# UNCTAD

# REGIONAL VALUE CHAINS

## BACKGROUND PAPER

# INTERNATIONAL TRADE, REGIONAL INTEGRATION AND FOOD SECURITY IN SOUTH ASIA WITH SPECIAL FOCUS ON LDCS

**Ramesh Chand**

National Centre for Agricultural Economics and Policy Research
New Delhi, India

**BACKGROUND PAPER NO. RVC 4**

**This study was prepared for UNCTAD's project on ¨Development Oriented Integration in South Asia" funded by Asian Development Bank and Commonwealth Secretariat. The financial support for the paper by Commonwealth Secretariat is gratefully acknowledged. The views in this paper are those of the author and not necessarily those of UNCTAD or its member states. The designations, terminology and format employed are also those of the author.**

# INTERNATIONAL TRADE, REGIONAL INTEGRATION AND FOOD SECURITY IN SOUTH ASIA WITH SPECIAL FOCUS ON LDCS

**Ramesh Chand**[*]

## UNCTAD AND COMMONWELATH SECRETARIAT

**October 2012**

[*] Director, National Centre for Agricultural Economics and Policy Research
New Delhi, India

## I. INTRODUCTION

South Asia, consisting of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka, is home to more than 23 per cent of global population but it accounts for less than 3 per cent of global output (GDP). All countries in South Asia are classified in low income or low middle income category. Poverty and hunger are the most serious problems faced by the region. About 43 per cent of poor and 36 per cent of undernourished population of the world is concentrated in South Asia. Despite rapid growth of some of the economies in the region incidence of poverty, hunger and malnutrition has not seen perceptible decline. All these countries except India have been net importer of food as own production has not been sufficient to meet their domestic requirement.

Historically South Asian countries have followed inward looking trade policy both in terms of trade within the region and in terms of trade with rest of the world (outside South Asia). Though these countries sometime faced the situation of availability of cheap food in international market, but trade was not considered reliable source to meet the needs of principal food of domestic population. There have been apprehensions about the effect of trade liberalization on domestic agriculture and long run sustainability of food security. Moreover, unlike other regions like South east Asia, EU, and North America, regional integration in South Asia has remained low and, strong barriers exists for trade between the neighboring countries. Except Sri Lanka -India free trade agreement, other trade pacts in the region did not succeed in promoting free movement of goods between these geographically contiguous nations. Thus, both intra regional and inter regional trade has remained below potential.

A formal beginning for promoting regional economic cooperation and trade in South Asia started with the formation of South Asian Association for Regional Cooperation (SAARC) in 1985 involving seven countries namely India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan and Maldives. A regional trading block among these members was formed in April 1993 with the signing of SAARC Preferential Trading Agreement (SAPTA) for giving preferential market access to the exports of the member countries. These countries have moved further to achieve South Asia Free Trade Area (SAFTA), and signed SAFTA Pact in 2004. The agreement came into force on 1st January, 2006 and the trade liberalisation process commenced from July 1, 2006. It aimed at considerable liberalisation of trade within the region to increase in intra regional trade. But level of inter country trade under SAFTA is said to be far below the potential and reduction in the size of Sensitive Lists is considered important to increase the quantum of

regional trade (SAARC 2012). Because of this, much progress could not be achieved in regional trade in South Asia despite efforts for promoting preferential trade. Pakistan has still not granted even MFN status to India though negotiations between the two countries to achieve the same are in advance stage. Two, due to porous border between India and other countries in South Asia lot of unrecorded exchange of goods takes place between India and other countries in the region. The fact remains that unlike the other geographic regions like South east Asia, Europe and North America the regional integration in South Asia has remained weak.

Some countries in South Asia import food from distant countries when their neighbouring country export same food outside the region. Liberalised trade in the region particularly among neighbouring countries can be very beneficial for consumers (lower prices) and for producers (lower transaction cost). This will also result in reducing inefficiencies in production by promoting competition and by harnessing complementarities and comparative advantage.

Quite often when one south Asian country is faces short supply of a food commodity, some other country in the region has surplus production. This offers tremendous scope for stabilizing supply and prices through liberalized trade. South Asia is experiencing high growth in population in the region of 1.5 per cent. Demand for agrifood commodities in the region is projected to rise at a much higher rate than population growth as there is a large consumption deficit. Per capita consumption of most of the food items is much lower than what is required for a healthy diet and healthy living. Moreover, with rising per capita income and changes in tastes and preferences demand patterns in South Asian countries are diversifying. Demand for variety, new products and attributes is on the rise. Demand for processed food products is rising much more rapidly than demand for raw products. These trends and shifts in demand patterns and preferences cannot be addressed through local production and processing and they open new avenues for trade in agri-food commodities and investments in agri-food processing.

It is being increasingly realized that liberalisation of trade among the countries within South Asia can go a very long way in improving food security of the region. South Asia is a very large geographic region with varied climate, different types of natural resource endowment and diversity of production. These variations are expected to generate location specific comparative advantages in food production.

Of late, realization has been growing about the benefits of increasing trade and regional integration among South Asian countries and improving food and nutrition security through free movement of agriculture and food commodities. South Asian

countries are also found to have common interest in WTO (Chand and Bathla 2005). In order to actualize such benefits there is a need to identify (i) country level and regional level production and utilization, and, surplus and deficit of agri-food commodities, and (ii) inter dependence of agricultural markets. In this backdrop the present paper focuses on following:

1. Examine regional surpluses and regional deficits in food and other agricultural commodities and outline the importance of regional integration and cooperation in the context of food security in the region.
2. Undertake country level analysis in terms of surpluses and deficits in the identified agricultural commodities, including food and estimate the potential for regional trade.
3. Estimate the extent of co-movement in prices of the identified agricultural commodities in South Asian countries; and its impact on formal and informal trade in agricultural commodities.
4. Examine the extent and importance of liberalization in food processing industries.
5. Assess the potential for FDI in food processing industries in LDCs of the region.
6. Examine the constraints (economic, political and social) to trade and investments in agricultural commodities in South Asia, with special focus on LDCs
7. Suggest way forward and possible steps for regional integration and cooperation in agriculture in the context of food security.

