Agricultural Trade in South Asia

Barriers and Prospects

Nitya Nanda

SAWTEE Working Paper No. 03/12

Agricultural Trade in South Asia
Barriers and Prospects

SAWTEE Working Paper No. 03/12

South Asia Watch on Trade, Economics and Environment (SAWTEE)
26 Mamata Galli ♦ P.O. Box: 19366 ♦ Tukucha Marg
Baluwatar ♦ Kathmandu ♦ Nepal
Tel: 977-1-4444438 / 4424360
Fax: 977-1-4444570
Email: sawtee@sawtee.org
Web: www.sawtee.org

Agricultural Trade in South Asia
Barriers and Prospects

Nitya Nanda

Abstract

Agriculture plays an important role in providing livelihood and food security in South Asia. Openness to agricultural trade varies across South Asian countries, yet agricultural trade plays a crucial role in many countries of the region. The sector‟s share in exports is reasonably high, though many of the countries are net food importers. While factors like lack of complementarities, diversification of export baskets and trade facilities are important barriers to trade, supply-constraints appear to be the most important barrier despite a scope for progress in the elimination of tariff and non-tariff barriers. In a climate change scenario, agricultural trade might improve the availability of food items. However, greater intra-regional trade will not necessarily improve the overall food security situation in South Asian countries.

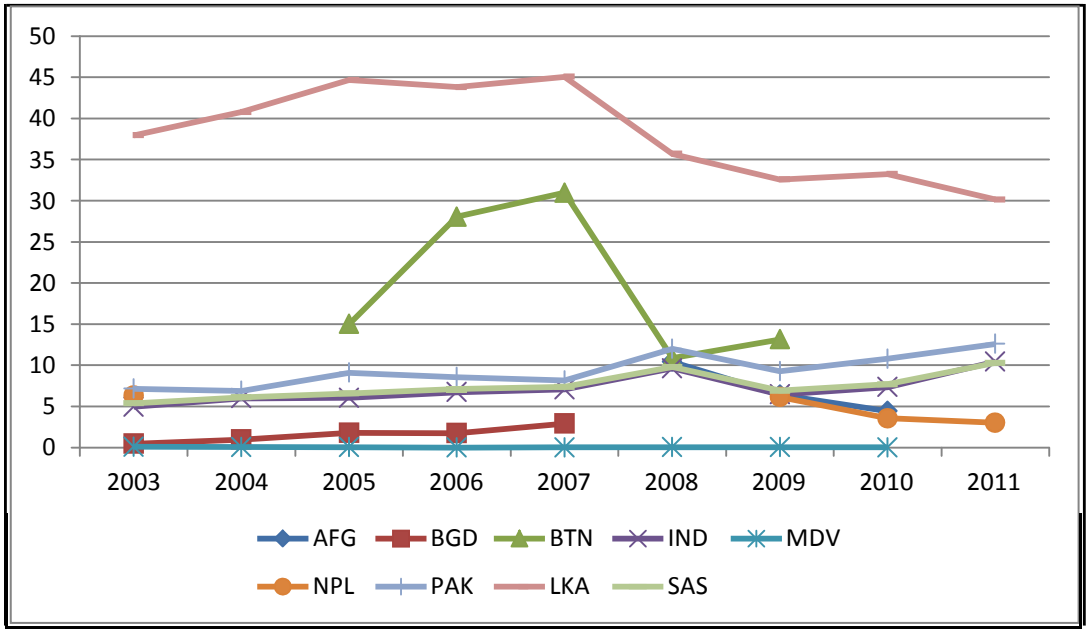
I. Introduction

Agriculture plays a unique role in South Asian economies. Though the share of agriculture in GDP has come down over the decades, it continues to employ majority of the population in all South Asian countries. In 2010, while only about 18 percent contribution to GDP came from agriculture, it provided employment to 51 percent of the population in South Asia. Agriculture is thus extremely important for providing livelihood and food security in these countries. Furthermore, agriculture sector also has a close economic link with other sectors of the economy mainly because South Asian countries in general have weak external economic linkages.

Share of agriculture in employment is significant in most South Asian countries but the share of food exports in total merchandise exports is high for only some South Asian countries (Table 1). Nonetheless, it can be argued that agricultural trade plays an important role in providing livelihood to a large number of people in South Asia. On the other hand, food imports as a share of total merchandise imports is high in all South Asian countries, except the Republic of India. Hence agricultural trade plays a significant role in ensuring food security in all these countries. Interestingly, in some countries the share of food imports in total imports and the share of food exports in total exports are both significant,

indicating that agricultural trade in these countries not only provide livelihood and food security, but also determines their ability to import food. The Islamic Republic of Afghanistan, the Republic of Maldives, the Federal Democratic Republic of Nepal, the Islamic Republic of Pakistan and the Democratic Socialist Republic of Sri Lanka fall under this category. In this context, it is important to realize that trade policy of a country can have conflicting impacts on livelihood and food security. Given the role of agricultural trade, South Asian countries thus need to maintain a fine balance between these two policy objectives.

Figure 1: Trade Intensity of South Asian Agriculture (in percent by year)



Source: World Integrated Trade Solution (WITS) and WDI (accessed on 7 November 2012)

Trade intensity, measured as the share of agricultural exports in value added in agriculture has been going up in South Asia (Figure 1). However, the picture is not quite similar in all countries. Despite the decline in recent years, trade intensity of agriculture is highest in Sri Lanka. But trade intensities in Afghanistan, the Kingdom of Bhutan and Nepal have been stagnant in recent years. The rising trade intensity in India and Pakistan is actually driving the overall rise in trade intensity of agriculture in South Asia. India"s trade intensity of agriculture has almost doubled between 2003 and 2011. Another noteworthy feature of agricultural trade in South Asia is that all countries, except India and Sri Lanka have maintained deficits in agricultural trade (Figure 2). But recently, Sri Lanka has also been running agricultural trade deficits.

In an attempt to boost intra-regional trade, South Asian countries have signed the Agreement on South Asian Free Trade Area (SAFTA). Moreover, some countries

in the region have also signed bilateral trade agreements with deeper commitments. India‟s bilateral agreements with Bhutan, Nepal, Sri Lanka and Afghanistan, and Pakistan‟s agreements with Sri Lanka and Afghanistan are worthy of mention in this context. Agricultural trade among South Asian

Table 1: Agriculture Sector Data for South Asian countries, 2010

	AFG	BGD	BHU	IND	MDV	NPL	PAK	SLK	SAS	World
Agriculture value added , % of GDP	29.92	18.59	23.18	17.74	3.14	36.53	21.18	12.79	18.28	2.81
Share of agriculture in employment (2005)	-	48.10	43.60	55.80	-	-	43	30.70	53.53	35.02
Crop Production Index (2004-6=100)	125.03	131.01	91.99	119.07	84.17	113.02	100.14	122.42	-	-
Cereal yield (kg per hectare)	1908.1	4143.5	2177.2	2536.6	2000	2294.5	2591.9	3974.3	2690.6	3563.5
Food exports (% of merchandise exports)	40.05	6.22	7.17	8.26	96.15	19.08	16.79	26.89	11.69	8.21
Food imports (% of merchandise imports)	13.69	13.90	11.47	3.95	22.35	13.56	13.08	15.35	6.86	7.43

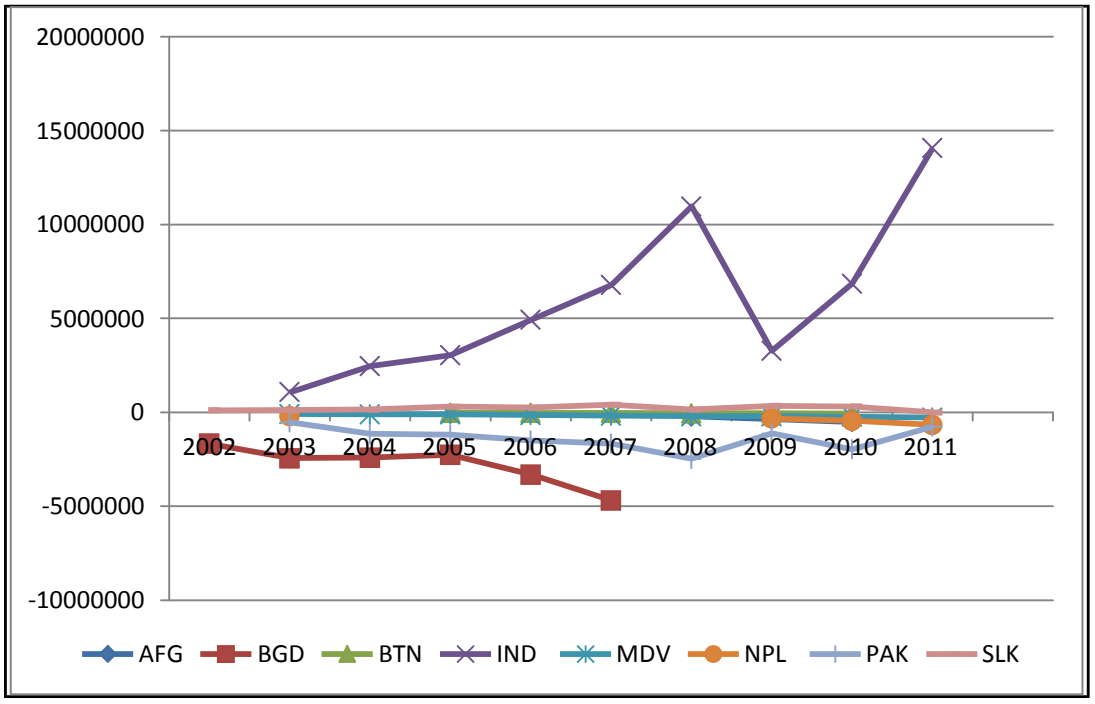
Source: World Development Indicators (WDI) (accessed on 07 November 2012)

