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Review

The role of agriculture education and training on agriculture economics and national development of Bangladesh

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This article analyses the prevailing situations of the agricultural sector in Bangladesh using both secondary and primary data. Findings show that agriculture was the main economic sector with an employment of 95% of total population with a share of 78% of Gross Domestic Product (GDP) in 1971. After the first few years of independence, education policy was concentrated for the development of agriculture education from secondary to tertiary level because government considered agriculture as potential to economy. Currently, 75% of the populations' professions are agriculture industry and contribution towards GDP is only 22%. While the decline of employment is not notably dropped, contribution towards GDP shared by agriculture sector is dramatically descended. The article examined the probable underpinning reasons causing agriculture as a less productive industry. With many reasons, it is noted that education system is not currently supporting the development of agriculture industry. With narrations, this article proposes a policy change towards agriculture education aiming an improvement of agriculture economics of the country which ultimately will bring national development.

Key words: Agriculture education, agriculture economics, education and development, national development, GDP sharing.

INTRODUCTION

In the era of science and technology, employment in agriculture provides lower wages than many other professions; as a result many countries are less attentive providing predilection in policy formulation of agriculture and agriculture education (Alston et al., 1998a). Many developed and mid-developed countries arranged alternative industries for employment forcing developing countries to depend on agriculture fundamentally with a continuous decline to the share of GDP (Alston et al., 1998b). The countries that are unable to arrange alternative form of employment must need to depend on agriculture even though income potential is unsatisfactory and sluggish. Nevertheless, either some countries or a portion of population of the globe must be involved at agriculture in order to ensure the food supply for the population (Arcand, 2000). Therefore, stopping agriculture industry is not a resolution rather it is now thus important to discover the ways that can ensure more productivity of the sector with the investment of less time and limited human resources (Alesina and Perotti, 1993; Alam, 2008b). Outstanding researches in the area of agriculture and the employment of well trained human resources can provide a substantial productivity (Ashley and Maxwell, 2001). This will only be possible if a well-timed agriculture education is delivered targeting different groups and levels with a decent collaboration of education, training and agriculture policy of a country.

Research problems

Agriculture was the main economic sector in Bangladesh employing 95% of total population with a share of 78% of Gross Domestic Product (GDP) in 1971 (Karim 1997 and Islam, 1997). Currently, 75% of the populations' profes-

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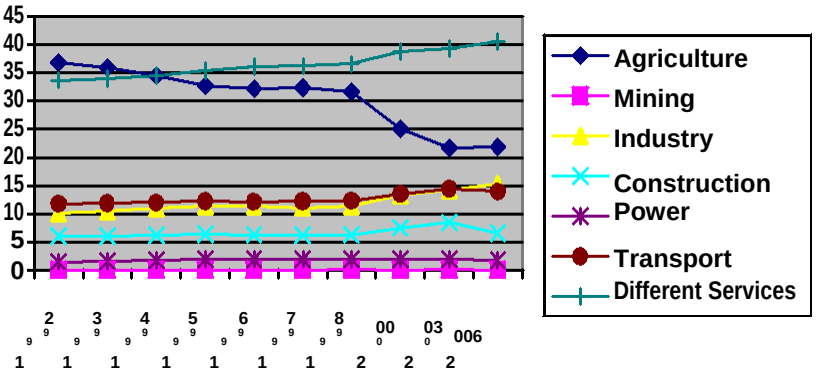

Figure 1. Percentage Share to GDP of Agriculture and Other sectors.
Source: Compiled from different publications of Bangladesh Bureau of Statistics.

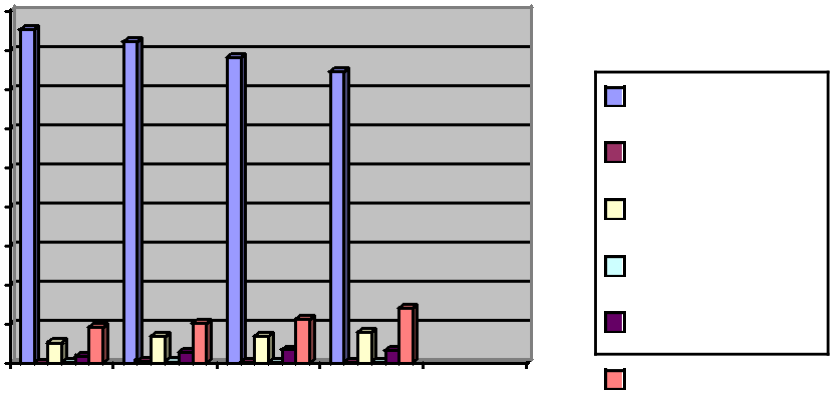

Figure 2. Percentage share of Employment in Agriculture and Other sectors of economy.
Source: Compiled from different publications of Bangladesh Bureau of Statistics.

sions are agriculture or agro industry and contribution towards GDP is only 22% (Table 3, and Figures 1 and 2). While the declining of employment is not markedly dropped, contribution towards GDP shared by agriculture sector is dramatically descended. Bangladesh has become a salesmanship country that neither produces scientific products nor agricultural products in order to earn foreign currency with some exception of garments products forcing the country to depend on foreign aids (Alam, 2009). Once upon time, country's foreign currency earning was dominated by the export of agricultural goods. These days, Bangladesh can not meet its own increasing food demand let alone exporting. There are many constraints (that is, political, natural calamity, people choice, ostensible modernization and globalization) that hinder the development of agriculture sector. However, lack of multi diversified quality agriculture education, training and research is graver concern than those (Alam, 2008a). If the country continuously fails to ensure a greater GDP share through agriculture sector, the life of majority of the population will remain be miserable with continuous deteriorating.

Since 1950's, a good number of research works in the context of sub-continent have been conducted to understand the role of agriculture on development and to discover the prospects and challenges with the offer of solution to address the constraints. A research is yet to be conducted to understand the role of education and training on agriculture development in Bangladesh thus this work is a new piece of work in its nature.

Research aim and questions

The aim of this study was to understand how agriculture education and training can contribute for development of Bangladesh through acceleration of agriculture economics. This study endeavored to find the answers of the following research questions. Answers of these research questions help to achieve the aim of this study.

What was the scenario of agricultural sector earlier?
What is the present scenario of agricultural sector?
Why does this difference occur?
What are the main constraints for the development of agriculture sector?
What is the role of agriculture education and training for the development of the sector?
How education can address the constraints experiencing at the sector?

Before conclusion and suggestions made at final section, findings and discussions section will answer these research questions. Prior to these, the writing that follows respectively includes literature review and data used for this study.

LITERATURE REVIEW

Literature review includes the concept of development and role of agriculture on national development. This part also fundamentally argues about the role of agriculture education and training on development of agriculture industry.

Theories in development

Since the 1950s there have been at least three main schools of thought on the definitions and approaches towards development. The first school is that of the economists. Economists (e.g. Bernstein, Shultz, Psacharapolous) view development primarily in terms of a nation's relative prosperity. A nation's development is assessed by measuring any increase in its gross national product (GNP) (Thomas and Potter, 1992). Development is achieved through investing in human capital and "raising the productivity capacities of societies" (Thomas and Potter, 1992).

