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The Role of BRAC Seed on Livelihood Changes

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Acronyms

AFSP	(Agriculture & Food Security Programme)
ADB	(Asian Development Board)
BRAC	Development organisation
BIDS	(Bangladesh Institute of Development Studies)
BADC	(Agriculture Development Corporation)
BRRI	(Bangladesh Rice Research Institute)
BCUP	(Borgachashi Unnayan Programme)
BBS	(Bangladesh Bureau of Statistics)
BSGDMA	(Bangladesh Seed Growers, Dealers, Merchants Association)
CG	(Contract Growers)
CIA	(Central Intelligence Agency)
DAE	(Department of Agricultural Extension)
FGDs	(Focus Group Discussions)
HYV	(High Yielding Varieties)
IRRI	(International Rice Research institute)
KIIs	(Key-Informant Interviews)
MDGs	(Millennium Development Goals)
MOA	(Ministry of Agriculture)
MV	(Modern Varieties)
NSB	(National Seed Board)
NGO	(Non-Governmental Organisation)
VOs	(Village organisations)
SCA	(Seed Certification Agencies)
SM	(Seed Multiplication)
TLS	(Truthfully Labeled Seeds)

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Executive summary

Geographically the study area such as Gopalganj and Bogura district is highly diversified and potential in crop cultivation. In terms of farmer's seed selection, it is depend on farmer's individual decision. Two major factors that works to the farmer to choose on which seed to cultivate. The first factor is for commercial purpose and the second factor is for consumption purpose. The commercial factors that driven farmer decision in the selection, mainly those are short duration of crop varieties, inputs cost and output price. Farmers are cultivating inbred HYV in local term *Ufshi* varieties for consumption purpose because of its taste, texture and pleasant to eat. The farmer who has more land prefers to cultivate HYV BRR1 *dhan* 29, BRR1 *dhan* 28 varieties for personal consumption in both study areas. Agro-ecologically low land is highly suitable for hybrid cultivation because that requires less irrigation and cost effective for the farmer. Farmers belongs to high land are prefer to cultivate HYV varieties to avoid natural calamities like rain, flood etc.

In Bogura district, there is double crop season mainly *Boro* (in Bangla month *Magh-Fulgun*) and *Aman* (in Bangla month *Ashar-Srabon*) season. Farmers adopt hybrid rice varieties widely especially in *Boro* season to increase profit commercially as hybrid seed produce double the amount compared to local/inbred/HYV varieties. In the same district, during *Aman* season HYV BRR1 *dhan* 28, BRR1 *dhan* 29, BRR1 *dhan* 49, BRR1 11 and local varieties call *Mamun* are predominant. However, during *Boro* season hybrid varieties cultivation is predominant. Therefore, along with HYV varieties, BRAC *Jagoron*, *Alloran* and *Sathi* and hybrid *Hira* by Supreme seed company cultivation take place extensively. Some pocket areas use advance technology like Power Tiller especially during the largest paddy season namely *Boro* season.

Agro ecologically local weather and repetition use of hybrid varieties is highly influence both in production and farmer's decision. For example in Shibganj *Upazila* of Bogura district, BRAC hybrid variety called *Sathi* is not adopted extensively. Study revealed that a few years back, farmers had good production using *Sathi* variety but gradually farmers are experiencing less production using same variety. Study further added that as *Sathi* hybrid variety is saline-tolerant so ecologically it is more suitable in Gopalganj district compared to Bogura district. Since then the farmers do cultivate hybrid *Tiya* from other company and produce around 30 to 32 *maunds* crop per *bigha* (6-7.5ton/hect.) in that area. However, farmer face difficulties when they approach to selling hybrid *Sathi* and *Tiya*. The study further added hybrid *Sathi* and *Tiya* both varieties are long and thin in shape so when milling the rice it get broken and nobody wants to buy it. Furthermore, farmer prefer to cultivate Potatoes and other green vegetables before *Boro* season in the same area to increase the profit and for the same reason there is also some pocket area also choose to cultivate Mustard, Sugarcane and Jute .

Agriculture is the main source of income of the farmers in Gopalganj district. Single crop cultivation is predominant and mainly *Boro* season in this area. During *Boro* season along with BRR1 *dhan* 28, BRR1 *dhan* 29, BRAC hybrid seed varieties call *Sathi*, and *Hira* from Supreme brand goes in the field extensively. As this area is rich in fertile but half of the year submerged hence other crops such as various types of pulse like grass pea (*Khesari*) and Black gram (*Mashkalai*) cultivation take place during that time. The other reason is only agriculture is the main source of the income hence some pocket area also cultivates various types of vegetables. Due to submerge for six months there is no traditional varieties of rice take place to cultivate indeed farmers prefer to cultivate short duration hybrid varieties because that help farmer to avoid the natural calamities. Mainly BRAC hybrid *Sathi*

cultivation takes place extensively as it is saline tolerant. Some part of the study area farmer also cultivates BRAC *Rupali* hybrid varieties. However, farmer faces difficulties to sell BRAC hybrid *Rupali* and *Rupali-7* during peak season as this variety is thin and produces amounts around 24 to 25 kg rice out of 40 kg paddy, which is not profitable to them compared to *Jagoron*, *Alloran* and *Sathi* hybrid varieties.

The harvest timing is very crucial in Gopalganj because sometimes if the farmer can cut the crop even a day earlier, it can save their crop from submerged by sudden flash flood. A horizontal vital factor that farmers mentioned that to have a good understanding and regular communication with other fellow farmers is a potential driver to increase their productivity for all. This harmony is necessary because farmers then able to take all the farming steps together starting from germination to harvest because even a day later harvest than other farmer that puts them under great stress.

There is another marketing factor is early harvesting paddy can reach the market earlier as those are likely to get a better price for it. The price of HYV BRRI *dhan 28* is higher than the hybrid. However, despite good harvest farmers do not obtain a good amount of paddy to some extent. Because paddies get rotten if those get fall in disaster as majority of the region is geographically low-lying that influence submerges frequently. Therefore, the farmers said that, *they would be much benefited even if the full cycle of paddy harvesting can be finished in 10 days earlier*. However, rice cultivation depends on an exact and season-specific cultivation that differs extensively between geographical location and weather. Hence this choice would not be achievable simply by planting the seeds in ten days earlier than they normally do as in that case, the temperature would not be in favour of crop because germination would not be work out at that time then.

Regarding home production of seed there is two distinct portraits observed in two different districts. Traditionally farmers used to preserve seed by their own. However, at present farmers have access to get a quality seed with affordable price and available in the market. High seed price is seen as an indicator of seed quality. HYV/inbred seed varieties are available in the market under the two name called foundation and TLS. Foundation seed is only possible to preserve for two times cultivation while TLS is not. In Gopalganj, a few farmers preserve seed, farmer mostly depends on commercial seed because farmers are not likely to take any technical risk of reliability. Therefore, intra farmer selling of seed is less in practice. However, traditional home production of seed take place in different pockets in Bogura district because cropping intensity is high as majority of the farmers conserve home seed especially for the *Aman* season. Hence exchange of seed allows farmers to build up networking with each other. Furthermore, although price variation between home production seed and commercial seed is not so high but farmer of this area find it is suitable to them.

Study further revealed one of the insight that is *bumper hybrid cultivation allow farmer with large farm size to make decision on to produce enough production for consumption and for tenancy compare to less farm size and well off farmer*. Since, introduction of hybrid seed bought green revolution to the farmer hence the overall paddy sell has increased. However, farmers prefer to cultivate new hybrid seed varieties compare to old one as farmers believe that the new varieties are a quality seed and would bring high yield in production. Furthermore, the study revealed that same varieties in the same field does not bring high yield. In addition, farmer prefer to cultivate new variety each year or go for to use by rotation. Because an insight explain further destruction in cultivation by use the same variety of hybrid seed in *Shibganj Upazila* is: *Some of the farmers had same hybrid seed in cultivation last year but did not receive high yield because of 'repeated use of the same seed variety'*. In Gopalganj, there is same experience that *using same hybrid variety there is less*

production. In the past, production used to get 35 to 40 maunds (about 8-9 ton/hect.) per bigha now only 25 maunds (about 6 ton/hect.). Study further quoted that 'hybrid dhaner boyosh hoye giyeche' that means existing hybrid varieties is too old.

Neighbor's high yield encourage to cultivate hybrid seeds among the farmer. However, local dealer's motivational message is also high in magnitude to encourage farmers although it is not so easy to introduce a new variety to them. Conversely, as the risk level is quite high and as a result, high level of inertia works on the farmers' attachment with the seed variety on which farmer's decision get priority to cultivate. For instance, the local dealer finds that *the most suitable 'Alloran' hybrid seed is for low lying area* in Gopalganj district. With this spirit of optimistic 'Alloran' hybrid variety introduced to the farmers by the local dealer in 2000 and it was received well but the seeds germination failed in 2002 hence that hit the brand reliability as less yield brought farmers destruction on that variety.

In terms of marketing, there is enough supply of rice production in the market as hybrid seed variety produce high yield and it makes price of the rice lower, and on top of that, the government has set the price of rice low. The study found that per *maund* (0.04 ton) cultivation of paddy costs for the farmers is more than BDT 600 to BDT 670, and the market price of paddy is between BDT 500 to BDT 600 per *maund*. This price gap discourage farmer to engage in the paddy field. Farmer expects the price of coarse rice should be higher. Since there is a government price cap set on the price of paddy farmers cannot sell paddy at a price higher than that fixed price.

The study further revealed that paddy marketing also depends on the local traders. According to the farmers that *due to the lower price of paddy, the trader does not buy rather say government itself not buying how we can buy?* Farmer stated that *government fixed price paddy rate but there is a lack of implementation*. During discussion with the farmers at one stage, they mentioned that *government do not need rice but farmer need cash*. As farmer deprived of the fair price of their product, so farmers are looking for alternative livelihood options. In the fiscal year 2012-13, *Aus* rice production fell to 3%, which is 22.58 lakh (about 2.3 million) tones due to reduced acreage (BBS, 2010). In the study area, some of the farmers are farming potato, vegetables, sugarcane etc. Recently farmers are shifting to cultivate potatoes and mustard seeds in the study area.

The study further added that farmer's trends to get deprived of their fair price compared to actual production cost. Because of farmer's input cost, for *fertiliser*, irrigation, seed and labour are quite higher than selling price. Moreover, farmer has to depend on the dealer to sell their products with low price. Focus Group Discussion with the farmers revealed that during the harvesting they have to sell paddy at a lower price to the dealers as they are unable to keep it in their storage. They end up selling it up at BDT 450. However, the dealers do not run their rice mills at that time instead store it while the farmers are compelled to sell it for a lower price because of lack of cash and storage capacity. As a result, the farmers end up in economic crisis and get discourage to production. After selling that product, farmer have to pay labour wages, pesticide and fertiliser bill to the shop owner. Therefore, despite farmer contribution to the rural economy quite high still the system of the market deprive farmer to get fair price.

The farmers mentioned in the group discussion that *the government only talks about rice price, but they do not specify whether it is going to be procuring thin (chikon) or hybrid (mota) rice*. If the farmers is slightly well-off then they could hold the rice for two to three months before selling and then difference gets up to BDT 100 to BDT 120 is the higher price per *maund*. At present, the price of 1 kg hybrid seed is about BDT 235 to BDT 260, and the price of hybrid paddy is about BDT 500 per *maund* (0.04ton) and price of

foundation/inbred is BDT 650 per *maund*. However, the price of hybrid paddy is lower than the price of BRR1 *dhan* 28, BRR1 *dhan* 29. The farmers usually sell hybrid to the owner of local rice mill and the dealer.

Sometimes economic issues occur, as the price of the hybrid variety is lower. Although fine rice price is rose to 5.81%, BDT 43 to 48 per kilogram whereas coarse rice prices to 5.17%, BDT 29 to 32 per kg (DAE 2012). Due to the low price of paddy, it is not only that the farmers are suffering but also they are worried about the future of the sustainability of their agricultural activities. Focus Group Discussion with the farmer revealed that low rice price adversely affects small farmers to stern determine which paddy to cultivate. This is especially because though in the season the price of paddy is low however, price of paddy is even get lower during the off season because production supply in the market is high. However, in the discussion study found that medium and small farm size farmer mostly prefer to cultivate coarse rice because this variety produce high yield which support them to get rid of the liquidity constrain.

For the last 2 or 3 years, the market price of paddy is in the worst situations that make smallholding farmers to live hand to mouth or even worse. They are in trap of borrowing, and the amount is piling up every year. In some case of the worst situation, smallholder farmers are about to sell their land to repay the loan. They recapitulate their economic conditions in terms of the profit they retain from farming. Furthermore, they claimed about the input cost (fertiliser, fuel for irrigation, day labour) an inflation that has doubled within last 3 to 4 years than the deflation or stagnation of the output price. In this situation, they are eagerly looking for an alternative livelihood. Some of them to decide to replace to cultivate jute. Moreover, some of them are just observe the year and leave vacant. The dilemma work for the farmer that if the current price situation of paddy persists, they would not continue with rice production anymore. The comment about paddy price from the farmer below:

“If every year paddy price seems so lower then cultivation would not take place; ultimately Boro rice cultivation will be over”.

Paddy price is crucial as it is interlinked to sharecropping, and for that a lot of farmer with large farm size are in a dilemma as they face challenges to sharecropping. Study revealed that if it is persist in their mind that if there is tenancy challenges then that the land would have to be cultivated by the farmer himself or would stay as vacant or uncultivated. Farmers who used to do tenancy farming shifting their occupation to informal sector that bring to them higher income. Farmers with large farm size face challenges to convince small holding farmer for sharecropping as paddy price is very low. To illustrate the extent of the problem farmer said that even if a farmer owner of the 50 *bigha* land (8 hectares) and it is not possible to cultivate all the land by the owner themselves. There is a sharecropping crisis in local term *pachani* as the production cost is higher than the paddy price hence tenancy is in the decreasing trend. This trend would arise suffering for the farmer with large farm size as they are finding tenants challenges. On the other hand marginalised farmer finding challenges to continue cultivation as they trend to deprive of their fair price.

Majority of the farmers in the FGD mentioned that construction labours get BDT 300 to BDT 350 per day and there are some other who are becoming rickshaw pullers. Farmer's are losing interest in rice cultivation since the price is too low. In addition, during the harvesting season often, it is difficult to find day labourer for the paddy field. On the previous days, people who used to harvest paddy now a days drive an easy bike to communicate people from one place to another and earn BDT 500 to BDT 700 per day, which is more profitable, than harvest paddy which is a hard work than other informal work.

Apart from the farmer's opinion, the study captured rural women's participation in the agriculture-related activities. Women's contribution in the germination stage and post-harvest processing is high. Women's engagement in the field depends on household economic condition and socio-cultural background. Women belongs to poor marginal social classes are active at the field level farming of Gopalganj district.