The paper begins by presenting socio and agro- economic characteristics of South Asian countries and then proceeds to address above mentioned aspects of trade, regional integration and food security.

## II. South Asia in Global Setting

South Asia is most populous region in the world. With total population of 1.57 billion (in year 2011) it accounts for 23 per cent of world population. The share of region in land and water resources is much lower than its share in population. The per capita arable land in South Asia is lower than the world despite the fact that 41 per cent of total land area is arable land as compared to 11 per cent for the world as a whole. There is a stark contrast between share of South Asia in global population and economic output. South Asia generates only 2.9 per cent of global national product which is less than $1/7^{th}$ of South Asia's share in population. Low per capita income in the region is associated with very high incidence of poverty and hunger. Some basic facts relating to population, per capita income, land resources, poverty and under nutrition and trade are presented in Table 1.

**Table 1: South Asia in global setting**

| Variable | Year | South-Asia | World | Share (%) |
|---|---|---|---|---|
| Gross National Product ($ billion) | 2009 | 1735 | 59163 | 2.93 |
| Population (million) | 2009 | 1568 | 6775 | 23.14 |
| Land Area (Sq. km) | 2009 | 4771220 | 129710719 | 3.68 |
| Arable Land (% of land area) | 2009 | 41 | 11 | |
| Arable Land derived (Sq. km) | 2009 | 1973940 | 13859525 | 14.24 |
| Poverty (People Living on less than 1.25 a day) (millions) | 2005 | 596 | 1374 | 43.38 |
| Prevalence of Under-nutrition (%) | 2005-09 | 22 | 14 | |
| Prevalence of Under-nutrition derived (million) | 2009 | 345 | 949 | 36.37 |
| Total Merchandise Export ($ million) | 2009 | 204760 | 12492190 | 1.64 |
| Total Merchandise Import ($ million) | 2009 | 323199 | 12595548 | 2.57 |

Source: World Development Indicators 2011, The World Bank, Washington DC, USA

More than 43 per cent of World's poor, based on per capita daily income of less than $1.25, live in Asia. Similarly, more than 36 per cent of total under nourished persons in the world are inhabitants of South Asia. Trade ratios of South Asia are quite low. The region constitutes 1.64 of global merchandize export and 2.98 per cent of global merchandize import. These shares are smaller than its share in global output implying that South Asia trade lesser share of its production compared to the world average.

## III Socio and Agro-Economic Profile of SACs

Agriculture is the mainstay of economies of South Asian countries. About 18-34 per cent of national output and 33-66 per cent employment are contributed by this sector in various countries in the region. Among the five major countries in the region per capita income is highest in Sri Lanka (Table 2) followed by India with per capita income of $ 1220. Nepal comes at the bottom with per capita income of $440. Bangladesh is notch above Nepal with per capita gross national income of $580. Even the country with highest per capita gross national income in the region is ranked at 151. This shows that South Asia is having very low level of income compared to most other countries.

Per capita arable land varies from 0.06 hectare in Sri Lanka to 0.14 hectare in India. More than one third of total national output in Nepal is contributed by agriculture sector. Agriculture contributes around one fifth of national output in Pakistan, Bangladesh and India. In all the countries share of agriculture in employment is much higher than its share in output. In Nepal, two third of workforce is engaged in agriculture which is more than double the employment share of agriculture in Sri Lanka.

Agriculture value added per worker is meagre in Nepal where two third workforce is employed in agriculture sector. Sri Lanka, which has lowest share of employment in agriculture, is at the top in agriculture value added per worker. Agriculture value added per worker in Sri Lanka and Pakistan is far higher than Bangladesh and India (Table 2).

More than half of total population in Nepal and Bangladesh suffers from poverty based on the World Bank norm of $1.25 per person daily income. Similarly, more than 40 per cent people in India live under poverty based on the norm of $1.25 per capita daily income. Poverty in Pakistan based on this norm was 22.6 per cent. Sri Lanka shows lowest incidence of poverty in the South Asia. High dependence on agriculture for livelihood and slow growth in employment opportunities in non agriculture sector are the salient features of South Asian countries and these are largely responsible for widespread poverty and under-nutrition in the region.

**Table 2: Salient features of economy of South Asian countries**

| Particular | Reference year | Bangla-desh | India | Nepal | Pakistan | Sri Lanka |
|---|---|---|---|---|---|---|
| Per capita gross national income ($) | 2009 | 580 | 1220 | 440 | 1000 | 1990 |
| Income rank in the world | 2009 | 189 | 160 | 196 | 171 | 151 |
| Arable Land (ha. Per capita) | 2008 | 0.05 | 0.14 | 0.08 | 0.12 | 0.06 |
| Poverty, people living on less than $1.25 a day (%) | 2004 - 2007 | 49.6 | 41.6 | 55.1 | 22.6 | 7.0 |
| Share of Agriculture in GDP (%) | 2009 | 19 | 18 | 34 | 22 | 13 |
| Workforce in Agriculture | 2006-10 | 48.1 | 56.1 | 65.7 | 45.1 | 32.5 |
| Agriculture value added/worker (2000 $) | 2009 | 435 | 468 | 238 | 903 | 926 |

Source: World Development Indicators 2011, The World Bank, Washington DC, USA
Note: Workforce data taken from Key Indicators, 2011, Asian Development Bank.

## Hunger and Nutrition

Hunger is generally estimated from dietary energy intake. A person having dietary energy intake below a threshold (norm) level is classified as hungry. Such persons are also termed as undernourished. Country wise information on dietary energy intake, incidence of under nutrition and number of person undernourished during 1990-1992 and 2006-2008 is presented in Table 3. The Table also provides estimates of hunger and

nutrition for developing countries and world as a whole to make comparison with South Asia.