The second school of thought is that of the sociologists (e.g. McClelland, Weber, Inkeles, Smith). They propose that modernising a country leads to economic development and a modern society. With modernisation as the main goal, the emphasis is placed on education, technology and industrialisation as the agents of transformation. Underdeveloped countries can, they say, be transformed into modern countries with similar economies, societies and politics as those in the prosperous west (Thomas and Potter, 1992; Little, 1999).

In the 1960s and 1970s, another group of theorists (e.g. Seers, Sen, Edwards) began to consider development from a human needs perspective. The emphasis here was not so heavily focused on economic growth as the primary indicator of development, but more on assessing the needs of individuals: their freedom, equity, participation and empowerment to fulfil their potential capabilities (Thomas and Potter, 1992). Sen, for example, argues that:

"If, instead, the focus is ultimately on the expansion of human freedom to live the kind of lives that people have reason to value, then the role of economic growth in expanding these opportunities has to be integrated into that more foundational understanding of the process of development as expansion of human capability to lead more worthwhile and more free lives" (Sen, 1999).

Before the 1990s, the economists carried the strongest voice. The argument for investing in human capital through investment in education was considered to lead to higher rates of return (both private and social) that would far outweigh the initial investment. Education policies in both developing and underdeveloped countries reacted to this by implementing programmes which led to massive expansion in education provision. In some countries, this approach seems to have worked (e.g. in East Asia) (World Bank, 1995; Fletcher, 1974) resulting in industrialisation and, to some degree, modernisation. But in others, such as Bangladesh, the results in terms of economic indicators have been disappointing (World Bank, 2002; Fagerlind and Saha, 1989).

However, by the 1990s, a more holistic view of development was beginning to take centre stage, especially in organisations such as UNESCO and UNDP. From this perspective, human development is not just measured in terms of the economy but also in terms of freedom, equity (access to education, health), participation and quality of life. UNDP (2002, p2) defines this wider meaning thus:

"Human development is about much more than the raising of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accordance with their needs and interests. People are the real wealth of nations. Development is thus about expanding the choices people have to lead lives that they value. And it is thus about more than economic growth, which is only a means – if a very important one – of enlarging people's choices."

We support the view that national development must be a country's development in terms of its economic and social freedom. We also consider that economic freedom and social freedom are interrelated. One cannot succeed without the other (Thomas, 1981; UNESCO, 2001). To increase national economic development, a country must have social freedom and, to achieve social development, a country must have economic freedom. Tables are provided to establish this concept.

It is important to note that this comparison does not consider the quality of education provided in the countries included. Furthermore, GDP has been calculated to include foreign aid received by underdeveloped countries from developed countries. In some countries, a lower

Table 1. Five underdeveloped countries (Identified by UNDP).

Country	HDI rank	GDP per capita (PPP$)	Adult literacy rate	Education index	Life expectancy index	Corrupt country placing *(Transparency International)*
Bangladesh	145	1,602	41.3	0.40	0.57	01
Nigeria	148	896	63.9	0.58	0.44	02
Angola	161	2,187	42.0	0.36	0.34	03
Madagascar	147	840	66.5	0.59	0.46	03
Kenya	134	1,022	82.4	0.72	0.43	04

Source UNDP: Human Development Report (2002) and Transparency International: Corruption Perceptions Index 2002. http://hdr.undp.org/reports/global/2002/en/indicator/indicator.cfm?File=index.html &http://www.transparency.org/pressreleases_archive/2002/2002.08.28.cpi.en.html

Table 2. Five developed countries (Identified by UNDP).

Country	HDI rank	GDP per capita (PPP$)	Adult literacy rate	Education index	Life expectancy index	Transparent country placing (Transparency International)
Finland	10	24,996	.. 1	0.99	77.6	01
Denmark	14	27,627	.. 1	0.98	0.85	02
Iceland	7	29,581	.. 1	0.96	0.90	03
Sweden	2	24,277	.. 1	0.99	0.91	04
Canada	3	27,840	.. 1	0.98	0.90	05

Source UNDP: Human Development Report (2002) and Transparency International: Corruption Perceptions Index (2002) http://hdr.undp.org/reports/global/2002/en/indicator/indicator.cfm?File=index.html &http://www.transparency.org/pressreleases_archive/2002/2002.08.28.cpi.en.html

income (GNP) produces a better quality of life, due to the correct balance between income and the purchasing power controlling the value of basic goods. The placing of corruption and transparency column in the Tables 1 and 2 is a key indicator, as transparency is an aspect of social development that can help achieve not only economic development, but also human development. Conversely, corruption is an aspect of social decadence that will hinder any level of National Development-ND (Alam, 2009; Woodhall, 1997).

The role of agriculture on development

Many scholars have already examined the role of agriculture on development. Some of them argue that agriculture plays a vital role for the economic growth. Recent data shows that GDP sharing of agriculture sector is lower than other sectors while agriculture consumes a bigger portion of human resources and fund (Alam, 2008a). Thus, arguments are made that investing in agriculture is not an epoch-making decision for a progressive country (Coulombe and Mckay, 2003) . This kind of argument is fairly tricky as; if the production of agriculture goods is being stopped what would happen to not only food supply for the huge population of the world but also to the supply of raw materials used by major scientific industries that provide a higher GDP (Binswanger and Quizon, 1986). Indeed, currently the earning of GDP is significantly lower compared to the vast majority of populations are employed at the agriculture sector. There are many reasons for the low level of contribution of agriculture sector. These are mainly related to non-skilled workforce, use of low level and time-consumed technology and old fashioned cultivation that deserve a revolutionary change (Bryceson, 2000 and Barrett et al. 2003) . However, it is must be noted that since professsions of the ruling elites of a country are not agriculture, they are not serious ensuring a good life for the framers ("Some of the developed countries provide subsidy for their agriculture industry, while most of the developing worlds impose higher tax to their poor farmers compared to the richer industrialists. It is worth to note that privileged group also does not pay the right tax imposed to them since they have very diplomatic and corrupt connection with high officials and politicians. What' more, farmer has to pay the 'land tax' whether he/she can make profit or lose. This tax is additional amount from the regular tax paid according to the 'income code'. In contrast, businessmen and service holders need to pay

Table 3. Comparison of sectoral earnings/income (constant price), GDP sharing with trend (increase/ decrease and Impact on total GDP.

