BADC produced an inevitable result. Considering the implications of those policies for stable agricultural production and food security various efforts have been made to designed an effective distribution system. The main distribution channels of urea and non-urea fertilizers are depicted in the figures below.

5.4.1 Channels of BCIC Fertilizer Distribution

BCIC dealers lift urea fertilizer from the following points:

a. Chittagong Urea Factory, Chittagong.

b. Ashugonj Fertilizer & Chemical Company Ltd.

c. Ghorashal Urea Fertilizer Factory, Narshindhi

d. Mohendranagar BCIC Buffer godown, and

e. Private Sector Importers (PSI) of Noapara and Magura

Non-urea fertilizers (e.g., TSP, DAP and SSP) from

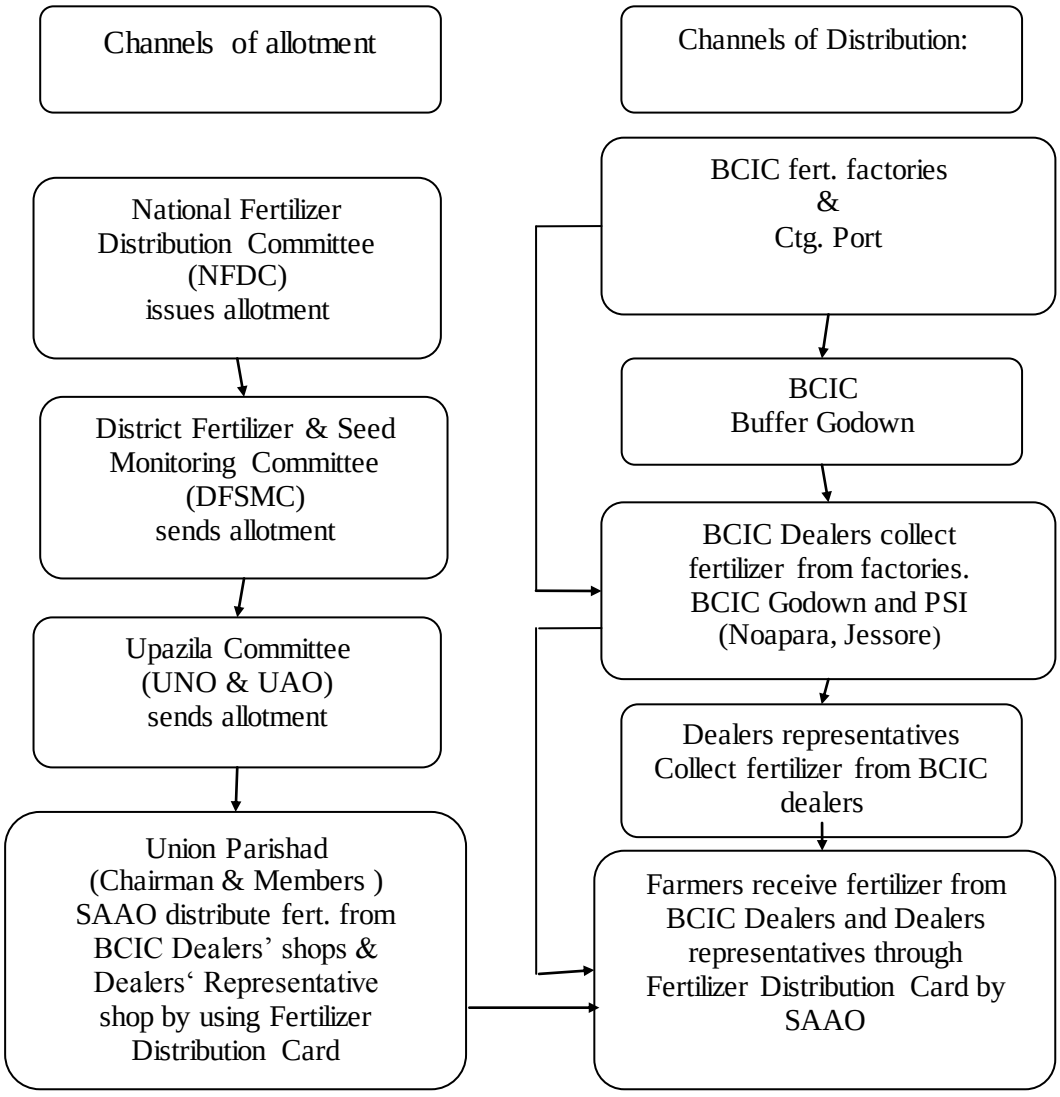
a. TSP complex, Chittagong.

