Exploring Cooperation in Sustainable Agriculture and Value Addition in BIMSTEC Region

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Research and Information System for Developing Countries
विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

INNOVATION LAB FOR
FOOD SECURITY POLICY RESEARCH, CAPACITY, AND INFLUENCE (PRCI)

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Preface

Profesor Sachin Chaturvedi
Director General, RIS

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) has emerged as one of the fastest-growing regions of the world. After 27 years of its existence, the region is rapidly 'catching up' with its peers in the immediate neighbourhood of South East Asia, reflecting development convergence in Asia. This progress is further buoyed by increasing trade among them and with others in the region, driven by price competitiveness. The objective of highlighting these developments is to present that BIMSTEC is a vibrant and economically active region, where growth convergence is taking place due to the rapid growth of the region. This may get further acceleration as graduation of LDCs moves forward.

The collective goal of these member states is to foster cooperation and collaboration across various sectors, and agriculture emerges as a critical driver for economic development within this regional framework. As the global agricultural sector grapples with challenges arising from climate change, pollution, lack of nutritional security, decreasing genetic diversity, and evolving protectionist trade regimes, the BIMSTEC nations are not insulated from these challenges.

RIS has been keenly focusing on examining the prospects and role of agriculture and its specific sub-sectors in fostering the process of intra-regional trade in the BIMSTEC region. RIS, along with the International Food Policy Research Institute (IFPRI) has brought forth this report that highlights the importance of investigating potential avenues for regional cooperation among all members of BIMSTEC in areas of agricultural trade. In order to stabilise prices, promote regional food security, increase production and productivity, and establish resilient value chains, the chapters urge the BIMSTEC member states to work more closely together.

I compliment Dr Priyadarshi Dash, Associate Professor, RIS for bringing out this important study, which would serve as a useful reference for policymakers, academicians, practitioners, and other stakeholders in the BIMSTEC region.

I acknowledge the editorial support of Dr Ivy Roy Sarkar. Thanks are also due to the RIS Publication Unit for brining out this report so elegantly.

Sachin Chaturvedi

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Deepening Trade Cooperation in BIMSTEC Region to Promote Sustainable Agriculture: Bangladesh Perspectives

Mustafizur Rahman*

Muhammad Nafis Shahriar Farabi**

I. Introduction

Recent developments in the global markets for agricultural commodities have led to a renewed interest in deepening regional initiatives as a tool for addressing emergent challenges. Although, over the past years, the share of agriculture in the GDP has come down significantly, the sector continues to remain crucially important in all the BIMSTEC countries in terms of ensuring food security, creating employment, and generating livelihood opportunities. In the recent past, the global scenario as regards trade in agricultural commodities and prices of agricultural products has been undergoing significant changes and experiencing considerable volatility. Prior to this, commodity supply chains were affected significantly by the ongoing Covid pandemic. The adverse impact of all these has percolated to the local markets in the BIMSTEC region through imported inflation. Price hikes of fuel, gas and fertiliser have led to the rise in the cost of domestic production of

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agricultural products, which, in turn, has fueled domestic agricultural prices. It is in the view of this challenging scenario that exploring opportunities for BIMSTEC-wide regional cooperation in agricultural trade-related areas has assumed such heightened importance. It is argued in the paper that closer collaboration among the members of the BIMSTEC grouping could contribute to enhancing production and productivity, developing value chains, stabilising prices, and helping to ensure regional food security. As may be recalled, the objective of the BIMSTEC includes widening and deepening collaboration in a few key sectors, as well as integrating more effectively with Southeast and East Asia's regional production and value chains (De, 2017).

It is in this backdrop that the present study has looked at issues of trade and trade cooperation involving the BIMSTEC member countries from three vantage points: while Section I contextualises the present agriculture scenario of BIMSTEC region, Section II looks at the agriculture sector in the BIMSTEC region, the emerging global commodity price scenario and why issues of deepening agricultural trade are becoming important from the perspective of ensuring food security in the BIMSTEC region. Section III examines the state of intra-regional trade in agricultural products and identifies areas of potential cooperation to stimulate and create trade opportunities; Section IV comes up with a number of proposals to deepen BIMSTEC-wide cooperation and collaboration in agriculture to harness the opportunities of enhanced trade in the region.

II. Emerging Scenario and the Need for Renewed Attention to the Agriculture Sector in the BIMSTEC Region

In spite of its declining share in the GDP, agriculture continues to remain a crucially important sector in all the BIMSTEC economies. Although, over the past years, the share of agriculture has seen a secular decline in all BIMSTEC economies, its importance in terms of food security and employment remains crucially important for all the regional countries. A significant share of labour market participants is engaged in agriculture-related activities, primarily in the cropping sector but also, and increasingly so, in the non-crop sub-sectors such as livestock, poultry and fisheries. Indeed, the share of non-crop agriculture in agricultural GDP has been rising at a fast pace in recent years. For example, the share

of the non-crop agriculture sector in agricultural GDP of Bangladesh share has been on the rise in recent years and stood at 51.4 per cent[1] of agri-GDP in FY2021-22, supporting that of crop sector.[2] Trade in non-crop agri-products also constitutes an increasingly larger share in agricultural trade of BIMSTEC countries.

Table 1: Share of Agriculture in the GDP of BIMSTEC Countries

Country	2010	2015	2020
Bangladesh	17.0	14.8	12.9
Bhutan	14.8	14.4	19.2
India	17.0	16.2	18.3
Myanmar	37.4	27.3	22.0
Nepal	33.2	26.5	23.1
Sri Lanka	8.5	8.2	8.4
Thailand	10.5	8.9	8.6

***Source*:** Based on World Bank Database (n.d.).

Agriculture's share in Bangladesh's GDP has been on a secular decline over the past years and has come down to 12.9 per cent in FY 2020-21. This is the case with other BIMSTEC countries as well where, as Table 1 indicates, the share of agriculture has also been declining over the years. Among the BIMSTEC member countries, share of agriculture in GDP is still significantly high only in Nepal (23.1 per cent) and Myanmar (22.0 per cent). Agriculture remains primarily a labour-intensive sector in the BIMSTEC region. In Bangladesh, for example, more than 41.0 per cent of labour force participants are engaged in agriculture. This high share, however, indicates that labour productivity in agriculture is much below the corresponding labour productivity figures for manufacturing and services sectors. 41.0 per cent labour force producing 12.9 per cent of GDP testifies to the fact that productivity in agriculture is about one-third of the national average productivity level in Bangladesh.

As noted, however, from the point of view of food security, agriculture sector's importance remains very high in all the BIMSTEC countries. Particularly in the backdrop of the Covid pandemic, the importance of the sector from the perspective of ensuring availability and access to food and food security has been revealed and reinforced

by the unfolding reality of the pandemic times. This was a time when a number of food exporting countries imposed a ban on exports and had put in place a number of protectionist policies driven by food security related concerns. This and the recent hike in global food prices have induced key stakeholders in the BIMSTEC region to recognise that the agriculture sector ought to be given renewed attention and the attendant needed tasks to be undertaken with the urgency that they deserve. How closer cooperation among the countries of the BIMSTEC region could be brought to play to deepen cooperation in the development of agriculture sector and how intra-regional trade in agricultural goods could be widened and deepened have emerged as important issues in the relevant discourse.

It is to be noted in view of the above that BIMSTEC leaders were in agreement, early on, following the establishment of the grouping, that closer regional cooperation in agriculture related areas could generate rich dividends. Indeed, within the ambit of BIMSTEC-wide cooperation, trade and investment[3], as well as agriculture[4] were recognised as among the 14 sub-sectors which were prioritised for deepening cooperation among countries of the BIMSTEC regional grouping. Initiatives in view of this included holding of BIMSTEC Expert Group Meeting on Agricultural Cooperation (EGMAC) on a regular basis. Till now, seven EGMACs, two Workshops on Good Agricultural Practices and a Workshop on Improving Agricultural Trade and investment have been held within the ambit of the BIMSTEC. As would be recalled, the third BIMSTEC-EGMAC in Kandy, Sri Lanka had identified nine projects for implementation: (a) Organisation of workshop on improving agricultural trade and investment; (b) Private sector participation in agri-value chain management; (c) Research collaboration for use of alternative energy crops; (d) Strengthening of Agriculture Statistical Information System; (e) Organisation of workshop on Good Agri-practices; (f) Development of agricultural bio-technology and bio-safety; (g) Prevention of trans-boundary animal diseases; (h) Collaboration among educational institutions including agricultural research institutes; (I) Development of seed sector.

Regrettably, because of a lack of funds and resources, no tangible follow-up activities could be undertaken to take the aforesaid plan of action forward, although, their realisation could potentially contribute to closer BIMSTEC-wide cooperation in agriculture and ensure greater

food security. However, in the backdrop of the Covid experience, and in view of the potential dividends and positive externalities originating from closer cooperation in agriculture, it is increasingly felt that the deepening of cooperation in agri-related areas is an idea whose time has come. Initiatives towards closer cooperation in agricultural trade-related areas ought to be seen as central to this. Implementation of the above-mentioned planned initiatives could contribute importantly to enhancing intra-regional trade in agriculture. This could happen in several ways, including expansion of trade in agri-inputs (such as seeds), development of value chains (which would have positive impacts on both production and productivity), and expansion of trade cooperation would stimulate entrepreneurship in agri-related activities. All these would be consumer welfare-enhancing through higher access to agri-items at competitive prices and by way of greater regional food security. Initiatives at closer trade cooperation through the envisaged BIMSTEC-Free Trade Agreement could also play an important role in this connection, by inducing and incentivising enhanced trade in agriculture-related goods and services among the BIMSTEC member countries.[5]

Table 2: Yield of Selected Crops (per hectare)

(Figures are in tons/ha; for 2020)

Items	BIMSTEC Member Countries							Vietnam
	Bangladesh	Bhutan	India	Myanmar	Nepal	Sri Lanka	Thailand	
Jute	1.2	4.0	2.6	0.9	1.3	--	1.9	4.5
Maize	8.5	3.6	3.1	3.9	3.0	4.0	4.4	4.9
Rice, Paddy	4.8	4.3	4.0	3.8	3.8	4.8	2.9	5.9
Sugar cane	42.7	30.5	77.3	66.1	49.6	59.3	40.9	62.2
Wheat	3.1	1.6	3.4	1.9	3.1	---	1.2	---

Source: Estimated based on FAOSTAT (n.d.).

Note: According to the Food and Agriculture Organization (FAO), Yield is defined as the harvested production per unit of harvested area for crop products.

As Table 2 indicates, in terms of some of the major agri-products, there is a significant difference among the BIMSTEC countries in terms of crop yield per hectare. Compared to non-member Vietnam, for example, yield is lower for such important agri-products as paddy. Whilst soil and weather conditions could explain a part of the reasons for the yield difference, studies indicate that there are significant opportunities for bridging the gaps through cross-country learnings and cooperation in areas of agricultural production practices, soil conservation, quality of outputs, reduction of wastages, raising the quality of inputs and seeds, agri-product diversification, marketing of agri-products, technological embeddedness of agri-production, supply-chain management and lessons from best practices in all the aforesaid areas. Learning from cross-country experiences as regards adaptation to, and mitigation of, adverse climate impacts on agriculture could also provide rich dividends to all the member countries. Cooperation in these areas would benefit all the countries in the BIMSTEC region as can be seen from the experience of other regions.

Indeed, gains in terms of productivity, production and diversity of agri-production could also play a crucially important role in stimulating intra-regional trade in agri-products among the BIMSTEC countries. Deeper trade relations would reduce risks of price volatility, enable the conduct of agri-practices based on comparative advantages and contribute to regional food security. Regional cooperation could also help the BIMSTEC countries gain a strong foothold in the global market of agri-products by harnessing the advantages of regional cooperation. To note, while BIMSTEC countries are dependent on imports of many agricultural products from the global market, they are not being able to give their farmers the opportunity to access the opportunities of the global market to the extent possible because of various reasons, some of which have been flagged in the next section. Intra-BIMSTEC cooperation could be an important contributing factor in changing the prevalent scenario.

As will be seen from discussions in the subsequent sections, both intra-regional trade in agricultural goods and the share of trade in agri-goods in the global trade of BIMSTEC countries have remained rather low. However, the wide variations in agri-sector performance among the BIMSTEC countries are also pointers to opportunities for collaboration and learning, which could be beneficial to the member countries.

Particularly for countries in the region such as Bangladesh, which are amongst the most climate affected countries in the world, the importance of learning in areas of cropping intensity, climate-resilient production practices, climate-impacted adoption and mitigation and, in short, in areas of sustainable agriculture, can not be overemphasised. Indeed, in anticipation of adverse impacts of climate change Bangladesh will need to undertake significant changes in the current pattern of agri-practices, particularly those in the coastal regions of the country. These have enormous implications for the lives and livelihoods of people in these climate-vulnerable areas. This reemphasises the need for Bangladesh to take the lead role in the area of deepening BIMSTEC-wide cooperation in agriculture. Changes in cropping patterns, shift to more saline and drought-resilient cropping practices, exploration of intra-agriculture diversification, technology transfer and other initiatives towards climate-related adjustments are becoming increasingly important for Bangladesh. This also holds equally true for other BIMSTEC members as well.

Specialisation, diversification, and productivity gains based on closer cooperation will not only help maintain price stability and ensure food security but also open up opportunities in trade-related areas, which could, in turn, be a strong factor contributing to regional food security. Thus, in view of the emergent challenges and the unfolding opportunities, the need for closer cooperation in agriculture among the BIMSTEC countries ought to be given the highest priority by the policymakers.

It is from the above vantage points that the next two sections will look at the state of trade in agriculture among the BIMSTEC countries and what needs to be done to deepen and widen opportunities for cooperation in agriculture-trade related areas among the countries of the BIMSTEC grouping.

III. State of Intra-regional Trade in Agriculture in the BIMSTEC Region

In general, the degree of openness[6] of BIMSTEC economies, indicating trade integration of an economy, is considerably high; however, there are wide variations in the indicator among the BIMSTEC members. As Annex Table 1 shows, Thailand is the most open economy, with the degree

of openness being 112.4 per cent of the GDP, which for other BIMSTEC member countries ranged between 35.0 per cent and 80.0 per cent.

However, as regards trade in agri-items, intra-regional trade in the BIMSTEC region has lagged behind the overall trading scenario. As Tables 3 and 4 in the text show, intra-regional trade in agriculture in total trade (export and import) of agricultural products in BIMSTEC countries is rather low. As Table 3 shows, intra-regional agri-exports to the BIMSTEC region constitute only 12.7 per cent of total exports of agricultural products by the BIMSTEC countries. For some countries, such as Bhutan and Nepal, the shares are relatively high (corresponding shares being 96.5 per cent and 75.5 per cent)[7], while for the others, the respective shares ranged from 6.0 per cent to 25 per cent. This indicates that while the BIMSTEC countries have the supply-side capacity to trade in agri-items, it is not trading with regional countries to any significant extent. Understandably, the picture is not significantly different in the case of imports. Only about 9.1 per cent of BIMSTEC global imports of agri-products are from the regional countries.

Global agri-trade of BIMSTEC members, with exports being US$ 47.7 billion and imports being US$ 66.7 billion, is of considerable size (US$ 114.4 billion in total). In contrast, the share of intra-regional trade in these items is relatively small, with exports being US$ 6.0 billion and imports being US$ 6.1 billion. Thus, BIMSTEC's intra-regional trade in agriculture is only about 10.5 per cent of global trade of the same. The information in Table 3 and Table 4 reveal opportunities for increased agri-trade within the BIMSTEC region if supply-side capacities can be geared to the regional markets through initiatives at greater regional cooperation, not to speak of through the realisation of new opportunities for trade expansion and diversification through targetted measures.

Table 3: Exports of Agricultural Products: Intra-BIMSTEC, Regional and Global

(in billion USD; for 2020)

BIMSTEC Exporting Members		Importer							
		Bangladesh	Bhutan	India	Myanmar	Nepal	Sri Lanka	Thailand	Export to BIMSTEC
Exporter	Bangladesh	0	n.a.	0.17	0.001	n.a.	0.001	0.003	0.18 (14.94%)
	Bhutan	n.a.	0	0.009	0	n.a.	0	0.00001	0.01 (4.89%)
	India	1.32	0.108	0	0.08	1.1	0.51	0.34	3.46 (15.46%)
	Myanmar	0.05	0	0.46	0	0.01	0.01	0.4	0.93 (26.64%)
	Nepal	n.a.	0	0.43	0	0	0.00001	0.00003	0.43 (68.19%)
	Sri Lanka	0.005	0	0.25	0.0002	0.003	0	0.007	0.27 (28.60%)
	Thailand	0.08	0.003	0.27	0.41	0.004	0.06	0	0.83 (9.78%)
	Export to BIMSTEC	1.45	0.11	1.59	0.49	1.12	0.58	0.75	6.09
	Global Export	8.17	0.12	20.44	2.38	1.48	2.33	12.8	47.72
	Export of BIMSTEC Countries % of Global Export	17.8%	96.5%	7.8%	20.6%	75.5%	24.9%	5.9%	12.77%

Source: Author's calculation based on ITC Trade Map (n.d.).
Note: Figures in parentheses show share of agricultural exports as percentage of total export of concerned to the BIMSTEC region.
n.a.- data not available.

Table 4: Imports of Agricultural Products: Intra-BIMSTEC and Global

(in billion USD; for 2020)

BIMSTEC Importing Members		Exporter							
		Bangladesh	Bhutan	India	Myanmar	Nepal	Sri Lanka	Thailand	Import from BIMSTEC
Importer	Bangladesh	0	n.a.	1.32	0.05	n.a.	0.005	0.08	1.45 (16.19%)
	Bhutan	n.a.	0	0.11	0	n.a.	0	0.003	0.11 (16.74%)
	India	0.17	0.009	0	0.46	0.43	0.25	0.27	1.59 (19.09%)
	Myanmar	0.001	0	0.08	0	0	0.0002	0.41	0.49 (18.48%)
	Nepal	n.a.	0	1.1	0.01	0	0.003	0.004	1.12 (18.89%)
	Sri Lanka	0.001	0	0.51	0.01	0.00001	0	0.06	0.58 (16.87%)
	Thailand	0.003	0.00001	0.34	0.40	0.00003	0.007	0	0.75 (10.38%)
	Import from BIMSTEC	0.18	0.009	3.46	0.93	0.43	0.27	0.83	6.10
	Global Import	0.53	0.010	28.01	3.95	0.46	2.67	31.11	66.73
	Import of BIMSTEC as % of Global Import	33.02%	89.58%	12.35%	23.52%	93.63%	9.95%	2.66%	9.14%

Source: Author's calculation based on ITC Trade Map (n.d.).
Note: Figures in parentheses show share of agricultural import as percentage of total import of concerned country from the BIMSTEC region.
n.a.- data not available.

Table 5: Agricultural Products Exported by Bangladesh to BIMSTEC Countries

Country	Bangladesh's Major Agricultural Products Export to BIMSTEC Member Countries	
	Commodity	**Export volume (in million USD)**
Bhutan	**HS19:** Preparations of cereals, flour, starch or milk; pastrycooks' products	0.92(44.5%)
	Total agricultural export	2.1 (100%)
India	**HS 15:** Animal or vegetable fats and oils and their cleavage products; prepared edible fats, animal or vegetable waxes.	177.31(75.6%)
	Total agricultural export	234.4 (100%)
Myanmar	**HS19:** Preparations of cereals, flour, starch or milk; pastrycooks' products	0.26(30.1%)
	Total agricultural export	0.9 (100%)
Nepal	**HS 23:** Residues and waste from the food industries; prepared animal fodder.	22.82(64.1%)
	Total agricultural export	35.6 (100%)
Sri Lanka	**HS 07:** Edible vegetables and certain root and tubers	3.77 (81.3%)
	Total agricultural export	4.6 (100%)
Thailand	**HS 12:** Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal	3.30 (84.8%)
	Total agricultural export	3.9 (100%)

Source: Author's compilation from Bangladesh Export Promotion Bureau (EPB) database (n.d.).

Note: Figures in parentheses show share of the item in export of agri-items to the particular BIMSTEC member country.

The low levels of intra-regional trade are also highly concentrated in a few items. Table 5 provides information about the export of agricultural products from Bangladesh to the BIMSTEC member countries. As the table shows, Bangladesh's exports are highly undiversified, with one or two products accounting for most of the exports to the regional countries. For example, in the case of export to India, animal or vegetable fats singly account for 75.6 per cent of Bangladesh's total agri-export to the country; for export to Thailand, oil seeds account for 84.8

per cent of Bangladesh's total export to the country. Also, to note, India accounts for more than four-fifths of Bangladesh's total export of agri-products within the BIMSTEC region (Annex Table 2). This reinforces the observation that the export of agri-items is highly concentrated both item-wise and country-wise.

Table 6: Agricultural Products Imported by Bangladesh from BIMSTEC Countries

Country	Bangladesh's Major Agricultural Products Import from BIMSTEC Member Countries	
	Commodity	**Import volume (in million USD)**
India	**HS 10:** Cereals	351.7 (26.6%)
	Total agricultural import	1322.3 (100%)
Thailand	**HS 23:** Residues and waste from the food industries; prepared animal fodder	30.85 (39.0%)
	Total agricultural import	79.1 (100%)
Sri Lanka	**HS 23:** Edible vegetables and certain root and tubers	1.48 (31.5%)
	Total agricultural import	4.7 (100%)
Nepal	**HS 07:** Edible vegetables and certain roots and tubers	3.05 (76.7%)
	Total agricultural import	4.0 (100%)
Myanmar	**HS 07:** Edible vegetables and certain roots and tubers	34.7 (76.5%)
	Total agricultural import	45.4 (100%)

Source: Author's compilation from ITC Trade Map database (n.d.).

***Note*:** Figures in parentheses show share of the item in import of agri-items from the particular BIMSTEC member country.

The scenario is not significantly different in the case of imports either, although imports to Bangladesh are somewhat more diversified in terms of products. Here also, as is evinced by Table 6, India is the major source of import of agri-items, accounting for more than 90 per cent of Bangladesh's total import from the region. Import of cereals from India is the single most important import items (US$ 351.7 million out of total import of US$ 1322.3 million or 26.6 per cent of total import from the country), as Table 6 testifies. However, as Annex Table 3 shows, coffee,

tea and spices (US$ 278.8 million or 21.1 per cent) and food residue and prepared animal fodder (US$ 222.8 million or 16.8 per cent) are also important import items of Bangladesh. Thailand, with US$ 79.1 million worth of agri-items (about 8.0 per cent of Bangladesh's regional import of agri-items), is the other important source of Bangladesh's import of agricultural products from the region.

Table 7: Tariffs on Bangladesh's Top Agricultural Exports to BIMSTEC and MFN Tariffs Faced

Country	Tariff line at 6-digit level	Export Volume (in million USD)	MFN Tariffs (FY2021)
Bhutan	200989: Juice of any other single fruit or vegetable other than Cranberry Juice	0.70	10% (5%)
India	151590: Other fixed vegetable fats and fractions, nes	156.76	100% (27.08%)
Myanmar	190531: Sweet biscuits	0.19	15%
Nepal	230400: Oil-cake and other solid residues, of soya-bean	22.36	10% (6%)
Sri Lanka	070190: Other potatoes, fresh or chilled	1.99	Rs.20/per Kg
Thailand	120740: Sesamum seeds	3.21	20%

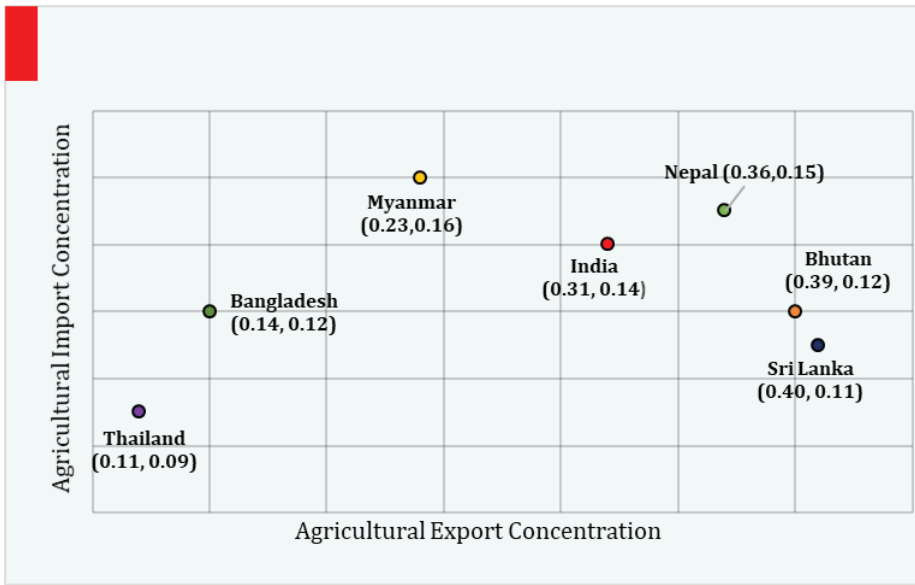
Source: Based on EPB (n.d.), Tariff Analysis Online, WTO (n.d.), ITC Market Access Map (n.d.).