Major economic sectors	GDP at constant price (based on 1995-96) (Million Tk.)	Trend (increase/decrease) of constant price (based on 2003-04) (%)	GDP sharing (%)	Trend (increase/decrease) of GDP Sharing (based on 2003-04) (%)	Year	Total GDP (Million Tk.)	Trend (increase/decrease) of total GDP (based on 2003-04)(%)
Agriculture, forestry and fishing	558,055		23.08		2003-04	1,859,392	
Mining	26,840		1.11				
Industry	390,688		16.16				
Construction	213,465		8.83				
Power	38,491		1.58				
Transport	236,764		9.79				
Different Services	953,144		39.44				
Total	**1,859,392**						
Agriculture, forestry and fishing	570,367	2.21	21.91	-5.07	2004-05	2,561,898	37.78
Mining	29,090	8.38	1.14	2.70			
Industry	423,690	8.43	16.58	2.60			
Construction	231,195	8.31	9.08	2.83			
Power	41,915	8.90	1.64	3.80			
Transport	255,522	7.92	10.01	2.25			
Different Services	1,010,119	5.58	39.64	0.51			
Total	**2,561,898**						
Agriculture	598,532	7.25	21.84	-5.37	2005-06	2,740,734	47.40
Mining	31,783	18.42	1.15	3.60			
Industry	468,197	19.84	17.08	6.19			
Construction	250,418	17.31	9.14	3.51			
Power	45,129	17.25	1.65	4.43			
Transport	275,922	16.54	10.07	2.86			
Different Services	1,070,753	12.34	39.07	-0.94			
Total	**2,740,734**						

Table 3 Contd.

Agriculture, forestry and fishing	625,796	12.14	21.37	-7.41	2006-07	2,927,918	57.47
Mining	34,430	28.28	1.18	6.31			
Industry	513,722	31.49	17.54	8.54			
Construction	267,964	25.53	9.15	3.62			
Power	46,075	19.70	1.57	-0.63			
Transport	298,093	25.90	10.18	3.98			
Different Services	1,141,838	19.80	39.00	-1.12			
Total	**2,927,918**						
Agriculture, forestry and fishing	645,852	15.73	20.83	-9.75	2007-08	3,099,924	66.72
Mining	37,509	41.23	1.21	9.01			
Mining	37,509	41.23	1.21	9.01			
Industry	550,772	40.97	17.77	9.96			
Construction	283,177	32.66	9.13	3.40			
Power	49,193	27.80	1.59	0.63			
Transport	323,566	36.66	10.44	6.64			
Different Services	1,209,855	26.93	39.03	-1.04			
Total	**3,099,924**						

Source: Compiled from different publications of Bangladesh Bureau of Statistics.

tax only after the earning of a certain amount of money. Due to flood, other natural disaster, farmers can not cultivate regularly; however, they still need to pay the 'land tax'. It is also added that service holders enjoy 'pension benefits' after the retirement whereas farmers have no chances to receive 'pension benefits'. This circumstances lead farmers to be di-motivated doing cultivation though still agriculture is the biggest sector for national income. In addition to, we must note that in most of the developing countries, same tuitions fees is paid by both children of poor farmer and elite industrialist to pursue 'high quality education' from reputed public education institutes where access is easier for elite children since they always receive careful parental participation for the development of their education and career. Moreover, their parents maintain high official connection. It generates a question to think,-why do underprivileged group always be victimized of lose, is it because they are not intellectuals and legislators? In my opinion, they are suffering since they are not intellectually capable enough to calculate their lose; moreover, they do not have any voice in the legislation process" (Alam and Rahaman, 2008). This often results an indecent wage for the farmers resulting a low level sharing to GDP through their income potential (Barrett and Reardon, 2000). Moreover, fiscal policy of many countries is not favorable to agriculture sector and

to farmers that leads to have many frustrations (Alam and Rahaman, 2008).

While recent arguments of economists at the field of science are related to GDP and GNP growth, others socialists deem that even though fundamental contributions of agriculture industry for economic development is lower, the overall contribution towards development made by agriculture sector is significantly wider. They argue that scientific industries are using the raw materials provided by agriculture industry (Fan and Rao, 2003; Lewin, 1993). Moreover, our daily lodging and fooding would not be managed if there is no strong agriculture sector. Furthermore, no sector has developed yet to provide employment for such huge population (Fan et al., 2004). Therefore, country needs to have many high earring sectors that can provide the employment (Evans, 1990). Moreover, a country needs agriculture sector with high level of technology that is able to maintain the supply chain of food for vast population and raw materials for other heavy industries with employing a reasonable number of populations (Fei and Ranis, 1961). But unfortunately, this is not the case since many developed countries do not prioritize agriculture in designing policy for their national development forcing poor countries' dependency on agriculture and to be remained them as poorer. Things would be changed if the agricultural dependent countries can make a difference as people of every country must need food. Likewise, industrialized countries must use raw materials for their heavy Industries produced by agriculture sector (Gabre-Madhin and Haggblade, 2002). To make this difference, agriculture dependent countries urgently need a trained workforce working at every level of agro economy sector (Gardner, 2000). Moreover, rich agriculture researches are badly needed for the multi-diversified agricultural development Unfortunately, countries dependent on agriculture do not conduct outstanding research on agriculture rather they depend on the researches conducted by the Industrialized countries (Haggblade et al., 1991; Haggblade et al., 1989; Hallak, 1990). To ensure a sustainable development through agriculture, the countries are required to assure a substantial agriculture education, training and research system.

Food and Agriculture Organization (FAO) opines that agriculture can build national economic development slowly but strongly with solid foundation (FAO, 1997; Document available at: http://www.fao.org/es/ESA/sofa.htm). FAO (1997) emphasises that agricultural revolution of a recently independent country not only helps it to be sound in managing own food but also helps to build infrastructure for industrial revolution by exporting and by producing raw material for industrial uses. But Alam (2008a) defines agriculture means both cultivation of various crops and producing necessary goods for industrial raw materials as well as petting the livestock. FAO (1997) argues that agricultural researches and invention of modern agricultural machineries will not be worthy unless the farmers are skilled enough to process and handle them accordingly. However, Alam (2008a) considers that to prepare productive and ideal farmers, well-timed training and education are to be provided them to accomplish with the professional objectives.

The role of education on agriculture development

Faculties of agriculture and agricultural colleges and universities were first formed in the belief that farm production could be increased as a result of the systematic application of current technology and agricultural research findings (Jamaluddin and Alias, 1997). The mission of these early educational institutions was to scientifically study agriculture with the participation of the farming community; to carry the results to a broad range of farmers who could use them; and to train farmers, extension workers, agricultural teachers and researchers so that agricultural production could continue to be increased on a sustained basis (Johnson, 1996).

Intermediate and higher education in agriculture continues to play a decisive role in rural development and sustainable agricultural production. An increasingly interdependent world, however, is producing new challenges for institutions where agriculture is taught (Kabir, 1995) . Over the years, the world has changed and, in many of the developing countries, agricultural education and training have failed to adapt and respond to the realities of rural societies (Mitchell, 1998).

Curricula and teaching methods and tools often have been developed that are not relevant to the development objectives of individual countries, to the needs of farmers and to the labour market in general (World Bank, 2002). The situation has further deteriorated as a result of economic crises. In many developing countries, the public sector used to absorb the large majority of agricultural graduates. This is no longer the case. Agriculture graduates are finding it increasingly difficult to become employed. Their education in agriculture has not been oriented to the needs of an increasingly sophisticated commercial sector (Tilak, 2002). Environmental degradation, rapid changes in scientific and technical knowledge, the changing role of women in society and the increasing marginalization of agriculture and rural life all call for changes in agricultural education.

