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# Export Readiness Analysis of Bangladesh's Vegetable Sector: A New Opportunity for Agribusiness Entrepreneurs

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**Abstract:** Bangladesh's economy has recovered from the harm done by COVID-19 and the ongoing crisis between Russia and Ukraine, but the country's growth has been negatively impacted by the recent slowdown in the global economy. In the fiscal year 2018-19, which preceded COVID-19, Bangladesh experienced an economic growth of 7.88 percent. In FY 2019-20, this growth rate dropped to 3.45 percent during the COVID-19 period. It then increased to 6.94 percent in FY 2020-21 and 7.10 percent in FY 2021-22. In FY 2022-2023, 484.98 lakh metric tons (MT) of food are to be produced. A total of 458.96 lakh MT of food was produced in FY 2021-2022. The quantity of food grains supplied to the public sector in FY 2021-2022 was 30.77 lakh MT. Food grains were distributed in an amount of 19.36 lakh MT during the current FY 2022-2023 through February 2023. Agriculture now receives Tk. 16,000 crore more in subsidies. Funds totaling Tk 12,660.78 crore have been made available to support fertilizer and other agricultural initiatives through February 2023. In an effort to determine the level of export readiness for vegetables in Bangladesh, this study carefully examined the sector's production and export performance, the difficulties that come with exporting vegetables, problems with the supply chains both forward and backward, and the requirements at the export destinations. It also evaluated government policies aimed at resolving supply-side barriers to vegetable exports. In contrast to RMG exports, Bangladeshi vegetable exports are not primarily focused on the EU and US markets. This study also identified some of the problems and constraints associated with exports, and some recommendations were given for policymakers and the governance of this sector.

**Keywords:** Vegetable; Economy; Export; Agriculture; Bangladesh.

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## 1. Introduction

Bangladesh's exports have increased dramatically in the last ten years. Exports reached \$5.03 billion in June 2022-2023, a 2.51% annual growth. In the recently ended fiscal year, earnings from the shipment of goods increased 6.67 percent on an annual basis to \$55.55 billion. Bangladesh reportedly received the highest amount of export revenue ever \$55.55 billion during the whole fiscal year 2022-2023. It is also imperative that we diversify our export base in terms of product category. High export potential agricultural and agro-based products make them excellent candidates for such an endeavor (EPB, 2023). Bangladesh produces a lot of agro-based products and has seen significant agricultural growth over the past three decades as a result of the adoption of good agricultural practices (GAPs), the modernization of production and harvesting processes, and the application of more advanced and sustainable technology (BARC, 2020). By increasing farming area and productivity at the same time, the nation is currently self-sufficient in the production of grain staples. Vegetables, among other agricultural products, are crucial to maintaining food security and meeting domestic food demand. A large variety of vegetables can be grown in Bangladesh due to its tropical and subtropical temperature and soil. In Bangladesh, the agricultural GNP is derived from vegetables to the tune of 3.2%. The total amount of vegetables produced in FY 2012-13 was 10,964 thousand metric tons, compared to just 7,400 thousand metric tons in FY 2008-09. An optimistic indicator of this sector's export potential can be found in an analysis of Bangladesh's recent patterns in vegetable exports. Bangladesh exported \$44.67 million worth of vegetables in FY 2008-09; in FY 2013-14, that amount increased to \$47.54 million in just 5 years. Bangladesh exports a variety of vegetable varieties to over 40 nations worldwide, however the markets for these products are primarily restricted to Bangladeshi expat communities. Our fresh vegetable export market in FY 2013-14 was made up of the following countries: EU region 25.87% (UK 19.09%, Italy 4.83%, and others 1.95%), East and South-East Asian countries 15.07% (Malaysia 12.52%, Singapore 2.55%), South Asian countries (Sri Lanka) 3.67%, and Middle Eastern countries (66.3%). Middle Eastern countries accounted for approximately 46.3% of our fresh vegetable

export market in FY 2013–14 (Saudi Arabia 22.08%, UAE 7.67%, Kuwait 6.84%, Qatar 6.80%, Bahrain 1.65%, Oman 1.26%); EU region 25.87% (UK 19.09%, Italy 4.83%, and others 1.95%); East and South-East Asian countries 15.07% (Malaysia 12.52%, Singapore 2.55%); South Asian countries (Sri Lanka) 3.67%, and other countries 9% (BBS,2023).

From the early 1990s, Bangladesh has been involved in a number of production and export development programs due to the potential of the vegetable sector. However, a number of issues frequently plague Bangladesh's vegetable sector's output as well as its export performance. The industry is confronted with several challenges in both the home and international markets. For instance, import-related policies in the importing nations, supply-side limitations, supply-chain and value-chain problems, and other factors have all contributed to the export of vegetables from Bangladesh being restricted. Given this, a study that aims to analyze the Bangladeshi vegetable sector's export preparedness by identifying these barriers and offering solutions becomes extremely important (Hortex Foundation, 2023).

## 2. Objectives of the study

- a) To present an overview of the existing status and/or performance of the production and export of the vegetables sector of Bangladesh.
- b) To evaluate Bangladesh's institutional networks that assist the vegetable industry.
- c) To recommend a series of potential policy changes aimed at maximizing Bangladesh's vegetable industry's export potential.
- d) Evaluation of Bangladesh's vegetable sector's policy frameworks and tactics.

## 3. Methodology

The process for gathering disparate ideas and points of view in order to perform a study is described in the methodology. Following the correct protocols during study periods and ultimately achieving the study's objectives is made easier. This article was prepared without the use of any particular study methodology. Secondary sources have provided all of the information. It was put together with the aid of the libraries at several universities through in-depth analyses of numerous articles that were published in books, reports, periodicals, magazines, websites, and other publications.