Further discussion on the role of agricultural extension officer revealed that the officer who are regularly supposed to provide technical support at the field level is less connected with the local farmer. In addition, this disconnection attitude makes farmer dissatisfy. For example with the '*paddy mizemara*' issue that farmers are facing challenges, this is one of the situations where the agricultural extension officers could have played a crucial role. During this challenging time of the farmer, local sub-dealer come forward to provide support. However, study found that there is well communication between local sub-dealer and agricultural extension officers. Moreover, each of the study area has numerous sub-dealers and the extension officers are getting all the field information via them, which would explain why they are not seen in the field.

The farmers have asked about the low price of paddy whether there is any opinion on this issue. In response study found that since they know that the price of paddy is market driven and majority of the farmers given their opinion that they have to leave it on the market. In relation to this above question farmers have asked again if they have approached to the government about it and in response study found that it is not that the government is unaware about low price of the paddy. Farmer expressed that since the government is concerned with keeping paddy prices low, there is no action by the farmers to get a better and higher price on their product. Conversely, the market price makes them surprising that should be manipulated to provide them a fair price. It is important to note that while doing FGD in the Taltola Bazaar of Gopalganj district some of the farmers showed strong feelings against the governments decisions of not procuring rice lately and how they have not been giving any agricultural subsidy either.

Farmers ensure family demand of rice for the year by doing hybrid cultivation that includes meeting up household expenses by selling of extra hybrid crop production. Although on an average market price between HYV and hybrid varieties per *maund* (0.04 ton) BDT 100 to BDT 120. Still, farmers adopted widely hybrid rice varieties to get profit commercially. Farmer said *despite lower price of hybrid paddy it is still though profitable to cultivate as it has a higher rate of productivity*. The study further found that introducing hybrid has been a great help to them as previous day farmer used to sowing 3 or 4 seedlings for one bunch of paddy but with hybrid one seedling is enough for one plant. As a result, they need less space for seedbed, getting more profit with less effort at that level. Conversely, low land used to not cultivate to void losses. Since the inception of hybrid lands are used multiple times that is the source of hope for the people are living in nadir of the income pyramid.

Abstract

As food prices rise and climate change effects on food security, development of agricultural productivity has become the key issue all over the world. To achieve high crop productivity, use of appropriate quality seed is one of the essential factors, which leads to ensure high yield and alleviate rural poverty. This paper aims to reveal firstly; the farmers' perception and satisfaction of using BRAC hybrid seeds in the stage of purchase, germination, cultivation, profitability, consumption, harvesting and marketing, and women participation in post harvest operations, secondly; how these understanding would contribute to farmers' livelihood improvement. The study conducted during November 2012 to January 2013. Major instruments of data collection were- Focus Group Discussions (FGDs) and Key Informants interviews (KIIs). Data was collected from Bogura and Gopalganj districts of Bangladesh. The result showed that local Agroecological conditions and farming systems determine the demand for different types of seed. Farmers have specific reasons for preferring HYV and hybrid seed in different seasons. The commercial factors which drive farmer decision to buy hybrid seed was mainly duration of crop varieties, inputs cost and output price. The farmer cultivates hybrid for commercial and HYV/Inbred for consumption purpose. Hybrid varieties germination was sensitive to accuracy and timing of to the steps involved. Germination rate was vital and in case of failure, that affects brand reliability. Farmers were not bothered by the price of seed if production is high. Introduction of using hybrid seed changes farmer's lifestyle and bought sufficient production for yearly consumption. Higher income was deriving by selling hybrid seed production that uses for household development and children's education. Women involvement at field level depends on household economic condition and socio cultural background. However, the price difference between HYV and hybrid paddy and overall paddy price were crucial to the farmer.

Chapter 1

1. Background

As food prices rise and climate change effects on food security, development of agricultural productivity has become the key issue all over the world. To achieve high crop production, use of appropriate quality seed is one of the essential factors, which leads to ensure high yield and alleviate rural poverty.

On that occasion BRAC, the largest NGO ranked no one on the Global Journal's list of top 100 NGOs, has been playing a vital role in the growth of agriculture sector in Bangladesh for more than 30 years. It was not only that BRAC has provided financial access to the farmers and enabled them to cultivate crops, purchased livestock, but also taken comprehensive approaches to farmers technical issues, conducted research to develop better varieties and provided them agricultural extension services to produce high yielding crops and ensure food security.

As BRAC acquainted that the hindrance to the development of productivity is the scarcity of quality seeds in the market, in early 80s BRAC started its seed distribution using group approach under development programme. In 1996, BRAC started seed production with assistance from Bangladesh Agriculture Development Corporation (BADC) under the Ministry of Agriculture's project, since then BRAC has been leading the seed industry of Bangladesh for 15 years. To ensure food security under adverse effects of climate change, BRAC has been working to develop saline, drought and water-tolerant varieties. In 2012 BRAC own two seed research centres, two processing plants and nine seed farms and it has released three hybrid rice varieties, three vegetable varieties. BRAC seeds spread over the country contribute increasing the productivity of crops that supporting the livelihood of farmers in Bangladesh. BRAC has achieved market shares of 32% in hybrid rice, 50% in hybrid maize and 12% in potatoes. This fact signifies BRAC Seed is so-called social enterprise, which generates a surplus and supports their development programmes of BRAC, financially to address BRAC's social and philanthropic missions. As a programme supporting enterprise, it makes a profit of BDT 103 Million (BRAC, 2010) and contributes toward financial sustenance of BRAC's other development programmes. Social enterprise and assessment of its impact on development issues receiving much attention lately. Despite of the facts mentioned above, however, it is yet to see any research focusing on BRAC Seed Enterprise.

1.1 Overview of the BRAC Agriculture and Food Security programme

BRAC's agricultural programme takes comprehensive approaches, working with governments to ensure food security. BRAC build a system of production, distribution and marketing of quality seeds at fair prices, conduct research to develop better varieties and practices for the agriculture sector, offer credit support to poor farmers, and promote the use of efficient farming techniques and proven technologies.

The combination of these efforts results in enhanced livelihood and increased food production in the country, which in turn ensures food security and progress towards achieving the MDGs of eradication extreme poverty and hunger. Agriculture & Food Security Programme (AFSP) is currently operating with the same approach in eight countries in Bangladesh, Uganda, Tanzania, Sierra Leone, Liberia, South Sudan and Haiti.

1.2 Accelerate BRAC toward MGDs

Among BRAC's programmes relate to the MDGs, AFSP is directly related to MDG1: Eradicate Extreme Poverty and Hunger. BRAC alone supplies about 50 per cent of the maize seed. BRAC has also contributed to developing two types of Hybrid varieties of maize (BRAC 1997).

1.3 Components of the programme

There are two Research centres in Gazipur and Bogura and a tissue culture laboratory in Gazipur and nine agricultural farms in the different Agroecological Zones (AEZs) in around 210 acres of land for testing new varieties. **RESEARCH AND DEVELOPMENT UNIT** is continue in research to develop short duration, cold tolerant, salt and submergence tolerant and premium quality high yielding inbred rice varieties and disease-free plants and exploring the effect of climate changes and monitoring the performance of hybrid rice in waterlogged conditions to improve its performance. BRAC has already released ten varieties of hybrid rice, three hybrid maize and nine vegetable varieties.

- a. **Seed production and marketing unit (Seed Enterprise)** - Started with vegetable seed production and marketing in 1996. BRAC's enterprise, named "*SUFOLA BEEJ*", started production of hybrid maize, rice and tissue culture potato. It is considered as a marketing component of outcomes from the research and development unit. It consists of two seed processing plants processing annually around 5500 MT of seeds, and nine seed farms. As of 2011, it has achieved market shares of 32 per cent in hybrid rice, 50 per cent in hybrid maize, 12 per cent in potatoes, and five per cent in vegetables (BRAC 2011). There are two seed processing centres in Gazipur and Bogura, and eight seed storages in Bangladesh. It generates a surplus and plays a vital role, as a project supporting enterprise, distributing good quality seeds to farmers at the same time financially complements BRAC's other programmes.
- b. **D.light design**¹ Agriculture and Food Security Programme (AFSP) has launched solar powered products in Bangladesh aiming to provide power sources for the marginalised people with zero/limited access to the national power grid. These population groups are almost 40 per cent of the rural poor, and these products have immensely improved the quality of their lives, especially the school going children, as they now have better quality light (The Daily Star, 2012).
- c. **Agricultural extension unit** implements programmes with collaboration with other organisations. Through agriculture extension project, around 500,000 local farming families are given training and access to farming technologies and credit services to help boost land productivity and income with a key focus on disaster-prone and remote areas. "Second crop diversification programmes" started under initiatives of ADB, provides credit support for farmers and agriculture extension service.
- d. **Tenant farmer development programme** is providing farmers credit service and agricultural technical extension service. It has started in 2009, collaboration with

¹ D.light design- US based social enterprise coming up with solar solution to power crisis.

Bangladesh Bank BRAC has disbursed loan to sharecroppers at the low interest rate (Bdnews24 2009).

1.4 Overview of BRAC Seed Enterprise

Seed Enterprise is a seed processing and marketing unit under AFSP. In early 80s, BRAC started its seed distribution using group approach under development programme. In 1996, BRAC started seed production with assistance from Bangladesh Agriculture Development Corporation (BADC) under the Ministry of Agriculture's project. Bringing of the programme support enterprises, BRAC Seed is providing financial profit to BRAC and supporting other programmes to achieve financial stability and reduce dependency on donors. They maximise and monetise market opportunities. This contribution goes directly to the BRAC fund and used for different programme funding source.

BRAC enterprises are committed toward achieving financial, social and environmental returns; BRAC takes a unique approach in definition its triple bottom line by focusing on three ethoses: people, profit and the planet (the "3Ps").

- People: It must serve the needs of poor people
- Planet: It must be environmentally friendly, and
- Profit: It must make profit to help keep BRAC's development works sustainable

a. Serve the needs of poor people-addressing MDGs

In case of BRAC seed, "People" means a farmer who has no access to good quality seed. BRAC Seed is targeting farmers to ensure food security, and it contributes to MDGs in terms of eradicating extreme poverty. Moreover, seed enterprise is creating job opportunities for dealers and BRAC staff. Over 4000 dealers, sub-dealers and distributors get benefit from their sales contribution, and there are roughly 378 staffs are working for Seed enterprise.

b. Environmentally friendly-no chemical fertiliser

In respect of "Environmentally friendly", BRAC seed does not sell chemical fertiliser. According to their policy environmental friendly, BRAC Seed does not market those products, which could be harmful to environment.

c. Financial sustainability –maximise market opportunities

As a programme supporting enterprise, BRAC Seed maximises and monetises market opportunities. For the year 2012, the revenue of the enterprise counted over BDT 1004 million and surplus BDT 94 million (BRAC 2012). BRAC has been producing and marketing high quality of hybrid, inbred and open pollinated variety of rice, maize, potato and vegetable seed to meet up the demand of farmers need.

d. Seed Enterprise and hybrid rice

BRAC has been focused on developing hybrid rice varieties and HYVs. BRAC has released 10 hybrid varieties (under current Seed Policy, private organisation is not allowed to release any HYVs)

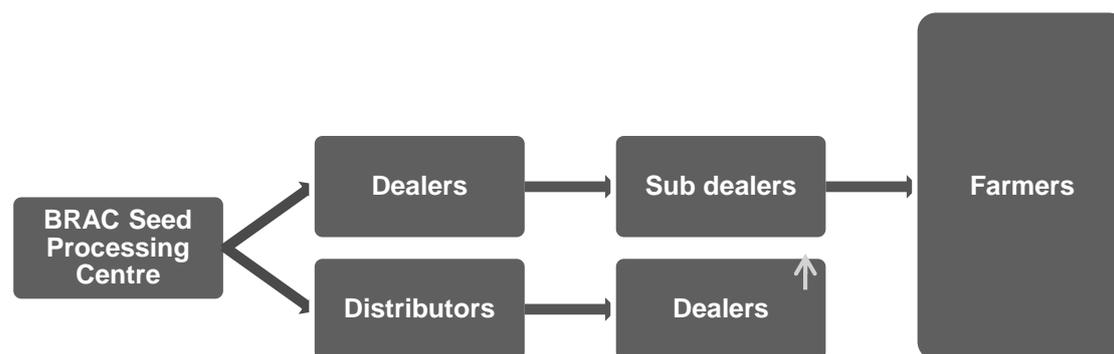
Table 1. Hybrid rice varieties released by BRAC

Name	Year	Features
GB4 (Jagoron)	2002	Well adapted both high & low temperature <i>Boro</i> variety, Growth duration 145-150 days but also cultivate in <i>Aus</i> season, Yield 8.50-9.50 mt/ha
HB08 (Alloran)	2005	<i>Boro</i> variety, Growth duration 140-145 days Salt tolerant, Suitable for coastal area, Yield 8.00-9.00 mt/ha
BW001 (Shakti)	2006	<i>Boro</i> variety, Growth duration 130-135 days & less than BRRRI <i>dhan28</i> Slender rice and good cooking quality like as BRRRI <i>dhan 28</i> Yield 7.50-8.50 mt/ha
HB09 (Sathi)	2007	<i>Boro</i> variety but also cultivate in <i>Aus</i> season, Growth duration 140-145 days. Bacterial Blight tolerant, Yield 8.50-9.50 mt/ha
BRAC5 (Shakti2)	2009	<i>Boro</i> variety, Growth duration 140-145 days. Slender rice and good cooking quality Number of spikelet 288 per panicle, Yield more than 40 kg/ decimal
BRAC6 (Shakti3)	2009	<i>Boro</i> variety, Growth duration 145-150 days. Course rice, Yield 8.50-9.50 mt/ha
HE88 (Rupali)	2010	<i>Boro</i> variety, Growth duration 145-150 days but also cultivate in <i>Aus</i> season. Course rice, Yield 9.00-10.00 mt/ha
HE25 (Magna)	2011	<i>Boro</i> variety but also cultivate in <i>Aus</i> season, Growth duration 140-145 days. Bacterial Blight tolerant. Course rice, Yield 8.50-9.50 mt/ha
HB12 (Mukti1)	2011	<i>Aman</i> variety, Growth duration 110-118 days. Bacterial Blight tolerant Course rice, Yield 5.50-6.50 mt/ha
GB0102 (Rupali7)	2011	<i>Boro</i> variety, Growth duration 145-150 days. Slender rice, High protein containing and good cooking quality Number of spikelet 227 per panicle Yield 9.00-10.00 mt/ha

Source: Adopted from BRAC AFS Programme

1.5 Marketing system of BRAC

Figure 1. Dealer's distribution model



Source: Adopted from BRAC AFS Programme

BRAC seed enterprise used to market exclusively for its VOs (Village organisations) members and credit holders of BRAC; however, in 2005 BRAC has changed its marketing strategy, and included professional dealers into the distribution channel. BRAC seed does marketing under the name of “SAFALO BEEJ”; it is based on the policy that BRAC as an

NGO doesn't sell products under BRAC's name to maximise profit. BRAC Seed is distributing to the BRAC dealers and distributors, and sub-dealers distribute seeds to farmers.