b. DAP in little quantity is collected from DAP factory, Chittagong,

c. Chittagong Port and

d. BADC godown, imported by BADC.

According to regulation, PSI must sell their imported fertilizers to the BCIC dealers. The dealers (BCIC) also receive the PSIs part of allotments that they will get from the respective PSIs. The dealers, however, prefer to receive the supply from the nearest BCIC buffer godown instead of directly from the factories or import points. This will minimize the time and transportation cost.



Source: BCIC

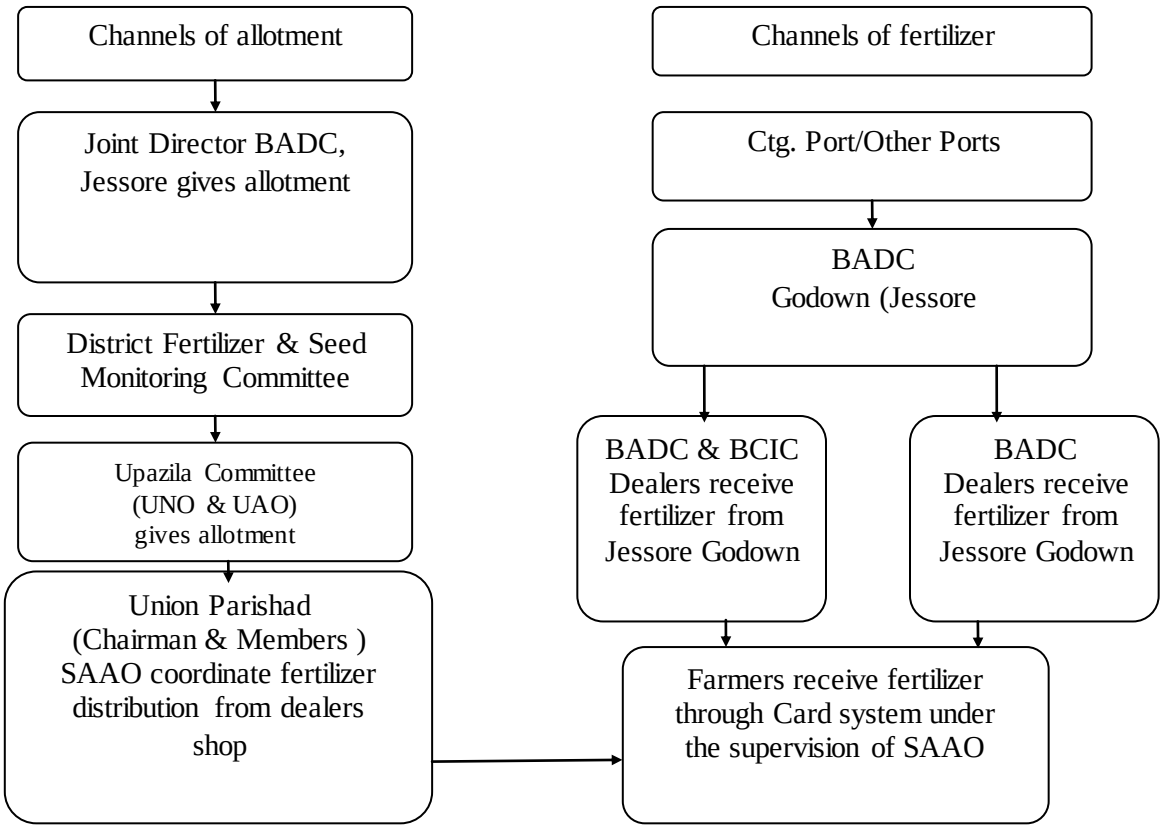
Figure : 5.4.1 Distribution Channels of fertilizers produced and imported by BCIC