In response to the urgent need to review and adjust teaching and training programmes in agriculture at all levels, FAO carried out three complementary initiatives as part of its overall work to improve agricultural educa-tion and training throughout the world. Two expert consultations dealing with these issues were held in Rome (FAO 1997). The first, in 1991, was to discuss the results of a sample survey of 20 agricultural universities, colleges and other institutions selected from throughout the world. The results and recommendations of this meeting of

authorities in the field of higher agricultural education are summarised in the document "Strategy Options for Higher Education in Agriculture: Expert Consultation' (Alam, 2009 and FAO 2003).

The second expert consultation was held in 1993 and was titled "Integrating Environmental and Sustainable Development Themes into Agricultural Education and Extension Programmes". This consultation identified some of the obstacles and challenges to be faced in integrating such themes in higher agricultural education, particularly in developing countries (FAO, 2003). It suggested some measures to strengthen the environmental and sustainable development content of programmes of teaching, research and public service (Estudillo and Otsuka, 1999; CSA, 2001). Case studies commissioned for the consultation illustrated the current situation in selected faculties of agriculture in ten countries (Ellis, 2005).

In addition, eight regional round table meetings were organised throughout the world with the participation of heads of university faculties of agriculture, agricultural colleges and technical education institutions, high schools and officials of Ministries of Agriculture and Edu-cation (Ellis and Harris, 2004) . These meetings focused on specific problems faced by agricultural education and training in each of the regions. The round tables aimed at analysing problems and opportunities in each region to assist governments in the development of future educational programmes. The meetings were intended as the first steps toward practical action that could be carried out to improve agricultural education at the national and regional levels.

Government participation in the direct management of educational institutions varies considerably from country to country. However, the overwhelming majority of higher and intermediate level institutions where agriculture is taught in the developing countries are dependent on government (Dollar and Kraay, 2002). In general, objecttives, organizational structure and resources are determined by national policies, which also define the relationships between education, research and extension. Under these conditions, agricultural education is essentially seen as an instrument of the agricultural and/or educational policy of the government and oriented towards national objectives as they are perceived and defined.

In many countries, especially those which have recently become independent and those that had centrally planned economies, agricultural education and training was designed mainly to prepare officers for the administrative and technical services for rural and agricultural development, state farms and training centres FAO 2003) . This situation of close dependency on government led to a rigidity in programmes and teaching (methods, staff recruitment and mobility.

Dependency on governments also affects operational budgets. Teaching resources, technical equipment and out-of-school activities are often cut back as national economic problems arise. Agricultural education institutions may not be allowed to obtain additional resources through advisory or commercial activities, although this situation has changed in recent years in some countries (Diao and Hazell, 2004; Dorward et al., 2004).

In general, the technical and vocational level institutions are the ones most closely tied to government policy and control (Alam 2008a and Doward et al., 1998). In contrast, agricultural faculties which are part of comprehensive universities usually enjoy the greatest level of freedom regarding government policy. The disadvantage this often brings is their difficulty in establishing and maintaining links with research and extension (Dixon et al., 2001).

Data

Data used for this paper are two kinds as nature. One group of data is used to understand the contribution of agriculture sector for the economy of Bangladesh; the other group is used to understand the role of education for the development of agriculture economics. Data used understanding the discourse of agriculture and economics are collected through established secondary sources mainly from Bangladesh Bureau of Statistics (The only public owned body for collecting data and maintaining statistics with the production of huge number of reports). These data are used for discussing and analyzing sections 4.1 to 4.4.

The data used to understand, the role of education on the development of agriculture sector are collected through few field researches conducted by the International Labour Organisation (ILO)(A unit of United Nation working to ensure decent work for every one with an ambition of raising productivity of every worker through education and training) and BRAC (The world largest NGO working to reduce the poverty of the poorest of the poor having head office in Dhaka, Bangladesh with many operational offices in South Asia and Africa). The first author of this paper was one of the key coordinators of these researches. The main focus of those researches was to understand the key economic sector and the major employers in Bangladesh. Theses projects also looked; how education system in Bangladesh can enhance the progress of those key economic sectors. Those researches collected data conducting survey at household of the different villages in Bangladesh. Demographical, occupational, education and other issues are purposefully but scientifically considered for selecting those particular villages in order to ensure diversity with prejudice free. Instrument used for this survey was questionnaire that identified the respondents' professions, types of job involved in, income of respondents and their families, education and training level, and the need and use of education and training for implementing the tasks. Moreover, focus group discussion was conduc-

ted identifying different groups and clusters. Some in-depth semi structure interviews were conducted that includes following people: policy makers of the country; policy; makers of the education and training provisions; policy makers of agriculture provision; teachers/ academics and social elites; farmers (involving with different kinds of farming with various levels and types of education); students (studying different kinds of education institutions with a variety of courses and programmes).

The data gained through the survey, focus group discussions and interviews are used from sections 4.5 to 5 for the discussions and analysis purpose. Moreover, data from secondary sources supplements where necessary.

FINDINGS AND DISCUSSIONS

Before answering the specific research questions outlined at introductory section, let us put forward some general information regarding labour force employed at agriculture industry and their income providing statistics as this will help to understand further discussion and analysis.

Occupationally, 75% of the civilian labour force, which is currently estimated at 56 million, is directly or indirectly engaged in agriculture. Only 12% is engaged in industry. Unemployment is estimated at around 18.5% (BBS, 2005) . In terms of age structure, it is more youthful than in the western countries. Heavy pressure of population on scarce land has no doubt created an extremely unfavourable land-man ratio.

Coupled with this is the problem of unequal distribution and heavy fragmentation of land in the rural areas. This is expected to improve with more vigorous efforts at poverty alleviation and raising of educational and social consciousness. Sluggishness of the agricultural sector has resulted in its increasing dependence on the whims of nature and the per capita daily availability of food grains coming down to low level of 432 gram. Nearly 45% of the people live below the poverty line.

As the country steps to the 21st century, it aims at accelerated economic growth, human resource development and self -reliance. Central to all the efforts to reach those targets will be poverty alleviation, rural development, involving women in all national activities and creating a well-educated healthy nation to be able to face up to the challenges of a fast moving technologically advanced global society.

Past scenario of agriculture sector

Until mid 1990's the pattern and style of agricultural industry followed the same road that was followed in early 1950's (Ahmed and Donovan, 1992) . A rapid movement to livestock, readymade agro food and other modernization of agricultural products takes place with low level of technology and no high-tech manpower and research.

Agricultural holdings in Bangladesh were generally small (Ahmad, 1987). Through cooperatives, the use of modern machinery is gradually gaining popularity. Rice, Jute, Sugarcane, Potato, Pulses, Wheat, Tea and Tobacco considered as principal crops were only cultivated earlier. No attempts were made to establish to agro food, readymade food and agro processing industries. The crop sub- sector dominates the agriculture sector contributing were main of total production. In the 1990's, fisheries, livestock and forestry sub-sectors were 4.67, 7.67 and 3.4% respectively.