Note: AFG=the Islamic Republic of Afghanistan; BGD=the People"s Republic of Bangladesh; BHU= the Kingdom of Bhutan; IND=the Republic of India; MDV=the Republic of Maldives; NPL=the Federal Democratic Republic of Nepal; PAK=the Islamic Republic of Pakistan; SLK=the Democratic Socialist Republic of Sri Lanka; SAS=South Asia. These abbreviations have been used in later tables and figures as well.

countries have been on the rise in recent years which could be due to pruning of sensitive lists as well as due to India‟s offer of duty free access to imports coming from the Least Developed Countries (LDCs). However, there are concerns over existing tariff and non-tariff barriers, and the lack of adequate infrastructure. Lack of trade complementarities is also often cited as a factor in regional trade (Mamoon et al. 2011).

It is also believed that the South Asian trade negotiations have yielded relatively fewer opportunities for agricultural trade compared to non-agricultural trade, likely because agriculture is a politically sensitive issue in most countries in the region (Samaratunga et al. 2007, 35). Some studies however argued for a cautious approach, as liberalization of trade in agricultural goods can have both costs and benefits (Ghimire and Adhikari 2001; Razzaque and Laurent n.d.). However, India‟s unilateral offer on duty-free access to LDCs of course might be a game changer, particularly for the four LDCs in South Asia.

Figure 2: Agricultural Trade Balance in South Asian Countries (in $„000)



Source: WITS (accessed on 7 November 2012)

The next section of the paper analyses the trends and patterns of trade in agricultural goods in South Asia. The analysis is based on the 19 of the 24 commodity groups as followed in the commodity classification of agricultural goods in United Nations Commodity Trade (UN Comtrade) database (Annexe 1). The third section deals with barriers to agricultural trade in the region which also

includes a sub-section on econometric analysis to understand the determinants of agricultural trade in South Asia. The fourth sections attempts to find some linkage between agricultural trade, climate change and food security in the region. The fifth section concludes the paper.

II. Trends and Patterns of Agricultural Trade in South Asia

During the period 2008-2009, the average annual trade in agricultural goods within South Asia was in excess of $4 billion and India accounted for about 57 percent of the total trade. While India trades with all South Asian countries, the same is not true for other countries. This is probably due to the fact that most South Asian countries do not share a common border with each other. While India shares its borders with all countries except Afghanistan and Maldives, other countries only share borders with India with the exception of Pakistan and Afghanistan who also share a common border with each other. This is also reflected in regional orientation of trade flows of agricultural goods (Table 2).

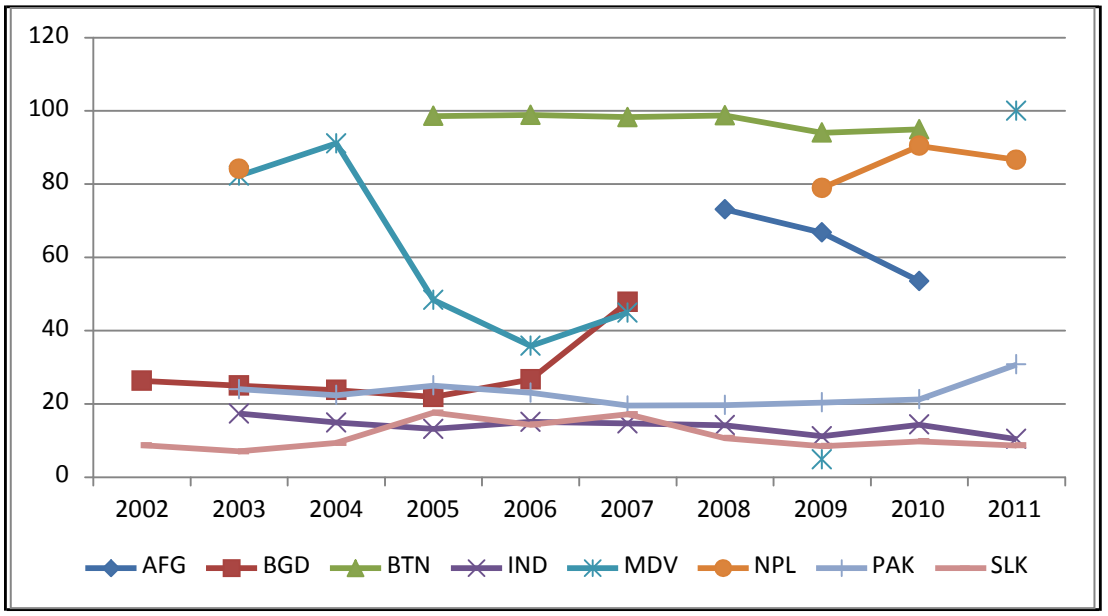
Table 2: Agricultural Trade Flows in South Asia, average of 2008-2010 (in $„000)

Exports	Imports								
↓	AFG	BGD	BTN	IND	MDV	NPL	PAK	SLK	RSAS
AFG	-	-	-	86802	-	-	80060	125	166987
BGD	76	-	1528	24384	86	1507	10660	416	38657
BTN	-	9141	-	92561	-	201	-	-	101903
IND	46772	1090890	9698	-	28152	204568	752082	320338	2452500
MDV	-	-	-	74	-	-	0	124	198
NPL	-	51921	414	128823	3	-	365	1693	183219
PAK	745158	166852	-	94932	4624	7	-	89269	1100841
SLK	144	4825	-	203778	25252	232	46500	-	280730
RSAS	792150	1323628	11640	631353	58116	206514	889668	411965	4325036

Source: WITS (accessed on 7 November 2012).
Note: There are some data gaps here and there. For Bangladesh, data was not available after 2007. In all such cases mirror data were used when possible.

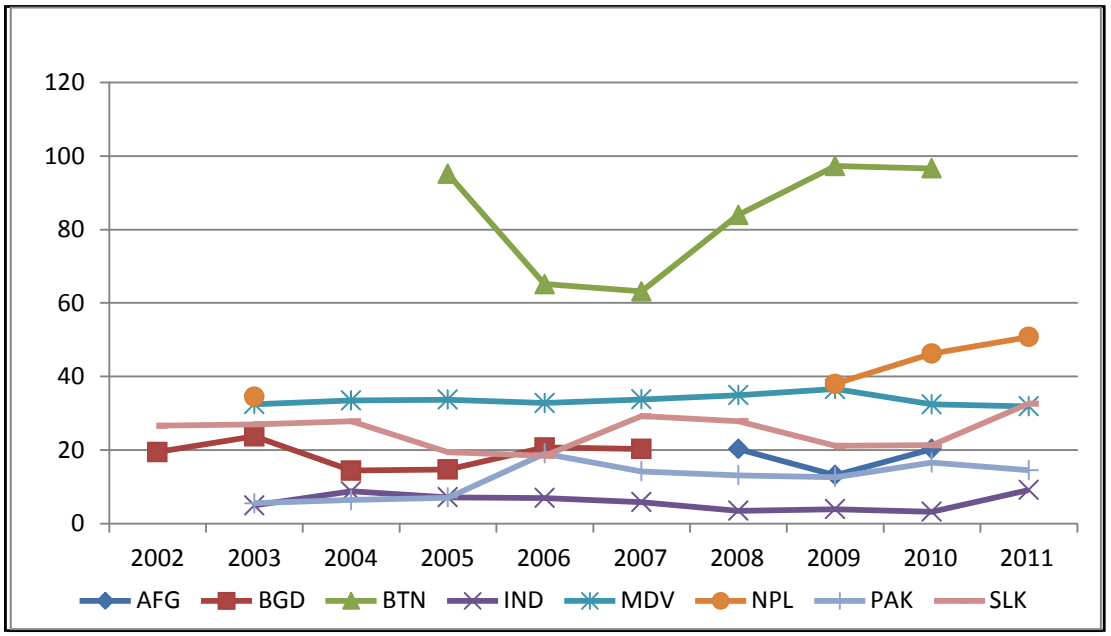
Share of regional trade in agricultural exports is low for most countries in South Asia except for landlocked countries like Afghanistan, Nepal, Bhutan and Maldives. Share of regional trade in agricultural exports has shown a stagnant or decling trend over 2002-2011, except in cases of the People"s Republic of Bangladesh and Maldives (Figure 3). However, complete data for the two countries were not available for the period considered here.