As would be seen from Table 3, dietary energy intake in all South Asian countries has remained lower than not only the world average but also the average of developing countries. Further, this gap in dietary intake of energy has increased during 1990-1992 and 2006-2008, for India, Bangladesh, Nepal and Pakistan. Though all South Asian countries have experienced some improvement in per capita energy intake the increase has been very small, in the range of 3 to 16 per cent over a period of 16 years.

**Table 3: Incidence of hunger and under nutrition in South Asian countries and world**

| Country | Dietary Energy Consumption (Kcal/person/day) | | Prevalence of undernourishment in total population (%) | | Number of undernourished persons (million) | |
|---|---|---|---|---|---|---|
| | 1990-1992 | 2006-2008 | 1990-1992 | 2006-2008 | 1990-1992 | 2006-2008 |
| Bangladesh | 1960 | 2270 | 38 | 26 | 44.4 | 41.4 |
| India | 2290 | 2360 | 20 | 19 | 177.0 | 224.6 |
| Nepal | 2190 | 2340 | 21 | 17 | 4.2 | 4.7 |
| Pakistan | 2210 | 2280 | 25 | 25 | 29.5 | 42.8 |
| Sri Lanka | 2170 | 2370 | 28 | 20 | 4.8 | 3.9 |
| South Asia | 2270 | 2360 | 22 | 20 | 267.5 | 330.1 |
| Developing World | 2440 | 2640 | 20 | 15 | 833.2 | 839.4 |
| Total World | 2610 | 2790 | 16 | 13 | 848.4 | 850.0 |

Source: State of Food Insecurity, FAO

Prevalence of under nutrition during 2006-2008 varies from 17 per cent (in Nepal) to 26 per cent (in Bangladesh). Dietary energy intake among the South Asian countries show a very narrow variation, 2270 to 2370 Kcal/person/day. Despite small improvement in per capita calorie intake, the prevalence of undernourishment shows large improvement in Bangladesh and Sri Lanka. The latest data provided by FAO show that prevalence of under nutrition based on dietary energy intake remains highest in Bangladesh despite tremendous progress made by the country in improvement of under nutrition. Population facing under nutrition in Bangladesh has declined from 38 per cent during 1990-1992 to 26 per cent in the years 2006-2008. There has been little progress in reducing prevalence of under-nutrition in India, Sri Lanka and Nepal. Despite decline in per cent of population facing under nutrition, the number of undernourished persons has increased over time in all countries except Sri Lanka and Bangladesh. Number of

undernourished persons in India has increased from 177 million in 1990-1992 to 225 million in the recent years.

## IV. Production, Consumption and Surplus at Regional Level

Agricultural production in South-Asia as a whole shows sharp year-to-year fluctuations. These fluctuations are much stronger at country-level than at regional-level. Because of this, a single year estimate does not capture correct situation of agriculture and food and trade in the region or a country. Therefore, in order to have credible information on surplus/deficit of different food items the paper uses 3-years average of production, trade and stock. Surplus or deficit have been computed from data available on production and consumption and related aspects reported by FAO in Food Balance Sheet for individual country. The regional data was arrived at by summing up country level production, consumption, trade, stock etc.

Surplus/Deficit was computed as under :
Surplus / deficit = Production (less) food consumption, utilization as feed, seed, and processing and other utilization, (plus) import, (less) import, (less) net change in stock

While production data is available upto the year 2009 or 2010 in some cases, the data on utilization reported in food balance sheet of FAO is not available beyond 2007. In order to get the estimate of surplus for latest years the food balance sheet data on various items of utilization was extrapolated for year 2008 and 2009. This was done by multiplying ratio of utilization (in various uses) to production in year 2007 with production in years 2008 and 2009. Three years average of production and domestic utilization were used to estimate surplus/deficit at country and regional level. The estimates of surplus for South Asia for major food commodities are presented in Table 4.

The paper covers cereals (total, rice and wheat), pulses, vegetable oil, sugar, vegetables, fruits, eggs, meat and milk. This list leaves a very small fraction of total agriculture which consists of several small items. Cereals, mainly rice and wheat, are the staple food for all countries in South-Asia. Average production of cereals in the region during 2007-2009 was 286 million tonne (mt). South-Asia as a whole consumed 238 mt of cereal as food. Consumption of cereal in other uses like seed, feed processing was 34.2 mt. Total utilization of cereal per year in South-Asia during 2007-2009 was estimated at 272.6 mt. Based on these estimates South-Asia is found to have surplus of 13.4 mt of cereals which is 4.7% of cereal production in the region.

**Table 4: Production and utilization of major food products in South Asia during 2007-2009, million tonne**

| Item | Production | Food consumption | Other Consumption | Total utilization | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|---|---|
| Cereals - Excluding Beer | 286.14 | 238.51 | 34.21 | 272.73 | 13.41 | 4.69 |
| Rice (Milled Equivalent) | 136.17 | 114.96 | 10.96 | 125.92 | 10.26 | 7.53 |
| Wheat | 103.40 | 94.92 | 9.03 | 103.95 | -0.55 | -0.53 |
| Pulses + (Total) | 15.98 | 16.58 | 3.10 | 19.68 | -3.70 | -23.13 |
| Vegetable Oils + (Total) | 8.72 | 11.07 | 4.29 | 15.36 | -6.64 | -76.22 |
| Sugar (Raw Equivalent) | 29.57 | 26.19 | 0.03 | 26.22 | 3.35 | 11.32 |
| Vegetables | 100.39 | 92.55 | 6.58 | 99.13 | 1.27 | 1.26 |
| Fruits - Excluding Wine | 78.66 | 68.17 | 10.52 | 78.69 | -0.03 | -0.04 |
| Eggs | 3.93 | 3.33 | 0.50 | 3.84 | 0.09 | 2.37 |
| Meat | 8.75 | 8.14 | 0.01 | 8.15 | 0.61 | 6.95 |
| Milk - Excluding Butter | 145.59 | 116.49 | 29.18 | 145.67 | -0.08 | -0.05 |

Source: 1. FAO Food Balance Sheet 2007.
2. FAOSTAT

Rice and Wheat account for 84 per cent of total cereal production in South-Asia (rice 47.5% and wheat 36.1%). Total annual absorption (consumption in all uses) of rice in the region during 2007-2009 was 126 mt comprising 115 mt of food and 11 mt of other uses. Total utilization of wheat was 103 mt comprising 94 mt of food consumption and 9 mt of other uses. South-Asia was found to have 10.3 mt rice surplus while it is having a small deficit in wheat to the tune of 0.5 per cent of production.