5.4.1 Channels of BADC Fertilizer Distribution

Usually, the Joint Director, BADC (Jessore) allocates imported fertilizers to the Deputy Commissioner with a copy to Director, Department of Agricultural Extension (DDAE). Then DDAE allot fertilizers to different Upzilas with an approval from DC and send copies to UNO and UAO. The Upazila Committee allot these fertilizers to dealers with a copy to Union Parishad (UP). At the lowest tier there is Union Parishad and the SAAO distributes fertilizers from dealers' shop using 'Fertilizer Distribution Card'. In this distribution mechanism, there is a direct nexus between BADC and the

district levels instead of Upazila. There is lack of proper coordination between BADC and Upazila Agriculture officer (UAO).

BADC dealers procure non-urea fertilizers from the BADC godown imported by BADC. They have also demanded allotment of urea in addition to TSP and MoP. Otherwise, urea buyers coming for urea goes away and never come back for only TSP and MoP.



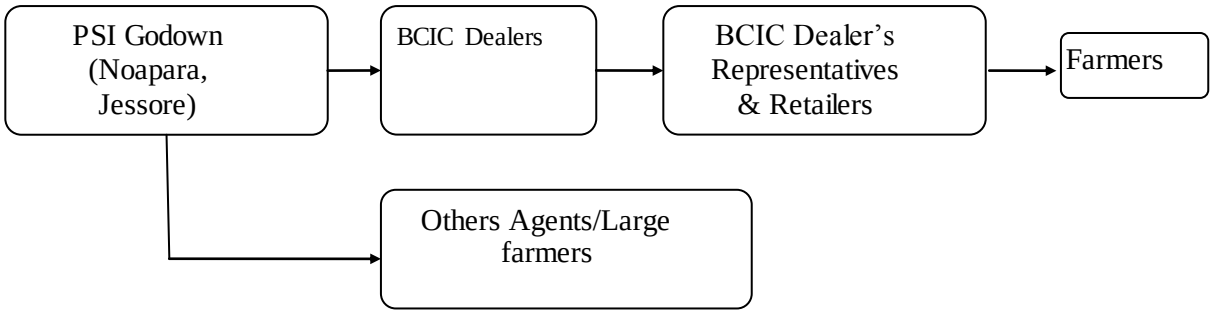
Source : BADC

Figure: 5.4.2 Distribution Channels of BADC imported fertilizers

5.4.2 PSI Fertilizer Distribution Channels

National Fertilizer Distribution Coordination Committee (NFDCC) usually issues allotment for non-urea imported fertilizers which the private sector importers are supposed to sell/distribute through the BCIC dealers. But, virtually they sell these to different agents. Moreover, it is alleged that PSI also gets supply from different hidden sources. To maintain control over fertilizer market sometime dealers sell fertilizers even at prices lower than those fixed by the government. In this case, some

dishonest importers refill the empty sacks of original fertilizers with low grade fertilizers. Thus, the importers in the private sector retain their control in the fertilizer market and as a result it remains effervescent round the year. USAID (1996).



Source: BCIC

Figure : 5.4.3 Distribution Channels of PSI imported fertilizers

5.5 Recent Fertilizer Policies

5.5.1 Dealership System

Following the fertilizer crisis in early 1995, a judicial commission was formed by the government to probe into the matter. Meanwhile, the government, in consultation with the Bangladesh Fertilizer Association (BFA), appointed district level dealers through public advertisements and district-based selection committees headed by the Deputy Commissioners. BFA and the local Chambers of Commerce and Industries had their representations in the Selection Committees. A total of about 4000 dealers were appointed by BCIC to make the fertilizer distribution system more efficient and also to serve areas where there were no dealers previously. Later, the dealer network was extended to the thana level for even distribution of fertilizer. The number of fertilizers dealer was limited to a maximum of 10 (ten) in each thana. The responsibility of dealer selection/scrutiny at district/thana level was entrusted to the District Fertilizer and Seed Monitoring Committee. Like urea, TSP and SSP fertilizer produced by BCIC are also now being distributed and marketed through dealers. Dealers may lift urea as well as TSP and SSP from BCIC factory gates and may also purchase urea from buffer stock centres. The Government has control

