Fact Sheet

Corporate Agriculture in Bangladesh and Alternative



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Introduction

With a total population of approximately 150 million living in an area of 147,570 square kilometers, Bangladesh has predominantly an agrarian economy. Agriculture is the single largest production sector of the economy employs around 52% of the total labour force though it contributes around 20% of the country's GDP and earns about 14% of foreign currency (BER, 2010). Only three decades ago the lion share of the GDP used to come from agriculture. In 1971-72 the contribution of agriculture to GDP was about 50% while the contribution of industry & service sector was only 14% & 36% respectively. But, in 2009-10 the contribution of agriculture has gone down to 20% while the contribution of industry and service sector has gone up to 30% and 50% respectively. This scenario doesn't indicate the diminishing importance of agriculture for the development of the country but unveils the negligence or lack of foresight of the national policy makers towards agriculture over last four decades though, still today, the performance of this sector has an overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, food security etc. of the country that seems to be understood again by the present government. As a result, agriculture is getting back its importance to the policy makers to some extent.

The truth of the above statement is supported by the decisions of previous governments to lock out agro-based industries of the country one after another. When the agriculture of the country, in fact, is getting the shape of industrial agriculture and when it is necessary to establish new agro-based industries for reinforcing economic growth of the country the policy makers were eager to demolish few agro-based industries of the country like jute and sugar. Instead of controlling reckless corruption of the top management and solving other problems to make the industries profitable the governments were enthusiastic to follow the structural adjustment prescription imposed by the WB, IMF and ADB to dig grave for these industries resulting in lock out of the many jute mills including Adamji the biggest jute mill of Asia. It is piteous to mention here that when WB provided us loan to lock out our jute mills at the same time it provided loan to India to establish new jute mills. On the other hand, we import huge amount of sugar from abroad when our sugar mills are struggling for survival. On the other hand, although the garment is our number one export industry, we have been failed to establish backward linkage with our cotton farming that could contribute significantly to our GDP. As a result, cultivation of Jute, Cotton and Sugarcane, three major cash crops of the country, is being declined day by day.

In early sixties, green revolution technology based agricultural production system was introduced with a commitment of ensuring food self-sufficiency for the ever-increasing population of the country. It is true that this agricultural production system and prescribed technologies have significantly increased the production of food grain but is has altered the whole traditional production system of the country giving rise to a commercial form of agriculture from its subsistence nature. Such transformation has caused various types of social, economic, cultural, health, ecological, and environmental impacts as well as affected the livelihood of the small, marginal and landless farmers of the country.

The corporation is grasping the whole agricultural production system of the country with support from trade liberalization policies like AoA and TRIPS of WTO which is a big challenge for our small, marginal and landless farmers in terms of their survival in the global market competition. Moreover, food security and climate change have become two big challenges for recent years. It is therefore, essential to rethink about the mode of production/production system of the country to face the emerging challenges, most importantly for the survival of small, marginal and landless farmers who constitutes about 88% of the farmer community of the country. The objective of this fact sheet is to see insight of the whole situation of the agriculture of Bangladesh from farmers' perspectives and find out alternatives of corporate agriculture.

Major Concerns for the agriculture of Bangladesh

The agriculture of Bangladesh has been facing varieties of challenges. It will be disastrous for achieving development goal of the country if she fails to face the challenges with firm consistent. The most important challenges are discussed below.

Decreasing Agricultural Land & Increasing Population

There is no doubt that the biggest challenge for the agriculture of Bangladesh is to feed her ever-increasing population by the increasing production from the available cultivable land which is reported to be decreased at a rate of about 1 % per year (Draft NAP 2011). This trend indicates that there will be no cultivable land within next hundred years until and unless agricultural land is protected by legislation. Adoption of land use planning and crop zoning have been discussed for half a century, but nobody undertakes this basic task and protects productive land through adopting effective legislation. Reckless grabbing of agricultural land is visible everywhere of the country though the government adopted a Land use policy in 2001 without any legislative measures to implement it. It is matter of hope that the present government is going to formulate law to protect agricultural land from using as non-agricultural purposes though it's implication is far-reaching. However, immediate & effective actions must be taken to protect agricultural land for ensuring food security of the country as well as livelihood security of the farmers who constitute majority portion of her population. On the other hand, population control is another burning issue for a country like Bangladesh which is suffering from huge burden of population and resource scarcity.

Food security

Ensuring food security of all the people is a great concern for the agriculture of the country. In early sixties, green revolution technology based agricultural production system was introduced in the country with a commitment of ensuring food self-sufficiency for the ever-increasing population of the country. It is true that green revolution technology based chemical agriculture has achieved substantial progress in boosting up production of food grains but the food security of mass people is yet far-reaching. As a consignee Bangladesh accepted the definition of food security given by FAO in World Food Summit 1996 which is "Food Security exists when all people at all times have physical and economic excess to sufficient **Safe and Nutritious** food to meet their dietary needs and food preferences for an active and healthy life". But very unfortunately, the policy makers of the country translating food security mainly as boosting up production of food grains and deploying their all out efforts to promote chemical agriculture in order to achieve the goal of ensuring food security.

Table-1: Food grain production & requirement in Bangladesh

Figure in lakh(000000) metric ton

Fiscal Year	Production	Import	Food Aid	Total Availability	Total Requirement	Production Surplus	Total Surplus
1999-00	221.3	12.3	8.7	**242.3**	**214.9**	**6.4**	**27.4**
2000-01	237.9	10.6	4.9	**253.4**	**217.7**	**20.2**	**35.7**
2001-02	230.6	12.9	5.1	**248.6**	**220.9**	**9.7**	**27.7**
2002-03	268.7	29.7	2.5	**300.9**	**223.5**	**45.2**	**77.4**
2003-04	276.4	25.0	2.9	**304.3**	**225.5**	**50.9**	**78.8**
2004-05	264.9	30.9	2.9	**298.7**	**228.6**	**36.3**	**70.1**
2005-06	277.9	22.7	1.9	**302.5**	**230.3**	**47.6**	**72.2**
2006-07	289.4	23.3	0.9	**313.6**	**233.6**	**55.8**	**80.0**
2007-08	311.2	32.0	2.5	**345.7**	**236.9**	**74.3**	**108.8**
2008-09	329.0	29.0	1.2	**359.2**	**241.7**	**87.3**	**117.5**
2009-10	341.1	34.5	0.08	**375.68**	**245.2**	**95.9**	**130.48**
2010-11	370.4*	30.0	1.5	**401.9**	**247.4**	**123.0**	**154.5**

* target estimated by DAE.
Source: Bangladesh Economic Review 2011 and Handbook of Agricultural Statistics, 2007

But, the statistics regarding food (though food grain only) production & requirement give us very much interesting messages. The food grain production & requirement in Bangladesh is shown in table-1.

The data presented in the table-1 indicates that

Bangladesh is a food surplus country since 1999-2000 fiscal year which was a food deficit country before that period. But, very surprisingly Bangladesh is a net food importing country till today. It is to mention here that the projected requirement in 2050 is 377.9 lakh metric tons (calculated by the author from the presented data) which reveals that present production of food grains is sufficient upto the year 2050. That means if the present yield and level of production could be maintained that will be enough to supply required food grains upto the year 2050. Moreover, we have got the yield potentials of our existing HYVs of rice. The research shows that there is a big yield gap between research field and farmers field due mainly to the lack of proper crop management capacity of our farmers. Another research reveals that the production could be increased upto 20% if only quality seeds could be ensured. So, if these two areas could be improved then production could be increased substantially. In the mean time we can improve the capacity of our research institutions to develop our own hybrid and even GM varieties if they get sufficient back up support. Therefore, we don't need to be depended on exotic hybrid seeds which is not only threat for our ecology and environment but also great threat for our agriculture as a whole because if we are depended on external sources for our seeds and suddenly the supply is stopped then such dependency could throw us into immense trouble. However, the above figures bring many vital questions in front.

Firstly, why Bangladesh is not exporting food grains rather importing increasing amount of food grains every year?

Secondly, why the availability of food is always a panic in the country which went to a peak during 2008 while the supply of food grain in the same year was a surplus of 117.5 lakh metric ton?

Thirdly, why the consumers have been suffering a lot due to reckless price hike of food grains since many years where the government seems to be helpless to control the price?

Fourthly, why the government is so much eager to boost up the production of food grain by any means like promoting hybrid varieties that requires more poisonous chemicals?

Fifthly, why around 40% poor people of the country can't afford minimum food for their dietary requirement?

The answer lies within the unfair and unjust distribution system of food prevailing in the country. It is undoubtedly true that only ensuring sufficient supply of food can't ensure food security which is also recognized by the WB study. But unfortunately, the WB policy makers looking for the solution of this problem into increasing the purchasing power of the people. As a solution they are promoting micro credit mainly to make money available to the poor people to come to the market as consumers though we have already seen the struggle of consumers when supply is even adequate in the market. For better understanding of our food security constraints the global food security paradigm should be realized.

Contrary to the 18th century warnings of Thomas Malthus and his modern followers, study after study shows that global food production has consistently outstripped population growth, and that there is more than enough food to feed everyone. According to the United Nations Food and Agriculture Organization, enough food is produced in the world to provide over 2800 calories a day to everyone - substantially more than the minimum required for good health, and about 18% more calories per person than in the 1960s, despite a significant increase in total population (Mousseau, 2005)

Despite that, the most commonly proposed solution to world hunger is new technology to increase food production. The Alliance for a Green Revolution in Africa, funded by the Bill and Melinda Gates Foundation and the Rockefeller Foundation, aims to develop "more

productive and resilient varieties of Africa's major food crops to enable Africa's small-scale farmers to produce larger, more diverse and reliable harvests" (AGRA, 2008).

