

**CPD-CMI**  
**Working Paper Series**

**3**

**Agricultural Trade between  
Bangladesh and India**  
*An Analysis of Trends,  
Trading Patterns and  
Determinants*

Mustafizur Rahman  
Mazbahul Golam Ahamad  
A K M Nazrul Islam  
Muhammad Al Amin

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The purpose of this Working Paper Series is to disseminate the outputs of the CPD-CMI programme among the various stakeholders with a view to ensuring wider outreach of the programme output.

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# Contents

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<i>Acronyms</i> .....	<i>ix</i>
1. Introduction .....	1
2. Literature Review.....	3
3. Data and Methodology .....	6
4. Results and Discussions: Evolution of Agricultural Trade Policy Changes in Bangladesh and India .....	10
5. Results and Discussions: Trends, Patterns and Determinants of Agricultural Trade between Bangladesh and India .....	26
6. Concluding Remarks and Policy Implications.....	40
References .....	43

# List of Tables and Figures

---

## Tables

Table 1 : MFN Tariff Structure in Bangladesh: 1999-00 and 2005-06.....	17
Table 2 : MFN Tariff Structure in India (2001-02 and 2006-07).....	20
Table 3 : Relative Tariff Ratio Index for Bangladesh and India (HS 2 in 2007).....	24
Table 4 : Category-wise Share of NTBs Existing in the SAARC Region.....	25
Table 5 : Bangladesh's Trade Balance with India.....	29
Table 6 : Bangladesh's Agricultural Trade with the World and India.....	31
Table 7 : Major Agricultural Export Items of Bangladesh to India at HS 6 Digit Level.....	33
Table 8 : Major Agricultural Import Items by Bangladesh from India at HS 6 Digit Level.....	35
Table 9 : Bangladesh-India Cereal Trade with the World and India: 2000-2007.....	36
Table 10: ADF and PP Unit Root Test for Stationarity.....	37
Table 11: Estimated ARDL Model based on Agricultural Trade between Bangladesh and India.....	38
Table 12: Long-run and Short-run Elasticities of Agricultural Trade between Bangladesh and India.....	39

## Figures

Figure 1 : Unweighted Average Para Tariff Rates for Different Categories.....	18
Figure 2 : Unweighted Average Protective Import Duty Rates for Different Categories.....	19
Figure 3 : Growth of Bangladesh's Overall Trade with Trade Openness.....	27
Figure 4 : Growth of Bangladesh's Overall and Agricultural Trade with the World.....	28
Figure 5 : Bangladesh's Export and Import Growth with India.....	30
Figure 6 : Growth of Bangladesh's Agricultural Trade with India.....	32
Figure 7 : Share of Different Categories in Export of Agricultural Commodities by Bangladesh to India.....	34
Figure 8 : Share of Different Categories in Import of Agricultural Commodities by Bangladesh from India.....	36

## Annex Tables

Annex Table 1 : Major Characteristics of Economy and Agriculture in Bangladesh and India.....	46
Annex Table 2 : Bangladesh's Degree of Openness and the Extent of Globalisation.....	47
Annex Table 3 : India's Degree of Openness and the Extent of Globalisation.....	47
Annex Table 4 : Definitions and Sources Used for the Estimation of ARDL Bounds F-test Model.....	48
Annex Table 5 : Expected Signs of Long-run and Short-run Elasticities of the ARDL Models.....	48
Annex Table 6 : Bangladesh's Trade with the World and India: 1989-2007.....	49
Annex Table 7 : Bangladesh's Trade with the World and India: FY2005-06 to FY2009-10.....	49
Annex Table 8 : Bangladesh's Trade Balance with India: FY2005-06 to FY2009-10.....	50
Annex Table 9 : Top Export Destinations of Bangladesh's Agricultural Commodities and India's Ranking.....	50
Annex Table 10: Top Import Sources of Bangladesh's Agricultural Commodities and India's Ranking.....	51
Annex Table 11: Bangladesh's Agricultural Trade with the World and India: FY2005-06 to FY2009-10.....	51
Annex Table 12: Bangladesh's Export of Agricultural Commodities to India at HS 2 Digit Level.....	51
Annex Table 13: Bangladesh's Import of Agricultural Commodities from India at HS 2 Digit Level.....	52
Annex Table 14: Bangladesh's Cereal Trade with the World and India: FY2005-06 to FY2009-10.....	53

# Acronyms

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ADF	Augmented Dickey-Fuller
AER	Annual Export Receipt
AEZ	Agricultural Export Zone
AIC	Akaike Information Criterion
AIP	Annual Import Payment
ARCH	Autoregressive Conditional Heteroscedasticity
ARDL	Autoregressive Distributed Lag
ASIDE	Assistance to States for Infrastructure Development of Exports
AVE	Ad Valorem Equivalent
AoA	Agreement on Agriculture
BADC	Bangladesh Agricultural Development Corporation
BBS	Bangladesh Bureau of Statistics
BFTA	Bilateral Free Trade Agreement
BIS	Bureau of Indian Standards
BSTI	Bangladesh Standards Testing Institution
CPI	Consumer Price Index
DAP	Diammonium Phosphate
DF-QF	Duty-free Quota-free
DEP	Duty Entitlement Passport scheme
DFIA	Duty Free Import Authorization scheme
DTA	Domestic Tariff Area
EOU	Export Oriented Unit
EPB	Export Promotion Bureau
EPCG	Export Promotion Capital Goods scheme
EPZ	Export Processing Zone (Bangladesh)
EPZ	Export Promotion Zone (India)
FCI	Food Corporation of India
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GATT	General Agreement on Tariff and Trade
GDP	Gross Domestic Product
HS	Harmonized System of Coding
HYV	High-Yielding Variety
ICT	Information and Communication Technology
IMF	International Monetary Fund
INR	Indian Rupee
IV	Instrumental Variable
LDC	Least Developed Country
LERMS	Liberalized Exchange Rate Management System scheme
L/C	Letter of Credit
MAI	Market Access Initiative scheme
MFN	Most Favoured Nation
MoP	Muriate of Potash
NAS	New Agricultural Strategy
NGO	Non-Government Organisation



NTB	Non-Tariff Barrier
ODA	Overseas Development Assistance
PDS	Public Distribution System
PP	Phillips-Perron
PPP	Public-Private Partnership
QR	Quantitative Restriction
RMG	Readymade Garments
RTA	Regional Trade Agreement
RTR	Relative Tariff Ratio
SAARC	South Asian Association for Regional Cooperation
SAF	Structural Adjustment Facility
SAFTA	South Asian Free Trade Area
SAFTA-TLP	SAFTA Trade Liberalization Plan
SAP	Structural Adjustment Programme
SAPTA	SAARC Preferential Trading Arrangement
SATIS	SAARC Agreement on Trade in Services
SPS	Sanitary and Phytosanitary
STE	State Trading Enterprise
SoE	State-Owned Enterprise
TBT	Technical Barrier to Trade
TRAINS	Trade Analysis and Information System
TRQ	Tariff Rate Quota
TSP	Triple Super Phosphate
UECM	Unrestricted Error Correction Model
US	United States
USD	United States Dollar
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VKUY	<i>Vishesh Krishi Upaj Yojana</i> (India)
WITS	World Integrated Trade Solution
WPI	Wholesale Price Index
WTO	World Trade Organization
2SLS	Two-Stage Least Square

## 1. INTRODUCTION

Bangladesh is a net importer of agricultural commodities including foodgrains, live animals, edible oil, sugar, fruits, onion, lentil, milk and milk products. Despite the good domestic production of some of these items, the country needs to import as well in view of the high local demand. Available empirical evidence suggests that the trends and patterns of Bangladesh's imports of agricultural commodities from the world market experienced a significant changes over the past decade in line with the changes in the pattern of domestic production and national demand. In FY2009-10, about 13.5 per cent of Bangladesh's total imports were from India, while only 1.8 per cent of its exports were destined for the Indian market. For agricultural items, India has historically remained an important source of import for Bangladesh. This is true, particularly for cereals, live animals, onion, fruits and sugar. 13.9 per cent of Bangladesh's agricultural import was sourced from India in FY2009-10; to contrast, only 6.9 per cent of her total agricultural exports were destined for India in the corresponding year.

From the beginning of 1990s, following significant trade liberalisation reforms in both the countries, visible changes have taken place in the respective economies of the two countries. Trade policies have undergone important changes and their economies have experienced increased global integration. Significant changes have occurred in both the economies (and in agriculture sector) in terms of their respective gross domestic product (GDP) growth rates, value addition of agriculture in GDP, agriculture trade as a percentage of GDP, investment and domestic consumption (Annex Tables 1 to 3). Today, India is seen as an emerging global economic power.<sup>1</sup> One of Bangladesh's own major achievements is that the country is able to transform its economy from an 'aid dependent' one to a 'trade dependent' one. The nature and extent of Bangladesh's external trade over the years have also changed significantly. It was the agricultural commodities which dominated her import basket during the period of 1970s and 1980s; at present her imports are much more diversified and include intermediate inputs and capital machineries as well as final consumer goods. Bangladesh's export basket also observed significant changes: in the early days resource-based and traditional agricultural products such as jute and jute goods dominated her export basket; in contrast, at present it is industrial goods such as the readymade garments (RMG), pharmaceuticals, leather products, etc. which constitute the overwhelming bulk of Bangladesh's exports.

With the significant changes in overall external trading patterns experienced by both Bangladesh and India, visible changes have taken place in the structure of agricultural trade as well. The share of Bangladesh's agricultural trade in its total trade with India rose from 11.8 per cent in 1989 to 30.8 per cent in 2010. Foodgrains accounted for the overwhelming share in the agricultural trade between these two countries. About one-third of total exports from India to Bangladesh were of agricultural, fishery and livestock products (WTO

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<sup>1</sup>India already established itself as the fourth largest economy in the world after the United States (US), China and Japan; and is expected to be the third largest economy by 2015 and emerge as the largest economy by 2050. India's share in the global trade is also rising at a fast pace at present. Moreover, its domestic production and consumption of industrial goods have also been increasing rapidly with the emergence of a strong and economically empowered middle-class consumer class.

2006). With the rise in the volume of bilateral trade in agricultural products, the structure of trade has also changed significantly over the years.

Bangladesh's agricultural trade with India assumes high significance particularly because most of the traded items from India belonged to the group of products which are considered essential items such as foodgrains, onions, live animals, etc. For such items any policy shift, even short-term policy changes, can have significant impact for a large number of people in Bangladesh. This, in turn, can have important political consequences in Bangladesh. It is also important to bear in mind in this context the reality of the increasing climatic impacts and the volatility in the global foodgrain market. Bangladesh, being a net importer of agricultural commodities such as foodgrains, thus, cannot but be very sensitive to the dynamics of change in the food market and the role Indian policies could play in this connection.

### 1.1 Rationale of the Study

India's agricultural trade policy has fluctuated frequently in recent years, especially for export commodities such as foodgrains, onion, sugar, etc., mainly originating from the need to meet domestic requirements, and the compulsion of keeping domestic prices at low levels. In the years 2007 and 2008, India imposed various export restrictions in the form of strengthening governmental control over foodgrain exports, setting minimum export prices (at very high levels), putting in place quantitative restrictions, allowing export through only a limited number of ports, and in the end, imposing export bans on certain items. Policies pursued by India, particularly with regard to foodgrains, have important implications for both availability and prices of foodgrains in Bangladesh, and on the welfare of the general people of the country.

Conversely, Bangladesh's rising export of agricultural commodities to the Indian market, particularly over the last 5-6 years, added an important dimension to her trade with India. According to expert opinion, there is a significant potential for export of Bangladeshi agricultural and agro-based products to the Indian market, particularly to the North-Eastern states of India.<sup>2</sup> In this connection, from a forward looking perspective, a number of possible developments are needed to be taken into cognisance including the signing of a Bilateral Free Trade Agreement (BFTA) with India and the stance and commitments that India takes in the World Trade Organization (WTO) regarding the liberalisation of agricultural trade. Against the above mentioned backdrop, the present study attempts to understand the trends and patterns of Bangladesh-India agricultural trade with a view to identifying the major determinants of bilateral trade flows. It is hoped that this will provide useful policy insights for designing an appropriate agricultural trade policy for Bangladesh.

### 1.2 Objectives of the Study

The broad objective of the study is to explore the trends and patterns of agricultural trade between Bangladesh and India in view of frequent changes in India's agricultural trade

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<sup>2</sup>The region known as the Seven Sisters of India includes Assam, Manipur, Tripura, Nagaland, Meghalaya, Arunachal Pradesh and Mizoram.

policies in recent years together with understanding the major determining factors that influence Bangladesh-India bilateral agricultural trade.

The specific objectives of the study are: i) to document the evolution of agricultural trade policies, both in Bangladesh and India; ii) to analyse the trends and patterns of agricultural trade between Bangladesh and India; iii) to identify the major determinants of bilateral agricultural trade (export supply and import demand) between Bangladesh and India; and iv) to suggest policy measures in the area of agricultural trade with a view to enabling Bangladesh to address the volatility in the global agricultural market.

### **1.3 Scope of the Study**

The scope of this study is limited to understanding the trends, patterns and major determinants of agricultural trade (export and import) between Bangladesh and India. The study tries to cover bilateral trade of agricultural commodities at disaggregated level, during the period of 1989 and 2007.<sup>3</sup> The study aims to provide policy inputs to stimulate policy debate which promote public awareness about relevant issues, stimulate policy debates on Indo-Bangladesh bilateral trade in agriculture and to inform and influence policy making at various levels in view of the emerging challenges in a volatile market environment. The present exercise, however, has been constrained by paucity of the needed data on the state of Bangladesh-India trade in agriculture. Reliable data on informal trade in agricultural items, which by all accounts is not negligible, is by and large absent. Moreover, trade in agriculture items with India is also impacted by trade in similar items with other countries; but this has remained outside the purview of this report.

### **1.4 Organisation of the Paper**

The rest of the paper is organised as follows. Section 2 reviews important literature on trade and trading patterns between Bangladesh and India, also the determinants of bilateral trade. Section 3 explains the evolution of agricultural trade policy and changes over time in Bangladesh and India. Section 4 presents the results and discussions on the trends, patterns and determinants of bilateral agricultural trade (export supply and import demand) between Bangladesh and India. Finally, Section 5 concludes with policy recommendations.

## **2. LITERATURE REVIEW**

In recent years, issues related to bilateral economic cooperation between Bangladesh and India have been receiving increasing attention (Rahman *et al.* 2011). Despite this growing interest, surprisingly, till date only a few studies have attempted to capture the trends, patterns and determinants of agricultural trade between Bangladesh and India (Bakht 1996; World Bank 2006 cited in Rahman *et al.* 2010). Most of the available studies on Bangladesh-India bilateral trade have rather focused on aggregate trends and general features. Given the increasing importance of agriculture in the face of global warming-led climate change, rising

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<sup>3</sup>Due to the absence of comparable data, authors are unable to use data for the period before 1989 and after 2007 for analysing trends, patterns and estimating determinants of agricultural trade between Bangladesh and India. However, the study extended trend-related analysis up to the year 2010 to get a glimpse of the current bilateral trade at aggregated product level between Bangladesh and India.

inflation and high food prices, the need for an in-depth understanding of dynamics and trends in agricultural trade between the two neighbouring countries has assumed high significance in the current context.

Historically, trade in foodgrains, vegetables, jute, cotton, fish, animals, etc. between Bangladesh and India has played an important role in their respective economies. Nevertheless, an opportunity for a new momentum in Bangladesh-India bilateral trade was created after 1991, when both the countries initiated major trade reforms, moving away from the erstwhile protective trade regimes. Although, traditionally agricultural trade used to play an important role in Bangladesh-India trade, because of faster expansion of non-agricultural trade (textile items, industrial raw materials, machineries, chemicals, etc.) over post-reform periods, its share in overall bilateral trade has seen significant decline in recent years. However, the volume of agricultural trade, for both the economies, have experienced resurgence and been on the rise in very recent years, particularly for products such as foodgrains, live animals, vegetables, onion, fruits and fruit juice, and raw jute and jute products. In view of developments following Bangladesh Prime Minister's visit to India, in January 2010, increasing opportunities for expansion of trade between Bangladesh and the North-Eastern parts of India has now been created (Rahman *et al.* 2010).

The possibility of greater connectivity between the two countries could play an important role in this context. Rahman *et al.* (2011) argue that mere duty-free quota-free (DF-QF) market access to the Indian market was unlikely to enhance Bangladesh's export significantly. To utilise the full benefit of cooperation, there was a need to move beyond tariff liberalisation in goods into other areas including services, investment and connectivity. Diversification of Bangladesh's export basket beyond apparels is an important issue no doubt; however, equally important is the need for development of infrastructure and incentives to stimulate bilateral investment. For instance, De and Bhattacharyay (2007) drew attention to the need for strengthening of trade facilitation in the region. World Bank (2006) suggested improvement of transport sector, storage and administrative infrastructures at the Bangladesh-India land borders, and also highlighted the need for harmonisation of customs administration to deepen economic cooperation. These studies also argued in favour of regional cooperation in energy and infrastructure which could yield important dividends in terms of cross-border investments and joint ventures.

Besides the expansion of trade-related forward and backward linkages, a number of studies have also raised the issue of signing a Bangladesh-India BFTA. They have argued that an FTA between Bangladesh and India would trigger benefits to both the partners (Bhuyan and Ray 2006). De and Bhattacharyay (2007) also stressed that bilateral agreements would enable Bangladesh to improve the present trade balance that is heavily against Bangladesh. Harintha (2004) estimated that bilateral trade between any two pairs of member countries of the South Asian Association for Regional Cooperation (SAARC) would be about 10.5 times higher under the SAARC Preferential Trading Arrangement (SAPTA) compared to two otherwise similar countries in absence of a Regional Trading Agreement (RTA). This would not only enhance intra-regional trade, but would also lead to increased bilateral trade with non-members.

On the other hand, World Bank (2006) argued that bilateral export potential between Bangladesh and India was rather limited even if a BFTA was signed. By using industry case studies, World Bank study measured economic welfare implications of an FTA between the two countries. It was found that under an FTA, cement, light bulbs and sugar exports of India to Bangladesh would increase. On the contrary, Bangladesh's export will increase in the RMG sector. Using a probit model Jayathilaka and Keembiyahetti (2009) estimate that economic mass of the partners, similarity in economic size, differences in relative factor intensity, political stability and past import tariff are major determinants of forming an FTA from which partner countries could benefit.

The impact of FTA, however, may vary depending on disincentive features of signing countries. Siriwardana and Yang (2007) measured the effects of proposed FTA between India and Bangladesh. The study found that the formation of an FTA would result in significant rise in Bangladesh's trade with India and would help narrow Bangladesh's trade imbalance. The authors argued that both the countries will experience a substantial surge in manufactured goods exports to each other in view of duty-free market access under the proposed FTA. The study concluded that Bangladesh's labour-intensive manufacturing sectors would experience significant boost if the FTA was implemented. Nonetheless, one recurring and common argument that was put forward in the aforesaid studies was that full potentials of bilateral trade between Bangladesh and India will be realised only when there is adequate trade facilitation in the region.