Note: *Figures in the parentheses show actual applied tariffs because of preferential market access provided partner countries under preferential schemes.

Intra-BIMSTEC trade in agriculture is impeded to a considerable extent by the relatively high tariffs on agri-products. For example, while import tariffs on Bangladesh's agri-items exported to the regional countries tend to vary across items, as Table 7 bears out, these are, in general, high. Some items, though, enjoy preferential access as is seen from the figures in parentheses (most likely thanks to SAFTA-related concessions). Since, as part of SAFTA, India has a preferential scheme for the LDCs,[8] one can assume that all agri-items exported by Bangladesh to

India are able to access the Indian market on preferential items, i. e., on a duty-free, quota-free basis. However, preferential access may not be available when Bangladesh graduates out of the group of LDCs, in 2026.[9] The development of regional value chains could compensate for the loss of preferential market access for graduating BIMSTEC LDCs and more stringent conditionalities in accessing the development finance (Rahman and Bari, 2018). However, BIMSTEC-FTA could play an important role in terms of preferential market access beyond this timeline. ASEAN could serve as an example to emulate in this connection. Several ASEAN states have implemented major unilateral tariff reductions and have signed the WTO Information Technology Agreement (ITA); and five of the founding ASEAN members have improved border clearance through the implementation of single windows and other measures (Pomfret, 2016).

Figure 1: Agricultural Trade Concentration of BIMSTEC Countries: Global



Source: Based on ITC Trade Map (n.d.).

Note: First value in parentheses shows level of agricultural export concentration with second value in the parentheses shows level of agricultural import concentration.

The high concentration of intra-regional trade in a few products can be juxtaposed to the global trading scenario of BIMSTEC countries in

agricultural products.[10] Figure 1 presents the degree of global agri-trade concertation of BIMSTEC countries. The Figure shows that the global agricultural trade of BIMSTEC countries is significantly diversified in contrast to the highly concentrated BIMSTEC intra-regional trade. This would indicate that there are potential opportunities to increase intra-regional trade, based on existing supply-side capacities and also through the creation of new opportunities to strengthen agri-related supply-side capacities and trade creation.

Table 8 presents intra-regional trade in processed food and agro-based products in the BIMSTEC region. BIMSTEC countries' intra-regional agricultural trade in agro-processed goods is not significant and whatever trade takes place, it is highly concentrated only in a small number of items. Except for Nepal, for which almost half of the agri-exports are within the region, for the other regional countries, the direction of trade is similar to the one for overall trade in agri-products i.e., trade mostly takes place with extra-regional countries.

Table 8: Processed Food and Agro-based Products Trade Among BIMSTEC Countries (in billion USD; for 2019)

Country	Export to BIMSTEC	Export to the World	Export to BIMSTEC as % Export to the World	Import from BIMSTEC	Import from World	Import from BIMSTEC as % Import to the World
Bangladesh	0.3**	1.3**	20.0	0.6	3.3	18.1
India	3.5	55.2	6.3	0.8	25.27	3.2
Myanmar	1.7	30.6	5.7	0.4	10.6	3.8
Nepal	0.3	0.6	48.2	0.9	8.7	10.3
Sri Lanka	1.9	31.5	6.1	1.6	11.9	13.4
Thailand	1.3	28.7	4.7	0.4	7.7	5.2

***Source*:** Authors' calculations based on World Integrated Trade Solution (WITS) dataset (n.d.).

***Note*:** *Processed food and agro-based product export and import have been calculated using the products listed in the commodity group "Processed food and agro-based product" in the International Trade Centre (ITC) dataset.

**Bangladesh's export data of processed food and agro-based products has been calculated using the data of Export Promotion Bureau (EPB) for FY19 (since this is not available in the WITS dataset)

*** Bhutan's export and import data on "Processed food and agro-based product" is not available on the WITS dataset

Trade in agri-inputs could play an important role in establishing value chains within the BIMSTEC region. For example, the size of agri-seed traded within BIMSTEC is worth about US$ 354.8 million; of this, the share of Bangladesh's import of seeds (US$ 45.9 million) is about 13.0 per cent, mostly from India. In the case of Bangladesh, the MFN import tariff rates on some of the seeds are zero or low, for others, these are high (e.g., for maize the duties are 25 per cent). Import tariffs on rice seeds are high in India (80.0 per cent), as is the case for oil seeds for Thailand (30.0 per cent).

In this backdrop, the preferential scheme, sensitive list and rules of origin for agri-items will be important to take note of in view of the envisaged BIMSTEC-FTA. If most traded agri-items are provided DF-QF market access, this could stimulate intra-regional trade in agriculture. If the majority of these are put on the sensitive list, then the situation will remain more or less the same. Facilitated by multi-modal connectivity and trade logistics facilitation, preferential market access could lead to more trade, stimulate backwards and forward linkages and encourage the establishment of value chains in the BIMSTEC region.

IV. Proposed Measures to Deepen Agriculture Trade Cooperation in BIMSTEC Region

The preceding sections have focused on the state of agricultural trade as it stands at present and highlighted why BIMSTEC-wide trade in agriculture has emerged as an area that demands urgent attention from policymakers. The analysis has shown that intra-regional trade in agriculture has continued to remain at very low levels. The analysis also reveals that there are significant opportunities to raise intra-regional trade in agri-products through trade diversion to the region as also by creating new opportunities through trade creation, including in agri-inputs and processed agri-products by way of concrete initiatives to deepen cooperation among the countries of the region. Some of the possible initiatives and measures in this connection are presented in the following discussion.

Realisation of BIMSTEC Secretariat initiatives

It is pertinent to recall here that the BIMSTEC secretariat has taken a number of initiatives over the years which were targeted at establishing closer cooperation in agriculture related areas. As was noted earlier,

Table 9: Stylised Data on Trade in Seeds by BIMSTEC Countries in 2020

Country	**Seed Exports to BIMSTEC** (in million USD)	**Seed Exports to Bangladesh** (in million USD)	**Seed Exports to Bangladesh as % of Seed exports to BIMSTEC**	**Seed Imports from BIMSTEC** (in million USD)	**Seed Imports from Bangladesh** (in million USD)	**Seed Imports from Bangladesh as % of Seed imports from BIMSTEC**
Bangladesh	2.99	---	---	49.57	---	---
Bhutan	0.00	0.00	---	0.26	0.00	0.00
India	206.14	40.36	19.58	56.93	0.02	0.04
Myanmar	96.45	2.59	2.69	31.85	0.00	0.00
Nepal	0.03	0.00	0.00	133.14	0.00	0.00
Sri Lanka	0.58	0.00	0.00	13.21	0.05	0.38
Thailand	48.62	3.01	6.19	69.85	2.92	4.18
Total	**354.82**	**45.96**	**12.95**	**354.82**	**2.99**	**0.84**

Source: Author's calculations based on ITC Trade Map (n.d.)

Note: Rice seed, Vegetable seed, fruit seed, oil seed, maize, grain sorghum, barley, buckwheat, and durum wheat seed are the nine type of seeds that have been considered in this table.

successive EGMAC Workshops have identified a number of potential areas in this connection, including promotion of trade and investment, value chain management, research, good agri-practices and exchange of agri-related data and information. The Workshop on Promotion of Agriculture Trade and Investment[11] had recommended incentivisation of intra-regional investment and the creation of a common e-portal platform to showcase the products of BIMSTEC countries to stimulate intra-regional and global trade in agri-items. The time has come for the BIMSTEC member countries to follow up on these recommendations with concrete actions.

Exploiting potentials of BIMSTEC-FTA

The negotiations as regards the BIMSTEC-FTA have proved to be quite protracted which has given rise to a lot of frustration. However, it is welcome news that members have reached an agreement for the FTA in goods[12] and this could be signed at the upcoming Fifth BIMSTEC Summit to be held in March 2022.[13] Whilst the trade liberalisation plan, extent, and coverage of the sensitive list and rules of origin for preferential market access are yet to be made public, it is hoped that the agreement will lead to greater cooperation among the countries in the BIMSTEC group and will result in trade creation including in agricultural products. It will be of advantage to all BIMSTEC countries if the FTA includes initiatives and proposals to incentivise intra-regional trade opportunities for trade in agri-items, through preferential market access and flexible rules of origin. Indeed, stronger reciprocal cooperation could lay the pathway towards resilient BIMSTEC (Raihan, 2022).

Given that the majority of BIMSTEC members are LDCs, a two-track trade liberalisation plan could be helpful in addressing the concerns of relatively weaker economies of the grouping in this regard. Also, to note, three of the four LDCs will be graduating anyway over the next few years, so from a market access point of view, such a gesture is not going to be onerous for the offering partners. Hopefully, the agreement will also cover the removal of non-tariff measures through standardisation and harmonisation, and measures towards trade and customs facilitation and addressing of technical barriers to agricultural trade. BIMSTEC members need to streamline tariff and non-tariff barriers that impede the growth of intra-regional trade in food products (RIS, 2021).

Signing of BIMSTEC-wide MRA

BIMSTEC members may think of signing a region-wide Mutual Recognition Agreement (MRA), which will go a long way to complement and strengthen the BIMSTEC-FTA. Particularly in view of trade in agricultural goods, delays in customs clearance because of SPS-TBT compliance-related concerns tend to be a major hindrance. BIMSTEC-wide MRAs could play an important trade-facilitating role in this connection. Here, the work of the South Asian Regional Standards Organisation (SARSO) could also be leveraged to speed up the process of signing of the MRAs. In anticipation of the MRAs, members could start by agreeing to a common conformity assessment procedure through recognition of accreditation and certification concerning agri-products.

Incentivising intra-BIMSTEC FDI flows

It will be pertinent to mention that Bangladesh has put in place a number of policies and incentives to stimulate FDI in general, including the agriculture sector, and promote the cause of enhancing trade in agri-products globally and within the region. Incentives to promote trade and investment concerning agricultural and food processing in Bangladesh include the followings: (a) Reduced Corporate Income Tax (CIT) for 5 to 10 years, depending on location, for industrial undertakings engaged in processing of locally produced fruits and vegetables; (b) Full tax exemption on income from rice bran oil production up to 10 years; (c) 20 per cent special rebate on electricity consumption for agro-processing units; (d) Tax exemption on royalties, technical knowhow and assistance-related fees (and their repatriation); (e) Exemption of import duties on capital machineries for agro-processing and agro-based industries; (f) Full repatriation of profits and initial investment amount.

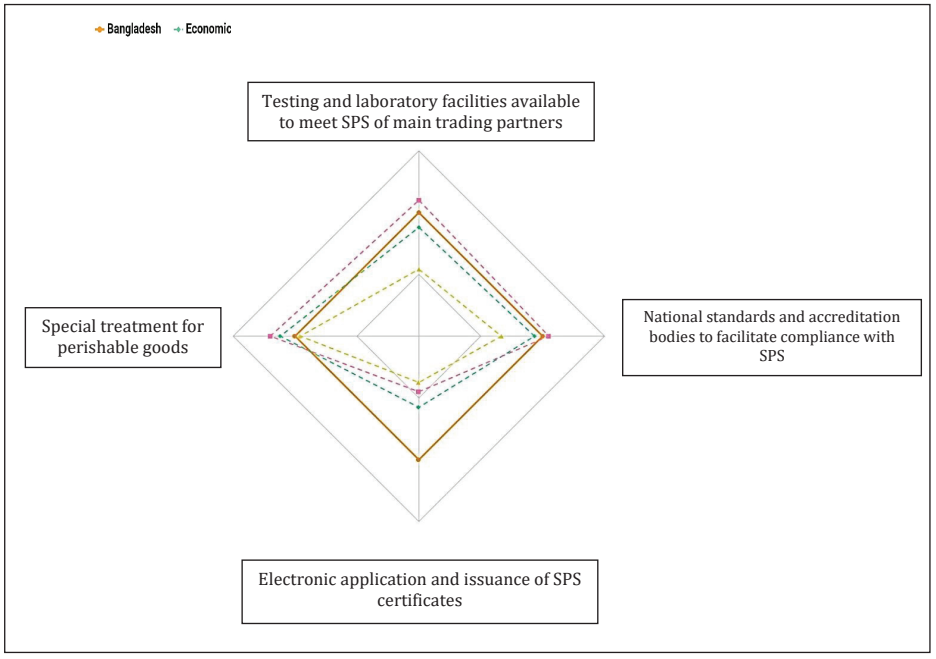
For exporters also, there are a number of support measures in place, which include the followings: (a) 50 per cent tax exemption for income accrued from export; (b) No VAT to be imposed on export of agri-goods; (c) 20 per cent export subsidy (cash incentive) for exporters of locally processed agricultural products and 100 per cent halal meat; (d) Duty-free market access (preferential treatment) to more than fifty countries enjoyed as an LDC.

Going for triangulation of trade-investment-transport connectivities

The ongoing initiatives to deepen multisectoral transport connectivity and measures in areas of trade facilitation and logistics could play an important role in stimulating intra-regional trade and investment in agriculture-related areas to the benefit of all the BIMSTEC member countries and the people. The experience of ASEAN shows that the member countries were able to take effective advantage of their geographical proximity by developing robust infrastructures (for example, by establishing strong road and rail networks)(Kummritz, Taglioni and Winkler, 2017). The bottlenecks here discourage trade, particularly that of trade in agri-products. This is because of the specific nature of agricultural goods which are subjected to various testing at customs points. On the other hand, speedy transportation and clearance are also crucial to trade in agri-items where the deepening of multimodal transport connectivity and logistics and trade facilitation measures will play an important role.

Stimulating logistics-trade facilitation

Figure 2: Agriculture Trade Facilitating



Source: United Nations (2021)

Figure 2 shows the comparative situation of Bangladesh vis-à-vis global, regional countries and the LDCS with regard to the Agriculture Trade Facilitation. It can be clearly seen that Bangladesh's performance scores in terms of the four sub-indicators are lower compared to other regions and groupings. Evidently, a lot needs to be done in the four identified areas: (a) Testing and laboratory facilities available to meet SPS of main trading partners, (b) Special treatment for perishable goods, (c) National standards and accreditation bodies to facilitate compliance with SPS and (d) Electronic application and issuance of SPS certificates. BIMSTEC-wide cooperation among member countries could help strengthen these key parameters, which are crucial to promoting the cause of intra-BIMSTEC trade in agri-goods. It will be important to put in place trade facilitation measures, including in areas of standardisation of the quality of agri-products, content requirements concerning inputs and ingredients, customs procedure harmonisation, single window at the border and interoperability of systems, green channels at customs clearance points. These could be powerful contributors to stimulating intra-BIMSTEC trade in general and trade in agri-items in particular.

Strengthening research collaboration

Within the BIMSTEC grouping, India and Thailand have relatively strong research infrastructure in agriculture-related areas. Cooperation among the member countries through the dissemination of knowledge, exchange of professionals as also technology and know-how transfer could help raise productivity and lead to product diversification in agriculture, which could in turn stimulate trade in agri-goods within the region. BIMSTEC countries could think of establishing a regional research and innovation centre to facilitate collaboration in the concerned areas. Here, collaboration with SAARC institutions such as the SAARC Agriculture Centre could also be explored as this could potentially benefit both the groupings, particularly because five of the BIMSTEC members are members of both groupings.[14] BIMSTEC Secretariat could think of setting up a regional seed bank to ensure the supply of quality seeds and promote collaboration for the production of high-quality seeds.

Taking common stance in view of WTO negotiations

The ongoing discussions in the WTO concern a number of issues of interest to the BIMSTEC member countries. There is a need to project a

coordinated approach in the context of this. Particularly those that relate to the agriculture and fisheries sectors. For example, in view of the ongoing negotiations in the WTO on Agriculture and Fisheries Subsidies, BIMSTEC countries should collaborate to come to a common stance as regards the issues for discussion on the table. As regards the *Agreement on Fisheries Subsidies*, BIMSTEC members should work together to ensure that the concerns of graduating LDCs and developing countries are adequately addressed. The interests of the artisanal and small-scale fisheries sector and the livelihood of fish folks will need to be protected. Fishing in territorial waters, exclusive economic zones and high seas needs to be differentiated in a way that safeguards the interests of these countries. Actionable subsidies, general exceptions and Special and Differential Treatments (S&DTs) will need to be defined by taking into cognisance their interests. As may be recalled in this connection, the revised Fisheries text introduced by the Chair of the Negotiating Group has been opposed by India and other developing countries since, among other factors, an appropriate time frame for transition has not been incorporated in the text.[15] BIMSTEC countries can forge a common stance in support of this.

In the context of the discussion on the *Agreement on Agriculture*, a number of issues are being discussed – domestic support, cotton subsidies, small farm holders, public stock holding, export restriction, exemption for humanitarian food purchases under the World Food Programme; and improved transparency, among others. These negotiations must take cognisance of the concerns of the graduating LDCs as also developing country members. Here also, BIMSTEC members of the WTO can come together to safeguard their common interests.

V. Conclusion

The preceding discussions have highlighted the emerging urgency of deepening BIMSTEC-wide cooperation in agricultural trade-related areas as a critically important policy intervention to ensure regional food security. It was argued that in view of the Covid experience and the attendant food security concerns, food price hikes in the backdrop of imported inflation and the ongoing Russia -Ukraine conflicts with its supply-chain disruptions, the importance of taking a fresh look at widening and deepening of intra-regional trade in the BIMSTEC region can not be overemphasised. Also. the adverse climate impact on the agriculture sector, productivity and production practices has added an

urgency to the need for cross-country collaboration in the BIMSTEC region.

In the above backdrop, the chapter has made an attempt to show that facilitating market access, providing better trade and logistics facilitation and creating opportunities for the exchange of information and learning in areas of research, agri-practices and innovations could result in significant benefits for all the regional countries.

The analysis has shown that intra-regional trade in agricultural products in the BIMSTEC region is dismally low at present, both in absolute terms and as a share of BIMSTEC regions' global trade in agriculture. These are also highly concentrated in a few items. Trade in agri-inputs and processed items is low and the value chains are either underdeveloped or absent. Several factors have contributed to this. MFN duties on many traded agri-items are relatively high, trade-logistics facilitation needs much improvement, the productivity of agricultural products is lower than competing countries from outside the region, and the state of cross-country learning and exchange of information is rather discouraging.

The paper has stressed that there are significant opportunities to diversify and expand intra-regional trade through concrete measures aimed at expanding preferential market access, improving trade and logistics facilitation, promoting research collaboration, developing regional value chains, incentivising intra-regional trade and articulating common stance and taking common stand at various relevant international fora such as the WTO. Initiatives in line with recommendations articulated at various BIMSTEC fora to promote cooperation in agri-related areas, as also the envisaged BIMSTEC-FTA, could play an important part in realising the potential opportunities in the form of higher production and greater supply, enhanced trade, higher consumer welfare and promotion of agri-related entrepreneurship in the region.

For the three graduating LDCs of the BIMSTEC grouping, sustainable LDC graduation will hinge on the capacity of these countries to adjust to the new trading scenario on graduation. Graduation will entail significant changes in the market access situation (arising from preference erosion) and policy flexibility (more stringent rules as regards compliance and commitments). The impacts of all these for the agricultural sector of the graduating LDCs will be tangible (e.g., preference erosion; allowable

flexibilities in areas concerning policies in support of the agriculture sector such as subsidies; increasing demands in SPS-TBT areas). In this backdrop, closer cooperation within the ambit of the BIMSTEC grouping ought to be seen by the member countries as an integral part of sustainable LDC graduation.

Endnotes

[1] Share of Fisheries sub-sector in Bangladesh's Agricultural GDP was about 22.4 per cent while those of animal farming (livestock and poultry) and forest and related sub-sectors were 15.4 per cent and 13.6 per cent respectively.

[2] The share of crop and horticulture in total agricultural GDP of Bangladesh was 48.6 per cent in FY 2020-21.

[3] Trade and investment were identified as one of six priority areas at the second BIMSTEC Ministerial Meeting held in Dhaka on 19 December, 1998.

[4] Agriculture was included in the priority list at the 8th BIMSTC Ministerial Meeting held in Dhaka on 18-19 December, 2005.

[5] The framework Agreement on the BIMSTEC-FTA was signed in Phuket, Thailand on 8 February, 2004 and came into force on 30 June, 2004.

[6] Share of earnings from trade (exports and imports) in GDP of a country expressed as percentage.

[7] Mostly exports to India with which both the countries have close economic and trade ties.

[8] The Indian LDC scheme provides zero-duty access for all products exported by the LDCs other than 25 items (mostly, liquor, arms and narcotics).

[9] Since the other two graduating LDC of SAARC, Bhutan and Nepal, have bilateral FTAs with India, they may continue to enjoy DF-QF market access for agri-items beyond their respective graduation timeline. Bhutan is scheduled to graduate in 2023, and Nepal in 2026.

[10] The Herfindahl–Hirschman index (HHI) measures concentration of exports and imports of a country. In case of exports HHI is equal to the sum of the squared shares of all individual products exported. When export revenues are distributed over many products, HHI approaches zero. Same is the case for imports. HHI varies from 0 to 1, with 0 showing very high degree of diversification and 1 showing very high degree of concentration.

[11] This was held in Thimpu, Bhutan on 29-30 November, 2017.

[12] The original idea was to have an FTA that would include both goods and services.

[13] The Fifth Summit wil be held in Colombo, Sri Lanka.

[14] These are Bangladesh, Bhutan, Nepal, India and Sri Lanka. This collaboration could also be of much benefit to the BIMSTEC member countries in view of the likely climate impact on agri-practices and agriculture sector in the region.

[15] These countries are asking the developed country members to follow the principle of 'Polluter Pays' and 'common but differentiated responsibilities'.

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Annexes

Annex Table 1: Trade Openness in BIMSTEC Region (as percentage of GDP)

BIMSTEC Countries	1997-01	2002-06	2007-11	2012-16	2017-20
Bangladesh	28.8	31.2	41.6	43.8	35.2
Bhutan	79.6	91.8	110.2	95.2	80.9
India	25.1	37.5	50.4	48.1	40.4
Myanmar	1.0	0.3	0.2	39.2	59.7
Nepal	57.0	45.1	45.1	49.2	45.8
Sri Lanka	81.4	75.2	56.5	50.2	49.1
Thailand	107.5	126.2	131.3	130.7	112.4

Source: Based on WDI database (2022)

Annex Table 2: Agricultural Products Exported from Bangladesh to BIMSTEC Countries

Country	Bangladesh's Major Agricultural Products Export to BIMSTEC Member Countries	
	Commodity	**Export volume (in million USD)**
Bhutan	**HS19:** Preparations of cereals, flour, starch or milk; pastrycooks' products	0.92(44.5%)
	HS 20: Preparation of vegetables, fruit, nuts or other parts of plants	0.80 (38.7%)
	HS 17: Sugar and sugar confectionery	0.18 (8.7%)
	HS19: Preparations of cereals, flour, starch or milk; pastrycooks' products	0.92(44.5%)
India	**HS 15:** Animal or vegetable fats and oils and their cleavage products; prepared edible fats, animal or vegetable waxes.	177.31(75.6%)
	HS 19: Preparations of cereals, flour, starch, or milk; pastrycooks' products	20.66(8.8%)
	HS22: Beverages, spirits, and vinegar	18.86(8.0%)
	Total agricultural export	234.4 (100%)

Myanmar	**HS19:** Preparations of cereals, flour, starch or milk; pastrycooks' products	0.26(30.1%)
	HS 07: Edible vegetables and certain root and tubers	0.19(22.0%)
	HS 22: Beverages, spirits and vinegar	0.17(19.7%)
	Total agricultural export	0.9 (100%)
Nepal	**HS 23:** Residues and waste from the food industries; prepared animal fodder.	22.82(64.1%)
	HS12: Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	4.14(11.6%)
	HS 07: Edible vegetables and certain root and tubers	3.11(8.7%)
	Total agricultural export	35.6 (100%)
Sri Lanka	**HS 07:** Edible vegetables and certain root and tubers	3.77 (81.3%)
	HS 20: Preparation of vegetables, fruit, nuts or other parts of plants	0.71 (15.3%)
	HS12: Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal	0.07(1.5%)
	Total agricultural export	4.6 (100%)
Thailand	**HS 12:** Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal	3.30 (84.8%)
	HS 21: Miscellaneous edible preparations	0.34(8.7%)
	HS 05: Products of animal origin, not elsewhere specified or included	0.24(6.2%)
	Total agricultural export	3.9 (100%)

Source: Author's compilation from Bangladesh Export Promotion Bureau (EPB) database (n.d.)
Note: * Export data of FY21 has been used to calculate the export volume and shares
**Figure in parentheses shows share of the respective agricultural product export as percentage of total agricultural export to the country.