1.6 Rationale of the study

Under PETRRA project, it was observed that, farmers have limited access to good quality seeds. Farmers' participatory experiments carried out in Philippines and Bangladesh showed that good quality seed could increase rice yield by 8 to 10 per cent. It is estimated that Bangladesh can produce an additional 2.1 million metric ton of rice seed annually and could earn a worth of US\$ 201 million by using quality seeds (Hossain *et al.*, 2003). The seed industry in Bangladesh comprises both public and private sector initiatives. However, in reality, only 47% quality rice seed is provided by the public (17%) and private (40%) sector, which implies the rest 43% seed come from the farmers known as informal seed and considered as below standard (BSGDMA 2007).

Quality seed alone is not sufficient to increase crop productivity. For the cultivation of non-traditional crops, capacity building such as technical training of farmers is required to gain knowledge. Islam *et al.* (2010) studied that most of the farmers' have inadequate knowledge regarding modern cultivation and post-harvest technologies. Therefore, the question arises whether the farmers who use BRAC Seeds (Annex-1) are well trained or informed by DAE, NGOs or dealers to make the most of high-quality seeds advantage.

Considering above facts, an assessment of the performance of BRAC seed enterprise is essential before planning and designing future strategy of BRAC Seed enterprise. This study will bridge these gaps and development of BRAC seed enterprise. Contribution of this enterprise to the BRAC's mission, such as alleviation of poverty and ensure food security. This study will also contribute to enhancing accountability and transparency of seed enterprise for stakeholders, and develop strategic engagement between BRAC, development partners and government by sharing knowledge and lesson to be learnt. Based on the findings, implications will be made for BRAC Seed, enable to look back the effectiveness of their approach and improve their operation to ensure availability of high-quality seed for farmers.

1.7 Study objectives

The study objectives are:

- a. To understand farmers' perception of BRAC Seed with regard to purchase, cultivation, harvest, marketing, profitability and consumption, inputs, germination, duration, pests and diseases, yield, women's participation and home seed conservation
- b. How using of BRAC seed contribute to farmers' livelihood improvement

Chapter 2

2. Seed situation at national level

Quality seed is a strategic input, works as an impetus in rice production to mitigate the challenges of food security in Bangladesh. Here the term 'Quality Seed' represents seeds that are produced under intensive care that would ensure a standard level of germination, able to overcome certain geographical limitations (drought, salinity, and submerge tolerant) and finally results into a good yield of rice.

Over 11.7 million hectares of land in Bangladesh is dedicated to rice production. It provides about 70% of direct human calorie intake of the 152 million people (BBS 2012) making it the most important food crop in Bangladesh. However Annual average population growth rate of the country is about 1.34% (BBS 2011) and the last couple of years our per year food grain deficit was about 1-2 million tons. We can fill up the gap of calorie demand by producing more rice through using quality seed. According to IRRI, use of quality seed is only 17%, and semi-quality (mixture of both good and bad) seed is around 40%. This implies 43% of rice seed comes from the informal sector where quality is unknown. This leaves a potential for achieving self-sufficiency in the rice sector.

Over the last two decades, Bangladesh is experiencing on an average a steady 5% growth rate. However, the matter of concern is that in the process of growth "agriculture sector's" contribution is diminishing day by day 18.3% of GDP in 2012 where about 45% (CIA 2013) of the labour force is directly involved in this sector. These key statistics asserts the income distribution of this group of people. If Bangladesh is to achieve its Millennium Development Goal (MDG) of a 50% reduction in poverty by 2015, it has to maintain 7.5% growth rate in the following year. This requires that the annual growth in agriculture must be at least 4% (Rice statistics in Bangladesh 2006). This would be possible only through an increase in agricultural productivity based on modern agricultural technology and a supply chain linking farmers directly with the consumers at the national level as well as export markets.

To sustain the large and growing population, we must care about the cultivation of rice. Moreover, at the very first stage of care, the quality of seed we are considering for the rice production grab the focus. Quality seed plays a significant role in bringing out the qualitative and quantitative change in the traditional agriculture sector in Bangladesh.

2.1 Types of seed

The foremost types are in below:

a. High Yielding Varieties (HYV)/inbred

The term HYV/inbred in rice denotes all high yielding varieties (HYV) developed over past 30-35 years. All currently known modern varieties or HYV in rice are inbred varieties. high yielding varieties (HYV) seeds are mainly produced and provided by different government agencies. Two types of HYV seeds are available in the market in below:

- Foundation seed and
- TLS (Truthfully Labeled Seeds)

b. Hybrid varieties

The hybridisation technique, however, involves two separate parental lines. When the resulting offspring have one or more traits that are superior to those of their parents, we have a phenomenon called heterosis or *hybrid vigour*. (The term heterosis means the higher yielding capability of newly developed hybrid over its parental lines. This term is widely used in hybrid crops to denote higher yield of hybrids over their parental lines). Private firms mainly operate the hybrid seed market and so do the government authorities but in very limited scale.

2.2 Authorities of providing quality seeds

The seed industry in Bangladesh comprises of both public and private sector initiatives. The seed policy of the government of Bangladesh initiated the active participation of private sectors and NGOs in 1998. In the private sector, there are more than 100 companies involved, with over 5000 registered seed dealers operating across the country. The recent expansion of the private sector seed companies has resulted in the engagement of thousands of contract farmers into the formal seed production chain, leading to improved livelihoods amongst the rural community (BSGDMA). Several agencies under Ministry of Agriculture (MOA) are working to ensure the production and distribution of quality rice seed. These are shown below:

2.3 Bangladesh Agriculture Development Cooperation (BADC):

Bangladesh Agriculture Development Cooperation (BADC) operates with a vision of the **development of agriculture through the supply of agricultural inputs and dissemination of technologies among the farmers to ensure national food security**. One of the missions of BADC is –“Production and supply of high yielding varieties of quality seeds of different crops”.

2.4 Seed Certification Agencies (SCA):

Seed Certification Agencies (SCA) is doing seed testing and certification of the seeds produced by Public, private and NGO sector. Seed Certification Agency has been performing its role for seed certification of five notified crops (rice, wheat, jute, potato & sugarcane). The Agency certify and maintain seed quality through field inspection, seed testing and variety testing as per decision of the National Seed Board (NSB) and regulations provided by the National Seed Policy 1993.

2.5 Department of Agricultural Extension (DAE):

The Department of Agricultural Extension (DAE) is the largest public sector extension service provider in Bangladesh. Its mission is providing needs- based extension services to all categories of farmers and enabling them to optimise their use of resources in order to promote sustainable agricultural and socioeconomic development. The core functions of DAE include increasing agricultural productivity human resource development and technology transfer. DAE has contributed significantly to crop production, particularly in rice and wheat and help the country to attain self-sufficiency in food.

2.6 Bangladesh Rice Research Institute (BRRI):

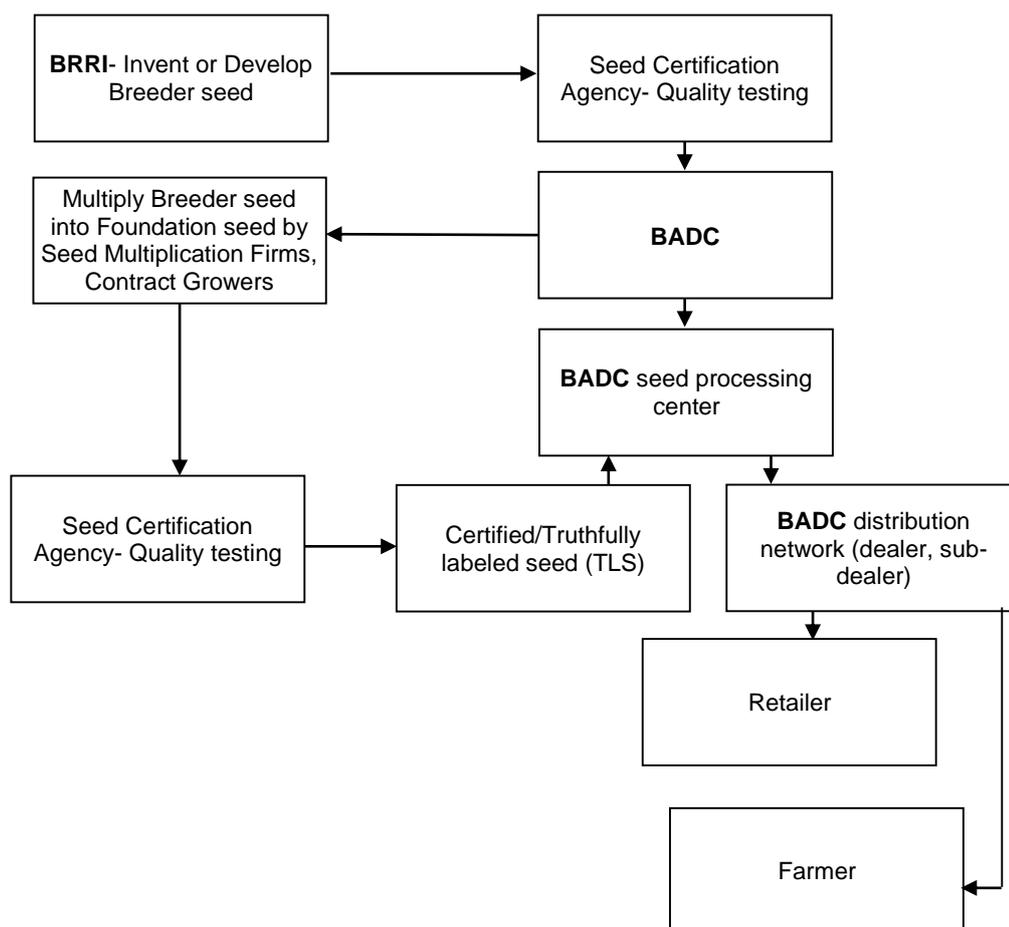
Bangladesh Rice Research Institute (BRRI) mainly do research and develop rice varieties both for favourable and unfavourable AEZs (Draught, saline and submerge tolerant).

Production and distribution through government agencies:

In the early 70s, at the pre-stage of “Green Revolution”, adaptation of HYV rice technology has brought a structural change in the traditional agriculture sector. However, the fact is the genetic quality of seeds normally degenerates with time. In case of cereal, it is found that replacement of seed is necessary as the frequency of 3 to 4 years. Therefore, replacements of the old varieties seed by new varieties at regular intervals are essential. Normally varieties of breeder seed invented or developed in the breeding stations in BRRRI are released by NSB after proper examination and then handed over to BADC for multiplication as foundation seeds. Foundation seeds are multiplied as certified truthfully labelled seeds (TLS) at Seed Multiplication Farms (SM Farm) and Contract Growers (CG) zones of BADC. Seeds produced by SM Farms and Contract Growers are collected and processed properly in BADC seed processing centres, and ultimately they are distributed among the farmers through BADC’s distribution network. Thus, BADC is entrusted with the task of production, processing, preservation of quality seeds and making them available to the farmers.

Besides that, DAE produces a large amount of seed through “Seed exchange project.” The seed certification agency verifies the qualities of those seeds.

Figure 2. BADC seed production and distribution chain



Source: Author; 2013

2.7 Private companies/NGOs

There are some other private companies operating in the hybrid seed market. Some of the pioneers are shown as below:

- BRAC
- Supreme
- ACI
- Ispahani
- Lalteer

2.8 Annual seed demand and supply

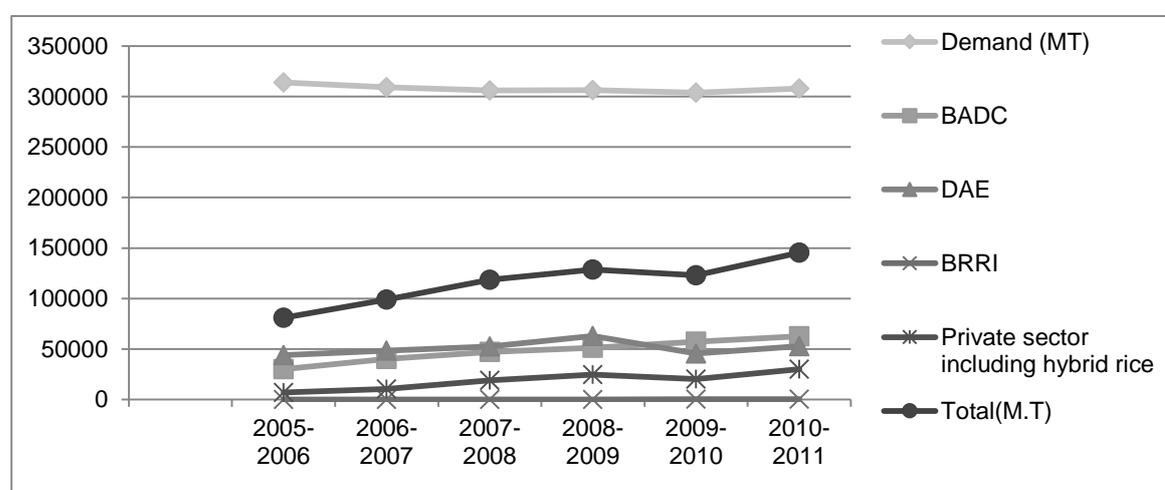
The following table shows the yearly market demand and supply of quality seeds. The demand for quality seed is more or less stagnant as expected because scarcity of arable land for rice cultivation. BRRI, BADC, and DAE are mainly responsible for invention, production and distribution of HYV seed. Data shows that these three authority is meeting the demand in higher percentage every year and in 2010-11 BADC alone meets the 20% of the total seed demand, whereas private sector is meeting only 9% in that particular year (Akanda 2011).

Table 2. Seed supply as a per cent of total demand in parenthesis

Year	Demand (MT)	Seed supply by public and private sectors(M.T)				Total (M.T)	%
		BADC	DAE	BRII	Private sector including hybrid rice		
2005-2006	314000	30000 (10)	44000 (14)	56	7000 (2)	81056	26
2006-2007	309300	40000 (13)	48447 (16)	53	10300 (3)	98800	32
2007-2008	306000	47090 (15)	52500 (17)	110	18800 (6)	118500	39
2008-2009	306500	51190 (17)	62950 (21)	120	24500 (8)	128760	42
2009-2010	304000	57235 (19)	45420 (15)	130	20200 (7)	122985	40
2010-2011	308000	62435 (20)	52850 (17)	150	30000 (10)	145435	47

Sources: (MOA 2008)

Table 3. Seed supply graph of total demand



Sources (MOA 2008)

2.9 Seasonal seed use

Bangladesh has three main seasons for cultivating rice. Farmers have been adopting several HYV varieties in the *Aus* and *Aman* season along with the local varieties. *Boro* season is the largest season in terms of production of rice in where hybrid varieties covering 19%, HYV varieties covering 78% of the land. In *Boro* season, local varieties cover only 2% of the land, which is the lowest among all the seasons. However, *Boro* season is covering smaller land area than *Aman* but characterised with a predominance of modern varieties (MV) makes it the largest production season.