Similarly, the Manila-based International Rice Research Institute has initiated a public-private partnership "to increase rice production across Asia via the accelerated development and introduction of hybrid rice technologies" (IRRI, 2008). And the president of the WB promises to help developing countries gain "access to technology and science to boost yields" (WB, 2008).

Scientific research is vitally important to the development of agriculture, but initiatives that assume in advance that new seeds and chemicals are needed are neither credible nor truly scientific. The fact that there is already enough food to feed the world shows that the food crisis is not a technical problem - it is a social and political problem. Rather than asking how to increase production, our first question should be why, when so much food is available, are over 850 million people hungry and malnourished? Why do 18,000 children die of hunger every day? Why can't the global food industry feed the hungry? The answer can be stated in one sentence. The global food industry is not organized to feed the hungry; it is organized to generate profits for corporate agribusiness.

The agribusiness giants are achieving that objective very well indeed. This year, agribusiness profits are soaring above last year's levels, while hungry people from Haiti to Egypt to Senegal were taking to the streets to protest rising food prices. These figures are for just three months at the beginning of 2008. Grain Trading: **Archer Daniels Midland (ADM)**. Gross profit: $1.15 billion, up 55% from last year Cargill: Net earnings: $1.03 billion, up 86% Bunge. Consolidated gross profit: $867 million, up 189%. Seeds & herbicides: **Monsanto**-Gross profit: $2.23 billion, up 54%. Dupont Agriculture and Nutrition. Pre-tax operating income: $786 million, up 21%. Fertilizer **Potash Corporation**. Net income: $66 million, up 185.9% Mosaic. Net earnings: $520.8 million, up more than 1,200% (Hattingh, 2008).

The companies listed above, plus a few more, are the monopoly or near-monopoly buyers and sellers of agricultural products around the world. Six companies control 85% of the world trade in grain; three control 83% of cocoa; three control 80% of the banana trade (Hattingh, 2008). ADM, Cargill and Bunge effectively control the world's corn, which means that they alone decide how much of each year's crop goes to make biofuel, sweeteners, animal feed or human food.

As the editors of Hungry for Profit write, "The enormous power exerted by the largest agribusiness/food corporations allows them essentially to control the cost of their raw materials purchased from farmers while at the same time keeping prices of food to the general public at high enough levels to ensure large profits" (Magdoff, 2000).

Over the past three decades, transnational agribusiness companies have engineered a massive restructuring of global agriculture. Directly through their own market power and indirectly through governments and the WB, IMF and World Trade Organization, they have changed the way food is grown and distributed around the world. The changes have had wonderful effects on their profits, while simultaneously making global hunger worse and food crises inevitable.

However, food production, consumption and exchange should be a life affirming process, ensuring the metabolic interaction between human communities and the nature. Food should be escaped from the clutches of global market players and from their endless urge of accumulation and self-expansion to whom food is simply a tool to make profit. Resisting the ideology of food as merely commodity for consumption and trade but it is critical to ensure collective command and control of the community over the conditions of food production and

distribution as well as food itself. Further the resistance is to reclaim as nourishment and joy as a gift of nature to be shared with all in order to build relations among communities. The sharing will have to take place not only between the human beings but within all live forms. So, many politically conscious farmers, NGOs and social movements active in agriculture, food, nutrition and other relevant areas including various disciplines of science and technologies are proposing "Food Sovereignty" in place of food security. For example, LaVia Campesina an Europe based farmer organization define “Food sovereignty is the right of each nation to maintain and develop their own capacity to produce foods that are crucial to national and community food security, respecting cultural diversity and diversity of production methods.” (Via Campesina -1996).

Climate Change

Climate change is another grave concern for the agriculture of the country. Climate change will have a massive impact on food production and may jeopardize food security in Bangladesh. All the previous Intergovernmental Panel on Climate Change (IPCC) impact assessments recognized Bangladesh as one of the most susceptible to the negative impacts of climate change. Given the contribution of agriculture to the livelihoods of general people of the country and its dependence on climate regime, any significant change in climate regime can have far reaching impacts on the overall socio-economic system of Bangladesh.

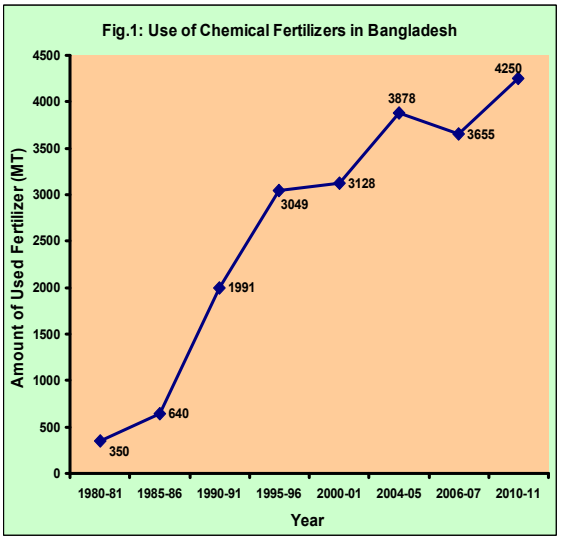
Agricultural crop of Bangladesh is influenced by seasonal characteristics and different variables of climate such as temperature, rainfall, humidity, day-length etc. It is also often constrained by different disasters such as floods, droughts, soil and water salinity, cyclone and storm surges. Increasing trend of insect occurrence & disease infestation induced by climate change is another threat for Bangladesh agriculture. Several studies indicated that climate is changing and becoming more unpredictable every year in Bangladesh. Its variability extreme weather events are being experienced more frequently than ever before. Hazards like floods, droughts, cyclones and salinity intrusion are likely to be aggravated by climate change and sea level rise. Flood and water logging in the central region, flash-flood in the northeast region, drought in the northwest and southwest region, and salinity intrusion and coastal inundation in the coastal regional would be a more acute problem in future. All of these will have an extra bearing on the agriculture sector.

Different models predict different level of impacts for yield reduction under different climate change scenarios. The GFDL model predicted about 17 % decline in overall rice production for Bangladesh and as high as 61% decline in wheat production under 4 degree changes in temperature. The highest impact would be on wheat followed by rice (Aus variety). Of the three varieties of rice grown in Bangladesh, the Aus rice (grown during the summer, monsoon period under rain-fed conditions) seems to be the most vulnerable. The Canadian Climate Change Model (CCCM) also predicted a significant fall in food-grain production.

Extreme temperature due to climate change would affect livestock. High temperature would affects livestock in a number of ways: causes great discomfort as in the case of human, decreases feed intake and alters nutrient metabolism leading to high loss of energy and thirdly the combined effects of discomfort and nutrient metabolism reduces their productivity, resulting in financial loss of the farmers. Apart from extreme temperature, natural disasters such as cyclone and tidal surge as mentioned above, cause immense loss and sufferings to livestock through destruction of forage crops as well as housing.

Soil Fertility Depletion

The well-known proverb that "the soil of Bangladesh is more pure than the pure gold" which was used to describe the fertility status of the soil of Bangladesh, is no more applicable because soil fertility status has seriously been depleted. The definition of soil fertility is the ability of soil to supply all essential nutrient elements for optimum crop production in an adequate quantities and available forms. But, so far at least six, out of thirteen essential nutrient elements that plant uptake from soil, are found moderate to severely deficient in the soil of Bangladesh which are being used as synthetic fertilizers. The use of chemical fertilizers is shown in figure-1.



Source: Handbook of agricultural statistics 2007 & Bangladesh economic Review 2011

The figure shows that until the decade of 90s the use of chemical fertilizers was not so high which was very rapidly increased about five times during the period of 1985 (640 MT) to 1995 (3049 MT) and since then it is increasing rapidly. This repaid increase is the drastic liberalization of agricultural trade by the then military government who implemented the structural adjustment policy of WB in a wholesale manner. The figure also shows that the use of chemical fertilizers has been increased 12 times from 350 MT to 4250 MT within only last three decades from 1980 to 2011.

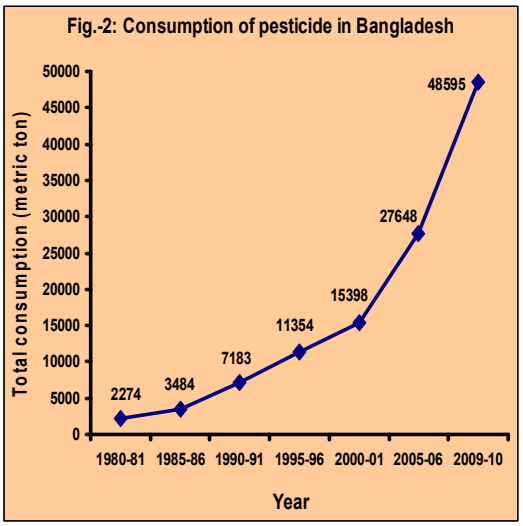
Hand book of Agricultural Statistics 2007 also shows that next to Korea (379 kg/ha), Japan (282 kg/ha) and China (225 kg/ha) fertilizer consumption in Bangladesh is the highest among the Asian countries. Even in the neighboring country India (102 kg/ha) it is much lower than that of Bangladesh (159 kg/ha). However, excessive use of chemical fertilizers is not only hazardous for health & environment but also major cause of soil fertility degradation. The soil organic matter status which is called the 'life of a soil' has gone below 0.5% in many soil of the country while the optimum amount of organic matter is 5%. The assessment committee for losses of soil fertility (BARI, 2004) reported that 10-70% soil fertility has been depleted in different AEZ of Bangladesh during the period of 1967-68 to 1997-98 due mainly to intensified crop cultivation. If this situation is not properly handled then, undoubtedly, our soil will not be able to produce sufficient food for future generations which is a grave concern for the food security of the country.