Bangladesh was the largest producer of Jute (BBS, 2005) . Rice being the staple food, its production is of major importance. Rice production stood at 20.3 million tons in 1996-97 fiscal year (BBS, 2005). Crop diversification program, credit, extension and research, and input distribution policies pursued by the government are yielding positive results. The country is now on the threshold of attaining self-sufficiency in food grain production (Islam, 1997).

Agriculture dates back to 9500 BC when farmers in the "Fertile Crescent" of Southwest Asia first started to deliberately cultivate certain crops (Abramotive, 1986) . In the middle ages, the industry took a leap forward with the advent of irrigation and crop rotation. Finally, in the late 19th and early 20th century, new technology such as the tractor greatly increased the speed of crop production, as well as the scale of the harvest (Karim, 1997, Faruque, 1998) . Whereas before greater than 50% of the population was engaged in agricultural activities, that number has been reduced to the current figure of less than two percent for industrialized countries. However despite all the increases in technology, the basic ideals behind agricultural production remain the same: to provide food for oneself and others by planting crops and raising livestock (Alam 2008a and BBS, 2005).

Present scenario of agricultural sector

Meeting the nation's food requirements remains the key-objective of the government. Although, in recent years there has been substantial increase in grain productions (World Bank, 2002), it is dream for Bangladesh now to earn foreign currency through the export of agro products. However, due to calamities like flood, loss of food and cash crops is a recurring phenomenon which disrupts the continuing progress of the entire economy (UNDP, 2002, United Nation Population Division-UNPD 1999, United Nation, 2007).

The current agriculture industry is composed of enterprises involved in animal or crop production, as well as those performing related support functions such as research and development, labor contracting, and pest and disease management**.** The animal production segment includes not only the standard beef, dairy, chicken,

or pork farms, but also apiaries (bee farms) and aquacultures (fish and seafood farms). Similarly, plant production comprises not only food crops but green-houses, nurseries, and field crops such as tobacco, tea or cotton (World Bank, 1995).

In recent years, the fisheries and livestock sector have been playing an increasingly important role in the economy uplift efforts of Bangladesh. Those are labour-intensive and quick -yielding sector which augments growth and alleviates poverty. Around 1.3 million people are directly employed in the fisheries sector alone (BBS, 2005).

The country has immense natural potential for developing the fisheries sub-sector. The sector contributes 3.3% of the GDP and 10.33% of the agriculture sector. The sector includes open water bodies such as rivers, canals, lakes, etc. And closed water bodies such as ponds and flood- control polders totalling 4 million hectares (BBS-2005, Ministry of Agriculture, Bangladesh). Almost 80% of the country's protein require-ment, around 70% of exports in the primary commodity category and almost 9% of total exports come from these sub-sectors. The sub-sector marked a continuous annual growth of 8.6% since 1996 (BBS, 2005). This increase is due to both Government and private initiatives (Alam, 2008b). Fish production increased to over 1 .4 million during 1997-98.

The Government is providing various incentives to the sector like offerings infrastructure, credit, research and extension facilities. Different NGOs are also undertaking programs to motivate and train fishermen and thereby raise production. Hatcheries are being set up through private initiatives. Bangladesh Fisheries Development Corporation is providing marketing and storage facilities to the fishermen and fish traders.

With an annual growth rate of over 8% since 1993, the contribution of the livestock sub-sector to GDP and the agriculture sector as a whole is currently 3.2 and 10.11% respectively (BBS-2005) showing much potential to develop as a commercial sector with employment and income generating opportunities both in the rural and urban areas. A large number of enterprises-cattle, poultry and dairy farms have grown in the private sector in recent years.

Shortage of Livestock products is attributed to the prevalence of diseases, poor quality of animals and feed shortages. Under the public sector, improvement of the genetic quality of existing stock is currently carried out through establishment of breeding stations and cattle raising units and a wide network of artificial insemination services (Ahmed, 1987) . An extensive program has been undertaken for fodder cultivation under which much improved seeds and seedlings are being distributed to the farmers, the NGOs and the private farms.

Agriculture is, at the same time, an old and new industry; it has been in practice for thousands of years, but the manner of production has changed dramatically in recent years (Alam, 2008b). The invention of advanced agricultural machinery has enabled farms to supply much more food with a much smaller workforce, though some planting and harvesting tasks still require numerous workers, and livestock establishments require some labour year-round. There is also a difference in the manner of sale of the product: with the exception of some roadside produce stands or subsistence farming, most farms or ranches sell their crops or meat and/or dairy products directly to a processing plant or grocery establishment

Why does this difference occur?

Currently, agricultural industry is slowly moving from cultivation to animal rearing. Natural calamity and disaster can hit and make damage cultivation easily than animal rearing. Although, some difficult diseases sometime make the framers frustrated, they still strive to prevent or to cure. But not only diseases but also natural disaster can completely destroy the cultivation of crops (Alam, 2009). These days, farmers of Bangladesh (a country known for its natural disaster) are not willing to take such challenges against natural disaster. Pre and post disaster management system is weak in developing countries (Abrar et al. 2004). Moreover, no insurance or subsidy is provided for the affected farmer by the natural disaster.

Earlier, farmers did not have any education (Adelman, 1984). These days, education is an increasing trend and unemployment rate amongst primary and secondary graduates are higher (Alam and Shahjamal, 2008). So currently, many primary, secondary and even tertiary graduates without jobs are forced to join as workforce to agriculture sector (Alam et al, 2009). As the childhood of these graduates was passed under the shadow of school building, they can not cope with heavy sun, rain and thunder involved with the cultivation process at field under the open sky. This motivates them to search an alternative form of agriculture. This may provide them employment allowing country to earn a little foreign currency, but production of food and crops are seriously being affected resulting food crisis for the country (Alam and Khalifa, 2009).

Constraints for the development of agriculture sector

High levels of rural poverty

Poverty in Bangladesh is primarily a 'rural phenomenon', with 53% of its rural population classified as poor, comprising about 85% of the country's poor. Achieving the Millennium Development Goal (MDG) of halving poverty to 26.5% by 2015 will require a growth rate of at least 4.0% in agriculture and 7.0% in the non-farm sector (Islam 1997; Alam, 2009). However, economic and institutional realities, the country's geographical and demographic characteristics, and its vulnerability to natural

disasters, make this a very challenging task. These people are involved with the agriculture and they lack the funding to invest. With almost no subsidy for government or in some case high interests rate imposed by the bank, people cannot do framing and having a less productivity (Alam and Rahaman, 2008).

Low agricultural productivity

Another challenge is rapidly shrinking land base. While the country's population is growing at the rate of 1.6% per year, demographic pressures and increased urbanization have caused cultivated area to decline at a rate of 1% per year (Alam, 2008b). As cropping intensity has approached its limit (about 175% now), growth will need to come from intensification of cereal production, diversification into high-value crop and non-crop activities, and value addition in the agro-processing sector, including storage, processing and marketing (World Bank, 2002). This will require reforming the agricultural research and extension systems, and financial and other regu-lations. Land administration and security issues also need to be addressed.