Pulses (dried leguminous vegetables) are a regular part of South-Asian diet and also a major source of protein. Pulses are consumed both by vegetarian as well as non-vegetarian population in various forms. Generally they are consumed as a `*Curry*' along with rice, wheat or other cereals. Over time, pulse production in South-Asia has remained either stagnant or experienced very slow growth. The green revolution technology rendered pulse production relatively much less remunerative than cereals. Thus, large area under pulses has shifted towards production of cereals; in some places pulses have been pushed to less fertile or marginal lands. As a result, production of pulses in the region could not keep pace with growth in population, and, per capita production and consumption of pulses has witnessed sharp decline over time. This, in turn, has caused adverse effect on protein intake in the region.

During 2007-2009, average production of pulses in the region was close to 16 mt. Total utilization of pulses was close to 20 mt, which leaves a gap of about 4 mt between regional production and utilization. The level of deficit of pulses is 23 per cent of recent level of production.

Quantity of vegetable oil consumed as food was 27 per cent more than production in the region. Then there was consumption of edible oil in other uses to the tune of 4.29 mt. The total utilization of vegetable oil in the region was 15.4 mt which is 76 per cent more than the regional production. This leaves a deficit of 6.6 mt of vegetable oil in the region. The deficit in terms of oilseed is much higher and is given by the deficit of vegetable oil divided by extraction rate of oil to oilseeds. A crude estimate shows that South-Asia need to raise oilseed production by about 19 mt to match the deficit in production and consumption of vegetable oil in the region.

South-Asia produced 29.6 mt of sugar (raw equivalent) as against total utilization of 26 mt. During 2007-2009 the region on an average has 3.4 mt of surplus sugar.

Vegetable production in South-Asia was estimated to be 100 mt and total utilization was reported to be 99.13 mt. About 93 of the total utilization of vegetable goes as food. At current level of production and consumption the region is having a surplus of 1.27 mt vegetables. Fruit production is estimated at 78.7 mt and total consumption is also the same. About 86 per cent of fruit production is utilized as food and remaining 14 per cent is in other uses. At present level of production and consumption in South-Asia has a small deficit (30 thousand tones) of fruits.

Among livestock products, milk is the largest item of production and consumption in the region. Total production of milk per year is 145.6 mt and total utilization is estimated to be 146 mt. About 80 per cent of total milk utilization is used as food. This production and consumption balance leaves 80 thousand tonne of milk deficit in the region. The deficit was 0.05 per cent of the total production. Total egg production in South-Asia during 2007 to 2009 was 3.93 mt. The amount of egg used as food was 3.33 mt and half a million tonne of eggs are consumed in other forms. This makes total utilization of egg to be 3.84 mt. South-Asia shows surplus in egg production of the order of 90 thousand tonne. Ratio of surplus to total production is 2.37 per cent. Meat production in the region was close to 9 mt and total utilization was 8.15 mt. South-Asia shows surplus of 0.61 mt of meat.

From the regional food balance it is concluded that South-Asia has large surplus of rice, sugar and meat and small surplus of eggs and vegetables at current level of consumption. The region show large deficit of vegetable oils and pulses.

## V. Country-Wise Production, Domestic Use and Surplus/Deficit

Country-wise production, utilization and surplus/deficit for various food items are presented in Tables 5 to 14.

**Foodgrains**

India is the largest producer of rice and wheat in the region. It produced 94 mt of rice and 78.4 mt of wheat per year during 2007-2009. The 2nd largest producer is Bangladesh for rice and Pakistan for wheat. During the 3 years period from 2007-2009 average absorption of rice in India was 87.96 mt which left the country with a surplus of 6.32mt of rice. Bangladesh and Pakistan also used less rice than what they produced resulting in a surplus of 1.18 mt and 3.2 mt respectively. Sri Lanka and Nepal have small deficit of rice.

During the 3 years period selected for the study India's production and domestic use of wheat were closely balanced with 0.31 mt of deficit. Pakistan shows highest surplus of wheat in South-Asia. The country produced 22.8 mt and consumed 20.2 mt leaving a surplus of 2.6 mt. Nepal was self-sufficient in wheat with 1.5 mt of production. Sri Lanka does not produce any wheat but it consumes close to 1 mt, thus a deficit of same magnitude. Similar is the case of Maldives which shows deficit of 20,000 tonne of wheat.

All South-Asian countries consumed more quantity of pulses than what they produced. Pulse production in India during 2007-2009 was 14.4 mt and consumption was 17.1mt. This leaves a deficit of 2.66 mt of pulses in India. Bangladesh produced 0.22 mt and consumed 0.67 mt resulting in a deficit of 0.45 mt. Pakistan produced 1.06 mt and consumed 1.48 mt showing a deficit of 0.43 mt. Sri Lanka consumed 180 thousand tonne of pulses and produced only 20 thousand tonne showing a gap 160 thousand tone. Nepal produced 240 thousand tonne and consumed 250 thousand tonne and faced a deficit of 10 thousand tonne. Pulses are not a part of regular diet in Maldives.