Production of safe & nutritious food

Ensuring availability of food grains may be the solution for mitigating hunger but not for the food security. Because, for food security it is essential to ensure availability of safe and nutritious food. But, chemical intensive modern agriculture producing food full of poisons because huge amount of poisonous chemicals are being used in different stage of food supply chain from production, processing and preservation.

The plant protection wing of the then Pakistan government first imported pesticides in Bangladesh in 1956. At that times the pesticides were supplied to farmers at free of cost. The Bangladesh government after the liberation continued to give 100% subsidy to pesticides until 1974 which was reduce by 50% in 1979. The government fully cut off the subsidy and

invited private sector to import pesticides in 1980 under the structural adjustment program of WB. Despite the removal of subsidy the use of pesticides became double (figure-2) during the period of only five years from 1985 to 1990 that indicates the dependency of farmers on pesticides that was created through providing subsidies during previous years. The figure also shows that the use of pesticide in 1980-81 was 2274 metric tones (MT) which was increased to as high as 48595 MT in 2009-10. That means pesticides use increased 21 times over the period of only three decades from 1980-81 to 2009-10 which seems to be increased at a rapid rate in future. This trend also indicates that all efforts of promoting integrated pest management have virtually been failed in the country. In this context it is a big question how it is possible to ensure food security with the poisonous food produced by modern agriculture. But, it is undoubtedly true that the modern agriculture has tremendously swelled up the pesticide and fertilizer business of the corporations and their profit.



Source: Handbook of Agricultural Statistics 2007 and Plant protection Wing, DAE, MoA, Dhaka.

On the other hand, many of the modern varieties giving higher yield by increasing bulk of the food not the nutrition status. Although the data presented in the table-1 shows that Bangladesh is a food surplus country since last one age but FAO data on nutrition gives us reverse messages. The FAO data says that the rates of malnutrition in Bangladesh are among the highest in the world. More than 54% of preschool-age children, equivalent to more than 9.5 million children, are stunted, 56% are underweight and more than 17% are wasted.

The data further says that Bangladeshi children also suffer from high rates of micronutrient deficiencies, particularly vitamin A, iron, iodine and zinc deficiency. Malnutrition among women is also extremely prevalent in Bangladesh. More than 50 percent of women suffer from chronic energy deficiency. It is also well-known to all that due to consumption of poisonous food the health hazards and disease occurrence is increasing in an alarming rate in the country. It is therefore, crucial to rethink about the production system of the country in no time to foster production of safe and nutritious food at any cost.

Control over seed & genetic resources

The farmers are losing their inherited and hundreds of thousands years control over agriculture of the country day by day under the regime of neo-liberal market economy. The market players are gradually taking the driving seat of our agriculture where the farmers have little space. It is the seeds which led the whole process. Seed is not only a production input but also the key factor to regulate the whole agricultural production system. It is also linked to the whole lifestyle of a community including the culture, religious belief, food habit etc. Seed is the holder and carrier of the crop diversity of a country and the region leading to a unique agricultural system. So, the question of ownership of seed resources is a vital agenda for the very existence of traditional agricultural system of the country as well as the livelihood of the farmer community. Now-a-days, after the inclusion of agriculture in the trade liberalization agreements of WTO, the multinational corporations have identified seed business as a thrust sector for their monopoly agribusiness. In order to achieve their target they have been introducing hybrid and GM-varieties and using terminator technology so that

the farmers fail to produce & preserve their own seeds for cultivation that are eradicating farmers own seeds from their hands. Introduction of such varieties are promoting the business of agrochemicals, agro-equipment and other highly expensive technologies of the multinational corporations. As a result, the peasants are becoming fully depended on the corporations for their crop production. This sort of dependency is a great threat for the sustainability of the poor peasants of Bangladesh in agriculture and also for sovereignty of the country itself.

Bangladesh is very rich in biodiversity with thousands of species of crops, plants, animals, birds etc. The culture of the country has been developed based on this biodiversity. Bangladesh is famous for its cultural heritage popularly known as "Thirteen festivals in twelve months" which were based on diversified crops and the cropping seasons of the country. The Bengalese was world famous for their hospitality which was also based on crop diversity enriched with diversified food habit. Special varieties of rice and other crops were cultivated for special types of food items. The ever-increasing monoculture of HYV rice has been destroying the invaluable biodiversity and cultural heritage of the country. The irrigation block of HYV boro rice restricts the cultivation of pulses, oilseeds, vegetables etc. which is also a threat for food security of the country specially in terms of nutrition uptake. It has also massacred the socio-economic structure of the country. A large number of alien species/varieties of different crops which have already been introduced in the ecosystem of the country without prior and proper scientific investigation on their possible impact on the ecosystem and native species. The National Seed Approval Committee of the government of Bangladesh approved the import of hybrid seed in 1998 without any prior assessment of the impacts of such seeds in our agriculture, environment & ecosystem. In addition, very recently Bangladesh has entered into an agreement with Cornel University of America and USAID that will promote genetically modified crops which are reported to be destructive to the biodiversity and that's why GM crops are banned in many country of the world including Europe.

The peasants of Bangladesh are already experiencing severe seed crisis. The problems of ever-increasing market price, businesspersons' manipulated seed crisis, below quality seed, lower germination rate etc. are increasing day by day. The crisis must reach to a peak when the corporations will take total control over seed resources of the country. The corporations have already occupied about 80% of vegetable seed market and it is so far 20% for rice seed market of the country. In the global context, the top 10 seed companies account for $14,785 million - or two-thirds (67%) of the global proprietary seed market (ETC Group 2007). It is not far away when the multinational corporations will capture the whole seed market of the country and that situation must be suicidal for the farmer as well as for the freedom and sovereignty of the country.

Since the early 1970s the pesticide industries have gone through a period of consolidation. Today, after a flurry of merger and acquisitions, corporate domination specifically over the agrochemical market and the food system in general has reached a peak. The top five agrochemical companies, Syngenta (a merger of Novartis and AstraZeneca), Aventis (Rhone-Poulanc and AgroEvo), Monsanto (present name Pharmacia), BASF and DuPont hold dominant position in the seeds, pesticides, pharmaceuticals and related markets. Presently, these companies account for nearly two-thirds of the commercial seed market and virtually 100 per cent of the market for GM seeds. Monsanto alone occupies 91% of genetic crop of the world (ETC Group 2007). Only three big companies Monsanto (Pharmacia), Aventis Crop Science, and Syngenta are controlling the major part of the world agriculture and the seed market. Such control is established by the monopoly ownership of world genetic resources facilitated by the patent law under TRIPS agreement of WTO. The present trend of such

monopoly control of MNCs over the genetic resources along with merger and acquisitions among the MNCs apparently signals that the control of world food chain is going into the grip of few MNCs.

In the year 1970, the BRRI was established to develop high yielding rice varieties that better suited to local growing conditions and ecosystem. So far, the institute has developed 51 HYVs and 2 hybrid varieties, BINA has developed 8 varieties, BAU one variety and BSMUA one rice variety. On the other hand, BARI has developed 21 varieties of wheat, 4 of maize (including 3 hybrid varieties), 32 of potato, 24 of pulses, 21 of oilseeds, 41 of vegetable and 26 of fruits. Those varieties are not patented and on-farm conservation is possible by the farmers (except the hybrids). If we even take the point that we have no other way but increasing the crop yield to meet up the growing demands of food for the increasing population of the country then our research institutes have already proven their capacities and potentials in this regard. Moreover, still there is a huge gap between the yield potentials of these varieties and the yield at farmers' fields. The main reason of this gap is the lack of capacities of the farmers to manage these varieties with intensive technologies and external-inputs for getting better yield. Lack of capital and the crisis of seeds, fertilizers, diesel, electricity etc. are also very vital reasons for the yield gap. So, it is essentially a logical question that "Why should we go for importing exotic varieties in the name of increasing crop yield without solving the aforesaid problems".

The ownership and control of seeds concentrated in too few hands and a food supply based on too few varieties planted widely are the worst option for food security. On the other hand, it will be a disaster for the poor farmers in the least developed and developing countries like Bangladesh because traditionally they rely on farm saved seeds and only enter the market to purchase seeds about once in about once in several years. But, if they buy and plant patented seeds, companies can insist that they purchase new seeds every year. Seeds are often sold in a package with fertilizers, pesticides, which further increases farmer's dependence on the market, while also increases the risk of indebtedness when crops fail due to adverse climatic conditions. It would also decrease farmers' access to seeds, reduce efforts in publicly funded plant breeding, increase the loss of genetic resources, prevent seed sharing and could put poor farmers out of business.