Poorly functioning input and output markets

The lack of easily accessible markets and collusion by the traders pose significant constraints in both agricultural input and output markets. Marketing margins are high relative to services provided. Lack of market information and infrastructure, the poor law and order situation, the existence of syndicates, and collection of illegal tolls further aggravate the situation.

Marketing of agricultural commodity is inextricably related to its production. But the Department of Agricultural Marketing (DAM) remains as the weakest of all the existing organizations in the agricultural sector. Markets for the agricultural commodities are generally under middlemen's control, which is very discouraging for the farmers. This is not at all favorable for boosting agricultural production.

Lack of enabling rural investment climate

For nearly 45% of the rural population, who are already landless or functionally landless (owning less than 0.05 acre of land), and a majority of the new labor force every year, a declining land base and a small urban employment means that employment in the rural non-farm sector presents the best chance to escape poverty (BBS-2005). The growth of the rural non-farm sector, however, is constrained by lack of or poor quality of rural infrastructure and services, highly centralized government framework, weak rural financial systems, and a poor law and order situation.

Weak rural institutions

While the NGO sector in Bangladesh is well developed and the quality of informal institutions is improving, formal rural institutions remain very weak. Government agencies at all levels face overlapping functions, lack of coordination, low skill levels and incentives, and lack of responsiveness, exacerbated by an urban bias. Elite capture is also quite common in rural areas.

Vulnerability to natural disasters

Bangladesh is the terminal floodplain delta of three large rivers - Ganges, Brahmaputra and Meghna. Every year about 20 to 30%, and every few years about 40%, of the country is flooded, causing serious damage to infrastructure, crops and the overall economy. Projected climatic changes and rise in the sea level are likely to worsen the situation. Since independence in 1971, the Government has made large investments to protect against floods and cyclones. However, issues such as public and private roles and community participation in disaster management, environmental protection, and institutional reforms of Bangladesh Water Development Board (BWDB), need to be addressed.

In conclusion of this section, we note that constraints for the development of Bangladesh agriculture sector are manifolds such as: Agriculture is dependent on the vagaries of nature and is risky; Arability of cultivable land is decreasing; Lack of proper land use planning; Widespread poverty among the population engaged in agriculture; Lack of required capital for agricultural activities; Agricultural commodities are rapidly perishable and post harvest losses are too high. While these are the barriers, there are many opportunities. These are: agriculture sector is the single largest contributor to GDP; Crop production system is highly labour intensive and there is an abundance of labour supply in the country; Agriculture is the largest source of employment for skilled and unskilled labour; Favorable natural environment generally exists throughout the year of crop production; Wide range of bio-diversity exists for different crop; Different crops agricultural commodities are the main source of nutrition, including protein, minerals and vitamins; Agricultural commodities have comparatively higher value added than non-agricultural commodities.

These opportunities will only be functional if Bangladesh can produce skill manpower with a high tech agro technology. This would be impossible unless Bangladesh can ensure a substantial agriculture education in Bangladesh.

Situation of agriculture education

This is fundamental part of this paper. This part analyses the current situations of agriculture education, training

and research in Bangladesh providing some accounts from past. 58% of respondents with an age range 16 to 35 involving at farming went to a primary education, 21% went to secondary education, and 10% also completed secondary education. It is also found that a significant portion of population living at village with higher secondary, graduation and post-graduate certificates are also involved with agriculture as part time while they engage with their other professions (that is, teaching, clerical works, health workers, carpenter, pipe fitter, auto-rickshaw drivers). Productivity of the firms managed by higher educated group is higher than the firms managed by less educated group. It is also found that since educated group are well advanced; they know better business technique than their counterpart. Sometimes, they also deprive the less educated group through different kinds of diplomacy.

56% of respondents with an age range 36 to 55 involving at farming had no education, 32% went to primary education, 8% went to secondary education, and a very few of them completed secondary education. The work performance of this group and income potential are far behindhand than the group with an age range 16 to 35. Now, question may be raised, why agriculture currently share less GDP than before since more productive people are involved in. In point of fact, total income of agriculture sector is not declined rather increased (Table 3 and Figures 1 and 2). But income of people involved with various progressive business sectors (that is, IT industry, Bank, Education, Housing, NGO, Electrical and Electronics industry) has dramatically increased (Figures 1 and 2). This forces a lower level share of GDP through agriculture. This also resulted to a very comfy life for small portion of people while the large portion of people involved in agriculture are passing very hardship with continuous deterioration. This circumstance is developed because of huge imbalance of income of these two groups (high earning and low earning) losing the buying capacity of the poorer group through increase of cost for fundamental goods. If this circumstance continues, it will not only halt economic development but will also bring social decadence.

Let us see the problems with the education system that are also responsible for this unwanted circumstance. Education and training provided through formal and informal provision have been trying to bring some changes but the success is very apathetic. The discussion that follows includes different types, level of educacations' contribution towards development of agriculture.

Primary education

Findings show that major part of the population employed at agriculture earlier is the school leavers from the primary level. Primary school system never offers any courses on agriculture education (Alam, 2008b). However, the gravest frustration is that the course contents of the primary education do not include anything asserting farming as a noble profession at least and farmers of Bangladesh are sacrificing significantly (Alam et al., 2009). While Bengali medium schools have a few motivational words for agriculture professions, English medium schools insults farming profession in many ways. If the children are not taught to be respectful to every profession, how we can desire a distinct national character amongst our populations; let alone the development of farming profession (Alam 2008a, b). Within the current situation, primary education makes the children less motivated towards agriculture. It also makes them disrespectful to many others professions. This attitude threats not only to economic development but also to social development.

Secondary education

The employment rate of secondary graduates and secondary school leavers is significantly high at agriculture industry with an increasing leaning (Alam, 2008). Earlier, there was an optional subject named 'agriculture science' for male and 'home economics' for female at secondary education level (Bangladesh Bureau of Educational Information and Statistics, 2007). Policy priority to Technical and Vocational Education and Training (TVET) has already taken out these optional courses from the secondary education system (Alam, 2008a). While TVET has taken serious attention for education policy formulation, TVET is only concerned providing training and education with an aim of exporting manpower. Within the current climate, I agree that there is need to export trained manpower to accelerate the income of foreign currency. But Bangladesh is more than equally needed the skilled workforce inshore (Adelman, 1984; Atkinson, 1997). Praiseworthy to note that the countries hiring people from Bangladesh must produce some products by this workforce. These products serve those countries internal needs and surpluses are exported to other countries even to Bangladesh (Alam, 2009). Thus, producing of such goods and export those to other countries are more profitable than simply to export manpower (Bliss and Stren, 1978). However, this needs a long term plan, mission, and vision with a firm commitment.