A review of literature shows that various tests are in existence to assess determinants of trade and their elasticities. Use of Autoregressive Distributed Lag (ARDL) bounds F-test approach is common. Yazdani and Shajari (2009) examined the role of macroeconomic factors such as real domestic income, foreign income, real domestic and foreign M2, real exchange rate on balance of trade between countries. It was found that real exchange rate positively affects the trade balance. They also added that domestic real income had the highest impact on agricultural trade in both long-run and short-run periods. Waliullah *et al.* (2010) found similar impact of exchange rate on trade balance for Pakistan. Additionally, domestic real income and money supply (both domestic and foreign) are found to have the highest and lowest effects on agricultural trade balance in the short and long-run, respectively. The study also argued that increasing agricultural productivity and better marketing systems is the key to improving trade balance. On the other hand, Samaratunga and Thibbotuwawa (2006) found that domestic support for agricultural production and exports could have high influence in determining the pattern of agricultural trade among South Asian countries. The study by Ozun and Turk (2010) identified excess production as a determining factor contributing to rise in export.

Sugema (2005) has analysed the determinants of real export and import demands of an economy. The study came up with the conclusion that real exchange rate, real production capacity and real domestic income influence bilateral trade significantly. Sikdar *et al.* (2005), on the other hand, sound a cautionary note by arguing that an increasing bilateral trade could be harmful to Bangladesh economy since this could make her dependent on India for the supply of essential goods.

Thus, one gets different signals from a review of the literature. Nevertheless, the fact remains that overviews and/or aggregate level analyses often do not allow the capture of actual trends and their impacts on the ground. It is from this perspective that a disaggregated level analysis, in this case concerning agricultural items, assumes such importance and prominence in the context of bilateral trade between India and Bangladesh. From the above perspective, there is a need for mapping the trends, patterns and determinants of agricultural trade between India and Bangladesh in order to identify the required policy interventions to stimulate bilateral trade between these two important South Asian economies.

### **3. DATA AND METHODOLOGY**

#### **3.1 Analytical Concepts**

##### ***3.1.1 Evolution of Trade Policy Changes in Bangladesh and India***

The present review of the evolution of trade policy in Bangladesh and India refers to major phases of trade policy changes in both the countries, and also the current trade regimes in these countries. Trade policy changes are documented in three sub-sections: i) trade policy changes in Bangladesh; ii) trade policy changes in India; and iii) changes in tariff rates and protection measures in agricultural trade between Bangladesh and India. The section puts emphasis on analysing the changes in agricultural trade policies of both the countries.

##### ***3.1.2 Trends and Patterns of Agricultural Trade between Bangladesh and India***

Trends and patterns of bilateral agricultural trade between Bangladesh and India have been analysed by making use of agricultural trade data from 1989 to 2007. Depending on the availability, in some cases, data has been analysed up to FY2009-10. The section includes information on the changes in trend, pattern and composition of overall as well as agricultural trade between Bangladesh and India. The analysis identifies some of the most traded agricultural commodities and their positional shifts over time. Finally, a number of scenarios have been put forward to indicate possible changes in the trends and patterns of Bangladesh-India agricultural trade in the coming years.

##### ***3.1.3 Model Specification to Estimate the Determinants of Bilateral Agricultural Trade (Export Supply and Import Demand Separately) between Bangladesh and India***

The study employed ARDL bound F-test for estimating the determinants of bilateral agricultural export supply and import demand between Bangladesh and India. In estimating the major determinants of bilateral agricultural export supply and import demand with its long-run and short-run elasticities, an ARDL bounds F-test model was considered to be an effective method given its strengths over other available econometric methods in this respect.<sup>4</sup> After a careful consideration of interrelationship among various bilateral agricultural export supply and import demand variables, this study finally considered total

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<sup>4</sup>Other available methods for estimating bilateral trade determinants are Two-Stage Least Square (2SLS), Instrumental Variable (IV), Vector Error Correction Model (VECM), Vector Autoregressive (VAR) using Johansen's cointegration approach, etc.

agricultural production in Bangladesh and India, Consumer Price Index (CPI) of Bangladesh, bilateral real exchange rate and the role of SAPTA agreement, as major determining factors for the long-run and short-run bilateral agricultural export supply and import demand<sup>5</sup> between Bangladesh and India.<sup>6</sup>

In view of this, the following mathematical equations are considered to estimate the determinants, as well as the long-run and short-run elasticities of bilateral agricultural export supply and import demand between Bangladesh and India:

$$(1) \ln.ATBI_t = \alpha_1 + \beta_1 \ln.TAPB_t + \beta_2 \ln.TAPI_t + \beta_3 \ln.CPIB_t + \beta_4 \ln.BRER_t + D_1(SAPTA) + \varepsilon_{t1}$$

As total trade is equal to export supply (X) and import demand (M), then Eq. (1) can be divided as following two different models:

Model 1: Export Supply of Agriculture Commodities from Bangladesh to India (BXBI)

$$(1a) \ln.BXBI_t = \alpha_1 + \beta_1 \ln.TAPB_t + \beta_2 \ln.TAPI_t + \beta_3 \ln.CPIB_t + \beta_4 \ln.BRER_t + D_1(SAPTA) + \varepsilon_{t1}$$

Model 2: Import Demand of Agriculture Commodities from India to Bangladesh (BMIB)

$$(1b) \ln.BMIB_t = \alpha_1 + \beta_1 \ln.TAPB_t + \beta_2 \ln.TAPI_t + \beta_3 \ln.CPIB_t + \beta_4 \ln.BRER_t + D_1(SAPTA) + \varepsilon_{t1}$$

In Eq. (1, 1a, 1b), ATBI, TAPB, TAPI, CPIB, BRER,  $D_1$  and  $\varepsilon_{t1}$  represent agricultural trade between Bangladesh and India; total agricultural production in Bangladesh; total agricultural production in India; CPI (proxy of inflation) for Bangladesh; bilateral real exchange rate between Bangladesh and India; SAPTA dummy; and error term respectively. The double log specified Eq. (1a) and Eq. (1b) allows capturing the elasticities of the identified variables and  $t$  represents time in the equation.

The study tested the above equations using a cointegration analysis based on ARDL bounds F-test<sup>7</sup> approach developed by Pesaran *et al.* (2001) using yearly time series data for the

<sup>5</sup>The study uses bilateral export supply and import demand of agricultural commodities between Bangladesh and India as dependent variables. Data on bilateral export supply and import demand carried out through formal trading channels bear this out (however, informal trade appears to follow similar trends). It is thus obvious that if local (Bangladesh) production increases this will have a negative impact on the import volume, while the reverse (if Indian production increases it will have a positive impact on export volume) is true because India still remains a major source of agricultural imports for Bangladesh. In recent years, when India had imposed a ban on its exports of agriculture commodities for various reasons, this had adverse impact on Bangladesh's imports from India. Moreover, it is also observed that no significant agricultural trade can be seen between Bangladesh and India where same goods are both exported and imported by the same party.

<sup>6</sup>Although some other determining factors are selected in the initial estimation process, authors finally use the five selected variables for estimating the determinants of agricultural export supply and import demand between Bangladesh and India, after screening their statistical suitability and availability of comparable datasets.

<sup>7</sup>Comparatively, ARDL bounds F-test is a more efficient econometric tool for time series analysis than the other methods mentioned earlier, because: i) it allows different order of integration in the same equation; ii) can identify the cointegrating equation based on bounds F-statistics; and iii) can estimate both short-run and long-run coefficients of the model and assumes that all variables in the model are endogenous in nature. The model considers sufficient number of lags (based on the Akaike Information Criterion (AIC) to capture the data generating process in a general-to-specific modelling framework.



period of 1989 to 2009. According to Pesaran *et al.* (2001) and Pesaran and Shin (1997), an augmented ARDL model can be expressed in the following form:

$$(2) y_t = \alpha_0 + \sum_{i=1}^k \beta_i x_{it} + \gamma z_t + e_t$$

In Eq. (2),  $y_t$  is the dependent variable,  $\alpha_0$  is the constant term,  $x_{it}$  represents independent variables, and  $z_t$  includes the dummy variables. Rearranging Eq. (2), an Unrestricted Error Correction Model (UECM) version of an ARDL model can be obtained in terms of the lagged levels with first difference:

$$(3) \Delta y_t = \alpha_0 + \alpha_{1t} + \lambda_{yx} v_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta y_{t-i} + \sum_{i=0}^{p-1} \theta_i \Delta x_{t-i} + \gamma_t z_t + e_t$$

In Eq. (3),  $\Delta$ ,  $t$  and  $\theta_i$  stand for first difference operator, time trend and short-run movements of the 'agriculture trade' model, respectively. If the model variables show no quadratic<sup>8</sup> but linear trend, it can specify the UECM version of the ARDL equation as follows:

$$(4) \Delta y_t = \alpha_0 + \lambda_{yy} y_{t-1} + \lambda_{yx} x_{t-1} + \sum_{i=1}^{p-1} \theta_i \Delta y_{t-i} + \sum_{i=0}^{p-1} \theta_i \Delta x_{t-i} + \gamma_t z_t + e_t$$

Following Pesaran *et al.* (2001), the UECM version of the ARDL model for 'agriculture export supply and import demand between Bangladesh and India' depicted in the Eq. (1) can be expressed as follows:

$$(5) \Delta \ln. ATBI_t = \alpha_0 + \sum_{i=1}^{a1} \omega_{1i} \Delta \ln. ATBI_{t-1} + \sum_{j=0}^{b1} \beta \Delta \ln. TAPB_{t-j} + \sum_{k=0}^{c1} \gamma \Delta \ln. TAPI_{t-k} + \sum_{l=0}^{d1} \theta \Delta \ln. CPIB_{t-l} + \sum_{m=0}^{e1} \sigma \Delta \ln. BRER_{t-m} + \lambda_1 \ln. BXBI_{t-1} + \lambda_2 \ln. TAPB_{t-1} + \lambda_3 \ln. TAPI_{t-1} + \lambda_4 \ln. CPIB_{t-1} + \lambda_5 \ln. BRER_{t-1} + \lambda_6 SAPTA_t + \varepsilon_{1t}$$

Following Eq. (1a) and Eq. (1b), Eq. (5) can be written as follows:

**Model 1: Export Supply of Agriculture Commodities from Bangladesh to India (BXBI)**

$$(5a) \Delta \ln. BXBI_t = \alpha_0 + \sum_{i=1}^{a1} \omega_{1i} \Delta \ln. BXMI_{t-1} + \sum_{j=0}^{b1} \beta \Delta \ln. TAPB_{t-j} + \sum_{k=0}^{c1} \gamma \Delta \ln. TAPI_{t-k} + \sum_{l=0}^{d1} \theta \Delta \ln. CPIB_{t-l} + \sum_{m=0}^{e1} \sigma \Delta \ln. BRER_{t-m} + \lambda_1 \ln. BXBI_{t-1} + \lambda_2 \ln. TAPB_{t-1} + \lambda_3 \ln. TAPI_{t-1} + \lambda_4 \ln. CPIB_{t-1} + \lambda_5 \ln. BRER_{t-1} + \lambda_6 SAPTA_t + \varepsilon_{1t}$$

**Model 2: Import Demand of Agriculture Commodities from India to Bangladesh (BMIB)**

$$(5b) \Delta \ln. BMIB_t = \alpha_0 + \sum_{i=1}^{a1} \omega_{1i} \Delta \ln. BMIB_{t-1} + \sum_{j=0}^{b1} \beta \Delta \ln. TAPB_{t-j} + \sum_{k=0}^{c1} \gamma \Delta \ln. TAPI_{t-k} + \sum_{l=0}^{d1} \theta \Delta \ln. CPIB_{t-l} + \sum_{m=0}^{e1} \sigma \Delta \ln. BRER_{t-m} + \lambda_1 \ln. BXBI_{t-1} + \lambda_2 \ln. TAPB_{t-1} + \lambda_3 \ln. TAPI_{t-1} + \lambda_4 \ln. CPIB_{t-1} + \lambda_5 \ln. BRER_{t-1} + \lambda_6 SAPTA_t + \varepsilon_{1t}$$

In Eq. (5, 5a, 5b),  $\omega$ ,  $\beta$ ,  $\gamma$ ,  $\theta$ ,  $\sigma$  show short-run and  $\lambda_i$  ( $i = 1, 2, 3, 4, 5$ ) express long-run elasticities respectively. Following Hendry (1995), a parsimonious model is then estimated using 'general-to-specific' modeling approach through a process of elimination of statistically insignificant variables from the model. The UCEM version ARDL bounds F-test requires two steps in estimating the elasticities. The first step is to determine the existence

<sup>8</sup>Existence of trend can be retrieved from graphical presentations of the series.

of a long-run cointegrating relationship among the model variables using the Wald F-test of the model based on following hypothesis:

$$H_N: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$$

$$H_A: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 = 0$$

Due to data limitation in the present study, the study has employed the critical values suggested by Narayan (2005)<sup>9</sup> for limited observations by using the method of Pesaran *et al.* (2001). Unit root tests<sup>10</sup> in terms of 'with trend' and 'without trend' are then employed to detect the order of integration of the variables. Now if the equation is found to be integrated in the long-run or cointegrated, then the second step is to estimate the long-run as well as short-run coefficients of the model using least-square regression techniques, where the selection of appropriate lag for each of the independent variable is based on Akaike Information Criterion (AIC).<sup>11</sup>

Standard goodness of fit indicators of the estimated models are also checked along with employing relevant post-estimation diagnostic tests and stability tests. The diagnostic tests are used to examine serial correlation, and heteroscedasticity associated with the estimated models for export supply and import demand.

### 3.2 Data Requirements and Sources

For documentation of the overall trade policy changes in addition to the changes in agricultural trade policies, both in Bangladesh and India; related trade policy documents including export-import and comprehensive trade policies were collected from the Ministries of Commerce and Industries of the respective countries. Trade policy reviews (WTO 2007a) available on the WTO website were also surveyed for the purpose of the analysis. Tariff data used in the study were accessed from Trade Analysis and Information System (TRAINS) database whereas para tariff and other non-tariff data were taken from different published and web sources along with published working papers.

In addition, for analysing the trends and patterns of Bangladesh-India agricultural trade, the study has used agricultural trade data for the period of 1989 to 2007 extracted from UN Comtrade (2010) by using World Integrated Trade Solution (WITS).<sup>12</sup> Agricultural products are identified at the HS 2 and HS 6 digit levels for all commodities mentioned in Chapters 1 to Chapter 24 of the Harmonized System of Coding (HS), including jute and jute products

<sup>9</sup>If the calculated F-statistic is larger than the upper bound of the critical value, then the null hypothesis is rejected. This suggests that the variables included in the 'agricultural trade' model are cointegrated in the long-run. For this, if I (0) is true for the explanatory variables, then the selected model variables are cointegrated on the basis of lower bound of the value (Tang 2003).

<sup>10</sup>The commonly used unit root tests are Augmented Dickey-Fuller (ADF) tests and Phillips-Perron (PP) tests in terms of with and without trend.

<sup>11</sup>Long-run elasticities are calculated from the estimated coefficients of one lagged explanatory variables divided by the coefficients of the one lagged level dependent variables and then multiplied by (-1) (Bardsen 1989; Hoque and Yusop 2010), and the short-run elasticities are retrieved from estimated coefficients of respective first difference variables.

<sup>12</sup><http://wits.worldbank.org/wits>

reported in Chapter 53. In some instances, related data has been reported up to 2010; this information has been taken from Annual Export Receipts (AER) and Annual Import Payments (AIP) reports published by the Bangladesh Bank.

Finally, for estimating the determinants of Bangladesh-India agricultural trade (export supply and import demand) using ARDL Bound F-test, the study have used data extracted from UN Comtrade (2010) and Bangladesh Bank. The definitions and sources of the series of the model are listed in Annex Table 4. Annex Table 5 also describes the expected sign of related elasticities of ARDL models based on theoretical aspects and previous empirical studies.

## 4. RESULTS AND DISCUSSIONS: EVOLUTION OF AGRICULTURAL TRADE POLICY CHANGES IN BANGLADESH AND INDIA

### 4.1 Trade Policy Changes in Bangladesh

Bangladesh has largely followed an import-substituting trade and industrial policy till the early 1980s. During the 1980s, she had pursued a number of trade reform initiatives with an aim to open up the economy. As is known, in the 1980s and 1990s, under pressure from key donors including the World Bank and the International Monetary Fund (IMF), reform measures in trade and industrial policies were initiated in many of the aid receiving developing countries. The aim was to move from import-substituting, public sector-led, inward looking development strategies to an export-oriented, private sector-led and outward looking one; Bangladesh is not an exception. In Bangladesh, major changes in trade policies were initiated in the beginning of the 1990s through significant reduction of various customs duties and waiver in the tariff, removal of trade-related quantitative restrictions (QRs), elimination of import licensing procedures, and through unification of exchange rate regimes. Recent trade policy initiatives in Bangladesh have attempted to boost export performance of identified sectors, and products including agriculture sector through various targeted incentives and policy supports.

To understand trade policy shifts in Bangladesh, in line with CPD (2008), the present study has categorised these years into three different phases, i.e. Phase I (1972 to 1980); Phase II (1981 to 1990) and Phase III (1991 onwards).

**A. Phase I (1972-80):** Phase I can be termed as 'pre-reform phase' characterised by public sector-led import substituting industrialisation strategy. Protective measures in the form of quantitative restrictions, restricted import licensing, differentiated and high rate of nominal tariffs, an overvalued domestic currency and subsidised loans to traded goods sector were the hallmarks of this phase. This period also saw nationalisation of major industries like jute, textile and sugar; 86 per cent of its industrial assets were put under government control (CPD 2008). When public sector enterprises were found to be inefficient, government decided to denationalise number of enterprises. In 1976, government allowed public-private partnership (PPP) in public sector enterprises and decided to encourage foreign direct investment (FDI) in most of the erstwhile reserved (negative list) sectors.

**B. Phase II (1981 to 1990):** The second phase can be termed as 'moderate trade liberalisation period'. Initiatives are undertaken to shift from import substituting strategies towards more export-oriented industrial policies. In this period, under the Structural Adjustment Programmes (SAPs) supported by the World Bank and IMF, the country experienced a radical shift towards a more liberalised trade regime. Reforms in this period mainly aimed at privatisation of state-owned enterprises (SoEs), withdrawal of quantitative import restrictions and minimising tariffs. Government started to encourage private sector participation through 390 enterprises were denationalised, including banks and sectors like apparels and textiles. In 1982, a New Industrial Policy (NIP-82) was introduced with the primary objective of encouraging more participation from the private sector in the industrialisation process of the country. Bangladesh signed a three-year Structural Adjustment Facility (SAF) loan with the IMF (1986-89). The Revised Industrial Policy (RIP-86) envisaged substantial reduction in QRs on imports and introduced schemes providing incentives for export-oriented industries, including zero-tariff on imported inputs and special support in the form of establishing export processing zones (EPZs).

**C. Phase III (1990 onwards):** Major progress in trade policy reform took place in the 1990s with substantial scaling down of tariff lines, reduction of various types of custom duties, removal of trade-related QRs, elimination of import licensing and unification of exchange rate regime in the country. At present, higher tariffs are applicable for finished products, while lower or zero tariffs are in place for intermediate or primary products and for machineries. Export-oriented inputs are enjoying zero tariff duty.<sup>13</sup> As a result of various reform initiatives undertaken during the second and third phases, Bangladesh's degree of openness increased significantly; the rise in export was reasonable. Extent of globalisation increased from 21.2 per cent in FY1980-81 to 56.5 per cent in FY2008-09. Overseas development assistance (ODA), which was a major source of foreign exchange in the 1980s, accounted for only 11.9 per cent of the total export in FY2008-09; this share was as high as 158.1 per cent in FY1980-81 (Annex Table 2).