## 4. Findings of the study

### 4.1 The vegetable sector's production performance & Bangladesh's agricultural output overall

One of Bangladesh's primary economic engines is agriculture. Over time, the nation's agriculture has improved productivity and diversified into high-value crops and non-crop agriculture, demonstrating extraordinary success. The goal for food grain production in FY 2022–2023 is 484.98 lakh metric tons (MT), up from 465.83 lakh MT in FY 2021–2022. The goal for domestic food grain procurement is 17.35 lakh MT in the FY 2022–2023 revised budget. 11.56 lakh MT of food grains were imported into the nation under government supervision as of February 2023. But the private sector imported 17.53 lakh MT in total 4.14 lakh MT of rice and 13.39 lakh MT of wheat. The total amount disbursed in FY 2022–2023 was Tk. 21,066.51 crore, or roughly 68.15 percent of the target, as opposed to the target of Tk. 30,911.00 crore until February 2023. In reaction to the effects of Corona, agricultural input subsidies have been raised, agricultural inputs have been made available, and the availability of agricultural credit has been expanded in an effort to boost productivity. In the FY 2022–2023 budget, Tk. 16,000.00 crore has been set aside for fertilizer subsidies and other agricultural activities in an effort to boost agricultural output, and Tk. 150.00 crore has been set aside for seed production initiatives to help farmers (BER, 2023). Fish production from both marine and inland water sources totaled 47.59 lakh MT in FY 2021–22; this figure is intended to reach 47.81 lakh MT in FY 2022–23. 32.04 crore dose vaccines for 17 diseases of cattle and poultry have been produced and administered in FY 2021–2022 in an effort to prevent various diseases and lower the financial risk of diseases. From FY 1973–74 to FY 2014–15, the GDP grew by 5.6 and 20.8 times, respectively, in the agriculture sector. During the period of 1973–1974 and FY 2014–15, the value of the agricultural GDP went from US\$ 5.21 billion to US\$ 28.92 billion, while the national GDP increased from US\$ 8.92 billion to US\$ 194.98 billion. Through FY 2010–11 to FY 2014–15, the Sixth Five Year Plan had an average growth in the agricultural GDP of 3.5%. Since the nation can now nearly feed its whole population with staples produced domestically, this has helped the nation attain food self-sufficiency (BBS, 2015).

Bangladesh's nutrition has improved in part because of Bangladesh's consistent improvements in diversifying its livestock, fish, and vegetable crops. Agriculture's 16.33% GDP contribution in FY 2013–14 was followed by a fall to 15.6% in FY 2014–15 attributed to the sector. Once again, with 44% of the labor force employed, agriculture is the industry with the highest employment rate, which helps to reduce poverty. It shall continue to be the cornerstone of Bangladesh's efforts to provide food security, nutrition, and poverty alleviation. The National Agricultural Research System (NARS) institutes, farmers, agricultural universities, government and non-government organizations, and development partners are just a few of the value chain actors who have made sincere and dedicated efforts to contribute to Bangladesh's remarkable agricultural growth. From low input subsistence to semi commercial to commercial agriculture with increased input consumption and high value produce output, Bangladeshi agriculture has been progressively changing. The adoption and dispersion of

technology must pick up speed in order to continue with this transition process. Bangladesh has developed its food grain production to the point where it is self-sufficient, although commercial farming still need assistance from the Government of Bangladesh (GoB).

Despite Bangladesh's strong performance in exporting vegetables to other countries, the vegetables sub-sector is plagued by numerous issues. To effectively tackle these issues, funding for market and value chain development, postharvest loss minimization, contract, group, and supervised farming and group marketing promotion, entrepreneurship promotion, and improved transportation and storage facilities will all need to be allocated to this subsector. Enhancing institutional capabilities to deliver necessary services to small farmers, traders, exporters, and other supply chain actors will also be necessary in order to develop demand-led value chains and strengthen smallholder farmers' market links. Improvements in technology adoption and dissemination will also be needed, as will investments in capacity development for managing the quality and safety of vegetables. To improve the lives of farmers, agricultural entrepreneurs, exporters, and consumers for their food, nutrition security, and, ultimately, export promotion, it is imperative to develop the functional and technical capacities of individuals (such as farmers, exporters, processors, entrepreneurs, agriculture researchers, and extension personnel), organizations, and an enabling business environment along with the knowledge exchange among the diverse actors in the agricultural value chain. Overall export results for Bangladesh Over US\$ 31 billion was exported by Bangladesh to the international market in FY2014-15. The national agricultural production and high domestic demand have played a significant role in this success, but the RMG alone is not to be undervalued. Given their 16% GDP share, exports are crucial to the expansion of the country's economy. The United States and the European Union were Bangladesh's top international destinations for its 729 items exported in FY 2014-15. Other countries that Bangladesh has yet to investigate for exportable produce include Africa, Latin America, and Russia and the CIS.

Of our total export revenue, just seven products accounted for about 92%. This suggests that the export portfolio of Bangladesh is quite limited. Exports of Bangladeshi goods, such as RMG, chemicals, and agro-processing products, would increase as a result of the WTO's recently ended Nairobi Ministerial Conference resolution to provide 25% local value addition for LDCs in the case of DFQF. Bangladesh's access to the international market would be increased by the decision on preferential market access. Being the third-largest producer of vegetables in the world, Bangladesh must take use of the tremendous potential for exporting vegetables to the mainstream export market by meeting the demands of import countries and foreign customers.

## 4.2 Production performance and trend

Table:1 shows that the total production of vegetables, which included pumpkin, brinjal, patol, potato, lady's finger, jhinga, bitter gourd, Arum, Puishak, Chichinga, cucumber, cauliflower, water gourd, tomato, radish, and beans Production rose dramatically showed a positive trend. A total of 721,000 acres of land were utilized for vegetable agriculture in FY 2004 – 05, according to data on productivity and area under cultivation. The area under cultivation for vegetables has grown over time; in FY 2011–12, there were 907,000 acres under cultivation. However, there has been a notable increase in production, with the output per acre rising from 2,607 kg in FY 2004–05 to 6,530 kg in FY 2013–14 as well as in FY 2021-22 [Agricultural Statistics Yearbook, 2008, 2010, 2011, 2012; Bangladesh Statistical Yearbook, 2009, 2010,2023].