Table 4. Comparative land use scenario under rice production of different varieties

Seasons	Total land coverage('000, Acres)	% area coverage		
		Local varieties	HYV	Hybrid
<i>Aus</i>	2432	28.67	71.33	0.00
<i>Aman</i>	13993	32.11	67.89	0.00
<i>Boro</i>	11631	2.29	78.56	19.16
Total		19.79	72.55	7.66

Source: DAE; Agriculture Yearbook 2009-2010

2.10 The trend in hybrid seed use in *Boro* season

From the following table, we see that every year the composition of cultivation of local, HYV, and hybrid varieties are changing. The total coverage of hybrid and local seed area is diminishing whereas, the HYV coverage area is exerting an opposite scenario as it has been increasing every year. Area coverage of local variety has been gradually decreasing. The change in 2010-11 was about 26% implying that over the years the importance of Modern Varieties (MV) for the *Boro* season is increasing. After 2008-09, the change of hybrid land area is negative, and according to the government and non-government organisations, this negative trend would continue in the following years. It is obvious that the HYV is replacing the hybrid and local variety.

Table 5. Trend in hybrid seed use in *Boro* season

Year	Local variety		HYV variety		Hybrid variety		Total Area(000' hector)	
	Area (%)	% change in total LV land	Area (%)	% change in total HYV land	Area (%)	% change in total hybrid land	Total Area	% change in total land
2007-08	2.74		80.09		17.17		4610	
2008-09	2.59	-3.08	80.16	2.44	17.25	2.83	4718	2.36
2009-10	2.28	-12.15	83.15	3.53	14.57	-15.72	4709	-0.20
2010-11	1.66	-26.36	84.56	3.07	13.78	-4.12	4772	1.35

Source: Yearbook of Agricultural Statistics of Bangladesh 2011, BBS mechanisms

This diminishing trend of local variety is a good sign that Modern Varieties (MV's) are replacing it. However, the gradual decrease in the hybrid rice production area can be a matter of concern because the yield rate of hybrid seed is higher than any other variety. Both the increasing trend of HYV and decreasing trend of hybrid can be explained by production cost and related issues. Authors narrated about the HYV and BRAC hybrid varieties in terms of agro-ecological condition, farmer's decision to seed selection, the reason of choosing, production cost, women involvement and finally how hybrid seed yield extra profit that contributing in farmer's livelihood that vividly derived from the local two distinct contexts in the following chapters.

Chapter 3

3. Methodology

Qualitative method considered for this study and data collection done during November 2012 to January 2013. The main data instruments are below:

3.1 Focus Group Discussions (FGDs)

Under the two diversified districts a total 12 FGDs are conducted on farmer. Six FGDs are conducted in Bogura district and six FGDs are considered for Gopalganj district. In between three FGDs are considered for each of the *upazila* in Bogura district. The same number of FGDs are considered for each of the *upazila* of Gopalganj district. Based on high and relatively lower market share there are three neighbouring villages are selected purposively at each of the *upazila* (Sub-district) level. The purpose of these villages' selections were mainly to capture the difference in practice and perceptions at various level of the BRAC seed user. Selection of these tools allowed us to identify general perception of the issue, i.e., about various cropping pattern, general perception and motivation to cultivate hybrid rice, source of BRAC seeds and its timely availability, their opinion about commercial seed performance in comparison to home-seeds or other distributor's seeds available at the local market.

3.2 Key-Informant Interviews (KIIs)

A total 20 KIIs are considered under the two districts. In between ten KIIs are conducted in each district, and in between five KIIs considered for each *upazila* of Bogura district. However, the same number of KIIs are considered for each *upazila* of the Gopalganj district. The key stakeholders are dealer, sub-dealer, distributors and primary beneficiary, i.e., farmers and their wives. Considering data saturation, four KIIs are conducted on dealers, four on sub-dealer, two interview on distributors, two interview conducted on BRAC officials, four with farmers and two with the wives of farmers and two with female farming day labourer interviewed for this study. Furthermore, data on specific topics and to triangulate the descriptive data some of the key comments made during the Focus Group Discussions on which why and how conversation noted from the respondent of the KII. For example, in the group discussion if farmers mention the instruction of BRAC seed dealers at the time of purchasing, followed by Key-Informant Interviews conducted on individuals to reveal specific details of the instruction. An atmosphere has been created where the interviewer and interviewee can discuss the topic in detail and to capture the supply and demand side scenario that included women involvement in farming practice. The interviewer, therefore, can make use of cues and prompts to help and direct the interviewee into the research topic.

3.3 Sampling

To conduct FGDs respondents are selected based on pre-determined criteria; particularly the farmers with good farming experiences, mostly male over 30 years old, owner of small, medium and large farm size. In order to get a comprehensive insight of the potential hybrid rice seed varieties high market share and reason of less use or low market share three neighbourhood villages are selected purposively for Focus Group Discussion. Using 'snowball sampling technique', i.e., a suitable farmer would help to get another suitable farmer through ranges of local farmers for the FGD were selected. For Key-Informant

Interviews suitable and experienced FGD respondent and individual were identified and interviewed.

3.4 Data collection

Data collection was done by two teams; one research associate along with JICA Intern accompanied each team at the different locations. For conducting the surveys, four qualitative enumerators having academic in anthropology and rich experience in conducting FGDs and KII recruited. Three-day training facilitated to aware research assistants about the research purpose. The technical aspect of the data collection covered by the BRAC field officers. Moreover, the data obtained from the interviews was recorded after taken the consent of the participants. Field notes were considered for quick view of the descriptive data set. End of each field days, both teams discussed together about collected data. Both teams prepared a summary notes. Enumerators along with researchers transcribed the recordings. All transcriptions and multiple notes were used along with the audio recordings.

3.5 Data analysis

a. Data familiarisation

Familiarisation refers to the process during which the researcher becomes Familiarised with the transcripts of the collected data (i.e. interview or focus group transcripts, observation, field notes) and gains an overview about the data. Audio recordings helped the researcher becomes immersed in the data by listening, recognises emerging themes or issues in the dataset through reading the transcripts. However, the enumerators followed the process of transcription, which leads to a degree certain of Familiarisation with the factors were considered. Transcripts were made using recorded sound files and comprehensive notes taken during the fieldwork. The transcripts were checked by other researchers to increase the validity and further Familiarisation of the data. Translated transcripts were read and finally compiled.

b. Data reduction

In this study researcher followed coding strategies to check the inter-reliability. Codes, inductive codes and subcodes are generated and identified. Full description included colour coding and highlights are generated appropriately from the transcript.

c. Data display

Descriptive data read thoroughly to identify recurrent themes and to crosscheck. Data were drawn from its original textual context under the thematic framework or a priori research; inquiries that placed in consist of the headings and subheadings or case study in a manner to develop the report.

3.6 Ethical consideration

As per existing rules an approved letter signed by the authority of Agriculture and Food Security Programme and the director of BRAC research and evaluation division. During data collection ethical part of the study have read and explained to the potential respondent. Once respondent's consent was collected, then they were assured about the confidentiality of their provided information that would use only for study purpose. In addition, respondents were ensured that their name or any form of identification would not be shared or used in the report.

3.7 Study area

The seed marketing system in Bangladesh is divided into several zones, according to which market share of BRAC hybrid rice seed varies. In the southern part of Bangladesh, Barishal and Khulna zone has the market share of 31% and 20% respectively. At the northern part, Bogura, Dinajpur, Rangpur and Kurigram has the market share of 33%, 35%, 31% and 25% respectively. However, in Cumilla and Mymensingh zone market share of BRAC hybrid rice seed varies were 13% and 22% respectively.

In order to capture the change in seed demand for hybrid rice across diversified geographic locations, study has selected two zones with high market share and geographically diversified such as Bogura from north-western Bangladesh and Gopalganj from the southern zone. Under Bogura district, two *upazilas* Dhunat and Shibganj were selected where one *upazila* has high market coverage and suitable for rice crop production, on the other hand, another which has relatively lower demand for hybrid rice seed. Under Gopalganj districts Gopalganj *sadar* and Kashiyan *upazilas* were selected in the same manner.

3.8 Brief profile of the Bogura district

There are 30 Agroecological Zones (AEZs) in Bangladesh categorised on the basis of four elements such as physiography, soils, land levels in relation to flooding and agroclimatology. Bogura district is situated in the North and covered by Barind Soil Tract. Including riverine area, it occupies an area of 2920sq. km. This soil tract is the most fertile and productive. Eastern Bogura is covered by Karatoya – Bangali Floodplain and northern Bogura covered by Tista Meander Floodplain. River Jamuna watered on the North- Eastern part of that district which is navigable throughout the year that makes the soil alluvial. Bogura district is influenced by a tropical climate with the monsoon. The fertile soil of the Karatoya floodplains is suitable for paddy, Jute and Rabi crops.

3.8a Demographic features

According to the population census 2001, a total number of households of Bogura district were 688 thousand. Estimated number of households of the district in 2008 were 731 thousand and population were 3499 thousand. The percentages of the male and female population were 50.93% and 49.07% respectively. *Dhunat* has an average literacy rate of 19.3% (7+ years of schooling), and the national average of 32.4% literate (BBS 2008) while *Shibganj* has an average literacy rate of 24.1% (7+ years of schooling). However, Literacy rate among the town people was 63.2%.

Table 6. *Upazila* wise households and population size of Bogura district

Study area	Population census-2001		Estimated (July 2008)	
	Household (000)	Population (000)	Household (000)	Population (000)
District Total	688	3013	731	3499
Dhunut	64	271	66	315
Shibganj	83	352	85	409

Source: Agriculture Census 2008

3.8.b Economic situation

Agriculture and livestock sectors play the vital role of economy in this district. Of the total 7,91,343 holdings of the district 57.26% holdings are farms that produce varieties of crops

namely local HYV paddy, Jute, sugarcane, wheat, tobacco vegetables, pulses and other cash crops and minor cereals. Paddy covers about 55.71% of the gross temporary cropped area. The district is very famous for modern irrigation and scientific cultivation system. The participation of female persons in non-farm activities is 14.23% while the participation of male is 85.77% (BBS 2008). Cropping intensity (area in acre) in *Dhunat Upazila* 190% in 2008 compare to 181% in 1996 while 240% in *Shibganj Upazila* compare to 213% (BBS, 2008). From the point of the researcher views, this study area was rich in fertile soil as tropical monsoon watered most of the year that influence farmer to cultivate land three times in a year.

3.9 Brief profile of the Gopalganj district

Gopalganj district is medium lowland area consider as a *beel* centres smooth low-lying Gangetic basin. During November to February starts dry winter season. The main river Madhumati, Kumar and Bilrolte are navigable during the monsoon. These rivers are not influenced by the tidal surge. For irrigation, these rivers serve as a good reservoir system. This area normally influenced by various climatic factors especially most of the year get flood during monsoon.

3.9.a Demographic features

According to the population census 2001, a total number of households of Gopalganj district was 222 thousand, and the population was 1165 thousand. Estimated number of households of the district in 2008 was 283 thousand, and the population was 1,355 thousand.

Table 7. Upazila wise households and population size of Gopalganj district

Study areas	District Total			
	Population Census-2001		Estimated (July 2008)	
	Household (in thousand)	Population (in thousand)	Household (in thousand)	Population (in thousand)
	222	1165	283	1355
Gopalganj Sadar	60	322	78	374
<u>Kashiyani Upazila</u>	45	229	65	266

Source: Census of agriculture 2008

3.9.b Economic situation

The economy of Gopalganj is predominantly agricultural. Farmer's are in common practice to cultivate mixed broadcast *Aus* and deepwater *Aman* in this area. *Aman* seedlings may be transplanted if floodwater recedes early enough. Most of the farms produce varieties of crops mainly local and HYV paddy, vegetables, spices, pulses and cash crops like sugarcane, jute, wheat and other minor cereals. Rice covers about 71.15% of the gross temporary cropped area. Almost all sort of vegetables are cultivated particularly bitter gourd, pumpkin, potato and brinjal are grown abundantly. Pisciculture and rearing of livestock and poultry add an additional income to the rural household. Non-farm activities are not very much significant in Gopalganj. Female participation in non-farm activities is very poor. Cropping intensity (area in acre) in Gopalganj Sadar was 124% in 2008 compare to 161% while in Kashiyani Upazila 139% compare to 162% (BBS 2008). From the point of the researcher views, this study area considered as lowland area as the study revealed due to sea level rise saline intrusion damaging crop area. The farmer cultivates land once a year that included negative desire to crop production as farmer deprived from the actual cost.

Chapter 4

Empirical findings and Discussion

Objective 1. To understand farmers' perception of BRAC Seed that includes inputs, germination, duration, pests and diseases, yield, women's participation, marketing issues and profitability.

4.1 Bogura district

In this chapter, study attempted to blend into a rational narrative, without losing the complexity, richness and diversity of the information that obtained through the Focus Group Discussion (FGDs) and Key Informant Interview (KIIs). All the information mentioned below are empirically captured from the different stakeholders of BRAC Seed Enterprise. Study findings compiled farmer's perception regarding BRAC hybrid seed and other varieties, which is in practice at the field level.

Mainly two crop cycles such as *Aman* and *Boro* in Bogura district. Prior to the *Boro* season, potato and a green vegetables like pointed gourd cultivation take place to some extent. Just before *Boro* season, a short period is locally known as *Rabi* season. As farmer mentioned that just after the *Rabi* season, mainly hybrid rice varieties take place to cultivate because at that time HYV cultivation gets too late to cultivate in the study area.

In 1995 total seed requirement was for rice HYV 60% (MOA 1995). The study found in the *Boro* season starting from November to February and in Bangla month (*Ashar-Srabon*); most of the farmers cultivate hybrid and HYV (*Ufshi rice*) varieties such as HYV BRRI 28 and BRRI 29 along with other local varieties. Farmer mainly cultivates hybrid during the *Boro* season as a widely and it is roughly 80%. During *Aman* Season from Bangla month (*Ashar-Srabon*) farmer cultivate BRRI *dhan* 49, BRRI *dhan* 29, BRRI *dhan* 28 and local varieties call *Jirashal* and *Minicate* and it is around 20%. The study further added that among the local farmer inbred varieties such as BRRI *dhan* 28 most adopted in the Shibganj *Upazila*. About 5% farmers cultivate HYV foundation *Vitti* seed in the study area. An interesting finding here to mention that during *Boro* season farmer does combine cultivation with hybrid *Hira* (Supreme Seed Company) and hybrid *Sathi* (BRAC variety) and during *Aman* seasons BRRI *dhan* 28 and the local rice variety *Minicate*.

4.2 Farmer's opinion

4.2.a Dhunat upazila

The study found while discussion in a group that most of the farmers are in this region primarily produces hybrid coarse rice in the local term "*Mota Dhan*". Stakeholder dealer as a key player urged that farmer's prefer to cultivate mainly BRAC hybrid *Jagoron*, a *Boro* rice varieties; hybrid *Rupali* and widely hybrid *Hira* and *Hira-2* varieties from Supreme Seed Company. BRAC hybrid *Jagoron*, *Alloran* and *Sathi* varieties are more popular in this study area although those varieties harvesting duration little bit longer than other varieties as farmer mentioned.