Significant changes have also been made in export and import policies of Bangladesh in the very recent times. In Export Policy 2009-12, the government come up with targeted incentives to promote a number of thrust sectors, eight in all. These are: agro-products and agro-processing products, light engineering products, footwear and leather products, pharmaceuticals products, software and information and communication technology (ICT), home textile, ship-building industries and toiletries products. Incentives included loan with low interest rate, carrying goods with reduced air fare, special rebate in utility services such as electricity, water and gas, financial benefit and subsidy based on Agreement on Agriculture (AoA) and Agreement on Subsidies and Countervailing Measures of WTO, privileges for establishment of backward linkage industries to reduce production cost, bond facility or duty drawback, facility for technological upgradation and infrastructure facility, facility for international market expansion and initiative to attract FDI in these sectors. Twelve special Development Sectors will also receive similar facilities. The policy also extended product-specific facilities for RMG, frozen fish, handicrafts made from bamboo and coir fiber, tea, jute, leather, pottery and some other agro-based products. On the other hand, the Import Policy (2009-14) has attempted to facilitate imports of technology in order

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<sup>13</sup>More detail discussions on the changes in tariff rates are available in the Section 4.3.1 of this paper.

to promote use of modern technology. Availability of industrial raw materials was facilitated through withdrawal of restrictions, with a view to increasing competition and efficiency; import of quality and hygienic products were also promoted. The policy, however, included 25 items<sup>14</sup> in the control list.

#### ***4.1.1. Agricultural Trade Policy Changes in Bangladesh***

As part of the aforesaid trade reforms, Bangladesh has undertaken a series of policy measures towards liberalisation of her agricultural trade. Bangladesh moved away from a predominantly state-owned agriculture trading in the 1970s and 1980s towards a private sector-led agricultural trading, particularly since the late 1980s. Bangladesh Agricultural Development Corporation (BADC), the major government institution to modernise agriculture, gradually started to phase out its operation since the late 1970s; its once dominant role in import sale and distribution of fertiliser, irrigation equipments and seeds were taken over by the private sectors.

An important step towards liberalisation of agricultural trade was taken when restrictions on import of small diesel engines was removed in FY1987-88. In the following year, in FY1988-89, import duty on the item was also withdrawn. Subsidy on deep tube-well is withdrawn in 1992. Abolition of import duties on shallow tube-well and low lift pumps resulted in availability of irrigation engines at a significantly lower rate which led to a spectacular growth in the coverage of irrigated land during the late 1980s.<sup>15</sup> In FY1988-89, private sector importers and distributors got permission to make bulk purchase of chemical fertilisers and import triple super phosphate (TSP) and muriate of potash (MoP).

Direct cash subsidy for agricultural export was launched since 2000; a cash subsidy of 20 to 30 per cent (depending on the degree of local content) was launched to boost exports of agricultural commodities and processed items. From FY2004-05, a fertiliser (non-urea) programme aimed at providing 25 per cent subsidy on imported DAP (diammonium phosphate), MoP and TSP fertilisers was introduced with a view to reducing price differences between urea and non-urea fertilisers, ensuring a balanced use of various types of fertiliser, maintaining soil fertility, and reducing production costs for crops. Besides fertiliser, private sector and non-government organisations (NGOs) are also allowed to import improved germplasm for research and development. They are also allowed to produce or import foundation seeds to sell in the local market.<sup>16</sup> Import of foodgrains through private channel played a major role in providing both supply and price stabilisation since FY1992-93. Private sector contribution in importing foodgrain started in FY1992-93

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<sup>14</sup>These include poppy seeds, dried posta dana, wine lees, argol, liquefied propane, butanes, petroleum gas and other gaseous hydrocarbons, petroleum oil residues, sodium cyclamate, special kinds of insecticides, polypropylene, two stroke engines of three wheeler vehicles and three wheeler vehicles of two stroke engines as banned items.

<sup>15</sup>Between FY1986-87 to FY1989-90, coverage of irrigation jumped from 16.48 per cent to 20.89 per cent, with 62.1 per cent increase in coverage area.

<sup>16</sup>Except five notified crops, i.e. rice, wheat, sugarcane, potato and jute, in fear of importing cheap, poor quality seeds that could potentially spell disaster in the country, and also their respective importance for the economy and for ensuring food security.

with a 32.2 per cent share, which increased to 68.4 per cent in FY2000-01 and reached as high as 83.9 per cent by FY2009-10.

Selective and careful agricultural trade liberalisation in Bangladesh in the coming days needs to focus on a number of areas. These include: agro-processing sector, trade in climate-resilient technologies, high-yielding variety (HYV) seeds and technologies that can be easily adapted to local conditions for production of foodgrains, horticulture, fisheries, sea food, poultry and other agro-based industrial products. Opening up the local market for global competitors will need to be carefully done taking into cognisance the interests of, domestic agro-processing and industrial units, and also the interests of small and marginal farmers.

## **4.2 Trade Policy Changes in India**

India pursued a policy of 'Economic Socialism' during the Cold War period. After decades of pervasive restrictions covering both international and domestic trade, India started to exercise some limited policy reforms in the 1980s; the reform process was sharply accelerated from 1991 (Jayasuriya *et al.* 2008). India started to step out from her restrictive policy to a more liberalised one<sup>17</sup>, and became more integrated with the global market as a result of the reforms pursued since the 1990s and also as part of her commitments in the WTO. India undertook a significant departure from the long legacy of centrally directed and inward-oriented development policies, and this journey entailed major policy shifts in the area of international trade.

Major policy shifts towards liberalisation had come first through the Export-Import Policy (Exim Policy) 1992-97 (GoI 1998). However, reforms had already been initiated early through the introduction of the Liberalized Exchange Rate Management System (LERMS) in 1992, just before the announcement of Exim Policy 1992-97. Under the LERMS, exporters were required to surrender 40 per cent of the foreign exchange earnings at the official exchange rate (Kalirajan *et al.* 2001). Reforms in the manufacturing sector were also taken by reducing average tariff rates, restricting import licensing for industrial inputs and capital goods, and compulsory industrial licensing (WTO 2007b). Introduction of Duty Exemption scheme and Export Promotion Capital Goods (EPCG) scheme facilitated promotion of export by reducing tariff on imported raw materials. Export Promotion Zones (EPZs) and Export Oriented Units (EOUs) schemes were liberalised, and these were opened up for 100 per cent foreign equity participation. In 1997, negative list applicable for imports was considerably shortened, by 27 per cent, in one single stroke.

State trading monopolies, created with a view to exercise control over export and import (canalisation), was a common phenomenon in India for several decades. Nevertheless, as part of the reforms merchandise import of canalised items were reduced from 27 per cent in 1988-89 to 19 per cent in 1996-97. In order to promote trade among SAARC countries, India solely removed all QRs on imports of 2,300 items from SAARC countries with effect from 1 August 1998 (Kalirajan *et al.* 2001). In addition, since 1 March 2000, under an FTA with Sri Lanka, India permits duty-free access for more than 1,000 tariff lines, and a 50 per cent margin over the rests. The BFTA particularly emphasises on liberalising the services

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<sup>17</sup> During the period of 1981-2008, India's degree of openness is increasing about thrice (Annex Table 3).

sector trade, by modifying several schemes. Protection level associated with import tariffs had remained significantly high in India, with a relatively high and visible anti-export bias in the trade policy, despite undertaking many reform measures. However, a number of incentives and steps were introduced to remove the attendant anti-export bias. Market Access Initiative (MAI) scheme, Focus Market scheme, Duty Entitlement Passport (DEP) scheme, Duty Free Import Authorization (DFIA) scheme were some of the policy instruments which had been introduced in India's foreign trade policy (GoI 2011) to facilitate production of exportable goods.<sup>18</sup> Tax holidays were also offered to investors in EPZs and EOUs (WTO 2007b).

The latest Exim Policy 2009-14 has aimed at accelerating economic growth, increasing employment opportunities and doubling merchandise trade by 2014. Notwithstanding, one of the major objectives of the new Exim policy has to diversify the export basket and discover new markets worldwide under the Focus Market scheme. Specific and targeted incentives have been introduced towards technological upgradation in selected export sectors under the EPCG scheme.

#### ***4.2.1 Agricultural Trade Policy Changes in India***

India followed a state-controlled agricultural trade regime during the 1970s and 1980s. From the early 1990s, she undertook various liberalisation measures to open up her agricultural trade. India's import-licensing policy, relating to import of consumer products, which was a major obstacle to trade, was gradually withdrawn.

It may be recalled in the above connection that with increasing domestic demand for foodgrains accompanied by rising population, India started to feel the need to ensuring long-term food security in the mid-60s. In response to the emergent situation, the government introduced the New Agricultural Strategy (NAS), concentrating on HYVs and adopted improved technologies in some selected regimes. This package of advanced technology resulted in the 'Green Revolution' of the early 1980s in India. The resultant higher domestic production of food and technological breakthrough led to a change in the composition of exportable agricultural products.<sup>19</sup>

Although, some changes were witnessed during the 1990s in India's agricultural trade policy, policy shifts, in many instances, did not deliver the expected outcome. Till the late 1990s, more than 31 per cent of India's imports of agricultural and fisheries products were subjected to licensing. India pursued restricted trade policies from the early 2000s in the form of sanitary and phytosanitary (SPS) measures. Import monopolies were in existence for rice, copra, wheat and other coarse grains, except for maize and barley. Tariff rate quotas (TRQs) were used to protect domestic agricultural production. India continued maintaining State Trading Enterprises (STEs) for imports of urea and justified this under the General Agreement on Tariffs and Trade (GATT)-STE rules that allow government-authorized import or export monopolies of agricultural inputs. Other non-tariff measures such as reactivation

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<sup>18</sup>Export-Import Policy(s) of India 1997-02, 2004-09 and 2009-14 are also assessed for reviewing the trade policy changes over this period.

<sup>19</sup>By 1980s, export values of coffee, rice, fish and fish products came close to tea, oil cakes, cashew kernels and cotton. However, share of tea export fell from 40 per cent in 1960 to 17 per cent by the end of 1990s.

of quarantine regulations, standard certificates and limiting number of entry ports were also exercised by India.

India's revised Exim Policy 1992-97 promoted exports of agricultural and allied products and services in a significant manner. Despite these initiatives, export of rice, non-basmati and low-grade, was controlled by a minimum export price support policy which can be seen as a step backward. According to some authors this has not been in the interest of the farmers because the border price for rice was lower than the international market price during the early 90s (Kalirajan *et al.* 2001). For maintaining a buffer stock for Public Distribution System (PDS), export restrictions were also imposed on cereals (durum wheat and non-fair average quality of jowar) subject to some ceiling.

With growing pace of liberalisation, both on account of domestic reforms and as part of WTO commitments, India started to experience a rise in the share of agricultural exports in 1995-96. This period also observed a minimum export price support policy by withdrawal of quantitative ceiling on rice and export permission for no more than 2.5 million tonnes of wheat and 0.5 million tonnes of durum wheat. Horticulture and floriculture sectors emerged as attractive export sectors in this period after the introduction of air freight subsidy measure. The Exim Policy 1997-2002 also offered special incentives for agriculture and allied agricultural sectors and announced to establish product-specific Agricultural Export Zones (AEZs). Under the schemes of EOUs and EPZs agriculture sector was allowed to sell 50 per cent of their outputs in the Domestic Tariff Area (DTA), without making any value addition. These units got permission of importing equipments worth INR 50 million and above, under a 'zero duty EPCG' scheme.

The Exim Policy 2004-2009, introduced a new scheme called *Vishesh Krishi Upaj Yojana* (VKUY) (Special Agricultural Produce Scheme) for promoting exports of fruits, vegetables, flowers and minor products. Assistance to States for Infrastructure Development of Exports (ASIDE) funds was built to be utilised for development of *Krishi Upaj Yojana* AEZs, whereas units in AEZs were exempted from bank guarantee. Capital goods imported under the EPCG scheme were allowed duty-free access and could be installed anywhere in the AEZs.

However, agricultural trade remained rather restrictive in the 1990s despite some reforms. India's agricultural trade liberalisation efforts of the 2000s, through some reduction in tariff, are often counterbalanced by the higher non-tariff barriers. From 2007, India started imposing restrictions on exports of foodgrains to ensure local food security and keep market price under control in the face of higher domestic demand in the face of production failures and a shortage in tradable foodgrains in the global market. Such a policy, in place even in 2010 and imposed by such an important foodgrains-exporting country as India, had a significant adverse impact on the availability, price and welfare of many net food-importing countries including Bangladesh.

It is true that the pace of agricultural trade liberalisation across the South Asian countries has been significantly lower when compared to their overall trade liberalisation because of some obvious reasons. Conversely, it is also true that in recent years SAARC countries are increasingly reforming agricultural trade liberalisation policies through various measures to ease movements of inputs, import and adoption of agro-technologies, etc. Agricultural trade



liberalisation in the coming decades is expected to be an area of great interest across the world, particularly due to the volatility in the production of foodgrains, climate change-related impacts and the fluctuations in the price levels. Agricultural trade for both Bangladesh and India assumes high significance as a large part of their respective population is still engaged in agriculture and their welfare is critically dependent on agriculture sector performance. But it is also important to keep in mind that such liberalisation policies must address the interests of marginal and poor farmers and distributional impacts in the society. A carefully crafted liberalisation policy, not excluding some needed governmental interventions in critically important areas, such as in case of food distribution and agricultural credit, is likely to benefit the farmers. Such an overall trade policy will also have important positive impact on bilateral agricultural trade between Bangladesh and India in the coming days.

### **4.3 Tariff Structures and Protection Measures in Agricultural Trade between Bangladesh and India: A Comparative Analysis**

Bilateral trade in agricultural commodities between Bangladesh and India are confronted with various barriers, including tariff and non-tariff ones. A review of existing literature shows that agricultural trade faces the highest level of protection in both countries. In view of the fact that both Bangladesh and India are net food-importing countries, the major reason that inform a cautious approach to trade in agricultural products may be attributed to the overriding concern to ensure food security of their respective people. In order to protect agricultural trade, Bangladesh and India deploy various policy instruments including high tariffs, TRQs, non-tariff barriers (NTBs) (technical/sanitary), subsidies (on domestic production as well as on exports), and anti-dumping and other safeguard measures.

#### ***4.3.1 Tariff Structure of Bangladesh: Some Stylised Facts***

As was noted earlier, major tariff reforms were carried out in Bangladesh in the early 1990s; some of these were deepened in subsequent years. Bangladesh's tariff structure reveals that between the period of 1990-91 and 2005-06, Bangladesh has reduced the number of tariff bands from 18 to 4; maximum rate of tariff from 350 per cent to 25 per cent; unweighted average tariff rate from 88.6 per cent to 13.5 per cent and weighted average tariff rate from 42.1 per cent to 9.6 per cent.

The analysis of changes in simple average Most Favoured Nation (MFN) applied tariff rate in Bangladesh reveals that it has reduced MFN tariffs moderately between the years of 1999-00 and 2005-06. Between the periods, Bangladesh has reduced simple average MFN applied tariff rate from 22.2 per cent to 15.5 per cent. The tariff rate for textiles and clothing has reduced from 31.5 per cent to 21.3 per cent; tariff rate for WTO defined agricultural products decreased from 24.6 per cent to 18.1 per cent; agricultural products from 25.1 per cent to 19.6 per cent; and WTO non-agricultural products from 21.9 per cent to 15.1 per cent (Table 1).

Table 1: MFN Tariff Structure in Bangladesh: 1999-00 and 2005-06

(in Per cent)

Tariff		MFN 1999-00	MFN 2005-06
<b>Bound Tariff</b>			
1.	Bound tariff lines (per cent of all tariff lines)	13.2	15.0
2.	Simple average bound rate	188.4	163.8
	<i>Agricultural products (HS 01-24)</i>	196.1	187.1
	<i>Industrial products (HS 25-97)</i>	148.6	94.3
	<i>WTO agricultural products</i>	197.7	191.0
	<i>WTO non-agricultural products</i>	50.0	38.1
	<i>Textiles and clothing</i>	50.0	44.4
3.	Tariff quotas (% of tariff lines)	0.0	0.0
4.	Duty-free tariff lines (% of tariff lines)	0.0	0.2
<b>Applied MFN Tariff</b>			
1.	Simple average applied rate	22.2	15.5
	<i>Agricultural products (HS 01-24)</i>	25.1	19.6
	<i>Industrial products (HS 25-97)</i>	21.8	14.7
	<i>WTO agricultural products</i>	24.6	18.1
	<i>WTO non-agricultural products</i>	21.9	15.1
	<i>Textiles and clothing</i>	31.5	21.3
2.	Overall standard deviation of tariff rates	13.2	8.8
3.	Coefficient of variation of tariff rates	0.5	0.6
4.	Tariff quotas (% of all tariff lines)	0.0	0.0
5.	Duty-free tariff lines (% of all tariff lines)	8.3	7.5
6.	Non-ad valorem tariffs (% of all tariff lines)	0.0	0.1
7.	Non-ad valorem tariffs with no AVEs (% of all tariff lines)	0.0	0.1

Source: WTO (2006).

Note: AVE refers to ad valorem equivalent.

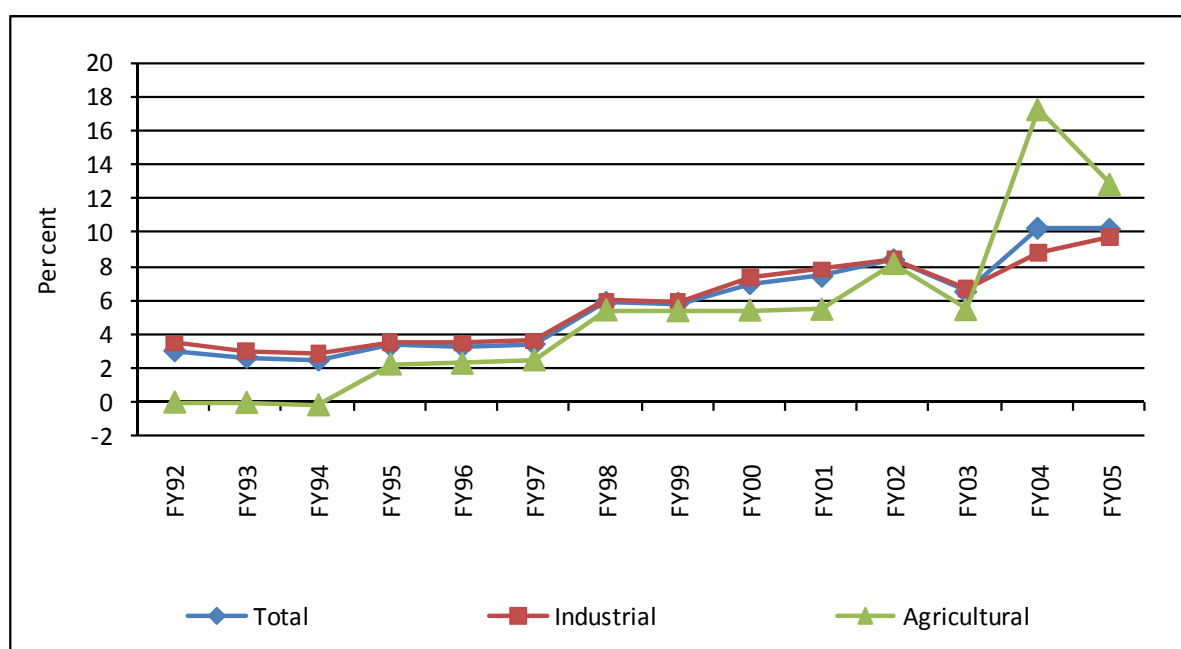
As per the commitment in the WTO, Bangladesh has brought most of her agriculture items under WTO's bound tariff schedules. She has also reduced the simple average bound tariff rate from 188.4 per cent to 163.8 per cent (Table 1). Agricultural products enjoyed higher bound tariff rates compared to the ones for industrial products, non-agricultural products and clothing. It is seen that average bound tariff rate of Bangladesh for WTO defined agricultural products, was 191.0 per cent in 2005-06 and 197.7 per cent in 1999-00, and the rate for non-WTO defined agricultural products (HS 01-24) was 187.1 per cent in 2005-06 and 196.1 per cent in 1999-00. On the other hand, bound tariff rate for industrial products was 148.6 per cent in 1999-00 and 94.3 per cent in 2005-06; 50 per cent for non-agricultural products in 1999-00 and 38.1 per cent in 2005-06 (Table 1). However, it may be mentioned here that between the comparable periods, Bangladesh has increased her bound tariff lines from 13.2 per cent of all tariff lines to 15 per cent.