Annex Table 3: Agricultural Products Imported by Bangladesh from other BIMSTEC Countries

Country	Bangladesh's Major Agricultural Products Import from BIMSTEC Member Countries	
	Commodity	**Import volume (in million USD)**
India	**HS 10:** Cereals	351.7 (26.6%)
	HS 09: Coffee, tea, maté and spices	278.8 (21.1%)
	HS 23: Residues and waste from the food industries; prepared animal fodder	222.8 (16.8%)
	Total agricultural import	1322.3 (100%)
Myanmar	**HS 07:** Edible vegetables and certain roots and tubers	34.7 (76.5%)
	HS 09: Coffee, tea, maté and spices	4.4 (9.7%)
	HS 10: Cereals	2.9 (6.5%)
	Total agricultural import	45.4 (100%)
Nepal	**HS 07:** Edible vegetables and certain roots and tubers	3.05 (76.7%)
	HS 23: Residues and waste from the food industries; prepared animal fodder	0.37 (9.2%)
	HS 05: Products of animal origin, not elsewhere specified or included	0.22 (5.5%)
	Total agricultural import	4.0 (100%)
Sri Lanka	**HS 23:** Edible vegetables and certain root and tubers	1.48 (31.5%)
	HS 09: Coffee, tea, maté and spices	1.48 (31.5%)
	HS18: Cocoa and cocoa preparations	0.56 (11.9%)
	Total agricultural import	4.7 (100%)
Thailand	**HS 23:** Residues and waste from the food industries; prepared animal fodder	30.85 (39.0%)
	HS 08: Edible fruit and nuts; peel of citrus fruit or melons	17.87 (22.6%)
	HS 21: Miscellaneous edible preparations	6.87 (8.7%)
	Total agricultural import	79.1 (100%)

Source: Author's compilation from ITC Trade Map database (n.d.)
Note: *Import data of 2020 has been used to calculate the import volume and shares
**Data as regards Bangladesh's agricultural product import from Bhutan is not available
***Figure in parentheses shows the share of the respective agricultural product import as percentage of total agricultural import from the country.

Annex Table 4: Agricultural Trade Concentration of BIMSTEC Countries: The Herfindahl–Hirschman Index

Country	Agricultural Export Concentration	Agricultural Import Concentration
Bangladesh	0.14	0.12
Bhutan	0.39	0.12
India	0.31	0.14
Myanmar	0.23	0.16
Nepal	0.36	0.15
Sri Lanka	0.40	0.11
Thailand	0.11	0.09

Source: Authors' calculations based on ITC Trade Map (n.d.)

Note: The level of trade concentration in specific products is measured using the Herfindahl–Hirschman Index (HHI).

2

Exploring Cooperation in Sustainable Agriculture and Value Addition in BIMSTEC Region

Aleen Mukherjee

I. Introduction

The economic landscape within BIMSTEC is characterised by its heterogeneity, with variations in per capita incomes ranging from US$835 in Nepal to US$6,593 in Thailand. Despite this economic diversity, the collective strength of BIMSTEC is substantial, with a combined GDP of around US$2.7 trillion in 2016 and average annual growth rates between 3.4 and 7.5 per cent from 2012-2016. By 2016, the economic size had expanded to approximately US$3.5 trillion, with a total population nearing 1.7 billion. This significant economic geography is largely influenced by India, which accounts for 74 per cent of the total BIMSTEC economy and 80 per cent of its population, making it a pivotal member of the grouping. Following India, Thailand and Bangladesh are notable for their economic contributions, with Thailand being the second largest economy (13 per cent) and Bangladesh (10 percent) accounting for a significant portion of the population (Palit et al., 2018).

BIMSTEC, initiated to combine the 'Look West' policy of Thailand and ASEAN with the 'Look East' policy of India and South Asia, serves as a link between ASEAN and SAARC. This regional grouping encompasses seven countries around the Bay of Bengal, home to around 22 per cent of the world's population. These countries are not only significant in terms of demographic presence but also play a crucial role in global trade dynamics, as one-fourth of the world's traded goods cross the Bay every year

* COO, NCDEX Institute of Commodity Markets and Research (NICR).

The economic potential of BIMSTEC is further underscored by the prospects of trade enhancement through the BIMSTEC FTA. Studies indicate the potential of US$ 43 to 59 billion in trade creation under this agreement, highlighting its significance in deepening cross-border production links and generating new value chains (De, 2017). The BIMSTEC Trade Negotiating Committee (TNC) has been diligently working towards finalizing the List of Goods as per the Framework Agreement signed in 2004, aiming to rationalize various non-tariff measures. The anticipation of finalizing an FTA soon underscores the commitment of BIMSTEC countries to leverage their economic heterogeneity and collaborative strengths for enhanced regional trade.

However, BIMSTEC stands as a testament to the collective economic potential of a set of heterogeneous economies, led by dominant players such as India and Thailand, striving towards augmented regional trade through the progressive steps towards a Free Trade Agreement.

II. Trade Scenario among BIMSTEC Nations

The Bay of Bengal is an especially important trading route for many countries. About 25 per cent of the world's traded goods, 70 per cent to 80 per cent of China's energy imports, and over 90 per cent of South Korea and Japan's energy imports flow through the Strait of Malacca, the southern end of the bay. BIMSTEC covers 3.7 per cent of the global surface area and is a market of almost 1.7 billion people (or 22.2 per cent of the global population). In 2018, the combined BIMSTEC economy was worth US$3.7 trillion (Chaterji and Choudhary, 2021), accounting for 4.3 per cent of global gross domestic production (GDP). The average per capita GDP was US$2,191, with Thailand, Sri Lanka and Bhutan above the average. In 2018, the BIMSTEC countries had an average of 6.6 per cent GDP growth rate; among them, Bangladesh had the highest growth (7.9 per cent) and Bhutan had the lowest growth (2.3 per cent)[1].

In 2018, BIMSTEC accounted for 3.8 per cent of global trade (US$1.50 trillion out of US$38.90 trillion), while intra-regional trade totalled US$94.61 billion (IMF, 2020). Out of the total global trade, intra-regional trade within BIMSTEC was 6.30 per cent. This shows that BIMSTEC is a less integrated region than ASEAN (intra-regional trade of 24 per cent) and the European Union (intra-regional trade of 64 per cent) (WTO, 2019). In 2018, India had the highest trade share among all BIMSTEC members (40.26 per cent), while Bhutan had the lowest (2.11 per cent).

India also had the highest trade share in BIMSTEC's global trade (55.42 per cent), while Bhutan had the lowest (0.16 per cent). At the same time, 85.71 per cent of Bhutan's trade was with the BIMSTEC region (the highest), while only 4.30 per cent of Thailand's trade was intra-regional (the lowest) (Chaterji and Choudhary, 2021).

Table 1: Economic Indicators of BIMSTEC Countries (2017)

Country	Per Capita GDP (US$)	GDP(US$ Billion)	Population (Million)	FDI Stock (Million)	Trade of Goods & Services (US$ Million)
Bangladesh	1,516.5	249.7	164.7	14,5570	95,979
Bhutan	3,110.2	2.5	0.8	190	1,949
India	1,939.6	2,597.5	1,339.2	377,683	1,094,673
Myanmar	1,298.9	69.3	53.4	27,806	..
Nepal	835.1	24.5	29.3	1,608	14,052
Sri Lanka	4,065.2	87.2	21.4	11,070	44,275
Thailand	6,593.8	455.2	69.0	219,368	54,4345

Source: World Bank and UNCTAD.

Table 2: BIMSTEC Trade (2018)

Country	Intra-BIMSTEC trade		BIMSTEC global trade		Intra-Regional Trade Share in Global Trade (%)
	Volume (US$ Million	Share of Countries (%)	Volume (US$ Million)	Share in BIMSTEC Global Trade (%)	
Bangladesh	10,958.0	11.6	89,094.4	5.9	12.3
Bhutan	1,997.9	2.1	2,331.1	0.2	85.7
India	38,087.7	40.3	832,257.2	55.4	4.6
Myanmar	7,369.8	7.8	36,209.8	2.4	20.3
Nepal	9,295.7	9.8	13,607.1	0.9	68.3
Sri Lanka	5,619.1	5.9	33,361.0	2.2	16.8
Thailand	21,279.1	22.5	494,984.7	33.0	4.3
BIMSTEC	**94,607.2**	**100.0**	**1,501,845.3**	**100.0**	**6.3**

Source: Based on IMF data.

Agriculture is the largest source of employment in all BIMSTEC countries, and the incidence of poverty is the highest among farmers and farm labourers. Poor households in the region spend a large share of their income on food. Food prices, therefore, have a significant impact on poverty and food and nutrition security. Farmers' incomes can go up, and the availability and affordability of nutritious foods can improve with an increase in regional trade. More trade can also reduce producers' and consumers' vulnerability to weather and price shocks. All BIMSTEC countries are also highly vulnerable to climate change because of their location, high levels of poverty, and high dependence on agriculture. Trade policies can help in rationalising and diversifying cropping patterns, make diet diversification less expensive, and raise the incomes of farmers by integrating them into the regional value-chains.It is important to note that many BIMSTEC economies are relatively smaller to be able to undertake economic activities that could exploit substantial economies of scale. Economies of scale are better utilised in grander markets rising out of economic assimilation, and small countries have greater market penetration. Significant benefits can be derived from the BIMSTEC economies by adjoining and sharing the factors of production and the huge marketplace through preferential trading policies.

Challenges facing by the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) primarily stem from the region's comparatively lower levels of intra-regional trade and investment when compared to other regional blocs. Several factors contribute to this disparity, including a deficiency in connectivity and information dissemination, inadequate infrastructure, and a lack of essential telecommunication links. Furthermore, the absence of warehouses and cold storage facilities, coupled with insufficient accommodation options, poses significant constraints to seamless trade operations at border points. Addressing these challenges is imperative for BIMSTEC to unlock its full economic potential and foster greater collaboration among member nations.

III. Intra-region and Inter-region Trade Barriers BIMSTEC

Though there are numerous opportunities to enhance trade in agricultural commodities and processed food products within among the BIMSTEC

members the intra-regional trade has been extremely low. The key reason could be most of the countries have identical surplus goods to trade, which leads to competition in the international market rather than the alliance doing syndicated efforts to penetrate inter-regional or global markets.

As far as inter-regional trade is concerned, there are bipartite trade pacts as a part of focused efforts by respective governments. However, with rapid changes in the global dynamics of the commodities trade, these bilateral trade agreements act as a hindrance due to misuse, thereby defeating the purpose of the common good of the people in both countries. For example, India is the world's largest importer of edible oils, with dependence on imported oils rising to 65-70 per cent of its 24-million-tonne consumption in recent years. Imports are largely affected from Indonesia and Malaysia for palm oils, which account for over 60 per cent of the total import basket of around 15 million tonnes, while the rest comes from South America and Ukraine.

To prevent the discretionary use of imported edible oils and save the foreign exchange outgo, the Indian government imposes a very high incidence of customs duty, which is as high as 45 per cent at times. This high rate of customs duty opens opportunities for illicit trade by routing South American soft oils through India's east and north border at zero or negligible duties. These imports enter countries like India under the comprehensive trade agreements that exempt tariffs on bilateral trade. In such cases, local Indian traders, who import through legal channels lose business to those entities who import from neighboring countries.

Similarly, some of the neighbouring countries within the alliance, where borders are landlocked[2], have been allowed to import goods by seaport to Indian port for a later transport by road to the destination country. In the process, a lot of goods are marketed illegally in the country, where ships are offloaded for further transportation via roads. This, too, threatens the existence of some of the local companies engaged in the same business.

Such incidences happen during period of heavy regional imbalances in the supply of commodities due to natural calamities non-tariff barriers, or geopolitical reasons.

One such area prone to illicit trade practices is spices. As India imposes heavy customs duty to avoid dumping poor quality spices from some South-East nations, the same goods are imported by routing the consignments from BIMSTEC countries via road or sea or even air routes

to circumvent custom duties by misusing the bilateral trade treaties.

All the above malpractices in intra-regional cross-border trade have emerged in recent years with the development of commodities trade across the globe, while bilateral trade agreements were done much before when officials involved in such agreements may not have imagined such situations. As a result, renegotiations and revised treaties are being considered. To prevent such re-routing trade practices, the important clause of "certificate of origin" is made mandatory during such transactions, which reasonably protects some products, though not all.

In yet another example of conflicts in bilateral trade, the stable policy environment is challenged during the years of extreme surplus or deficit supply years. This is clearly evident in the case of Pulses. India has traditionally been dependent on Myanmar for around 700,000-900,000 tonnes of pulses annually. This includes around 500,000 tonnes of Black matpe or Urad, and the rest is Pigeon Pea or Tur, Moong beans and Peas. However, to address local socio economic issues, we have seen frequent curbs on the import of pulses during surplus periods, which are later eased during shortages. This disrupts the production cycle in the sourcing country, besides hurting the trade volumes. A comprehensive long-term pact or diplomatic-level memorandum of understanding is necessary to ensure smoother trade and a seamless supply pipeline in the destination country.

There are various commodities in which the alliance member nations are global suppliers. For example, Thailand and India are among the largest exporters of sugar in the world after Brazil. In the current fiscal, India is likely to have exported over 6 million tonnes of sugar, while Thailand's exports were hit due to lower production, thanks to the drought-like situation in the country. There is an immense scope for both countries to come together and explore remunerative global markets on a longer-term basis instead of competing with each other and limiting the financial gains. The same can be replicated in rice and in lot of processed food areas.

IV. Prospects, Challenges and Way Forward for BIMSTEC Integration

A. Easing Tariff and Non-tariff Barriers facilitates trade: Any discussion on BIMSTEC and an FTA between the member states invariably raises

the example of SAARC and SAFTA and the possible lessons to be learnt from there. It has been argued that Intra-regional trade among SAARC countries is low mainly because of the lack of comparative advantages in their economies. The argument is that being mostly agrarian economies, they export similar products and therefore, intra-regional trade remains low (at just 6-7 per cent). One example is tea exports from India and Sri Lanka. The question is whether this holds true for BIMSTEC also. Probably does. Even though there are some complementarities in the exports and imports of the member countries, intra-regional trade is low due to many hurdles like tariff and non-tariff barriers, lack of connectivity and logistical hurdles. International classification of Non-Tariff Measures (NTMs):

- Sanitary and phytosanitary measures
- Technical barriers to trade
- Pre-shipment inspection and other formalities
- Price control measures
- Licenses, quotas, prohibitions and other quantity control measures
- Charges, taxes and other para-tariff measures
- Finance measures
- Anti-competitive measures
- Trade-related investment measures
- Distribution restrictions
- Restrictions on post-sales services
- Subsidies (excluding export subsidies)
- Government procurement restrictions
- Intellectual property
- Rules of origin
- Export-related measures

With regard to standards, development across South Asia remains relatively immature and there are considerable asymmetries in testing procedures across South Asian countries. Harmonisation of standards, tariff elimination as well as dismantling of all para-tariff and non-tariff barriers are key for regional integration. Establishment of a seamless system of cross-border movement of both cargo and people is a major challenge for the BIMSTEC. For easing up cross-border movement and establishing greater connectivity, the existing trans-border formalities, vehicular movement and customs procedures need to be simplified.

The use of modern technology could play an important role in speeding up the procedures. The BIMSTEC countries should work on a Single Window facility that allows parties involved in trade and transport to lodge standardised information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. In the context of the current state of play, BIMSTEC remains one of the least connected regions in the world. BIMSTEC initiative will need to be geared to build the road, rail, port and air transport connectivity, which at present hinders the deepening of trade and investment infrastructure. Improving the state of connectivity within the region, and mobilising the required resources to build the necessary infrastructure must be seen from the perspective of long-term development strategy of BIMSTEC members.

Trade facilitation via liberal transit, business-friendly customs, transport corridors, etc., is necessary. This process will partly address some of the non-tariff barriers in the region and give the required fillip to trade. In fact, tariff reductions may not matter as much as non-tariff trade barriers. It has been emphasised that these less tangible obstacles are the "actual culprits" impeding integration. BIMSTEC should focus on facilitating the (1) mutual recognition of national standards, (2) harmonisation and development of common standards, and (3) identification and targeted exploration of existing value chains across the region. There is also a view from experts that BIMSTEC members can consider settling for a limited FTA since a limited trade deal is currently better than no deal.

B. Global Supply Chains: Today, the market and large production in it are based on global **supply chains** and in BIMSTEC, we see little signs of any strong regional value chains. The availability of productive resources (land, labour and capital) keeps changing in every modern economy. The BIMSTEC countries must leverage the already built integrated border check-posts and containerised movement of goods, and must realign the tracking of all cross-border movements to prevent any misuse to take advantage of the world seeking to shift global manufacturing hubs out of China in the post-pandemic era. The BIMSTEC region is the ideal alternate location for this shift. Trade routes and supply chains will be the new business plans for multinational enterprises in the days to come. This is why increased cooperation is crucial so that resilient and reliable supply chains can be developed in the BIMSTEC region and turn it into a hub. The member countries

must develop a sustainable regional group that can take advantage of the momentum of the diversifying manufacturing locations, as this is an opportune time for South Asia to integrate meaningfully and enjoy gains from regional trade.

C. The COVID-19 pandemic has underlined the need to develop an uninterrupted supply chain for food, medicines and other basic essential commodities. With the global supply chain severely disrupted as a result of the pandemic, there is an opportunity for more intra-regional trade among the BIMSTEC countries. To seize this opportunity, member states should agree on some trade facilitation measures, including the simplification of customs procedures, the introduction of an electronic tracking system for cross-border container movement, and the acceptance of electronic versions of export-import-related documents. They should also conclude the pending BIMSTEC FTA and BIMSTEC Customs Cooperation Agreement to increase the volume of intra-regional trade. Trade facilitation measures need to be accompanied by efficient transport connectivity to ensure the easy movement of goods and people. Renewed emphasis will be needed to develop a resilient regional transport connectivity system capable of withstanding future disruptions. In this milieu, BIMSTEC member states should consider harnessing the unexploited potential of intra-regional trade to speed up their recovery from the pandemic (ESCAP, 2020).

D. Infrastructure (reduced trade transportation costs): Efficient road, sea/river ports rail and air transport infrastructure have a larger role to play in increasing trade flow. Lack of which at present hinders the deepening of trade and investment infrastructure as suboptimal trade and transport infrastructure at border points escalates the cost of export and import, which, in turn, affects potential intraregional trade opportunities.

As roads represent the dominant mode of both domestic and regional transportation, upgrading the trade-related infrastructure at borders and customs checkpoints is of utmost importance to strengthen overland connectivity in the BIMSTEC region. The border access roads and arterial road links need to be upgraded. Appropriate trade facilitative infrastructure needs to be put in place at the land customs points to aid the smooth flow of cargo across the borders.

Transport infrastructure bottlenecks, by increasing costs for exporting goods and importing intermediate inputs, weigh on firms'

competitiveness. They also make it difficult for some regions to seize the opportunities that trade can offer for local development. The construction of highways and rural roads has accelerated in recent years. India has also made great progress in building airport-related infrastructure. However, seaport infrastructure lags behind and, together with poor trade logistics, hampers India's external competitiveness. Around 90 per cent of India's external trade (by volume) and 70 per cent (by value) are handled by ports (NITI Aayog, 2018). Most container handling ports lack the capability to handle large container vessels due to inadequate depth (water depth to match global cargo handling efficiencies). India has only one trans-shipment port in Kochi. A large share of containers is thus transshipped through other ports, such as Colombo and Dubai, creating additional costs and delays.

There is a huge SPS and TBT-related infrastructure deficit, which, in turn, affects the efficiency of export and import operations at ports.

E. Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) - An Asian Development Bank (ADB) study reveals that South Asian countries have long been imposing several kinds of NTBs on imports[3], with a significant share of specific NTBs (86.3 per cent) related to SPS and TBT measures. Findings of the ADB study show SPS and TBT measures dominate in cross-border trade between India, Bangladesh, and Nepal. In Nepal, labelling requirements were found to be a major barrier, while in India and Bangladesh, marking requirements and inspection requirements were the key NTBs barriers affecting trade flow.[4]

Although India is making considerable efforts to align its standards with international standards, it has yet to integrate domestic standards with global standards. FSSAI has aligned its food standards with Codex standards, although gaps remain. For instance, the requirements of Good Agricultural Practices, Good Hygienic Practices (GHP), and HACCP are not fully regulated in India.

Several factors negatively impact the effective enforcement of regulations in India, including a weak enforcement infrastructure at both state and central levels, inadequate testing agencies, shortage of inspectors, lack of skilled personnel, no uniformity of enforcement, and no availability of information.

The enforcement of regulations in India has some fundamental flaws inherent to its structure: for instance, it relies excessively on its own

inspection machinery (government laboratories and other agencies) to verify compliance. This effectively pushes the onus of compliance with regulations onto the industry, and regulatory compliance should be fulfilled before any inspection takes place. However, this does not happen in practice, and there is a need to create a system where the industry meets with compliance without any regulatory inspection. Furthermore, India's exports face SPS-related barriers in international markets due to the lack of a domestic monitoring system. India has not yet drafted appropriate guidance documents for domestic and export manufacturing units and products, including additives, contaminants, packaging, storage, and transportation. The current infrastructure for regular monitoring (additives, contaminants, and residue limits) is very weak for both domestic and imported products.

- India's SPS and TBT regulatory bodies continue to struggle with the lack of information on food regulations of other countries and their agreements, quarantine procedures, HAPPC, and other related procedures. The availability of such information is critical not only for exports, but also for imports; for identifying strategic changes needed in the national, regional, and global regulatory environments; and for keeping the Indian industry updated and fully informed.
- India is relatively advanced in developing standards. Several BIMSTEC countries have significant SPS and TBT-related gaps in institutions and regulatory architectures, which hamper cross-border trade. One of the key problems faced in the region is that of multiple regulating agencies that have produced numerous outdated and/or unnecessary regulations.
- The overarching problem of a multiplicity of standards and regulations relating to SPS and TBT frameworks within India also exists in other countries. This multiplicity of standards within the domestic environment of an importing country acts as a barrier, largely because the legitimate expectations of both exporters and importers are heavily compromised by divergent regulatory frameworks. Ultimately, this negatively impacts the entire cross-border trade ecosystem in the BIMSTEC region. Divergent rules and regulations are also the source of many regulatory and technical impediments to the growth of intraregional trade in the region. Followings are some of the examples:

- India and Sri Lanka have well-developed comprehensive food regulations covering information on food additives, containments, toxins, maximum residue limit, preservatives, antioxidants, processing aids, colours, sweeteners, flavours, and emulsifying and stabilising agents. Bangladesh and Nepal have limited information, while Bhutan has almost no information on the same components. There are likewise significant gaps in food standards across the BIMSTEC countries: for example, FSSAI has established specific standards for instant noodles in India, while other BIMSTEC countries have no standards for the same product, and while frozen food is well-regulated in India and Sri Lanka under their respective food acts, they are not regulated in Bangladesh, Bhutan, and Nepal.
- Food preservatives are categorised as class I preservatives or class II. Most class I preservatives are common across India, Bangladesh, Nepal, and Sri Lanka, while Bhutan has no information on class I preservatives, as shown in Table 3. India classifies edible vegetable oil as class I, while Bangladesh and Nepal consider wood smoke under this class of preservatives. Bangladesh, Nepal, and Sri Lanka recognise hops and portable alcohol as class I preservatives (Asian Development Bank, 2020).

Table 3: Class I Preservatives of India, Bangladesh, Bhutan, Nepal, Sri Lanka

Class I Preservatives	India	Bangladesh	Bhutan	Nepal	Sri Lanka
Not restricted Unless Otherwise provided in the rules	Common salt Sugar Dextrose Glucose Syrup Spices Vinegar Honey Edible vegetable oils	Common salt Sugar Dextrose Glucose Syrup Spices Vinegar Honey Wood smoke Hops Commercial salt Alcohol or potablespirit	Not applicable	Common salt Sugar Dextrose Glucose Syrup Spices Vinegar Honey Wood smoke Hops Alcohol	Common salt Any soluble carbohydrate sweetening matter Spices Vinegar Honey Potable spirits or wines

Source: Food Regulations of South Asia Subregional Economic Cooperation countries.

- Bangladesh, India, Nepal, and Sri Lanka have developed trade portals which become focal points for providing comprehensive information on various SPS and TBT regulations for the trading community; Bhutan has yet to establish such trade portals. Information is not always available in English translation.
- Bangladesh, India, and Sri Lanka have established national single window (NSW) systems, while Bhutan, Nepal, are at different stages of developing national systems. The countries are at different levels in establishing and implementing national single-window systems.
- Bangladesh, India, and Sri Lanka have accreditation bodies that confirm laboratories' capacity to provide certification for goods, after assessing their technical competence to test, and other related parameters. Other countries, including Nepal and Bhutan, are at much earlier stages of developing national accreditation bodies.
- Country-specific NTBs in India and Nepal find a diverse range of barriers in each country that restrict cross-border trade. Nepalese export of agricultural products to India requires testing and certification at land customs stations. It was noted that Indian testing laboratories are located in distant locations, which increases the challenge to obtain testing certificates for clearance of consignments. In addition, specific products are subject to tariff quota limits, including imports of vegetable fats, acrylic yarn, copper products, and zinc oxide. Nepal's exporters in India also face barriers such as transit fees, special additional duties, and state-specific taxes. Exports from India to Nepal face obstacles and restricted market access, the majority of which occur at the border, such as port hassles and delays, congestion, and unavailability of railway wagons.
- A study by the Institute of Social Economic Change reveals that India's exports to Sri Lanka face obstacles in obtaining an objective certificate from food laboratories. The process for obtaining the certificate is complicated and time-consuming. For instance, in the export of mango pulp to Sri Lanka, India's exporters are required to obtain a Health Certificate from Sri Lanka's Ministry of Health and conduct routine analysis on the export product. Such avoidable barriers routinely affect the costs of trade across South Asia. Sri Lanka's exports to India face similar avoidable hurdles with Indian officials demanding multiple samples from the same product and batch due to different packaging sizes of the goods. The cost

associated with certification is very high and can be set arbitrarily: unnecessary procedures add costs to the products, increase the price of imports, and render them less competitive.