Table 1: Product-wise data of yearly growth in vegetables production in Bangladesh in quantity (in thousand metric tons)

Year	Pumpkin	Brinjal	Potato	Patal	Lady's finger	Cucumber	Cabbage	Cauliflower	Tomato	Radish	Bean
2003-04	126	358	3907	41	24	25	129	101	120	211	59
2004-05	138	340	4856	61	26	24	142	109	122	223	61
2005-06	161	334	4161	61	33	28	176	138	131	229	73
2006-07	158	333	5167	68	39	32	183	139	137	236	83
2007-08	190	338	6648	70	39	37	211	156	143	267	83
2008-09	208	338	5268	72	40	44	206	153	151	257	88
2009-10	217	341	7930	78	42	55	220	160	190	260	89
2010-11	217	340	8226	83	43	48	207	168	232	257	95
2011-12	341	354	8205	86	45	50	213	166	255	260	94
2012-13	218	368	8605	85	44	49	200	166	251	252	93
2013-14	245	444	8950	48	45	55	217	813	360	252	110
2014-15	278	450	9254	84	52	57	259	268	414	271	122
2015-16	291	475	9474	86	54	60	296	268	369	281	129
2016-17	295	507	10216	86	55	71	213	278	389	281	137
2017-18	303	516	9744	85	56	65	321	274	385	281	135
2018-19	320	530	9655	54	-	73	331	307	388	308	144
2019-20	340	558	9606	91	56	83	384	283	415	287	170
2020-21	365	587	9887	98	70	95	380	295	448	316	170
2021-22	374	619	10145	110	85	100	395	342	442	322	170

Source: Statistical Yearbook Bangladesh 2010 & 2014 & 2023

*Table 2: List of importing markets for a product exported by Bangladesh (Mirror),  
Product: Fresh or chilled vegetables, Unit : US Dollar thousand*

Importers	Exported value in year									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total	21,141	19,459	20,289	18,584	17,231	13,171	8,080	12,822	15,607	9,403
United Kingdom	6,572	6,950	4,889	1,885	2,752	2,659	1,943	4,500	4,837	6,071
Italy	2,141	1,589	1,026	546	924	1,048	678	1,352	1,272	2,032
Canada	2	3	5	466	478	515	456	152	268	518
Germany	98	135	103	34	12	17	45	153	221	191
France	463	375	108	56	109	44	41	101	117	169
Malaysia	3,477	3,010	4,204	3,256	2,400	1,307	501	539	138	116
Sweden	113	75	62	14	7	3	14	57	49	93
Ireland	1	52	29	0	0	0	0	72	92	89
Malta	0	0	0	0	0	0	0	0	4	39
Switzerland	11	8	3	8	16	8	2	8	8	35
Singapore	14	26	41	35	43	29	21	58	24	17
Hong Kong, China	0	0	0	0	0	0	0	0	3	16
Netherlands	0	0	0	0	0	0	4	1	0	15
Belgium	1	2	2	0	2	0	0	5	1	1
New Zealand	0	0	0	0	0	0	0	0	0	1
Finland	0	0	2	1	3	0	0	0	0	0
Greece	176	169	70	29	23	91	38	38	27	0
Qatar	53	0		7	17	21	37	14	15	
Bahrain	895	1,405	1,636	1,575	1,412	924	164	524	285	
Brunei Darussalam	0	0	0	0	0	0	0	4	1	
Jordan	0	0	46	125	117	147	89	97	116	
Kuwait	2,988	1,413	2,421	3,207	3,864	2,263	2,075	2,225	2,816	
Lebanon	72	121	57	11	5	21	25	56	47	
Maldives	9	0	5	11	4	13	2	2	14	
Oman	351	440	384	442	475	600	305	153	18	
Saudi Arabia	561	616	2,336	4,175	1,551	772	7	314	12	
United Arab Emirates	3,143	3,070	2,860	2,693	2,858	2,605	1,633	2,397	5,222	
Belarus	0	0	0	8	159	84	0	0		

Source: Data from ITC Trade Map, 2023.

Table 3: List of products exported by Bangladesh , Product: vegetables and certain roots and tubers, Unit : US Dollar thousand

Exported value										
Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Other vegetables, fresh or chilled	1,398		2,211	30,615	28,987	32,159	26,072	12,290	21,532	27,175
Potatoes, fresh or chilled	14,641		18,642	11,254	15,052	8,602	9,393	16,454	16,325	17,870
Vegetables, uncooked or cooked	2,900		2,048	2,115	2,923	2,798	3,813	4,679	5,086	4,659
Roots and tubers of manioc, arrowroot, salep, Jerusalem artichokes, sweet potatoes and	0		21	811	848	2,294	1,583	1,307	2,400	2,289
Cabbages, cauliflowers, kohlrabi, kale and similar edible brassicas, fresh or chilled	23		0	1,129	1,447	1,663	608	202	3,408	2,274
Leguminous vegetables, shelled or unshelled, fresh or chilled	68		36	3,215	1,935	2,462	2,886	1,907	3,420	2,093
Cucumbers and gherkins, fresh or chilled	0		0	146	823	733	413	204	633	886
Dried leguminous vegetables, shelled, whether or not skinned or split	0		1,078	1,581	895	805	553	299	321	461
Carrots, turnips, salad beetroot, salsify, celeriac, radishes and similar edible roots, fresh . . .	0		0	19	34	224	199	112	327	146
Tomatoes, fresh or chilled	180		88	27	135	90	39	4	96	71
Vegetables provisionally preserved, e.g. by sulphur dioxide gas, in brine,	94,292		46,007	156	127	31	221	314	84	49
Onions, shallots, garlic, leeks and other alliaceous vegetables, fresh or chilled	53		2	510	2,588	3,068	538	45	58	38
Lettuce "Lactuca sativa" and chicory "Cichorium spp.", fresh or chilled	0		104	3	317	1,703	286	15	208	26
Dried vegetables, whole, cut, sliced, broken or in powder	114		12	4	28	30	45	9	10	6

Source: Data from ITC Trade Map, 2023.

## 5. Current market infrastructure for vegetables export

The standard and testing requirements set at the export destinations form the fundamental criteria for vegetable exports, and are therefore understandable, given that vegetables are highly perishable and frequently directly linked to health and food safety. A similar amount of attention should be paid to the sector's current domestic market infrastructure as well as the research of those limitations on the global market. Because the growth and export of vegetables depend greatly on having suitable infrastructures for marketing and distribution. According to Khandker et al. (2009), p. 685-722, effective transportation and product handling are essential for the trade of agricultural products, guaranteeing fair prices and reducing poverty in rural regions. Consequently, this subsection will endeavor to conduct an analysis of the information gathered from comprehensive interviews in order to pinpoint the existing domestic and international market infrastructure that influences Bangladesh's exports of vegetables.

### 5.1 Poor market infrastructure

The poorly organized market infrastructure for vegetables exported from Bangladesh was discovered through interviews with exporters, middlemen, suppliers, and farmers. The performance of vegetables as exports is hampered by the weak connections between the participants in the supply chain, such as farmers, input suppliers, and markets. Many Char, Hawar, Beel, and other rural areas of Bangladesh, as well as certain impoverished communities with inadequate transportation and infrastructure, are the primary producers of vegetables.