Transformation of agriculture of Bangladesh

In order to understand the transformation of agriculture of Bangladesh from the farmers view points ten FGDs were conducted with the farmers in ten villages of four unions under Shailkupa upazila of Jhenaidah district. It is to mention that the villages are located within the Ganges-Kobadak (G.K) irrigation project area. Mainly the aged farmers were selected as FGD participants so that they can describe the transformation from their own experience. Female were also participated in the FGDs. Several in-depth interviews of selected farmers from the FGD participants were also conducted. Moreover, data of crop production cost were also collected from the same participants. The findings of the FGDs, in-depth interview and the collected data are described below as a summary.

The Milestone of Transformation

It was very difficult for the participants to remember the exact time when the transformation towards modern agriculture was started. But, they could clearly identify that with the start of GK project the modern agriculture was initiated. Since then irrigated boro rice cultivation was started with the water of GK project. It is to note that G.K project is the first irrigation project of Bangladesh which was conceived in 1954 and came into full operation since 1961.

But unfortunately, it became a failed project due mainly to Farakka barrage at upstream of the Ganges river established by India since it began operations on April 21, 1975. The GK project had totally failed to supply water during 1992-1996 due to low flow in the river Padma. The project became operational again after signing of the water sharing treaty with India in 1996 but suffered from water scarcity almost every year. So, huge number of shallow tubewells has been set up by the farmers. Now, the irrigated boro cultivation is totally depended on under ground water irrigation by shallow tubewell. At the start of GK project irrigation was very cheap, BADC supplied seeds of HYV at free of cost, DAE supplied pesticides at free of cost. The farmers had to buy only 10-15 kg of Urea fertilizer for one acre of land at very low cost. But, they got almost double (50-60 mounds/acre) yield than that of local variety (25-30 mounds/acre). The cost of production was only little higher than the traditional varieties but the yield was almost double. So, the farmers easily accepted the new varieties and technologies. Before that the farmers had their self-reliant and integrated production system. every farm family produced varieties of crops mainly for their family needs.

Impacts of the transformation from Farmers' Perspective

Although transformation from subsistence to commercial farming increased the yield and production of rice but the farmers by turn have been fallen into various problems. One of the root cause of the problems is that the market dependency for agricultural production is being increased day by day and the farmers are losing control over agricultural production system to the market or market players. The source of agricultural inputs before and after green revolution is presented in the table below.

Table-2: The Sources of crop production inputs before and after green revolution.

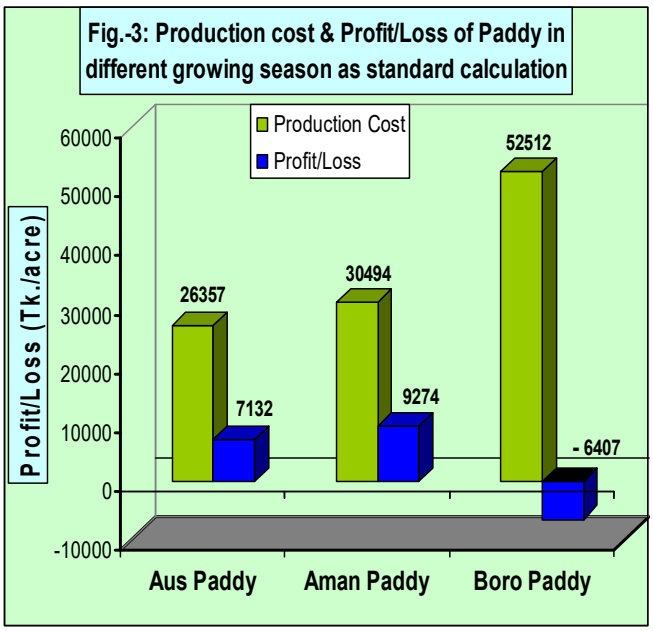
Production activities	Before green revolution		After green revolution	
	Inputs	Source	Input	Source
	Land	Own, Local	Land	Own, Local
	Labour	Own, Local	Labour	Own, Local
	Capital	Own, Local	Capital	Own, Local, NGO, Commercial Bank
Land preparation	Country plough, ladder, cow	Own, Local	Tractor, power tiller	Market
Seed sowing	Local Seeds	Own, Local	HYV, Hybrid seeds	Market
Fertilizer use	Organic fertilizer	Own, Local	Chemical fertilizers	Market
Pest control	Indigenous method with local materials	Own, Local	Chemical pesticides	Market
Weeding	Hand weeding instruments	Own, Local	Chemical weedicides	Market
Irrigation	Local irrigation materials	Own, Local	Deep & shallow tube well, surface irrigation pump, electric motor, diesel etc.	Market
Harvesting	Cow	Own, Local	Harvester machine	Market

From the table-2 it is observed that after introduction of green revolution technologies farmers have become totally depended on the market for their production inputs and technologies. As all crops have become cash crops and the whole production system has become market oriented then it is clear that the agriculture of the country is no more at subsistence level rather it has been transformed into commercial agriculture governed by the corporations. It was subsistence when farmer produced crop for their food & other family needs. They sold only the surplus of their products to the market. They selected crops based on their food culture and considering other family needs which is very rare now-a-days.

The transformation has got both positive & negative impacts on various aspects of social, economic, cultural, health and environmental life and livelihood of the farmer community which were stated by the farmers are briefly described below.

According to the farmers' opinion both the yield and total production of food grains eg. rice and wheat and vegetables have substantially been increased. It is important to note that earlier vegetables were mainly homestead products. Most of the vegetables were produced in the homestead by the women. Now, the vegetables are mainly cultivated in the field as a cash crop. Earlier Jute, Cotton, sugarcane were mainly cash crops but now every crop has become cash crop. However, the yield of pulses (lentil, gram, mung bean etc), oilseeds (mustard & sesame) spices (onion, garlic, chili, turmeric) has also been increased substantially but total production has been decreased because the production land of these crops has been occupied by rice and wheat. As a result, monoculture of rice has drastically been increased. Now-a-days only rice is being cultivated in more than 80% of land resulting in reduced crop diversity which is very much necessary not only for food security and meeting up diversified family needs but also maintaining soil fertility status, reducing risk of crop failure and conservation of biodiversity and environment.

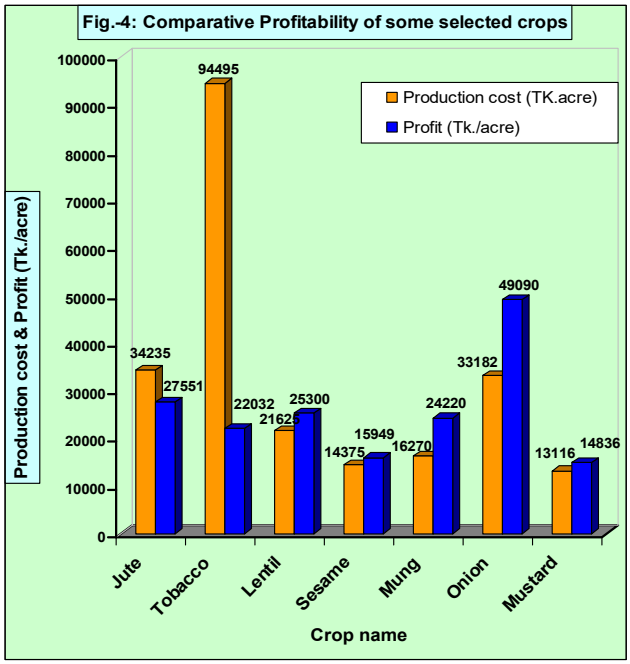
The production cost and profit/loss of paddy in different growing season is presented in fig.-3. The data presented in the figure and shows that average production cost for Aus, Aman & Boro rice are 26357, 30494 and 52512 Tk./acre respectively. The cost of production for boro rice is due mainly to very high irrigation cost. The data also shows that net profit for Aus & Aman rice are 7132, 9274 Tk./acre respectively while it is a loss of 6407 Tk./acre for boro rice. The data reveals that rice cultivation is not much profitable while farmers have to count substantial loss for cultivating boro rice. Therefore, it is a big question why farmers cultivate rice when it is not much profitable or even loss. the answer will be found later on.



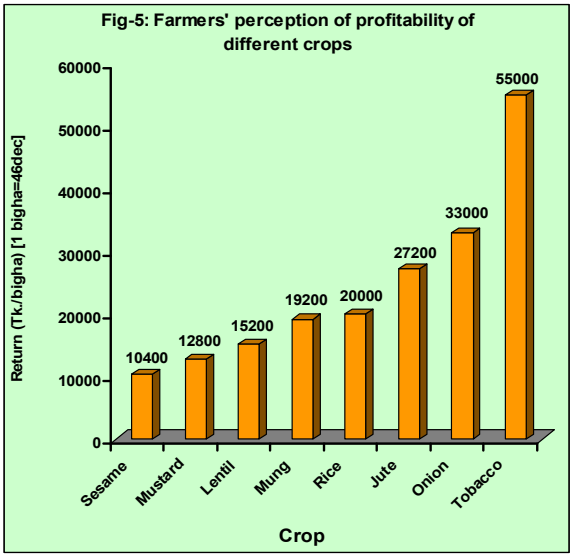
Source: Data collected from farmers of Jhenaidah district.

Comparative profitability of some other major crops of Jhenaidah district is shown in figure-4. The data presented in the figure shows that Onion is the most profitable (49090 Tk./acre) followed by Jute (27551 Tk./acre), Lentil (25300 Tk./acre), Mung bean (24220 Tk./acre), Tobacco (22032 Tk./acre), Mustard (14836 Tk./acre) and Sesame (14375 Tk./acre). It is therefore, clear that all of these crops are more profitable than rice. It is important to note that though the profitability of tobacco is higher than mustard & sesame but its' cost of production is very much high triple or more than that of the other crops. The farmers become interested to cultivate tobacco mainly because the market is ensured; they get the inputs in credit from the company; and get return at a time that seems to be big amount of cash for them.