- A lack of harmonised labelling requirements is recognised as a key concern in South Asia. For example, the Food Safety and Standards Authority of India (FSSAI) prefers stickers over labels on imported food products from other countries, which often creates the need to relabel entire consignments. The complexity and rigidity involved in India's labelling regulations significantly undermine the competitiveness of South Asian products exported to India. Relabeling often incurs expenses for repackaging, warehousing, and making the India-specific labels. Such requirements can be onerous and expensive for small importers who must bear the extra costs resulting from the complex regulations of FSSAI.[5]

F. Sharing factors of production (FDI –investment cooperation)- Many BIMSTEC economies are relatively smaller to be able to undertake economic activities that could exploit substantial economies of scale. Economies of scale are better utilised in grander markets rising out of economic assimilation, and small countries have greater market penetration. Significant benefits can be derived from the BIMSTEC economies by adjoining and sharing the factors of production and the huge marketplace through preferential trading policies. The BIMSTEC region had a low foreign direct investment (FDI) inflow in 2015-2018. The average FDI inflow in the BIMSTEC member states was about 1 per cent to 3 per cent of GDP, although Myanmar fared better (FDI inflow of 4 per cent to 6 per cent of GDP)[6].

Trade liberalisation may boost FDI inflows and productivity. Foreign investment usually brings technology, knowledge and management skills, boosting productivity and export performance in the host country. It may also facilitate access to global markets. FDI can also boost activity in small and medium-sized enterprises (SMEs) to global value chains, contrary to the frequent belief that benefits accrue mainly to large firms.

In India, Restrictions on FDI remain higher than in most countries, especially in agriculture, banking and insurance, legal, accounting and audit services. In retail trade, 100 per cent FDI is allowed and large foreign retailers have recently invested in India. However, new guidelines for FDI in the e-commerce sector remain relatively restrictive. Restrictions on FDI, combined with structural bottlenecks, act as an impediment to

FDI inflows. Further liberalisation and simplification of FDI policy could trigger foreign investment.

G. Post-Pandemic Strategies-BIMSTEC countries must liberalise and facilitate trade and production, and enact institutional reforms and border controls. In the aftermath of the COVID-19 pandemic, the increased focus by policymakers and businessmen on securing a 'one-main-source' supply scenario, amid rising tensions between China and many other countries, should lead to a rethinking of better connected and diversified local supply hubs. This represents a great opportunity for the BIMSTEC countries to capitalise on the changing landscape. Businesses could potentially move closer to customers by adding local and new regional supply chains.

New trends exacerbated by COVID-19 shocks, such as rethinking supply chain security, policy shifts toward more economic nationalism and accelerated digitalisation in a wide range of sectors, will have far-reaching consequences for international production over the next decade.

With intra-BIMSTEC trade currently accounting for 5 per cent of its global trade (amid the post-COVID-19 scenario), the grouping must consider settling for a limited free trade agreement (FTA), the first step to expand trade, rather than having no deal at all. The grouping could simplify the rules of origin and strengthen its implementation with time. It must also target non-tariff barriers consistently with trade facilitation on border controls, mutual recognition of national standards, harmonisation and development of common standards, and the identification and targeted exploration of existing value chains across the region.

The potential to achieve better outcomes for regional development will increase manifold if the member countries collectively present BIMSTEC as a destination for trade and investment. A common platform helps in pooling resources and also helps in reducing the "transaction costs" of doing business. It is also important for the Bangladesh, Bhutan, India, Nepal Initiative to be operational for BIMSTEC to be successful. There remains a great opportunity to exploit the regional value- chain within BIMSTEC. A recent policy paper suggests that with the value-added trade dynamics of Thailand and India, other BIMSTEC countries can be integrated not only through backward linkages but can also participate in global commodity and service value chains.

V. BIMSTEC-Free Trade Area

The BIMSTEC Free Trade Area (FTA) framework agreement was signed in February 2004, and included six constituent agreements – Agreement on Trade in Goods, Agreement on Trade in Services, Agreement on Investment, Agreement on Cooperation and Mutual Assistance in Customs Matters, Agreement on Rules of Origin and Operational Certification Procedures, and Agreement on Trade Facilitation [7](Agreements on the trade in goods and customs cooperation are expected to be signed soon. Customs cooperation and trade facilitation agreements are being negotiated to remove non-tariff barriers)

In 2017, the average tariff rate in intra-regional trade in South Asia was 6.8 per cent, which was higher than in ASEAN (2.7 per cent), Latin America (1.1 per cent), Sub-Saharan Africa (3.1 per cent), transition economies (0.4 per cent), and West Asia and North Africa (1.9 per cent).[8] Non-tariff barriers and issues such as a lack of connectivity and infrastructure, high transaction costs, complex customs procedures and huge informal cross-border trade are obstacles to smooth intra-regional trade. Various domestic compulsions have also prolonged the trade negotiations. The BIMSTEC tariff reduction list is wider than other agreements, and some member states appear to be apprehensive of losing customs revenue and significant harm to domestic industries if the FTA is implemented (ORF, 2017).

BIMSTEC can be and is a bridge that would benefit and link both SAARC and ASEAN regions. In fact, the original intention of the member states of this inter-regional body was inspired by the idea of turning the two regional groupings into a free trade area and opening the door for investment, identifying priority projects on trade, transportation, tourism, energy, health and agriculture through collective action.

Trade accounts for over 60 per cent of the combined GDP of BIMSTEC members. Between 2002 and 2017, the share of intraregional trade among BIMSTEC member states rose from 3.6 to 5 per cent. This remains lower than comparable figures in other regional trade blocs, including 7 per cent among SAARC members, and 29 per cent among ASEAN states. There are many opportunities to prosper together in the BIMSTEC region. Deeper regional trade and connectivity will reduce the isolation of India's northeastern states and the two landlocked BIMSTEC countries (Bhutan and Nepal) since they will benefit from a reduction in transaction costs among the other countries. Businesses in

the region can also benefit from better access to markets in South and Southeast Asia, and can create regional value chains through small and medium enterprises that integrate in the global value chains. In addition, free trade reduces monopoly, lowers prices, and increases economic efficiency. The informal trade can be diverted to official channels and bring revenue and other benefits with the barrier-free trade provisions.

Tariffs are no longer the major barrier to intra-regional trade, but the cost and time to trade remain relatively high (Singh, 2018). Tariffs have reduced as a result of global, regional and bilateral agreements, and no longer appear to be the major barrier to trade in BIMSTEC. Instead, it is the non-tariff barriers that are the main cause of dismal intra-regional trade in the region (De and Chirathibvat, 2018). The FTA will grant all BIMSTEC member states greater market access since it connects South Asia, one of the least economically integrated regions, and Southeast Asia, one of the most integrated regions. To reduce BIMSTEC countries' huge trade burden due to a wide variety of non-tariff measures (NTMs), the way forward is to negotiate MRAs (mutual recognition agreements, for trade in goods initially).

VI. Revitalising India's North-East: Efforts from BIMSTEC

BIMSTEC is focused less on geopolitics and more on common regional concerns of economic and social development. This should have made it a more fast-moving process. From a South Asian perspective, BIMSTEC allows its members to engage deeper among themselves on a common platform. To an extent, it can cover the deficiencies of the South Asian Association for Regional Cooperation (SAARC) in its attempt to evolve into a meaningful platform for regional cooperation and development in South Asia. The presence of two large Asian economies – India and Thailand balances the economic strength within the group, which is a source of comfort for the other members and reduces their fear of dominance. The success of BIMSTEC would also help the South and Southeast Asian countries expedite other arrangements/projects involving both regions, such as the MGC (Mekong-Ganga Cooperation), the Asian Trilateral Highway and the Bangladesh-China-India-Myanmar.

The Northeast borders four BIMSTEC countries (Bangladesh, Bhutan, Nepal and Myanmar), making it a key cog in regional cooperation. It is home to about 3.8 per cent of the Indian population, covers 8 per cent

of the country's geographic area, and has approximately 5,300 km of international borders (Ashok, 2019). India has been viewing this area from the perspective of increasing investments through transnational connectivity, particularly with Bangladesh, Myanmar and Thailand (Xavier, 2018). The Northeast presents a trillion-dollar economic opportunity that can be enhanced with better transportation, border infrastructure, e-commerce integration, and modernised cross-border supply chains—all of which are still unrealized (De, 2019). If this potential is tapped, "Indian policymakers expect that the country's exports will pick up, that more investments will flow in, and that regional integration will serve as a positive springboard for greater global economic interdependence" (Xavier, 2018). This will bring development to the Northeastern states of India and internationalise India's hinterland economy through maritime and cross-border hubs on the eastern coast with Bangladesh and Myanmar. "India's support for the Asian Development Bank's (ADB) East Coast Economic Corridor and its multimodal regional corridor from Kolkata to Kanyakumari reflects the domestic dimension of this new Bay of Bengal strategy" (Xavier, 2018). While the Northeast has historically remained 'marginalised' due to local insurgencies, the new connectivity projects will eliminate the region's 'remoteness' by linking it to the centre (New Delhi) through West Bengal, with Kolkata as the liaison city (Shrivastava, 2005). The integration of physical connectivity through the "rationalization and harmonization of various collaborative policies across the neighbours, rules and laws within the region" will facilitate complementarities between the Northeast and India's neighbours and serve as a lever for a shift (Sarma and Choudhury, 2017).

BIMSTEC can play an instrumental role in promoting and preparing the Northeast to unleash its potential by hosting various connectivity projects for subregional development. Economic collaboration and investment programmes with the neighbouring countries through industrial parks (such as those being developed by the ADB in Assam). Special economic zones can also be set up for specific projects like timber and food processing in the eight Northeast states. Smart cities can also be established. The signing of the Convention on International Transport of Goods Under Cover of TIR Carnets (TIR Convention) will facilitate seamless trade and transportation in the region. India has ratified the TIR Convention, while Bangladesh and Myanmar are yet to do so. India may play a constructive role to encourage the two nations to

ratify it soon. A *Northeast Trade Portal* can have the potential for finding relevant products and markets with relevant counties of the region and will enhance trade connectivity and economic growth in the region. The involvement of development banks such as the ADB will be key for the development of connectivity in Northeast India.

Endnotes

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3

Sustainable Production, Quality, Value Chain and Trade: Unveiling BIMSTEC Cooperation in Food and Agriculture

Satish Y. Deodhar*

I. Introduction

Circa 4th century BCE, Kautilya, a brilliant statesman from the Asian continent, wrote a treatise on the science of political economy titled *Arthashatra* (Bisht, 2019). In that treatise, he had mentioned that the sustenance and livelihood of people depend on wealth which is acquired from natural resources. And, importantly, he defined the science of political economy as a means of sustainable use of natural resources for the welfare of the subjects. As the modern economies of the world are groping with the problem of over-exploitation of natural resources, greenhouse gas emissions, salinity ingress, carbon footprints, and the resultant climate change, Kautilya's emphasis on sustainable use of natural resources has warranted urgent attention.

Modern economists, too, have begun to define economics in terms of sustainability. Kate Raworth defined economy in terms of a food product – a ringed doughnut (Raworth, 2017). To her, human deprivation is

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the hole in the middle of the doughnut and planetary degradation lies beyond the ring. Economic science should ensure that we stay within the ring. The foundation of socio-economic welfare prevents us from slipping into the hole, and, the ecological ceiling prevents us from escaping into planetary degradation. In this endeavour, the food and agricultural sector has a vital role to play. Recognising this role, the World Trade Organization (WTO), which came into being in 1995 had initiated a series of multilateral agreements, including the Agreement on Agriculture (AOA), Agreement on Sanitary and Phytosanitary Measures (SPS), Agreement on Technical Barriers to Trade (TBT), Agreement on Trade-Related Intellectual Property Rights (TRIPS), and a few others (WTO, 2017).

Experience of the last two and a half decades has, however, shown that implementation of these benchmark multilateral agreements and changes their-in have shown very slow progress. Moreover, the discussions in every biennial ministerial meeting of the WTO have almost halted any further liberalisation. While WTO considers trade-related liberalisation as a dynamic long-term phenomenon, fortuitously, its institutional structure has allowed and tolerated free trade agreements (FTAs) among trading blocks and/or contiguous regions from a medium-term perspective. The political economy aspects of such trading blocs also cannot be overlooked. In the light of this, the Webinar organised jointly by the Research and Information System for Developing Countries (RIS) and the International Food Policy Research Institute (IFPRI) for the regional organisation - Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a very welcome move.

As I see it, the Webinar is important from three perspectives. First, developing countries cannot wait longer for the WTO-led multilateral liberalisation to take place. Second, sustainability has become the cornerstone of economic development and the food and agriculture sector has a vital role to play. And third, issues in food and agriculture production, quality and security, value chain, trade, and sustainability are intricately linked to the countries lying in the contiguous and littoral areas of the Bay of Bengal constituting BIMSTEC. In this context, the three technical sessions - Promoting Trade in Agriculture in BIMSTEC, Prospects of Food Processing and Regional Value Chain in BIMSTEC, and Food Security and Safety Issues in Agriculture are organically related to the sustainability issues.

II. Promotion of Food and Agricultural Trade

The creation of trading blocs results in two kinds of effects – one is trade creation and the other is trade diversion. Trade creation is considered a welcome economic effect, for as per the comparative advantage in different products and economies of scale, production moves from his-cost producer to low-cost producer within the trading block. And, of course, consumers in all member countries benefit. On the other hand, the conventional trade diversion effect alludes to a negative impact where production moves from low-cost producer outside the trading block to the high-cost producer within the trading block. However, the traditional trade diversion effect ignores sustainability issues. It is wise to import corn from a neighbouring country than from the US, for transporting corn halfway across the world creates large carbon footprint and ozone depletion harmful to the world. Importantly, the cost of this damage does not get included in the private books of account.

Similarly, being a country of continental proportions, it may not necessarily make sense to send Indian ginger all the way from India's North-Eastern states to down south in the Indian state of Tamil Nadu, for it creates more carbon footprint than simply trading that same ginger across the border from India's North-Eastern states to neighbouring countries. The cost of carbon footprint is a negative externality on the global village (Wakeland et al, 2011). Being 'Vocal for Local' within BIMSTEC makes sense. Preferential no or lower customs duties on member countries can be justified on the basis of negative externalities in trading with distant lands. Of course, this argument pre-supposes excellent connectivity among the BIMSTEC countries. While some road infrastructure projects have been undertaken, they could be expanded much more. In the recent past, the kilometres-per-day frequency of road infrastructure has substantially gone up in India, thanks to the active role played by the road transport and highways ministry. Such initiatives could be replicated on either side of the border areas among neighbouring BIMSTEC countries.

And then there are other important trade related issues that BIMSTEC can take up via-a-vis developed countries. For example, fisheries trade is an important component for the littoral countries of this grouping. In the proposed WTO Agreement on Fisheries Subsidies, which will be taken up in the 12th ministerial conference (MC12), BIMSTEC will have to be vocal about the elimination of subsidies which developed

countries give for fishing in the high seas beyond 200 nautical miles of exclusive economic zone (EEZ) (Grynberg, 2003). Such subsidised unbridled fishing negatively impacts the environment and sustainability of the global commons. On the other hand, BIMSTEC littoral countries may protect the subsidies on boats and fuel given for fishing in the territorial waters (within 12 nautical miles from the shore) and up to the EEZ limits. Moreover, in the light of the COVID pandemic, a waiver on the intellectual property rights (IPR) over vaccines must be sought. Such a waiver would help India in extending the vaccine supply to BIMSTEC countries at a very affordable rate. The waiver is justified on the economic principle of positive externalities it causes not only among BIMSTEC countries but the world as a whole. Such a waiver may set a precedent for food and agriculture-related animal and plant health issues. With more than 50 per cent of the population in the country grouping depending on the food and agriculture sector, rural and agricultural households in BIMSTEC countries would directly benefit from such a waiver.

III. Food Processing and Regional Value Chain

For many decades, the twin deficit of the inability of ensuring remunerative prices for farmers on the one hand, and inability of providing large quality volumes of agricultural produce to food processors on the other has been a vexing issue (Acharya, 1997; Bhardwaj, 2023) . For long, the value chain in food and agriculture is characterised by cascading effects of layers of trader margins. This needs to be replaced by value addition services. Ironically, the impediment has been that the government-controlled market-yards are characterised by the monopsony of a few licenced traders and the inability of the government, and justifiably so, to finance, procure, and store all the agricultural produce at its announced minimum support prices (MSP). To remove these anomalies, the government of India rightfully ended the limit on stockholding of agricultural produce by processors, allowed farmers to sell produce anywhere in the country, and facilitated contract farming. While these measures were already implemented in a few states, the central government had to claw-back these reforms due to "farmer" protests. This episode has been a classic case of the government getting the science of reform right but missing on the art of introducing such reforms. There is a lesson to be learned by all the member countries of BIMSTEC when they engage in such reforms. Due consideration must be given to the political economy of

the food and agricultural sector – The government must be seen initiating a consultative process and bringing reforms in staggered manner- first to cash crops like jute, cotton, and sugarcane, followed by horticultural products, and finally to food grains.

MSP and agricultural input subsidies have also led to an imbalance in cropping patterns away from pulses and oilseeds and have had an unsustainable impact on the environment in terms of an increase in the salinity of soils, lowering of the water table, and air pollution. While BIMSTEC countries may continue to argue at the WTO forum for continuing the aggregate measure of support (AMS), which may exceed 10 per cent of agricultural GDP, this is not fiscally sustainable in the long run. If the destitute farmers are to be helped, the better way would be to introduce direct benefit transfers (DBT) instead of subsidies and MSP. India has already initiated this process and will be strengthening it further. India's experience should come in handy to other BIMSTEC countries.

Developing countries have always been caught up with catching-up with the emerging technologies in the developed world. In this context, two of the technologies BIMSTEC countries may want to proactively pursue. As is commonly known, as the population of the developing countries grows, land ownership gets sub-divided with every passing generation. For example, for almost 80 per cent of Indian farm households, the average land holding is barely 1 hector and it will go down further as the population grows. The same would be the case with other BIMSTEC countries. To increase productivity, vertical farming technology will turn out to be a boon, where multiple-layer farming is possible on a given piece of land. Hydroponics and aeroponics can be effectively employed to grow leafy vegetables, some of the short horticultural crops, and spices. Drip and sprinkle irrigation should become the norm for the rest of the crops substituting flood irrigation. This will help increase productivity as well as conserve water and maintain soil health. Indian firms such as Jain Irrigation have made forays in this field and their model can be replicated both in India and in BIMSTEC region.

An important source of environmental degradation which will hit BITSTEC countries in future is the consumption of meat. As per capita incomes in developing countries will grow, consumption of meat is bound to grow. However, this will come at a price. It has been

established that ruminating livestock creates methane gas emissions. Further, a kilogram of protein coming from a meat source requires more than 1000 times as much water as is required for a kilogram of protein coming from pulses and other plant-based sources of protein. Water contamination is also an important element of the excessive water usage for meat production. Moreover, the deforesting of lands is increasing as more and more lands are being used for the production of animal feed such as soymeal. To address this issue, the developed world is focusing on processed alternatives to meat that are either plant-based or lab-grown. A cooperative effort among the BIMSTEC countries on research and development of alternate meats will help the population reduce the frequency of meat consumption and offer a double help – sustainability of the planet as well as healthy protein choices for the consumers.

IV. Food Security and Food Quality

Developing countries have suffered for long from a unique Trilemma of hunger among the destitute, malnutrition due to imbalance in food intake among the haves, and obesity among the well-to-do. While the problem of hunger has mostly been taken care of after the onset of the green revolution, the absolute size of the destitute in countries like India is very large (Buttel, 2000; Popkin et al, 2012). For several decades, a public distribution system for food grains has been in place in India. Named as fair price shops or ration shops, these have been offering food grains at subsidised prices. However, pulses, which are an important source of protein have never been offloaded in these shops. One of the reasons for this is the lopsided growth in the production of food grains which have been supported by MSP. To diversify the food intake, especially of protein, MSP may be offered to pulses and they should be made available in ration shops for the destitute. MSP for pulses is justified on the basis of economic principles– pulses are water-conserving crops, they have soil nitrogen fixing properties, and are an essential source of protein much needed for a balanced nutritive diet. Moreover, as mentioned earlier, if plant-based meat substitutes are to be produced, pulses will be an essential component of such products. All in all, subsidy or MSP on pulses is justified on the grounds of environmental safeguards and sustainability.

Nutrition and safety are the two important characteristics of food quality. On the issue of malnutrition and the provision of balanced nutrition to the poor, the Indian government has initiated mid-day meal

(MDM) scheme. It addresses issues of hunger, nutritional food, and incentives to go to school among children of poor households. While the developed countries have food stamps programmes and current policy options consider direct benefit transfer (TBT), in the context of nutritional supplements, the MDM scheme seems to be the best option to deliver nutrition to the children of poor families. Experience of BIMSTEC countries such as Thailand will be of use to other member countries. Thailand has been fortifying wheat flour, noodle seasonings, and soy sauce with nutrients such as iron, folic acid, and vitamin A for many decades and her experience will be quite useful in fortifying ethnic foods in other member countries. While such measures will help the poor, there is also a need to educate the middle class and the affluent class on the dangers of overindulgence. In this context, strengthening labelling requirements on nutritional content will be very useful. Currently, member countries, including India mandate nutrition information per 100 gm of serving size on a food packet. However, labelling information may further be sharpened by mandating a percentage of the recommended daily requirement (% RDA) on food products.

While the emergence and application of modern chemical inputs have increased the productivity of agricultural produce, the attendant safety problem arising out of chemical residues has assumed paramount concern now. In this context, harmonisation of standards for chemical residues among BIMSTEC countries on agricultural and food products assumes importance. Such harmonisation of standards is critical to avoid non-tariff barriers to trade among the member countries in general and the safety of farmers and consumers in particular. Experience of member countries at the WTO forum on SPS and TBT agreements and formulating standards at the Codex Alimentarius Commission (CAC) should come in handy to harmonise standards at the BIMSTEC level (Thorstensen & Costa Vieiria, 2019). Of course, biological and physical hazards are also a concern, and BIMSTEC countries may arrange for training programmes, good manufacturing practices (GMPs) and Hazard Analysis and Critical Control Points (HACCP) for the labour force involved in primary and secondary food processing.

Chemical fertilisers and pesticides intensive agriculture and their chemical residues have had disturbing consequences on farmers and consumers. This was particularly noticeable in the granary states of

India – Punjab and Haryana. In the last decade, an overnight train running from Bhatinda in Punjab to Bikaner in Rajasthan was famously called the cancer train. Most of the passengers have been poor cotton farmers and their relatives are going to a hospital in Bikaner for cancer treatment. The travesty of the situation is that while cancer patients get 100 per cent subsidy on train tickets, passengers accompanying them get 70 per cent subsidy. Major factor behind this cancer train is the unregulated use of fertilisers and pesticides. Cancer train is only one of the signals of a countrywide phenomenon. The message is not lost on scientists and farmers. Two competing approaches are being considered to counter this menace. If technology-led genetically modified (GM) crops are being considered as a substitute which requires minimal or no use of pesticides, many are also vouching for organic and natural farming techniques, which give good returns in the long run, ensuring carbon sequestering and environmentally sustainable use of land.

On the GM technology front, BT-cotton has substantially replaced the non-GM cotton varieties worldwide, including in India (Herring, 2014). However, countries like India are resisting introduction of GM food crops. BT Brinjal has been already adopted in Bangladesh for little less than a decade now, and reports are that Indian farmers may have used the variety through informal channels (Kumar et al, 2011). It will be important to learn from the experience of Bangladesh in introducing GM food crops, for there are many eligible other food crops on which research and trials have already been done and scientists are waiting to get a green signal for introducing them. Whether GM or organic and natural farming, BIMSTEC countries may have to institute focused medium to long-term research and cooperation on the adoption of specific agricultural commodities which are most suitable for safe and sustainable agricultural development. The two approaches need not compete but complement each other on a case-by-case basis. As an extension activity, BIMSTEC countries can promote awareness of the two approaches.