over the sale prices of urea (ex-factory price + buffer stock price), also TSP and SSP produced by BCIC but not over the retail prices. It is noteworthy that following some

disruptions in the fertilizer supply, the interim government during the period of 2007 allowed the appointment of three sales representatives

under each of the government authorized dealers all over the country. The aim was to enhance farmers' access to fertilizer input. As a result, about 15,000 new representatives joined with the new 5,000 union level authorized dealers. Over the years, the government made drastic changes in the dealership system for fertilizer distribution. Shamsul Alam, *et.al.* (2007) found that on an average sub-dealers purchased 80% from dealers and Input Marketing and Management System in Relation to Food Security in Coastal Region of Bangladesh.

5.5.2 Dealership Policy 2008

The main objective of the Dealership Policy 2008 was to appoint at least one dealer for each union by cancelling the previous upazila-based system. The Union was the focal point for fertilizer distribution.

Under the revised dealership policy, priority will be given to selection of new union/ municipality dealers from amongst the local residents of respective unions/municipalities. Except in unions/municipalities, no dealers will be appointed in police/metropolitan thanas. Except BCIC-approved dealers, the sale of urea will remain restricted for others. Fertilizer can be sold by opening fertilizer sales centers and appointing one sales representative for each block/municipal ward in the area specified for the dealer. In the Policy of 2008, fertilizer dealership was made non-transferable; and in case of a new appointment, only one dealer can be appointed for each union. In appointing new dealers for the union/municipality, the Upazila Fertilizer and Seed Monitoring Committee after proper scrutiny, will send the applications for dealership to the District Fertilizer and Seed Monitoring Committee. On the basis of recommendation made by the District Fertilizer and Seed Monitoring Committee, BCIC will finally appoint dealers. As envisaged in the Policy of 2008, the District Fertilizer and Seed Monitoring Committees to be headed by the Deputy Commissioners were to monitor the overall fertilizer situation like supply of urea and other fertilizers in each district, lifting/storing situation, sale, observation of fertilizer price situation, selection of fertilizer dealers and evaluation of the dealers' performances. Moreover, with a view to monitoring the fertilizer and seed situation in each union/municipality under upazila, it was proposed to organize an Upazila

Fertilizer and Seed Monitoring Committee headed by the UNO. To ensure effective fertilizer distribution, it was also proposed to introduce a Card System among the farmers. With regard to the lifting of fertilizers, it was decided to allot equal amounts of fertilizers to every dealer depending on the actual timeline-based demand for such fertilizers. Fertilizer is to be distributed from the nearest factory/buffer godown for convenience of transporting fertilizer to any district. Fertilizer produced in the factory and imported should be supplied directly to the buffer godown. In cognizance with the Policy 2008 and subject to the availability of fertilizer, BCIC is supposed to supply allotted quota of urea, TSP, DAP and

SSP to the public or private organizations at prices fixed by the Government. Urea, DAP, TSP, SSP produced by BCIC and imported fertilizer are included within the jurisdiction of this Policy. Fertilizers of other sectors may also be included. Hossain. Md. Mosarraf and Sheikh Bodiul Alam (2009). Fertilizer Marketing and Distribution System in Bangladesh. Ministry of Agriculture (MoA), Government of Bangladesh, Dhaka.

5.5.3 Dealership Policy 2009

The 2008 Dealership Policy seemed weak in its implementation. As such, with approval of the National Coordination and Advisory Committee for Fertilizer, the government has formulated the Integrated Policy 2009 to guide appointment of fertilizer dealers and fertilizer distribution. It is intended to stamp out the old arrangement and streamline the field level distribution of fertilizers. The new policy was scheduled to come into force from 1st October, 2009. Its main objective was to ensure adequate and timely supply of fertilizers (especially urea) to the farmers. The salient features of the policy are as follows:

· Appointment of union-wise dealers

· Abolition of sales representatives of dealers

· Restrict dealership within the district

· Fix-up priorities in appointment of dealers

· Introduction of retail sale of fertilizers

. Arrangement of ID Cards for the retailers.