However, it is a big question that why farmers cultivate rice as it is not profitable for them. In finding answer of this question it was found that farmers never calculate their profit/loss as a professional businessmen though agriculture is now a business for them. They just calculate yield & total production and their values. Even they don't calculate their total investment for a crop production. It is to mention that the data presented in the previous figures were calculated by standard method where value of their own resources eg. cow dung, their own and family labour, lease value of land and the interest of their running capital were also included to the cost of production which is never calculated by the farmers. Generally, they compare the profitability of different crops just from total production and the market price. Actually, they don't calculate the profit or loss rather they just calculate the total return from a crop. For example, from one bigha (46 decimal in local measurement) of land they get approximately 25 mounds of rice. So, if the price of per mound rice is 800 Tk. then they get the return of Tk. 20,000 from one bigha while it is 19,200Tk, 15,200Tk, 12,500Tk and 10,400Tk for Mung bean, Lentil, Mustard and Sesame respectively. Therefore, according to farmers' perception the most profitable crop is tobacco followed by onion, Jute, Rice, Mung bean, Lentil, Mustard and Sesame (fig.-5).



Source: Data collected from farmers of Jhenaidah district



Source: Data collected from farmers of Jhenidah district

From the above discussions it can be concluded that farmers never see agriculture as a business though they have already entered into commercial production system. As a result, they are being easily exploited by the market players. On the other hand, they continue their production even though it is not profitable for them because they have no other alternative. They are just serving the market players as a slave while the market players and the corporations becoming bigger and larger out of the agribusiness by extracting profit from the poor farmers.

Overall results of introducing green revolution technologies

The farmers identified results of the introduction of green revolution technologies as follows.

1. At initial stage yield was increased very rapidly but now it is stagnant or in decreasing trend.
2. Farmers have lost their self-reliant production system.
3. The cost of production has drastically been increased resulting of decrease in profitability.
4. Due to increased market dependency of farmers the market players are exploiting farmers in many ways. Farmers are being exploited by the market during buying inputs and selling their products and they are not getting fair prices of their products.
5. The production of Pulses, oilseeds and spices has been decreased drastically. So, the farmers have to buy those from the market with very high prices.
6. Farmers specially women have lost their seed resources.
7. Use of local resource based inputs is decreased or eliminated.
8. Use of chemical fertilizers and poisonous pesticides has been increased very much.
9. The biodiversity and crop diversity has been reduced.
10. Agro-ecosystem has been ruined.
11. Soil fertility status has drastically been depleted.
12. Insect occurrence and disease infestation has been increased manifold.
13. Climate has been changed and disasters like, drought, flood, water logging, salinity, cyclone etc. have been increased.
14. Ground water table has gone down resulting in scarcity of drinking & irrigation water.
15. The risk in crop production has been increased manifolds. Thus the farmers' tension for protecting their crops has been increased.
16. Environment has been degraded.
17. Health hazards and diseases have been increased manifold. So, the treatment cost has been increased.
18. The fish resources have almost been abolished.
19. Production of livestock and local chicken, duck etc. has been drastically reduced.
20. Farmers have lost their indigenous knowledge of crop production. Farmers have been depended on external sources or market for their production technologies.
21. Opportunity for women to participate in production system is reduced.
22. Rural cultural elements have been demolished.
23. Farmers' opportunity of leisure & recreation has been reduced.
24. Family bondage and social harmony is destructed. Individualism has been increased.

The list could be longer but this is enough to realize that how much we have lost by dint of single gain of increasing production of food grains.

Macro perspective of the transformation

It is clear from the previous discussion that the agriculture of Bangladesh is already transformed into a commercial form. While Dr. Hassanullah (2008) termed the present situation of Bangladesh Agriculture as a transitional phase. He said, "Agriculture in Bangladesh, as well as in many other developing countries, is passing through a transitional phase of transformation from subsistence to commercial in nature. During the last three decades from the seventies to the nineties, an enormously large investment was made for agricultural development in various sub-sectors and commodities supported by donor agencies. Some of those programs were rapid expansion of public sector input distribution systems in the sixties and the seventies, intensive crop development programs (sugarcane, jute, tobacco, wheat, maize, oilseeds, minor crops, horticulture) in the seventies, merging six organizations and introducing the Training & Visit model through Extension & Research Projects and Agricultural Research Management Projects in the eighties, Crop Diversification

Projects, Agricultural Services Innovation and Reform Projects, Agro-based Industries and Technology Development Projects and Seed and Fertilizer Projects in the nineties, etc." It is needless to mention that all of the aforesaid programs and projects paved the way for the corporation to intervene into the market of the country that led to the commercial formation of our subsistence agriculture. Most importantly the structural adjustment program imposed by the WB enhanced the commercialization process by liberalization & privatization of agriculture sector of the country.

But unfortunately, it seems that such transformation is fully recognized neither by the farmers nor by the government policy makers while government still feels the necessity of commercialization. That's why the draft NAP 2011 has set the priority of commercialization of agriculture from its subsistence nature. On the other hand, a report entitled 'Transformation of Agriculture for Sustainable Development and Poverty Alleviation in Bangladesh' published by the ministry of agriculture (2006) says, "In the face of rapidly changing national, regional and global economic environment, Bangladesh agriculture is facing the challenge to reinvent itself to withstand competition and at the same time continue to provide food and employment opportunities for the vast majority of the population. To this end, the Government is in the process of articulating a new vision for the sector, realizing that the past and current visions with relatively heavy emphasis on production of food are no longer adequate. In this process, the Government is seeking ways and means to make agriculture more competitive through incentive compatible policies and measures with the view to transforming the sector for sustainable agricultural development, food security and poverty alleviation within the overall framework of the country's Poverty Reduction Strategy Paper (PRSP)".

The report further says, "In spite of the existence of many problems and constraints to sustainable agricultural development in Bangladesh, a quiet agricultural revolution process has been taking place in the country. This process has evolved in response to emerging macro-economic policy and sector policy reforms. These policies included market and trade liberalization and substantial reduction in public sector intervention in agriculture. Driven by the farmers themselves and the private sector, agriculture is beginning to transform itself from a **largely peasant based subsistence activity to a commercial entrepreneurial activity**. The initiation of the transformation process was made feasible with the help of new technology, irrigation expansion and new opportunities to commercialization due to growth of the rural non-agriculture sector and improved rural infrastructure".

Rationale for transformation into Corporate Agriculture

The agriculture production & marketing system prevailing in the country may be termed as corporate agriculture. It is argued that large-scale corporate agriculture is more efficient than peasant farming prevalent in the country. It leads to better allocative efficiency, induces higher private investment in agriculture, and results in higher output, income and exports (Mishra, 1997). In Bangladesh the average operational size of the landless holdings is only below 0.2 hectares including homestead, for marginal holdings it is 0.2 to 0.6 ha, for small holdings 0.6 to 1.0 ha, for medium holdings 1.0 to 3.0 ha and for large holdings it is $\geq$ 3.0 ha. Moreover, small farms are highly fragmented. Land transactions have led to further fragmentation making them non-viable in terms of resource use as well as family sustenance. The costs of fragmentation included increased travel time between farms and hence lower labour productivity, higher transportation costs of inputs and outputs, negative externalities for land quality improvement like irrigation, loss of land on boundaries and greater potential for disputes (Mani and Pandey, 1995). It is therefore may be the fact that the expected development of our agriculture is not possible by these tinny peasants. But unfortunately, the

landless, marginal and small holding constitutes about 88% of the total holdings of the country. This is the key feature to be considered for any sort of development planning of the agriculture as well as of the country as a whole.

Although so far as efficiency is concerned, there is no conclusive evidence of farm productivity rising with increasing farm size, rather small farms have been found to have higher output per hectare (Toulmin and Gueye, 2003). In fact, land reforms drew their logic from the evidence which pointed to the inverse relationship between farm size and productivity (Lipton, 1993). Also, economies of scale are important not at the production level but at the processing stage which can be availed of under contract farming or co-operative processing arrangements (Vyas, 2001). If the argument of efficiency of large holding has any logic at all, it can still be practised by increasing the size of operational holdings even under the existing land laws by way of consolidation. Ownership of land is not a necessary condition for corporate agriculture. The case of India can be mentioned here as an example. Since agricultural sector in India, quite in contrast to the industrial sector, has functioned in a competitive environment - with very large number of producers and consumers in the market - there is no evidence to suggest that under the present system of peasant farming, allocation of resources is inefficient (Rao, 1995). If a proof is needed, it should be seen in the growth rate of agricultural production and changes in the efficiency of capital use. Agricultural production has grown at an average rate of 3 –3.5% per annum since the late 1960s and the marginal efficiency of capital in Indian agriculture more than doubled, from 0.150 in the 1960s to 0.414 in the 1980s (Mishra, 1997).