The inefficient distribution of veggies is significantly impacted, according to respondents, by the weak connectivity between these rural areas and the city of Dhaka. Due to a lack of an efficient marketing network, Bangladeshi vegetable exporters are mostly situated in Dhaka and often buy their veggies for export from wholesale markets like Shyambazar and Kawran bazar.

For this reason, these wholesale markets are essential to Bangladesh's vegetable export supply chain since they maintain product quality during packaging, pre-shipment handling, and shipping to domestic and international locations. Unfortunately, most of Bangladesh's wholesale markets are dilapidated, unclean, and devoid of contemporary amenities like cold storage rooms, warehouses, and adequate drainage systems (Hortex Foundation, 2018).

In addition, there's a dearth of sanitary areas for washing and storing veggies, thus fruit is frequently cleaned in contaminated or unclean water. They make it more difficult to harvest, store, and provide fresh veggies for export. Once more, the narrow roads leading to these marketplaces pose a significant barrier to huge vehicles like trucks used for the loading and unloading of produce containing vegetables.

### **5.2 Poor transportation system**

A handful of exporters are either directly linked to the vegetables production process itself or directly purchased from the farmers for export. But they are greatly hamstrung due to an absence or lack of prior transportation process in the country, such as absence of the Cool Supply Chain transport facility (including reefer vans), insufficient road access to the growing/production areas for large vehicles for loading and unloading etc., which often cause the loss of a large quantity of vegetables due to their highly perishable nature. Again, as opined by the stakeholders during the FGD, the poor road conditions hamper the proper functioning of reefer vans. All these results in the deterioration in the quality of vegetables. Respondents, during the interviewing, opined that even though quality of Bangladeshi fresh vegetables have significantly improved than it was 15 years ago, the problem of transportation actually eats away their profit margin, as about 30 percent of vegetables normally gets deteriorated or spoiled due to this nagging problem (Bhuiya, 2014). In most cases, vegetables are transported by open trucks, which leads to degradation in the quality of fresh vegetables. This problem could have been resolved through the introduction and the implementation of the cool chain maintenance system, which calls for government support and intervention, to transport fresh vegetables from the farms to the customs ports of export. It goes without saying that this will lengthen the vegetables' shelf life. However, it's also true that there are a lot of reasons why implementing this new system won't be simple. The approach will first increase transportation costs compared to using open vehicles. Second, as was already indicated, there is now poor road transportation from settlements to customs ports. The rural roads become muddy, especially during the wet seasons, making them nearly impassable, at least briefly. Third, the current means of transportation are not intended specifically for the transportation of vegetables. Fourth, exporters find it extremely difficult to get their goods to the Dhaka airport on time due to the constant traffic congestion on all main highways and metropolitan thoroughfares. However, it's also true that there are a lot of reasons why implementing this new system won't be simple. The approach will first increase transportation costs compared to using open vehicles. Second, as was already indicated, there is now poor road transportation from settlements to customs ports.

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### **5.3 Political Uncertainty**

In particular, exporters, who were among the respondents, stated that regular hartals, strikes, and other political upheavals impede and interfere with vegetable shipping. Truck drivers are advised to refrain from operating their vehicles during road blockades because trucks and vans are prone to burning. It's also getting harder to get insurance when a strike happens. If some drivers are discovered to be willing to operate a truck during those days, the truck fare that is asked in exchange for assuming such risks turns out to be extremely high (Hoq, 2012). It raises the price of exportable vegetable transportation. Once more, purchasers are reluctant to purchase veggies on certain days due to the disturbance in transportation caused by political instability. Additionally, because of the uncertainty, suppliers have decided not to accept any orders from exporters. The farmers are unable to timely harvest their produce as a result. Consequently, the quality of the vegetable's declines. In particular, during the recent political upheaval that persisted throughout the first half of 2015, this issue cost the vegetable producers and exporters the most amount of money (Chanda, 2009).

### **5.4 Delay and Cancellations of Flights**

According to several participants, specifically exporters, Biman Bangladesh Airlines flights are frequently delayed. Fresh vegetable quality is negatively impacted by these frequent delays in reaching their destinations. The national flag carrier,

Biman, has the ability to change or cancel its flight schedule at any time, hence exporters frequently suffer significant losses due to this uncertainty. Regarding vegetables, exporters also mentioned that because of Biman's frequent schedule disruptions, their regular monthly exports of thirty tons had dropped to twenty tons during the past three months (Hoq,2012).

Furthermore, several fresh produce importers shifted their business from Bangladesh to other nations like Malaysia, India, and Thailand, according to 2015 research by the Horticultural Export (Hortex) Foundation. A few of the main causes of this diversion are irregular supply, flight cancellations, and tardy arrival of flights at the airports of the importing countries, while one major reason is the restriction of imports from Bangladesh because of quarantine pests (Chanda, 2009).

### **5.5 Policies from the government encouraging the export of vegetables**

Through market development and crop diversification, the GoB has placed a strong emphasis on the production and export of vegetables, especially high-value agro-processed goods. In order to promote vegetable exports, the GoB provides assistance. For instance, it created and carried out the 1993 National Seed Policy (NSP), the 1997 Seed Rules, the 1993 National Agriculture Extension Policy, and the 1997 Integrated Pest Management Policy. The agriculture industry has developed overall thanks to the implementation of these measures. To ensure the quality of seeds, whether they are produced domestically or imported, the NSP and Seed Rules incorporated a number of restrictions.

Additionally, the processes for importing seeds have been streamlined. The NSP delineates and charts the distinct function of the Department of Agricultural Extension (DAE) in promoting and overseeing high-quality seeds to farmers. In the 2015–18 Export Policy, the government has once again designated agricultural products and agriculturally processed goods as a priority sector. As a result, these products will be eligible for easy-to-get loans, aid in exploring overseas markets, and income tax rebates. Additionally, to encourage vegetable exports, the GoB offers financial incentives. Fruits and vegetables are eligible for an export subsidy of 20% of the FOB (Free on Board) value of the exported veggies, according to the most recent Bangladesh Bank circular (FE circular no. 8, dated July 13, 2015). Potato exports are also eligible for cash incentives valued at 20% of the FOB value. Important responsibilities are also played in promoting vegetable exports by several GoB departments and divisions, including the Ministry of Commerce (MoC), the Ministry of Finance (MoF), and the Ministry of Agriculture (MoA). For instance, the MoA established the Hortex Export Development Foundation, also referred to as the Hortex Foundation, in an effort to increase the nation's export revenue.