**Table 5: Production, utilization and surplus of rice in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 94.29 | 87.96 | 6.32 | 6.71 |
| Bangladesh | 30.36 | 29.18 | 1.18 | 3.88 |
| Pakistan | 6.42 | 3.25 | 3.18 | 49.46 |
| Sri Lanka | 2.35 | 2.39 | -0.04 | -1.68 |
| Maldives | 0.00 | 0.01 | -0.01 | -- |
| Nepal | 2.76 | 3.13 | -0.37 | -13.56 |

Source: Same as in Table 4.

**Table 6: Production, utilization and surplus of wheat in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 78.35 | 78.66 | -0.31 | -0.39 |
| Bangladesh | 0.81 | 2.72 | -1.91 | -235.55 |
| Pakistan | 22.76 | 20.18 | 2.58 | 11.32 |
| Sri Lanka | 0.00 | 0.89 | -0.89 | -- |
| Maldives | 0.00 | 0.02 | -0.02 | -- |
| Nepal | 1.48 | 1.48 | 0.00 | 0.00 |

Source: Same as in Table 4.

**Table 7: Production, utilization and surplus of pulses in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 14.44 | 17.09 | -2.66 | -18.41 |
| Bangladesh | 0.22 | 0.67 | -0.45 | -199.62 |
| Pakistan | 1.06 | 1.48 | -0.43 | -40.21 |
| Sri Lanka | 0.02 | 0.18 | -0.16 | -765.00 |
| Maldives | 0.00 | 0.00 | 0.00 | -- |
| Nepal | 0.24 | 0.25 | -0.01 | -2.38 |

Source: Same as in Table 4.

**Livestock products**

India showed surplus production of milk whereas all other countries in the region showed consumption exceeding production. Average production in India was 107.6 mt and domestic use was 106.6 mt. India showed a surplus of 1.03 mt of milk. Milk consumption in Bangladesh exceeds production by 0.37 mt. Pakistan produces 33.3 mt of milk and consumes 33.40 mt, thus having a deficit of 0.12 mt. Milk production in Sri Lanka is below 0.2 mt whereas consumption was 0.8 mt. Sri Lanka has milk deficit of more than half a million tonne. Both Maldives and Nepal showed a milk deficit of 20000 tonnes each.

**Table 8: Production, utilization and surplus of milk in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 107.59 | 106.56 | 1.03 | 0.96 |
| Bangladesh | 3.06 | 3.43 | -0.37 | -11.94 |
| Pakistan | 33.28 | 33.40 | -0.12 | -0.36 |
| Sri Lanka | 0.19 | 0.77 | -0.58 | -313.64 |
| Maldives | 0.00 | 0.02 | -0.02 | -- |
| Nepal | 1.48 | 1.50 | -0.02 | -1.40 |

Source: Same as in Table 4.

**Table 9: Production, utilization and surplus of meat in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 5.31 | 4.70 | 0.62 | 11.63 |
| Bangladesh | 0.59 | 0.59 | 0.00 | 0.00 |
| Pakistan | 2.43 | 2.43 | 0.00 | 0.13 |
| Sri Lanka | 0.13 | 0.14 | 0.00 | -3.82 |
| Maldives | 0.00 | 0.01 | -0.01 | -- |
| Nepal | 0.28 | 0.28 | 0.00 | -0.36 |

Source: Same as in Table 4.

**Table 10: Production, utilization and surplus of eggs in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 3.082 | 2.983 | 0.099 | 3.20 |
| Bangladesh | 0.247 | 0.248 | -0.001 | -0.39 |
| Pakistan | 0.511 | 0.512 | -0.001 | -0.21 |
| Sri Lanka | 0.059 | 0.060 | -0.001 | -1.92 |
| Maldives | 0.000 | 0.002 | -0.002 | -- |
| Nepal | 0.032 | 0.032 | 0.000 | 0.00 |

Source: Same as in Table 4.

In the case of meat, India showed surplus, Bangladesh and Pakistan are just balanced. Nepal showed small deficit and Sri Lanka consumes 4 per cent more than what it produced. The magnitude of surplus of meat in India was 62000 tonnes. The country produced 5.3 mt and consumed 4.70 mt of meat during 2007-2009.

Except India all South Asian countries showed excess of consumption of eggs over production. India showed a surplus production of 0.10mt which corresponds to 3.20 per cent of total egg production in the country. Egg production and consumption in Bangladesh is about 250 thousand tonne. Pakistan produces and consumes a little more than half a million tonne of eggs.

**Horticultural Products**

Fruit production in agriculture in India was 66.7 mt and domestic use was 66.56 mt. Production exceeded domestic consumption by small amount of 0.14 mt. Bangladesh produces 3.56 mt of fruits and consumes 3.68 mt. The country has a deficit of about 120 thousand tonnes. Pakistan produces 6.5 mt of fruit and consumes almost all of it. Sri Lanka, Maldives and Nepal show a deficit of 10 to 90 thousand tonne of fruits.

**Table 11: Production, utilization and surplus of fruits in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 66.702 | 66.557 | 0.144 | 0.22 |
| Bangladesh | 3.559 | 3.680 | -0.121 | -3.41 |
| Pakistan | 6.518 | 6.448 | 0.071 | 1.08 |
| Sri Lanka | 0.722 | 0.737 | -0.015 | -2.06 |
| Maldives | 0.013 | 0.031 | -0.018 | -- |
| Nepal | 1.142 | 1.235 | -0.093 | -8.14 |

Source: Same as in Table 4.

**Table 12: Production, utilization and surplus of vegetables in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 88.393 | 86.446 | 1.946 | 2.20 |
| Bangladesh | 3.364 | 3.557 | -0.194 | -5.76 |
| Pakistan | 5.301 | 5.539 | -0.238 | -4.49 |
| Sri Lanka | 0.729 | 0.903 | -0.174 | -23.84 |
| Maldives | 0.011 | 0.019 | -0.008 | -- |
| Nepal | 2.596 | 2.663 | -0.067 | -2.57 |

Source: Same as in Table 4.