A closer look at the other indicators of tariff structure also supports the view that Bangladesh has reduced tariff barriers significantly between the periods of late 1990s and mid-2000s. For instance, it may be noted here that the TRQ as percentage of total tariff lines in Bangladesh was zero during the period between 1999-00 and 2005-06. Moreover, special safeguard and the domestic tariff peak, i.e. tariff rate exceeding three times the overall simple average applied rate, was zero in Bangladesh during the period between 1999-00 to 2005-06. Duty-free tariff line is also increased, albeit insignificantly, from zero per cent in

1999-00 to 0.2 per cent in 2005-06. This implies that at least some products are entering into Bangladesh market without paying any duty.

Even though the role of tariff rate has decreased over the last one and half decades, the role of various kinds of para tariffs such as customs surcharges, additional charges, internal taxes and charges levied on imports has been on the rise. This has added distortion in trade between Bangladesh and her trade partners. It is found that during this period, overall rate of para tariffs has experienced some increase. It has risen from 3 per cent in 1991-92 to 10.2 per cent in 2004-05 (Figure 1). It may be noted here that the para tariff rate for agricultural products increased from the very low rate of -0.01 per cent in 1991-92 to 12.81 per cent in 2004-05. Similarly, it has increased from 3.44 per cent in 1991-92 to 9.76 per cent in 2004-05 for industrial products.

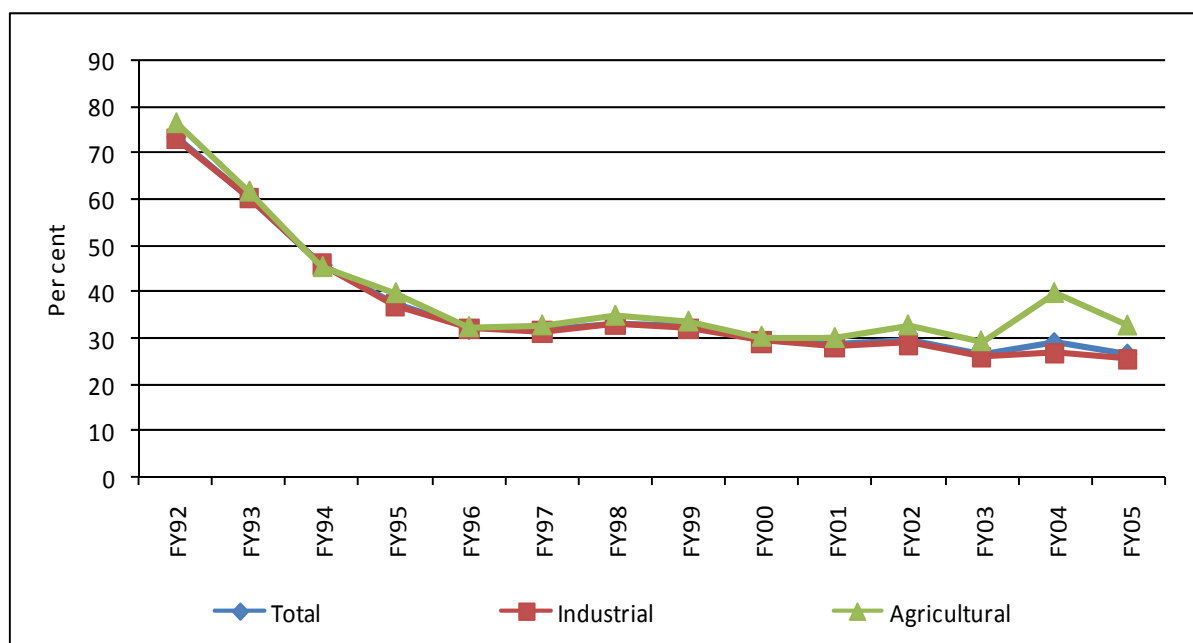
Figure 1: Unweighted Average Para Tariff Rates for Different Categories



Source: Authors' compilation from World Bank (2006).

Nonetheless, total protection rate (both tariff and para tariff) in Bangladesh has decreased significantly from 73.62 per cent in 1991-92 to 26.62 per cent in 2004-05 (Figure 2). During this period, total protection for both industrial and agricultural tariff lines has decreased at the same pace from 73.16 per cent to 25.43 per cent and from 76.63 per cent to 32.7 per cent respectively.

Figure 2: Unweighted Average Protective Import Duty Rates for Different Categories



Source: Authors' compilation from World Bank (2006).

#### 4.3.2 Tariff Structure of India: Some Stylised Facts

India has brought significant changes in her tariff structure over the last one and half decades. During this period, she has reduced bound tariff rate as per commitment to WTO and decreased MFN duties for all types of products in varied proportion to liberalise the economy. It is found that between the periods of 2001-02 and 2006-07, she has increased the percentage of duty-free tariff line from 1.1 per cent to 2.6 per cent, which allowed more products to access the Indian market with duty-free status. During this time India has reduced simple average MFN applied tariff rate from 32.3 per cent to 15.8 per cent.

A closer look at the simple average MFN applied tariff structure indicates that India has reduced MFN duties for non-agricultural products quite insignificantly; however, this was not the case for agricultural products during the early 2000s. It is found that average MFN applied tariff rate for all types of agricultural products in India is fixed at 40.7 to 42.7 per cent barring some exceptions between 2001-02 and 2006-07. However, during this period, tariff rate for industrial products decreased from 30.8 per cent to 11.9 per cent; WTO non-agricultural products from 31 per cent to 12.1 per cent; and clothing and textiles from 31.3 per cent to 12.3 per cent. It may be mentioned here that despite drastic reduction in various MFN duties, India still maintains higher number of bound tariff lines compared to many other developing countries. It is found that in 2006-07, 75.2 per cent of all tariff lines in India had bound their duties (Table 2).

Table 2: MFN Tariff Structure in India (2001-02 and 2006-07)

(in Per cent)

Indicator		MFN		
		2001-02 Tariff excluding AVEs	2006-07 Tariff excluding AVEs	2006-07 Tariff including AVEs
1.	Bound tariff lines (% of all tariff lines)	NA	75.2	75.2
2.	Simple average applied rate	32.3	15.8 (15.1)	17.5 (16.8)
	<i>Agricultural products (HS 01-24)</i>	41.7	42.7 (38.2)	42.7 (38.2)
	<i>Industrial products (HS 25-97)</i>	30.8	11.9 (11.8)	13.9 (13.8)
	<i>WTO agricultural products</i>	40.7	40.8 (36.2)	40.8 (36.2)
	<i>WTO non-agricultural products</i>	31.0	12.1 (12.0)	14.1 (14.0)
	<i>Textiles and clothing</i>	31.3	12.3 (12.3)	22.5 (22.5)
3.	Domestic tariff 'peaks' (% of all tariff lines)	1.3	2.7 (2.6)	3.9 (3.7)
4.	International tariff 'peaks' (% of all tariff lines)	93.9	13.8 (12.5)	19.1 (17.8)
5.	Overall standard deviation of tariff rates	13.0	17.4 (15.0)	20.7 (19.2)
6.	Coefficient of variation of tariff rates	0.4	1.1 (1.0)	1.2 (1.1)
7.	Duty-free tariff lines (% of all tariff lines)	1.1	2.6 (2.7)	2.6 (2.7)
8.	Non-ad valorem tariffs (% of all tariff lines)	5.3	6.1 (6.1)	6.1 (6.1)
9.	Non-ad valorem tariffs with no AVEs (% of all tariff lines)	5.3	0.0 (0.0)	0.0 (0.0)

Source: WTO (2007b).

Note: Data in parentheses include exemptions, applicable at the full 8-digit tariff line. AVE refers to ad valorem equivalent.

#### 4.3.3 Changes in Bilateral Agricultural Tariff Rates between Bangladesh and India: A Comparative Analysis

Analysis of agricultural tariff rates between Bangladesh and India, from the perspective of two broad categories of agricultural items such as food and beverages and consumer goods, demonstrates that the MFN applied tariff rate decreased in both the countries between 1989 and 2007. Bangladesh imposed 125.9 per cent MFN applied tariff on food and beverage items imported from India in the year 1989, which was reduced to 8.7 per cent in 2007. On the contrary, India imposed differential MFN applied tariff rates on this category. In 1992, the rate was 12.8 per cent, which increased to 45.2 per cent in 2007, despite a decrease in the year 1997 (10.1 per cent). Notwithstanding, higher tariff barriers, Bangladesh's exports of this commodity to the Indian market increased significantly during this period. In 2002, Bangladesh exported USD 2.1 million worth of food and beverages to India, which increased to USD 29.7 million in 2007. It may also be mentioned here that Bangladesh's import of food and beverages items from India increased by twelve-folds (from USD 17.9 million to USD 220.5 million) between 1989 and 2007, in view of significant tariff liberalisation policies pursued by Bangladesh for this category of agricultural products in this period.

Bangladesh also reduced its MFN applied duties considerably on consumer goods imported from India, from 133.23 per cent in 1989 to 20.29 per cent in 2007, whilst India increased her respective duties from zero to 12.5 per cent over the comparable period. Bangladesh's export of consumer products to India increased from a mere USD 0.02 million to USD 7.59 million over this time. Bangladesh's exports of consumer products could rise further if and when India's tariff rates are decreased in the future.

Analysis of changes in the protection level of agricultural trade between Bangladesh and India at disaggregated product level reveals that the average weighted applied tariff rates were significantly high for most of the traded agricultural commodities, during 1991-2007, despite the fact that both the countries had adopted more liberalised trade policies. The range of Indian applied tariff rate applicable for agricultural products identified at HS 2 digit level was 10.6 to 52.5 per cent during 1991-1999, which subsequently increased to 16 to 79.8 per cent in 2000-2007. Alternatively, the range of applied tariff rates in Bangladesh was found to be 5.5 to 109.3 per cent during 1991-1999, which then reduced to between zero to 30.4 per cent in 2000-2007.

An in-depth analysis of the Indian tariff rates reveals that India's weighted average applied tariff rate had come down for a number of items including: i) products of animal origin (from 45.7 to 30.0 per cent); ii) animal or vegetable fats (from 52.5 to 19.3 per cent); iii) sugar and sugar confectionary (from 52.5 to 19.3 per cent); iv) preparation of cereals (from 33.3 to 27.5 per cent); v) preparation of vegetables, fruits and nuts (from 40 to 27.3 per cent); and vi) tobacco and manufactured tobacco (from 40 to 35 per cent) between 1991-1999 and 2000-2007.

Some agricultural export items from Bangladesh, on the other hand, had to face higher duties to enter into the Indian market during 2000-2007 compared to the earlier period of 1991-1999. Between the comparable periods, average applied tariff rate imposed by India have increased for products such as: i) fish and crustacean (from 11.7 to 16 per cent); ii) edible fruits and nuts (from 20 to 53 per cent); iii) coffee, tea and spices (from 10.6 to 54.5 per cent); and iv) other vegetable, textile fibres, paper yarn and wove (from 10.9 and 19.9 per cent). During the period of 1989-2007, India had imposed the highest average tariff rate on edible fruits and nuts (49.4 per cent); tariffs are low for textile fibres, paper yarn and wove products (17.2 per cent). It may be noted here that among the top five agricultural export items of Bangladesh to India (identified on the basis of their respective trend growth rates), the weighted average applied tariff rate was found to decrease for residuals and waste from food industry and products of animal origin from 40 and 45.7 per cent to 32 and 30 per cent respectively between 1991-1999 and 2000-2007.

In contrast, over the same period Bangladesh has reduced its weighted average applied tariff rate significantly for most of the agricultural commodities imported from India, except for the products of live trees and other plants. Due to lower tariff rates, imports of some selected products from India were increased significantly during the late 1990s and early 2000s. From the analysis of trend growth rates of agricultural imports, it was found that five products observed the highest growth rates of 0.53, 0.4, 0.39, 0.37 and 0.35 per cent respectively during 1991-2007. These were: i) residues and wastes from food industry; ii) animal and vegetable fats and oils; iii) preparation of vegetables, fruits and nuts; iv) miscellaneous edible preparations; and v) cereals. A closer look at the tariff rates for these products shows that the rates came down significantly between 1991-1999 and 2000-2007. Moreover, the weighted average duty rates for these products are found to be 23.3, 83.1, 88.5, 106.9 and 25.5 per cent respectively during the period of 1991-1999, and reduced to zero, 22.5, 27.5, 19.4 and 6.1 per cent respectively during the period of 2000-2007.

#### ***4.3.4 An Analysis of the Sensitive Lists of Agricultural Products***

##### ***Bangladesh's Sensitive List of Agricultural Products under SAFTA***

The sensitive list of Bangladesh in the South Asian Free Trade Area (SAFTA), for non-LDCs (least developed countries), included 1,249 products (covers 24 per cent of total tariff lines) of which 149 products belonged to the group of agricultural commodities (HS 01 to HS 24 plus HS 53). Bangladesh's import of sensitive agricultural commodities from India was increasing over time, by seven-fold between 2000 and 2007. It was found that Bangladesh imported USD 81.5 million worth of sensitive agricultural products in 2000, which has increased significantly to USD 601.8 million in 2007. The share of sensitive agricultural products in total agricultural import increases from 13.3 per cent to 25.8 per cent between 2000 and 2007. Notwithstanding, the composition of import has been changing over time. Bangladesh has imported 67 items from agricultural sensitive list in 2000, which came down to 62 items in 2007. From the data, it is found that the import has become more concentrated in recent years compared to a decade back. In 2000, top five import items accounted for items capturing 65.8 per cent of total import value of agricultural sensitive products, which increased significantly to 89.6 per cent in 2007. The top five import items in 2000 were: i) semi-milled or wholly milled rice (HS 100630); ii) raw sugar (HS 170111); iii) lentils (HS 071340); iv) onions and shallots (HS 070310); and v) wheat or meslin (HS 100190). In 2007, semi-milled or wholly milled rice, raw sugar, and onions and shallots remain in the top five basket and two new products: i) cane or beet sugar (HS 170199); and ii) other fruits (HS 090420) added in the list.

An analysis of the various tariff barriers reveals that Bangladesh has been reducing duties on sensitive agricultural products in recent times. It was found that the weighted average MFN applied tariff rate for 62 agricultural sensitive products varied between 4 to 25 per cent in 2007, whilst it ranged between zero to 37.5 per cent for 67 products in 2000. In 2007, 70.7 per cent of the products faced 25 per cent MFN applied duties; 10.3 per cent entitled with zero to 5 per cent duties, while the remaining 18.9 per cent experienced 6 to 20 per cent applied duties.

On the other hand, duties on 63.9 per cent of the products were 37.5 per cent; 27.8 per cent items experienced 6 to 30 per cent duties, and the remaining 8.4 per cent faced zero to 5 per cent MFN applied duties in 2000. Analysis of tariff rates for top five import items shows that semi-milled or wholly milled rice experienced zero per cent duty in 2000 which increased to 5 per cent in 2007. However, the tariff rates for onions and shallots have decreased to 15 per cent in 2007 from 25 per cent in 2000. Tariff data for raw sugar and other fruits were not available for the two periods identified for the purpose of analysis. From the remaining top five products, tariff rates for lentils and wheat or meslin were 5 per cent in 2000 and 15 per cent for other fruits in 2007.

##### ***Indian Sensitive List of Agricultural Products under SAFTA***

As per the SAFTA Trade Liberalization Plan (SAFTA-TLP), duties on items outside the sensitive list were to be reduced to zero to 5 per cent at the very outset (positive list), whereas duties on some of the other items required to be reduced gradually to zero to 5

per cent over seven years, starting from 2007 for the non-LDCs, and over 10 years for LDCs (residual list). Items in the sensitive list of member countries, as per the SAFTA-TLP, are to be outside the ambit of tariff reduction and need to enter the importing country by paying MFN duties.

According to the SAFTA Agreement, the sensitive list of a member country is to be reviewed every three years. India's initial sensitive list of 763 items for the LDCs was perceived to be rather restrictive (Rahman *et al.* 2011).<sup>20</sup> Nonetheless, India agreed to review her sensitive list at an accelerated pace; indeed she has revised the list twice since 2006. The number of items in the sensitive list for the SAARC LDC members was reduced to 744 in 2005, and then further to 480 in 2008.<sup>21</sup> Outside the sensitive list, India provided accelerated duty-free treatment for almost all items, excepting a few where tariffs were reduced to zero and 5 per cent (Rahman *et al.* 2010). Of the 763 items in the initial sensitive list, 294 items belonged to agricultural commodity (HS 01 to HS 24 plus HS 53), which was further decreased to 247 in the revised list. In 2007, Bangladesh exported 17 agricultural items (which are in the sensitive list products) worth of USD 13.6 million to India. Of these 17 items, four items (HS 080290, HS 151190, HS 151519, and HS 151590) faced 100 per cent MFN duty rates with export value of USD 5.8 million (42.7 per cent of export earnings from the total agricultural sensitive products). Two products (HS 150790 and HS 151499) also faced MFN tariff rates of 45 and 75 per cent respectively with a trade value of USD 2.9 million (21.8 per cent of the export earnings from total agricultural sensitive products). The remaining 11 items (HS 030429, HS 050610, HS 070190, HS 110520, HS 151620, HS 151790, HS 190590, HS 190590, HS 230240, HS 230650, HS 230690, HS 240120), worth USD 4.9 million (35.7 per cent of the export earnings from total agricultural sensitive products), faced 30 per cent MFN tariff rate in 2007. It may be noted here that total agricultural export of Bangladeshi products comprising a total of 57 items (identified at HS 6 digit level) to the Indian market in 2007 was about USD 64.9 million; out of this earnings from the sensitive agricultural items comprised of 20.9 per cent of total agricultural export earnings.

On its part, Bangladesh exported 14 products to India, which belonged to the Indian sensitive list, with an export value of USD 1.3 million in 2004. Among these items, seven products (HS 080290, HS 080450, HS 090210, HS 090240, HS 150790, HS 151190 and HS 151499) with a combined export value of USD 1.2 million (96.1 per cent of the total export earnings from agricultural sensitive products in 2004) enjoyed preferential tariff rate of 35 to 90 per cent; the remaining seven faced MFN tariffs in the Indian market. Bangladesh exported a total of 51 agricultural items identified at HS 6 digit level, which had a combined value of USD 11.1 million to India in 2004, the share of sensitive list items in this was only 10.9 per cent. In 2004, 13.7 per cent of the total agricultural export items were in the sensitive list, which increased to 29.8 per cent in 2007. Export earnings from the sensitive list items also doubled between 2004 and 2007 (from USD 10.9 million to USD 21 million). This would indicate that given a more liberal access to the Indian markets for these items, Bangladesh was likely to be able to increase her export earnings from these products significantly. In this backdrop, the recent offer by India to provide duty-free market access

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<sup>20</sup>India's sensitive list for non-LDCs included 884 items. Bangladesh's own sensitive list included 1,249 items for LDCs and 1,254 items for non-LDCs.