4.2.b Shibganj upazila

BRAC introduced hybrid *Alloran* and *Jagoron* in 2000 to 2001 since then hybrid cultivation taking place, but the study revealed that those varieties are not so widely adopted by the

farmer in this region. The study further added that few of the farmers cultivated BRAC hybrid variety *Sathi*. In the past farmer experienced less production using BRAC hybrid varieties in this study area. The major rice variety was *Mamun* locally called *Sharna* and around 80% of farmers cultivated this variety in this area. The study found *Mamun* variety yields only 15 to 20 *maunds* per *bigha* (about 4-5ton/hect.), so the concern farmers are not happy with that amount of production. Among the farmer hybrid, *Hira* rice variety from Supreme Seed Company became well adopted and eventually around 80% to 90% of farmers replace with hybrid rice seed *Hira*.

4.2.c Hybrid and HYV/Inbred varieties

In terms of production, BRAC hybrid variety cultivation takes on a larger scale; because hybrid seed have more demand in the market and farmer produced for selling commercially, as it has a high productivity which produce around 85 to 88 *maunds* per acre (about 8.5-9ton/hect) locally known as good *pholon*. Farmer stated that *they are more interested in cultivating hybrid rice as it has a higher production rate, which makes them more profitable.* The study further found that local varieties *dhan* that produce about three tons per hectares while hybrid produces almost double the amount that is around seven tons per hectares. According to the farmer, *roughly 60-70% of the farmer who has a substantial land cultivates hybrid rice for selling.* A farmer's statement noted about BRAC hybrid *Rupaly-7* as below:

One of my friends cultivated Rupaly-7 hybrid seed bought from BRAC. Later hanged a signboard near to the field. That year there was a bumper production, and many of them encouraged to cultivate that variety.

The study further added that the purposes of producing the hybrid rice are for selling and HYV such as BRR1 dhan 28, and BRR1 dhan 29 are for consuming. For example, if a farmer owns substantial suppose 12 *bighas* (about 2 hectares) of land that farmer prefer to cultivate traditional crop varieties in 2 *bighas* (0.3 hectares) for consumption, and the rest of the land such as in 10 *bighas* (1.6 hectares) prefer to cultivate hybrid crop varieties. Farmer said local variety seeds have a lower yield rate per acre but due to its repeating production capability; they produce it even a lower yield. However, some of the farmers mentioned that depending on the soil quality local varieties could be produced per *bigha* up to 20 *maunds* (about 5 ton/hectares).

4.2. d High land

Crop production depends on soil quality and availability of irrigation water on time. Discussion with farmer revealed that highlands are suitable for *kharif* or perennial dry land crops if the soils are permeable. However, some of the villages of the study areas are comparatively high land. Those are double cropping land and the farmers mentioned that high land is less suitable for hybrid crop production due to timely irrigation difficulties.

4.2. e Low land

Apart from high land, some other villages are located in lowland where the study conducted. The study found that low land is highly suitable for cultivating hybrid crops as high production depends on the land quality and availability of irrigation water on time. According to the lowland farmer:

Roughly, 90% farmers are cultivating BRAC hybrid rice along with HYV. Further added hybrid rice production rate in the low land was up to 20 to 25 maund per bigha (about 5-6ton/hect.) whereas, HYV BRR1 dhan 28 production rate was 18 to 20 maund per bigha (about 4.5-5ton/hect.). However, the study found that sometimes farmer keeps the low land as vacant in local term *potit* to avoid the risk of disaster like flood.

4.2.f Paddy inputs

a) Fertiliser and pesticide

Paddy inputs such as fertiliser, water and pesticide depend on the soil quality and textures. A farmer mentioned that hybrid rice and the HYV/inbred rice requires the same quantity of fertiliser and pesticide. However, BRAC hybrid seed requires more fertiliser and pesticide but since yield is higher, using BRAC seed farmers are satisfied with it. A dealer stated that *the yield would be better depending on the farmers if they can properly apply the inputs such as irrigation, fertiliser and pesticides. If these elements are not provided in the right combination yield could be lower.* However, the study found that fertiliser and irrigation are not available when farmer needed.

An in-depth discussion with a farmer from Shibganj *Upazila* stated that fertiliser *quantity written on seed packet as an instruction is limited, whatever written on there we applied almost double or even more on the crop field. If we follow fertiliser instruction as written there would be less production around 12 to 14 maunds per bigha (about 5-6ton/hect.) out of 28 to 30 maunds per bigha (about 7-7.5ton/hect.).* The study further added from Shibganj *Upazila* that triple cultivation required more *fertiliser* to add. In regard to asking the farmer about *fertiliser* quantity to use as before hybrid rice cultivation in *Boro* season; potato cultivation took place in that case whether fertiliser need to add more or less and in reply a farmer from the same area stated that *still not less than 20 kg and the fertiliser call phosphate which turn soil colour into black without adding that pest would attack leaves, that damage rice production adversely.*

Farmer stated that the *BRRRI dhan 28 varieties could be harvested before other varieties. As a result fertiliser and water requirement is relatively lower compared to the other varieties.* The study further added the HYV '*Ufshi*' varieties of rice is less affected by diseases whereas hybrid rice tended to be affected more and required the higher application of the pesticide. However, HYV BRRRI *dhan 28*, BRRRI *dhan 29*, BRRRI *dhan 49* varieties of rice require less water, less *fertiliser* and pesticides whereas hybrid rice require more *fertiliser* hence production cost is higher. Hybrid tends to get affected by pests, and the plant starts to rot locally say it *pochon dhore*.

However, local varieties require a lesser amount of fertiliser. Sometimes farmer minimising their workload by collecting all the *fertiliser* and pesticide required from the dealer. In the study area natural fertiliser is not widely used since there are not many cattle in the area but compost fertiliser used as around 1 to 1.5 *maunds* of cow dung in 1 to 1.5 decimal land (about 2-2.5ton/hect) while seedbeds get prepare intensively for 30 to 35 days. Traditionally *ashes* also mix with the soil, as farmer stated that it makes the soil soft which help to pick off the seedlings easily. The study revealed that organic compost use reduced less than before, because, the farmers do not have enough cattle due to less grazing land. The study further added that farmers are buying pesticide from the local shops and pay them back after harvesting crops. Most of the farmer trends to use chemical pesticide in the study area.

4.2.g Groundwater

Groundwater use for irrigation is a matter of growing concern in northern Bangladesh. Study revealed that geographically high land where farmer finding irrigation difficulties compared to low land. The study further added that there is groundwater crisis for irrigation HYV varieties from May to July in *Aman (Ufshi)* season that causes farmer high production cost. Farmer mentioned that if water from deep tube well use for irrigation, then 25% of the produced paddy have to delivery to the service provider of deep tube well as a payment. Moreover, as for tenancy, the calculation of payment in the form of paddy is done according

to the land size; thus 10 *maunds* (0.4 ton) rice is given to the landowner for per *bigha* (0.16 hectares) of land, which is not profitable for the farmer.

4.2.h Day labour

An in-depth interview with the farmer found that during harvesting, there have a scarcity of day labour and farmer has to pay high to them. A farmer mentioned that during harvesting *two day labour cost is equivalent to one maund paddy price* in Muthurapur village, Dhunat *Upazila* of Bogura district. On top of that day labour prefer to have costly rice like BRR1 *dhan 28* and *29* as a meal instead of *hybrid Hira, Jagoron and Alloran*. Because rice out of HYV is fine with polish texture and more pleasant to eat. From the analysis point of view, farmers faced crisis to get day labour during harvesting period and due to scarcity of day labour their demand of choice getting high, thus production cost becoming higher.

4.2.i Harvesting and marketing

The duration of harvesting for example: seedling plantation to ripening of paddy is about 120 days long. During winter season in *Bangla*, term *poush* month people in the village start planting seedlings and by the time in *Bangla* month call *Joishto* from (mid-May to mid-June) farmer do harvest within 130 to 140 days. For hybrid rice, it takes around four months to harvest. Farmer mentioned from the study area that BRR1 *dhan 28* harvesting slightly earlier; as a result, the seasonal storm could not harm. After harvesting BRAC hybrid paddy, it is difficult to plant jute since some of the BRAC hybrid harvesting time longer than HYV. However, still, many farmer cultivate jute after harvesting hybrid *Boro* rice.

Farmer also mentioned that *it is difficult to sell BRAC hybrid Rupali-7 to some extent which is a thin variety hence the government does not procure thin rice*. The study also added *the market demand for coarse rice, locally known 'mota Dhan' varieties are higher compared to Rupali-7 because of thin variety, so market demand is lower for this varieties*. However, study found that *Rupali-7* thin rice production is about 25-24 kg per *bigha* (0.2ton/hect.) which is not profitable to the farmers. As a result farmer's wish to cultivate hybrid coarse rice varieties. Farmer stated at this point that *when government start buying coarse rice from the local rice mill, then coarse rice get easy to sell with a good rate*. BRAC's *Shakti* paddy variety in local term *dhan* harvesting time same as BRR1 *dhan 28* but some of the other varieties like *Shakti-2, Alloran, Jagoron* and *Sathi* take relatively longer in harvesting.

4.2.j Home conserves seed

During *Aman* season HYV/inbred and local *Ufshi* varieties are predominant in the study area. There are many local rice varieties such as *Paijam, Gutti Sharna, Ranjit* seed take place to produce and conserve in those villages. Farmer mentioned *BRR1 dhan 28 varieties can be possible to conserve at home but after two to three years production rate become less*.

Few farmers only conserve seeds at home because of less germination rate. Study further revealed that *only 15% of the farmers are involved in home based traditional seeds conservation*. Furthermore, although traditional seeds conservation is in the down trend but around 30% farmer conserve seed at home in Shibganj *Upazila* of Bogura district. Farmers are mainly go for conservation for *Aman* local rice varieties call *Jirashal, Minicate, Kajol lata* and BRR1 *dhan 28* etc. However, a concern about seed conservation stated by those farmer below:

Traditional seed conservation does not work properly. Another problem is less yielding. Germination rate of conserved seed is very poor and sometimes not germinate.

However, during *Boro* season hybrid varieties are predominant in the field. After harvesting hybrid paddy farmers cultivate potatoes. Therefore, study found that commercial dependency on seed is higher among the local farmer.

4.2.k Influence by natural calamity

Focus Group Discussion with the farmer revealed that as some study area is high of the land therefore, less influence by various disaster compare to other area, but seasonally sudden disaster reduce production and in consequent rice price get higher. Study further added that during the harvesting period sudden natural calamity like prolong heavy rainfall and cold spell or other forms of disaster that effect the longer duration yield.

Furthermore, if temperature exist relatively higher, then brown grasshoppers locally say *badami gash foring* appear in the fields that eats the root in the local term '*gacher gora*' of paddy. As a result of the paddy tree locally call *dhan gach* slowly dies. Then farmer do use then pesticide to protect the paddy plant.

4.2.l Women's involvement in farming

Apart from the farmers' opinion, study also captured rural womens' participation in the agriculture-related activities. Traditionally womens' involvement in the crop field depends on household economic condition and socio-cultural background. In relation to cultivation, study found that rural women has a wide range of seasonality wisdom but not involved directly in the paddy field. The study further added that rural women have a lack of technical knowledge as they do not involve directly in many farming activities such as seed buying, crop and seed related decision-making, fertiliser regarding instructions etc. However, few of the farmer's wives mentioned that chemical fertiliser for hybrid seed cultivation needs to apply accurately. Focus Group Discussion with farmer added that since fresh grain arrive at home and through the crop processing women's involvement is quite high. As a women, they work in germination, seedling collection, harvesting and during the post-harvesting they do the trashing and drying of paddy etc.

4.3 Gopalganj district

Study revealed that as a study area Gopalganj district considered as a '*bhatir desh*', a low land and they cultivate for six months and leave vacant rest of the six months in a year as those crop lands submerged for six months. Farmers usually practice single cropping mainly in *Boro* season and mostly hybrid crop cultivation take place in this study area.

In addition, low and fertile land help villagers to cultivate various types of crops and vegetables like gourd, cucumber, sugarcane, tomato, and jute throughout the year. Furthermore, farmers are able to make individual decisions on their own cultivation based on their wish. Therefore, they never leave their lands unutilized. To maximise their profit most farmer make borderline in local term *gher* inside their lands and near to the edges of the *gher* they usually cultivate vegetables, and inside the *gher* they cultivate rice. Farmers in this village mentioned that most effective, diversified and advanced vegetable gardening call floating gardening is widely practice in this area.

4.3.a Gopalganj sadar upazila

Focus Group Discussion with the farmer revealed that majority of the farmers cultivate hybrid rice, while few farmers are farming BRRI *dhan 28* and BRRI *dhan 29* for personal consumption. The study further added that these two HYVs/inbred or in local term *Ufshi* varieties of paddy are lower in weight but tasty to eat. 75% of the farmers cultivate hybrid varieties locally call *Hira* over a decade, as it is good in production and reliable. Same

variety cultivation for a long that practice brings brand reliability among the farmers, which is also one of the reasons for them to continue farming hybrid *Hira*. Study further added that *Hira* seed variety- at least it never lead farmers to destruction as opposed to some other hybrid seeds that can cause a complete disaster. However, the farmer also mentioned that though hybrid *Hira* variety produces good production, but the bunch in local term *gocha* is not hard enough to resist a heavy wind, it may bends on the ground by a havey wind. If there is water logging due to heavy rainfall then within one-day seedlings come out of the paddy with hybrid *Hira* rice variety locally expressed *gajay jay*.

The study further found that farmer from the study area cultivate hybrid varieties for the last ten years. According to the farmers, *there are a lot of different varieties of hybrid seed, and more or less they are good, though the production depends on the varieties that individual farmer's cultivate*. The varieties those are mainly cultivate are hybrid varieties *Jagoron* by BRAC, *ACI* and *Hira* from Supreme seed Company.

4.3.b Kashiyani upazila

The lands of this area very diverse and produce good rice production. Study revealed that *the environment in this village is more suitable for hybrid cultivation as other varieties tend to die in the cold weather. However, once floodwater comes in, the paddy fall off the branch into the water and rots*. Though hybrid paddy varieties also have the same problem with submergence, but according to the farmer, *hybrid is better at tolerating cold weather*. However, the scenario is different in the west part of that *Upazila* in the local term "*Paschim Para*" only because of the different land pattern. A significant portion of land is high and in where farmers cultivate triple crops in a year.

However, irrigation is an input that varies widely. The study further added geographically if cultivation land connects to fresh water and get paddy input properly those lands produce good production yearly. According to *Upazila krishi* officer, *in this study area hybrid coverage is comparatively lower than HYV/inbred varieties*. An in-depth interview with the dealer noted that the land coverage of HYV is about 60% and the rest of is hybrid. Study further added in this locality production cost of hybrid is very low because of high land compared to HYV/inbred varieties, as HYV/inbred varieties require irrigation, fertiliser, and pesticide in time.