Figure 3: Share of Regional Trade in Agricultural Exports (in percent by year)



Source: WITS (accessed on 7 November 2012)

Figure 4: Share of Regional Trade in Agricultural Imports (in percent by year)



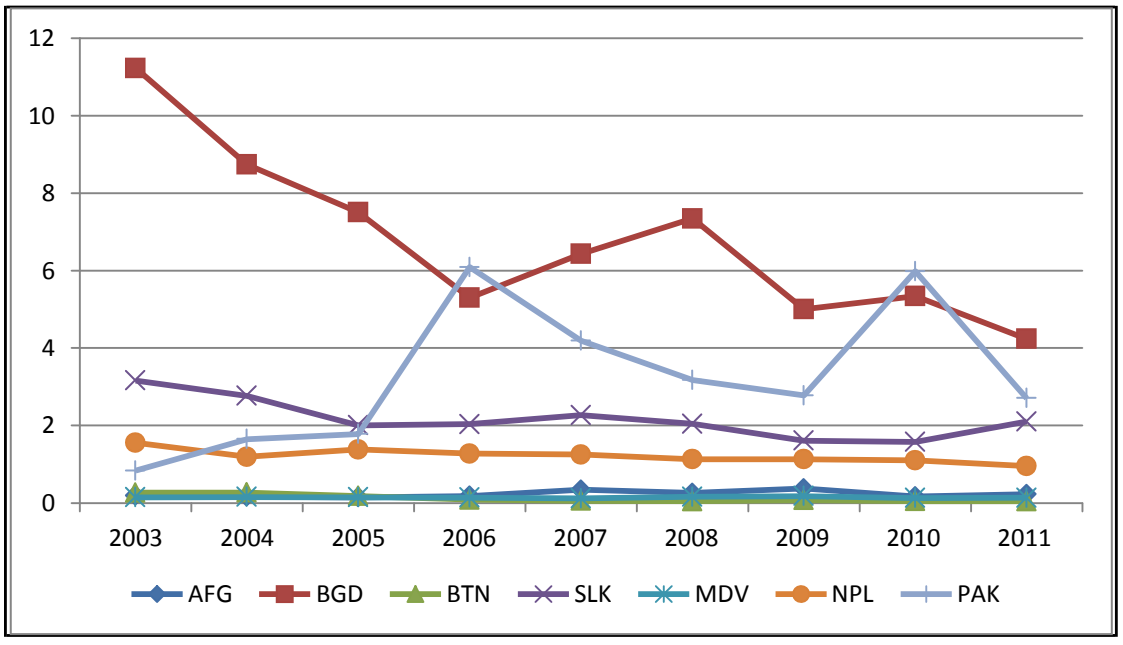
Source: WITS (accessed on 7 November 2012)

Similarly, the share of regional trade in agricultural imports also show a declining or stagnating trend in most countries of the region except in Nepal and India, both have showed an upward trend in recent years (Figure 4). Clearly, Bhutan has a

high share of regional trade in agricultural imports because the nation imports almost all of its agricultural goods from the region, notably from India and, to some extent from Bangladesh. Nepal also has relatively high share of its imports coming from the region, followed by Maldives and Sri Lanka. Hence, like exports, larger economies of the region import relatively smaller share of the agricultural goods from the region while, the smaller, landlocked and island nations import relatively larger share of their agricultural goods from the region. However, it is worth noting that although intra-regional trade in agricultural goods appears to be low overall, agricultural trade has the highest share of total intra-regional trade, i.e., in South Asia, agricultural trade is more intense than non-agricultural trade which is natural, in view of the nature of agricultural products (perishability, bulkiness etc).

Since India is responsible for more than half of intra-regional agricultural trade in South Asia, share of other South Asian countries in India"s trade can shed some light on the pattern of trade within the region (Figure 5). Bangladesh has always had the largest share of India"s exports but its share has declined from near 11 percent in 2003 to less than 5 percent in 2011. The second largest share of India"s export goes to Pakistan. Despite an historical upward trend, Pakistan"s share of Indian exports has been on the decline since 2005. Sri Lanka"s share has been steady at around 2 percent for quite some time, while the share of other countries have been less than 2 percent and are on a declining trend.

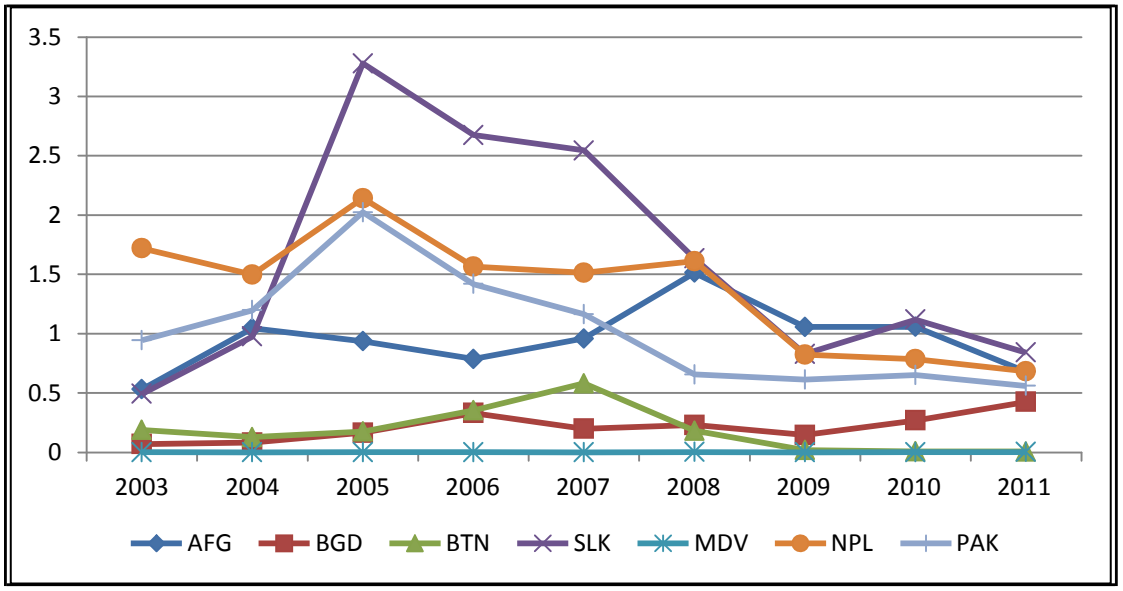
Figure 5: Share of South Asian Countries in India"s Agricultural Exports (in percent by year)



Source: WITS (accessed on 7 November 2012)

A glance at the share of South Asian countries in Indian agricultural imports brings forward an interesting picture (Figure 6). Share of all countries in the region showed an upward trend initially, but have been on a downward path in recent years, except for Bangladesh which shows a general upward trend. Sri Lanka‟s share in India‟s agricultural imports was almost negligible in 2003. With a share of only about 0.5 percent, Sri Lanka‟s was behind Nepal, Pakistan and Afghanistan. But after Sri Lanka signed a bilateral free trade agreement (FTA) with India, its share of India‟s agricultural imports increased six fold in just two years. Though Sri Lanka has since not been able to retain that level, it continues to be the largest source of India‟s agricultural imports in the region. Roughly, the year 2005 seems to be a turning point for most countries. In 2005, many countries reached individual peaks in their share of India"s agricultural imports, but unfortunately the share for many began to decrease thereafter. However, Afghanistan and Bhutan continued to increase their individual share till 2008 and 2007 respectively.

Figure 6: Share of South Asian Countries in India‟s Agricultural Imports (in percent by year)



Source: WITS (accessed on 7 November 2012)

(a) Comparative Advantage

Generally speaking, trade between countries is driven by comparative advantages and differences in technology, economies of scale or preferences, natural resources, climatic conditions and in some circumstances, by strategic trade policies. For agricultural trade, agro-climatic conditions of countries play a significant role. Prospects for trade expansion are likely to be low for countries that have comparative advantage in the production of similar products or have similar agro-climatic conditions. To understand this argument, Revealed Comparative

Advantage (RCA) index for South Asian countries' agricultural products have been estimated.

The concept of RCA is based on the assumption that the pattern of commodity trade reflects relative costs and differences in non-price factors (Balassa 1965, 103). In the theoretical model, comparative advantage is expressed in terms of relative prices evaluated in the absence of trade. Since these are not observed, in practice comparative advantage is measured indirectly. RCA uses the trade pattern to identify the sectors in which an economy has a comparative advantage, by comparing the trade profile of the country of interest with the world average. The RCA index for a product is defined as the ratio of the share of a country's exports to its share in world exports. RCA takes a value between 0 and $+\infty$. A RCA value of greater than one indicates export specialization or comparative advantage in that commodity or commodity group. It must be noted here that RCA may not reflect the true comparative advantage as it does not factor out the impacts of existing trade barriers while estimating comparative advantage.

Mathematically, RCA can be expressed as:

$$RCA = (\Sigma_d x_{isd}/\Sigma_d X_{sd}) / (\Sigma_{wd} x_{iwd}/\Sigma_{wd} X_{wd}) \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where s is the country of interest, d and w are the set of all countries in the world, i is the sector of interest, x is the commodity export flow and X is the total export flow. The numerator is the share of export of good i in total exports of country s, while the denominator is the share of world export of good i in total world exports.