<sup>21</sup>For India, number of tariff lines traded, at HS 6 digit level, was 5,054 in 2008.



for all items of export from Bangladesh ought to be perceived as an important development for increasing the export of agriculture items to the Indian market in future.

#### 4.3.5 Relative Tariff Ratio (RTR) Index for Selected Agricultural Commodities for Bangladesh and India

The Relative Tariff Ratio (RTR) Index, developed first by Sandrey (2000). Gehlhar and Wainio (2002), Wainio and Gibson (2002) further improved RTR that is a useful tool to explain the relative levels of tariff protection between two trading partners. The RTR considers bilateral protection between two countries (suppose, country A and B), where each tariff of country A is weighted by country B's total exports to the world for the same tariff line and vice versa. The index is constructed as the ratio between the actual tariff rates a country faces in the numerator and its imposed tariffs in the denominator.<sup>22</sup> In general, a ratio closer to 1 (one) means that both countries have similar tariff protection and thus face/impose comparable barriers. However, the RTR does not reflect the levels of tariffs, but only their relative ratios (Jank *et al.* 2003).

The estimated values of RTR index for selected agricultural commodities traded between Bangladesh and India reveal that only two of the commonly traded agricultural commodities: beverages, spirits and vinegar, and vegetable plaiting materials and vegetable products, having RTR value of 0.73 and 1.12 respectively, have similar tariff rates. On the other hand, coffee, tea and spices, sugars and sugar confectionery products with the RTR value of 68.98 and 85.06 have rather high dissimilar tariff structure. However, the remaining commonly traded products have moderately similar tariff structure in both Bangladesh and India (Table 3). As was noted above, since Bangladesh will be accorded duty-free access in the Indian market in future, RTRs will no longer be relevant and Bangladesh could potentially expand her export of agricultural items to Indian by taking advantages of the market access offer.

Table 3: Relative Tariff Ratio Index for Bangladesh and India (HS 2 in 2007)

HS Code	Product Name	RTR
03	Fish, crustacean, mollusk, other aquatic invert	0.01
05	Products of animal origin, nes or included	0.01
08	Edible fruit and nuts, peel of citrus fruit	0.08
09	Coffee, tea, spices	68.98
12	Oilseed, oleagi fruits, miscell grain, seeds	0.10
14	Vegetable plaiting materials, vegetable products	1.12
15	Animal/veg fats, oils & their cleavage products	0.15
17	Sugars and sugar confectionery	85.06

(Table 3 contd.)

<sup>22</sup>The RTR index is defined as  $\frac{X_i^B Y_i^I}{X_i^I Y_i^B}$ . Where: B, I = countries B and I;  $X_i^B$  = Ad-valorem equivalent tariff rate for product i in country B;  $X_i^I$  = Ad-valorem equivalent tariff rate for product i in country I;  $Y_i^I$  = Share of exports of product i in total agricultural exports in country I;  $Y_i^B$  = Share of exports of product i in total agricultural exports in country B.

(Table 3 contd.)

HS Code	Product Name	RTR
19	Prep. of cereal, flour, starch/milk	4.49
20	Prep of vegetable, fruit, nuts	0.05
22	Beverages, spirits vinegar	0.93
23	Residues & waste from the food industry	0.00
53	Other vegetable textile fibres, paper yarn, wove	0.00

Source: Authors' estimation based on the data extracted from UNCTAD's TRAINS database.

#### ***4.3.6 Nature and Extent of Non-Tariff Barriers (NTBs) in Agricultural Trade between Bangladesh and India***

At present, a plethora of non-tariff barriers are found to be in place that constrains agricultural trade between Bangladesh and India. Evidence suggests that SPS measures and technical barrier to trade (TBT) are the types of NTBs that limit the potentialities of agricultural trade between Bangladesh and India. Other than these, quotas, license requirements, anti-dumping and countervailing measures have also undermined flow of agricultural commodities across the Bangladesh-India border. Indeed, a study by ADB and UNCTAD (2008) suggests that NTBs remain a major limiting factor with regard to trade in the SAARC region. As the studies indicate, SPS, TBT and other non-tariff measures are widely prevalent in SAARC trade practices (Table 4).

**Table 4: Category-wise Share of NTBs Existing in the SAARC Region**

Non Tariff Barrier	Share (%)
SPS, TBT and other related measures	86.3
Tariff quota	9.8
Anti dumping measures	7.4
License requirement	5.3
Countervailing measures	1.2

Source: ADB and UNCTAD (2008).

Note: Percentage shares exceed 100 per cent since number of cases varies.

Imports and exports subject to state trading, in existence for a number of items in India, have tended to discourage bilateral trade, especially agricultural trade. Although, less prevalent than in the 1980s and 1990s, an analysis of the list of Indian imports subject to state trading, for the period of 2001 and 2006 reveals that a number of agricultural commodities are still subject to state trading during this period. Food Corporation of India (FCI) was responsible for import of wheat, rye, oats, maize, rice, grain sorghum, buckwheat, millet, canary seed, jawar, bajra, ragi and other cereals in 2001; this remained unchanged till 2006.

An analysis of the list of exports subject to state trading shows that onion was in the list both in 2001 and 2006. As is known, onion is an important agricultural import item from India by Bangladesh. During the 1990s, India had in place an import licensing system applicable for trade in consumer products. In the late 1990s, more than 31 per cent of India's imports of agricultural and fisheries products were subject to licensing system. The

period of 2000s experienced more stiff trade restriction on the part of India under the provision of SPS measures. In the early 2000s, import monopoly existed for rice, copra, wheat and all coarse grains, except for maize and barley. TRQs were used to protect domestic agricultural production in India. India continues to maintain state trading enterprises for importing urea. Other non-tariff measures included reactivation of quarantine regulations, standard certificates and limiting number of entry ports; these are applicable for certain agricultural products.

An analysis of QRs and NTBs imposed by Bangladesh from the 1980s to early 2000s reveals that the country has significantly reduced these barriers. Despite this, some QR and NTB measures still play an important role from the perspective of Bangladesh's trade in agricultural items. During the 1980s, almost 56 per cent of tariff lines in Bangladesh were subject to QRs, which came down to 5.1 per cent in the 2000s. In the 1990s, Bangladesh maintained import bans or restrictions which affected nearly 11.7 per cent of the national tariff lines. In the early 2000s, Bangladesh also had QRs on some selected agricultural commodities such as chicks, eggs, salt, etc. Moreover, Bangladesh also used to provide various cash compensation and export subsidy for selected agricultural commodities such as frozen fish, fresh fruits, crushed bone, etc. which were geared towards stimulating the export sector.

A broader look at trade policies adopted by Bangladesh and India shows that both Bangladesh and India had QRs in place for a number of agricultural items of import. Bangladesh maintained import licensing restrictions for certain items, though India does not have any import licensing on agricultural imports from Bangladesh. On the other hand, Bangladesh does not make use of anti-dumping measures, whereas India has resorted to such practices at times in case of agricultural trade (World Bank 2006).

From the above analysis, it can be summarised that despite some restrictions inhibiting trade in agricultural items between Bangladesh and India, bilateral agricultural trade between the two countries has been on the rise in recent years. If NTBs are removed, the bilateral trade in agricultural commodities was likely to rise further. In this respect, signing of Bangladesh-India FTA, with appropriate measures to deal with the attendant NTBs, could play an important role in expanding bilateral agricultural trade, as also the overall trade volume between the countries, in the coming years. Rahman (2000) suggests that one of the best ways to deal with NTBs, is to go for signing mutual recognition agreement and strengthen the capacity of related institutions including Bangladesh Standards and Testing Institution (BSTI) and Bureau of Indian Standards (BIS). Such an agreement could expand Bangladesh's exports to the North-Eastern states of India (the Seven Sisters) in particular, and the Indian market in general. However, such a deal will need to be carefully crafted, and issues relating to NTBs, trade facilitation, dispute settlement mechanism, etc. will need to be appropriately negotiated.

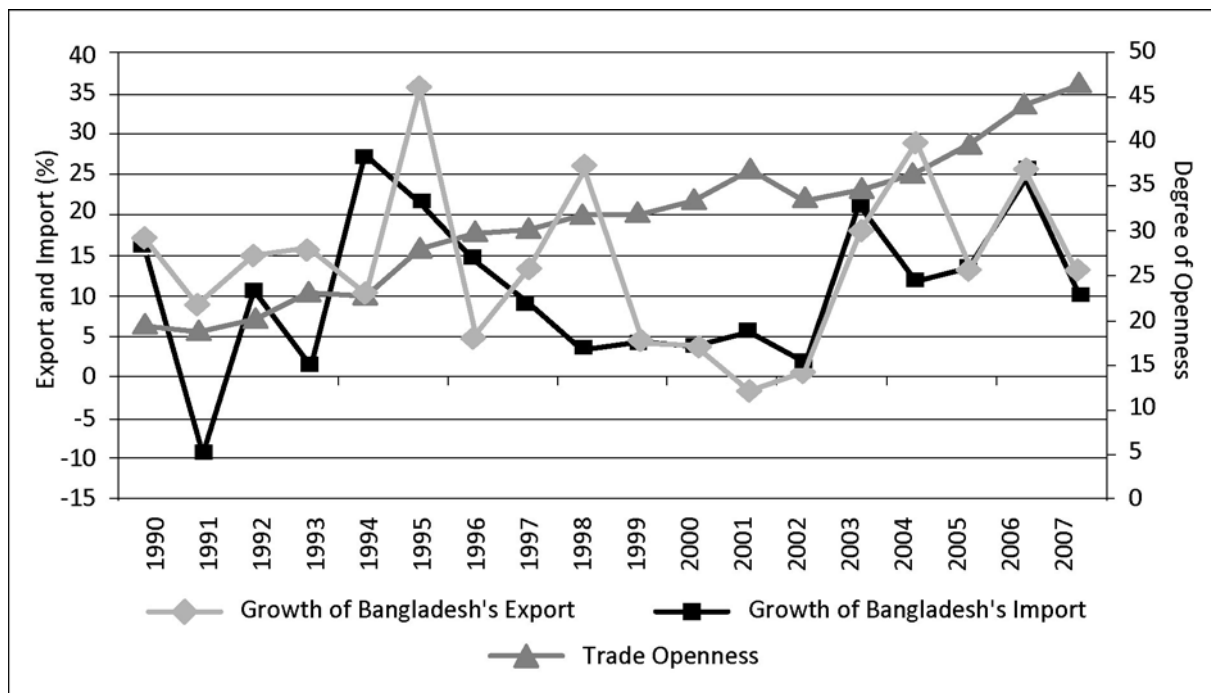
## **5. RESULTS AND DISCUSSIONS: TRENDS, PATTERNS AND DETERMINANTS OF AGRICULTURAL TRADE BETWEEN BANGLADESH AND INDIA**

### **5.1 Liberalisation and Growth of Foreign Trade in Bangladesh**

Degree of Bangladesh's trade openness has increased significantly since she started to liberalise her economy at an accelerated pace in 1991. Bangladesh's trade openness in

FY1990-91 was a lowly 16.8 per cent which increased to 56.5 per cent by FY2008-09. This was higher than many of her South Asian neighbours, including India. Bangladesh's export and import volumes, between these time lines, have also expanded by 9 and 6.5 times respectively. In FY1990-91, her export as a percentage of import is only 49.5 per cent, while the figure crossed 68 per cent in FY2009-10. This is indicative of the growing importance of foreign trade in the economy of Bangladesh<sup>23</sup>, with gradual transformation of the economy from an 'aid dependent' one to a 'trade dependent' country. The dynamics of trade openness is clearly visible from Figure 3. Additional information can be found in the Annex Table 6 and Annex Table 7.

Figure 3: Growth of Bangladesh's Overall Trade with Trade Openness



Source: UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Besides the expansion of trade volume, overall trends and trading pattern of Bangladesh have changed significantly over the past years. Over these years, RMG has emerged as the single most export earning sector in the country replacing jute and jute goods<sup>24</sup>, while leathers, footwear, pharmaceuticals, melamine, battery and plastic goods have contributed to a shift from the traditional export basket of raw jute and jute products, tea, frozen fish, etc. The share of agricultural exports from Bangladesh over the years has been shrinking from 25.7 per cent in 1990 to 5.4 per cent in 2008. Despite this, agricultural exports do have high importance for Bangladesh economy because of its domestic linkages. Since 1991, Bangladesh's import basket has also experienced significant changes. A large

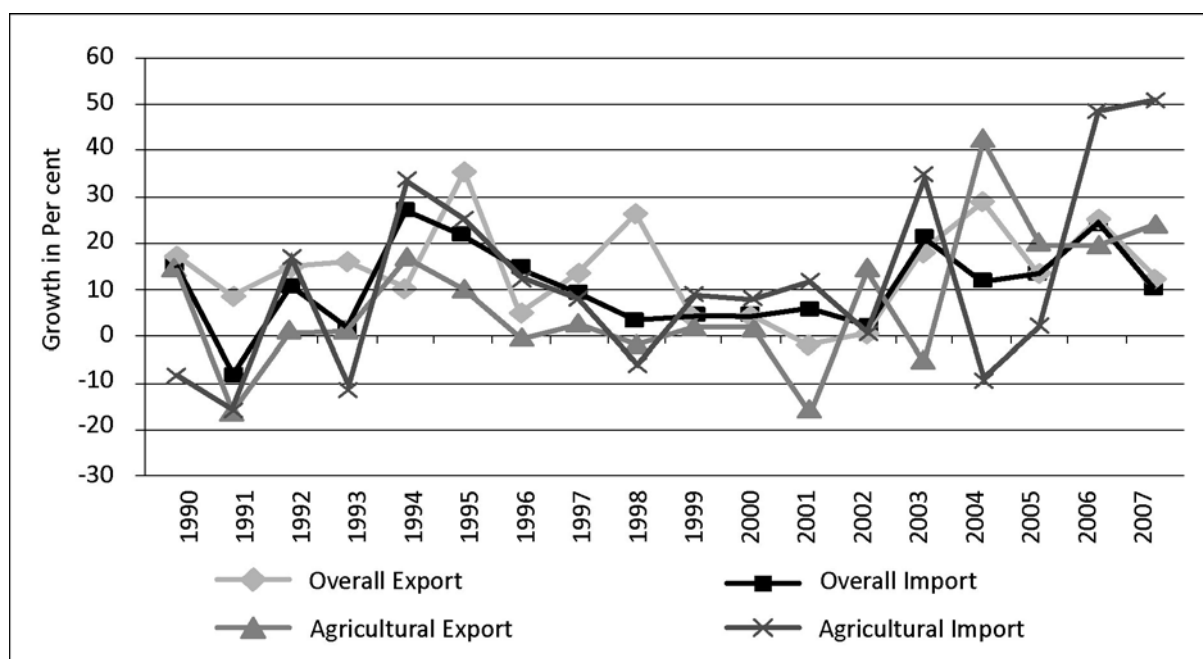
<sup>23</sup>Bangladesh's annual GDP growth is 4.3 per cent in FY1989-90 and 6.1 per cent in FY2007-08, while its GDP per capita increased from USD 250 to USD 718 during the same period. It also achieved an expansion of the FDI inflow from a slim USD 24 million in FY1990-91 to a reasonably higher USD 636 million in FY2009-10. Over these years, remittance inflow increased from USD 764 million to USD 10,987.4 million.

<sup>24</sup>The contribution of RMG sector in Bangladesh's total export earnings in FY2010-11 is about 76 per cent from a merely 3 per cent in FY1990-91.

part of the import is on account of inputs for export-oriented industries; relative importance of imports of agricultural commodities such as foodgrains, protein, edible oil, onion, lentils, etc. has also been on the rise. India has been a traditional exporter of agricultural commodities to Bangladesh. It is of interest to note here that Bangladesh's agricultural export to the Indian market has been on the rise in recent years.

Agricultural trade of Bangladesh has experienced considerable volatility in the past. The pattern of exports of agricultural commodities to the rest of the world market has been changing quite significantly in recent years, particularly after 2003 (Figure 4). A comparative analysis of Bangladesh's agricultural and non-agricultural export and import growth since 1989 shows that export growth of agricultural commodities until 2003 was quite low; however, since then exports have started to rise quite remarkably. In contrast, agricultural imports by Bangladesh have also started to increase after 2005 (Figure 4).<sup>25</sup> Bangladesh's imports of foodgrains, live animals and fibres from the global markets have been rising in recent years. Nevertheless, Bangladesh's agricultural imports and exports have both witnessed considerable degree of volatility in the past.

Figure 4: Growth of Bangladesh's Overall and Agricultural Trade with the World



Source: UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Despite a decreasing share of agricultural trade in the total trade volume of Bangladesh, and the emergence of RMG sector as the highest export earner, agriculture trade continues to

<sup>25</sup> Agricultural exports to India are expanded quite sharply since 2004. Presently, Bangladeshi agricultural and agro-based products are very popular in the North-Eastern states of India market. Exporters such as Pran Group exports agricultural and agro-based products such as fruits, processed juice and vegetable products to more than 70 countries of the world, including a good presence in the North-East Indian Seven Sisters states (Tripura, Assam, Mizoram, Manipur, Arunachal Pradesh, Nagaland and Meghalaya), where Bangladeshi agricultural and agro-based products have a high potentiality if agricultural trade between Bangladesh and India get easier in the coming days.

remain strategically important for the economy of Bangladesh, especially in the face of higher demand for foodgrains.

## 5.2 Nature and Extent of Bangladesh-India Agricultural Trade

India continues to remain one of Bangladesh's major trading partners; she was the fourth most important partner in FY2008-09 (Rahman *et al.* 2010). However, for India, Bangladesh as a trade partner is of relatively less importance. As is pointed out, Bangladesh-India bilateral trade potential have experienced some increase since 1991 (Table 5). Moreover, Bangladesh-India bilateral trade assumes high significance, particularly for Bangladesh, from the point of view of trading opportunity with the East Indian states such as West Bengal and the seven North-Eastern states of India. If the informal trade between the two countries is taken cognisance of, the extent of bilateral trade will rise significantly.