Majority of the farmers are cultivating BRAC hybrid varieties like *Sathi*, *Alloran*, *Jagoron*. However, other varieties from Supreme such as hybrid *Hira*, *folon-2* from ACI's and *ACI-1* also take place to cultivate. The study found that traditional varieties cultivation is disappearing over the year because of its low production. According to the farmer that *village located east side of the river called 'Kestopur' where people used to cultivate traditional varieties*. However, they do not do it as the production is very low from 15 to 20 *maunds per bigha* (about 4-5ton/hect.).

4.3.c Farmer's opinion

4.3.d Hybrid and HYV/inbred varieties

In Gopalganj district when asked about the choice of two different types of rice cultivation during the Key Informant Interviews with farmer found that if a farmer has to choose one for the commercial purposes, it would obviously be hybrid. However, when asked about the price of hybrid *Sathi* varieties seed is slightly more expensive compared to BRRi/inbred varieties. The farmer mentioned that *he buys 2kg inbred variety BRRi dhan 29 and 1 kg hybrid Sathi varieties. One is double than the other, but the price is almost the same*.

During *Boro* season villagers are practising mixed cultivation of Hybrid and HYV. Hybrid is best harvested when it is 70-75% matured. Otherwise, it is in local term *jhore jay* means falls off. Hybrid paddy also hard to cut as upper crest part of the paddy that hurts labour legs but in case of BRR1 *dhan 29*, it is in local term *dhan jhore jay na, kat te subiddha* means never falls off and easy to cut.

Study further revealed during FGD that BRAC hybrid varieties *Sathi*, and hybrid *Rupali*, is more popular but some of the study area specifically the village call Borashi is mainly cultivate hybrid *Sathi* varieties. According to the villagers, *all most 100%-90% of the framers in this area cultivates Sathi, but some people do cultivate a little BRR1 dhan 28 and BRR1 dhan 29 for personal consumption.* They do not do any traditional in local term '*deshi*' variety of rice crop cultivation.

Geographically some of the study areas in Gopalganj district influenced by saline water. As a result, it has found from the Focus Group Discussion that most farmers with low lying land use hybrid *Jagoron* as this variety is submerged tolerant. In this regard to *Jagoron* sustainability study further added that *even in the heavy rain this variety does not have any problem as the plant stem is quite strong.* Study further added from the Key Informant Interview about hybrid *Jagoron* seed variety is good and less affected by any manner as it has a good production rate. In other words, this variety is considered to them as safe bate. Furthermore, the study found that if the paddy is weighted, then the weight of hybrid is higher. However, in case of traditional measures like '*dhama*', then the *deshi* varieties counts as more. Here it is important to mention that *deshi* variety as the farmers are not that comfortable with BRR1 *dhan 28* and BRR1 *dhan 29*. The farmer said *though deshi varieties are thinner compared to the cost and production rate it is not worth it to cultivate those varieties.* The study further added that *local varieties production costs is roughly BDT 6,000 for irrigation. As a result, hybrid cultivation is more profitable to the farmer.* The farmers from Gopalganj district said *as long as the cost is not too different and with bit more effort if they get more production than why not cultivating hybrid crop?*

4.3.e Paddy inputs

a) Fertiliser and pesticide

In use of pesticide, the farmers expressed from Gopalganj district that in their region farmer do not need to use pesticides. Even if so farmer's use very little. That area seen to have a low number of pests attacking paddy cultivation hence the farmers use little pesticide. According to them, the little damage that happens due to pests that would happen with or without uses pesticide. Farmer also thinks that pesticides pollute the environment so they reduce to use pesticide in their lands. One thing to note that found from the study area, with a hybrid would have to be careful with the amount of pesticides and fertiliser used as the level of production is sensitive to the level of accuracy with which the different components are used. The study further revealed that hybrid gets more diseases compared to BRR1 *dhan 28* and BRR1 *dhan 29*. Once attacke by disease then the leafs of the hybrid plant turn red then again the farmers use different pesticides. From clearing the weeds until spraying pesticides, it cost around BDT400. Hybrid is also more prone to paste attacks.

4.3.f High land

Study found that high land requires more fertiliser compared to low land as the land is sandy. High lands are preferred to cultivate for the BRR1 *dhan 29*. The study noted during the FGD that this study area is divided by a canal and one side of the canal mainly cultivates hybrid. Since the other side of the canal is slightly higher, therefore farmer go for BRR1 *dhan 28* and BRR1 *dhan 29* over there. In addition study found that one side is lower which

is not suitable for HYV/inbred in local term *Ufshi* productions but the lower side is more fertile and suitable for a hybrid.

4.3.g Low land

Though farmers are substituting hybrid for HYV/inbred varieties, the substitution is more or less driven by the land pattern. Very low land is locally known as *Bill*, not fit for the HYV/inbred varieties as *Bill* is flood prone and HYV BRR1 *dhan* 29 and 28 takes 90 to 100 days for harvesting, it gets damage in the time of harvesting. However, BRAC hybrid *Sathi* can be harvested earlier within 125 to 135 days. As Hybrid *Sathi* has a strong stem, stand tall in the water. Therefore, without any damage hybrid is ensuring more rice production, covering those lands, which are previously uncultivated. Therefore, the land pattern is playing a crucial role in hybrid rice production in this area. As farmer said that *cultivate hybrid in the low land is suitable, and farmer just swan it in with less care and adding less fertiliser.*

4.3.h Daily labour

Study revealed that during the harvesting period a day labour from the supply side usually search for temporary work for the time being. Furthermore, land owner from the demand side also hire five to ten day labourer based on their size of land. An informal agreement consider between day labour and land owner. During the harvesting period hired laborers work hard and make temporary night halt age with the subsidy of meal and refreshment allowances for tea, smoking locally call *biri*. As labour cost is high hence, production cost also goes higher. Per day labour allowance varies geographically and by gender. Here interesting to mention that before harvesting group of day labour come from other part of the country mainly from Khulna and make temporary agreement with the land owner to work during the harvesting period.

4.3.i Harvesting and marketing

Majority of the farmer in the study area take service of the paddy trader (middleman/intermediary) in local term call *Beparis* who are from nearby areas and farmer thinks that it is highly reasonable. The farmer does not go through the hassle of marketing of their paddy. *Baparis* receive it from farmers home if they get informed. However, farmers would have to see at least around 5 to 10 *maunds* (1.5-3ton/hect) of production, otherwise it is not worth for the middleman/intermediary to come to pick it up. In case if farmers are selling lower amounts, they sell it personally together with neighbours.

Here is the timing of the sells depends on the farmer. It seemed that farmer sell paddy when requiring cash. So it could be farmer's liquidity substitute they hold on to until they need hard cash. If the market price is not good then sometimes farmer hold off selling their hybrid paddy and waits until the market price rises. However, it was mentioned in one of the KIIs that *it might be more profitable to sell it off right away. An in-depth discussion with the dealer said that in order to store paddy for later sells it needs to be dried up under the sun, and the problem with that is once dried the weight of paddy reduces and rats and other pests might reduce the quantity and quality of paddy.* As a result, the income expected from the volume sells reduces and the price of paddy, in that case, would have to go high enough so that it is still profitable for the farmers despite the lower volume.

Post-harvest as for the price of paddy farmer mentioned that before they used to able to sell 1 *maund* (40 kg) fresh grain for BDT 500 but now they are selling it for BDT 400-450. Other varieties apart from hybrid like BRR1 *dhan* 28 and BRR1 *dhan* 29 are slightly higher; the difference is about BDT 50 to BDT 120 per *maund*. The price of paddy in normally lower at the beginning of the rice season and generally towards the end of the season price rises.

However, the price of paddy unpredictable and fluctuate a lot. According to the farmer *unfortunately, few years back instead of going up the price of paddy at the end of the season has gone down.*

4.3.j Home conserves seed

Study revealed that since the introduction of hybrid they do not go through the hassle of home production of seed as farmer think that if it is produce at home, the quality is most probably not as good as the ones made scientifically. Most farmers prefer to make sure that the production is high and does not get any lower due to their lack of sincerity. One of the KII interviewees mentioned that *he used to conserve BRR1 dhan 28 for use as seed for production but not anymore.* The study further found that it is less expensive to buy seed every season than conserve it. Because first of all if farmer keeps their seed it takes a lot of storage space also when they plant the seedling they plant locally say '*gochagocha*' a couple of them at a time but in case of commercial seed half of the seed is enough, so farmer needs less seed. Farmer was also asked if any one among them that keeps his seed is there any occasion where other farmers would buy from each other. In a response that it does not happen in their area. However, earlier when farmers used to keep their seed they would give it away to others if they had extra seed. The analysis shows that this social interaction dependency and in a way consideration or harmony dimension is at least in this aspect is diminishing.

In the study village call *Roghunathpur*, the farmers gave an estimation of the amount of seed that they used to store. The measurement used for seed amount is called 1 *paiya*=10kg and 1 *sholi*=20 *paiya*. Previously large farmers used to keep as much as 5 *sholi* for next year's cultivation, which is a high amount. Now people buy seed 3 kg, 5 kg or 20 kg and large farmers buy 50 kg, which is hugely less than the amount required in previous days. Since hybrid seed is no one preserves for cultivation. Therefore, in overall it is cheaper to the farmers to buy than to store it for home cultivation.

4.3.k Salinity

Study revealed that many part of the Gopalganj district influenced by saline water that affecting paddy field adversely. Mostly a problem with the farmer's paddy plants where the seedling in local term *chhara* and the *sish* in the middle part dies then it failed to grow up healthy. Last year all the leaves of paddy plants became red and farmer mentioned that *it is due to the salinity of the water.* Farmer has been doing hybrid in this area for the last eight to nine years and before that along with *Boro* season farmer used to cultivate in *Aus* and *Aman* season. During these season many local varieties such as *Gazi Shail*, *BDR* also used to cultivate. However, currently, farmer do single cropping only but based on this finding, from the researcher point of view that farmer used to double cropping which could be the case if in the last decade or so flood, tide, salinity has been influencing further in, around this region. In relation to the above findings, majority of the farmer mentioned that *salty water comes in these areas from the southern part.*

4.3.l Women's involvement in farming

Study revealed that in the study areas it is found that the role and involvement of women in rice cultivation depend on the socioeconomic demographics of the village as well as the individuals themselves. The study added that in well to do Muslim and Hindu families' women do not do farming. However, in the marginally poor social classes, women are quite active in farming especially among in the minority communities. Women's involvement in farming in Muslim families was said to be very low. Women work in the seedbed in planting the seedling and taking them off the ground as well. Women help in paddy cutting, clearing out the weeds, and thrashing during cultivation and harvesting. It was also said that *women*

take part generally in boiling, drying and storing the cultivated paddy. However, due to the low price of paddy they are also losing confidence over rice cultivation and complain about the justification of rice cultivation.

A Key Informant Interview with a female farmer in below as a case study 1.

Female farmer Monika Ray (40) has been involved in farming since a very early age, in her own words “***Bolte paren mayer pet theke porei krishi kaj suru korechi***” that means she has started farming since childhood. She is directly involved in fieldwork, unlike other study villages where women have limited involvement in farming specifically in the pre-planting and post-harvesting period. Having born in a poor family Monika Ray had to work in the fields with her as her mother died when she was young, and she mentioned that even after she got married, she is continuing to work on the field as a farmer.

Monika Ray’s agricultural practices are much diversified. She has been cultivating vegetables for the last five years, and before that, she used to cultivate Jute and lentil in local term *Kolai* in the same land. She mentions though vegetable cultivation is hard work it has good profit, so she is continuing on vegetable farming. She says that in one *bigha* land, the highest amount of *Kolai* one can have is 10 *maunds* and even if she had sold them for BDT 500 per *maund*, she would not have broken it even. Compared to that vegetable cultivation if done properly would provide her with profit that could be twice the amount of the investment.

She does not have any land of her own; she normally takes small plot as a tenancy where she cultivates rice. Previously with normal paddy varieties, she could barely cover her cost and often needed with borrow from local elite people ‘*mahajans*’ or moneylenders. However, since she started using hybrid it has been a tremendous help to her as now she can not only cover her yearly rice consumption needs also can sell a bit which gives her a bit of cash to spare.

In her conversation, the role of dealers in cultivation is portrayed very nicely as along with fellow farmers, she mentions that the dealer is an important source of information for new seeds. Furthermore, since she is uneducated, she often reliant on the dealer to choose the right kind of variety for her. It was asked that if she was ever given seed that is not of good quality, she responded that in that case she can always come and ask the dealer and the local other farmers would also take her side hence there is a social accountability that she has faith upon which increases the local dealers reliability and credibility.

I am not too bothered about the seasonal price differences of seed. I buy a 1 or 2 kg packet of seed and a 5 to 10 taka difference per kg is not a big deal. Whichever variety gives higher productivity I prefer to buy that, therefore if the price is high or low is not something that I care too much about.

Last year she mentioned that *she could not hire anyone for harvesting and had to cut and carry paddy by herself and her son as the prices paid to the day labour is high compare to the alternatives they have*. Since the price of paddy has been low recently, she did not take any land tenancy for rice cultivation this year. However, that has not kept her away from the fields. She said that *not only her but also many other girls in her area goes to the field early in the morning even the ones for well to do families*. She mentioned that:

A lot of women in Gopalganj area work in the field. In the morning girls from all sorts of families go to the field for work, even the once from respectable families.

Chapter 5

Context Bogura and Gopalganj

5.1 BRAC seed branding

The study revealed that farmers are very much concerned about the quality of the seed they use in cultivation. This is because farmer found that only a small part of the total cost of production, but makes a big difference to yield. The farmer looks for high-quality seed and, if not sure which is best, go for the most expensive. In fact, sometimes farmers think that BRAC seed might not be as good otherwise why BRAC would sell at a lower price. Therefore, farmer's associate lower price with lower quality so in one hand it is good for farmers that they are getting it at a lower price but on the other hand, it is not as good for the company as it might be sending the wrong signal to some other farmers.

Furthermore, in the study area, farmers prefer using BRAC seed. An in-depth discussion with dealer revealed that initially, farmer was unaware of hybrid seed and later they started producing higher productivity using BRAC seed as it showed satisfaction in production compared to local varieties. An in-depth discussion with farmer revealed that *BRAC seed is good in terms of production and they never face any difficulties using BRAC seed*. However, some of them have bitter experience using BRAC seed. In Baniagathi village, Gopalnagar union, *Upazila Dhunat*, discussion with the farmer revealed that *BRAC Alloran and Jagoron seed in 2009 had severe production loss*. During Focus Group Discussion noted that *farmers have experienced that there is low germination rate by using seeds from other brand compare to BRAC seed*. In addition, by discussion with women found that *farmer's in the village have heard that BRAC seed has high production rate and have trust about its production. They further added that farmer's get technical support on the time of cultivation if they required*. However, farmers from low land stated that *Production gets higher using BRAC seed as low land soil is fertile*. Farmer further added that *using seeds from other brands or companies in hybrid seeds per acre yield varies by one or two maund*.