The main thrust of this policy is to remove all intricacies of the past developing a farmer friendly distribution system by invigorating union-wise dealer appointment. Union will be the `focal point' for fertilizer distribution, and each union parishad will have one authorized dealer. In the appointment of new dealers for union/municipality, the residents of the union will be given first priority. Dealers will be appointed through public advertisements. In the new policy, If there is only single applicant in a union, then he will be treated as a dealer subject to the fulfillment of other preconditions. BCIC, on recommendation of the District Fertilizer and Seed Monitoring Committee (Annex 1.4), will appoint dealers. Except in case of inheritance of an enterprise having a fertilizer dealership, the dealership is nontransferrable. It has been decided to reorganize the District Fertilizer and Seed Monitoring Committee

(DFSMC) to monitor the overall fertilizer situation. All parliament members (MPs) of a district will act as advisers to the District Fertilizer Seller Selection Committee headed by the Deputy Commissioner. Besides, the MPs in a Upazila will be advisers to respective Upazila Fertilizer and Seed Monitoring Committees. In the new policy, the MPs are also empowered to select retailers. The DFSMC is assigned with the responsibility to determine the maximum retail price of fertilizers for each district. However, the DFSM Committee is not empowered to allot/suballot urea or non-urea fertilizers to any institution under any circumstances. According to the MoA, the new Policy if properly implemented will enable the farmers to purchase fertilizers from the local market as per their demand pattern. As regards to the mechanism in selecting retail sellers, an ID Card of fertilizer retail dealership from the Upazila Agriculture Office (UZAO) is to be collected for retail sale of fertilizer. Headed by the UP Chairman, the retail fertilizer sales selection committee will be formed in each union for sorting out the retail seller. Out of the 6 committee members, 4 are to be nominated by the local MP. This committee is designated to

appoint retail sellers of fertilizer.

It is clear that local retailers with their ID cards are allowed to purchase fertilizer from the authorized dealer and sell it to the farmers. However, in case of insufficient stock of fertilizer with the dealer, the retailer can purchase fertilizer from any dealer of the

upazila using his own valid ID Card. It is stressed that if the contract is not renewed due to under/non-performance as reflected in the annual evaluation, dealership will be cancelled. Any party, dealer or authority (in 2008, only authority), can withdraw/cancel his/her dealership by issuing a 3- month prior notice in this regard. In the new Policy, there is no provision for sales representatives. Henceforth, appointment of 3 sales representatives for each dealer (countrywide total number being 15327) are cancelled. In light of this policy, those dealers who were previously appointed and have, at the same time, all eligibility to be appointed as dealers will be retained, and their contracts will be renewed and adjusted. Regarding the scope of the Policy, it may be said that urea, DAP, TSP, SSP produced and imported by the BCIC and the non-urea fertilizers imported by BADC and private importers have been included in this Policy.

5.6 Fertilizer use gap scenario of Bangladesh

Bangladesh is endowed with a climate favourable for the cultivation of a wide variety of both tropical and temperate crops. Rice is the staple food for above 150 million populations. Rice production system depends on a various management practices such as irrigation and fertilizer applications, crop management practices, use of new high yielding varieties and modern technologies. Boro rice is one of the major cereal food grains in Bangladesh which contributed more than 55% to the total rice production during 2008-09. Hybrid Boro rice yield depends on a considerable part on irrigation and fertilizer management practices. Fertilizer is the most important nutrient elements in soils and plays the most vital role in crop production in Bangladesh. Fertilizer application mainly depends on the soil types, growing season, irrigation applications and the cultivars used and agro-climatic conditions of the locations. Every year huge amounts of chemical fertilizer are imported from foreign countries and the import rate is significantly higher for non- urea fertilizer. Domestic production of urea fertilizer covered 50% to the total demand, where TSP (Triple supper phosphate) was only 10%, Gypsum was 40% and MoP (Murate of potash) was fully imported in 2008-09. Bangladesh government has set a target 19 million tons of Boro rice production under 4.8 million ha land in 2009-10. Therefore, to achieve the targeted production of Boro rice in this year, the fertilizer supply would be one of the major concern things to the whole production system. The major fertilizer such as urea, TSP, MOP, gypsum and ZnSO4would be required 13.83, 5.65, 6.94, 0.41 and 3.06 lakh tons, respectively