Further, the experiment of corporate farming in many developed and developing country situations did not succeed largely due to many internal and external problems of the agribusiness firms. For example, in Iran, most of the firms failed, when they were given large chunks of land for cultivation, due to the mismanagement which resulted from the lack of relevant experience. The main reasons were managerial in nature, like neglect of field improvement, no contingency planning, under-capitalisation, managerial inflexibility, and poor labour relations (Strohl, 1985; Johnson and Ruttan, 1994)). The external reasons included diseconomies of scale which suggested that there were limits to farm size growth worldwide (Johnson and Ruttan, 1994). Large-scale corporate farms failed in UK, Venzuela, Ghana, Brazil, and Philippines besides Iran despite the presence of significant ‘external economies of scale’ in terms of subsidised inputs including land, low interest credit, and tax and duty benefits (Johnson and Ruttan, 1994; Toulmin and Gueye, 2003). On the other hand, there have been many cases of success when the firms worked with local farmers under the contract system or leased in their land (Johnson, 1985).

Further, export-oriented agriculture requires large investments which only big agri-business enterprises can afford (Rangswamy, 1993). It is said that corporate farming is a must for stable production and export performance (Singh, 1994). It is also said that allowing companies to buy and operate land would open the doors to their technology in horticulture, food processing, etc. Further, if there is no ceiling on the assets of a firm, why should there be such a restriction on the farm firms or agribusiness enterprises? (Johl, 1995).

The key issue is how to protect the farmers, while allowing the companies to use their land where the farmers work as labour and suffer from the monopolistic contracts with the companies? (Dash, 2004). Also, in a country where the population pressure on agricultural land is already high, it is debatable whether captive or corporate farming is the most optimal use of agricultural or even degraded land. It already evident a major adverse fall out of such corporate agriculture in many developed and developing countries were displacement of large number of peasant farmers. By allowing companies to buy land will make farmers landless

since the companies would offer prices which may be too tempting for the poor farmers to resist and they may not be able to negotiate fair prices for their land and find out alternative source of their livelihood. Land owners, therefore, would run the risk of becoming landless. It is already happening in the country while huge number of landowner farmers becoming landless everyday, moving towards the township in search of their livelihoods and living very inhumane life in the slums.

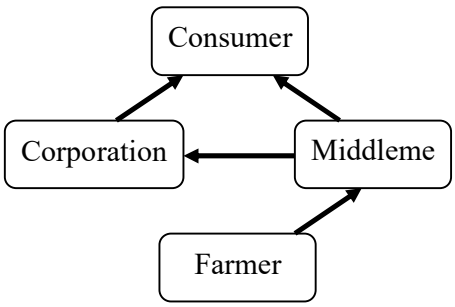
Therefore, the most vital question is how the holding size will be increased to get a minimum economic scale. There is not clear policy measures to solve this crucial problem which is the question of survival of 88% farming community. Without solving this crucial problem the government inviting the corporations that indicate the attitude that these small holders should get out of farming if they are not able to move on to more export-oriented and commercial crops. Only those who have the mindset, technology, management, and financial resources to face the challenge of the Second Green Revolution should be permitted to do farming as an agribusiness.

Forms & Impacts of Corporate Agriculture in Bangladesh

Three forms of corporate agriculture are found to be existed in the country which may be termed as i. Farmers' Independent farming, ii. Direct Corporate Farming, ii. Contract farming. These are described below.

i. Farmers' Independent Farming

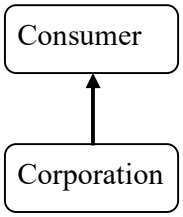
It is the traditional farming system prevailing in the country run by the farmers independently though depends on existing market chain for marketing of their products. Although in this system the farmers seem to be independent but they are not independent at all. Because, in this system a set of middlemen exists in the market chain who, in fact, controls the market and extract almost the whole profit generated from agricultural production. In this system farmers usually don't get fair price of their products though the price become double or triple at consumer level. In this system farmers are extorted by the market player in two ways. The farmers have to pay more and more when they buy the agricultural inputs from the market in one hand and get very less prices when they go to sell their produces in the market on the other. So, the market players are exploiting farmers both input and product market and getting huge profit while the farmers counting even loss from their products. The farmers are producing by investing their own land, labour, capital and shouldering all risks but in the end handing over their products to the market players like a slave.



On the other hand, in this system corporations mainly the corporations those are processing agricultural products also remain in vulnerable condition for uninterrupted supply of their necessary raw materials in time at reasonable price. Actually, the middlemen enjoy the most advantaged position in this system. As a result, this system is neither preferred by the corporations nor it is beneficial for the farmers.

ii. Direct Corporate Farming

In this system corporation directly run their own production farm and sale the products to the consumers. In Bangladesh there are a good number of public, private & NGO farms those are run directly by the corporation. The farmers

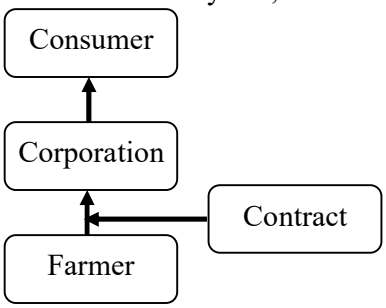


generally don't have any role to paly in this system other than working as a labour.

Although this system gives the corporation certainty of supply of their raw materials it is, in fact, not much preferred by them because it increases their volume of investment and management cost. Moreover, it needs large scale land available for them at a reasonable price which is often a big constraints in a country like Bangladesh where land is very scarce and fragmented.

iii. Contract Farming

Contract farming is the most preferable for the corporation because of its comparative advantages than the other two options as stated before. So, in more recent years, contract farming has been introduced more intensively by a number of private companies and NGOs as a part of their agribusiness ventures. Their primary focus is on high value agricultural products to cater to the needs of increasing urbanization and expanding international markets. Contract farming of tobacco is very well-known form of contract farming in Bangladesh. besides, BRAC has introduced contract growing of vegetables and fruits for export market and poultry and milk production for domestic market. PRAN has been promoting production of high value fruits and vegetables for domestic as well as export market. Aftab Bahumukhi Farm Ltd. (ABFL) is one of the commercial breeding farms that has introduced contract farming for broiler and layers production and integrated it with a supply chain to serve the urban consumers. Proshika has introduced contract farming for organic vegetable and fruit production mostly for the urban and foreign consumers. These are some few examples of contract farming in Bangladesh.



Contract farming involves contractual arrangements, written or verbal, between farmers and companies, specifying one or more conditions of production and/or marketing of an agricultural product. Contracting may be horizontal and vertical. If two or more different stages are tied together, this is 'vertical contracting'. If two or more parts are tied into one at the same stage of operation, this is 'horizontal contracting'. If both vertical and horizontal operations are tied together, this is 'circular contracting'. For example, in the broiler chicken industry there are various stages of operation, such as: hatching egg flocks, hatcheries, feed mills, feed stores, broiler production, processing, wholesaling, retailing and finally, the consumer of chickens. Contracting on any one of these stages is 'horizontal,' while contracting between any two of these stages is 'vertical'. Contracting involving both horizontal and vertical operations is called 'circular'. Conceptually, contract farming envisages five elements: (i) product specification in response to national or international markets; (ii) market specification, ensuring product delivery at agreed upon prices; (iii) resource supplies, including quality inputs, capital, credit and services; (iv) technical support, relating to production, harvesting and processing; and (v) risk sharing, specifying insurance against natural and market risks (Mandal et.al. 2004).

Because of the aforesaid five elements, contract farming is considered to be more advantageous for the farmers as it gives better marketing opportunity for the farmers and link them with wider market. As contract farming is a better option compared to the aforesaid two other systems many theorists are in favour of introducing contract farming as a solution of farmers' deprivations in the neo-liberal market system as an way of getting fair price of their products. Before going for any conclusion in this regards we can consider following two cases.

Case-1: Contract farming of tobacco

From several study it was found that the main motivation for the farmers to cultivate tobacco is the marketing facilities. Apart from the profitability aspect, guaranteed market and ready cash play an important role in the farmers' decision to grow tobacco (Islam, 2010). Although tobacco has a secured marketing because of pre-contract with the company but often the farmers face various problems in marketing their tobacco leaf. The contract tobacco growers have one kind of assurance to sell their products to the company but their tobacco is often rejected by the company due mainly to quality question. The farmers have no choice to sell their tobacco outside of the affiliated company even they could get higher price. If any farmer sells their products to the other company or traders then the company cancels the contract as punishment. When the supply of tobacco in the market is higher than the demands then the company wants to buy only the best quality tobacco rejecting the lower grades which cause tremendous suffering for the farmers and also increases the preservation & transportation cost of the farmers.

In Jhenaidah district British American Tobacco Company (BATC), Dhaka Tobacco Company (DTC) and Abul Khair Tobacco Company (AKTC) have their own contract growers. Among the companies BATC have better reputation in giving better marketing facilities and price to their contract growers. The other companies often deal unfairly with the farmers. The following case will illustrate the situation better.

Mr. Habibur Rahman a farmer of Bijoypur village under sadar upazial of Jhenaidah district had a card of BATC for eight years. But, last year (2009) the company cancelled the card because he sold a little part of his tobacco at higher price to the buyer of DTC. Then he got a card from DTC. This year (2010) Mr. Habibur Rahman suffered a lot to sell his tobacco because DTC officials played fraud in tobacco purchase. He sold his best quality tobacco at the rate of only Tk.65 to DTC where he had nothing to do. In fact, the company often compels the farmers to sell their tobacco to their brokers to whom the staffs of the company have hidden contract. The brokers purchased the tobacco from the farmers at the rate of Tk. 80-90 while they sell to the company at the rate of Tk. 120-130 or more. Then the profit is shared among the brokers and the company officials. Generally, the local musclemen are involved with this kind of brokery. So, the farmers can't say anything against such type of irregularities and corruption.