It is seen that out of 24 product categories, none of the South Asian countries have RCA or significant potential to achieve comparative advantage in five of them. Table 3 below lists and reveals each South Asian country's RCA value for the remaining 19 commodities. A country is said to have revealed comparative advantage in a commodity if the RCA value exceeds unity. If the RCA value in a commodity is less than unity, the country has the potential to develop comparative advantage in that commodity. In two of the classified commodities, no country has a clear comparative advantage, but Sri Lanka has the potential to develop comparative advantage. Hence only in 17 classified commodities, one or more countries have clear comparative advantage.

As can be seen from Table 3, only a single country has a comparative advantage in five different commodities, while two countries have a comparative advantage in another five commodities. Because no country has a clear comparative advantage in two specific commodities, three or more South Asian countries have revealed comparative advantage in the remaining seven commodities. Importantly, the table shows that there are some differences in comparative advantage or export specialization across South Asian countries. But it can also be observed that most

countries in the region have comparative advantage in limited number of agricultural products. Afghanistan, Bangladesh, Pakistan and Sri Lanka have comparative advantage only in four commodities, while Maldives has advantage only in two. India has RCA value greater than one in 11 different commodities listed in table 3, indicating that it is likely to benefit the most from intra-regional trade. Interestingly, Nepal and Bhutan also do well in this regard as they have RCA value greater than one in eight and six commodities respectively. Interestingly, the overlapping comparative advantages in similar products indicate that Nepal and Bhutan tend to compete for market access in similar goods.

Table 3: Revealed Comparative Advantage of Agricultural Products, 2010

	AFG	BGD	BTN	IND	MDV	NPL	PAK	SLK
Meat				2.0				
Fish etc.		12.1		1.8	14.4		P	1.2
Live trees, flowers etc.		1.7						
Vegetables		1.2	3.8	P		5.4		
Fruits and nuts	14.8		9.4	1.5		P	1.8	P
Coffee, tea & spices	2.3		4.9	2.8		5.8		18.7
Cereals				3.8			14.8	
Milling products, malt, starches etc.								P
Oil seeds	3.4			1.3				
Lac, gums, resins etc.	62.3			10.5		3.8	2.5	
Veg. plaiting materials			2.2	6.2		188.5	3.4	9.4
Meat/fish preparations					3.5			
Sugar				2.0			P	
Prep. of cereal, flour, starch/milk						1.7		
Prep of vegetable, fruit, nuts			4.1			2.6		
Miscellaneous edible preparations								P
Beverages			2.0			1.1	P	
Residues from food industries & fodder				3.0		1.7		P
Tobacco		1.2		2.1				1.1

Source: UN Comtrade Database (accessed on 10 November 2012)
Note: RCA value of less than unity is denoted by P which implies future potential.

(b) Diversity of Trade Basket

An important factor that very often determines trade intensity or trade performance of a country is sectoral diversity or concentration of the export basket. In the analysis of intra-regional trade flow, both export and import concentration

or diversity can give crucial indications. The Hirschmann-Herfindahl Index (HHI) is a measure of the sectoral or product concentration of a country‟s exports or imports. It tells us the degree to which a country‟s exports or imports are dispersed across different economic activities. HHI can also be used to measure export or import diversification. High concentration levels of exports are sometimes interpreted as an indication of vulnerability to economic changes in the product markets.

The sectoral HHI is defined as the sum of the squared shares of exports of each industry in total exports or imports for the region or country under study. It takes a value between 0 and 1. Higher values indicate that exports or imports are concentrated in fewer sectors. Alternatively, lower values indicate that exports or imports are diversified across sectors or products. Mathematically the HHI for exports of a country can be denoted as:

$$HHI^X = \Sigma_i(\Sigma_d x_{isd}/\Sigma_d X_{sd})^2 \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2a)$$

where s is the country of interest, d is the set of all countries in the world, i is the sectors of interest, x is the commodity export flow and X is the total export flow. Each of the bracketed terms is the share of good i in the exports of country s.

Similarly, the HHI for imports of a country can be denoted as:

$$HHI^M = \Sigma_i(\Sigma_d m_{isd}/\Sigma_d M_{sd})^2 \ldots\ldots\ldots\ldots\ldots\ldots \quad (2b)$$

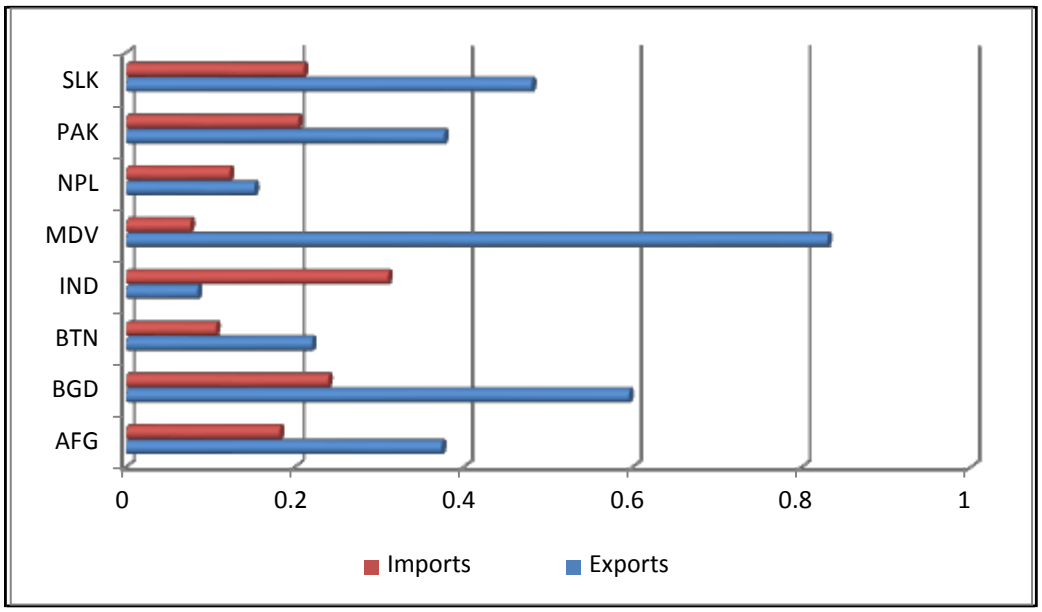
where s is the country of interest, d is the set of all countries in the world, i is the sectors of interest, m is the commodity and M is the total import.

Concentration in agricultural exports is fairly high in all countries except India (Figure 7). The HHI is higher than 0.8 for Maldives and higher than 0.5 for Bangladesh. However, import concentration is much lower in most countries in the region indicating that though they mostly export few goods, they import a wide range of agricultural products. Interestingly, while India has the lowest export concentration in the region, it has the highest import concentration. Since more than half of agricultural trade of South Asia is accounted for by India, its trade pattern is important for the whole region.

As can be seen in Figure 8, five out of eight countries in the region are dependent on a single commodity that accounts for more than 50 percent of the total agricultural exports. Clearly, fish etc. is the major export for Bangladesh and Nepal; cereals for Pakistan; tea and spices for Sri Lanka; and fruits and nuts for Afghanistan. These are generally not among the top import items in South Asian countries except cereals, which is among the major import items in Bangladesh, Bhutan and Sri Lanka (Figure 9). Apart from India, Nepal and Bhutan are the only

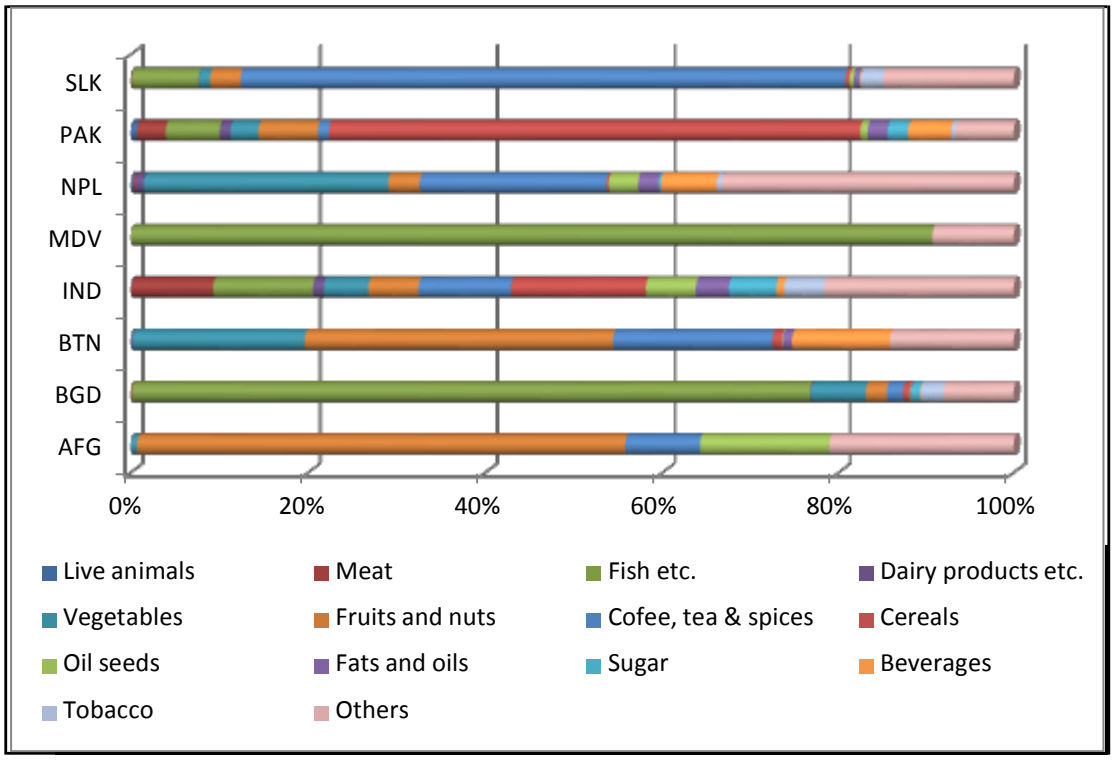
two countries that have a fair diversification of agricultural exports, and surprisingly both these countries are landlocked.