It was founded as a non-profit horticultural development and marketing organization in the private sector under the MoA to aid in the development of markets for a variety of goods with added value (ADB, 2012, p. 21). To bolster the Hortex Foundation's technical and financial foundation, the ministry has applied for a Tk 100 million seed money. The expansion of vegetable production and exports has been greatly aided by the Hortex Foundation.

Supporting the production of high-quality fruits and vegetables for export is a major responsibility of the MoA, through the DAE. For farming to be successful, the DAE's Upazila Agriculture Office gives farmers access to seeds, training based on need, and other technical assistance. The usage of fertilizers and pesticides is just one of the many topics on which agriculture officers offer guidance. They actively collaborate with farmers to ensure that the Maximum Residue Limit (MRL) is respected. To ensure that their veggies are of high quality, exporters turn to the DAE for technical help, mostly from the Quarantine Wing and field services. While field services officers provide farmers with various forms of support in growing vegetables at permissible levels and in pesticide usage techniques that stay within MRL, the Quarantine Wing assists them with quarantine matters.

In order to improve cultivation or produce of higher quality, DAE officials also offer assistance for the field implementation of research output. Integrated Pest Management (IPM)<sup>21</sup>, Crop Diversification, Irrigation Improvement, Integrated Area Development, Seed Production, Storage and Distribution, Small-holder Support, Integrated Agriculture Nutrition, Command Area Development, Food Security, and other projects are just a few of the horticultural development initiatives it has carried out in Bangladesh with funding from donors and the government. For better IPM practice extension, the DAE has also created a number of initiatives, including Farmers Field School (FFS), IPM Club, Extension Agent Visit, and Field Days (Morrison & Rashid,2011).

In order to cultivate a variety of high-value crops, including vegetables like summer tomatoes, the DAE launched its Second Crop Diversification Project in 52 upazilas throughout the nation in 2011. To shield the tomato plants from intense heat and rain, the farmers construct tunnels out of bamboo sticks and polythene, as directed by DAE. An initiative to automate the phytosanitary certification process and the issue of import permits was recently undertaken by the DAE.

The International Finance Corporation (IFC) has assisted the Plant Quarantine Wing in implementing an automation program for the issuance of phytosanitary certificates, release orders, and import permits. Respondent for this study, a senior DAE official, stated that the DAE is implementing another project called "Strengthening Phytosanitary Capacity in Bangladesh" with a GoB fund of taka 151 crore for the purpose of enhancing quarantine services and building the capacity of laboratories and other quarantine services.

Support services for the vegetable industry are also offered by the Ministry of Commerce (MoC). But the primary focus of these services is on supply-side restrictions and vegetable export promotion. Vegetables is a significant subsector of agro products, and the MoC established the Agro Products Business Promotion Council (APBPC) to effectively address supply side issues related to this industry.

Mango exports to ASDA, the UK's version of the Walmart grocery chain, are one of the APBPC's recent achievements.

With this consignment, mangoes were sent for the first time from Bangladesh to a major international store. According to the memory of an exporter who participated in this study, the APBPC assisted the exporters with packaging their goods. While drafting laws to assist the export of vegetables, the MOC also has an impact on the MoF and MoA. Regular seminars on fresh produce, harvesting, packing, market potential, and market discovery strategies are arranged by the Export Promotion Bureau (EPB), under the Ministry of Commerce (MoC), to help vegetable exporters increase their capacity. It also provides instruction on export regulations and export market requirements. Potential exporters and other stakeholders can obtain information on the vegetables sub-sector from the Trade Information Center of EPB, which gathers this data annually (EPB, 2023).

### **5.6 Institutional frameworks facilitating the export of vegetables**

The development of new and improved vegetable varieties is a significant contribution made by agricultural universities and other agricultural research institutes/councils to the production and export of vegetables. The subsequent paragraphs of this study will emphasize the part played by a small number of crucially chosen institutes/councils. A research think-tank called BARI, one of the government organizations, studies post-harvest management, plant protection, and variety development. A few of the latest cultivars have outstanding flavors and tastes. One of the three mango cultivars that Walmart (United Kingdom) has approved for import from Bangladesh under FAO-FSP23 is BARI Aam-3 (Amrapali).

An "organic farming model" was introduced by BARI's department of vegetables. With this innovative bio-farming strategy, farmers may grow as much or even more crops without utilizing artificial pesticides and fertilizers. As a result of not using chemical pesticides and fertilizers, production expenses are reduced by 25% (Wardad, 2014). BARI has produced two hybrids and eight OP (open pollination) types of brinjal. Additionally, it has created five different types of hyacinth beans, two pointed gourds, two danta, one ribbed gourd, one okra (BARI Dherosh-1), one bitter gourd, one wax gourd, and one red amaranth (BARI Lalsak-1) using indigenous germplasm.

Additionally, new potato types for both domestic and international consumption were created by BARI horticultural research specialists. BARI Alu 23 is made with export markets in mind. The BARI has created a tomato variety with thin skin, or flush character, according to the agricultural expert we spoke with. Because of this, the tomatoes have a lengthy shelf life.

The thin peel makes this BARI tomato type portable and of good quality, making it a desirable choice for possible export. Produced in the off-season are BARI's summer tomatoes (Bari Hybrid 4). After 1.5 months, this cultivar can be harvested. For encouraging safe and sustainable vegetable production, BARI was awarded the 2008 APEED Award. The first-ever potato seeds in Bangladesh, BARI Potato-46, were created in collaboration between Bari and the International Potato Centre (CIP). It would be better to use this type against Late Blight.

Recently, the Hortex Foundation (HF) has taken the lead among business sector organizations in encouraging vegetable exports. New producers, exporters, researchers, and entrepreneurs have all received assistance from the HF. By using a contract farming system with BRAC, an NGO, it has organized production for export while giving them a lot of help and support. Among the assistance given include training farmers and their field workers, providing seeds and other production inputs, educating them about import market regulations, and helping them implement EUREP-GAP and other quality standards.