Table 5: Bangladesh's Trade Balance with India

(Million USD)

Year	Overall Trade Balance			Agricultural Trade Balance		
	Export	Import	Trade Balance	Export	Import	Trade Balance
1989	3.32	168.64	-165.33	0.73	19.61	-18.87
1990	5.43	213.01	-207.58	4.46	21.51	-17.05
1991	5.47	199.81	-194.34	2.37	33.71	-31.34
1992	1.27	228.27	-227.00	0.30	55.90	-55.59
1993	2.42	258.62	-256.20	0.60	29.47	-28.86
1994	13.23	NA	NA	0.95	NA	NA
1995	26.95	615.17	-588.21	0.37	140.16	-139.79
1996	32.12	1082.62	-1050.50	0.14	319.87	-319.73
1997	23.86	1336.25	-1312.39	0.51	105.12	-104.61
1998	10.37	1040.69	-1030.32	0.71	308.48	-307.76
1999	NA	NA	NA	NA	NA	NA
2000	24.79	614.54	-589.75	0.97	106.71	-105.74
2001	16.44	889.59	-873.15	0.29	296.13	-295.84
2002	25.40	1235.84	-1210.43	0.93	317.68	-316.75
2003	40.76	1437.88	-1397.11	0.47	510.73	-510.27
2004	105.20	1278.71	-1173.51	36.75	246.84	-212.09
2005	177.73	1372.04	-1194.31	78.22	242.57	-164.35
2006	257.88	1875.67	-1617.78	113.13	492.88	-379.75
2007	523.68	2328.94	-1805.26	86.46	736.63	-650.17

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

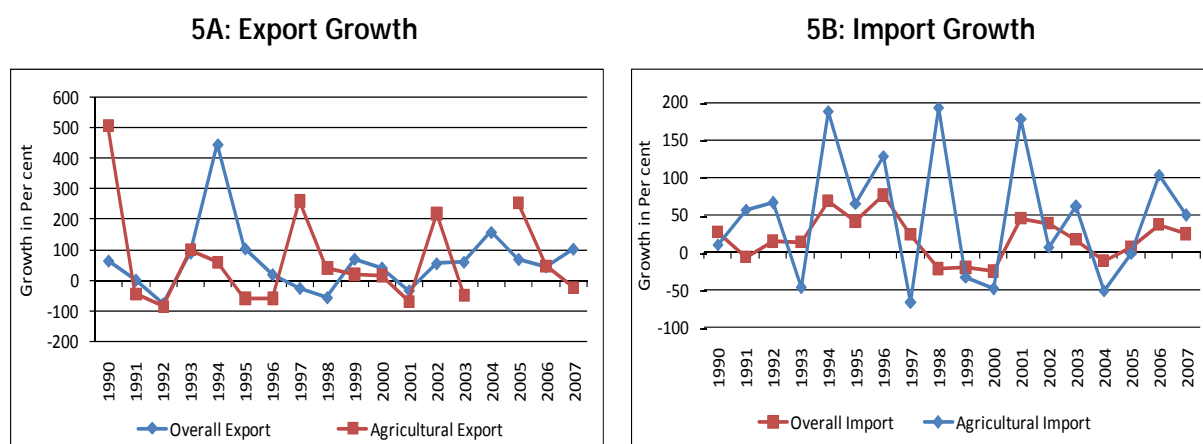
Immediately after independence in 1971, Bangladesh's dependence on Indian imports, particularly for foodgrains, sugar, fruits, vegetables, etc. was very high in view of the limited production capacity in Bangladesh. Since then, Bangladesh's import from India has continued to rise and increased manifold. Between 1989 and 2000, Bangladesh's import from India increased by 3.6 times; import increased by 1.5 fold between 2001 and 2005, and 1.7 times during the period between FY2005-06 to FY2009-10<sup>26</sup> (Table 5 and Annex Table 8).

<sup>26</sup>The study uses UN Comtrade (2010) data up to the year 2007. Due to unavailability, it uses Bangladesh Bank data for later period, which is reported according to fiscal year. The reason for not using Bangladesh Bank data for the whole study period is that it reported only aggregated data, whereas this study analysed data at disaggregated levels according to the HS codes.

One important feature of Bangladesh’s import basket from India is the predominance of raw materials, including raw cotton and yarn, for its export-oriented garments sector, which is rising quite rapidly in recent years.<sup>27</sup> In contrast, exports to the Indian market have also been increasing significantly over the last two decades.<sup>28</sup> Between FY2005-06 and FY2009-10, export doubled mainly due to increased exports of agro-based products to the North-Eastern states of India (Annex Table 8).

An analysis of the dynamics of Bangladesh’s trade with India shows that although, Bangladesh’s imports from the Indian market started to increase rapidly since 1996, her exports to the Indian market started to rise significantly only from 2004. Bangladesh’s overall import to export ratio with India is found to be 10.8 to 1 in FY2009-10, agricultural import to export ratio, on the contrary, was 12.5 to 1. Despite this, it is encouraging to note that the trends and patterns of agricultural trade between Bangladesh and India, in recent years, have been changing on a positive note for Bangladesh (Figure 5).

Figure 5: Bangladesh’s Export and Import Growth with India



Source: Authors’ calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Rahman *et al.* (2011) reported about increasing diversification of Bangladesh’s export basket to India. The study also points out that the share of traditional commodities in Bangladesh’s exports basket to India is coming down quite notably from 90.5 to 69.8 per cent between FY2004 to FY2008-09. Expansion of exports to India since 2004 has been mainly due to the increasing share of some non-traditional items such as apparels, melamine, cement, plastic, etc. These also included some agriculture items including raw jute, jute goods, fresh and chilled fish, nuts, agro-processed items such as fruit juice. The possibility of developing export-oriented agro-processing industries in Bangladesh is rated highly by trade experts. Rahman *et al.* (2011) also foresaw good possibility for export of agriculture and agro-based products from Bangladesh to the North-East India, if duty-free market access by India is further deepened, and NTBs and trade facilitation issues are adequately addressed.

<sup>27</sup>Raw cotton is not included in the list of ‘agricultural products’ used in this study.

<sup>28</sup>Export earnings become USD 523.68 million in 2007 from a mere USD 3.32 million in 1989.

### 5.3 Trends in Agricultural Trade between Bangladesh and India

Bangladesh's agricultural trade is largely characterised by exports mainly to the developed countries such as USA, UK, Belgium, Japan (Annex Table 9), among others, whereas her import partners for agricultural commodities are mostly a mix of developed and developing countries such as USA, India, Indonesia, Argentina, Brazil, Canada, etc. (Annex Table 10). USA has been able to retain its position as the most important importer of Bangladeshi agricultural goods, whereas India has emerged as the number one exporter of agricultural commodities to Bangladesh since the mid 1990s.

As an importer of Bangladeshi agricultural products, India started to rank highly since 2004 from the rather negligible positions held by her up to 2003. On the other hand, India remained one of the leading exporting countries of agricultural commodities to Bangladesh since 1971. India started to emerge as the leading agricultural exporting country for Bangladesh following the reform of the early 1990s both in India and Bangladesh. At present, India is the top agricultural exporting country for the Bangladesh market.

Between 1989 and 2010, Bangladesh's agricultural imports from the world market has increased more than 10 times compared to the rise of her agricultural exports to the world market which was 2.5 times. On the other hand, although India continued to remain an important exporter of agricultural commodities to Bangladesh, her import of agricultural products from Bangladesh started to increase only after the year 2004 (Table 6). Between FY2005-06 and FY2009-10, export increased due to mainly increased exports of agro-based products to the North-eastern states of India (Annex Table 11).

**Table 6: Bangladesh's Agricultural Trade with the World and India**

Year	Export of Bangladesh's Agricultural Products ('000 USD)		Bangladesh's Agricultural Export to India (% of Total)	Import of Bangladesh's Agricultural Products ('000 USD)		Bangladesh's Agricultural Import from India (% of Total)
	World	India		World	India	
1989	464474	734	0.16	719458	19606	2.73
1990	534393	4455	0.83	657302	21506	3.27
1991	441708	2370	0.54	550635	33714	6.12
1992	444764	304	0.07	641651	55896	8.71
1993	450374	604	0.13	569525	29466	5.17
1994	527898	952	0.18	NA	NA	NA
1995	580340	370	0.06	950940	140161	14.74
1996	577983	143	0.02	1071381	319870	29.86
1997	592592	513	0.09	1156633	105121	9.09
1998	583095	714	0.12	1084015	308478	28.46
1999	NA	NA	NA	NA	NA	NA
2000	609614	971	0.16	1270567	106707	8.40
2001	508411	294	0.06	1415224	296133	20.92
2002	582928	932	0.16	1429242	317684	22.23
2003	548669	466	0.08	1920475	510734	26.59
2004	779142	22031	2.83	1746127	246841	14.14

(Table 6 contd.)



(Table 6 contd.)

Year	Export of Bangladesh's Agricultural Products ('000 USD)		Bangladesh's Agricultural Export to India (% of Total)	Import of Bangladesh's Agricultural Products ('000 USD)		Bangladesh's Agricultural Import from India (% of Total)
	World	India		World	India	
2005	931218	78218	8.40	1776274	242566	13.66
2006	1112327	113131	10.17	2639755	492881	18.67
2007	1381750	86463	6.26	3985926	736631	18.48

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Growth of Bangladesh's agricultural trade with India remained rather modest till 2003.<sup>29</sup> It was also characterised by volatility in the growth of import from India (Figure 6). The reason behind low agricultural export figures for the Indian market may be attributed to the nature of Bangladesh's export basket which was dominated by manufactured items such as apparels. Bangladeshi products also faced high tariff rates in India for agricultural goods in the sensitive list (for more details, please see agricultural tariff section of this report). In contrast, Bangladesh continues to be dependent on India for a number of essential agricultural commodities such as foodgrains, onion, live animals, lentils, raw sugarcane, fruits, etc. Increased domestic demand and lower transaction costs have worked in favour of India.

Figure 6: Growth of Bangladesh's Agricultural Trade with India



Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

It needs to be noted here that despite the growing bilateral trade deficit with India, both in terms of overall trade, and also agricultural trade, some positive developments can be

<sup>29</sup>An unfavourable trade balance against Bangladesh since 1971, despite some significant changes after 2004.

discerned with regard to Bangladesh's exports to India in recent years (Rahman *et al.* 2011). A part of this dynamism may be explained by the preferential market access in India as part of the RTA (first SAPTA, and then SAFTA, which has been analysed in the preceding sections). Despite this positive vibe, there are still many obstacles which work against expansion of Bangladesh's agricultural trade with India. If the existing high tariff and para tariff rates are reduced, and NTBs and trade facilitation issues are addressed adequately, Bangladesh is likely to be able to increase her export of agriculture items to India significantly. This may help boost the exports of Bangladeshi products (including agricultural commodities) to the Indian market and help reduce the prevailing trade imbalance.

#### 5.4 Patterns of Agricultural Trade between Bangladesh and India

Bangladesh's export basket of agricultural commodities to the Indian market is rather narrow, concentrating on a limited number of items. Her agricultural export to the Indian market also has remained largely undiversified. The value of the top five selected agricultural export items from Bangladesh to India continued to maintain a share of about 90 per cent of the total export value over the years (Table 7). Until 1998, glycerol, black tea

**Table 7: Major Agricultural Export Items of Bangladesh to India at HS 6 Digit Level**

Year	Major Export Items	Export Value of Top 5 Products ('000 USD)	Percentage Share of Top 5 Products
1989	Glycerol, cashew nuts, black tea, unbleached woven fabrics	677	92
1990*	Whiskeys, other vegetables, glycerol, jute	4455	100
1991*	Black tea, jute, glycerol, unbleached woven fabrics, cane molasses	2369	100
1992	Glycerol, unbleached woven fabrics, tobacco, smoked fish, beeswax	301	99
1993*	Glycerol, other grape, other vege, other food	604	100
1994	Black tea, glycerol, frozen shrimp, ossein, unbleached woven	933	98
1995*	Frozen shrimp, glycerol, whiskey, cigarettes	370	100
1996*	Black tea, glycerol, frozen fish	143	100
1997*	Black tea, glycerol, other vegetable	513	100
1998	Black tea, other food, frozen fish, glycerol	688	96
2000	Frozen fish, vegetable fat, industrial monocarbox, vege products	924	95
2001	Frozen fish, black tea, single citrus fruit juice, indus monocarbox, vege products	267	91
2002	Frozen shrimp, black tea, multiple or cabled yarn jute, frozen flat fish, unbleached woven	905	97
2003	Frozen shrimp, cuttle fish, glycerol, ossein, jute	348	65
2004	Jute, fresh or chilled fish, unbleached woven fabrics, other nuts	32333	87
2005	Jute, other nuts, fresh or chilled fish	68352	87
2006	Jute, other nuts, fresh or chilled fish, jute	102029	90
2007	Jute, other nuts, fresh or chilled fish, unbleached woven	81531	94

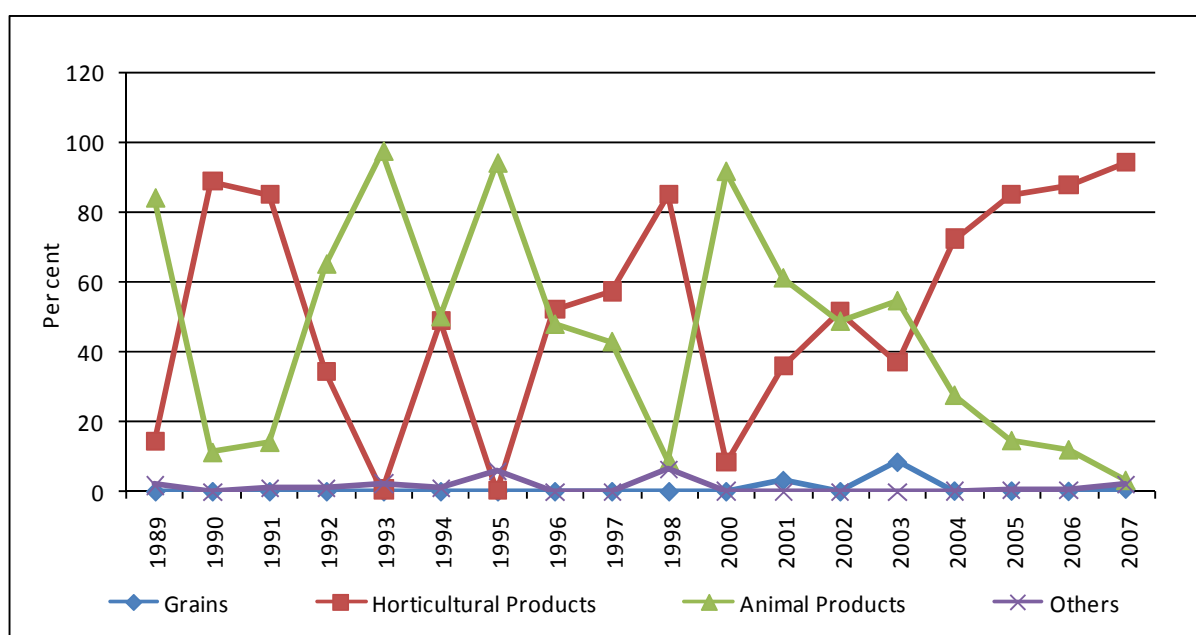
**Source:** Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

**Note:** \* Indicates all products. Related data based on HS 2 digit level is available in Annex Table 12.

and unbleached woven fabrics had been the most commonly traded agricultural items among the top five products. Since 2000, raw jute and jute products, frozen and fresh fish, including shrimp and *hilsa*, have started to dominate the commodity basket.

A disaggregated decomposition of major agricultural exports of Bangladesh to India shows that horticultural and animal products remained two of the most important export items for Bangladesh; however, their respective shares experienced some fluctuation over the past years. Of the most important horticulture products that are traded with India, fruits, black tea, other foods, processed juice, etc. are notable, while leather products, frozen and fresh fish remained two major animal products which are exported to India (Figure 7).

**Figure 7: Share of Different Categories in Export of Agricultural Commodities by Bangladesh to India**



**Source:** Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

**Note:** Grains include starches, oilseed and cereal preparation. Horticultural products includes live tree, edible vegetables, edible fruit, nuts, tea, coffee, vegetable plaiting materials, vegetable preparation, tobacco and other vegetable textile fibers. Animal products include meat, fish, crustacean, dairy products, products of animal origin, animal/vegetable fat. Others include sugar and sugar confectionary, miscellaneous edible preparations, beverages, residues and waste from the food industries.

Nonetheless, fish items consistently remained among the top 5 export items to India from Bangladesh since 1994, mainly due to favourable subsidy and tax exemptions policies of the Bangladesh government and the increasing demand in the Indian market. Backed by favourable policies and increased demand, the seafood processing sector turned out to be attractive as an export item and exports of these items to India rose significantly.

On the import side, Bangladesh's major agricultural imports from India are mostly foodgrains, onion, raw fruits, milk products, oil cake and live animals (Table 8). In spite of the significant expansion of cereal production in Bangladesh from a low 9.8 million MT immediately after its independence to over 35 million MT in 2010, the country imports

about 3-4 million MT of foodgrains every year. India, till recent times, was the largest rice exporter to Bangladesh. In the recent past, due to production failure and domestic food security concerns, India has started to impose ban on exports of foodgrains. This was one of the reasons for Bangladesh's import of rice from India has been on decline in recent years.

**Table 8: Major Agricultural Import Items by Bangladesh from India at HS 6 Digit Level**

Year	Major Import Items	Import Value of Top 5 Selected Products (USD)	Percentage Share (%)
1989	Onion, other fruit, apples, garlic, orange	16299	83
1990	Onion, other fruit, apple, orange, tobacco	18467	86
1991	Onion, fruits of genus capsicum, spelt wheat, garlic, other fruits	27381	81
1992	Onion, fruit, other fruit, apple, milk	48721	87
1993	Onion, bird's egg, other fruit, apple, fruits of genus capsicum	22875	78
1995	Rice, orange, durum wheat	113938	81
1996	Rice, spelt wheat, raw cane sugar	251561	79
1997	Rice, orange, onion, spelt wheat, raw cane sugar	57524	55
1998	Semi or wholly milled rice, other preparations, onion, apple	256143	83
2000	Rice, oil cake, raw cane sugar, dried lentils, onion	66993	63
2001	Spelt wheat, raw cane sugar, oil cakes, rice, maze	221384	75
2002	Spelt wheat, rice, oil cake, raw sugar cane, jute	225776	71
2003	Rice, spelt wheat, raw sugar cane, oil cake, onion	412055	81
2004	Spelt wheat, rice, onion, fruits of genus capsicum, dried lentils	186066	75
2005	Rice, spelt wheat, dried lentil, milk, maize	175867	73
2006	Rice, cane or beet sugar, onion, oil cake	347047	70
2007	Rice, cane or beet sugar, oil cake, onion, maize	587533	80

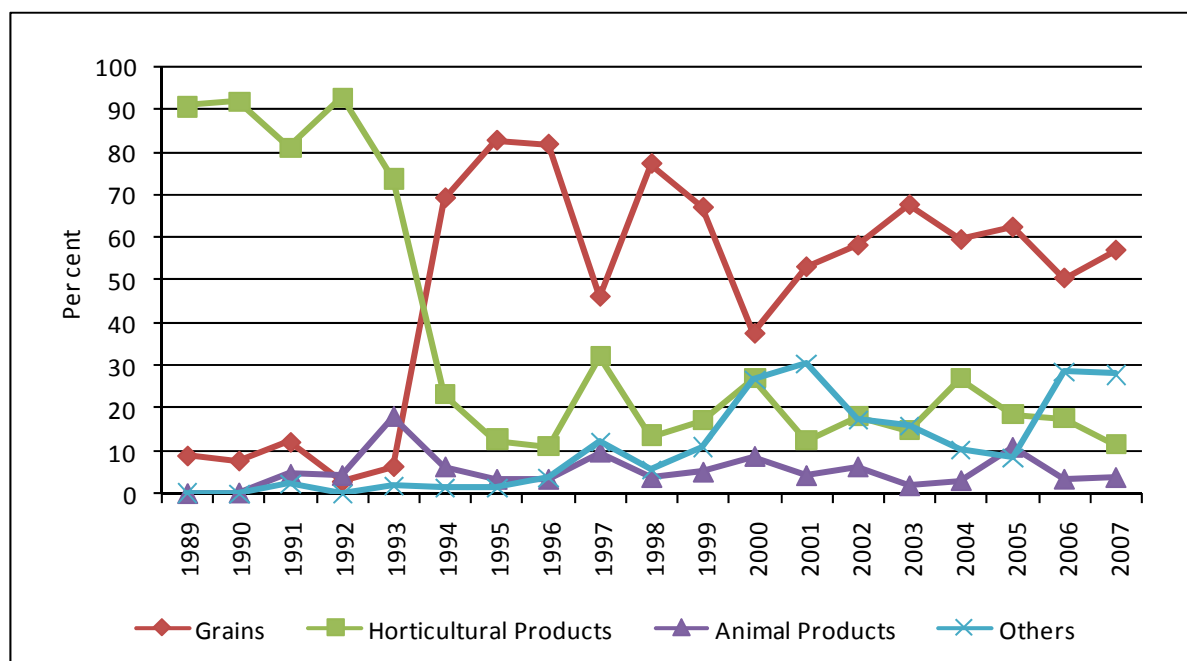
**Source:** Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

**Note:** Related data based on HS 2 digit level is available in Annex Table 13.

Pattern of India's exports of agricultural commodities to the Bangladesh market have changed significantly since the early 1990s. Share of horticultural products have declined, whilst imports of foodgrains by Bangladesh has posted a rise compared to the early 1990s. This continued till the recent past, before the bans imposed by India. The other two sub-categories of imported items from India, animal products and other items, maintained either insignificant or slow growth after 1991 (Figure 8).