Figure 7: Concentration in Agricultural Trade: HHI, 2010



Source: UN Comtrade Database (accessed on 10 November 2012)

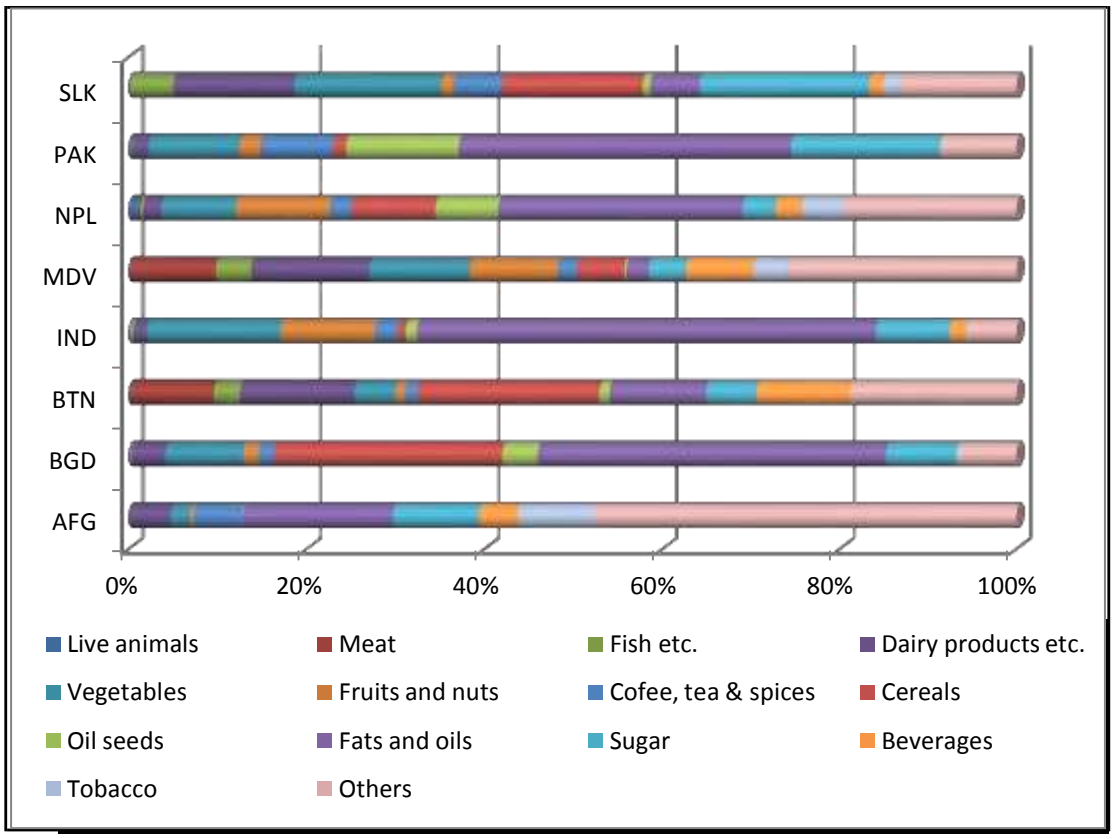
Figure 8: Diversification of Agricultural Exports, 2010



Source: UN Comtrade Database (accessed on 10 November 2012)

When it comes to imports, the picture is just the opposite (Figure 9). Since most countries have concentrated export basket, it is quite likely that they will have concentrated production pattern as well. This means that they will have to import almost everything. It is also interesting, though not surprising, India has the least diversified import basket. About half of its imports consist of fats and oils. While other countries do not show such high level of concentration on a single commodity group, fats and oils indeed do have a high share and is a major import for three other countries. Even in rest of the countries, fats and oils have a significant share in the import basket. This, along with the fact that fats and oils is not a major export item for any of the South Asian countries implies that there is relatively little scope for intra-regional trade in South Asia.

Figure 9: Import Diversification of Agricultural Products, 2010



Source: UN Comtrade Database (accessed on 10 November 2012)

(c) Trade Complementarities in the Region

Actual trade between two countries is also determined by the degree of trade complementarities that exist between them. It is also a measure of trade potential which may not be realised due to distance and other trade barriers. The complementarity index measures the degree to which the export pattern of one country matches the import pattern of another. It is defined as the sum of the absolute value of the difference between the import category shares and the export

shares of the countries under study, divided by two. The index is converted to percentage and hence the values range between 0 and 100. Mathematically, the index can be denoted as:

$$TCI_{sd} = [1-\{\Sigma_i|(\Sigma_w m_{iwd}/\Sigma_w M_{wd} - \Sigma_w x_{isw}/\Sigma_w X_{sw})|\}/2] *100 \ldots\ldots\ldots (3)$$

where d is the importing country of interest, s is the exporting country of interest, w is the set of all countries in the world, i is the set of industries, x is the commodity export flow, X is the total export flow, m the commodity import flow, and M the total import flow. In words, we take the sum of the absolute value of the difference between the sectoral import shares of one country and the sectoral export shares of the other. Dividing by 2 coverts this to a number between 0 and 1, with zero indicating all shares matched and 1 indicating none did. Subtracting from one reverses the sign, and multiplying by 100 puts the measure in percentage terms.

Table 4: Trade Complementarities between South Asian Countries, 2010

Export	Imports								
↓	AFG	BGD	BTN	IND	MDV	NPL	PAK	SLK	SA-IND
AFG		8		16			4	16	
BGD	9		16	15	22	19	15	16	
BTN		16		34		30			
IND	24	45	53		51	56	41	44	52
MDV				2				2	
NPL		26	32	33			36	35	
PAK	14	42		25	39	36		32	
SLK	16	12		14	25	22	21		
SA-IND				25					

Source: UN Comtrade Database (accessed on 10 November 2012)

Export complementarities as well as import complementarities are generally low among South Asian countries (Table 4). Afghanistan has the highest export

complementarity with India and Sri Lanka with a complementarity index value of 16. For Bangladesh, the highest export complementarity is with Maldives and Nepal with the index value of 22 and 19 respectively. Bhutan has relatively better export complementarity with India and Nepal with the index value of 34 and 30 respectively. With an index value of 36 and 35 respectively, Nepal has the highest export complementarity with Pakistan and Sri Lanka. For Pakistan, the highest export complementarity is with Bangladesh and Maldives with the index value of 42 and 39 respectively. On the other hand, Sri Lanka‟s export complementarities are relatively low. Sri Lanka‟s highest complementarity index value is 25 with Maldives, followed by Nepal and Pakistan with an index value 22 and 21 respectively.

Since India has the most diversified export basket, it also has relatively better export complementarity with all countries in the region; the lowest complementarity index value being 24 with Afghanistan and the highest index value of 56 with Nepal. With an export complementarity index value of 53 and 51, India also has good export complementarity with Bhutan and Maldives. However, India‟s import complementarities are much lower, the highest being 34 with Bhutan, followed by Nepal and Pakistan with an index value of 33 and 25 respectively. It is interesting to note that, except Maldives, India‟s import complementarity is the lowest with Sri Lanka, and yet Sri Lanka has the highest share in Indian imports in South Asia.

III. Barriers to Agricultural Trade

As has been seen in the previous sections, there are some natural factors that adversely affect intra-regional trade in South Asia. Countries have comparative advantage in similar products, there is lack of diversity in the export basket of agricultural goods, not to mention the lack of trade complementarities etc. However, there are some barriers that are policy induced. Of course, the two types of factors often interact with each other in determining the bilateral trade flows among countries. The following paragraphs discuss some of the barriers that affect regional agricultural trade in South Asia.

(a) Import Tariffs in South Asia

Import tariff is one of the oldest instruments used to protect domestic production of goods as well as to raise revenue. Import tariffs have generally come down across the globe, yet tariffs on agricultural goods remain much higher compared to other goods, particularly in the developed world. Considering that, import duty on agricultural goods in South Asian countries are relatively low, the average effective tariff on agricultural goods within South Asia is highest in Bhutan followed by India and Sri Lanka (Table 5). It should be noted that Bhutan is not yet a member of the World Trade Organization (WTO) and hence has no global binding commitment to lower tariffs.