Despite some early difficulties, BRAC was able to export over 1300 tons of high-quality horticultural products (fruits and vegetables) between July 1997 and March 2003 with the help of the Hortex Foundation's support and technical assistance. French beans were Bangladesh's first export commodity; after that, other high-value Asian crops including green chili, bitter gourd, yardlong beans, okra, etc., were added (Hortex Foundation, 2018).

Packing development, shipping logistics, and quality assurance are some of the value chain services Hortex Foundation offers to the commercial sector. Growers and exporters are also offered a range of services by it. Among these are export cost analysis (for green chilli), market intelligence support services, export directory distribution, advice/knowledge on quality requirements and regulations of export destinations, pineapple postharvest treatment and storage system, business ideas on quality production of vegetables under contract farming system for export, and export guidelines for exporting vegetables (to Malaysia, teasel, pointed gourd, stolon of taro, lemon, eddo, and cucumber) and vegetables (cauliflower, sweet gourd, spinach, and cucumber) to Scandinavian nations (Bhuyan, 2014).

It arranges conferences and workshops to inform producers, exporters, and other interested parties on the different standards and guidelines for quality that are increasingly being implemented by overseas purchasers under SPS and TBT. In order to get into the mainstream market, it is crucial to embrace GAP, which includes traceability, rigorous adherence to sanitary and phytosanitary regulations, and high-quality packaging.

The HF also assists exporters in establishing direct connections with importers in order to facilitate the export of value-added processed agro-commodities, ornamental plants, flowers, mushrooms, ayurvedic, herbal, and medicinal products, as well as some other agricultural items. Foliage and spices, including betel leaf, are also included in this category. Using local exporter M/S Dip International, Hortex, for example, enabled the trial export of 45 kg of hot water treated mango (nine types) to Walmart, ASDA Chain Shop (UK) in 2014.



### **5.7 Exports of vegetables are supported by development partners' initiatives**

The growth of the agricultural sector receives financial and technical help from development partners such as the Food and Agricultural Organization (FAO), Asian Development Bank (ADB), USAID, UKAID, European Union, World Bank, and international NGOs.

This subsection will showcase a few of the programs and assistance offered by the development partners to help Bangladesh's vegetable industry grow.

#### **5.7.1 PRICE project by USAID**

USAID launched the Poverty Reduction by Increasing Competitiveness of Enterprises (PRICE) initiative in 2008. PRICE has determined that there are three important sectors to operate on. The industries covered were:

- Horticulture, which is essential for crop diversification and export prospects.
- Aquaculture, which produces fish and shrimp and is Bangladesh's top agricultural foreign exchange earner, providing over 60% of the country's animal protein needs; and
- Leather, particularly footwear, which has seen strong growth over the last ten years.

PRICE-supported businesses and farmers have directly profited from enhanced production, higher yields, and stronger market links as a result of PRICE's initiatives in the horticulture, aquaculture, and leather sectors. Over 83,000 people were employed full-time by PRICE, which also helped about 100 private businesses and 33,000 farmers in horticulture and aquaculture. A wider variety of nutrient-dense vegetables were promoted in the area with the aid of the PRICE initiative, which introduced diverse crops. PRICE aimed to promote food security, raise wages and employment, and enhance the domestic supply and export potential of important horticulture goods.

Following discussions with important stakeholders and experts, this initiative developed an integrated value chain strategy to support the development of three horticulture crops: potato, eggplant, and mango. In 2011, USAID expanded PRICE's focus to include a wider basket of healthy vegetables, such as tomatoes, beans, and gourds, in order to support Feed the Future (FtF)'s goals of food security and nutrition.

To reduce losses and increase yields, PRICE, in collaboration with partners like PRIDE Agro Enterprise, implemented local variety improvement programs for eggplants, including Red-Eye-ret, White Eye-ret, and Kushtia Chega. It also promoted the use of contemporary, highly productive, pest-resistant cultivars. The market demand for these types is considerable. Similar in appearance to the native green oval-shaped eggplant, Parthib is a hybrid variety of eggplant that yields much more and is resistant to a number of local insects. From a range of hybrids available, PRICE staff carefully selected this type to be demonstrated throughout the summer (USAID, 2014).

A related USAID project, which is still under progress, is called Agricultural Value-Chain. It is part of the Food for Food effort and seeks to improve the value chain of agricultural products, particularly vegetables, in order to guarantee food security in Bangladesh's southern regions. USAID offers assistance in other domains as well. To spread knowledge about the recently introduced potato variety Bari Potato-46, USAID, CIP, The World Vegetable Centre (AVRDC), and BARI collaborated to organize a program recently.

Another initiative being carried out by Cultivating New Frontiers in Agriculture (CNFA) is the Agro-Inputs Project (AIP), which is financed by USAID. The aim of this initiative is to enhance the standard and accessibility of farming inputs for farmers operating in Bangladesh's Feed the Future (FTF) region.

#### **5.7.2 Asian Development Bank (ADB)**

A number of programs were also launched by the Asian Development Bank to promote the growth of the vegetable industry. One of these initiatives is the Bangladesh Agribusiness Development Project. Agribusinesses and value chain activities (such as the gathering, storing, processing, and transportation of agricultural products) are included in the goal of the credit component of the Bangladesh Agribusiness Development Project. This objective was later expanded to include upstream activities (such as the supply of inputs, equipment, and fertilizers).

Microfinance institutions facilitated the acquisition of raw materials by processors by means of loans. Participants in the Bangladesh Agribusiness Development Project built connections with Dhaka's retail establishments and established an association for the selling of fruits, vegetables, and spices. The project assisted the parties involved in setting up marketing organizations to strengthen farmers' bargaining positions and create market connections by appointing an agent.

In the 1990s, Bangladesh initiated and carried out its first Crop Diversification Project with the assistance of CIDA. Later on, with support from ADB, this project was carried out and grown. Started in 2010 (SCDP), a second crop diversification project is currently being carried out with support from the ADB. With the financial assistance of ADB under SCDP, DAE recently (Nov. 2015) arranged a four-day workshop in Chapai Nawabganj for 200 farmers on "Postharvest Management and value addition of high value crops."