Vegetable production and consumption exceeds production and consumption of fruits in India, Sri Lanka and Nepal, whereas it was lower in Bangladesh and Pakistan. India has surplus of 1.95 mt of vegetables which is 2.20 per cent of its total production. Bangladesh shows a deficit with production at 3.36 mt and consumption at 3.56 mt. Nepal consumes 67,000 tonnes more vegetables than what it produced. Pakistan, Sri Lanka and Maldives show small to moderate deficit of vegetables.

**Sugar**

In South-Asia sugarcane is produced at large scale in India and Pakistan while some production takes place in Bangladesh and Nepal also. During 2007-2009 India produced 25.5 mt of raw sugar equivalent and utilized 20.5 mt of it. This leaves close to 20 per cent production consisting of 5 mt of raw sugar equivalent as surplus in India. Pakistan produces 3.8 mt of sugar which is 14.5% less than domestic use (Table 13). Thus, Pakistan and all other countries, except India, in the region are having deficit production as compared to domestic absorption.

**Table 13: Production, utilization and surplus of sugar in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 25.500 | 20.523 | 4.977 | 19.52 |
| Bangladesh | 0.147 | 0.693 | -0.546 | -371.35 |
| Pakistan | 3.780 | 4.328 | -0.548 | -14.50 |
| Sri Lanka | 0.034 | 0.543 | -0.509 | -1496.88 |
| Maldives | 0.000 | 0.007 | -0.007 | -- |
| Nepal | 0.107 | 0.126 | -0.019 | -17.48 |

Source: Same as in Table 4.

The level of deficit of sugar is a little more than half a million tonne in Bangladesh, Pakistan and Srilanka each. Nepal shows deficit of 20,000 tonne. Maldives does not produce any sugar, therefore, entire domestic use consisting of 10,000 tonne is a deficit.

**Vegetable Oil**

All South-Asian countries consume more vegetable oil than what they produce (Table 14). Domestic use of vegetable oil in India is 48 per cent more than domestic production. While Nepal shows deficit of 76 per cent, Pakistan use 147 per cent more vegetable oil than what it produces. The deficit level of vegetable oil is very high in Sri Lanka and Bangladesh. Sri Lanka consumes more than 5 times and Bangladesh consumes more than 8 time of their domestic production of vegetable oil. India produced 7.4 mt of vegetable oil and it consumed about 11 mt leaving behind a deficit of 3 and a half million tonne. Deficit level of Pakistan and Bangladesh are 1.52 and 1.17 mt. Sri Lanka has a deficit of 330 thousand tonne while Nepal shows deficit of 50,000 tonne.

**Table 14: Production, utilization and surplus of vegetables oil in South Asian countries during 2007-2009, million tonne**

| | Production | Domestic use | Surplus/ deficit | S/D as % of production |
|---|---|---|---|---|
| India | 7.405 | 10.979 | -3.575 | -48.28 |
| Bangladesh | 0.148 | 1.316 | -1.168 | -788.89 |
| Pakistan | 1.032 | 2.550 | -1.517 | -146.97 |
| Sri Lanka | 0.071 | 0.406 | -0.334 | -468.42 |
| Maldives | 0.000 | 0.004 | -0.004 | -- |
| Nepal | 0.059 | 0.104 | -0.045 | -76.56 |

Source: Same as in Table 4.

**VI. Per Capita Food Supply**

FAO food balance sheet for the year 2007 shows significant variations in per capita supply/use of various food items as food in various countries in South-Asia (Table 15). Per capita annual supply and use of cereals as food among the 5 major countries of South-Asia was lowest in Pakistan which showed highest prevalence of under nourished population. Further, cereal consumption in Pakistan was highly concentrated in favour of wheat which accounts for more than 80 per cent use of all cereals in the country. However, Pakistan topped in per capita supply of milk. The next country in the ranking of per capita supply of milk was not even half of the level in Pakistan. Similarly, Pakistan also topped in per capita supply of sugar, meat and vegetable oils. Bangladesh topped in per capita supply of cereals, 88 per cent of which consists of rice. Except rice,

cereal and meat, per capita supply of all other food items in Bangladesh was lowest in the region. India topped in consumption of pulses, vegetables and fruits. Per capita supply of these items was 13 kg of pulses, 65 kg of vegetable and 45 kg of fruits. India was at the bottom in per capita supply of meat, closely followed by Bangladesh.

**Table 15: Per capita supply of various food items in South Asian countries, 2007, Kg/year**

| Item | India | Bangla-desh | Pakistan | Sri Lanka | Nepal | China | World |
|---|---|---|---|---|---|---|---|
| Cereals excl. beer | 152.6 | 180.9 | 129.8 | 143.5 | 171.3 | 152.5 | 146.6 |
| Rice (Milled Equivalent) | 70.9 | 159.7 | 14.5 | 97.3 | 78.0 | 76.8 | 52.9 |
| Wheat | 60.2 | 14.7 | 106.1 | 44.1 | 37.9 | 67.4 | 65.9 |
| Pulses + (Total) | 12.9 | 4.8 | 8.1 | 8.0 | 8.4 | 1.3 | 6.5 |
| Vegetables + (Total) | 64.8 | 19.7 | 30.0 | 40.1 | 77.9 | 279.9 | 119.4 |
| Fruits - Excluding Wine | 45.1 | 20.7 | 36.5 | 27.2 | 38.8 | 64.4 | 69 |
| Eggs + (Total) | 2.1 | 1.3 | 2.4 | 2.2 | 1.0 | 17.4 | 8.6 |
| Meat + (Total) | 3.3 | 3.6 | 13.4 | 6.8 | 9.8 | 53.4 | 40.1 |
| Milk - Excluding Butter | 68.7 | 16.2 | 159.0 | 36.1 | 40.9 | 28.7 | 85.1 |
| Sugar (Raw Equivalent) | 17.3 | 5.3 | 23.9 | 24.6 | 4.3 | 8.3 | 20.3 |
| Vegetable Oils + (Total) | 8.2 | 6.2 | 11.5 | 4.1 | 6.8 | 9.4 | 11.4 |

Per Capita supply, which is same as absorption as food, shows very wide variation across countries. The minimum variation was found in cereals. Per capita absorption varied between 5 kg to 13 kg for pulses, 16 kg to 159 kg for milk, 4 kg to 24 kg for sugar and 4kg to 11.5 kg for vegetable oil. Sri Lanka comes at the bottom in per capita absorption of vegetable oil and Nepal comes at the bottom in per capita absorption of eggs and sugar.