Table 5: Average Effective Tariffs on Agricultural Products, 2009

Exporting Country/Region	Importing Country							
	AFG	BGD	BTN	IND	MDV	NPL	PAK	SLK
WLD	7.26	18.52	49.34	34.6	17.07	14.56	19.1	21.8
AFG	-	19.5	-	34.69	-	-	11.54	15
BGD	4.38	-	36.67	37.36	23.93	19.29	12.22	24.78
BTN	-	24.05	-	1.07	-	22.5	15.88	-
IND	5.57	14.64	44.48	-	15.51	11.29	9.16	19.6
MDV	-	-	-	65	-	-	31.43	25.15
NPL	-	11.34	46	39.17	25	-	8.67	13.66
PAK	6.61	17.76	-	27.29	14.13	8.91	-	11.02
SLK	7.13	18.27	-	9.13	15.48	18.33	15.93	-

Source: WITS (accessed on 7 November 2012)
Note: The tariff figures are simple average of effective tariffs. In some cases tariff figures for 2009 were not available, figure for earlier year was considered.

The other two high tariff imposing countries, India and Sri Lanka have one interesting similarity. They are the only two South Asian countries that have maintained trade surplus in agricultural goods over the years, though in recent years, Sri Lanka has not been able to maintain its trade surplus. It appears that countries with high trade deficit in agricultural goods tend to impose lower import duty. May be these countries cannot afford to impose high import duty due to food security concerns. Bhutan is of course an exception in this regard as it has high trade deficit in agricultural goods and at the same time imposes high import duty. Among South Asian countries, Nepal faces the highest average effective tariffs in Bhutan and alternatively Bhutan also faces the highest average effective tariffs in Nepal. This is likely because the two countries have similar trade baskets as well as similar comparative advantage profiles.

While India imposes the highest average effective import duty in the region, its duty is lowest on agricultural goods coming from Bhutan, which is also the lowest duty on agricultural goods imposed by any country in the region. Interestingly, this is despite the fact that Bhutan"s import duty is the second highest for its regional partners. The latest tariff data was not available and hence the data provided in Table 4 might not have captured the impacts of India"s policy of offering duty free access to imports coming from LDCs and the pruning of sensitive lists in all countries. Furthermore, countries continue to impose several para-tariff measures that also affect agricultural trade within the region.

(b) Non-Tariff Measures (NTMs)

Non-tariff measures are legitimate means to regulate bilateral trade for achieving health, safety, environmental and other socio-economic objectives. However, they are often used in disguise to restrict trade, and hence are often termed non-tariff barriers. This practise is well recognised in global trade negotiations and as a result, Agreement on Technical Barriers to Trade (TBT) and the Agreement on Sanitary and Phytosanitary (SPS) Measures were signed to ensure that such measures are used for legitimate purposes and not to restrict trade. Nevertheless, the agreements are not easy to impose since legitimacy is often a matter of subjective assessment. While TBT relates to both agricultural and industrial goods, SPS are largely applied on agricultural goods.

NTMs affecting agricultural trade relate to standards, testing and certification procedures. For example, in India, there are bio-security and SPS requirements. Nearly all agricultural imports, including livestock and food products require some kind of SPS certificate and import permit. Getting such certificates are often time and resource consuming (Raihan 2012, 28). Bangladesh continues to ban imports of poultry products from India despite India having regained avian influenza-free status and many other countries lifting the ban. Till recently, Pakistan used to import from India on the basis of a positive list. Incidentally, it has not yet given India most-favoured nation (MFN) status, which now is expected to forthcoming anytime (Mukherjee 2012, 30). It is also noteworthy that South Asian countries tend to use export restrictions to deal with seasonal shortages of goods such as rice, onion, fish etc.

Incidence of NTMs is relatively low in South Asia not only compared to developed countries but also in comparison to many developing countries since the development of standards is quite immature in the region. However, it must also be noted that there is huge inequality with respect to development of standards and testing procedures across South Asian countries. As one would expect, in India, standards and testing procedures are better developed compared to its regional neighbours. Hence, other South Asian countries often find it difficult to meet Indian standards. On the other hand, some of these countries are often so dependent on essential commodities that they have limited options and cannot afford to impose high standards on agricultural imports.

Article 8 of the SAFTA Agreement provides for harmonization of standards, reciprocal recognition of tests, accreditation of testing laboratories etc., but without any strict restriction on time. Thus, the progress made so far in this regard is quite disappointing. While the need for a regional initiative was felt long ago, the Agreement on the Establishment of South Asian Regional Standards Organisation (SARSO) only came into effect on 25 August 2011. Interestingly, India has made more progress in its trade policies with countries from outside the region (e.g. Singapore) than it has with its regional trading partners.

(c) Trade Facilitation

Trade facilitation or rather lack of it appears to be one of the reasons for relatively low intra-regional trade in South Asia. Export and import costs are both higher in South Asia when compared to the world average (Table 6). What is more important is that the region has lagged behind others in making improvements in this regard. In 2005, the average import cost in South Asia was substantially lower compared to the world average, whereas the average export cost was marginally lower. In 2011, costs to import became marginally lower, while the export costs became substantially higher. It is also interesting to note that, globally, export costs are relatively lower compared to import costs. However, the same is not true for South Asia and more specifically for India, which does not provide such cost effect policies to boost international trade.

When it comes to efficient time management in the export and import of agricultural goods, South Asia fare much worse compared to the world average. Despite improvements made to remove such trade constraints in South Asia since 2005, the existence of such trade constraints, mainly high export costs are much greater in South Asian countries when compared to rest of the world. But it is important to note that the time taken by India to export agricultural goods is the lowest in the region and is far lower than the world average. This could also be one of the factors leading to India"s dominance in South Asian trade apart from its size. While export costs have increased all around the world, import costs have increased globally except in India where the costs have come down significantly. While most countries in the region have reduced the time to export, it has reduced substantially in India but has increased in Afghanistan. Similarly, most countries have reduced the time to import. Import time has reduced substantially in India and Pakistan, which is indeed good news for other countries in the region as they are the two largest economies of South Asia.

Nevertheless, it is well recognized that poor customs procedures and other infrastructural problems like lack of storage facilities at borders, particularly at Land Customs Stations along India-Pakistan and India-Bangladesh borders, limited space for loading bays and poor road conditions act as barriers to intra-regional trade in South Asia. Poor transit facility is also believed to be constraining intra-regional trade between Nepal and Bangladesh, Bangladesh and Pakistan, and India and Afghanistan. Though the SAFTA Agreement has provision for simplification and harmonization of customs clearance procedures, transit facilities, particularly for land locked countries, development of transport infrastructures and communications and facilitation of business visa, the progress made so far is not encouraging.

Table 6: Trade Facilitation Indicators in South Asia, 2011

	AFG	BGD	BHU	IND	MDV	NPL	PAK	SLK	S. Asia	World
Cost to export (US$ per container) – 2011	3545	965	2230	1095	1550	1960	660	715	1590	1414.24
Cost to import (US$ per container) – 2011	3830	1370	2505	1150	1526	2095	705	745	1740.75	1676.37
Export advantage	1.08	1.42	1.12	1.05	0.98	1.07	1.07	1.04	1.09	1.19
Time to export (days) -2011	74	25	38	16	21	41	21	21	32.13	22.09
Time to import (days) -2011	77	34	38	20	22	35	18	19	32.88	24.62
Export advantage	1.04	1.36	1.00	1.25	1.05	0.85	0.86	0.90	1.02	1.11
Cost to export (US$ per container) 2005	2180	902	1150	864	1200	1600	996	647	1192.38	1219.72
Improvement over 2005-2011	-62.61	-6.98	-93.91	-26.74	-29.17	-22.50	33.73	-10.51	-33.35	-15.95
Cost to import (US$ per container) -2005	2100	1287	1780	1324	1200	1725	317	639	1296.50	1440.11
Improvement over 2005-2011	-82.38	-6.45	-40.73	13.14	-27.17	-21.45	-122.40	-16.59	-34.27	-16.41
Time to export (days) – 2005	67	35	38	27	21	43	31	25	35.88	27.39
Improvement over 2005-2011	-10.45	28.57	0.00	40.74	0.00	4.65	32.26	16.00	10.45	19.35
Time to import (days) -2005	80	60	38	41	20	35	39	26	42.38	32.06
Improvement over 2005-2011	3.75	43.33	0.00	51.22	-10.00	0.00	53.85	26.92	22.42	23.20

Source: WDI (accessed on 07 November 2012)

Table 8: Indicators of Supply Side Constraints in Agriculture, 2010

	AFG	BGD	BTN	IND	MDV	NPL	PAK	SLK	SAS	WLD
Agriculture value added per worker (constant 2000 US$)		480.14	465.32	479.01	2671.38	242.05	962.62	906.88	510.35	1064.38
Arable land (hectares per person)	0.23	0.05	0.11	0.13	0.01	0.08	0.12	0.06	0.12	0.20
Average precipitation in depth (mm per year)	327.00	2666.00	2200.00	1083.00	1972.00	1500.00	494.00	1712.00		
Cereal yield (kg per hectare)	2045.20	4140.80	2159.10	2571.90	2041.70	2373.90	2789.70	3663.60	2728.87	3567.94
Droughts, floods, extreme temperatures (% of population, average 1990-2009)	1.06	4.58	0.01	4.36	0.03	0.70	1.06	2.16		

Source: WDI (accessed on 7 November 2012)

(d) Econometric Model

To better understand the factors determining trade flows of agricultural goods among South Asian countries, let us now look at an econometric model. A gravity model type econometric specification has been considered. The gravity model of trade is similar to other gravity models and it predicts bilateral trade flows based on the economic size of the two trading partners (often using GDP) and distance between two them. The model was first used by Tinbergen in 1962. The basic theoretical model for trade between two countries (i and j) takes the form of:

$$T_{ij} = K(M_i M_j / D_{ij}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

where T_{ij} is the trade flow between countries i and j (export from country i to j), M_i and M_j are the economic masses of country i and j respectively, D_{ij} is the distance between countries i and j and K is a constant.