### **5.7.3 KATALYST**

Vegetable production and export are promoted through programs run by the Agri-business for Trade Competitiveness Project (ATC-P), also known as KATALYST. Coordinated by Swisscontact & GIZ, KATALYST is executed with co-funding from the Danish International Development Agency (DANIDA), the UK Government, and the Swiss Agency for Development and Cooperation (SDC). From 2002 until the present, KATALYST has operated in Bangladesh. An initiative under the MoC is market development called KATALYST. With the help of improvements in the marketplaces for products, services, and inputs, it seeks to improve the income of impoverished men and women in rural areas by making small businesses and farmers more competitive.

Several sectors and cross-sectors are presently being supported by the project, including the agricultural sectors (vegetables, seed, maize) and the services sector (ICT, media, rural distribution, etc.). Furthermore, it collaborates with many industry participants, including governmental bodies, private enterprises, and trade associations, to enhance the business-friendly atmosphere. One collaborative project on the potato sector was completed by KATALYST and APBPC in FY 2011–2012.

Prior to this, in 2006, KATALYST conducted an additional program called "Adding knowledge to vegetable farmers: Enhancing embedded information in the distribution system." The Dhaka, Faridpur, Rajshahi, Rangpur, Bogra, and surrounding areas were the primary focus of the project. By offering farmers, merchants, and input suppliers training, interventions, and other technical services, the primary goal of this project was to increase the competitiveness of the horticulture (vegetable) industry (Katalyst,2006).

### **5.7.4 Food and Agricultural Organization**

For the growth of the vegetable industry, FAO offers a range of financial and technical assistance. For instance, it has been offering technical support for the Bangladesh Integrated Agricultural Productivity Project, which is carried out by the MoA as the implementation agency and is supported by the GoB as part of its Annual Development Plan (July 11–June 16–1st revised 30). Through enhanced national competencies, the initiative seeks to launch sustainable, national-owned investment programs in agriculture, food security, and nutrition.

Additionally, the Hortex Foundation received assistance from the FAO in order to carry out its Certified Master Trainers' Training Programme on Food Control in Horticulture Value Chain, which was organized by the HF in cooperation with the FAO-Food Safety Programme (FSP) and the DAE and conducted in Dhaka on November 22–27, 2014 (FAO, 2010).

### **5.7.5 Other projects:**

By August 2016, Solidaridad Network Asia (SNA), an international civil society organization with its headquarters in the Netherlands, hopes to have 57,000 farm households practicing sustainable agriculture in five districts in southern Bangladesh as part of the SaFaL (Sustainable Agriculture, Food Security and Linkages) project. January 15, 2016 issue of The Financial Express. An EU-funded study (BGD/75/21A) examined the conditions for Bangladeshi fresh horticulture produce to enter the UK's upstream markets. Under the Bangladesh Quality Support Programme (BQSP), component-2, this project was carried out by ITC, Geneva from November to December 2009. The EU also helped HF strengthen its capability by offering support from July 2006 to October 2007 under the EU-SPF (Small Project Facilities) Project in Administering SPS & Environmental requirements connected to fresh product export to European Union. Other active programs in the field are the FAO's Pilot Implementation across the Horticultural Value Chain project and the IFAD-World Bank's National Agricultural Technology Project. The Hortex Foundation is in charge of both of these initiatives (Hortex, 2018).

## **6. Conclusion and suggestions for influencing policy**

In the sections that came before, the study attempted to give a thorough analysis of Bangladesh's vegetable sector's export potential. In an effort to do this, it examined the factors influencing the nation's vegetable exports as well as the state of the sector's export preparedness and analysis. To do this, emphasis was placed on a few different vegetable products: potatoes, tomatoes, eggplant (aubergine/brinjal), pointed gourds (patol), lady finger (okra), beans or yardlong beans, cauliflower, and cabbages; also, citrus fruits such as lemons and satkora were included.

### **6.1 Prospective suggestions from the research**

In order for the nation to successfully utilize its export potential in the vegetable industry, this subsection offers future recommendations for the necessary investments and legislative changes. Although the precise recommendations have been emphasized in their corresponding sections (Sections 4 through 7) of this study, the following are some of the most important suggestions:

(i) As the GoB organizations' supportive role has greatly improved the productivity of vegetables and their export performance, the GoB should continue allocating funds so that the DAE, BARI, HF, and other organizations can continue to conduct research, provide training, and engage in other supportive activities aimed at promoting the production, marketing, and export of Bangladeshi vegetables.

(ii) Together with the HF, BFVAPEA, DAE, research organizations (BARI, BAU), development partners/NGOs, and other pertinent private sector organizations, the MoA and MoC can take a more active part in promoting the export of vegetables. Their duties may involve helping to ensure that quality production adheres to GAP, managing the harvest, creating effective market intelligence to support exports, and improving the ability to meet market entrance standards, among other things.

(iii) In addition, the GoB must take action to guarantee the prompt completion of ongoing projects, whether they are being carried out with or without help and support from development partners, in the agricultural sector generally and the vegetables sub-sector specifically.

(iv) The GoB policy, which offers cash incentives valued at 20% of FOB value, has proven to be a highly effective policy support in promoting the export of vegetables. It has helped the exporters of vegetables gain a competitive edge over their competitors and lessen the negative effects of restricted aircraft space and expensive air travel. Thus, it is appropriate to keep the policy in place. Teaching ignorant and rural farmers proper harvesting procedures and timing is a major implementation difficulty for the GoB (i.e., the DAE). To effectively handle this difficulty, the necessary actions must be taken.

## **6.2 The GoB should carry out the following initiatives to address the factors that negatively impact Bangladesh's vegetable exports**

a. It ought to promote contract farming's expansion. By establishing a direct connection between exporters and primary farmers and guaranteeing sufficient understanding of buyer requirements, contract farming successfully addresses the traceability issue.

b. In order to maintain the product's integrity and quality as well as the validity of the quality-specific certificates, the GoB shall keep up its efforts. It would be a good development if the HSIA installed additional scanners and automated PC processing and issuance.

c. Packaging buildings with controlled temperatures should be established, since this aids exporters in maintaining product specifications and quality in accordance with customer or importing nation regulations. It's a positive development that one is being built in Shyampur.

d. The GoB needs to prosecute exporting companies that are suspected of shipping veggies with manipulated or falsified PCs.

Growing concerns have been raised about potential fresh vegetable importers moving their business from Bangladesh to other nations as a result of noncompliance issues. In order to ensure the quality of vegetable production, storage and transportation through cold room facilities to preserve freshness, and supply to export markets on time at competitive prices, there should be an immediate, coordinated, and coordinated intervention from various ministries, Bangladeshi exporters, government agencies or departments, and growers.