Higher education

Eventually, higher education system has long history, heritage with a well setup for agriculture education. Along with few universities, many diploma level institutions with huge land and infrastructure are working in the area of agriculture education (Alam, 2008b). Recently, private education provision is also working for diploma level agriculture education (Alam, 2008a, b) with poorer resources and infrastructure. Graduates of these diploma

institutions are not directly involved in agricultural profession. They play a supervisory role to farmers with snobbish attitude. Interview data reveal that these graduates have no practical experience or empirical knowledge on farming. They live far isolation from the farmers as the part of ruling elite. While diploma graduates are at agriculture professions, many of the university graduates are not even bothered working at agriculture sector. Significant portion of university graduates at field of agriculture used this certificate to enter to public service commission (that is, policing, administrative, taxation, revenue and customs) as obtaining high score for public service examination is easier through these subjects (Collier, 2002; Alam, 2008b) . Moreover, many of them also used these certificates for overseas emigration (Australia, Canada) where they are in demand. Emigration to overseas and the employment to other professions do not provide any return for the investment to education rather provide a reverse return (Barro and Sala-i-Martin, 1995; Alam et al., 2009). Few graduates are also working at the public owned agriculture research institutes with almost zero productivity.

Training

Formal education system deprives agriculture education that develops the abhorrence to agriculture towards students. Rigorous efforts and endeavors made by non formal provision using training as an instrument to those graduates (graduates who are already victimized from formal provision) do not enjoy a greater success since students suffer from 'diploma disease'. Huge investment made through Ministry of Youth and Sports (MOYS) and Ministry of Agriculture (MOA) to provide training on agriculture has been contributing very little with an increasing trend. While MOYS's training concentrates on livestock rearing, training of MOA focuses on seeds and crops. Both of the providers heavily emphasize on theory, practical orientation is rather limited. Unfortunately, due to political commitments and pressure from donor agencies, a new policy advocates the shifting of the agricultural training to trade based training that are needed for the export of manpower.

BOU, BAU and NGO efforts

In total 18 programmes are offered at present from the different schools. The present number of students enrolled is about 300,000. School of Agriculture and Rural Development of the Bangladesh Open University (BOU) is actively engaged in educating people of the rural areas of the country with the help of modern technology of agriculture to boost up production of different agricultural commodities including field crops, poultry, dairy and fish. Non-government organizations (NGOs) in the country are also working tirelessly to educate the farmers with modern techniques of production. Bangladesh Agricultural University (BAU), Mymensingh along with several other colleges and universities of the country has been producing agriculture graduates who join the Department of Agriculture Extension to work as extension officers in order to transfer the updated technology to farmers. There are several research institutions in the country to do search in finding out solutions of local problems of farm production. But to reach the huge mass associated with so diversified fields of agriculture is not an easy task.

Course and curricula

The following writing analyzes the process maintained in designing the course and curricula for agriculture education offered by different types of providers.

Training provision

Only the non-formal providers working under the NGO, MOYS and MOA offer some kinds of training for the farmers or for impending farmers. The training programmes include the production of crops, storage of crops, pest control and management, livestock rearing. Recently, NGO provision is also working in the area of disaster management. The course curricula are theory burdened with a focus of western way for problem solving. While Bangladesh still uses low technology with poor economic structure, these westernized theories can not be taken into practical level to implement. Training providers verbalize that with the limited academic capacity and resources, they are unable to design own course curricula resulting dependency to Bangladesh Agriculture University (BAU). One respondent observes that BAU failed to supply a course curricula suited to local need. She opined that "the current function of BAU is a facilitator with no power or capacity to moderating or adding. BAU is the supplier of western theory, so we are providing theory burden training to the trainees. I personally feel that we sometime waste the time of the learners. But I really can do nothing except doing it as my job". Thus, policymakers may need to consider the influence of higher education and research on other levels of education and training in formulation of policy.

Primary and secondary provision

Attempts made by different training provisions are trying towards the goalpost. Primary and secondary provisions completely ignore the need of agriculture education. Rural primary and secondary graduates are mainly involved with agriculture sector. Thus these graduates are needed to offer courses on agriculture ensuring the multi diversities. It can be argued that primary graduates cannot be provided with field level of agriculture training.

Indeed, but no harm to offer them agriculture ethics and value courses with some food for thought for agriculture professions. Since offering courses on agriculture education is currently stopped at secondary levels, so discussions on existing practice on curricula design process is no longer relevant.

TVET

Technical and Vocational Education and Training institutions under Bangladesh Technical Education Board (BTEB) offer courses on agriculture. The target student population of these institutions is the dropped out group from general Secondary provision. These students use TVET system is as an effortless gateway to have a certificate. Since the students suffer from 'diploma disease' some unproductive theory burdened courses are being offered under the guidance of BTEB. Currently, a major TVET reform is in progress. Surprisingly, the TVET reform project funded by the European Union has not given any preference for the development of agriculture education. Instead of providing high priority to agriculture education, international consultants of the project are advocating taking out agriculture education from TVET system. One local expert of TVET commented "the TVET reform project was guided and controlled by so called foreign (international) experts who have either no idea on Bangladesh economy or even at TVET well, so what else we can expect from them; except losing our economy damaging our education system. But we hardly can change anything except paying more money to international consultants as the recruitment of international consultants is fundamental policy for donors". National policy makers would address this issue.

We must confess that there is a dearth of local competent experts but international experts with less-ability and with a low level of ethical value and bondage to developing world are not the real elucidation.

Higher and diploma education

Higher education is provided by the universities and the affiliated colleges/ institutions. There are few specialized universities/ institutions working at the field of agriculture. Most of them are located at urban areas providing access for the students from ruling elite group. These students neither want to be a farmer nor belong to the farmer community. This situation forces a theory burdened courses reflecting the colonial administrative view. Professed agriculturists and graduates from these universities are catered with a view to be an administrator. This attitude causes a discourteous higher education for agriculture with almost no researches. Course and curricula of agriculture higher education lack proper practical orientation with no obligation to agriculture ethics and law.

Affiliated colleges and institutions working under National University are located at rural area with the coverage of 90% of total higher education student population. Most of the affiliated colleges and institutions are located at comparatively remote and rural areas. Many of the students studying at the affiliates and lecturers are part time farmers. Unfortunately, no agriculture education is offered by the national university and its affiliates. The graduates of national university study very traditional subjects (History, Bengal, Islamic Studies, Arabic literature) as their academic quality (Students are from poorer family background. Ruling elites continuously deprive them primary to higher education so they fail to prove as able students) is below standard to study a saleable subject or a subject that can provide an employment at high earning GDP industries.

Some of the diploma institutions are working under BTEB. BTEB is monitored by the Directorate of Technical Education with a rigid supervision of Ministry of Education. A few agriculture institutions are also operating under the Ministry of Agriculture. BTEB is an academic organization having a long experience on pedagogy and examinations quality control, but no experience at the field of agri-culture. So the design and delivery of process of courses and curricula for agricultural education are not exempted from faulty. Diploma institutions working under the Ministry of Agriculture while can be benefited form some practical experiences of operation, lacks with many mechanisms and process that are involved for quality education.