Finally, an important aspect of the production, supply, trade, and quality of food products that has been overlooked by many developing countries is the timely availability of weather information to farmers and processors. In a country of continental proportions like India, from Aastha to Zee, there are not only 26 but hundreds of round-the-clock television channels for news and entertainment, and still, not a single dedicated channel is available for weather forecasts. Whether a cyclone,

storm, untimely rain, or draught, the Bay of Bengal littoral countries have a common cause of concern. Farmers' and food processors' decisions regarding sequencing of sowing, farm operations, harvesting, and, importantly, proper warehousing and delivery depend upon timely weather information. Therefore, a pure public good can be created by BIMSTEC in the form of a 24-hour weather channel with a viewer-friendly animation forecast with the backdrop display of BIMSTEC map. Countries like India have the wherewithal of scientific forecasting in institutions such as ISRO, C-DAC, and IMD. This knowledge can be married to the commercial delivery mechanism of media channels to come up with a PPP model to develop such a weather channel. Advertisements of agribusiness firms could partly finance such an effort. BIMSTEC owes this service to the farmers and food processors.

V. Concluding Remarks

RIS and IFPRI- led initiatives for the food and agricultural sector of BIMSTEC countries is very commendable. Time is opportune for BIMSTEC countries, especially when multilateral WTO negotiations are sluggish in general and standstill on food and agricultural issues in particular. If a few millennia ago, Kautilya talked about the sustainable use of natural resources, the same has been emphasised by modern economists by comparing the world economy to a ringed-doughnut. We neither want to escape out of the ring into planetary degradation nor want to slip from the ring into the hole of human deprivation. Alongside, the political economy aspects of the regional grouping cannot be overlooked as well. In this overall context, the focus of BIMSTEC on the role of the food and agricultural sector is extremely important – both from the environmental sustainability point of view and from the welfare enhancement perspective of farmers, processors, and consumers.

RIS-IFPRI has carved out three key technical sessions in the BIMSTEC webinar – namely, Promoting Trade in Agriculture in BIMSTEC, Prospects of Food Processing and Regional Value Chain in BIMSTEC, and Food Security and Safety Issues in Agriculture. Panel discussions by experts in these sub-categories would pave the way for sharper cooperation among the BIMSTEC countries for their mutual benefit. It is hoped that the webinar would lead to specific projects to be undertaken by food and agricultural scientists, economists, and technocrats, which would be of mutual interest to BIMSTEC countries.

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4

Prospects of Facilitating Trade of Processed Food and Agricultural Products in BIMSTEC Region

Sushil Kumar Saxena

I. Introduction

National Food Control Systems (NFCS) in developing and least developing countries are weak, fragmented, and not effective to protect consumers' health and ensure fair trade practices or help countries competing for export markets (Jaffee & Henson, 2004). Improving food safety and ensuring its compliance often costs much (requires more resources) and particularly least developed countries experience real challenge to demonstrate compliance with food safety legislations. Mandate of NFCS of a country also includes to ensure that the food and agriculture products, which are imported are in compliance with the standards and regulations of the said country and similarly, if any food and agricultural products exported from the country are in conformity with the standards and regulations of importing country.

The Codex has undertaken a significant initiative by formulating the Principles and Guidelines for National Food Control Systems, encapsulated in CAC/GL 82-2013. This framework is designed to guide national governments and their competent authorities in the establishment and maintenance of effective National Food Control Systems (NFCS). At its core, these principles are crafted to address the multifaceted challenges associated with ensuring the safety and quality

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of food products while fostering fair trade practices on a global scale. National governments are encouraged to incorporate mechanisms allowing for timely modifications, ensuring that these systems remain responsive to evolving risks, technological advancements, and changing global food safety standards. Below is the list of principles designed by NFCS to safeguard public health and promote integrity within the food trade:

Availability of resources at the national level (such as analytical capability, conformity assessment infrastructure and relevant resources) will influence the design of national food control systems; therefore, no two systems are identical. However, whatever the building of the national food control system, measuring its effectiveness is absolutely important to verify that resources are being optimal-used and consumers' health and economic interests are protected. Being able to demonstrate performance can also be very important to inform plans for further improvement and strengthening of the system and to access new markets and improve trade.

Present status of national food control systems of member countries of BIMSTEC region is briefly described in the following Table 1:

Table 1: Status of National Food Control Systems of BIMSTECH Member Countries

Sl. No.	Member Country	Brief of NFCS	Remarks
1	Bangladesh	The Bangladesh Food Safety Authority (BFSA) was established in 2015 under the Ministry of Food as a result of Bangladesh's 2013 Food Safety Act. The food safety system and the regulatory framework in the country are still in their infancy. The new food safety authority is building the necessary systems.	Consisting of single agency and under developing stage
2	Bhutan	Bhutan Agriculture and Food Regulatory Authority (BAFRA) under the Ministry of Agriculture and Forest (MoAF) is designated as the National Food Control Authority in the country. Food safety in Bhutan is governed by the Food Act (2005) and the Food Rules & Regulations (2017). In the absence of comprehensive national food standards, these food legislations empower BAFRA to follow the Codex standards and guidelines for regulation of food safety in the country.	Consisting of single agency and under developing stage

Table 1 continued...

Table 1 continued...

3	India	There are primarily three facets of the national food control system imports, exports and domestic. In India, domestic and import food trade is covered under Food Safety Standards Act (2008) regulated by Food safety Authority of India (FSSAI) and export trade is covered primarily under the Export (Quality Control and Inspection) Act (1963) regulated by Export Inspection Council of India (EIC).	Consisting multiple agencies and well developed
4	Myanmar	The Food and Drug Administration (FDA) one of the divisions under the Department of Health is mandated to ensure the safety and quality of Food including Drugs, Medical Devices and Cosmetics in the country. Under FDA, Food Control division and Laboratory division control activities of consumer safety and fair-trade practices.	Consisting of single agency and at infancy stage
5	Nepal	Department of Food Technology and Quality Control (DFTQC) under the Ministry of Agriculture and Livestock's Development mandated by Government of Nepal, as the apex organization responsible for the enforcement of Food Act and Regulations for the international trade of food and agricultural products.	Consisting of single agency and under developing stage

Table 1 continued...

Table 1 continued...

6	Sri Lanka	The national food control system relies heavily on end-product testing using a network of inspectors in the country. The system needs much input in quantity and quality to keep up with global trends in food safety. The food regulatory and enforcement system in Sri Lanka operates through a primary Food Act operated by the Ministry of Health with guidance of a Food Advisory Committee representing most sectors of the food industry in the public and private sectors.	Consisting of single agency and under developing stage
7	Thailand	In Thailand, it is shared responsibility. The Food Act of B.E.2522 is the major law aimed at protecting and preventing consumers from health hazards occurring from food consumption. According to the Food Act, the Ministry of Public Health is designated to be in charge of the execution of this act. The act also empowered the Ministry of Public Health to promulgate ministerial regulations, to appoint the Food Committee and competent officers, and to set up other activities in order to carry out the provisions of the Act. The Food Committee functions as an advisory board to the Minister or the competent officers on the matters related food control administration.	It is a shared responsibility and consisting of multiple agencies and developed

Source: Author's compilation.

From the above, it is evident that NFCS of member countries are at different stages and vary in their technical competence and capacity. The NFCS of least developing countries need resources and handholding to strengthen them as per international standards.

II. Potential for Processed Food and Agricultural Products Trade

Trade analysis of BIMSTECH member countries is attempted in the following Tables. It is evident that potential exists to further enhance the trade, including Processed Food and Agriculture Products in the region. Export/Import data of a member country versus other member countries of BIMSTEC for the financial year 2019-20 and 2020-21 and its respective growth is mentioned. Trade data is sourced from https://www.trademap.org/Bilateral_TS.aspx and figures are in USD Million.

Table 2.1: Trade Analysis of Bangladesh with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bhutan	8.50	5.00	82.00	53.00	-41.18%	-35.37%
2	India	1264.74	1091.66	8200.75	9691.56	-13.69%	18.18%
3	Myanmar	31.00	48.00	66.00	64.00	54.84%	-3.03%
4	Nepal	52.00	0.00	11.00	3.20	-100.00%	-70.91%
5	Sri Lanka	40.00	47.00	163.00	160.00	17.50%	-1.84%
6	Thailand	50.82	80.74	859.23	987.16	58.87%	14.89%
	BIMSTEC Total	1447.06	1272.40	9381.98	10958.92	-12.07%	16.81%
	Total	47632.00	42392.00	58004.00	48749.00	-11.00%	-15.96%
	% Share of Bangladesh	3.0380	3.0015	16.1747	22.4803	-1.20%	38.98%

Source: ITC Trademaps.

Table 2.2: Trade Analysis of Bhutan with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	82.00	53.00	8.50	5.00	-35.37%	-41.18%
2	India	317.00	215.00	760.00	690.00	-32.18%	-9.21%
3	Myanmar	0.00	0.00	0.00	0.00	0.00%	0.00%
4	Nepal	5.70	4.80	2.93	0.53	-15.79%	-81.91%
5	Sri Lanka	0.00	0.00	0.87	0.00	0.00%	-100.00%
6	Thailand	0.40	0.08	13.00	17.00	-80.00%	30.77%
	BIMSTEC Total	405.10	272.88	785.30	712.53	-32.64%	-9.27%
	Total	563.00	650.00	931.00	898.00	15.45%	-3.54%
	% Share of Bhutan	71.9538	41.9815	84.3502	79.3463	-41.65%	-5.93%

Source: ITC Trademaps.

Table 2.3: Trade Analysis of India with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	8,200.75	9,691.56	1,264.74	1,091.66	18.18%	-13.69%
2	Bhutan	738.60	701.02	405.73	433.00	-5.09%	6.72%
3	Myanmar	973.89	772.56	547.25	526.79	-20.67%	-3.74%
4	Nepal	7,160.35	6,838.46	711.61	673.16	-4.50%	-5.40%
5	Sri Lanka	3,800.91	3,498.23	903.69	642.94	-7.96%	-28.85%
6	Thailand	4,299.30	4,237.59	6,788.38	5,682.27	-1.44%	-16.29%
	BIMSTEC Total	25,173.80	25,739.42	10,621.40	9,049.82	2.25%	-14.80%
	Total	3,13,361.04	2,91,808.48	4,74,709.27	3,94,435.87	-6.88%	-16.91%
	% Share of India	8.0335	8.8207	2.2375	2.2944	9.80%	2.54%

Source: ITC Trademaps.

Table 2.4: Trade Analysis of Myanmar with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	66.00	64.00	31.00	48.00	-3.03%	54.84%
2	Bhutan	0.00	0.00	0.00	0.00	0.00%	0.00%
3	India	630.00	690.00	702.00	682.00	9.52%	-2.85%
4	Nepal	9.24	12.89	0.00	0.05	39.50%	4800.00%
5	Sri Lanka	33.15	5.91	3.04	1.36	-82.17%	-55.26%
6	Thailand	3256.00	3008.00	2195.00	1926.00	-7.62%	-12.26%
	BIMSTEC Total	3994.39	3780.80	2931.04	2657.41	-5.35%	-9.34%
	Total	18100.00	16920.00	18610.00	17960.00	-6.52%	-3.49%
	% Share of Myanmar	22.0685	22.3452	15.7498	14.7963	1.25%	-6.05%

Source: ITC Trademaps.

Table 2.5: Trade Analysis of Nepal with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	11.00	3.20	52.00	0.00	-70.91%	-100.00%
2	Bhutan	1.90	5.00	12.00	4.80	163.16%	-60.00%
3	India	525.00	557.00	7777.00	6838.46	6.10%	-12.07%
4	Myanmar	0.62	0.35	24.00	12.89	-43.55%	-46.29%
5	Sri Lanka	0.08	0.07	2.50	5.60	-15.66%	124.00%
6	Thailand	0.50	0.50	110.00	102.15	0.00%	-7.14%
	BIMSTEC Total	539.10	566.12	7977.50	6963.90	5.01%	-12.71%
	Total	959.00	888.00	12325.00	8038.00	-7.40%	-34.78%
	% Share of Nepal	56.2151	63.7523	64.7262	86.6372	13.41%	33.85%

Source: ITC Trademaps.

Table 2.6: Trade Analysis of Sri Lanka with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	163.00	160.00	40.00	47.00	-1.84%	17.50%
2	Bhutan	0.00	0.38	0.00	0.00	0.00%	0.00%
3	India	774.00	654.00	3830.00	3006.00	-15.50%	-21.51%
4	Myanmar	7.90	8.90	51.00	23.00	12.66%	-54.90%
5	Nepal	8.90	5.60	0.08	0.08	-37.08%	9.09%
6	Thailand	98.00	40.00	437.00	366.00	-59.18%	-16.25%
	BIMSTEC Total	1051.80	868.88	4358.08	3442.08	-17.39%	-21.02%
	Total	11974.00	10706.00	19474.00	15607.00	-10.59%	-19.86%
	% Share of Sri Lanka	8.7840	8.1158	22.3790	22.0547	-7.61%	-1.45%

Source: ITC Trademaps.

Table 2.7: Trade Analysis of Thailand with Other Member Countries

S. No.	Country	Export 2019-2020	Export 2020-2021	Import 2019-2020	Import 2020-2021	% Export Growth	% Import Growth
1	Bangladesh	859.23	987.16	50.82	80.74	14.89%	58.87%
2	Bhutan	42.89	50.95	0.14	0.05	18.79%	-66.43%
3	India	5504.06	7340.31	4291.58	4807.37	33.36%	12.02%
4	Myanmar	3798.78	4362.94	2795.97	3246.00	14.85%	16.10%
5	Nepal	40.87	102.15	0.53	0.55	149.94%	3.77%
6	Sri Lanka	302.72	376.15	72.72	78.99	24.26%	8.62%
	BIMSTEC Total	10548.55	13219.66	7211.76	8213.70	25.32%	13.89%
	Total	231634.11	246268.80	206156.38	236259.87	6.32%	14.60%
	% Share of Thailand	4.5540	5.3680	3.4982	3.4766	17.87%	-0.62%

Source: ITC Trademaps.

From the above trade data analysis of FY 2019-20 versus FY 2020-21, the growth of export/import in absolute terms indicates the following:

- It is observed that Bangladesh has negative growth in exports and positive growth in imports, having increased by 17 per cent in the region.
- Bhutan, Myanmar and Sri Lanka have negative growth in both exports and imports.
- India and Nepal indicate positive growth in exports, having increased by 2.25 per cent and 5 per cent, respectively and negative growth in imports.
- Thailand shows positive growth in both exports and in imports, having increased by 25 per cent and 14 per cent, respectively.

It is apparent that there is potential to further enhance the trade between the BIMSTEC member countries. Hence, efforts should be made to remove the identified bottlenecks by way of mutual cooperation.

III. Concerns of Regulatory Compliance of National Food Control Systems

One of the important principles of National Food Control Systems' indicating the primary role is to ensure consumer safety and fair-trade practices. The same objectives are also mandated by WTO and its two agreements, namely SPS and TBT, including by other international standards such as Codex, OIE and IPPC(FAO, 2017). Food regulations are based on domestic law and practice. However, they also operate within an international framework of rules and agreements.

Food control is a mandatory and regulatory activity of enforcement by national or local authorities to provide consumer protection and ensure that all foods during production, handling, storage, processing, and distribution are safe, wholesome and fit for human consumption and also conform to safety and quality requirements as well as, are honestly and accurately labelled as prescribed by law.

With an expanding world economy, liberalisation of food trade, growing consumer demand, developments in food science and technology, and improvements in transport and communication, international trade in fresh and processed food will continue to increase. Access of countries to food export markets will continue to depend on their capacity to meet the regulatory requirements of importing countries. Creating and sustaining demand for their food products in world markets relies on building the trust and confidence of importers and consumers in the integrity of their food systems.

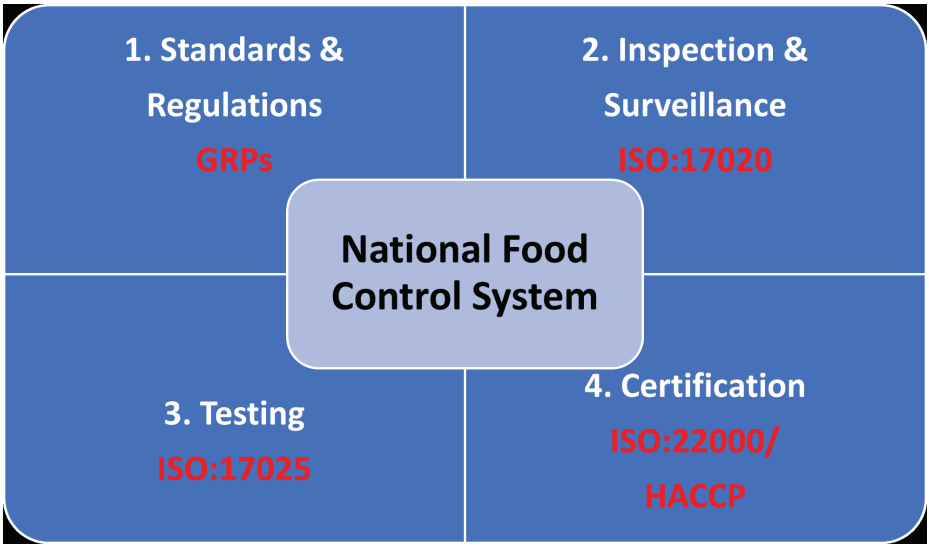
With regard to consumer safety, the concerns of National Food Control Systems are ever increasing. They need to ensure compliance with national, regional and international standards and regulations with regard to quality, safety, traceability, food fraud, authenticity and origin of the country. More and more stringent standards are laid down by regional and international agencies and being adopted by the member countries. There is a wide range of different standards and regulations in the food and agriculture sector, like hygienic standards, sanitary and phytosanitary standards, or maximum levels related to the content of aflatoxin, pesticides, contaminants or antibiotics etc. With regards to residues of pesticides and antibiotics, the levels are fixed at the default MRL/MRPL level, which is as low as detection limit of a sophisticated analytical instrument, which is always the challenge for the food testing capability of a national Food Control System.

IV. Cost of Regulatory Compliance

Cost of regulatory compliance applies to all the expenses of product conformity assessment with respect to standards and regulation for trade by the competent authority designated by a national food control system**.** It consists of four important pillars namely:

- Standards and Regulations
- Inspection and Surveillance
- Analytical capabilities and Conformity Assessments
- Certification for Compliance

The above pillars must be strong and should comply with applicable national, regional and international standards for smooth trade. Analytical capabilities is the backbone of a national food control system, as decisions for conformity or non-conformity of a product is always based on analytical results. The cost of regulatory compliance for export/ import of a product is always higher by a competent authority without any mutual bilateral/multilateral recognistion with trade partner/ partners. It is learnt that a particular product is exported to different countries, their standards and regulations may not be the same, and accordingly, the cost of compliance may also vary. It is also understood that if an exporting country has bilateral and multilateral recognition, the cost of regulatory compliance reduces accordingly as the systems of one competent authority is recognised by other competent authority.



V. System Recognition Approach

Mutual recognition and acceptance of the Inspection and Certification System of a competent authority/regulatory authority of the exporting country by the importing country and vice versa is a good and effective pre-border risk management option to facilitate trade. It is well recognised. and an accepted good practice. In this regard, Codex has also developed guidelines for the member countries to facilitate trade. As per Codex guidelines (CAC/GL 20-1995), member Countries should recognise that different inspection/certification systems may be capable of meeting the same objective and are therefore equivalent (Boutrif, 2003) . Similarly, Codex guidelines (CAC/GL 34-1999) elucidated that equivalence agreements are not generally intended as a condition for trade but rather as a means for ensuring that importing country requirements are met with minimal trade impediments. Codex guidelines (CAC/GL 53-2003) state that an importing country should recognise that sanitary measures different from its own may be capable of achieving its appropriate level of protection (ALOP) and can therefore, be found to be equivalent.

The significant benefits of the System Recognition Approach for facilitating the trade are stated below:

- It serves as an enhanced means of assuring that exported products conform to importing country's standards, regulations and other requirements.

- It eliminates duplication of activities (such as inspection and testing) and use of collective resources more efficiently and effectively.
- It reduces transaction costs to trade and the time taken for clearing a consignment.
- It is an established mechanism for the cooperation and exchange of expertise, assistance and information to help and assure the enhanced conformity with requirements.

VI. Equivalence in WTO

As per article 4 of Equivalence under the agreement on Sanitary and Phytosanitary Measures of WTO (WTO, 2017). underlined that members shall accept the SPS measures of other members as equivalent, even if these measures differ from their own or from those used by other members trading in the same product if the exporting member objectively demonstrates to the importing member that its measures achieve the importing member's appropriate level of sanitary or phytosanitary protection. It is further stressed that members shall, upon request, enter into consultations with the aim of achieving bilateral and multilateral agreements on recognition of the equivalence of specified sanitary or phytosanitary measures. The TBT Agreement of WTO requires that technical regulations on traditional quality factors, fraudulent practices, packaging, labelling, etc imposed by countries will not be more restrictive on imported products than they are on products produced domestically (WTO, 2017).. It also encourages the use of international standards.

VII. Success Stories and Future Roadmap for BIMSTEC

A few success stories are briefly stated below to illustrate that how the mutual recognition by competent authorities plays a crucial role in trade facilitation and reducing the compliance costs, as well as leading it to a win-win situation for respective countries.

India and Bhutan

Bhutan imports approximately 80 per cent share of its food and Agri products from India due to various reasons. There were bottlenecks in a speedy clearing of the import consignments from India. It was mainly due to a lack of analytical capabilities at BAFRA (Tobgay, 2007). Samples were sent for testing to nearby countries to ensure compliance with the

standards and regulations of BAFRA, which was a costly affair and time-consuming. In this background, BAFRA and EIC discussed to remove such bottlenecks and decided to conclude an understanding between the two countries to facilitate the trade.

An Agreement was signed between Export Inspection Council (EIC), Ministry of Commerce and Industry, Government of India (a competent authority and integral part of National Food Control System of India) and the Bhutan Agriculture and Food Regulatory Authority (BAFRA), Ministry of Agriculture and Forest, Royal Government of Bhutan in September 2013 to certify the food and Agri products export from India to Bhutan through recognition of equivalence of export inspection and certification system of EIC(Ministry of Commerce and Industry, 2024). The outcome is that in the year 2018-19, Bhutan imported Food, Agricultural and allied commodities from India worth US $ 74.04 million, which was approximately 14 per cent higher than the previous year.

Thailand and India:

In the year 2012, the Food and Drug Administration, the Ministry of public health, Kingdom of Thailand recognised the certification of Export Inspection Council (an official export certification body), Ministry of Commerce and Industry, and Government of India for food importation from India to Thailand and scope of certification shall comply with the relevant requirements of Thai Food and Drug Administration (Jha, 2013). This recognition is facilitating the export of food and Agri products from India to Thailand and reducing the cost and time.

India and Sri Lanka

Similarly, an Agreement for recognition of Export Inspection and certification system of Export Inspection Council of India for Import Inspection Scheme of Sri Lanka Standards Institution was signed in 2002 (EIC, 2023). This recognition is facilitating the export of goods including food and Agri products, from India to Sri Lanka and reducing the cost and time.

From the above, it is obvious that member countries of BIMSTEC should make efforts and play a significant role in trade facilitation for inclusive growth of trade in the region. Therefore, BIMSTECH should establish a Mutual Technical Cooperation Agreement (MTCA) to mutually accept the export certifications system of individual NFCS.

Hands should also be joined to promote capability building initiatives in strengthening NFCS and conformity assessment infrastructure in BIMSTEC, meeting the relevant international standards.

The main elements of the agreement should cover:

- Recognising and maintaining equivalence of export inspection and certification systems of member countries with import inspection and certification systems by other member countries.
- Member countries shall ensure that Food and Agricultural Products exported to other member countries are safe and wholesome and conforming to the standards and regulations of the importing member countries.
- Member countries shall immediately take appropriate remedial action, whenever any non-compliance is reported by an importing member country to avoid reoccurrence of such non-compliance in future.
- Member Countries shall extend cooperation in capacity building and training, whenever required by other member countries.
- Member countries shall cooperate and communicate to the fullest practicable extent their importing requirements as well as any changes, which shall include, but not be limited to relevant legislations, regulations, policies and procedures concerning enforcement.

The above will certainly help in facilitating the trade of processed food and agricultural products in the BIMSTEC region.

VIII. Conclusion

In conclusion, the prospects of facilitating trade of processed food and agricultural products in the BIMSTEC region hold immense potential for economic growth, regional cooperation, and food security. As the member countries continue to strengthen their ties and collaborate on trade-related policies, there is an opportunity to create a more robust and integrated market for processed food and agricultural goods.

The diverse agricultural landscapes and rich culinary traditions within the BIMSTEC nations provide a solid foundation for a thriving trade ecosystem. By leveraging each country's comparative advantages and focusing on value addition in the food processing sector, the region can foster innovation and create a competitive edge in the global market.

Addressing challenges such as non-tariff barriers, harmonizing standards, and enhancing infrastructure will be crucial to realizing the full potential of intra-regional trade. The successful experiences of BIMSTEC countries to foster trade facilitation highlight the immense collaborative potential that this region is yet to unleash in the agrarian sector.