Case-2: Protest of Contract Potato Growers against Bombay Agro Limited

"A news published on March 30, 2011 in the newspaper The Daily Star that over a hundred 'contract potato growers' of Thakurgaon and Panchagarh districts blocked Debiganj-Nilphamari road at Debiganj upazila headquarters for two hours on Thursday as food processing company Bombay Agro Limited has denied to buy potato from them as per previous agreement.

At around 4:00pm, the potato farmers besieged the office of Bombay Agro Limited and scattered over one hundred maunds of potato on Debiganj-Nilphamari highway, keeping the road blocked for two hours. Following an agreement signed with Bombay Agro Limited authority, the potato farmers cultivated Carage, Lady Rosetta and Asterix varieties of potato, taking the seeds for high prices from the company, the speakers said at a rally in front of the company office.

As per agreement, the company is to buy potato from their 'contract growers' at Tk 13 per kg but now the former is declining to comply with the agreement upon lame excuses as the present market price of potato in the harvesting period is lower than the contract rate, they said. If the company does not buy the potato as per agreement, the contract growers of Thakurgaon and Panchagarh districts will count huge losses. In that case, they will not be able to repay the loan that they took from Mercantile Bank Ltd to bear the cultivation cost including high prices of the seeds from the company, the speakers said. They warned of launching a tougher movement if the company does not take positive decision in this regard within a day or two."

Whatever be the result of this movement, this case discloses the internal problems of contract farming from the farmers' perspectives. The aforesaid farmers could anyhow organize a movement against the discrimination of the company that may not be possible for all farmers for all times. Moreover, the poor farmers are not as powerful as the company to fight for their rights within the given power structure of the country where the money can do everything. The company has such absolute power of money that the poor farmers don't have. So, the result of such movement is easily understandable. Therefore, the farmers have to silently digest all the discriminations, as stated in case-1,

Moreover, Sarwar (2008) reported that some agricultural processing companies initiated contract farming in Bangladesh in the late 1990s. The main objection with the contract farming is that the arrangements limit the farmers access to the market and the contractors usually pay less (administered price) to the farmers and sometimes they do not buy the products in seasons when price is high in the market rather they wait for the price to fall and then buys the produce in a cheaper price. The agribusiness farms are able to exploit the system as 1) the contracted i.e. the small farmers often do not understand the contract's terms and conditions; 2) very informal setting of contract through the selection of group leaders from the farmers who are close to the agribusiness firms, and 3) small farmers do not have bargaining power to get the contract right. Farmers are not compensated with the production loss due to externalities. In a country like Bangladesh where 82 percent farmers are small producers (less than 2.5 acre land possession) and having no bargaining power in respect to their counterparts' i.e. corporate business Contract farming as a means to achieve the new agriculture is not a prudent choice".

However, although the contract farming has been in practice for quite some time, there are issues that have not been adequately analyzed or understood. Some of the key questions that need to be addressed are as follows: Who are the contract growers and what are the contractual arrangements? To what extent the contract farming benefits the contract growers? Has the contract farming contributed to a reduction of price spread between the producers and the consumers? What needs to be done to improve the performance of contract farming in the changing nature of trade liberalization? How it is solution of Farmers' Marketing problems?

On the other hand, corporations are interested for High Value crops rather then necessary food crops essential for food security. For example, at present in Bangladesh contract farming is happening in case of tobacco, Shrimp, fruits, maize, vegetables, spices etc.. The corporations either produce junk food for domestic market or export to the foreign market the products produced as contract. None of these products are essential for food security. On the contrary those are detrimental for food security because those occupy very limited farmland of the country which is not enough to produce essential food items for food security. It is to remember that company run not for ensuring food security but for profit. If maize cultivation becomes profitable for company to produce bio-fuel certainly they will go for producing maize.

In fact, it is known from experiences of other developing countries, and of India where contract farming is now widespread, that agribusiness firms producing for export tend to undermine the local food production systems as they go in for export-oriented non-food crops by displacing area under basic food crops which is so crucial for local and national food security (Patnaik, 1996) and exploit farmers (Dash, 2004). Therefore, it is essential to become careful in time. It is obvious that company will never go for producing rice the staple food of the country because it is not high value crop for them. Such situation will be a great threat for the food security of the country.

Global Experiences of Corporate Farming

The draft NAP 2011 says "special attention will be given to post-production technologies, high value crops, value addition, agri-business management and trade. Enabling conditions will be created to expand local and overseas markets for agri-business opportunities". It could be realized from the NAP that the government is eager to invite the large investors in agriculture who will produce high value crops like Tobacco, Shrimp Maize, Strawberry, BAUKUL, Dragon fruit, other fruits, organic vegetables mainly to feed the high value consumers living in the cities or export to the market abroad to earn raw foreign exchange.

This trend is already happening in the country as discussed before. Many corporations, private entrepreneurs and corporate NGOs in the country investing in agriculture either to produce junk food or raw & processed food for the domestic or foreign market. Perhaps government is thinking to promote such high value agriculture in a large scale in the name of commercialization of our agriculture. If it happens it will, undoubtedly, be suicidal for the sake of food security of the country.

On the other hand, government is enthusiastic to promote competitiveness through commercialization of agriculture (Draft NAP 2011). It seems to be good from commercial perspective but the question is that with whom the poorest of the poor farmers of this country will compete and under what conditions? Will they have to compete with the corporate giants as well as domestic or foreign large-scale investors? Do they have that capacity? It is fact that the small, marginal and landless farmers of the country who constitute 88% of the farming community already in an unequal competition with the highly subsidized large-scale gigantic farmers of the developed and developing countries in the neo-liberal market of the country opened up by the pressure of WB, IMF and other donor agencies under the regime of WTO and its' AoA. We should be proud that our farmers still surviving very boldly and courageously in such an unequal competition for last many years. This competition is not simply unequal, it is in fact, a competition between a bicycle with an aeroplane. Therefore, it should be clear what is the further competitiveness to be created by the government.

However, it is real fact that over the past three decades the rich countries of the north have forced poor countries to open their markets, then flooded those markets with subsidized food, with devastating results for Third World farming. But the restructuring of global agriculture to the advantage of agribusiness giants didn't stop there. In the same period, southern countries were convinced, cajoled and bullied into adopting agricultural policies that promote export crops rather than food for domestic consumption, and favour large-scale industrial agriculture that requires single-crop (monoculture) production, heavy use of water, and massive quantities of fertilizer and pesticides. Increasingly, traditional farming, organized by and for communities and families, has been pushed aside by industrial farming organized by and for agribusinesses. The focus on export agriculture has produced the absurd and tragic result that millions of people are starving in countries that export food. In India, for example, over one-fifth of the population is chronically hungry and 48% of children under five years old are malnourished. Nevertheless, India exported US$1.5 billion worth of milled rice and $322 million worth of wheat in 2004 (FAO, 2004).

In other countries, farmland that used to grow food for domestic consumption now grows luxuries for the north. Colombia, where 13% of the population is malnourished, produces and exports 62% of all cut flowers sold in the United States. In many cases the result of switching to export crops has produced results that would be laughable if they weren't so damaging. Kenya was self-sufficient in food until about 25 years ago. Today it imports 80% of its food and 80% of its exports are other agricultural products (Angus 2008).

The shift to industrial agriculture has driven millions of people off the land and into unemployment and poverty in the immense slums that now surround many of the world's cities. The people who best know the land are being separated from it; their farms enclosed into gigantic outdoor factories that produce only for export. Hundreds of millions of people now must depend on food that's grown thousands of miles away because their homeland agriculture has been transformed to meet the needs of agribusiness corporations. As recent months have shown, the entire system is fragile: India's decision to rebuild its rice stocks made food unaffordable for millions half a world away (Angus 2008).

If the purpose of agriculture is to feed people, the changes to global agriculture in the past 30 years make no sense. Industrial farming in the Third World has produced increasing amounts of food, but at the cost of driving millions off the land and into lives of chronic hunger and at the cost of poisoning air and water, and steadily decreasing the ability of the soil to deliver the food we need for present & future generations. Contrary to the claims of agribusiness, the latest agricultural research, including more than a decade of concrete experience in Cuba, proves that small and mid-sized farms using sustainable agroecological methods are much more productive and vastly less damaging to the environment than huge industrial farms (Jahi Campbell 2008). Industrial farming continues not because it is more productive, but because it has been able, until now, to deliver uniform products in predictable quantities, bred specifically to resist damage during shipment to distant markets. That's where the profit is, and profit is what counts, no matter what the effect may be on earth, air, and water or even on hungry people (Angus 2008).

In search for alternative

It is obvious from the previous discussion that corporate agriculture may earn huge foreign exchange or make huge profit from domestic market and thus better contribute to the economic growth of a country but neither it is solution for food security nor for development of poor peasants of a country like Bangladesh. It is already mentioned that about 88% farm holdings of the country are small, marginal & landless categories who own maximum of 1 ha of land have been suffering much in the neo-liberal agricultural trading system. So, looking for any alternative, development issue of this big section of poorest population of the country must be prioritized. On the other hand, for producing safe and nutritious food for ensuring food security in the context of increasing climate change induced disasters must get equal priority. We should also remember that we can't simply deny the regime of neoliberal market economy or agricultural trade.