In general a gravity model uses GDP of the trading partners as the economic masses and hence is not able to distinguish between the directions of trade flows (T_{ij} and T_{ji}) between the countries. The specification considered here uses different economic variables for the economic masses of the exporting and importing countries and hence is able to distinguish between T_{ij} and T_{ji}. The basic model considered here can be expressed by the following function:

$$T_{ij} = f(AVA_i, GDP_j, AED_{ij}, TCI_{ij}, D) \quad \ldots\ldots\ldots \quad (5)$$

where T_{ij} is the trade flow between countries i and j (export from country i to j), AVA_i is value added in agriculture in country i, GDP_j is gross domestic product, AED_{ij} is the average effective import duty that the country i faces in country j, TCI_{ij} is the trade complementarity index for the exports of country i in country j, and D is a dummy variable which takes the value 1 if the countries i and j share border with each other and 0 otherwise.

(i) Justification and Data

The date for T_{ij} was obtained from WITS. Since agricultural export is subject to high fluctuations, average agricultural export from 2008-2010 is considered. In some cases, agricultural export data for all three years were not available and hence average of two years or even trade figure of a single year was considered. The data used in this analysis have been presented in Table 2.

Since the independent variable T_{ij} is a measure of agricultural exports from country i to country j, GDP of country i is not an appropriate measure of the size of the exporting country. Instead, agriculture value added to the GDP of country i is a more appropriate measure of the economic size of country i. This is because the value added to the GDP by other sectors is unlikely to influence the export of

agricultural goods from a country i to country j. The data for agricultural value added were obtained from the World Development Indicators.

Even though agricultural value added is considered as a measure of the economic mass of country i, the economic mass of country j is best represented by the GDP of country j. Because agricultural goods are used by the entire population as foods and also used as raw materials in industries, the GDP of country j is an ideal measure of the economic size of the importing country. Once again, the data for the variable GDP_j was obtained from World Development Indicators.

Average effective import tariff data for AED_{ij} was obtained from WITS database, whereas data for TCI_{ij} was estimated using trade flow data of agricultural goods obtained from UN Comtrade database. Data used for AED_{ij} is presented in Table 4 and the data for TCI_{ij} is presented in Table 3.

In a gravity model it is customary to use distance between two countries as one of the independent variables. Often a dummy variable for neighbouring countries is also used. However, measuring the distance has always been a difficult issue. In the South Asian context, the size of the countries are quite skewed and the geographical orientation of the countries is also quite peculiar where the largest country, India is at the centre and other countries are largely in the periphery. Moreover, for many of the smaller countries, trade occurs largely with the neighbouring regions of India, and hence, measuring distance poses an even greater challenge. Therefore, only a dummy for neighbouring countries is used in our specification.

The basic model considered here is:

$$\ln T_{ij} = \ln AVA_i + \ln GDP_j + D \quad \text{.....(6)}$$

where $\ln T_{ij}$ is the natural logarithm of T_{ij}, $\ln AVA_i$ is the natural logarithm of AVA_i and $\ln GDP_j$ is the natural logarithm of GDP_j.

However, as indicated earlier, the basic model was extended to include TCI and AED and the following two versions were estimated:

$$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + AED_{ij} + D \quad \text{.....(7a)}$$

$$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + \ln AED_{ij} + D \quad \text{.....(7b)}$$

Some other forms were also used where variable like population in exporting country, population in importing country, cost to export in exporting country as well as the sum of the cost to export in exporting country and the cost to import in

importing country were also considered. The following four specifications were tried:

$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + AED_{ij} + \ln POP_i + \ln POP_j + D$ ……(8a)

$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + AED_{ij} + \ln POP_i + D$ ……(8b)

$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + AED_{ij} + CTE_i + D$ ……..…. (9a)

$\ln T_{ij} = \ln AVA_i + \ln GDP_j + \ln TCI_{ij} + AED_{ij} + CTT_i + D$ ……..….. (9b)

where $\ln POP_i$ is the logarithmic value of the population of exporting country, $\ln POP_j$ is the logarithmic value of the population of the importing country, CTE_i is the cost to export in exporting country and CTT_{ij} is the sum of cost to export in the exporting country and the cost to import in importing country.

(ii) Regression Results

Estimated results of different regression equations are presented in Table 7. In the basic model, all the variables included are highly significant. All the variables also show expected signs, i.e., agricultural value added in exporting country, GDP of importing country as well as the neighbourhood dummy, all influence trade positively. When trade complementarity index and average effective duty are included, trade complementarity shows significance but only at the level of 80 percent, but average effective duty turns out to be insignificant. Significance of the original variables remains almost similar.

Table 7: Regression Results of Gravity Models

	Eq. 6	Eq. 7a	Eq. 7b	Eq. 8a	Eq. 8b	Eq. 9a	Eq. 9b
Intercept	-22.22*	-19.80*	-20.21*	-37.40*	-31.33*	-20.70*	-20.48*
$\ln AVA_i$	0.71*	0.49*	0.51*	2.56**	2.26***	0.54*	0.50*
$\ln GDP_j$	0.56*	0.57*	0.57*	1.07**	0.60*	0.55*	0.58*
$\ln TCI_{ij}$		0.84***	0.86***	0.34	0.46	0.80***	0.85***
AED_{ij}		-0.02		-0.01	-0.01	-0.02	-0.02
$\ln AED_{ij}$			-0.16				
$\ln POP_i$				-1.88***	-1.62***		
$\ln POP_j$				-0.42			
CTE_i						0.00	
CTT_{ij}							0.00
Dummy	2.53*	2.64*	2.61*	2.15	2.32*	2.65*	2.65*
Multiple R	0.75	0.77	0.77	0.79	0.79	0.78	0.77
R Square	0.57	0.59	0.59	0.63	0.62	0.60	0.60
Adj. R Square	0.53	0.53	0.53	0.54	0.55	0.53	0.52

Std Error	2.19	2.18	2.18	2.16	2.15	2.19	2.20
Observations	39	39	39	39	39	39	39

Note: * indicates significant at 95 percent level of confidence, ** indicates significant at 90 percent level of confidence and *** indicates significant at 80 percent level of confidence respectively.

When populations of both exporting and importing countries are also included in the equation, population of exporting country appears to be significant only at 80 percent level of confidence, while population of importing country turns out to be insignificant. But the status of other variables remains almost similar, except the trade complementarity index which turns out to be insignificant. However, when only the population of exporting country is included, the significance of agricultural value added comes down a bit. It might not be a good idea to include them together, as South Asian countries being at similar stage of development, population has a link with GDP and agricultural value added. Nevertheless, the negative sign of population in exporting country might be an important indication that availability of exportable surplus can be a factor in agricultural trade.

When trade facilitation indicators are included instead of population, whether as the cost to export in exporting countries or as the sum of cost to export in exporting country and the cost to import in importing country, nothing changes in the model, i.e., significance of the other variables remain almost similar, but the trade facilitation indicators turn out to be insignificant. This may appear to be strange as very often it is thought that trade facilitation is quite bad in the region and is one of the factors responsible for lower intra-regional trade in South Asia. It may however be noted that the trade facilitation indicators used in the model as reported by WDI are largely based on subjective assessment of stakeholders rather than hardcore data. Results pertaining to the variables considered in the basic models are quite stable in different specifications indicating that the basic model is quite robust.

(e) Supply Side Constraints

Regression results in all the specifications used here show that agricultural value added to the GDP of the exporting country is a significant factor in determining intra-regional agricultural trade in South Asia. However, the most important supply-side constraint in agriculture is the availability of land. Except Afghanistan, in all South Asian countries, availability of arable land is much lower than the global average. Among the remaining South Asian countries, India has the highest availability of per capita arable land. Bangladesh, Maldives, Sri Lanka and Nepal all have very low per capita availability of arable land. Though Afghanistan has the highest per capita availability of land, its agriculture is seriously affected by shortage of water. Similarly, though Pakistan"s availability of arable land is slightly below the Indian level, it faces serious water shortage as well.

Together with the availability of water and occurrence of extreme weather conditions, the lack of availability of arable land ensures that the supply capacity of agricultural products is weak in most South Asian countries. Such weak supply capacity might have partly been responsible for the fact that most countries in the region are net importers of agricultural products. Agricultural productivity is another factor that might have caused constraint on agricultural trade and yet in some countries there is substantial scope for improvements in agricultural productivity.

Another supply-side constraint could be the availability of infrastructure. Lack of proper roads indicates that farm lands are not well connected to the ports. In countries like Nepal, traders in Kathmandu might find it difficult to access hinterland farms in Nepal and find it easier to import agricultural goods from India, contributing to agricultural trade deficit.

IV. Agricultural Trade, Climate Change and Food Security

It is widely argued that South Asia will be one of the most adversely affected regions in terms of the impact of climate change on agricultural yield. A study by Laborde (2011) shows that both the overall level of economic activity and trade flows will react to climate change. According to this study, trade policies may not significantly alter the overall economic impact of climate change in South Asian countries but may lead to relatively significant changes for the poor.