The BIMSTEC region, with its strategic location and economic diversity, has the capacity to emerge as a major player in the global agri-food trade. As the member nations continue to deepen their economic integration and streamline trade facilitation measures, the collective effort will not only boost the prosperity of individual nations but also contribute to the overall development and resilience of the BIMSTEC community. The shared commitment to promoting trade in processed food and agricultural products paves the way for a brighter, more interconnected future for the region.

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5

Food Security and Food Safety in Bangladesh: Way Forward

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I. Introduction

As being located in a region of South Asia, Bangladesh became founder member of a regional economic bloc named 'BIST-EC' comprising of Bangladesh, India, Sri Lanka and Thailand. Afterwards 'BIST-EC' was renamed as the Bay of Bengal initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). As a BIMSTEC member, Bangladesh's economic growth is praiseworthy compared to other member countries. For the last couple of decades, Bangladesh has been showing its capacity to generate employment to a great extent. Soon after being free from Pakistani occupation, war-ravaged country, Bangladesh was unable to feed the people with then stock food grains. The then government began moving worldwide in seeking food support along with aid to run the war-torn economy. Bangladesh's birth in 1971 came through a huge food deficit. Post-independence Bangladesh in the 1970s faced severe food shortages and was a net importer of rice

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until the late nineties (Ahmad *et al*., 2014). Between 1975 and 1977, more than 1.3 million metric tons of food grains came into Bangladesh as food aid, which was more than 85 per cent of the total inflow of food grain (Hossain *et al*., 2005) Food aid has played an important role in meeting the domestic food demand. In the early years after independence, the country faced major food deficits, most of which were taken care of through grain imports from the United States under the PL 480 program. Between 1975 and 1977, more than 1.3 million metric tons of food grains came into Bangladesh as food aid, which was more than 85 per cent of the total inflow of food grain. Since Bangladesh's liberation in 1971, the government has been trying hard to control the population growth and triumph over food insecurity (Roy *et al*., 2018). With the introduction of high-yielding dry season irrigated Boro rice, Bangladesh has recently achieved rice self-sufficiency, with about a three-fold production increase during the last four decades (Ahmad *et al*., 2014). A quarter of the population of Bangladesh is food insecure. Bangladesh is ranked 68th out of 79 countries in the 2012 (Hasan *et al*., 2018). After independence, Bangladesh experienced a devastating famine in 1974 and the country is still one of the most poverty-stricken societies where hunger, food insecurity, and inequality are common phenomena (Islam, 2012). About 45 per cent of the population was food insecure based on the Household Food Insecurity Access Scale (HFIAS). Increases in domestic production and augmented capacity of the government to import food grains commercially have resulted in the downward trend in food aid in recent years. Presently, this share has come down to less than 35 per cent of total cereal imports with wheat accounting for 98 per cent of the total food aid (Mahabub *et al*., 2005). Amidst unfavorable global supports, Bangladesh was able to overcome the challenges with its prudent agricultural policies. After fifty years of independence, Bangladesh is in better position in terms of food availability. Despite having food availability in Bangladesh, it's close to seventeen crore population are in fear of getting safe food. The contribution of the agriculture sector to the country's GDP is obviously significant. With nearly 15 per cent contribution to GDP, the agricultural sector is being observed to move ahead with employing more than 41 per cent people of the total workforce. It is worth mentioning that the sector has been playing a pivotal role for a long in respect to providing a living standard for people living in rural areas.

Food security encompasses three elements: availability, accessibility and utilisation (Begum *et al*., 2013). Agriculture is the prime economic activity in Bangladesh, but global warming is expected to severely reduce the yield of various crops, including wheat and rice, directly affecting the food security of 170 million people. Even though Bangladesh has achieved significant progress in agriculture, especially with respect to rice production and yield, the demand for rice still outstrips domestic production, and the country remains a net importer of rice (Hossain *et al*., 2005). For both rural and urban areas, the total consumption of food declined in 2010. The total intake was about 11 per cent and 15 per cent lower in rural and urban areas, respectively, and for the national level, it was 12 per cent lower than the minimum requirement. In 1995-1997, both the calorie and protein intake had decreased, but in 2003-2005, it increased, an upward trend for dietary fat consumption between 1969-1971 and 2003-2005 (Begum *et al*., 2013). The annual rice production is estimated to be 26.53 million tonnes, while fish production is 2.32 million tonnes (Ahmed, *et al*., 2009). The productivity of rice and wheat grows at a rate of 10 per cent or more per decade (Faisal *et al*, 2004). Bangladesh experienced famine in 1974 due to a) the destruction of infrastructure during the civil war with Pakistan in 1971 and b) consecutive natural disasters leading to a substantial reduction in rice production. In view of that experience, for long periods, food security was synonymous with achieving self-sufficiency in rice production and stabilisation in rice prices (Dorosh et al, 2004). A doubling of rice production from the mid-1970s to the turn of the last century, improvements in road and communication infrastructures and increased real incomes made possible by general economic development have transformed the Bangladesh food economy. Indeed, Bangladesh passed a major milestone in its efforts to achieve food security at the end of the 1990s, since for the first time in its history, food grain production exceeded target requirements (based on 454 gm/person/day). Yet food security has not been achieved, and whatever progress has been made would be difficult to sustain in view of the growing pressure of the population on extremely scarce natural resources.

Domestic food grain production remains susceptible to floods and droughts, thereby perpetuating the threat of major production shortfalls and inadequate food availability. Moreover, increases in

cereals production have not been accompanied by significant increases unavailability of other foods. Nearly 40 per cent of the population lives below the food consumption-based poverty line, lacking sufficient resources to afford a diet of 2,122 kilocalories (kcal) per person per day, along with other basic necessities. Apart from the prevailing deficit in total calorie intake, the normal diet of Bangladeshi people is seriously imbalanced, with inadequate consumption of fat, oil and protein, and with more than 80 per cent of calories derived from cereals. Women and children are especially vulnerable due to their greater nutritional requirements. This dietary imbalance reflects insufficient domestic production of non-cereal foods (pulses, oilseeds, fruits, meat, milk and eggs), low incomes, food preferences and lack of nutrition education. Moreover, the general health and sanitary environment and caring practices compound the problem of translation of food consumption into nutrients, contributing to poor nutritional outcomes (Mahabub *et al*., 2005). Bangladesh has nearly achieved self-sufficiency in food production (Mannaf and Uddin, 2012), especially in the case of rice. The production of rice (the staple food of Bangladesh) was assumed to have tripled over the last 30 years (Debashis *et al*., 2018). The staple food of most people in Bangladesh is rice and more than 70 per cent of their daily calories comes from rice (Roy *et al*., 2018). Bangladesh has made considerable progress in achieving national food security by increasing annual rice production from 151 kg/capita in 1995 to 217 kg/capita in 2010 (MacKirby *et al*., 2015). It is observed that from 1991-92 towards 1998-99, there was a deficit in rice production, and the deficit ranged from 458 to 2867 thousand metric tons (Rahman *et al*., 2009). Later, the country reached to a marginally self-sufficient in rice production, and it exceeded the country's total requirement of about 1600 to 4000 thousand metric tons (Rahman *et al*., 2009).

Bangladesh has experienced substantial transformation in the demographic, health, and nutritional status of the population since achieving independence in 1971. From a nation of 75 million people struggling to be emancipated from the clutches of subjugation, food insecurity, and profoundly high rates of malnutrition among children and women, the country is now a nation of 165 million people self-sufficient in the staple rice, fish, and vegetables. Malnutrition rates among children and women have decreased significantly over the

past two decades. Micronutrient deficiencies are still present, albeit in substantially reduced proportions. There are several contributing factors that have made this possible. Agricultural production has increased many fold, freshwater fish farming, as well as catch from the ocean have expanded, and the poultry as well as cattle rearing industries have successfully blossomed, providing eggs and milk to the population. Moreover, earnings from the ready-made garments industry and remittance from migrant workers have increased, markedly charging up the economy. Overall, it is the national development over the last couple of decades that has contributed to the huge exemplary impact on nutrition and food security in Bangladesh (Fahim *et al*., 2021).

II. Policy Highlights

In view of the SDGs goals sequence, it can be clearly said that the issue of "eradication of poverty rate" has been accorded the highest priority. Poverty refers to forms of economic, social, and psychological deprivation among people arising from a lack of ownership and control of or access to resources for the attainment of a required minimum level of living. In Bangladesh, three methods are used for poverty line estimation. The methods are the direct calorie intake method (DCI), the food energy intake method (FEI), and the cost of basic needs method (CBN). DCI and CBN methods for estimating the poverty line have gained more popularity in Bangladesh. According to the MDGs report released by the Bangladesh government, Bangladesh saw commendable progress in reducing the significant poverty rate, with the national poverty headcount ratio declining from 56.7 per cent in 1991-92 to 31.5 per cent in 2010. Even though, above 50 per cent poverty rate existed in Bangladesh in 2000. Afterwards, through five-year plan programmes, the poverty rate was reduced. The poverty headcount ratio for 2015 was estimated at 24.8 per cent indicating that Bangladesh is demonstrating its ability in respect of reducing poverty rate, no doubt. Though Bangladesh, in the meantime, achieved its success in the affairs of food security, Bangladesh lags far behind in terms of assuring food safety for close to 170 million populations living across the country. After so many years of independence, Bangladesh could not bring diversification in food, resulting in receiving about 70 per cent of daily energy from rice, which is known as the staple food of Bangladesh. Due to the absence of 'nutrient-dense' foods in

the food menu- that comes from- fruits and vegetables, animal source foods- the industries people are noticed to suffer from many diseases. A person needs to intake about 400 gm of fruits and vegetables as per WHO suggestion. Bangladeshi people take only 200 gm. sadly saying that Bangladesh is currently, amongst the lowest consumers of meat in the world on average. Since nutrient-dense foods are perishable, their impact on health is severe. Bangladesh has yet to make sure of taking safe food despite having enormous food in stock. There are nearly half a dozen acts related to food safety in Bangladesh. But their enforcement is seldom noticed. The acts are Food Safety (Contaminants, Toxins and Harmful Residues) Regulations (2017), Food Safety (Food Hygiene) Regulations (2018); Food Safety (Food Processing and Administration System) Rules (2014); Food Sample Collection, Testing and Analysis Regulations (2017); Use of Food Additives Regulations (2017). Bangladesh Food Safety Authority (BFSA) came into being in 2015 with the aim of protecting consumers' interests in relation to food. Besides, BFSA's vision is to protect people's lives and health by ensuring safe food in the country. Although the Food Safety Act in Bangladesh was incorporated in 2013, its wide-range enforcement is rarely found.

III. Methodology

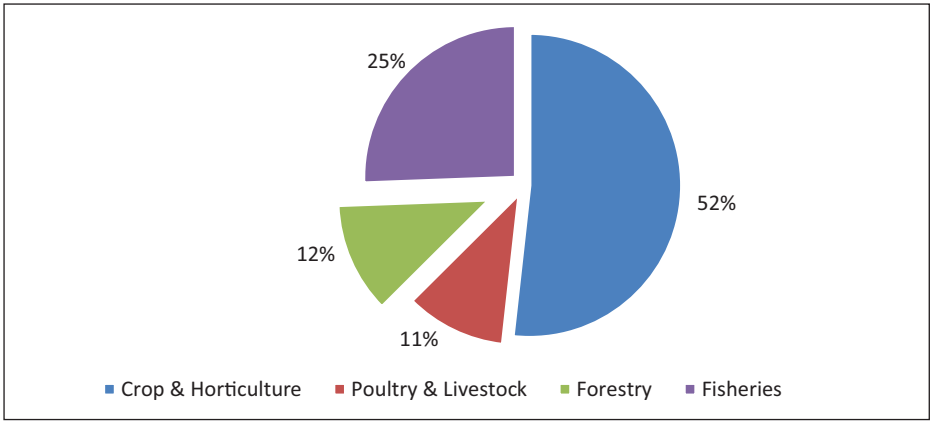
There are two types of data sources – primary data and secondary data. As sourcing of secondary data needs less time, this paper has been written using secondary data. The data sources are very reliable. Data collected from the state-owned Bangladesh Bureau of Statistics (BBS) in the period of 2009-10 to 2018-19 made the paper authentic. The 8th Five Year Plan Report prepared by the Bangladesh government shows a great deal of contemporary information that has been extracted for this paper. Besides using the Fisheries Statistical Yearbook 2020 as a data source, data from the state-run Department of Livestock Services (DLS) has been taken. Rome of Italy-based Food and Agricultural Organisation (FAO) worked as a data source also. In this paper, *DATABD.CO* - a one-stop source for business data in Bangladesh. Besides, Comtrade data, as reported by Bangladesh, has also been used.

IV. Results and Discussions

Over the past two decades, Bangladesh economy grew at a faster pace. Reform in the agricultural sector, adoption of prudent economic policies,

and decent fiscal management helped turn Bangladesh's economy into a development model. With its current GDP growth, Bangladesh has, in the meantime, been termed as the fastest-growing economy in the world. In the South Asia region, its placement in terms of economic growth is praiseworthy. The lowest growth that the country saw the last time was in the fiscal year 2001-2002, which was 4.36 per cent, according to data from the BBS. The GDP growth rate came as a wonder in recent fiscal years. GDP growth rate in FY 17 was 7.28 per cent while 7.86 per cent in FY 18 and 8.15 per cent in FY 19. Due to the fast-spreading coronavirus, the growth rate came down to economic shocks. In FY 20, amid the pandemic, the growth rate was achieved at around 5.24 per cent, with the country's per capita income reaching $2064. Besides, the virus hit the agriculture sector and saw a decline to 3.11 per cent in FY 20 from 3.92 per cent in FY 19.

Figure 1: Sector-Wise Contribution (%) in Agricultural GDP, 2018-19



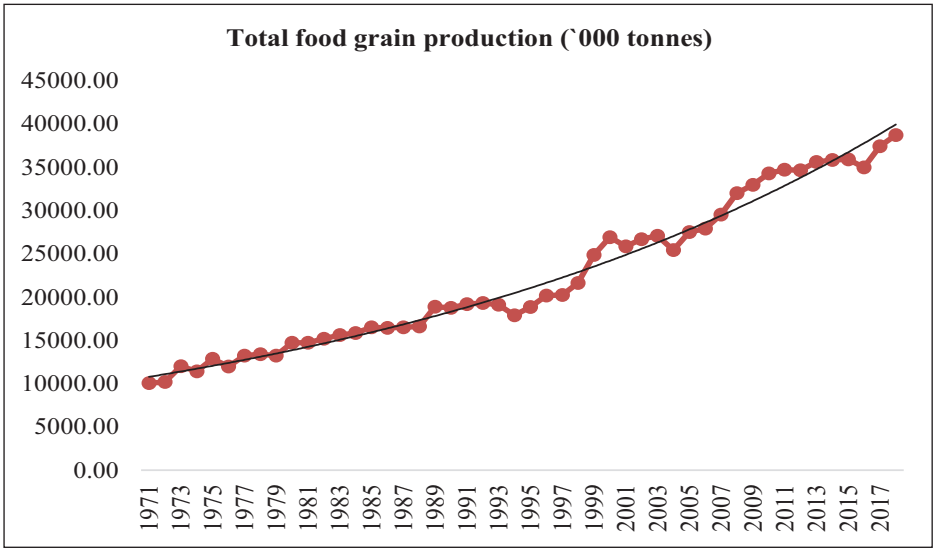
Source: Author's compilation from different sources (Refer to section III).

Amid Covid-19 pandemic, growth in industry fell to 6.48 per cent from 12.67 per cent where manufacturing dropped to 5.84 per cent from 14.20 per cent. The country's per capita income (GNI) has increased by 8.12 per cent to $ 2,064, which is equivalent to Tk 1,74,888. Per capita income was $ 1,909 in FY19 and $1,751 in FY18. The GDP growth rate of Bangladesh reached 6.94 per cent in the fiscal year 2020-2021, while the per capita income increased to $2,591, according to the Bangladesh Bureau of Statistics. It is mentionable here that GDP per capita in 2000 was US$ 525 only. With respect to poverty reduction, Bangladesh, over

the past decade, has shown its ability to do more than expected. In 2000, the poverty rate in Bangladesh was recorded at 52.3 per cent, and the rate came down to 20.5 per cent in 2019. The success with respect to the reduction of the poverty rate came following the five-year plans (FYP) policy along with impressive policy guidelines drafted from time to time.

From 2005 to 2010, the country's agriculture sector's contribution for poverty reduction was significant. During this period (from 2005 to 2010), the agriculture sector contributed 69 per cent of total poverty reduction in Bangladesh. However, the contribution put by the agriculture sector in reducing poverty was 20 per cent from 2010 to 2019, down from 2005 to 2010 statistics due to rapid industrialisation. The share of agriculture has declined from about half of total GDP during the 1970s to about one-third during the 1980s. The share of agriculture declined further –from about 30 per cent in 1989/90 to 25 per cent in 1999/00 and 20 per cent in 2009/10 (The Daily Star). Despite such declines, the economy is still predominantly agrarian. The sector still provides employment to more than 45 per cent of the country's labour force. For the last decade, the labour force, who engaged in farming for decades, is now been transformed into an industrial belt in search of livelihoods. The resource base for agriculture has been shrinking. The land area operated by rural households has declined from 9.2 million hectares in 1983-84 to 8.2 million hectares in 1996, indicating that, on average, nearly 82,000 hectares of land are going out of agriculture due to increased non-agricultural uses such as growth of physical area under municipalities and cities (607,000 hectares), increase in homestead land within rural areas (142,000 hectares) and development of rural roads and other infrastructure (252,000 hectares). As a result, the average size of a farm holding has declined from 1.70 hectares in 1960 to 0.91 hectares in 1983-84 to 0.68 hectares in 1996 and 0.40 hectares in 2008. The labour engaged in agriculture has also been declining. The number of farming households increased from 10.0 million in 1983-84 to 11.8 million in 1996 and 14.9 million in 2008. Non-farming households constituted 34 per cent of all rural households in 1996, compared to 27 per cent in 1983-84. This share increased to 42 per cent in 2008. Households providing agricultural labour on others' farms declined from 22.6 per cent of all rural households in 1983-84 to 16.9 per cent in 1996 and 9.6 per cent in 2008.

Figure 2: Food Availability VS Food Security



Source: Author's compilation from different sources (Refer to section III).

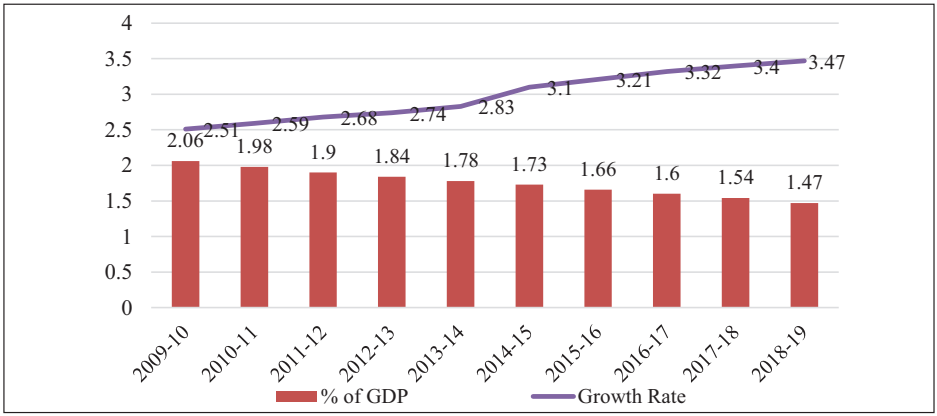
If we take the average of agricultural GDP for, say, 2005/6-2008/09 and 2014/15-2018/19, we see an increase from Tk 96,700 crore to Tk 135,000 crore (or 40 per cent or so) while the contribution to total GDP fell from around 18 per cent to 14 per cent. On the other hand, despite the fall in its share, agriculture still remains the main source of employment, providing a livelihood to 40 per cent of the labour force. In the case of crops, rice output has gone up from around 12 million metric tonnes in the late 1970s to more than 36 million metric tonnes today. In the case of crops, rice output has gone up from around 12 million metric tonnes in the late 1970s to more than 36 million metric tonnes today. This was possible due to several factors. The main reason was the increasing predominance of the dry season boro rice, facilitated initially by the introduction of deep tube wells as well as surface irrigation. But the main impetus came in the mid to late 1980s when privatised shallow tube wells were encouraged through policy shifts. Simultaneously, the policy of subsidised chemical fertiliser provided the additional impetus to grow high yielding varieties. While boro was no more than around 2 million metric tonnes in the late 1970s, before the turn of the century, it rose almost four times to more than 8 million metric tonnes and overtook a man as the main rice. The larger shift came about during the last 20-25 years, and by now, boro output stands at just short of 20 million metric

tonnes while aman output has risen from 7-8 million metric tonnes to 13-14 million metric tonnes. Aus has become totally marginalised, accounting for only less than 3 million metric tonnes.

Wheat showed quite some promise early on and contributed nearly 2 million metric tonnes around the turn of the century. But the output later dwindled to nearly 700,000 million metric tonnes in around 2006-07 although it slowly revived but only to somewhere around 1 million metric tonnes. On the other hand, maize output has steadily grown to around 3.5 million metric tonnes by 2018-19. This was mainly due to its increasing demand for use as poultry feed. Potato is another crop which saw an increase in output to 10 million metric tonnes in the present day from about 1 million metric tonnes in mid-1980s, a 10-fold increase. The other crop which saw a large increase is oilseed (an amalgam of several types in official statistics, including mustard as well as, curiously, coconut). From around 450,000 metric tonnes of output in 1987-88, it fell to around 300,000 metric tonnes and later increased to just above 500,000 metric tonnes by 2014-15. What happened since then is anybody's guess as for the next 3 years, the outputs (as published in Economic Review 2019 quoting BBS) were 934,000 metric tonnes (a jump of 86 per cent), 560,000 metric tonnes (a fall of 60 per cent) and then 1,026,000 metric tonnes (or a 83 per cent rise). Crops for which output showed either a decline or static situation include pulses, sugarcane and possibly jute. In the case of pulses (much of its lentils and Kheshari), in the early 1980s, the officially reported production was around 500,000 metric tonnes, which fell to less than half of that to around 200,000 metric tonnes in around 2009-10 and then somewhat revived to roughly double of that by 2017-18.

Bangladesh agriculture sector, amid untold limitations, had been able to show its credential in ensuring food security. Just after the independence era, Bangladesh faced around 30 lac tonnes of food deficit. In today's Bangladesh, there is no sign of falling into food insecurity due to the bumper production of food grains. If sector-wise contribution in agricultural GDP is seen in Fiscal year 2018-19, clear views are possible to get. The contribution of crop and horticulture to GDP was 52 per cent, 25 per cent in fisheries, 12 per cent in forestry, and 11 per cent in poultry and livestock. Bangladesh's score in the crop production index is approximately 146.4, whereas 145.3 in the food production index (based on the year from 2004 to 2006).

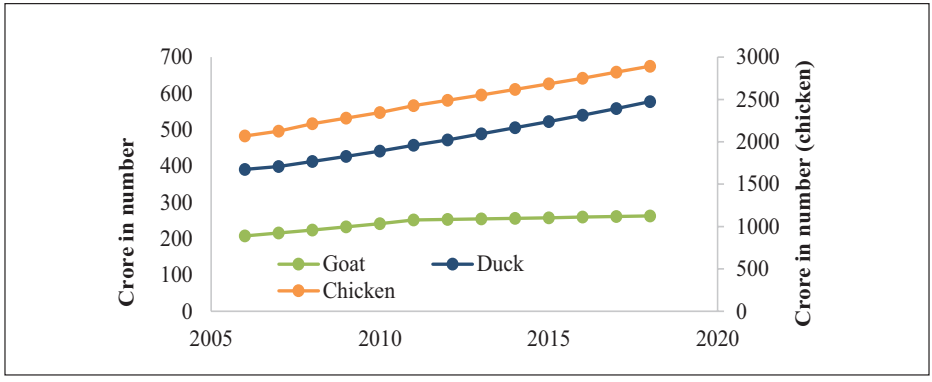
Figure 3: GDP and its Growth



Source: Author's compilation from different sources (Refer to section III).

Bangladesh ranked first in fruits production, 2nd in fish production, 3rd in rice production, 12th in livestock production. In terms of food availability and food security, Bangladesh's performance is better than any other nation in the BIMSTEC region. A total of 10000 thousand tonnes of food grains were produced in 1971. In 2017, the production increased to above 35000 thousand tonnes, indicating a positive trend in the production of food grains. GDP per capita was below US $ 200 in 1972 and in 2018, per capita GDP was increased to above US$ 1800. Now, this figure is above US$ 2500. From 1974 to 1976, GDP per capita growth had been upward. Afterwards, for political instability, the GDP per capita growth was observed to shrink.