(applying fertilizer in recommendation dose). Applying on the basis of soil fertility, fertilizer requirement would be 13.2, 4.20, 4.64, 0.38 and 2.85 lakh tons, respectively and on the basis of farmer demand in field level, it would be 12.60, 5.23, 6.43, 0.39 and 2.51 lakh tons, respectively. The urea fertilizer stock will become 9.5 lakh tons after importing 3.5 lakh tons from Qatar. More than 3 lakh tons urea may be shortage in the total growing season which is above 24% compared to the total demand. From this study, it is clear that there is large gap between targeted production of Boro rice and fertilizer input. Therefore, timely supply and availability of fertilizer should receive top priority to sustain/increase Boro rice production when food availability is crucial factors for poverty stricken people, when the country being challenged with feeding increasing population. Bangladesh Economic review (2001).

5.6 System/Method of Payment/Allotment of Subsidy

The salient features of the system and method of payment and allotment of subsidy for TSP, DAP and MoP (Potash) fertilizers for FY 2008-09 as declared by the Agriculture Economic Research (AER) and MoA are as outlined below:

i. Continuation of the payment of subsidy to the TSP, DAP and MoP fertilizers imported through bonafide importers registered solely by the Department of Agricultural Extension (DAE)
ii. Import of TSP, DAP and MoP of specific quality as per annual demand and in coordination with the Bangladesh Fertilizer Association (BFA).
iii. Due to differences in 'country of origin' and 'location', C&F and CFR prices of fertilizers should be determined before payment of subsidy.
iv. Subsidy to be given only when the amounts of imported TSP, DAP and MoP are equivalent to heir demands estimated by the government.
v. Subsidy is to be paid for each fertilizer by type & source of fertilizers.
vi. Selling Price of fertilizers is to be determined by incorporating 15% subsidy with total import value.
vii. Release of the subsidy money on the basis of documents evidencing amounts of fertilizer sold by the importer and lifted by the dealers.
viii. Strengthen present monitoring system to ensure the benefit of subsidy to the dealers.

CHAPTER VI

SUMMARY

Fertilizer is a major input for crop production. Fertilizers that are most commonly used by the farmers of Bangladesh are urea, TSP and MoP, of which urea alone shares 70-75% of the total fertilizer use. Fertilizer use in this country has increased over time due to expansion of irrigation facilities and depletion of soil fertility induced by higher cropping intensity and cultivation of high yielding crop varieties. Sometimes a fertilizer crisis had arisen in the country. The farmers could not buy urea fertilizers in required amounts in time because of insufficient availability. They were unable to buy non-urea fertilizers like TSP and MoP in needed amount because of the high price. Further the farmers were not getting expected benefits from the use of mixed and non-urea fertilizers due to adulteration. Overall, the study indicates that inadequate availability of urea fertilizers and the high price of non-urea fertilizers (TSP and MoP) were the major constraints for fertilizer access and use. These constraints have been largely removed with the change of fertilizer sale and price policies by the Government. Now, the major issues are related to fertilizer (non-urea) adulteration, unbalanced fertilizer use and fertilizer use at lower rates by the marginal and small farmers. In order to investigate the The problems of farmer towards getting fertilizer a study was conducted in Muktagacha upazilla under Mymensingh district during January 2019 to June2019 .There only the small scale farmers in total respondents were randomly selected for interviews. This study is conducted with the direct interview to the farmers. Farmers are selected randomly by the preference of their Age, land ownership, cultivational crops etc. Some discussion with the local dealers is conducted to know the marketing activities of fertilizer. Most of the cases farmers are ready to answer the questions but in some matters (Income, actual production) the tried to hide something or ambiguous. Statistical analysis is done to run the study. Under this study it is clear that when farmers have no much money on that time they need fertilizer and when they have money on that time there is no use of fertilizer. So With all other supports management of farmers need and availability can reduce the problem.