(i) The current practice of Bangladeshi businesses serving export markets through a market-to-market strategy will have to end (i.e. buying veggies from domestic market and selling same to international markets). Exporters must contact growers and farmers in order to verify that high-quality veggies are collected and meet importers' needs. They must also keep an eye on growers' and farmers' adherence to certain production guidelines and standards. In this sense, contract farming may be useful. This will also assist in figuring out traceability, which is important for increasing exports and successfully meeting needs, particularly those of the EU market.

(ii) Quality vegetable production for export markets can be ensured by implementing contemporary production techniques, such as contract farming. Special rules and mechanization in the relevant regions will also be required for the industry producing and exporting vegetables.

(iii) Everyone involved should work to improve the quality of the veggies that are in demand by implementing various value-adding initiatives, such as modernizing the handling, grading, packing, processing, and transportation setup.

(iv) One-stop facilities for certification and inspection of quarantines are necessary to bolster the DAE's Plant Quarantine Wing's ability to oversee and inspect quarantines.

(v) By supplying inspection tools and other essential equipment, the GoB must allot additional funds to reinforce the SPS system and increase the DAE's capabilities. The GoB might also think about creating a distinct division inside the DAE to handle SPS problems and other requirements related to market entry.

(vi) To increase the DAE's laboratory technicians' proficiency in using Good Laboratory Practices (GLPs) and carrying out analytical diagnostics, a certification program for technicians is required. Establishing or identifying at least two fee-for-

service laboratories for potential vegetable exporters will also be necessary, provided that the laboratories have the requisite infrastructure, equipment, and skilled personnel.

(vii) A technical and administrative procedure is required to recognize areas of low pest prevalence (ALPPs) and pest-free areas (PFAs) in order to accept the phytosanitary status of a bounded region. It's a potent weapon against pest pressure and establishes the capacity to export goods (citrus to the EU, for example). Areas of Low Pest Prevalence/Pest Free Areas may therefore be established by making the required efforts.

(viii) In order to effectively diversify our vegetable exports, we need to consider the advantages and disadvantages of competing Asian countries like China, India, and Myanmar. In our current and prospective export destinations, we will be able to accomplish this in order to capture both the mainstream and ethnic markets. There must be more GoB action in promoting both horizontal and vertical diversification in Bangladesh's vegetable industry, given that the country has failed to accelerate any significant export diversification in this area.

(ix) In order to protect public health, food safety, and the ability of plants and animals to resist pests and illnesses, we must be prepared to face the fact that all nations will continue to implement SPS measures. In developed cultures, a variety of private sector standards have also evolved. These quality criteria are non-negotiable; thus, our veggie goods have to meet them. Bangladesh has so worked to raise the hygienic quality of the vegetables it exports to the developed world to meet their requirements for food safety and health. The GoB should continue to actively support and aid in these initiatives.

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## References

- [1] ADB. (2012). Evaluation Knowledge Study: Support for Agricultural Value Chain Development. (Reference Number: EKS: REG 2012-15).
- [2] Bangladesh Bureau of Statistics (BBS). (2023). Yearbook of agricultural statistics of Bangladesh. Ministry of Planning, Government of the People's Republic of Bangladesh.
- [3] Bangladesh Bureau of Statistics (BBS). (2014). Yearbook of agricultural statistics of Bangladesh. Ministry of Planning, Government of the People's Republic of Bangladesh.
- [4] BARC. (2020). Bangladesh Good Agricultural Practices Policy 2020. Retrieved from [https://barc.portal.gov.bd/sites/default/files/files/barc.portal.gov.bd/page/f152389f\\_b9fa\\_4fa6\\_8cc2\\_148df01aed6d/2023-06-25-07-23-97982a5e7178e796cf550f598b845147.pdf](https://barc.portal.gov.bd/sites/default/files/files/barc.portal.gov.bd/page/f152389f_b9fa_4fa6_8cc2_148df01aed6d/2023-06-25-07-23-97982a5e7178e796cf550f598b845147.pdf)
- [5] Bhuyan, D.M.A. J. (2014) Hortex Newsletter, Vol 14, No. 03 & 04, July-December.
- [6] Chanda, D. (June, 2009). Post-harvest management of fruits & vegetables for better quality and export, Hortex Newsletter 9(2).
- [7] Bangladesh Bureau of Statistics (BBS) (2015). Ministry of Planning, GOB and Bangladesh Economic Review.
- [8] Export Promotion Bureau. (2023). Bangladesh vegetable exports in 2023. Retrieved from <https://epb.gov.bd/>
- [9] Food and Agriculture Organization of the United Nations (2010). Agricultural value chain development: Threat or opportunity for women's employment?
- [10] Hortex Foundation, Ministry of Agriculture, Government of Bangladesh. (2018). Annual Report . Dhaka, Bangladesh.
- [11] Hortex Foundation, Ministry of Agriculture, Government of Bangladesh. (2023). Annual Report . Dhaka, Bangladesh.
- [12] Hoq, M.S., Raha, S.K., & Sultana, N. (2012). Value addition in vegetables production, processing and export from Bangladesh. Bangladesh Journal of Agricultural Research, 37(3).
- [13] Khandker Shahidur R., Bakht Zaid, Koolwal Gayatri B. (2009). "The Poverty Impact of Rural Roads: Evidence from Bangladesh." Economic Development and Cultural Change 57(4): 685-722.
- [14] KATALYST Bangladesh. (2006). Bringing Knowledge to Vegetable Farmers; Improving embedded information in the distribution system. Dhaka, Bangladesh.
- [15] Morrison, J., & Rashid, M. A. (2011). Bangladesh – Agricultural Trade Policy Issues. In Articulating and Mainstreaming Agricultural Trade Policy and Support Measures. Rome: Food and Agriculture organization of the United Nations.
- [16] Ministry of Finance, Bangladesh. (2023). Bangladesh Economic Review.
- [17] Seed fund sought to strengthen Hortex Foundation. (2015, August 6). The Financial Express.
- [18] Wardad, Y. (2014, May 11). Organic agro produce export can fetch country \$1.0 bn. The Financial Express.
- [19] United States Agency for International Development. (2014, February). Building Skills and Market linkages in Bangladesh: Bangladesh Poverty Reduction by Increasing the Competitiveness of Enterprises (PRICE), Final Report.