Cereal occupies a prominent position in the structure of Bangladesh's imports of agricultural commodities from India. Bangladesh imported about 54 per cent of her cereals from India during 2001-2005 whilst this has decreased somewhat to 35 per cent during FY2005-06 to FY2009-10 (Table 9 and Annex Table 14), a significant share in her global imports of the items. On the other hand, during this same period, India exported about 11 per cent of her global export of cereals to Bangladesh. Bangladesh thus remains a major destination of cereal exports from India.

Figure 8: Share of Different Categories in Import of Agricultural Commodities by Bangladesh from India



Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Note: Grains include cereal, starches, oilseed, cocoa and cereal preparations. Horticultural products includes live tree, edible vegetables, edible fruit, nuts, tea, coffee, lac, gums, vegetable plaiting materials, vegetable preparation, tobacco and other vegetable textile fibers. Animal products include live animals, meat, fish, crustacean, dairy products, products of animal origin, animal/vegetable fat, meat preparation. Others include sugar, sugar confectionary, miscellaneous edible preparations, beverages, residues and waste from the food industries.

Table 9: Bangladesh-India Cereal Trade with the World and India: 2000-2007

('000 USD)

Year	Bangladesh's Import Scenario			Indian Export Scenario		
	Trade Value		Proportion (%)	Trade Value		Proportion (%)
	World	India		World	Bangladesh	
2000	271959	36071	13.3	639846	59128	9.2
2001	378577	154137	40.7	899682	149140	16.6
2002	268458	180767	67.3	1558939	167477	10.7
2003	474157	341343	72.0	1396163	415538	29.8
2004	264054	140991	53.4	1831274	350628	19.1
2005	402324	139209	34.6	1915272	368958	19.3
2006	647369	235981	36.5	1588583	157966	9.9
2007	1015857	401921	39.6	2770923	469249	16.9

Source: Authors' compilation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS) (accessed in May 2011); and Export Import Data Bank, Department of Commerce, GoI (2010).

It also needs to be kept in mind that a large share of Bangladesh-India agricultural trade remains unaccounted for due to informal nature of the trade. While reliable data on

informal trading<sup>30</sup> between Bangladesh and India is not readily available, it is safe to assume that a large part of this trade is destined for Bangladesh.

## 5.5 Determinants of Agricultural Trade (Export Supply and Import Demand) between Bangladesh and India

### A. Results from Unit-root Tests

Following Enders (1995), this study uses both Augmented Dickey-Fuller (ADF) (1981) and the Phillips-Perron (PP) (1988) unit root test.<sup>31</sup> From Table 10, it can be concluded that the model variables included in the agriculture trade (export supply and import demand) between Bangladesh and India are non-stationary at level but stationary at first difference.

Table 10: ADF and PP Unit Root Test for Stationarity

Variable	Augmented Dickey-Fuller (ADF)				Phillips-Perron (PP)			
	Level		First Difference		Level		First Difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend	Intercept	Intercept and Trend
Ln.BXBI	-4.755193 (3)***	-4.786867 (3)***	-5.538823 (3)***	-5.062824 (3)***	-0.131487 (0)	-1.543611 (1)	-2.898442 (3)*	-2.850635 (4)
Ln.BMIB	-3.134043 (0)**	-4.189212 (0)***	-6.854362 (0)***	-6.683131 (0)***	-3.134043 (0)**	-4.180512 (2)***	-13.90656 (17)***	-15.64679 (18)***
Ln.TAPB	1.997316 (0)	-0.600652 (0)	-3.290672 (0)**	-4.230837 (0)***	2.282143 (2)	-0.587153 (1)	-3.290672 (0)**	-4.228288 (2)***
Ln.TAPI	-0.389115 (0)	-3.822723 (4)	-2.999008 (4)**	-3.265438 (4)*	-0.392369 (1)	-2.053338 (1)	-4.221396 (0)***	-4.150066 (0)**
Ln.CPIB	-0.878394 (0)	-1.196716 (0)	-4.495821 (0)***	-4.646683 (0)***	-0.895691 (1)	-1.196716 (0)	-4.495821 (1)***	-4.678477 (2)***
Ln.BRER	-3.376911 (3)**	-2.895973 (1)	-4.147790 (1)***	-4.391688 (1)***	-2.235521 (5)	-1.997652 (9)	-3.811635 (9)***	-5.296725 (18)***

Note: \*\*\*Significant at 1 per cent level; \*\*Significant at 5 per cent level; \*Significant at 10 per cent level.

### B. Results from ARDL Model of Agricultural Trade between Bangladesh and India

An UECM version of the ARDL models with three lag of Eq. (5a) and (5b) are estimated to find out the elasticities from bilateral agriculture export supply model and import demand model respectively. Then Hendry's 'general-to-specific' modeling approach is employed for each of the equation using the Akaike Information Criterion (AIC). The results on Eq. (5a) and (5b) are presented in Table 11. The validity of the estimated equations is confirmed by employing relevant post-estimation diagnostic tests. The Breusch-Godfrey LM test statistic

<sup>30</sup>The term informal is used to denote: i) illegal economic activities by others; ii) parallel markets (i.e. those unregulated by the government) and by still others to mean; and iii) extra-legal activities (Nisha and Sanjib n.d.). A study by the World Bank (2006) mentioned that total smuggled exports from India to Bangladesh may have been around USD 500 million, about 42 per cent of Bangladesh's recorded imports from India in 2002-03, and/or about 30 per cent of total imports (recorded plus smuggled).

<sup>31</sup>Selecting the most appropriate unit root test is difficult.

rejected the first and second order serial correlation for Eq. (5a) and Eq. (5b). Further, Autoregressive Conditional Heteroscedasticity (ARCH) test statistics confirms that the residuals are homoscedastic in Eq. (5a) and Eq. (5b).

**Table 11: Estimated ARDL Model based on Agricultural Trade between Bangladesh and India**

Variable	Model 1: Export Supply from BD to IN (Dependent Variable: BXBI)			Model 2: Import Demand from IN to BD (Dependent Variable: BMIB)		
	Coef.	P-Val.	SE	Coef.	P-Val.	SE
L.Ln.BXBI	-1.475	0.053	0.633			
L.Ln.BMIB				-2.053	0.008	0.526
L.Ln.TAPB	6.010	0.488	8.219	-17.997	0.013	5.174
L.Ln.TAPI	-11.710	0.278	9.958	12.432	0.17	3.814
L.Ln.CPIB	10.574	0.175	7.013	10.113	0.006	2.417
L.Ln.BRER	9.94	0.189	6.836	-1.845	0.180	1.128
SAPTA	3.374	0.230	2.565	2.668	0.004	0.583
LD.Ln.BXBI	0.874	0.144	0.531			
LD.Ln.BMIB		0.637	10.561	0.236	0.453	0.294
LD.Ln.TAPB	-5.206	0.106	11.142	3.885	0.407	4.358
L2D.Ln.TAPB						
LD.Ln.TAPI	20.658	0.152	6.760			
L2D.Ln.TAPI						
LD.Ln.CPIB	-10.858	0.248	7.421	3.121	0.061	1.357
L2D.Ln.CPIB				11.652	0.006	2.812
LD.Ln.BRER	-9.347	0.230	2.565			
L2D.Ln.BRER				9.311	0.004	2.076
Constant	34.735	0.675	79.530	16.451	0.004	35.894
R <sup>2</sup>			0.637			0.926
Adjusted R <sup>2</sup>			0.067			0.791
F-statistics			1.12			6.85
Prob. (F-statistics)			0.458			0.014
Durbin-Watson D-statistics			2.224			2.022
Breusch-Godfrey LM test		(1):1.013[0.314] (2):3.594[0.165] (3):13.725[0.003]		(1):0.336[0.562] (2):4.931[0.085] (3):10.270[0.016]		
ARCH test		(1):0.023[0.879] (2):0.070[0.966] (3):0.099[0.992]		(1):0.422[0.516] (2):0.610[0.737] (3):0.458[0.928]		
ARDL Bounds F test Statistics			3.55			7.50

Note: \*\*\*Significant at 1 per cent level; \*\*Significant at 5 per cent level; \*Significant at 10 per cent level.

The computed F-statistics based on the Wald tests are 3.55 and 7.50 for Eq. (5a) and Eq. (5b) respectively. The test statistics for Eq. (5a) exceeded the upper bound of 3.52 at 10 per cent level of significance, suggesting that the null hypothesis of no cointegrating relationship is rejected. Therefore, the long-run cointegrating relationship is confirmed among the variables of agriculture export supply models (Model 1) for Bangladesh. In addition, the test statistics for Eq. (5b) exceeded the upper bound of 5.06 at 1 per cent level of significance which confirms cointegrating relationship pertaining to variables of agriculture import demand models (Model 2) for Bangladesh.

### C. Long-run and Short-run Elasticities of Agricultural Trade between Bangladesh and India

Table 12 presents the estimated long-run and short-run elasticities of agriculture trade (export supply model and import demand model) between Bangladesh and India with respect to total agricultural production of Bangladesh (TAPB), total agricultural production of India (TAPI), consumer price index of Bangladesh (CPIB), and bilateral real exchange rate (BRER) along with 'SAPTA' dummy for Eq. (5a) and Eq. (5b).

Table 12: Long-run and Short-run Elasticities of Agricultural Trade between Bangladesh and India

Variable	Model 1: Export Supply from BD to IN (BXBI)		Model 2: Import Demand from IN to BD (BMIB)	
	Long-run Elasticity	Short-run Elasticity	Long-run Elasticity	Short-run Elasticity
L.Ln.TAPB	4.072	-5.206	-8.762***	3.885
L.Ln.TAPI	-7.394	20.658	6.053***	-
L.Ln.CPIB	7.164	-10.858	4.924***	3.643*
L.Ln.BRER	6.739	-9.347	-0.898	-
SAPTA	2.285	-	1.299	-

Note: \*\*\*Significant at 1 per cent level; \*\*Significant at 5 per cent level; \*Significant at 10 per cent level.

Table 12 shows both long-run and short-run elasticities of Eq. (5a) and Eq. (5b). Long-run elasticities of export supply model based on Eq. (5a) are consistent and shows expected signs but are not statistically significant. Additionally, short-run elasticities of export supply model are also statistically insignificant. Conversely, long-run elasticities of import demand model based on Eq. (5b) shows theoretically consistent and statistically significant relationship.

Long-run elasticity of total agriculture production of Bangladesh (TAPB) shows a strong negative impact on agricultural import demand of Bangladesh from India. The long-run elasticity of TAPB implies that a one per cent increase in the total agricultural production in Bangladesh could lead to a significant decrease in the bilateral agriculture import demand from India, by 8.76 per cent. Total agricultural production of India (TAPI) and consumer price index of Bangladesh (CPIB) also indicate statistically significant and positive impact on bilateral agricultural import demand of Bangladesh from India.

Among other positive impact variables, total agricultural production in India shows significant elastic impacts. The long-run elasticity of TAPI implies that a one per cent increase in the total agricultural production in India could lead to a significant increase in the agriculture import by Bangladesh from India, by 6.05 per cent.

The variable consumer price index for Bangladesh (CPIB) implies that a one per cent increase in CPI in Bangladesh could lead to an increase in the agricultural import demand of Bangladesh from India by 4.92 per cent and 3.64 per cent in the long-run and short-run respectively. CPI shows low positive impact on bilateral agricultural import demand of Bangladesh from India, but bilateral real exchange rate (BRER) between Bangladesh and India and SAPTA shows no significant impacts on agriculture import demand of Bangladesh. The estimated value and sign of CPI is also similar with Rahman (2000). The study found that in case of Bangladesh inflation affects bilateral trade (import) positively (elasticity,  $\eta = 0.08$ ). On the contrary, the short-run elasticity of CPIB positively influences



agricultural import demand of Bangladesh from India. The CPI of Bangladesh indicates that domestic price level plays an important role in influencing agriculture import demand (Hoque and Yusop 2010), particularly in the long-run. Consequently, keeping the inflation rates low (by maintaining lower CPI through appropriate monetary and fiscal policies) would be a better policy mix to improve bilateral trade balance (reducing the level of trade deficit) between the two countries.

## 6. CONCLUDING REMARKS AND POLICY IMPLICATIONS

The paper investigates the evolution of agricultural trade policy, trends, trading patterns and determinants of bilateral agriculture trade between Bangladesh and India. The trends of bilateral trade flows bear out that India has continued to remain an important trading partner for Bangladesh, both in terms of overall trade flows as well as trade in agricultural commodities. Despite the significantly large bilateral trade deficit with India, Bangladesh's exports to the Indian market have experienced robust growth in recent years, particularly over the past five years. In parallel, Bangladesh's import from India has also been on the rise over the corresponding period with the resultant rising bilateral trade deficit.

Analyses of trends and trading patterns undertaken in the present study reveal that the demand for Bangladeshi agricultural commodities such as jute and jute products, fruit juice, vegetable items and agro-based products have evinced rising trends in the Indian market in recent years. This is particularly true with regard to the North-Eastern states of India. In particular, this trend has been clearly visible since 2004 when significant positive changes were experienced through growing diversification of the agricultural export basket of Bangladesh. Bangladesh's imports of agricultural commodities such as onion, wheat and rice from the Indian market have also seen a rapid rise over the corresponding period.

It was observed in the paper that changes in trade pattern depends significantly on trade policy changes in such areas as tariff and para tariff rates, NTBs and trade facilitation measures. Bangladesh has reduced her agricultural tariffs significantly since the 1990s, although the level of her para tariffs applicable to certain products remained high.<sup>32</sup> However, in most cases the tariffs on agri-items were found to be lower in Bangladesh when compared to those of India. Coffee, tea and spices, sugar and sugar confectionery products exported by Bangladesh faced tariff rates of different ranges in India. The need to ensure compliance with India's SPS measures-related requirements oftentimes constrain market access in view of weak state of capacity in Bangladesh to address the attendant issues. Furthermore, India's wide-ranging 'sensitive list' was also one of the key

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<sup>32</sup>The simple average applied MFN tariff rate of Bangladesh was reduced from 22.2 per cent in 1999-00 to 15.12 per cent in 2008-09. On the other hand, the corresponding figure for India, which was 32.3 per cent in 2001-02, came down to 17.5 per cent in 2006-07. Moreover, India's agricultural tariff rate, which was 41.7 per cent in 2001-02, increased to 43.2 per cent in 2008-09.

constraints inhibiting expansion of Bangladesh's agricultural exports to India.<sup>33</sup> This obstacle, however, has now been removed through India's offer of duty-free access to all exportables from Bangladesh. In view of this recent developments, it will be the non-tariff barriers which will play a critically important role in determining Bangladesh's ability to realise the potential opportunities of Indian offer and export of these items to India.

Econometric estimation of Bangladesh's import demand undertaken for the present study revealed that domestic agricultural production together with India's agricultural production and inflation in Bangladesh have significant influence on import demand of Bangladesh (from India) in the long-run. Additionally, national inflation also affects her import demand positively in the short-run. Estimates of export supply of agricultural commodities have displayed the expected, albeit insignificant relationship. It is also important to note that tariff role did not emerge as a significant variable in the econometric exercise, indicating that it was the non-tariff factors that were of key importance from the perspective of increasing Bangladesh's exports to India.

Based on these findings, a number of policy initiatives could be considered with a view to stimulate agricultural trade between Bangladesh and India. Now that India has offered duty-free market access to Bangladesh, including agri-exports, Bangladesh should put a renewed emphasis on enhancing her supply side capacities in producing agricultural items for export to the Indian market. Importantly, Bangladesh should come to an understanding with India that the latter will not put in place any export ban, particularly in case of export of rice, during times of food crisis. Bangladesh's positive gesture with regard to transit and transshipment facilities to India should create a favourable environment for trade in agricultural goods by way of bringing down costs and reduced lead time.

As the analysis has identified, SPS-TBT related NTBs constrain Bangladesh's export of agricultural items to India in a significant way and to a significant extent. There is, thus, a need to strengthen compliance capacities of Bangladesh in this respect. The BSTI will need to be significantly strengthened in areas of compliance capacity. A mutual recognition agreement, with regard to certification, lab-testing and standards, needs to be signed between BSTI (of Bangladesh) and BSI (of India). Moreover, harmonisation of customs classification and procedures is needed to facilitate cross-border movement of agricultural items. Appropriate testing facilities should be put in place at border points to remove unnecessary delays and harassment of exporters. Availability of letter of credit (L/C) opening and banking facilities, particularly in the North-East region, will be critically important. Customs harmonisation between the two countries will also help reduce the hassle at border points. In this connection, Bangladesh should keep in mind the interests of her agricultural trade with India in the context of the ongoing negotiations under SATIS (SAARC Agreement on Trade in Services) where offer and request lists are currently being finalised.

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<sup>33</sup> Out of the 480 listed products in the Indian 'sensitive list' (2008), a total of 247 were found to be agricultural items which included many of agricultural items of export interest of Bangladesh. In 2007, about 21 per cent of Bangladesh's total export earnings from India, on account of agricultural commodities, belonged to the 'sensitive list' products. On the other hand, Bangladesh's import of 'sensitive list' products from India belonging to the agriculture sector, have been on a rapid rise in recent times – import of these items increased by seven-folds between 2000 and 2007. As was noted earlier, India has offered Bangladesh duty-free market access since January 2012 for all items including agri-products.

More intensive exchange of agri-professionals of the two countries and creating greater opportunities for commercial presence should be kept in mind in this connection. Better trade facilitation is likely to significantly bring down costs of both export and import, helping Bangladesh to raise its export competitiveness in agri-products in the Indian market and reducing prices of imported agri-items from India. Reduced cost of agricultural raw materials will also help Bangladesh to enhance export competitiveness of her manufactured agri-items.

In view of the duty-free access offered by India, attracting Indian investment to Bangladesh, targeting the Indian market of agri-items, taking advantage of the preferential market access, remains a promising possibility. Now that India has allowed investment from Bangladesh in the North-East region, there is a possibility to set up agri-manufacturing facilities, by Bangladeshi entrepreneurs, in this region. This could also deepen bilateral trade cooperation in agri-items between the two countries.

Bangladesh's policymakers should give higher priority to increase domestic agricultural production and supply side capacities in items which have already demonstrated their export potential in the Indian market. In this regard, closer collaboration between research institutions of Bangladesh and India will enable Bangladesh to access modern agricultural technology from India and benefit from technology transfer. This would lead to productivity gains and increased competitiveness of her agricultural exports which is crucial to Bangladesh's ability to take advantage of the duty-free access of agri-items in the Indian market.