CHAPTER VII

POLICY IMPLICATIONS AND RECOMMENDATIONS

7.1 Policy Recommendations

7.1.1 Fertilizer Demand Management

1. Across all categories we observe that as the land is used intensively, the percentage of farmers who experience fertilizer deficit is decreasing. Special emphasis has to be on the subsidy reception of the smaller farmers, so that they do get the benefits of subsidy (in combination of discussions on subsidy, we actually recommend that subsidy is specifically targeted to the smaller farmers.
2. It has been found that a significant portion of farmers have collected fertilizers from the open market which are supposed to be sold completely through the dealers appointed by the government. Therefore, it seems that there is substantial amount of leakage of fertilizer from government machinery for rent seeking purposes by concerned distribution agents. Remedial steps have to be taken by concerned authority to stem these leakages.
3. Total fertilizer demand or requirement from household level is significantly higher than the official estimates. It has to be investigated whether the fertilizer shortage that often happens is due to this mismatch between farm household level information and the official data. This fertilizer requirement data has been collected from household level and it represents farmers' perception. Therefore, we should interpret the data with caution. However, regardless of the reliability of household level data, these findings indicate that the whole process of estimation of fertilizer requirement has to be thoroughly reviewed.
4. It has been found that significant portion of farming households suffer from deficit in fertilizer in all major categories of fertilizer. If the fertilizer distribution were efficient which reduced this household level deficit, it would have contributed to a significant boost in agricultural production. Therefore

supply bottlenecks which are impeding efficient fertilizer distribution has to be removed for increased agricultural production.

5. Regional distribution should also be further investigated. We have found TSP and MoP is quite low in the Sylhet division. It should be investigated whether this low use is due to supply bottlenecks or geographical characteristics. In terms of regional variation, farmers in Dhaka division suffer from higher probability of fertilizer deficit compared to other divisions. Further research and investigation is needed to identify the factors behind this higher risk suffered by farming households in Dhaka.
6. Most farmers are concentrating on a particular mix of fertilizers which is urea, TSP and MoP. Since these three are the most used fertilizers, the availability of these three 122 should be made the most efficient. Currently the focus is mostly on the urea distribution but TSP and MoP also require major impetus in efficient distribution.
7. Most of the farmers mentioned high price of fertilizer as a major reason that they could not avail the fertilizer. But in the case of urea, more than fifty percent of farmers mentioned timely unavailability and inadequate supply as the major reasons of their fertilizer crisis. Therefore, it should be thoroughly investigated the reasons for distribution inefficiencies that caused unavailability of fertilizer in different channels of administration.

7.1.2 Fertilizer supply and distribution

1. The present policy of urea production, import and distribution under the Government control should be continued.
2. For the case of non-urea fertilizers (TSP, DAP and MoP), the on-going policy of private sector import mainly and distribution by the Government control can be continued. Strong monitoring is needed at storage and distribution points to check adulteration of these fertilizers.
3. The SRDI laboratories (under MoA) can analyze fertilizer samples at random from market in every six months and report to the National Fertilizer Committee (NFC).

7.1.3 Fertilizer estimation template

The fertilizer template as developed in this study can be considered for use by the Upazila Agriculture Officer (UAO) for fertilizer demand estimation. This template can also be used from micro to macro levels from farm to country levels.

Present price of urea (Tk. 12/kg) and that of non-urea (TSP Tk. 22/kg, MoP Tk. 25/kg and DAP Tk. 30/kg) are affordable to the farmers. The present system of urea sale (no slip or card system, dealer shop open all days) is quite good for the farmers to buy and use required amount of urea for their crops.