It is interesting to compare intake of various food items in South Asia with world average and with China which has very low level of undernourishment. Undernourished population in China is reported to be 10 per cent which is less than half of the incidence of undernutrition in South Asia (WDI 2011 p. 110). Per capita supply/use of vegetables and fruits is awfully low in Bagladesh, Pakistan and Sri Lanka as compared to China and the world average. Cereals account for close to 70 per cent of physical supply of food in Bangladesh. In other South Asian countries this share varied between 31 and 49 per cent. World average for share of cereals in total food supply for food is 29 per cent.

These results show that food intake in South Asia is highly skewed toward cereals. Bangladesh show highest per capita supply of cereals and lowest supply of vegetables, fruits, eggs and pulses indicating dominance of calorie but poor supply of protein. Except for milk in Pakistan, per capita supply in all the South Asian countries

needs to change in favour of livestock products and horticultural products for a balanced diet and to achieve required level of proteins, nutrients, and minerals.

## VII. International Trade at Region and Country Level

Regional export, import and net trade in different food items are presented in Table 16. It is interesting to point out that some of the items are exported as well as imported. This could be due to year to year fluctuations or composition of the group. During 2007-2009 the total export of cereal from the region was 10.8 mt and import was 7.7 mt. The region has net trade (export-import) of 3.1mt of cereals. Average export of rice from the region was 6.6mt. The region also imported small amount of rice. Net trade of rice was 5.8 mt. The trade scenario of wheat is almost reverse of what is witnessed in rice. Average import of wheat exceeded 6 mt and net trade in wheat was (-) 5.6 mt.

**Table 16: Export, import and net trade in various food items, total of South Asia, 2007 to 2009, million tonne**

| Item | Export | Import | Net trade |
|---|---|---|---|
| Cereals - Excluding Beer | 10.794 | 7.702 | 3.092 |
| Rice (Milled Equivalent) | 6.572 | 0.766 | 5.807 |
| Wheat | 0.756 | 6.380 | -5.625 |
| Pulses + (Total) | 0.156 | 4.246 | -4.090 |
| Vegetable Oils + (Total) | 0.516 | 10.249 | -9.733 |
| Sugar (Raw Equivalent) | 2.937 | 3.171 | -0.233 |
| Vegetables | 2.572 | 1.911 | 0.661 |
| Fruits - Excluding Wine | 1.413 | 1.714 | -0.300 |
| Eggs | 0.068 | 0.002 | 0.066 |
| Meat | 0.550 | 0.020 | 0.530 |
| Milk - Excluding Butter | 0.686 | 1.221 | -0.535 |

Source: Same as in Table 4.

South-Asia imported more than 4 million tonnes of pulses and more than 10 mt of vegetable oil each year during 2007-2009. The region also exported small quantity (0.51mt) of vegetable oil. Level of export of sugar was 2.94 mt and imports were 3.2mt. The region exported 2.6 mt of vegetables and 1.4 mt of fruits. The level of export was higher than import for vegetables whereas reverse holds true for fruits. Among livestock products, South-Asia exported 7 thousand tonnes and imported 2 thousand tones of eggs. Export of meat as 0.55 mt with net trade of 0.53 mt. Milk import exceeded export by half a million tonne.

### Country-wise Trade

Country wise information on quantity of export, import and net trade in selected food items is presented in Tables 17 to 22. Trade in wheat during 2007-2009 shows that Pakistan is the highest exporter of wheat in the region. Its average export of wheat was a little more than half a million tonne. However, Pakistan also showed average import of wheat close to 1.7 mt. A country going for export and import at large scale is result of sharp year to year fluctuations in production and self-sufficiency at the margin. For instance, in the case of Pakistan it exported more than 1 mt of wheat during 2007 and imported 1.8 mt and 3.1 mt of wheat during 2008 and 2009. It is precisely because of a country sometime importing and sometime exporting that the paper has used years average to estimate level of trade and surplus. During the three year period i.e. 2007-2009 Pakistan remained net importer of wheat to the tune to 1.1 mt.

The level of fluctuation in production and in net trade of wheat in India is much lower than that of Pakistan, eventhough, like Pakistan, sometime India go for import and sometime for export. On an average, India shows net import of 0.9 mt. Bangladesh is the largest importer of wheat in the region. Its average import comes to 2.7 mt. Sri Lanka on an average import 1 mt of wheat. Nepal import as well as export less than 2 thousand tonne of wheat. It is interesting to point out that all South Asian countries are net importer of wheat to varying degree.

Rice is the largest traded agricultural food commodity in the region. Both India as well as Pakistan figure among top exporters of rice not only in the region but also in the world. Average export of rice from India is around 3.7 mt and from Pakistan 2.8 mt. Bangladesh show average import close to half a million tonne (Table 17). Nepal and Sri Lanka import 147 and 87 thousand tonne of rice on an average.