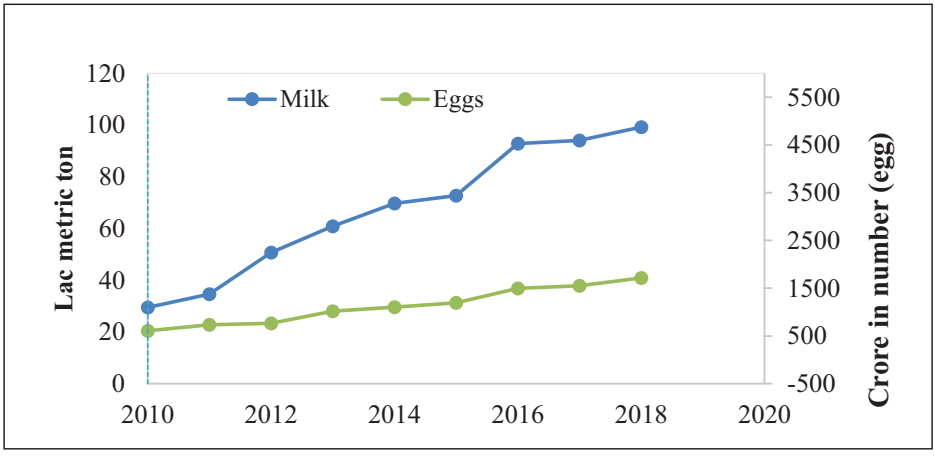
Figure 4: Number of Livestock and Poultry (crore)



Source: Author's compilation from different sources (Refer to section III).

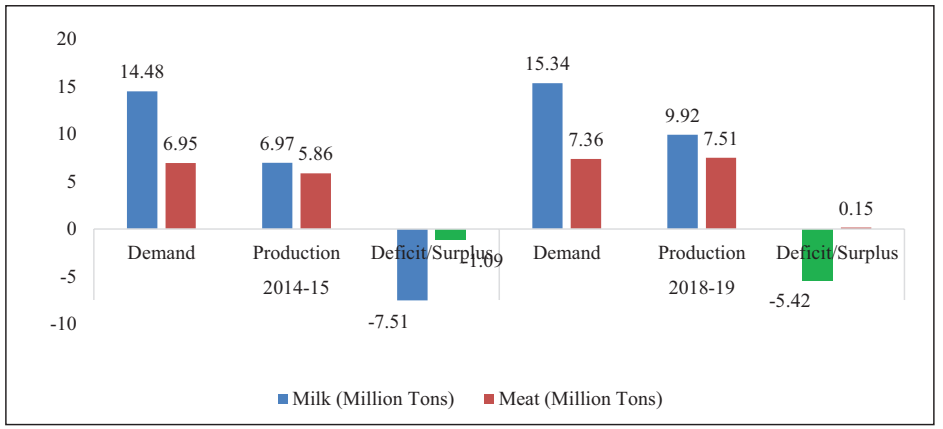
As fisheries contribution in agricultural GDP is 25 per cent, its production (including inland and marine) has been proved to be significant. According to *the 8th FYP Report & Fisheries Statistical Yearbook 2020, the* average growth of inland fisheries in Bangladesh is 6.7 per cent against 3.25 per cent for marine fisheries. Though the blue economy remains unexplored, the share of marine fisheries is better to look at. Inland fisheries production in 1991 was completely meager in weight. In 1991, about 0.50 million tonnes of marine fisheries were produced and in the present context, the production increased to manifold (above 3 million tonnes up to 2018). Marine production also rises to above 3 million tonnes. FAO study reveals that up to 2010, Bangladesh could supply fish and fishery products above 20 kgs (per capita basis), whereas in 1980, below 10 kgs fish and fishery products were supplied. The significant volume of fish exports is notably being observed. Fish items had been included in export baskets many years ago. Its demand is growing worldwide. Export of shrimp and prawns is done more compared to other fishes, which brings foreign currency to a great extent. Besides, a crab export in recent years is on the rise.

Figure 5: Production of Milks and Eggs



Source: Author's compilation from different sources (Refer to section III).

Figure 6: Current Status of Milk and Meat Demand, Production and Gap



Source: Author's compilation from different sources (Refer to section III).

The contribution of livestock sector in the country's GDP is remarkable also. The emerging sector made approximately 2.06 per cent contribution to GDP in fiscal year 2009-10, where its contribution shrank to 1.47 per cent in FY19 (FAO). According to FAO estimation, its growth rate in GDP is expected to be 3. 47 per cent. In view of the current number of livestock and poultry, FAO made the projection. In 2005, the number of chicken, duck and goat was close to 500 crore, 400 crore and 200 crore. The number was raised to above 3000 crore (chicken), 2500 crore (duck) and 1000 crore (goat) in 2020.

Nevertheless, around 30 lac metric tonnes of milk production were recorded in 2010 which increased to above 100 lac metric tonnes in 2020. It is worth mentioning that nearly 25000 crore eggs were counted in 2020, whereas its number in 2010 was 20 crore. The production of milk and meat is showing the ability to minimise the gap between demand and production. In FY 2014-15, total production of milk and meat was registered at 6.97 and 5.86 million tonnes against total demand of 14.48 and 6.95 million tonnes showing a -7.51 deficit. The deficit decreased to -5.42 from- 7.51 per cent in FY 2018-19. The number of egg production in FY 2014-15 was 10995.2 million against the total demand of 16504.8 million, indicating that the 5509.6 million was a deficit. In FY 2018-19, the deficit shrank to 372.37 million.

V. Conclusions and Policy Recommendations

For the last decade, Bangladesh has shown its credentials in producing farm products that have ensured food security. With its own produce, Bangladesh is able to address current food demand amidst any economic shocks. Bangladesh is now ahead in respect of food self-sufficiency, employment generation, poverty reduction and economic growth compared to other BIMSTEC member states. In the context of economic indicators, rapidly growing LDCs are now Bangladesh, Cambodia, Ethiopia, and Rwanda. Though Bangladesh, in the meantime, achieved its success in the affairs of food security, Bangladesh lags far behind in terms of assuring food safety for close to 170 million population living across the country. Due to the absence of 'nutrient-dense' foods in the food menu- that comes from- fruits and vegetables, animal source foods- the industries people are noticed to suffer from many diseases. A person needs to intake about 400 gm of fruits and vegetables as per WHO suggestion. Bangladeshi people take only 200 gm. Bangladesh is currently, amongst the lowest consumers of meat in the world on average. Bangladesh has yet to make sure of taking safe food despite having enormous food in stock. There are nearly half a dozen acts related to food safety in Bangladesh. The acts are Food Safety (Contaminants, Toxins and Harmful Residues) Regulations (2017), Food Safety (Food Hygiene) Regulations (2018); Food Safety (Food Processing and Administration System) Rules (2014); Food Sample Collection, Testing and Analysis Regulations (2017); Use of Food Additives Regulations (2017). Bangladesh Food Safety Authority (BFSA) came into being in 2015 with the aim of protecting consumers' interests in relation to food. Although the Food Safety Act in Bangladesh was incorporated in 2013, its wide-range enforcement is yet to be widely enforced.

To mitigate the challenges of the sector these policies are recommended: i) need for adopting long-term strategies in order to meet the challenges related to health; ii) ensure staples having high calorie and better nutrition aiming to boost people's resilience; iii) need for promoting kitchen gardens and diversifying agricultural produce to fulfill domestic demand as well as for export earnings; iv) to establish global standard cold chain with a view to keep perishable nutritious food stock for a longer period; v) move for developing infrastructure development, supply chain management, cold chains, and agro-processing zones might have been arranged under Public- a public-private partnership.

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6

The Present Status and Future Prospective of Agricultural Sustainability and Value Addition in Sri Lanka

U. M. Aruna Kumara

I. Introduction: Geographical Overview

Sri Lanka is situated in the Indian Ocean, north to the Indian peninsular. Both countries are separated by the Palk Strait. The Bay of Bengal is northeast to Sri Lanka, and its influence is always present and felt. Therefore, Sri Lanka is one of the historical countries in the BIMSTEC region. It is located between latitudes 5°55′ and 9°51′ N and longitudes 79°41′ and 81°53′ E and has a maximum length of 432 km north to south and a maximum width of 224 km west to east. Predominantly tropical in nature. All the climatic characteristics of the tropical environment are native to Sri Lanka. These environmental characteristics are favourable for agricultural subsistence from the ancient historical era. Sri Lanka was referred to as the Spice Garden due to its heterogeneous nature with many spices and condiments. Most of the inhabitants of Sri Lanka are primarily farmers and are involved with agriculture based livelihood. These farmers have been able to achieve

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agricultural sustainability through traditional farming systems and indigenous technologies.

Cultivation and cultivation patterns of many farming systems are highly dependent upon the prevailing weather conditions of the country. Based on the annual rainfall, Sri Lanka can be divided into three main tiers. The Central part of the country, which receives considerable higher amount of precipitation, is identified as the wet zone. North, North-East, East and South-East coastal belt and North-central part of the country where low rainfall is recorded are referred to as the dry zone. The lands in between these two zone are characterized by intermediate climatic conditions as a combination effect. In addition to that, the wet and intermediate zone can be further sub-divided into up, mid and low countries based on the topographical distribution. With other agronomic features such as soil types and ecological characteristics, Sri Lanka can be subdivided into forty six agro-ecological zones. Based on these agro-ecological zones, various types of agricultural practices are performed. The up-country wet zone is mainly covered by natural vegetation, where water catchment can be found. These areas are conserved and remain as a natural verging forest cover. That eventually supports the development of ground-water tables and natural streams and waterfalls to make the country a bountiful tourist destination. With these resources, agro-based tourism is one way of value addition to Sri Lankan agriculture. As far as foreign revenue is concerned, Sri Lanka is at the bottom of it. Therefore, the rural livelihood of this poor inhabitance of upcountry hilly can be sustained with agro-based tourism as a strategic intervention. The development of necessary infrastructures and the popularization of this conceptual framework of agro-based tourism among rural inhabitants are the major responsibilities of local authorities and the government of Sri Lanka. As an example, Indonesia was able to develop this concept and they are now receiving its benefit in socioeconomic development of the rural population. Cooperation together with regional countries and sharing their experience in economic and cooperative development is one of the sustainable approaches Sri Lanka needs to follow. These relationships would be beneficial to overcome the socioeconomic crises and economic drawbacks of the country. Therefore, exploring cooperation in sustainable agriculture and value addition in the BIMSTEC region is timely and important for Sri Lanka in order to develop international collaboration for a better future.

II. Climatic Division and Agricultural Impact

Wet Zone Plantation

Different types of export oriented plantation crops were introduced by colonial rulers to the wet zone of Sri Lanka. Coffee was the first plantation crop introduced, but eventually, it was replaced by tea due to coffee rust caused by fungal pathogens. At the moment, tea is the most famous export-oriented plantation crop in Sri Lanka. There are two types of tea plantations in Sri Lanka, namely up country tea and low-country tea. Up-country black tea is famous among the global community due to its intact flavour and aroma. Low country tea comes in big bulk and is fairly low in flavour and aroma due to environmental conditions. Up and mid part of the wet zone is fascinated with the tea plantations (Wijetunga & Sung, 2015). Most of these plantations are owned by the local private sector. In addition to that, there are some small- holders and government owned plantations also available. Most of the labour force is enriched by the Tamil community as their inherent job. However, managing tea plantations with the local Tamil community became a real problem at the moment due to the migration of the young generation to the cities in order to find different occupations than they were born. Tea Research Institute of Sri Lanka is a government-owned body which looks after every aspect of tea cultivation, from field to international trade. Tea boar is also one of the government bodies which facilitate tea marketing. Ceylon Tea is the trade name of Sri Lankan tea in the international market. It has a good reputation in the EU and Middle East countries. Sri Lanka earns a considerable amount of foreign currency through this business. There are various value added tea brands are available locally and internationally. Golden tips, biodynamic tea, and organic tea are some of the products.

In addition to that, the area covered by the low country wet zone is comparatively larger and many small scale tea plantations are available in this region. Most of the inhabitants of this area are directly and indirectly involved in tea cultivation and marketing. These small scale farmers do not have facilities to process their product. Therefore, tea collectors are prominent in this area. Tea collectors are the middlemen in the postharvest supply chain and they bargain for the price. A lot of tea leaves are auctioned, or directly supplied to the tea factories situated in the countryside. Therefore, many government officers are involved in different lines of tea production and processing. Those

officers are responsible for providing technical and market-related information to the tea growers. In addition to that, various government subsidiaries are given to those farmers for their sustainability in tea cultivation. However, farmers are frustrated all the time due to the low income generated from this business. Price fluctuation at national and international markets has an adverse effect on the farmer's net income. Re-exporting and exporting low quality tea by some of the illegal businessmen has polluted the golden name of Ceylon tea in the international trade. Most of the tea plantations in this low country wet zone are owned by families. Therefore, less care and poor management activities led to the production of good quality tea with potential yield. Most of the plantations are old and in a production declining period. As a result of that, rejuvenation or replanting needs to be done. However, these operations are rarely done due to the high cost of labour and land preparation. Pests and diseases, and seasonal droughts have created an immense influence on their cost of production. Therefore, most of the farmers give up tea cultivation and replace it with other crops such as fruits, vegetables and minor export agricultural crops such as Nut Meg, Clove and Piper etc.

In addition to tea in low country wet zone, rubber also has good potential to contribute to the local economy. Many job opportunities have been created with rubber-based industries situated in this area. Same as tea, some rubber plantations are owned by private companies and they have a fairly large extent. Most of the local people in this area have good skills relating to rubber cultivation and processing. In addition to that, families-owned small-scale rubber plantations can be seen in this area. The Rubber Research Institute of Sri Lanka is a government body which facilitates the necessary technical guidance for rubber cultivation, processing and marketing activities for local growers (Seneviratne, 2021). Weather conditions in this area are well adapted to the cultivation of rubber. Most of the rural inhabitants in this area fulfil their household requirements through rubber cultivation. Old rubber trees are uprooted in order to develop the next generation. Old rubber trees are sold for timber and fuel wood purposes. These are the additional income generated from rubber plantations. Therefore, rubber is the second most important plantation crop that generates foreign revenues. However, in the recent past, rubber plantations were replaced by oil palm as a profitable agribusiness. Therefore, the area covered by the rubber in this area became declining with time. The main output

of this oil palm is vegetable oil for cooking purposes. Several large-scale palm oil processing firms are situated in this area. Being an exotic crop, oil palm has created several environmental issues, such as the reduction of the groundwater table and occupied by some wild animals. As a result of that, the popularity of the cultivation of new oil palm plantations became lesser. Therefore, the introduction of new plantation crops has created a negative impact on the socio-cultural activities of the local population.

Other than the plantation crops in the wet zone of Sri Lanka, up country vegetable has big demand in the local market. Most of the areas in the mid country wet zone are suitable for the cultivation of some temperate crops such as potato, carrot, broccoli, cauliflower, beans, leeks, tomato, bell pepper etc. Therefore, weather conditions prevail in the wet zone of Sri Lanka is somewhat similar to the temperate zone of the world. This weather condition favours the cultivation of many temperate fruits and vegetables, cut flowers and foliage. The extensive farming system is the most famous farming system in this area. Mix crop cultivation can be seen in most of the vegetable production systems. In addition to that, cultivation under protected cover is famous for temperate fruits such as strawberries in this location. Gerbera, Crisantmamum, Orchid like tropical cut flowers and Alstamaria, Carnation and Roses like temperate cut flowers are cultivated commercially under the Polly tunnels. All these businesses are managed by the private sector and the government does not involve such export-oriented agribusiness in this area. Sri Lanka only shares 0.2 per cent in the global floriculture industry. However, Sri Lanka has good weather conditions to cultivate temperate, tropical and sub-tropical cut flowers and foliage as a potential export-oriented agribusiness. This smell is absorbed by private companies and they have started large scale export oriented floriculture industries in up country Sri Lanka. These production systems are designed with semi intensive manner and cultivate cut flowers and foliage under the Polly tunnels. Appropriate new technologies are used by these establishments for agronomic activities and postharvest handling. Anyway, government interest towards export oriented floriculture industry has been limited to expand this sector at the cottage level. As a strategy of local government, the floriculture sector was popularized among women in rural area as women empowering programme (Padmini, & Kodagoda, 2017). Most of the self-employment was generated through this process, and now they are receiving its benefits. However, the Sri Lankan government

needs to start export oriented agribusiness with potential areas such as floriculture industries in order to fulfil the foreign currency requirement.

Continuous production of vegetables can be seen in the up country of Sri Lanka. Most of these lands belong to families and they are doing this cultivation from generation to generation. Sinhala and Tamil ethnic groups are popular in this area and both are good farmers. Land fragmentation or production coming from the marginal land is one of the significant characteristics in this area. Due to high elevation, land is arranged as terraces or contour lines. Flat land, to a large extent, is limited in this area. Even though they have fairly small land, they manage to continue as commercial farming with farmers' associations. Farmers are united under farmers' association and decisions are taken on select crop types based on the market demand. Excessive use of agrochemicals is the success of these farming systems, which create considerable damage to the natural ecosystem. Farmers never consider consumer protection and food safety. Their main concern is the final yield in kilograms. All the farmers in this area have their own small vegetable plot, managed with less chemical and much more organic to their subsistence. This revealed that they know the impact of their produce on human health. As a result of that, most of the educated young generation prefer to purchase organically treated fruits and vegetables from the local market in Sri Lanka. Up country vegetables are marketed all over the country through Dedicated Economic Centers set up by the government of Sri Lanka. Site specific fertilizer recommendation technique was introduced to these areas as a measure to minimize the consequences generated by careless use of agrochemicals, including inorganic fertilizers. No one of the farmers adapted to this technique and continued their way forward.

Erratic weather conditions adversely affect the wet zone cultivation due to unexpected land slides and flooding. To overcome these environmental issues, some of the young farmers started to cultivate vegetables under protected cover. Off-season cultivation and continuous supply of fruits and vegetables are profitable agribusiness. Therefore, protected agriculture is more famous among the interested and educated young farming community in Sri Lanka. Aligning with this, well developed super market system is available in Sri Lanka. These super markets are very famous among the middle and high-income classes to select their vegetable requirement (Perera, Kodithuwakku, & Weerahewa, 2011). Organically treated fruits and vegetables, which are certified by Sri Lankan Good Agricultural Practices, are welcome

by these super markets. As a result of that, there is competition among farmers to obtain SL-GAP certification. SL-GAP was introduced by the Department of Agriculture, Sri Lanka. Department of Agriculture is a public institution and looks after the agriculture sector in Sri Lanka. This department is fully enriched with skilful researchers and administrators. Achieving the specifications of SL-GAP certification process is much easier with protected agriculture. That is also one reason for the popularity towards protected agriculture in Sri Lanka. These agro-based industries in the wet zone of Sri Lanka provide more employment opportunities to overcome unemployment in the young generation. Permanent, temper and wage-based occupations are quite common in this area. Rural poverty, low levels of education and child labour are some of the socioeconomic crises in this area.

In contrast, crop-livestock mixed farming systems, crop-livestock integrated farming systems, and sole livestock production systems can be seen in the wet zone of Sri Lanka. Some of these systems are run as semi-commercial farming systems. Half of the production from crops and livestock is used for their household requirement and the surplus is sold and earned money as the main way of revenue. These systems are much more sustainable and well-balanced with the ecosystem. In addition to that, some of the job opportunities are created for rural inhabitants. Other than semi-commercial systems, few large-scale sole livestock production systems are very famous in the wet zones. Most of these systems are characterized by the dairy industry. Boss torus-type English breeds, such as Holston Frisian, Jersey and Ayrshire are well adapted to this cooler climate. Their production is optimized under certain conditions. Rather than the landless ruminant management system, grassland-based ruminant management is popular. Milking is done at the shelters and allows animals to graze in open fields. The major output of this system is raw milk and converted into powder form, cheese, butter, veal and yoghurt as a value-added product. In Sri Lanka, never rear cattle or buffaloes for meat purposes. In addition to cattle, goats, sheep and rabbits are reared in small quantities for meat and milk purposes. These industries also provide good opportunities to generate new occupations in the country. A large number of people are involved in this process, both direct and indirect. This large scale animal production system is managed by the private sector. The government does not have such large livestock-based industries other than a few that are available in farms run by the National Livestock Development Board

(NLDB). With all this information, we can understand that the private sector in Sri Lanka plays a major role in the socioeconomic sustainability of the country. Private-public partnerships need to be enriched in order to strengthen the private sector of Sri Lanka. In addition to that, almost all of the export oriented agribusiness is handled by the private sector of Sri Lanka. Environmental-related issues, such as contamination of natural waterways with animal secrets, generation of methane as a greenhouse gas and bad odour are some of the consequences that arise from this sole livestock production system.

N.F.C. Ranaweera, a national consultant to the FAO, has pointed out that Sri Lanka has a big opportunity to grow their dairy sector as a profit-oriented agribusiness (Ranaweera, 1985). Sri Lanka is largely self-sufficient in most animal products, apart from the dairy sector. However, the consumption of dairy products has increased dramatically since the 1970s when the Government adopted open economic policies. Currently, Sri Lanka is about 15–20 per cent self-sufficient in its milk products. The rest of the gap is usually filled by imported milk powder from several countries, including New Zealand and Australia. The dairy industry has the potential to contribute considerably to Sri Lanka's economic development. A traditional industry that has survived thousands of years, milk production also plays an important role in alleviating nutritional poverty in all age groups. In addition to that, it is a source of extensive employment opportunities, mainly for rural communities.

The Government's ambitious target for growth in dairy production was an increase towards 50 per cent self-sufficiency in milk products by 2015, according to the "Mahinda Chinthana Manifesto". At the current growth rate of 1–2 per cent, the sector will need to grow at about 15 per cent annually for the target, with no increase in total consumption. This was a challenging task, given the current state of the industry, which only supplies approximately 20 per cent of the domestic requirements. This contrasts with two decades ago when, prior to the economy's opening in 1977, domestic sources of milk provided nearly 80 per cent of Sri Lanka's consumption needs. Given the current levels of malnutrition, particularly among pre-school children and pregnant mothers, milk production is an important activity for improving the nutrition situation. In order to achieve this target, "Divi Naguma Project" was implemented and improved breeds of milking cows were given to selected farmers (Kulathunga, Perera, & Udawattha, 2022). Popularized the consumption of liquid milk among people instead of

powder milk. Milk is produced in all districts in Sri Lanka. According to the agriculture census, the largest cattle populations are found in the country's dry and intermediate zones. The wet mid- and up-country areas are often perceived as the main dairy-producing areas. The dry and dry intermediate zones produce 50 per cent more milk than the wet and wet intermediate zones.

The average cattle or buffalo farm has around five heads of stock, with significantly larger herds in the dry zones (Vithanage et al, 2013). In the wet and intermediate zones, there are two to three heads per farm. Only about 12 per cent of the cattle are found in the wet zone, with the majority of the better dairy breed stock found in that area. The rest of the cattle are spread equally between the dry and intermediate zones (Pagthinathan, & Sathiyasegar, 2013). Some 32 per cent of the total cattle population is in the four dry intermediate zone districts, and more than three-quarters of cattle are in either the dry or dry intermediate zones. The 1.1 million neat cattle and 0.3 million buffalo were reported in 2019, showing constant figures in line with the year 2018. There is now an increasing trend in the percentage of upgraded dairy animals, including dairy buffalo. The majority of livestock are reared in small-scale operations. Many factors influence the distribution of livestock in Sri Lanka; dominant among them are agro-ecological zoning and proximity to markets and feed resources. However, 100.8 MT '000 of milk products were imported to Sri Lanka in the year 2019 (Dharmasiri and Jayarathne, 2021). This indicated that there is a huge requirement for milk-derived food items to meet the needs of infants and other age groups. So, Sri Lanka needs to have a well-organized strategic plan to minimize the importation of milk-derived substances through self-sufficiency.

The marketing of milk in Sri Lanka is complex and varied. There are individual farmers who sell directly to processors, consumers, hotels, cafeterias and canteens. Cooperatives are organized primarily for the purpose of collecting and selling milk to either hotels or processors. The formal, or processed dairy, market consists of small dairy cooperatives, larger local cooperatives, district dairy cooperatives, dairy cooperative unions and networks of collection points and milk chilling centers operated by cooperatives or the main dairy processors. Most farmers are not members of cooperatives or farmer societies. There are a few large-scale processors who have organized farmers to sell their milk to them. Contributing to the informal market are small private milk collectors,

small local processors of traditional dairy products, retailers and dairy producers who sell directly to hotels and restaurants or to consumers. Small local processors of modern dairy products also contribute to the supply.

The growth rate of the agriculture sector, including plantation crops, livestock, forestry and fisheries to GDP was 17.2 per cent in 2017, having increased from 8.0 per cent in 2015 (Central Bank of Sri Lanka, 2020). However, the growth rate of the sector declined up to 9.0 per cent in the year 2018. 103,728 Rs. Million was earned from livestock products in the year 2017. Cow and Buffalo milk production, liters mn. 447.6, was recorded in the year 2019 (Central Bank of Sri Lanka, 2020). However, 1,043,994 Rs. Million was recorded as the income generated from the Agriculture, Forestry and Fishing sector in the year 2017 (Central Bank of Sri Lanka, 2020).