7.1.4 Fertilizer use by farmers

1. Policy support is needed to increase the ability of marginal and small farmers to buy fertilizers.
2. Training, field demonstration and motivational work need to be strengthened so that the farmers can use balanced fertilization.
3. Use of modern technology and organic fertilizer needs to be promoted to reduce the use of pilled urea.

7.2 Recommendations

On the basis of the findings, the following recommendations were made for the improvement of existing system, marketing facilities.

1. Government should provide sufficient credit and subsidy to the farmers and other value adding actors.
2. In the time of showing seeds minimum price of fertilizer should be declared by government to ensure that they can cover their production cost.
3. Government would get important information and find the way to monitor the market to lessen the price fluctuations.
4. Value chain analysis is an effective source of market information. So the market information obtained from it should be made available and easily accessible for all value chain actors.
5. To keep the price at reasonable range unnecessary prolongation of value chain should be eliminated. For example if the farmers have the

opportunity to get the fertilizer directly in the market that would reduce the extra value added by the middlemen.

6. Infrastructure and transport system should be developed. But if the fertilizer price becomes higher then farmers would occur loss. In input costs for those productions should be reduced or subsidized.
7. Government should finance the farmers in the time of selected crop cultivation . For that reason, government could not assume about the supply and demand for various crops. This would reduce in the farmers were capable to store their crops up to a certain period. That would ensure better price for the farmers in the time of harvesting and also could ensure comparatively lower price in the off season.

CHAPTER VIII

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CHAPTER IX

APPENDICES

PROBLEMS OF FARMERS TOWARDS GETTING FERTILIZER IN SELECTED AREA

INTERVIW SCHEDULE OF FARMERS

SI. No. : ..... Date: .....

Name of the respondent: .....

Village .....

Thana / Upazilla .....

Post Office:.....

District: .....

<u>Direction:</u> Please check ( ) and rate yourself honestly based on what you actually observe ,give the statements using the scale: 5-Over satisfied; 4-Satisfied; 3-Neutral; 2-Dissatisfied; 1-Very Dissatisfied.

No.	Variables name	1	2	3	4	5
1	**Perceived Interaction problems**					
	Interaction with the Seller or Supplier easy and understandable					
	It is not easy to take fertilizer in credit					
	Fertilizer is available when necessary					
	the current channel is comfortable to collect the fertilizer					
2	**Perceived problems**					
	Buying from the local market increase cost					
	There have enough sufficient supply when necessary					
	Buying a huge amout creat a great loss					
	The seller or dealer made artificial scarcity					
3	**Facilitating conditions**					
	Government encourages the use organic or inorganic fertilizer for agricultural production					
	I believe government will provide more subsidy and other facilites					
	I have the knowledge about the seasonality of production					
	Getting more credit facilities during cultivation					

4	**Trust in attitude**					
	I trust about the Government promise of supplying fertilizer					
	Legal/technical infrastructure is sufficient in supply the fertilizer					
	I trust the dealers when they supply					
	I trust the pricing system of them					
No.	**Variables name**	**1**	**2**	**3**	**4**	**5**
5	**Behavioral intension**					
	I predict I would use technology to access fertilizer pricing information					
	I will recommended others to use technology to access fertilizer pricing information					
	I intend to build up relations with Agricultural Extention officer for regular informatin					
	I intend to updated about the overall pricing system					
6	**Adoption**					
	I will be reliable to use the traditional channels					
	Removing the dealer or supplier reduce the price					
	Direct purchasing reduce cost and time					

Demographic Information

<table>
<tr>
<td><u>Gender</u>

o Female
o Male</td>
<td><u>Age group :(Years)</u>

o 20-30
o 30-40
o 40-50
o 50 above</td>
<td><u>Education</u>

No read or write

Read only

Read & Write only

I read up to Class……..</td>
</tr>
<tr>
<td><u>Past experience:</u>

o First time visitors
o Repeat Visitors</td>
<td colspan="2"><u>Income:(BDT)/Month</u>

o Less than 10 thousand
o 10-20thousand
o 20-30 thousand
o 30-50 thousand
o 50 thousand above</td>
</tr>
</table>

Thank you for your nice cooperation.