In addition, study found that marketing insight that branding company like BRAC and Supreme are producing own seed and occupied market mostly compared to other smaller seed companies. In Gopalganj BRAC, hybrid variety *Sathi* is more popular. However, according to the farmers that *BRAC seed not entered the market as much in that area. Only 'Sathi' seed was introduced, they mentioned that the problem that they faced with Sathi is that plant fall off even before it was cut in great numbers. Moreover, after that no one used to cultivate Sathi varieties*. Study further added that there are other study villages where farmer have mentioned that *the BRAC hybrid Sathi seed plant is a bit soft*.

It was thought among the farmer that BRAC hybrid *Shakti* seed variety quite slimmer to BRAC hybrid *Sathi* but slightly thinner is not as popular since *Sathi* variety produces about 120 *maunds* while BRAC hybrid *Shakti* variety produce 100 *maunds* per acre land. Furthermore, hybrid *Sakti-2* variety with harvesting duration only 115 days introduced as a new variety in the market a year ago, so people are not familiar with the new variety yet. Therefore, from the dealer point of view that *gradually farmer will get to know about the new variety and once couple of farmers takes the initiative to cultivate this new variety others will also follow*. Therefore, the dealers are trying to encourage the farmers to cultivate BRAC hybrid *Sakti-2*. Once it starts, the outcomes are going to be better, than majority of the farmers will prefer this variety to cultivate.

While researcher had discussion with the farmer, they have shared their bitter experiences with hybrid variety called *Modhumoti-2* in 2012 where many farmer had a big loss. But two

years back same variety had showed good production but last year farmer's experienced great loss due to which is locally termed as '*dhan jole geache*' that means completely burned which is a sort of disease since then majority of the farmer not using that variety anymore.

5.2 Taste and stickiness of hybrid

High amylose rice is favored in most of the tropical Asia, including Bangladesh. The market price of hybrid grain is lower than HYVs because of its perceived poorer eating quality. Study revealed that *cooked hybrid rice more likely to soft, not well in taste and pleasant*. Some of farmer stated that *even poor people in the village preferred to consume polish rice instead of coarse rice*. Finding came from Focus Group Discussion that *farmers have an option to sell coarse, fat grain to get cash in hand and to buy thin, polish grain to consume for entire year*. Study further added that BRAC hybrid *Rupali-7* is very good in taste if follow proper rice cooking such as no drain water. Study further added that cooked rice from *Rupali-7, Shakti* are soft though *Rupali-7* rice is better in taste than other hybrid variety. However, in the summer-cooked rice from *Rupali-7, Shakti* hybrid varieties did not stay long and get stale if drain water while cooking then rice taste stays long.

5.3 Germination of BRAC seed

Traditionally rural women is directly involved with seed related activities. In-depth interview with farmer's wives revealed that most of women in the village directly involved to the seed germination process. Focus Group Discussion with women revealed that *once seed packet bought at home then it has to be dried up at least 1 to 2 hours under the strong sunlight, then those seeds has to be soaked for 24 hours, followed by filtering moisture and then covering seeds with jute sack until germination. Then seeds get sprouting to seedling*.

The study revealed about BRAC hybrid seed *Jagoron* with multiple experiences as a case study 2.

Some of the farmers faced challenge with the germination of *Jagoron* seed varieties. In-depth discussion with dealer mentioned that he cultivated that varieties to test first but faced no challenges with the germination rate. He himself is the owner of 17 *bigha* of land. He gets 90 *maunds* paddies per acre using BRAC hybrid seed, but used to get 36 *maunds* by cultivate of traditional crop varieties. He mentioned that high production is depends on the type of land, the amount of *fertiliser*, water and pesticides are used on time.

Another challenge is below:

Jagoron seed from BRAC had some problem like the rice plant especially one in a line get taller in an unusual manner. In-depth discussion with dealer mentioned that *in case of any paddy related challenges usually we provide technical support to the farmers for better production*. However, he (the dealer) personally thinks that challenges face by the *Jagoron* rice seed variety because this variety is rather old.

The other challenge is below:

Hybrid *Jagoron* rice varieties falls easily by gentle breeze. Therefore, farmers in this area do not want to cultivate *jagoron* varieties. In compare farmers producing good yield using *Hira* rice varieties from Supreme company.

BRAC *Jogoron* seed comparatively tends to be attacked by diseases and pests. Pesticide usually use twice to control pest for *Jogoron* seed. Whereas, for *Alloran* pesticide usually use once.

Usually women traditionally do not go to the field. Seedlings are carried out to the field by their male counterpart. In-depth discussion with women found that *germination rate of the BRAC hybrid seed varieties is very high which about 80 to 85% is*. Comparatively low land

farmer's revealed that BRAC seed rate is around 90-95% which is higher than high land. However, some farmers from lowland stated as below:

Once collected seeds from BRAC office found poor quality germination. Production had very low. Most of the farmer had severe loss using that seed packet during that production year.

However, study revealed that there is no 100% germination using BRAC seed in Gopalganj district. In addition, farmers mentioned that *in general most seed varieties provide 75-80% germination rate though there is an occasion when germination has failed using different company's seed.* It was also found from the interviews that hybrid germination is faster than BRR1 dhan 29 and BRR1 dhan 28 and farmer recognise that hybrid seedlings are ready about a day earlier than BRR1 dhan 29 to cultivate. Some of the farmers also mentioned that *hybrid paddy ripens earlier and no complaints using BRAC seed about germination.*

Study further added that about the germination rate of BRAC seed that there are many steps involved that requires attention to detail and accuracy. In the case where any of the steps may have been slightly different the germination would not be good and everything goes well if accuracy done perfectly.

Some of the study pocket area found that farmer face challenge about the germination rate despite the extra addition of DIP, Urea fertiliser etc. The technical problem is seed has be soaked at least for 24hrs to germinate in high rate. However, after keeping it for one day it retained more heat than usual. Then the colour of the paddy came out to be slightly reddish. Meanwhile, the fertiliser DIP, Kargil and Zinc usually mix with. In terms of local temperature which influence seedlings to grow appropriately and in some case damage badly. It is very common aspect that even though high production using BRAC hybrid *Sathi* is good, however the farmers feel worry about using same varieties in the next season.

5.4 Lack of technical step during seed germination

In-depth discussion with dealer revealed that among the farmers who have faced trouble during seed germination may there are lack of technical step that do not follow properly. Study further added that some of the farmer do not follow seed soaking properly which is a step where troubles may occur for proper germination. The discussion came to the point in the Focus Group Discussion that *the main reason for lower germination is that did not soak the seeds in water for long enough as there is inadequate of water in the seedbed.* Some of the farmer mentioned that *as farmer do not follow the steps properly as a result the exact seed colour not shown what it is expected to be.* Study found lack of knowledge about the technical steps, hamper proper seed germination rate. Dealer sometimes announce around the village in local term *miking* to let the farmers know about seed quality, germination process etc.

Sometimes it's seen that since hybrid seed is relatively more expensive the farmers of Gopalganj are more careful while doing the germination of these seeds as well as the fact that the germination rate for them are good to begin with. On the other hand, since other seeds are cheaper there is low rate of germination when farmers are not careful during the germination process of these seeds. The seedbed requires some fertiliser but it is standard for most types of rice cultivation.

5.5 Source of BRAC seed

Study found BRAC seed is available in the local dealer shop, BRAC office and in the Agriculture extension office and accordingly they provide seed to the farmer in time. Some of the farmer also mentioned that *the dealer oppose them.* Study found that dealer supply

the seed packet to the shop to sell and farmer usually buy from there. However, the place where is no BRAC seed dealer there is slightly difficult for farmer to get BRAC seed. Apart of BRAC seed, other company's seeds are also easily available.

Farmers from Gopalganj district usually come to know about hybrid seed from neighbours when it take cultivation with bumper production in their local area, fellow farmers, radio, television and seed stores. In addition, BRAC staff came and organise meetings with the locals. However, the farmers expressed that they mainly hear from the dealer about hybrid seed though there are other existing announcement of hybrid seed.

5.6 Seed price and supply

In-depth discussion with dealer and farmer revealed that BRAC hybrid seed price is cheaper as it is BDT 230 to BDT 240 per kg packet compared to the other company's hybrid seed price which is BDT 290 for 1 kg packet hence it is BDT 40-50 less per pack compared to the others. Discussion with farmer revealed that seed price fixed by the shop owners, at that time farmer do not have any alternative option to buy seed. Regarding syndicate of seed dealers for seed price cap study found that the farmers are not experience with, but a few years ago, there was a seed dealers syndicate for hybrid seed varieties namely *Hira* seed of Suprme Company. An in-depth discussion with the farmers found that they have a lack of knowledge about seed syndicate and Seed Company's name.

There is no problem in the supply of BRAC seed. Farmers of the study area mentioned that *they do not have any complain about BRAC or other company's seed supply and annoyance*. However, farmers have complained about that Block Supervisor or Agriculture Extension Officer about that they make a list of farmers name by the help of *Upazila* Nirbahi Officer (UNO) and provide seed to them and deprive other farmers who are not in the list.

The study revealed from Gopalganj district that farmers are mostly happy with the supply of BRAC seed and mentioned that *they normally get the amount of seed that they require*. However, sometimes if the supply of seed is low, then sellers hold the stock until buyers buy it for a slightly higher price. According to the farmer, *the level of inconvenience due to this is not that high*. Beginning of the season when the seed demand is high, prices can be BDT 5 to 10 higher and then the price goes down in the end of the season. As for the price of BRAC seed is BDT 5 to 10 difference to other seeds and farmer found it is quite similar compared to other company's seed price. *The main concern is that we are used to buying seed like this. So we are not too concerned about which variety is more expensive and which one is less by a farmer from Tatola Bazar; Gopalganj Sadar.*

One important aspect came out in the interview is that the farmers in the Roghunathpur village sometimes mentioned that they do suffer from fake seeds and deprive to get good production despite adding all necessary inputs at the same manner. Regarding collecting seeds, the study found that if a farmer has to collect BRR1 *dhan* 28, BRR1 *dhan* 29 through the chain management of government there are lots of other procedures that include visiting the *Upazila* *Krishi* Office and so on. On the other hand, collecting BRAC seed is quite straight forward, as long as there is a branding of BRAC seed then if farmer orders then the seed would be available directly to them. Therefore, the farmer gets more benefit in terms of a collection of seeds from BRAC.

5.7 Seed packaging and instructions

The study revealed that the packaging system of BRAC seed is quite good and the other seed company packaging is also not bad. A brief guidelines for seed user is provided on

the top of the BRAC Seed packet and details instruction also inside the seed packets, which is functioning well. There are contact details so for any agriculture-related issue farmer can contact with the responsible person directly. Most of the companies including BRAC follow seed instruction are similar to details instruction. The study found that out looking of the 1 kg hybrid and 2 kg foundation seed packet by BRAC and other company almost same. However, the study further added that the seed packets 'get up' need to be rework in some of the pocket area. No wonder is comparing the outlook with the other modern products from different company's seed packets people do not buy BRAC *Ufshi* inbred varieties because of using a *khaki* sack. BRAC needs to keep up with the trends in the market and change their outlook in line with the existing ones in the market.

Regarding asking among the farmer whether they read seed instruction written on packet or not and in reply farmers from Shibganj *Upazila* said that *yes! We read, and sometimes we do not read*. The study further added *from the farmer that what we will read there. As usual, that we are used to doing it; we know what to do when*. From the analysis of the above statement revealed that some times over confidence of farmer and less concern about technical instruction and less access to the resource that affect seed germination rate adversely.

In Gopalganj study, reveal that from the interviews of the farmers who are educated read the instructions given in the packet. Some of the educated farmers boldly said that *they read the instruction*. However, since most of the farmer in the study area has limited education, they normally get assistance from their dealer or sub-dealer in reading the instructions and normally ask for further help from the dealer. Key Informant Interview with a farmer from Golabari village mentioned that among the farmer if anyone is educated said that normally reads the instructions and described all the steps simply therefore there is no problem in understanding the instructions. He mentioned that most farmers have an overall idea about the process and the amounts required of cultivating using hybrid seed based on their experience. Farmer also gets support from the local dealer. In Roghunathpur village, since some of the farmer had training as a result they said that they all know how it's done, but they still admit that if the instructions are followed strictly, then the production get substantially higher.

From the point of the dealer it is better to put the instructions on top of the packet instead of giving it inside though it may require some further change in the outlook of the packet. The study found that it is obvious that it is not plausible for the farmer to buy a packet and then tear it to read the instructions. Hence, the information such as germination, productivity and the amount required such as per acre land information like that should be written on the packet.

About BRAC seed packet a large dealer stated *if the packets are made into 2 kg then the cost of production would be reduced, but it is important to remember that there are problems with bigger packets as well. To cultivate one-acre land 6kg seed is needed but the amount of land people cultivate varies a lot. Some people have land as small as 10 katha and for the ones with small land bigger packets of seed are troublesome*.

The dealer from the study area think 2 kg seed packets might be more profitable in terms of cost but as long as company does not equally increase the price of 2 kg packet compared to the 1kg seed packet. The study further added there is not much difference in this opinion whether the seed packet is 1 kg or 2 kg. An in-depth discussion with dealer found that farmers prefer new packets and even if the packets change farmers would not have any problem recognising BRACs seed as long as BRAC's name is there as BRAC has a good brand reputation and recognition.

5.8 Seed dealer and sub-dealer

The study revealed that dealers face difficulties when more seed demand arises than supply. BRR1 *dhan 28* is popular and high market demand because it requires less irrigation and short maturity duration (90 to 100 days). As farmer stated after harvesting BRR1 *dhan 28* it is possible to cultivate Jute in that same field. In-depth interview with dealer and sub-dealer revealed that seed trader finds no difficulty to understand about seed quality and instruction. From the sub-dealer point of view that *BRAC seed is popular and well sold in the study area, around 70% farmer buy BRAC seed. Eighty per cent (80%) of the population in the study area uses BRAC seed and 20% people use other company seeds. The dealer also mentioned that other seeds are comparatively more expensive than BRAC seed.*

Also, sub-dealer do share the technical experience with the farmer, and the majority of them follow while new variety and found very good production in cultivation. According to the sub-dealer that *a lot of farmers are trend to stick to one type of seed varieties that fails in production. As for example, that dealer described the technique that mostly applies to their cultivation and in return farmer receive bumper production. The study found from the sub-dealer that cultivated Alloran varieties from BRAC seed in a plot while Jagoron in another plot. Out of this combination farmer's found a good production.*

Study revealed that before any decision-making in cultivation between farmer, dealer and sub-dealer interaction is high. An in-depth interview with dealer revealed that in case of seed-related matters farmer often meet with dealer to be informed early. Further, added that farmer also interacts with local elite people and they discuss with their neighbour about seed quality, quantity, price, availability etc. A BRAC seed dealer said *when he was a BADC seed dealer had an opportunity to participate the comprehensive training on agriculture. Since then, he knows BRAC seed is good. Initially, he knows about BRAC Jagoron and Alloran seed, and gradually he knows other BRAC seed as well.* An in-depth interview with a dealer also found that at the initial stage when BRAC started introducing hybrid rice varieties in 1999 and distributed *Alok* seed among the officer at the regional office. Once some people used this variety of paddy eventually, the rest of the local farmer followed the users and started using *Alok* seed in cultivation. Exceptionally, few dealer mentioned that *using BRAC Alok seed production is very high but the main stem is weak, and grain drops down by even any gentle breeze.*

BRAC seed dealer reads the instructions carefully as farmers gather to them to know about seed instructions such as cultivation methods, how to prepare the seedbed, fertiliser quantity. Necessary cultivation guidance written in Bangla which they found pretty easy to understand. In-depth interview further added that dealer and sub-dealer encourage farmer to read instruction and to discuss with them when necessary. However, the study found that farmers mostly do not read the instructions rather give priority to hear from dealers, local elite people or neighbour. An in-depth interview with farmer revealed unpleasant attitude with farmer and dealer sometimes also can happen if dealing with them related cultivation not goes smooth. The incidents that happened in the study area described below:

There has been an occasion where farmers came with the stick to beat up dealers after using some of the seeds available in the market, but that never happened with BRAC seed. This year three or four farmers complained about BRAC seed, but the dealer thinks that is because the farmers may not have followed the instructions inside the packet properly.