However, if we first consider the survival issue of small, marginal & landless farmers then what should be alternative of corporate farming when it is necessary to increase the holding size for them is the first question. Mishra (1997) has given the answer of this question and proposed for a way to increase the holding size. He said, "If operational holdings are to be enlarged for more viable operations, that can be achieved by making the land lease market more efficient or by pooling land together under some co-operative enterprises, for collectively buying inputs and selling produce, if not for co-operative farming. **If agricultural growth is to be shared in order to realise the virtuous circle of growth and distribution, only a peasant farming system using modern technology of production can achieve it, as the East-Asian experience has shown.** Not only it is more competitive compared to the capitalist/corporate farming system, but also peasants do respond and adopt new technologies of production whenever opportunity arises. The experience of the Green Revolution in Punjab is an excellent example of this. Secondly, it is able to employ more labour as the peasant farmers substitute labour for capital much better, than the capitalist farming can ever do, given its normal motive to maximise profit (Mishra, 1997).

There is, however, a case for increasing the holding size at the lower end to make the holdings viable (Mani and Pandey, 1995). This can be done by provision of term credit through Land Development Banks to the small/marginal farmers below the poverty line, so that those willing could purchase land and increase the size of their ownership holdings (Rao, 1995). But, it may not help solve the problem of viability as it leaves no room for those at the lowest end who want to move out of it. The best course seems to be to have a free land market within the limits of land ceilings, with provision of land purchase credit facility for the small/marginal farmers. But, given the population pressure, family divisions, equal

inheritance law, and deep-rooted attachment to land, even this policy may not wholly succeed in eliminating the unviable marginal holdings. About 15 years ago, a working group of agricultural economists under the chairmanship of late Sukhmoy Chakravarty, had come to the conclusion that introduction of a floor to the ownership holdings would be necessary to tackle the issue. The U.P. Zamindari Abolition and Land Reforms Act of 1950 accordingly has a clause fixing the floor limit at 1.26 hectare. It is another matter that this provision has never been implemented. Of course, it goes without saying that the floor limit will have to be different in different states just as the ceiling limits are different (Mani and Pandey, 1995; Mishra, 1997).

Finally, there is a need to look at contract farming alternative as it meets the needs of both corporate agribusinesses as well as small producers. The superiority of contract farming over corporate farming is evident in its more widespread and sustained practice as compared with corporate farming experiences (Winson, 1990) and in its positive impacts like producer link up with profitable markets, better farm incomes, skill upgradation due to transfer of technology, and sharing of market risk even in India (Glover and Kusterer, 1990; Benziger, 1996; Dileep et al, 2002: Deshingkar et al, 2003; Dev and Rao, 2004). It does not at least make small farmers landless unlike corporate farming. Even the environmental aspects of contracting are not as damaging as small farmers maintain control over farm operations which is good for environmental sustainability though when unregulated and not ethically practiced, it can lead to environmental degradation (Morvaridi, 1995; Singh, 2002) and exclusion of small producers (Warning et al, 2003; Singh, 2006a). Further, there is sharing of benefits in contracting as against corporate farming. Of course, this requires regulation and monitoring of contracting agencies by third parties or farmer organisations like co-operatives and farmer groups or the state. In general, contract farming has positive impact on non-contract growers and rural development in general if properly leveraged with state policy and local institutions like group contracts, though it is not a development tool (Goldsmith, 1985). It has been in practice in India for quite some time now with mixed results and more recently, there has been policy thrust on this mechanism of vertical co-ordination. **Therefore, there is a need to build partnership into contract farming (Eaton and Shepherd, 2001) where companies not only offer contractual terms for working with farmers but also share their business risk and profits with producers as equity shareholders. It is being done successfully by a sugar company in Karnataka in south India.**

On the other hand, for producing sufficient safe and nutritious food for ensuring food security in the context of increasing climate change induced disasters is a great concern for the country like Bangladesh. By following the prescription of the donor agencies of industrialist countries our policy makers are looking for the technological solution of the aforesaid problem while the intellectuals of the industrialist countries thinking differently.

John Ikerd (1996) an American educationist states “a lot of well-informed, educated people see a very different future -- a "post-industrial" future for agriculture and the U.S. economy in general. They see a future in which "thinking," -- not just by the intellectually-gifted, highly-educated, and highly-paid few, but by people in general -- is the key to success. The human mind will be the source of progress for individuals, families, farms, businesses, communities, and nations. "High-think" rather "high-tech" will be "buzz word" of the 21st century. A "post-industrial" paradigm for agriculture implies a future very different from the typical "high-tech" vision of continued agricultural industrialization”.

He further states, “American agriculture is in the midst of a great transition. Three basic factors foretell end of dominance for the industrial paradigm of agriculture. First, the logical, economic and social gains from industrialization of agriculture have already been realized.

There is very little left to be gained from further specialization, mechanization, and routinization -- industrialization -- of agricultural production and marketing. Second, there are increasing problems -- environmental, social, and economic problems -- associated with continuing the industrialization process. The marginal costs of industrialization may have exceeded its marginal benefits as far back as two or three decades ago. Third, there is growing evidence the Industrial era has already ended in many sectors of the economy outside of agriculture and that agriculture will soon follow".

"This industrialization of American agriculture resulted in the most efficient agriculture in the world, at least in terms of the dollar and cents costs of production. This in turn made it possible for this nation to build the strongest economy in world. Equally important, the farmer gets only a single penny out of that dime, while nine cents goes to the marketing and input firms. We now pay more for packaging and advertising than we pay the farmer to produce the food. Future gains from the further industrialization of agriculture must be squeezed from the farmer's penny. There just isn't much left in to be squeezed out to benefit either farmers or society. We just can't make food much cheaper by putting more farmers out of business."

"At the same time that the benefits to society of an industrial agriculture have declined, the perceived threats of agriculture -- threats to the environment, threats to the natural resource base, and threats to the quality of life of farmers, of rural residents and society as a whole -- have risen. The same technologies that support our large-scale, specialized system of farming -- the industrial systems through which we have increased agricultural productivity -- have now become the primary focus of growing public concerns. Industrial systems historically have degraded their environment and depleted their natural resource base. Commercial fertilizers and pesticides -- essential elements in a specialized, industrialized agriculture -- have become a primary source of growing concerns for environmental pollution. Industrial systems of crop and livestock production also degrade the human resource base. Factory farms transform independent decision makers into farm workers -- people who know how to follow instructions or directions but not necessarily how to think. The early gains of appropriate specialization in agriculture lifted people out of subsistence living and made the American industrial revolution possible. But agriculture was the most ill-suited of all sectors for fully-industrialized, factory-like operations. Thus, full industrialization of agriculture occurred last, generated fewer benefits, created more environmental and social costs, and as a consequence, will likely last for a shorter period of time."

"So, there are logical reasons to question further industrialization and to believe that the future will be very different from the past. An alternative paradigm for U.S. agriculture, a new paradigm arising under the conceptual umbrella of **sustainable agriculture**, represents a logical, realistic, positive alternative to industrial agriculture". The paradigm of sustainable agriculture has emerged to solve problems created by the industrial model, primarily pollution of our environment and degradation of our natural resource base. However, this new paradigm seems capable of creating benefits the industrial model is inherently incapable of creating, such as greater individual creativity, dignity of work, and attention to issues of social equity."

The above statements can give us very important guidelines to set the goal of our agricultural development. If we really want our agriculture to be beneficial for majority small, marginal and landless farmers for their sustainable development as well as if we want to ensure our food security then we have to realize that only technical solution is not enough for that. We must recognize that food security and sustainable development of farmer are social, cultural, economic and political issues. On the other hand, climate change is an environmental &

ecological issue. So, we have to think for an agricultural production system which is economically viable, socially just, environmentally & ecologically sound and culturally appropriate that is we need to adapt sustainable agriculture.

It is a matter of hope that the government policies also addressing the issues of sustainable agriculture at least in black and white. The last objective of the draft national agricultural policy is "establishing a self-reliant and sustainable agriculture adaptive to climate change and responsive to farmers' needs" (draft NAP 2011). On the other hand, A report entitled 'Transformation of Agriculture for Sustainable Development and Poverty Alleviation in Bangladesh' published by MOA (2006) says "Conservation agriculture is a vital option to face a double challenge of increasing productivity and preserving the natural resource base, simultaneously". But unfortunately, we see the reverse actions in practice whatever may be written in the policy documents. Therefore, concrete political decisions and subsequent actions are essential to address the issues successfully.

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List of Acronyms

ADB	:	Asian Development Bank
AoA	:	Agreement on Agriculture
AGRA		Alliance for a Green Revolution in Africa
BARC	:	Bangladesh Agricultural Research Council
BARI	:	Bangladesh Agricultural Research Institute
BAU	:	Bangladesh Agricultural University
BER	:	Bangladesh Economic Review
BINA	:	Bangladesh Institute of Nuclear Agriculture
BRRI	:	Bangladesh Rich Research Institute
DAE	:	Department of Agricultural Extension
FAO	:	Food and Agriculture Organization of the United Nations
GDP	:	Gross Domestic Products
GM	:	Genetically Modified
HYV	:	High Yielding Variety
IMF	:	International Monetary Fund
IPM	:	Integrated Pest Management
MOA	:	Ministry of Agriculture
BSMAU	:	Bangabandhu Sheikh Mojib Agricultural University
NAP	:	National Agriculture Policy
NGO	:	Non Governmental Organisation
PRSP	:	Poverty Reduction Strategy Paper
TRIPS	:	Trade Relates Aspects of Intellectual Property Rights
WB	:	World Bank
WTO	:	World Trade Organization

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