Impact on agriculture through different channels will affect trade performance of the South Asian countries (Nanda 2010). In central India, wheat yields may drop by 2 percent in a pessimistic climate change scenario, and one study has estimated that even after accounting for farm level adaptation, a 2 °C rise in mean temperature and a 7 percent increase in mean precipitation will reduce net revenues by 8.4 percent. In Pakistan, cereal crops are already at the margin of stress and it has been estimated that wheat yields are predicted to decline by 6-9 percent in sub-humid, semiarid, and arid areas with 1°C increase in temperature, while even a 0.3°C rise could have a severe impact on important cash crops like cotton, mango, and sugarcane. In Sri Lanka, half a degree temperature rise is predicted to reduce rice output by 6 percent, and increased dryness will adversely affect yields of key products like tea, rubber, and coconut (Kelkar and Bhadwal 2007, 9). A study conducted by International Rice Research Institute (IRRI) has estimated that a 1 °C rise in temperature can reduce rice yield by about 10 percent. Rice being the staple food in many parts of South Asia, this could have serious implications for food security in the region.

Climate change is also likely to increase the frequency of droughts and extreme rainfall leading to floods and cyclones. Bangladesh, India and Sri Lanka are already badly affected by such events as crops are damaged on a regular basis. Many other

parts of South Asia are also affected from time to time. In Nepal and Bhutan, it is expected that increased severity and frequency of storms and floods could aggravate the occurrence of landslides, which will deposit sediments in agricultural lands, irrigation canals and streams, which, in turn, will contribute to deterioration in the quality of agricultural lands and affect crop production (Kelkar and Bhadwal 2007, 10).

Apart from temperature rise and extreme weather conditions, climate change can affect the agriculture sector by affecting the availability of water. Many parts of South Asia are already water stressed. Pakistan is already withdrawing about 80 percent of water available (citation needed). Though withdrawal rate in India is much lower, in parts of India, situation is as bad as Pakistan. Reduced productivity of agriculture would have implications for agricultural trade in all countries in the region. Except India, all countries in the region are net importers of agricultural goods. Hence, climate change will mean that most countries will have higher import requirements in agricultural goods, while India might face a decline in export of agricultural goods.

How food security will be affected in such a scenario is a complex issue. Food security of a nation can be analyzed within an A^4 framework where the 4 A"s stand for availability, accessibility, affordability and acceptability. Availability refers to the supply of food at the macro level. Accessibility refers to the ability of the people to buy foods irrespective of their location and affordability refers to the ability of the people to buy food at prices prevailing in the market. Finally, acceptability implies that food available should be safe and conforming to the taste and food habits of people.

Intra-regional trade can improve overall food availability but in a situation of general scarcity, the food available may not necessarily be affordable. Trade cannot improve accessibility which has to be ensured by national governments by improving supply channels. Collective efforts could also be useful if South Asian countries join hands to tackle the problem of food security. SAARC Food Bank established in 2007 can go a long way in this regard if managed properly since the SAARC Food Bank is expected to complement national efforts to provide food security. Finally, agricultural products coming from within the region might have greater acceptability as there are similarities in food preferences across borders within the region. However, it might be difficult to conclude that intra-regional trade in agricultural goods will improve the overall food security in a climate change scenario.

I. Conclusion

Though share of agriculture has been declining in South Asian countries, it continues to provide employment to large portion of the population, and hence plays an important role in providing livelihood and food security. Agricultural

goods have a relatively high share in exports in most countries of the region, and yet, most of the countries are net food importers. Agricultural trade has a complex role in providing livelihood and food security to the population of South Asian countries. Thus, the issue of trade in agricultural goods needs to approached with caution.

There are several barriers that are hindering growth in intra-regional agricultural trade in South Asia. However, it should be recognized that intra-regional trade in South
Asia is dominated by agricultural trade. The lack of trade complementarities between South Asian nations as well as the lack of diversification of export baskets is both important trade barriers. Comparative advantage patterns in agricultural goods are also not quite favourable in promoting intra-regional trade. Also, the lack of trade and infrastructural facilities are both to some extent responsible for the current situation of the intra-regional agricultural trade in South Asia.

The econometric analysis shows that tariff barriers are unlikely to have acted as a major hindrance to intra-regional agricultural trade in South Asia. It may be noted that Sri Lanka increased its trade in agricultural goods with India upon signing a bilateral free trade agreement with India. However, this case may not be generalized, as Sri Lanka, apart from India, has been the only South Asian country that has maintained surplus in trade in agricultural goods, while all other countries have consistently maintained deficit in agricultural trade.

The analysis also shows that the lack of supply capacity might be the most important barrier for agricultural trade in South Asia. It is difficult to quantify non-tariff barriers and hence difficult to include them in an econometric model. However, given that tariff barriers have not played any decisive role, it is unlikely that non-tariff barriers might have been significant obstacles to trade in agricultural goods within South Asia. It is also not clear if in a climate change scenario, intra-regional trade will play any major role in addressing food security concerns, though it can definitely make a contribution.

Since trade in agricultural goods is significantly linked to livelihood and food security concerns, reducing tariff and non-tariff barriers may not be seen as panacea. Hence, the major focus in South Asian countries should be on reducing the supply constraints. Elimination of supply constraints is likely to have a positive impact on intra-regional agricultural trade without having an adverse affect on the livelihood and food security of the people in South Asian countries.

References

Balassa, B. 1965. "Trade Liberalization and Revealed Comparative Advantage." The Manchester School of Economic and Social Studies 33:99-123.

Ghimire, Hiramani, and Ratnakar Adhikari. 2001. "Agricultural Liberalisation and its Impact on South Asia." Discussion Paper. SAWTEE, Kathmandu and CUTS, Jaipur.

Kelkar, Ulka and Suruchi Bhadwal. 2007. "South Asian Regional Study on Climate Change Impacts and Adaptation: Implications for Human Development." Occasional Paper. UNDP, Human Development Report Office.

Laborde, David. 2011. "Climate Change and Agriculture in South Asia: Looking for an Optimal Trade Policy." Paper presented at the Agriculture & Applied Economics Association"s 2011 AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 21-24.

Mamoon, Dawood, Sohail Paracha, Hammad Mughal and Annam Ayesha. 2011. "Pakistan"s trade competitiveness & complementarities in South Asia." Munich Personal RePEc Archive (MPRA) Paper No. 31369.

Mukherjee, I. N. 2012. "Non-tariff barriers facing South Asia: Case of India." Trade Insight 8(3): 30-31.

Nanda, Nitya. 2010. "International Trade and Climate Change: Issues for South Asia." Discussion Paper. SAWTEE, Kathmandu.

Rahman, Mustafizur, Mazbahul Golam Ahamad, A. K. M. Nazrul Islam and Muhammad Al Amin. 2012. "Agricultural Trade between Bangladesh and India: An analysis of Trends, Trading Patterns and Determinants." CPD-CMI Working Paper 3. Center for Policy Dialogues, Dhaka.

Raihan, Selim. 2012. "Non-tariff barriers facing South Asia: Case of Bangladesh." Trade Insight 8(3): 28-29.

Razzaque, Mohammad A. and Edwin Laurent. "Agriculture and Rice Trade Liberalisation: Potential Implications for South Asian Countries." Commonwealth Trade Hot Topics 48.

Samaratunga, Parakrama, Kamal Karunagoda and Manoj Thibbotuwawa. 2007. "Mapping and Analysis of the South Asian Agricultural Trade Liberalization Efforts." In Agricultural Trade: Planting the Seeds of Regional Liberalization in

Asia: A Study of the Asia Pacific Research and Training Network on Trade, 33-74, United Nations Publication.

Tinbergen, J. 1962. Shaping the world economy: Suggestions for an international economic policy. New York: The Twentieth Century Fund.

Annexe 1: Classification of Agricultural Commodity

01	Live animal
02	Meat and edible meat offal
03	Fish & crustacean, mollusc & other aquatic invertebrate
04	Dairy prod; birds' eggs; natural honey; edible prod nes
05	Products of animal origin, nes or included.
06	Live tree & other plant; bulb, root; cut flowers etc
07	Edible vegetables and certain roots and tubers.
08	Edible fruit and nuts; peel of citrus fruit or melons.
09	Coffee, tea, matï and spices.
10	Cereals
11	Milling products, malt, starches, inulin, wheat gluten
12	Oil seed, oleagic fruits; miscell grain, seed, fruit, etc
13	Lac; gums, resins & other vegetable saps & extracts.
14	Vegetable plaiting materials; vegetable products nes
15	Animal/veg fats & oils & their cleavage products; etc
16	Prep of meat, fish or crustaceans, molluscs etc
17	Sugars and sugar confectionery.
18	Cocoa and cocoa preparations.
19	Prep. of cereal, flour, starch/milk; pastrycooks' prod
20	Prep of vegetable, fruit, nuts or other parts of plants
21	Miscellaneous edible preparations.
22	Beverages, spirits and vinegar.
23	Residues & waste from the food indust; prepr ani fodder
24	Tobacco and manufactured tobacco substitutes

Source: UN Comtrade (accessed on 7 November 2012)