Agriculture Teacher training and practical orientation

Within the current climate, it is found that there is no teacher training process involved as part of teacher education for the teachers involved at agriculture education. Moreover, teachers are not involved either directly or indirectly with agriculture industry. No industrial attachment for teachers and no apprenticeship programme for students are currently considered as part of study. This circumstance provides a non-practical education system remaining the system far away from the reality.

Administrative constraints for agriculture education

Currently, the institutions working at the area of agriculture education are controlled, monitored and guided by many directorates and boards under the administrative control of various ministries. They are mainly Ministry of Education, Ministry of Agriculture, Ministry of Youth and Sports, Ministry of Labour and Employment, Ministry of Livestock and Ministry of Disaster Management, Ministry of Primary and Mass education, NGO Bureau etc. Under all these ministries, directorates are engaged to control and monitor the boards, while boards control and monitor the providers. There is very high level of bureaucratic

management approach with almost no inter -ministerial coordination, collaboration and supports let alone the directorate and board level. Instead of coordination, they experience a high level of conflict resulting many cumbersome. Huge overlapping amongst the providers in offering courses and programmes targeting the same group of population presents less or negative return from agriculture training and education (Alam et al., 2009).

Consequentially, many students receive same kind of training multiple times from different providers, but unfortunately sudden change of economy, circumstances and professions; these trainings are not in use or in very little use. Situations can be changed by better coordination amongst the ministries in association with the Ministry of Finance and Planning as it plays vital role for national policy direction towards economic and social development goal.

CONCLUSION

This concluding section tries to identify some key constraints experiencing within the education and training system in Bangladesh that impede the system function effectively. However, following suggestions are made bearing in mind that education and training system do not work at isolation; so problems experiencing with other sectors or overall politics and culture of the country may obstruct the proper implementation of the suggestions. Full or partial implementation of these suggestions will take a long way of agriculture education of the country.

Suggestions will be made at next section for the development of agriculture education from primary education to higher education serially with highlighting the problems and problem solving.

Suggestions to address key constraints

Primary education

Findings confirm that many people involved with the agriculture sector are primary graduates or school leavers. These days, mammoth attention to primary education would reduce the drop out rate from primary education. So students will join with agriculture with some forms of secondary education. Moreover, students studying at primary level are too babyish to provide agriculture trade based or practical education on agriculture. Thus, it would be appropriate to foster motivation towards agri-culture education providing some moral and ethical issues of agriculture education and the contributions of agri-culture and farmers for the development of Bangladesh with a historical account. Some kinds of lessons on disaster management and pest controlling would help the children to protect them. Moreover, they might be able to carry this learning if they join training on agriculture at later part of their life.

Secondary education

Many secondary graduates and school leavers are involved with the agriculture professions. Students at rural areas in Bangladesh usually start education late thus these students studying at secondary provisions from villages are mature enough to undertake trade based practical education on agriculture. Identifying the need, merit and interest, a wide rage of agriculture trade based courses should be made available for the secondary students. Students taking agriculture courses are needed to pro-vide some kinds of incentive as they are from poorer family background. However, caution steps are required so that system should not stop the pathway to higher education for them. System must be friendly and wider for them so that showing genuine intention and good performance, anyone can enter into higher education.

Diploma education

Diploma education programme on agriculture lacks practical training. Course and curricula are theory burdened. New courses and curricula need to be deigned responding to local economic need and employment pattern. Students must be taught a variety of subjects apart from trade based course likely agriculture ethics, value and agro economics. The job profiles and roles and responsibilities for diploma graduates need to be revised.

Within the revised versions, it needs to be ensured that diploma graduates are involved at farming process.

Higher education

Problems with agriculture higher education are manifolds. The universities and institutions working at area of agriculture higher education lack research environment. This develops an overall weaker agriculture education and training system. Development of agriculture always requires local research as the development of agriculture depends on many local factors (that is, soil, weather and climate, water, construction of land, behavior of rivers, science and education, local technology cannels, history, indigenous skills, genetic food habit and many other issues), subsequently research in agriculture should be updated and modern.

It is also important to rethink to introduce some trade based agriculture courses at the affiliates of the national university since many students and teachers of these affiliated institutions are part-time farmers. Students of these affiliates will remain be farmer even after their graduation as part-timers as they try to search employment adjacent to their villages.

Training and BOU programme

Currently overlapping of the training provided by different

kinds of providers is the major concern. This needs to be addressed through better coordination.

In conclusion of these subsections, we note that currently a lack of inter-ministerial coordination is the main concern for the development of agriculture education that needs to be addressed. Moreover, inter- coordination amongst directorates working under different ministries need to be improved. Both internal and external governance and regulatory control of micro and macro levels institutions need to be improved through formal and informal provision of governance with assuring accountability.

Further research

In order to receive a greater output through the implementation of these suggestions, researches need to be conducted to understand:

i) The common trades at agriculture sector and types and category of professionals need to do this particular trade.
ii) The ratio of part time farmers studying with the affiliates of the national university.
iii) The role model for agriculture ethics course for Bangladesh.
iv) The ways and management model and approach fordecent inter-ministerial and bodies coordination and collaboration.
v) The decent governance and regulatory mechanism for macro and micro level through formal and informal provisions.

Concluding remark

Policy-makers consistently fail to follow any of the suggestions made or, at best, partially implement them. A comprehensive solution continues to be elusive whilst the prevailing culture of corruption and political influence prevents the effective implementation of polices. Suggestions emerging as a result of this paper follow, however, we wish to emphasize that their straightforward and direct implementation may not fully address all of the existing problems. However, we firmly advocate that, if a transparent and open policy structure could be achieved and political interference minimized, the suggestions could go a long way towards solving at least some of the problems facing agriculture education in Bangladesh.

The agriculture education system cannot operate in isolation. The above suggestions identified overall actions that need to be taken by the sector, but highlighted potential areas for improvement across the entire state education system. In order to ensure a better policy in place, policy makers be competent to understand following common principles.

i) Increase of a sectoral income (slow or steady) may not be able to increase the percentage share to GDP, if any or few sectors of a country suddenly or dramatically improve/increase their income potential resulting a higher percentage share to GDP (Table 3 and Figures 1 and 2).
ii) Unparallel increase of income of a particular group of people involved at higher earning professions forces low earning group to have a hardship life since imbalance economic situations exist. Only an outstanding fiscal policy with a decent way of implementation can provide a balanced national economy (Table 3 and Figures 1 and 2).
iii) Increase of GDP of a nation may not be able to provide a better life for the majority of people; if the competitive nations are able t o increase more GDP than the counterparts. This will happen because people use global products these days due to globalization and free economic trade. So currently economy of a nation does exclusively not depends on GDP only rather it also depends on the share of GDP to Global Income and Service (GIS).

In conclusion of this paper, it is our wish for legislators to consider some of the suggestions put forward to assist agriculture sector function effectively. We believe that legislators are the central solution to the problems experienced within the sector. They need to take radical decisions and initiate the design of well-timed and workable policies. They should monitor the best practice of any policy designed. Beforehand, legislators should initiate and conduct extensive research in identifiable areas, focusing on specific issues. This will help with their design of good policy.

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