Study found that farmer discuss details about seed, price and related issues with the dealer In Gopalganj. Conversely, details facts gathered from the interview which is provided by the farmer and found it is very crucial insight about the regional dealer, sub-dealer, market

price, regulatory, profitability and other issues. Farmers normally tend to do the crops and varieties of crops that are more profitable and it depends on their own decision. The study revealed that BRAC marketing policy, at the beginning, was not that much in favour of farmer. There was a lot of bureaucratic complications. BRAC has been doing transparent business in his area for the last 3 to 4 years.

The initial seed price related issues that came up in the conversation was underrating and crossing selling of seeds. It was found that seed is often sold at a lower price than that is set by the company, which is defined as underrating. The dealers have a set of selling target by fulfilling it they receive a certain amount of commission. Hence, to fulfil their targets that they often sell seed at a lower price than the one set by the company. In some cases, though it means that they are making less profit but as long as it fulfils their selling quota, it works as an incentive to underrate seed price.

Dealers have a set area determined by the company that they are licensed to operate within, however there are incidents when dealers sell their product outside these areas. It is beyond the company instructions and is termed as cross selling. The study further noted that it happens quite often. However, according to the dealer that it is possible to identify without much difficulty if a dealer is cross selling or not. Therefore, if a dealer procures products that seem substantially more than the previous sells records, there is a high possibility that the dealer might be involved in cross-selling activities.

In term of dealers, commission at the sub-dealer level BRAC issues a letter stating the rate of commission on the seed sold. However, at the dealer and distributor level mostly the commission rate is unknown as a result the scope for selling seed at the slightly lower price to the dealer or sub-dealer is limited. Only BRAC has this policy of sending mails to the sub-dealers but according to the *Modhumoti* a large dealer that *other companies do not send mail notification about the commission rate to the sub-dealers*. Though due to the size of the businesses of most of the sub-dealers it is not possible for them to make a huge profit by differentiating on their sells volume, it still is an obstacle for perfect business practices.

In depth interview with an a *Modhumoti* dealer in Gopalganj found a crucial point is that it is important to suspend his or her seed selling license as soon as it is found that he or she is involved in cross-selling. He thought that if strict actions are not taken in right time it will encourage further cross-selling. Moreover, if a distributor who does not take action against it seem like an accompany in this matter.

The study found that the distributor who has also been the chairman of the dealer committee has suggested BRAC relevant authorities to provide a letter of authorisation to BRAC sub-dealers that would specify who can sell BRAC products. Furthermore, if any of the rules and regulations stated in the conditions of authorisation is breached than the authorisation would be cancelled. *Modhumoti* dealer thinks this would to an extent be able to solve the issue of overrating and underrating (the customer to buy from the seller who is selling the seed at a lower/higher price than the company price). While discussion held with the expert of the BRAC Agriculture and Food Security Programme has agreed with it due to the short notice on the part of the *Modhumoti* dealer, it was not possible to put the idea into practice for that term.

Chapter 6

Objective 2. How this understanding will contribute to farmers' livelihood improvement.

Context Bogura and Gopalganj

6.1 Cultivating hybrid that supporting livelihood

The study found that farmers are happy enough with BRAC hybrid seed cultivation. After a good harvesting farmer get joyful and do not get worried about consumption over the year. The study further revealed the extra income come from hybrid cultivation due to its higher production has an impact on the food consumption. Further, the families can afford to consume higher quantities of protein compared to earlier. Focus Group Discussion revealed that village people can able to buy sufficient meat, fish, egg and milk based on their needs. An in-depth interview with dealer found that due to use of hybrid seed there is diverse consumption pattern observed. An in-depth interview with dealer further revealed that there is no food deficit in those areas and the dealer thinks that the food deficit all over the country has also decreased. Focus Group Discussion with the farmer found the extra income is used in the development of their household as the seed varieties their forefathers used to cultivate compared to that hybrid has a higher level of productivity.

In addition, the study revealed that at present in the village most of the farmers have three times rice and low land farmers has stated that *using hybrid seed production is higher so nobody is starving*. The study also added that farmer's trends to adequate of production using the hybrid seed to meet their children's education and other expenses. However, from women prospective study found *even though plenty of production using hybrid seeds but not enough to run livelihood appropriately*. Focus Group Discussion with the farmer revealed that apart of cultivation farmer have to be involved with small, diverse earning business no matter the land limited or large farm size.

Furthermore in Gopalganj that the whole amount of paddy that they cultivated is not needed for their consumption. A farmer mentioned that *grain requirement of his family is about 40 maunds (1.6 ton) per year and he produce around 200 maunds (8 ton) of rice. The extra amount that he produced was sold*. According to the farmers, *about 85% of them are able to sold at least some of their paddy in the market*. After keeping their yearly needed amount the rest is sold. The amount that they would hold off for personal consumption that varies.

According to the local sub-dealer in Gopalganj; Borashi village that *before the introduction of hybrid rice the subsistence small farm size farmers of this area used to go to Khulna to work as labours during the harvesting period*. Some of the farmers from the study area used to go to Barishal district in boats for selling their product. However, since the introduction of hybrid to the people in the Gopalganj area are affluent and do not want or need to work as migrant labours anymore. In fact, now they have migrant labours coming from Khulna and working on their farms during harvesting seasons. In some cases when harvest labour crisis is high, there have been an incidents where the farmers delayed harvesting so far that it almost damaged their crops, but even then, they did not cut the crops by themselves. A statement from the key Informant Interview quoted in below:

Nobody in our area wants to cut paddy during the harvesting period. They rely on migrant labours. There are many farmers in the area but still none of them are interested in cutting the crops of the field.

This can be interpreted as a very strong indication of the high-level improvement in their financial status where they would rather waste a few of their crops than getting into the fields to harvest their crops. It could be because in the old days very subsistence level of farmers used to work as migrant labours during harvesting period hence by cutting their crops even if it is necessary they do not want to do by themselves as they did when they were poor or they do not want to do what the poorest farmers used to do.

Another interesting aspect about the subsistence amount contributing in a livelihood that came out from the FGD is that people's dependency on rice is reducing. Some of the FGD participants mentioned that people in the village do not have rice three times a day like the one they used to in the old days. Now-a-days a lot of them in the Borashi village have cereal and tea for breakfast like people in the cities. This can be interpreted as a sign of financial development as the tendency to follow the lifestyle of higher income groups as once economic situations improve. The farmer from Taitola village said that when they do cultivate BRR1 *dhan* 28 and BRR1 *dhan* 29 they barely had enough paddy to feed themselves. However, since hybrid has really high yield they are not only able to fulfil their yearly consumption but also can sell it in the market. Their expanding ability for all sorts of food has increased as mentioned by the farmer.

Farmer Case study- 3

Hasan Rumi, Farmer from Borashi, Gopalganj Sadar was asked to compare the two types paddy varieties as he is doing both of the varieties at the same time. He cultivates 2 *bigha* (33 *sotangso*) land half hybrid and half BRR1 *dhan* to get some paddy from the tenants and it enough for his family's annual consumption and sells the rest of it. The respondent cannot eat hybrid at all but mentioned that others in the village eat it. Hence, maybe hybrid consumption is somehow related to the financial situation.

According to him, if the paddy is weighted, then the weight of hybrid is higher. However, if it is measured with traditional measures like '*dhama*' then the *deshi* varieties counts as more. Here it is important to mention that *deshi* variety as the farmers is identifying could mean BRR1 *dhan* 28 and BRR1 *dhan* 29.

He mentioned that in earlier days everyone used to cultivate the *deshi* varieties before and since the introduction of hybrid in the market people slowly started to use hybrid seeds. He expressed that farmers nowadays are very conscious and therefore they cultivate the seeds that give them higher production. This is why he is also doing a hybrid.

People now-a-days are well aware hence they are cultivating hybrid varieties that are more profitable.

Chapter 7

Conclusion

The study showed that local geographical factors influence farmers' decision to determine the type of rice varieties to cultivate. Furthermore, commercial factors also drive farmers' decision to cultivate hybrid varieties because the production is double the amount achieved with HYVs. A farmer bears in mind the other input costs in regard to the value of the production. Farmers cultivate hybrids for commercial purposes and HYV/Inbred for consumption purposes because HYV has a fine texture and has a good taste compared to hybrid varieties.

The hybrid varieties' germination rate is sensitive to accuracy and timing and that requires many steps to be followed properly. For the farmer, the germination rate is a vital point and failure will affect brand reliability. In all cases, farmers are not bothered about the seed price at all if production is high. High seed price works as a signal of the quality of the seed, and is important because it makes a big difference to the yield.

The crop duration is a crucial issue in choosing the varieties for cultivation and it depends on location. Overall, hybrid introduction changes rural farmers' lifestyle because it brings sufficient production for yearly consumption. Higher income is derived by selling hybrid production and that income is used for household development and children's education. Although rural women are traditionally involved in certain farming practices, women's involvement at the field level depends on household economic condition and socio-cultural background. However, the paddy price is a vital concern to the small and medium farmers because they are currently deprived of fair prices and so are shifting to alternative livelihoods. There are price differences between HYV and hybrid paddy and the overall paddy price is crucial to the farmer.

Chapter 8

Recommendations

1. Generally farmers have a positive attitude to BRAC seed but this might be increased by better packaging and instructions on the outside of the package.
2. High price is generally seen as an indication of quality and the cost of seed is a small part of overall production cost, so price reduction should not be considered as a marketing strategy.
3. For new hybrid seed, germination can fail if instructions are not understood and followed. This affects the reputation of the seed supplier; therefore attention should be given to train the women farmers who carry out germination, to avoid this problem.
4. There is an unmet demand for new short-duration hybrid varieties, which could be met.
5. There is no programme or action from BRAC concerned with the use of BRAC that indicates seed and the price that the farmers are getting for their product. The farmers believe that BRAC could potentially play an important role in seeing to the proper marketing and fair pricing of the paddy which the farmers are cultivating with great effort using BRAC seed.

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Annexures

Annex 1. Details of BRAC Seed

7-1. History of BRAC Seed Enterprise

- 1972 Establishment of BRAC
- 1986 Vegetable programme (input of training and technical support)
- 1996 Birth of BRAC seed enterprise “*SUFOLA BEEJ*”
- 2005 Marketing policy has been changed from VO approach and distribute through dealers

7-2. Chain model of BRAC Seed and facilities

BRAC seed has two agricultural research and development centres and applied agricultural research for high yielding varieties and better crop management. Presently the focus is on rice, maize, vegetables and Plant Tissue Culture research including the development of inbred and hybrids. BRAC has established nine of the largest agricultural farms in different Agro ecological zones of the country in 210 acres of land. BRAC produces high quality seeds of hybrid and inbred varieties of rice, maize and different vegetables on own farms as well as through contract growers. BRAC has established two modern scientific automatic Seed Processing and Packing Plants. Through dealers and sub-dealers, seeds are sold to local markets or outlets, where farmers can purchase their seeds. The yearly capacity of this two processing centers is around 5,500 Metric Tons.

Facilities	Number	Location
Agriculture Research Centre	02	Gazipur and Bogura
Tissue Culture Lab	01	Gazipur
Agricultural Farm	09	Gazipur, Valoka, Dashuria, Magura, Meherpur, Sheerpur, Dinajpur, Birol, Jaldhaka
Seed Processing Centre	02	Gazipur and Bogura
Seed Storage	08	Valoka, Dashuria, Meherpur, Sheerpur, Dinajpur, Birol, Jaldhaka, Tongi
Total Agricultural land	200 acre	Different locations in Bangladesh

Annex-2

Expectation from BRAC

A lot of the farmers mentioned that instead of importing hybrid seed from China that cost hundreds of thousands Taka; efforts should be given to develop and introduce this technology in Bangladesh so that the money stay within the country. In terms of marketing of the rice, there is no programme or actions from BRAC concerning the paddy price to support farmers. The farmers believe that BRAC could potentially play an important role in watching the proper marketing and fair pricing of rice which the farmers are cultivating with great effort using BRAC seed.

Annex-3

Grateful to BRAC

Farmers are grateful to BRAC for bringing the seed hybrid technology at home and producing hybrid seed. At the same time, also aware on the fact that BRAC has access to the technical guidance and funding that enables them to produce and sell as the market price which situation is not applicable for the commercial companies. The farmers think BRACs role and situation is not comparable to other companies since this is a unique organisation. In the FGD interviews with the farmers they expressed that they appreciate BRAC promoting+ hybrid rice that has been tremendous help to them. In the part of Gopalganj, the farmers can harvest paddy earlier than other varieties which helps a lot since if it gets later in the season than water would submerge the fields which makes it very

difficult to cut paddy. Furthermore, thrashing, drying and all the other steps would be lagged behind and other complications would show up as well. Hence, the earlier they can cut the crop, the better it is to the farmer. Thus, farmer asked if it is possible to improve the seeds further so that the harvesting can be done even earlier than it would be really helpful for the farmer.

Comment of a farmer

“If BRAC had not been there for the farmer, we might not have been able to stand on our own feet”.

Annex-4

Other seed companies performance in comparison to BRAC

In the study area, the stock for other companies, at least with Modhumoti enterprise is less compared to BRAC. The two main companies selling most of the seeds are BRAC and Supreme. The other companies like Ispahani, EnergyPack etc., are relatively new in the market. Ispahani has been in the market for about two years, and Energypack for four years. According to the distributors EnergyPack's seed *germination was failed during their first two-three years of entering the market*. The seed market seems to be expanding with new entrants every year. Rahimafrooz entered in to the market recently with their seed. Compared to the existing companies in the market BRAC and Supreme are doing best so far.