Kandyan home gardens are one of the traditional sustainable farming systems in the wet zone of Sri Lanka (Pushpakumara *et al*, 2016). This system comes under crop livestock integration. Most characteristic feature of this system is the spices. Spices such as Cinnamon, Clove, Nut Meg, Betel, Piper, Aricanut, Cardamom and Vanilla are naturally fit with this system. All these spices are commonly called as export agricultural crops or minor export crops. Sri Lanka earns a considerable amount of foreign revenue through these crops. Therefore, they were labeled as export agricultural crops. These production systems are limited to marginal or small-scale landscapes owned by families in these areas. Production is heterogeneous, with many crops and livestock. The main income is generated from the spices. The production scale of these spices is comparatively minor compared to the major plantation crops with high export revenue. Therefore, these crops are called minor export crops. Almost all of the spices, exported from Sri Lanka, are generated from this system. Indigenous and traditional agronomic practices are common in this system. Due to its potential contribution to the local economy, Government provides substantial subsidies for this minor export crop production system. Rearing of a few cattle and backyard farming of local breeds of chicken is quite common in this system. The surplus of the milk generated from this system is collected by the reputed dairy industries to fulfill their requirements. Farmers are organized as farm clusters and collecting centers and necessary equipment is provided by the dairy industry. Educated unemployed women are recruited by the dairy industry in particular areas as collectors (Ranasinghe et al,

2023). She records the daily milk production of each and every farmer in the cluster and arranges their payment on a monthly basis. Therefore, farmers generate additional income from the milking cows. As a result of that, food security, economic stability and eradication of rural poverty are achieved by this sustainable system.

Dry and Intermediate Zone Plantation

Intermediate zone of the country is sub-tropical in nature. Combination of dry and wet climatic conditions are year round during different seasons. Subsistence and semi-commercial paddy cultivation is the main agricultural operation in dry and intermediate zones of Sri Lanka. In the wet zone of Sri Lanka, paddy cultivation is performed in terraces. Fairly plat landscape; alluvial soil and bi-model monsoon rain facilitate paddy cultivation in Sri Lanka. Staple food of local people is rice, generated from paddy. Sri Lanka is 95 per cent self-sufficient in paddy production (Perera, 2022). North-East monsoon rain received from October to February is the main cultivation season of the dry zone, which takes a fairly low volume of precipitation from the Bay of Bengal. During that season farmers are organized and they cultivate together. A large extent of land belongs to the dry zone, and many lands are devoted to paddy cultivation during this time. Therefore, this season is referred to as "Maha Kanna". Heavy use of agrochemicals for paddy cultivation is significant in this region. Agriculture instructors from the Department of Agriculture, Department of Agrarian Service, and Mahaweli Development Authority provide necessary guidelines and good agricultural practices. Unfortunately, farmers are not adhering to these rules and regulations. Farmers are heavily addicted to the chemical agriculture in order to have big harvests. This farming system has created many socioeconomic and environmental issues, leading to Chronic Kidney Disease (CKD) in rural Sri Lanka. With agricultural modernization, the use of animals for farm traction has been given up and replaced by the two-wheel and four-wheel tractors. In the recent past, the government has provided trans-planters for farmer associations in paddy cultivation areas initiated from dry zones. During the off-season, half of the land in the dry zone is devoted to paddy cultivation based on the supplementary irrigation. During this time, water is a limiting factor for agriculture. Rest of the land is used to cultivate low-country vegetables such as bitter gourd, luffa, snake gourd, pumpkin, cucurbits, chili and onion etc. Agro wells are constructed as a supplementary irrigation system.

Dry land cultivation of maize is very famous in the Dry Zone. Maize, soya, green gram, black gram and cowpea are cultivated in this area as raw materials for some private agro-based industries as a buy-back system. Those industries are providing planting materials, fertilizer, pesticides and education interventions. Therefore, Farmers are clusters, and they are faithful to sell their products to relevant private establishments. This model provides permanent income for farmers other than their main crop. These types of farmer associations with private agro-based industries create a win-win concept. Eventually, these projects facilitate employment opportunities for local communities and indirectly support to eradicate rural poverty in Sri Lanka.

Almost all of the fruits and vegetables generated in this area are collected to the Dedicated Economic Centers (DEC) situated in main areas in the dry zone such as Dambulla and Thabuthegama. In addition to that, regional collectors, wholesalers, retailers directly purchase from the farmers. Collectors are directly linked with the Dedicated Economic Centers or super market systems. Those supermarket also have their own postharvest system to collect fresh fruits and vegetables. Fairly large volume of fruits and vegetables are generated by this system. These commodities also circulated all over the country through marketing channels. Bargaining is common practice at Dedicated Economic Centers. Facilitator or middlemen play a major role in the Dedicated Economic Centers. Farmers receive less profit as compared to their production costs. Most of the profit is accumulated to middlemen and merchants. Even though farmers produce all over the year, they are never satisfied with their occupation. Farmer's grievances, rural poverty, low income are the problems of farmers which never resolve. Less interest in agriculture in the young generation is a big issue in this area. As a result of that, crop production under protected cover is also popular in this area as well.

In addition to that, the wet zone of Sri Lanka performs paddy cultivation with the help of south west monsoonal rain received from May to September. This is the main season of the wet zone and is referred to as "Yala Kanna". During this monsoon, comparatively large volume of rainfall is received in the wet zone. Soil salinity, floods and other natural disasters are the main constraints in this area due to the overload of water. Wetland preparation and dry land preparation are the common cultivation systems in Paddy. Rice-based farming systems such as rice-fish integration, rice-asolla-fish integration and

rice-duck-fish integration are not available in Sri Lanka. But these systems are very famous sustainable methods in other Asian countries such as Indonesia, Malaysia and Thailand etc. Therefore, Sri Lanka needs to study and adopt those sustainable systems to overcome the disadvantages of monocropping. Regional cooperation will be a great venue to rehabilitate conventional paddy cultivation in Sri Lanka. The intermediate zone of Sri Lanka benefits from rainfall and sustains paddy cultivation. In addition to that, fruit and vegetable production systems are available to a fairly large extent. Commercial fruit crop production such as banana, mango, papaya and pineapple can be seen in dry and intermediate zones. All these commercial systems belong to the private sector. Most of the products go to the local market and as raw materials for food processing industries. Fruits and vegetable export is a major business in Sri Lanka.

Surplus of the paddy produced in semi-commercial farming systems is purchased by the Paddy Marketing Board of Sri Lanka and private rice millers. There is no competition among these groups because the private sector collects huge amounts of paddy at a high rate per kilogram. Therefore, the price of the milled rice is controlled by the few private paddy millers with political backgrounds. As a result of that, the price of rice has increased incredibly. This is a severe issue in Sri Lanka because 75 per cent of the population purchase rice from the market for their household requirement. However, different farming systems in different geographical locations produce a really large volume of agricultural crop produced through the year round but the price is not controlled by the government. As a result of that purchasing power or cost of living is increasing daily. This pressure has a negative influence on the ruling party of the country. The dry zone of Sri Lanka is referred to as "Rural Sri Lanka" because most of the population has less access to a basic need such as education, health and occupations. Rural poverty is a significant characteristic of this society. Major occupation is subsistence or semi commercial rice-based farming system. Income generated from their systems never meets the needs of these communities due to poor managerial skills. Therefore, most of the middlemen, who do not have single land, receive the benefit of farming systems. Farmers are ever poor community but their third generation has adapted to make agriculture a profitable business through agricultural modernizations.

Semi commercial paddy cultivation is the main agricultural operation but fruits and vegetable cultivation also have good demand in this area.

Most of the inhabitants are dealing with agriculture as their second income. Other than this rice-based mixed farming system, minor export agricultural crops such as betel, pepper, ginger, turmeric and vanilla are cultivated as intercropping with coconut. Coconut is the third most important plantation crop in Sri Lanka. Intermediate zone has good soil and environmental condition for the proper growth and development of coconut. Coconut cultivation Board and Coconut Research Institute are the main governmental institutions which facilitate the requirement for coconut cultivation and processing in Sri Lanka (CRISL, 2018). Several large-scale coconut plantations are available in this region with good annual nut production. Crop livestock integration and intercropping of coconut can be considered as most sustainable farming systems in this zone. Commercial coconut plantations increase their production and net profit by integrating with ruminant and monogastric. Major ruminants include cattle and buffaloes. Among the European or English breeds, Jersey cattle are well adapted to the coconut triangle. However, their crossbreeds, such as Australian milking Zebu are much famous in this farming system. In addition to cattle, river-type Indian buffaloes such as Murrah, Nil Ravi and Surti are raring as a big herd due to higher fat content in their milk. Small ruminants such as goats are more famous than sheep in Sri Lanka. Other than ruminant pig and poultry play a major role as non-ruminant or monogastric. Large scale piggeries and broiler and lay systems are much more famous in the coconut triangle than other areas of the country. Cattle and buffaloes are raised mainly in the dairy industry but this monogastric also meets the need of meat requirement of the country. Sri Lankans heavily consume chicken and eggs than other meal types due to religious matters. These production systems are providing good job opportunities to the local people. Most of the inhabitants in close to these plantations are engaged in their farming system from generation to generation. Other than this commercial crop-livestock integration, semi commercial systems also prevail with villages with fairly enough land to manage large ruminant and monogastric.

In addition to that, large scale desiccated coconut and coconut oil processing industries are situated in this region. In the recent past, some of the export oriented virgin coconut oil and concentrated coconut milk processing industries have started aligned with the coconut triangle opening many job opportunities for the young generation with a good educational background. A fully automated poultry feed-producing factory was established in the coconut triangle by a multimillion private

company with export potential. Most of the coconut processing and animal feed processing industries are managed by the private sector but few farms are managed by the National Livestock Development Board (NLDB). The conventional farm management practices are quite common in these government-owned farms but much more sophisticated semi-automated systems are practiced by the private sector. Therefore, most of the agricultural technologies are practiced by the private sector with profit-oriented agribusiness but those public farms are becoming useless businesses due to poor management and unskilled labour force. It's very difficult to upclip the public sector than the private sector in Sri Lanka due to various calamities. Compared to the private sector, the public sector has more land for agriculture in Sri Lanka but the proper utility of these lands has never come to its maximum potential. If the government manages their land with proper technologies and sustainable principles, they will end up with good revenue. Therefore, the Sri Lankan government should follow the strategies and managerial principles performed by regional countries in managing their agriculture sector. In order to achieve their long-lasting objectives, Sri Lanka needs to develop international collaboration with regional countries through various agreements. These agreements may benefit the entire nation and their livelihood can be improved to a greater extent.

III. Challenges and Opportunities in Sri Lankan Agriculture

Sri Lanka is a bountiful country with year-round production of field crops, cereals, legumes, oil seeds, pulses, fruits and vegetables, cut flowers and foliage and major and minor export agricultural crops. In addition to that, the livestock industry provides a sufficient amount of meat, milk and eggs. No one of the Sri Lankans dies due to starvation or hunger. Therefore, an ample amount of agricultural productions meet the needs of the present generation but there is no guarantee that the future generation will be sustainable. Due to this overproduction, people do not concern about postharvest loss. As a result of that, postharvest loss of perishable agricultural commodities such as fruits and vegetables has higher postharvest loss. Half of the produce will not end up with the final consumer and is wasted in the postharvest channel. There is no idea to convert surplus to value added product as a postharvest strategy. Seasonal variation will results different types of fruits at different months.

With population pressure generated annually, Sri Lanka need to produce more, but land availability is limited for agricultural operations. So many agricultural commodities are get wasted during transport due to inappropriate transport systems. There are no transport facilities provided by the government to handle agricultural commodities like in develop nations. This is one of the greatest drawbacks which creates irreparable losses to crop produce.

Several government plannings have been proposed to develop railways lines with Dedicated Economic Centers, but still, there is no progress. No one of the Dedicated Economic Centre has a cool chain management facility. Therefore, heaping up of perishables as garbage is a common practice in these centers. There are some private owned pack houses for fresh fruits and vegetables; they use semi-automated technology for postharvest handling in order to prepare their export consignments. Same as in other sectors, private sector plays a major role in export-oriented agribusiness. Most of the fresh fruits and vegetables are exported to the EU and Middle East countries by private companies. The Government facilitates this business through the Export Development Board and the Board of Investment. Phytosanitary certification is done by the national Plant quarantine service under the supervision of the Department of Agriculture. Export certification is a must in international trade.

Postharvest is a big area of concern but less attention by the government. The National Institute of Postharvest Management provides necessary guidance and technical support to avoid postharvest loss but inappropriate postharvest handling has created detrimental effects on the global economy. Therefore, government needs to pay more attention on consumer protection and food safety through pre-harvest and postharvest management. Value addition or conservation for utilization is not practiced well in Sri Lanka. Progressive development in the postharvest sector will facilitate more benefits to the nation.

Therefore, the introduction of novel postharvest technologies to the Sri Lankan agriculture sector is a present requirement. In general, polypropylene or polysack bags are used as a packing material for fruits and vegetables. General transport is done with automobiles such as tractors, three-wheelers, lorry and trucks, heaping one another for maximum utilization of the vehicle. They never consider about the postharvest loss. Responsibilities of farmers will be over after the

sale, and the handler is responsible until loading or unloading. Rough handling of perishable can be seen everywhere. Maximum physical loss is attained during consecutive transport. In recent past, plastic crates were introduced by the Ministry of Consumer Affair to reduce the loss during the transport. But, farmers reject that concept due to excessive cost of transportation. These characteristics indicated farmers' perception on postharvest technology and postharvest management. Sri Lanka needs to develop proper supply chain management strategies. Intergovernmental relationships and collaborations would help to bring novel technologies in order to reduce the postharvest loss of agricultural commodities and value addition strategies to conserve the surplus. Proper management of harvest can be directed to the international market as profit oriented agribusiness. Unfortunately, there is no such policy in the system.

As I mentioned earlier, predominantly most of the rural inhabitance of Sri Lankans are traditional subsistence rice farmers. Farming is an inherent job, and they do it from their childhood to tomb. Other than rice, various cropping patterns and farming systems are managed by these farmers and produce various types of food to feed the nation. However, now the young generation in rural Sri Lanka is reluctant to perform farming as their primary occupation. Most of the youth in rural areas migrate to urbanized areas in order to find occupations, perform their education and settlement etc. Therefore, it eventually reduces the work force in rural area for agricultural operations. As a result of that most of the lands are given up from cultivation. This process of rural migration adversely affects the progressive development of the agricultural sector in Sri Lanka. In order to keep young generation in agriculture sector, the Department of Agriculture, Sri Lanka, has introduced agricultural modernization concept.

With this agricultural modernization process, protected agriculture or cultivation under protected cover has become much more famous among the young farmers than other technologies. The introduction of the farm machination or the use of farm machineries for agricultural operations is not equally distributed across the country. Farm mechanization is not possible in up country or many parts of the wet zone due to the undulated landscapes basically for paddy cultivation. However, farm mechanization is much practiced in the intermediate and dry zones of Sri Lanka. Two-wheel and four-wheel tractors for land preparation, trans-planter and combine harvesters are the most

significant machineries in the field. Many of the private companies have started agro-based industries to facilitate these machineries import from various countries. In addition to that, the Sri Lankan government has given tractors and trans-planters to farmer associations as a donation to popularize the farm mechanization. Anyway, affordability, farmers' perception and topography have created the limitations in agricultural modernization and farm machination. Most of the time, rich farmers and merchants in the area are the owners of the farm machinery, and they hire those machineries for the rest of the farmers.

Therefore, socioeconomic constrains have created a big gap among different farming communities in rural Sri Lanka. Those that can bear high initial costs for the construction of polytunnels and greenhouses have started cultivation under protected cover with good agricultural practices. Polytunnel growers are directly linked with exporters and supermarkets. As a result of that, they receive a considerable amount of higher income. Production of hybrid seed under the protected cover are also varies among a very famous among few private companies. Automation, control environment, hydroponic, aquaphonique, areophonic like technologies are not available in those poly tunnels. Just only cover with Israel net or polythene and drip or sprinkler systems for irrigation. Image processing, artificial intelligence, machine learning and neural networking for pest and disease detection, plant nutrient management are dreams of local scientists but do not have proper international collaborations. Even though, a system like this would not fit with the local farming community due to higher cost of production and limited knowledge of precision agriculture, agricultural modernization or technological innovations need to be customized to fit with the expectations of farmers and real solutions for the prevailing problems in the conventional agriculture. However, this protected agriculture has given big opportunities to the young generation and opened many job opportunities for rural Sri Lankans.

According to my understanding, export-oriented agribusiness is a way of uplifting the Sri Lankan economy to a satisfactory level. All the required pre requisites are fulfill by the Sri Lankan agriculture to start this business. Several large scale commercial agricultural companies have already shown the result of that. Unfortunately, the Sri Lanka government is not doing well in export oriented agribusiness like other countries such as Canada. In Canada, the government controls all the wheat related businesses but there is no restrictions on any individual

in cultivation. Dole Lanka Private Limited is a good example of banana export to several countries, including the Middle East. Cut flowers and foliage, TOM EJC Mango, concentrated coconut milk, many vegetables, Spices and condiments, coir dust bricks and pellets, poultry feed are some the of export items from Sri Lanka except major plantation crops. All these businesses are handled by private sector and government has given their fullest support. The Export Development Board, National Plant Quarantine Service, Sea Port and Air Port of Sri Lanka provide necessary support for handling export consignments. However, revenue collected from these businesses is less for the government but private sector receives more. Therefore, the Sri Lankan government needs to start export oriented agribusiness to overcome the dollar shortage in the country. It is highlighted that the 2022 budget has given opening for new export processing zones in order to expand the export sector in Sri Lanka.

In the process of export oriented agribusiness, the government should identify the potential agro-based sectors for the initiation of the export oriented raw and value-added products. Then government needs to collaborate with international agencies and countries which have the potential to purchase goods and services. As well as the government should identify the local companies which can facilitate the technologies and processing unit to achieve the expected outputs? Then the government of Sri Lanka needs to develop bilateral agreements with private sector as private public partnerships (PPP). This PPP should collaborate with regional potential countries for collaboration for technology transfer and improve the quality of outputs. After that, this product would have a better market in all over the world. This root is the best root, I believe, which we can use to develop the socioeconomic status of Sri Lanka.

Even though agriculture is the life of Sri Lankans, there are certain consequences too. Among those, the most significant problem is the health-related disorders such as Chronic Kidney Disease (CKD). There is an unknown etiology for this disease, but it is believed that it may be due to the heavy use of agrochemicals. Overdose of chemicals in agriculture is much famous in Sri Lanka. As mentioned earlier, kilograms of harvest is the dream of farmers but not the healthy diet for consumer. As a result of that, CKD was immersed in a socioeconomic crisis in the north central province of Sri Lanka, where most of semi commercial paddy cultivation and well-distributed farming systems of cereals, pulses, oil

seed and legumes are prevailed. Almost all of the victims of this disease are farmers.

As a donation, full equipped CKD treatment hospital was established in Pollonnaruwa, Sri Lanka, by the government of the Social Republic of China. Irrespectively, this disease was spared among all the age groups in the areas where agricultural is used as a primary income. As a remedy for this situation, several times the Sri Lankan government started to ban Glyphosate, like agrochemical, but it was very difficult to maintain due to the pressure developed from various social groups. In addition to that, acquit self-poisoning is a more significant issue in Rural Sri Lanka. Due to various socioeconomic problems, self-poisoning was used as a remedy to end their life. Therefore, widowers, parentless children and family- based problems became real hassle for government. Therefore, low education, early marriage, separations, sexual abuses are quite common socioeconomic issues in this area. All these consequences have direct or indirect effects on their primary occupation.

In order to overcome these negative impacts of chemical agriculture, several agricultural reforms were introduced by the government of Sri Lanka. Access to primary health and educational requirements was expanded by the government. As a result of that, socioeconomic development was resulted in rural Sri Lanka. Several subsidiaries for agriculture, such as seed or planting materials, livestock, educational interventions, processing facilities and technology transfer, were introduced to the rural community through various departments such as the Department of Agriculture, Department of Agrarian Services, Mahawelli Development Authority, Department of Export Agriculture, National Institute of Postharvest management, Department of Irrigation and water management etc. the use of chemicals and their impacts is higher in the rural community, as I mentioned at several times. As a result of that the present government decided to ban the use of chemical fertilizer and switched organic agriculture. Importation of chemical fertilizer and agrochemicals was restricted but this decision became a real trouble to the government. Various groups of people marched against the present government, and a big debate was developed within the country. Therefore, the government had to reverse the dissuasion due to the pressure from the farming community and opposition political parties. This highlighted that; changes of existing policies on behalf of the nation's development process would not be so easy. Various political and other agencies are behind the scenario.

Most of the educated agricultural professionals suggested that reform should be simple to complex in practical application. Further, their views were to initiate organic agriculture from one sector such as the plantation sector, and then shift to perishable such as fruits and vegetables. Based on the lessons learned from these changes, it would be beneficial to make decisions about the application of organic agriculture to main sectors such as paddy cultivation. Sri Lanka is 95 per cent self-sufficient with paddy as staple food. Sudden changes in all the sectors are not suitable. Therefore, gradual changes were requested by those educated front line as mentioned above. These changes were introduced during the main paddy cultivation season in Sri Lanka. In this season, a large number of paddy fields are cultivated with a rain-fed system in the dry zone of Sri Lanka. That also was one of the great concerns to refuse this government reforms.

Now, the government allows to import of agrochemicals, but they continue their process of organic agriculture through the Department of Agriculture. This information highlighted the addiction of local farmers to chemical agriculture and the power of the private agrochemical supplying agencies. Not only does this agrochemical damage to farmers through CKD, but there is an ample amount of damage to the natural ecosystem (Wimalawansa, 2015). Due to this environmental pollution, various endemic species of aquatic flora and fauna have become endangered and some have disappeared from nature. As a result, the biodiversity of aquatic and terrestrial ecosystems was reduced. In addition to that, the groundwater pollution can be considered as one of the consequences of chemical agriculture. Blue baby syndrome can be indicated as a result of groundwater pollution. With many examples, the present ruling party of Sri Lanka made good decisions to limit chemical agriculture, but support is very less from the relevant parties.

IV. Conclusion

Sri Lanka has well-reputed Department of Agriculture compost with researchers and administrators. The department conducts various timely important research in various research stations such as Rice Research and Development Institute, Field Crop Research and Development Institute, Fruit Crop Research and Development Institute, Horticultural Crop Development Institute, Plant Genetic Resource Centre, Grain Legume and Oil Seed Research and Development Institutes and Veterinary Research

Institute etc. In addition to that, Sri Lanka has fifteen national universities and they do various research and commercialization activities relating to agriculture and value addition. Other than those, there are various allied enterprises and organizations supporting agricultural development in the country. What we can see is that there is no proper collaboration, interconnection and united goals. Those organizations are working based on their own mandates, not common mandates. A basic reason for this pathetic situation is the lack of national policies.

National policy frameworks are not available for any field. Time to time political parties propose their policy through election propaganda. Once their ruling is over, such policies will be changed and new similar one will be proposed by the next ruling party. Therefore, national policies change from time to time without continuation. The most significant characteristic of economically sustainable countries is the national policy. Such national policies cannot be changed by anyone and should follow the same rules and regulations. The consequences of recurrent changes in national policies are wasting public money and stagnation of national development. Therefore, Sri Lanka needs to develop national policies for agricultural sustainability. Development of national policy or strategies for the sustainable development of a particular country cannot be done alone needs some assistance from regional countries. Cooperation together with regional countries is one way of mutual understanding for problem-solving and economic and cooperative development. Exploring cooperation in sustainable agriculture and value addition in the BIMSTEC region would be much beneficial for Sri Lanka to regain the power as grain storage of Asia.

Different regional countries have the same problem with different modes. Therefore, solutions that they have taken to overcome problems may be helpful for us to initiate strategies to overcome existing similar cases. As most of the people discussed, the introduction of organic farming in Nepal took ten years of time. At the end, they revealed that ten years would not be sufficient to achieve their expectations of organic agriculture. Cooperation for various sectors, mainly for agriculture would be better with Asian countries. Because the rice-based farming system is quite common in Asia. Regional cooperation for technology transfer, education, trade, humanity and cultural affairs are the other area we want to think about.

The Organization for Economic and Cooperative Development (OECD) is the most attractive agency due to their vision towards a Biological Economy. Biological economy emphasises the consequences of fossil fuel and they try to replace it with biological processors, such as biofuel. That is much more environmental friendly and cuts down the emission of greenhouse gases. However, cooperation with the OECD may have limitations for Asian countries. Most of the members are from the temperate zone. Therefore, the best alternative for us to work together and develop as one in Asia is economic and cooperative development through the BIMSTEC region. Therefore, Sri Lanka needs to explore possibilities to cooperate with the BIMSTEC countries for its agricultural sustainability and value addition to open many avenues for export-oriented agribusiness.

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