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## ANNEX TABLES

Annex Table 1: Major Characteristics of Economy and Agriculture in Bangladesh and India

Indicator	Bangladesh				India			
	1989-90	1991-99	2000-07	2008	1989-90	1991-99	2000-07	2008
Agricultural land (per cent of land area)	77.3	68.8	69.5	NA	60.9	60.9	60.7	NA
Arable land (per cent of land area)	70.4	61.5	61.4	NA	54.8	54.4	53.8	NA
Agriculture value added per worker (constant 2000 USD)	241.6	279.1	361.6	417.6	357.9	387.6	436.0	478.0
Agriculture value added (per cent of GDP)	30.3	26.8	21.8	19.0	29.3	27.5	20.4	17.5
Agriculture value added (annual per cent growth)	4.6	2.8	3.7	3.2	2.6	3.2	2.9	1.6
Agriculture value added (billion at constant 2000 USD)	8.1	9.5	12.7	14.8	73.6	86.7	108.3	125.1
Economically active population in agriculture (million)	33.5	34.0	35.2	35.6	205.8	223.3	248.1	261.6
GDP (million at constant 2000 USD)	28646.0	36957.1	57157.0	73939.7	263408.7	349731.1	587958.5	817936.8
GDP growth (annual per cent)	4.3	4.7	5.8	6.2	5.7	5.6	7.2	6.1
GDP per capita (constant 2000 USD)	250.4	287.4	381.3	462.1	313.1	373.2	546.3	717.5
GDP per capita growth (annual per cent)	2.0	2.6	4.0	4.7	3.6	3.8	5.6	4.7
Total population (million)	114.4	128.1	149.4	160.0	841.0	932.4	1071.3	1.1
Population density (people per sq. km)	878.7	984.3	1147.7	1229.2	282.9	313.6	360.3	383.4
Population growth (annual per cent)	2.2	2.0	1.7	1.4	2.0	1.8	1.5	1.3
Agricultural trade as per cent of GDP	4.15	3.75	4.95	7.71†	1.50	2.04	2.23	3.28
Agricultural trade as per cent of total trade	25.66	16.89	14.55	17.60†	9.80	11.42	6.96	5.40

Source: Authors' calculation based on data extracted from WDI (2010) and UN Comtrade (2010).

Note: Agricultural trade data for Bangladesh in 1994, 1999 and 2004 are not available. † indicates data for 2007.

Annex Table 2: Bangladesh's Degree of Openness and the Extent of Globalisation

(Million USD)

Indicator	FY1981	FY1991	FY2001	FY2009	FY2010
Export (X)	725.0	1718.0	6467.5	15565.2	16204.7
Import (M)	1954.0	3472.0	9335.0	22507.1	23738.4
Remittance (R)	379.0	764.0	1882.1	9689.3	10987.4
ODA disbursed	1146.0	1733.0	1369.0	1847.3	NA
FDI (net)	0.0	24.0	354.5	961.0	636.0
Total (1-5)	4204.0	7710.5	19603.4	50569.9	NA
GDP (current price)	19811.6	30974.8	47826.5	89564.0	99434.3
Degree of openness ((X + M) as per cent of GDP)	13.5	16.8	33.0	42.5	NA
Extent of globalisation (per cent)	21.2	24.9	41.0	56.5	NA
X as per cent of M	37.1	49.5	69.3	69.2	68.3
(X+R) as per cent of M	56.5	71.5	89.4	112.2	114.5
ODA as per cent of GDP	5.8	5.6	2.9	2.1	NA
ODA as per cent of export	158.1	100.9	21.2	11.9	NA

Source: CPD Trade Database and compiled from various sources such as the Bangladesh Bank and Export Promotion Bureau (EPB).

Annex Table 3: India's Degree of Openness and the Extent of Globalisation

(Million USD)

Indicator	1981	1991	2001	2008
Export (X) (current price)	11436	22986	60966	262819
Import (M) (current price)	16513	22983	65221	324848
Remittance (BOP at current price)	2300	3275	14144	49144
Net ODA received (current)	1973	2736	1704	2108
FDI (net) (BOP at current price)	NA	74	4074	22807
Total (1-5)	32220	52054	146109	661725
GDP (current price)	190454	267524	477849	1159171
Degree of openness (X + M as per cent of GDP)	14.7	17.2	26.4	50.7
Extent of globalisation (per cent)	16.9	19.5	30.6	57.1
X as per cent of M	69.3	100.0	93.5	80.9
(X+R) as per cent of M	83.2	114.3	115.2	96.0
ODA as per cent of GDP	1.04	1.02	0.36	0.18
ODA as per cent of export	17.25	11.90	2.80	0.80

Source: Authors' calculation based on the data extracted from WDI (2010).



Annex Table 4: Definitions and Sources Used for the Estimation of ARDL Bounds F-test Model

Variable	Description and Source
BXBI	<i>Bilateral Agricultural Export from Bangladesh to India ('000 USD)</i> : Total agricultural export from Bangladesh to India is calculated using UN Comtrade access through WITS dataset from 1989 to 2009. <b>Source</b> : UN Comtrade (2010) and Bangladesh Bank.
BMIB	<i>Bilateral Agricultural Import from India to Bangladesh ('000 USD)</i> : Total agricultural import from India to Bangladesh is calculated using UN Comtrade access through WITS dataset from 1989 to 2009. <b>Source</b> : UN Comtrade (2010) and Bangladesh Bank.
TAPB	<i>Total Agricultural Production in Bangladesh (MT)</i> : Total agriculture production (in MT) in Bangladesh is calculated based on top 20 agricultural products in Bangladesh reported in FATSTAT-Production from 1989 to 2009. <b>Source</b> : FAOSTAT.
TAPI	<i>Total Agricultural Production in India (MT)</i> : Total agriculture production (in MT) in India is calculated based on top 20 agricultural products in India reported in FAOSTAT-Production from 1989 to 2009. <b>Source</b> : FAOSTAT.
CPIB	<i>Consumer Price Index of Bangladesh (base year: 1996)</i> : CPI data calculated by Bangladesh Bureau of Statistics (BBS) based on 1996 prices is used in the study from 1989 to 2009. <b>Source</b> : Monthly Economic Trends (various issues), Bangladesh Bank.
BRER	<i>Bilateral Real Exchange Rate (Index)</i> : Bilateral real exchange rates between Bangladesh and India are from 1989 to 2009 calculated in two steps by using the following formula: Step 1: $NER_{bi} = \frac{NER_{b,USD}}{NER_{i,USD}}$ Where $NER_{bi}$ stands for bilateral nominal exchange rate of Bangladesh with India $i$ ; $NER_{b,USD}$ for Bangladesh's exchange rate with USD and $NER_{i,USD}$ for the India's exchange rate with USD. Step 2: $RER_{bi} = NER_{bi} \frac{P_i}{P_b}$ Where $RER_{bi}$ is the bilateral real exchange rate of Bangladesh with India $i$ ; $P_i$ is the Wholesale Price Index of India (WPI) <sup>34</sup> and $P_b$ is the Consumer Price Index of Bangladesh (CPI). <b>Source</b> : Authors' calculation based on Islam (1999).
SAPTA dummy	Based on Agreement on SAARC Preferential Trading Arrangement (SAPTA), entered into force on 7 December 1995, a SAPTA dummy is employed as instrument of trade liberalisation. The value 0 is considered for pre-SAPTA period (1989-1995), whereas 1 for post-SAPTA period (1996-2009).

Annex Table 5: Expected Signs of Long-run and Short-run Elasticities of the ARDL Models

Variable	Description	Expected Sign	
		Model 1: Dep. Var.: BXBI	Model 2: Dep. Var.: BMIB
TAPB	Elasticity of total agricultural production in Bangladesh	(+ve)	(-ve)
TAPI	Elasticity of total agricultural production in India	(-ve)	(+ve)
CPIB	Elasticity of consumer price index of Bangladesh	(-ve)	(+ve)
BRER	Elasticity of bilateral real exchange rate between Bangladesh and India	(+/-ve)	(+/-ve)
SAPTA	Elasticity of SAPTA	(+ve)	(+ve)

<sup>34</sup>In Bangladesh, Consumer Price Index (CPI) is used as an indicator of price inflation, while in India the Wholesale Price Index (WPI) is used as indicator of price inflation. In absence of comparable dataset both the respective indices have been used for the purposes of the present study.

Annex Table 6: Bangladesh's Trade with the World and India: 1989-2007

('000 USD)

Year	Export of Bangladesh		Export to India (%)	Imports of Bangladesh		Import from India (%)
	World	India		World	India	
1989	1326118	3315	0.25	2950161	168641	5.72
1990	1555134	5427	0.35	3425268	213006	6.22
1991	1688511	5472	0.32	3131980	199813	6.38
1992	1940164	1269	0.07	3463604	228272	6.59
1993	2252108	2417	0.11	3521991	258616	7.34
1994	2482460	13225	0.53	NA	NA	NA
1995	3363077	26954	0.80	5431063	615168	11.33
1996	3527808	32120	0.91	6223330	1082615	17.40
1997	4009123	23864	0.60	6784458	1336249	19.70
1998	5048792	10367	0.21	7017899	1040687	14.83
1999	NA	NA	NA	NA	NA	NA
2000	5483045	24789	0.45	7606796	614541	8.08
2001	5384342	16437	0.31	8040703	889587	11.06
2002	5414286	25402	0.47	8196282	1235835	15.08
2003	6402423	40764	0.64	9932370	1437876	14.48
2004	8265924	105204	1.27	11118928	1278712	11.50
2005	9322487	177731	1.91	12630082	1372037	10.86
2006	11696595	257884	2.20	15688516	1875666	11.96
2007	13139292	523676	3.99	17294324	2328935	13.47

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Annex Table 7: Bangladesh's Trade with the World and India: FY2005-06 to FY2009-10

('000 USD)

Year	Export of Bangladesh		Export to India (%)	Imports of Bangladesh		Import from India (%)
	World	India		World	India	
FY2006	10526160	149443	1.42	14777888	1868366	12.64
FY2007	12177860	205923	1.69	17164950	2269197	13.22
FY2008	14110800	281289	1.99	21629000	3392682	15.69
FY2009	15565200	266481	1.71	22507000	2863189	12.72
FY2010	16204700	298274	1.84	23738000	3214600	13.54

Source: Bangladesh Bank Annual Report 2009-10; Annual Export Receipts 2009-10, 2008-09 and 2006-07, Bangladesh Bank; Annual Import Payments 2009-10, 2008-09 and 2006-07, Bangladesh Bank.

**Annex Table 8: Bangladesh's Trade Balance with India: FY2005-06 to FY2009-10***(Million USD)*

Year	Overall Trade Balance			Agricultural Trade Balance		
	Export	Import	Trade Balance	Export	Import	Trade Balance
FY2006	149.44	1850.92	-1701.48	36.03	697.91	-661.88
FY2007	205.92	2227.04	-2021.12	47.94	881.98	-834.04
FY2008	281.29	3392.68	-3111.39	94.09	1655.79	-1561.70
FY2009	266.48	2863.19	-2596.71	93.11	1021.65	-928.54
FY2010	298.27	3214.60	-2916.33	80.31	1003.40	-923.10

Source: Annual Export Receipts 2009-10, 2008-09 and 2006-07, Bangladesh Bank; Annual Import Payments 2009-10, 2008-09 and 2006-07, Bangladesh Bank.

**Annex Table 9: Top Export Destinations of Bangladesh's Agricultural Commodities and India's Ranking**

Year	Top 5 Destinations	Rank of India
1989	United States, Japan, United Kingdom, Belgium-Luxembourg, Singapore	48
1990	United States, United Kingdom, Japan, Iran, Islamic Rep., Belgium-Luxembourg	21
1991	United States, United Kingdom, Belgium-Luxembourg, Japan, Pakistan	27
1992	United States, United Kingdom, Iran, Islamic Rep., Belgium-Luxembourg, Japan	54
1993	United States, United Kingdom, Japan, Belgium-Luxembourg, Singapore	47
1994	United States, United Kingdom, Belgium-Luxembourg, Japan, Germany	42
1995	United States, Japan, Belgium-Luxembourg, United Kingdom, Germany	55
1996	United States, Japan, Belgium-Luxembourg, United Kingdom, Germany	64
1997	United States, Belgium-Luxembourg, Japan, United Kingdom, China	48
1998	United States, Japan, China, Belgium-Luxembourg, Pakistan	46
2000	United States, United Kingdom, Belgium, Netherlands, Pakistan	38
2001	United States, United Kingdom, Belgium, Netherlands, Iran, Islamic Rep.	57
2002	United States, United Kingdom, Belgium, Iran, Islamic Rep., Pakistan	38
2003	United States, Belgium, United Kingdom, Pakistan, Iran, Islamic Rep.	56
2004	United States, United Kingdom, Belgium, Pakistan, Turkey	6
2005	United States, United Kingdom, Belgium, India, Pakistan	4
2006	United States, Belgium, United Kingdom, India, Turkey	4
2007	United States, Belgium, United Kingdom, Pakistan, India	5

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Annex Table 10: Top Import Sources of Bangladesh's Agricultural Commodities and India's Ranking

Year	Top 5 Sources	Rank of India
1989	United States, France, Argentina, Australia, Netherlands	12
1990	United States, Australia, Thailand, Netherlands, Brazil	10
1991	United States, Canada, Australia, Brazil, Argentina	7
1992	United States, Argentina, India, Malaysia, Australia	3
1993	United States, Malaysia, Brazil, Australia, Canada	7
1995	Unspecified, United States, India, Pakistan, Australia	3
1996	India, Unspecified, Brazil, Australia, Argentina	1
1997	Brazil, Malaysia, Australia, Argentina, India	5
1998	India, Australia, Malaysia, Canada, Argentina	1
2000	Argentina, Australia, India, Canada, Brazil	3
2001	India, Argentina, Australia, Indonesia, Brazil	1
2002	India, Argentina, Indonesia, Malaysia, United States	1
2003	India, Argentina, Malaysia, Indonesia, Australia	1
2004	India, Malaysia, Indonesia, Brazil, Australia	1
2005	Malaysia, India, Argentina, Indonesia, Brazil	2
2006	India, Indonesia, Malaysia, Argentina, Russian Federation	1
2007	India, Indonesia, Argentina, Brazil, Canada	1

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Annex Table 11: Bangladesh's Agricultural Trade with the World and India: FY2005-06 to FY2009-10

('000 USD)

Year	Exports of Bangladesh's Agricultural Products		Bangladesh's Agricultural Export to India (% of Total)	Imports of Bangladesh's Agricultural Products		Bangladesh's Agricultural Imports from India (% of Total)
	World	India		World	India	
FY2006	875927	36034	4.11	4036271	697913	17.29
FY2007	1016111	47940	4.72	4193534	881977	21.03
FY2008	1121889	94087	8.39	6981119	1655789	23.72
FY2009	989025	93115	9.41	6496901	1021650	15.73
FY2010	1149771	80306	6.98	7216762	1003402	13.90

Source: Annual Export Receipts 2009-10, 2008-09 and 2006-07, Bangladesh Bank; Annual Import Payments 2009-10, 2008-09 and 2006-07, Bangladesh Bank.

Annex Table 12: Bangladesh's Export of Agricultural Commodities to India at HS 2 Digit Level

Product Code	Product Name	Trade Value ('000 USD)			Average Growth Rate (%)	Trend Growth (%)	Rank
		1989-90	1991-99	2000-07			
12	Oilseed, oleagi fruits, miscell gr	NA	NA	164	5588	1.79	1
08	Edible fruit, nuts, peel of citr	28	NA	14357	1853	1.40	2
06	Live tree, other plant, bulb, root	NA	NA	620	2519	1.26	3
23	Residues, food industry waste	NA	NA	636	451	1.24	4
05	Products of animal origin, nes	NA	38	337	55	0.71	5
20	Prep of vegetable, fruit, nuts	NA	NA	143	31	0.44	6
03	Fish, crustacean, mollusk, other	NA	94	4362	363	0.36	7
53	Other vegetable textile, fibres, pap	2000	179	23506	2482	0.29	8

(Annex Table 12 contd.)

(Annex Table 12 contd.)

Product Code	Product Name	Trade Value ('000 USD)			Average Growth Rate (%)	Trend Growth (%)	Rank
		1989-90	1991-99	2000-07			
04	Dairy prod, birds' eggs, natural ho	NA	NA	202	10061	0.26	9
19	Prep. of cereal, flour, starch/milk	NA	NA	32	3	0.22	10
22	Beverages, spirits, vinegar	6	47	9	38	0.18	11
11	Prod. mill. Indust, malt, starches	NA	NA	31	-11	0.15	12
09	Coffee, tea, mati, spices	24	555	682	230	-0.03	13
07	Edible vegetables, certain roots	2	5	2	236	-0.04	14
15	Animal/veg fats, oils, their clea	551	224	306	67	-0.07	15

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Annex Table 13: Bangladesh's Import of Agricultural Commodities from India at HS 2 Digit Level

Product Code	Product Name	Trade Value ('000 USD)			Average Growth Rate (%)	Trend Growth Rate (%)	Rank
		1989-90	1991-99	2000-07			
23	Residues, food industry waste	4	5012	37061	178	0.53	1
15	Animal/veg. fats, oils, their clea	5	388	4339	134	0.40	2
20	Prep. of vegetable, fruit, nuts or	0	126	1135	53	0.39	3
21	Mis. edible preparations	22	208	3287	59	0.37	4
10	Cereals	0	105169	203802	35649	0.35	5
17	Sugars, sugar confectionery	0	2777	40449	2629	0.34	6
14	Vegetable plaiting materials	0	119	129	-1	0.20	7
04	Dairy prod, birds' eggs, natural ho	6	4137	9353	649	0.19	8
11	Prod. mill, Indust. malt, starches	7	422	210	55	0.14	9
01	Live animals	22	826	786	94	0.14	10
09	Coffee, tea, mati, spices	304	6194	9317	279	0.13	11
19	Prep. of cereal, flour, starch/milk	885	1197	4679	26	0.13	12
06	Live tree, other plant, bulb, root	0	42	85	208	0.12	13
05	Products of animal origin, nes	1	25	55	72	0.12	14
13	Lac gums, resins, other vegetable	60	215	352	27	0.11	15
24	Tobacco, manufactured tobacco	807	2863	3734	25	0.11	16
02	Meat, edible meat offal	0	5	5	-8	0.11	17
07	Edible vegetables, certain roots	12991	11457	35672	21	0.09	18
12	Oilseed, oleagi fruits, miscell gr	805	1117	2626	15	0.09	19
53	Other veg., textile fibres, pap	0	45	2731	699	0.06	20
08	Edible fruit, nuts, peel of citr	4638	10693	6837	47	-0.01	21
03	Fish, crustacean, mollusk, other	0	2373	1761	69	-0.13	22
22	Beverages, spirits, vinegar	0	63	49	416	-0.18	23
18	Cocoa, cocoa preparations	0	660	328	33	-0.47	24

Source: Authors' calculation based on UN Comtrade (2010) extracted by World Integrated Trade Solution (WITS), accessed in May 2011.

Annex Table 14: Bangladesh's Cereal Trade with the World and India: FY2005-06 to FY2009-10

('000 USD)

Year	Bangladesh's Import Scenario			Indian Export Scenario		
	Trade Value		Proportion (%)	Trade Value		Proportion (%)
	World	India		World	Bangladesh	
FY2006	484195	212452	43.9	1633620	269520	16.5
FY2007	650834	217171	33.4	1697400	158100	9.31
FY2008	1466632	822680	56.1	3682850	704520	19.1
FY2009	952376	251248	26.4	3344620	252630	7.6
FY2010	960936	129072	13.4	2991450	121000	4.0

Source: Export Import Data Bank, Department of Commerce, GoI (2010); and Annual Import Payments 2009-10, 2008-09 and 2006-07, Bangladesh Bank.

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