**Table 17: Export, import and net trade in wheat and rice, in South Asian countries, 2007-2009, thousand tonne**

| Country | Wheat | | | Rice | | |
|---|---|---|---|---|---|---|
| | Export | Import | Net trade | Export | Import | Net trade |
| India | 64 | 952 | -888 | 3707 | 7 | 3700 |
| Bangladesh | 1 | 2705 | -2704 | 11 | 496 | -485 |
| Pakistan | 536 | 1692 | -1156 | 2849 | 4 | 2845 |
| Sri Lanka | 153 | 1003 | -850 | 5 | 87 | -83 |
| Maldives | 0 | 26 | -26 | 0 | 24 | -24 |
| Nepal | 2 | 2 | -1 | 0 | 147 | -146 |

Source: FAOSTAT

As all South-Asian countries are having deficit of pulses, they import moderate to large quantity of pulses to meet their domestic requirement (Table 18). India imported on

an average 3 mt of pulses during 2007-2009. The country also showed small amount of export (137 mt). Level of import of pulses in other countries was 0.52 mt in Bangladesh, 0.41 mt in Pakistan and 0.16 mt in Sri Lanka. Nepal imported around 41 thousand tonne of pulses per year.

**Table 18: Export, import and net trade in pulses in South Asian countries, 2007-2009, thousand tonne**

| | Export | Import | Net trade |
|---|---|---|---|
| India | 137 | 3099 | -2962 |
| Bangladesh | 0 | 528 | -528 |
| Pakistan | 9 | 412 | -403 |
| Sri Lanka | 8 | 165 | -157 |
| Maldives | 0 | 1 | -1 |
| Nepal | 2 | 41 | -39 |

Source: FAOSTAT

Trade in vegetables show that India is large net exporter and other countries large net importer (Table 19). Average export of vegetables from India was 2.3 mt. India also import 0.57 mt of vegetables. Vegetable export exceeds import by 1.7 mt. Bangladesh import some amount of vegetables like India but it's export of vegetable is only 16 thousand tonne. Thus, Bangladesh is a net import of vegetables exceeding half a million tonne. Pakistan exported 235 thousand tonne of vegetable but at the same time imported close to 400 thousand tonne. This renders Pakistan with negative trade balance in vegetable to the extent of 158 thousand tonne. Sri Lankan import and net trade of vegetables was close to 250 thousand tonne during 2007-2009. Nepal is net importer of vegetable to the extent of 90 thousand tonne. Net export of vegetable from India is 70 per cent more than the combined net import of other South-Asian countries.

Fruits figure on both sides of trade, export and import. As there is a diverse composition of fruit basket, a country may be exporting some fruit and importing some other fruits. Average export of fruit from India during 2007-2009 was 0.87 mt which was lower than the imports which are placed at 1 mt. Thus, India remains net importer of fruit to the extent of 142 thousand tonne. Bangladesh export small quantity of fruit but its import is much higher (232 thousand tonne). Pakistan and Sri Lanka are net exporter of fruit in quantity terms. Nepal is involved in more than 100 thousand tonne of fruits import and its export is around 18 thousand tonne.

**Table 19: Export, import and net trade in vegetables and fruits in South Asian countries, 2007-2009, thousand tonne**

| Country | Vegetables | Fruits |
|---|---|---|

| | Export | Import | Net trade | Export | Import | Net trade |
|---|---|---|---|---|---|---|
| India | 2297 | 570 | 1727 | 868 | 1009 | -142 |
| Bangladesh | 16 | 571 | -555 | 14 | 232 | -219 |
| Pakistan | 235 | 393 | -158 | 434 | 294 | 140 |
| Sri Lanka | 18 | 258 | -240 | 79 | 43 | 36 |
| Maldives | 0 | 21 | -21 | 0 | 22 | -22 |
| Nepal | 6 | 97 | -90 | 18 | 112 | -95 |

Source: FAOSTAT.

Trade in eggs and meat show that except India other countries have very small trade. India exports 68 thousand tonne of eggs and more than half a million tonne of meat (Table 20) . Import of these two items by India was less than 1 thousand tonne. Pakistan export on an average 20 thousand tonne of meat and import 8 thousand tonne.

**Table 20: Export, import and net trade in eggs and meat in South Asian countries, 2007-2009, thousand tonne**

| Country | Eggs | | | Meat | | |
|---|---|---|---|---|---|---|
| | Export | Import | Net trade | Export | Import | Net trade |
| India | 67.5 | 0.0 | 67.5 | 525.7 | 1.4 | 524.4 |
| Bangladesh | 0.0 | 0.0 | 0.0 | 0.1 | 0.5 | -0.4 |
| Pakistan | 0.4 | 0.0 | 0.4 | 19.7 | 7.5 | 12.1 |
| Sri Lanka | 0.1 | 0.5 | -0.3 | 1.6 | 3.2 | -1.6 |
| Maldives | 0.0 | 1.3 | -1.3 | 0.0 | 7.6 | -7.6 |
| Nepal | 0.0 | 0.0 | 0.0 | 3.4 | 0.1 | 3.3 |

Source: FAOSTAT.

Trade in milk shows that India export 0.6 mt and import 0.1 mt, thus having net export of half a million tonne. Bangladesh does not have any export of milk and it imports 354 thousand tonne. Sri Lanka is the largest importer of milk in the region with more than half a million tonne import. Pakistan imports 191 thousand tonne and exports 56 thousand tonne. Nepal is involved in small amount of export and import of milk with net trade in favour of import.

Trade data in vegetable oil and sugar is presented in Table 22. All South-Asian countries import large volume of vegetable oil, while India also export close to 0.4 mt of vegetable oil. The level of import is 6.7 mt for India 1.9 mt for Pakistan and 1.3 mt for Bangladesh. Sri Lanka and Nepal import 188 and 162 thousand tonne of vegetable oil.

**Table 21: Export, import and net trade in milk in South Asian countries, 2007-2009, thousand tonne**

| | Export | Import | Net trade |
|---|---|---|---|
| India | 598.5 | 99.6 | 498.9 |
| Bangladesh | 0.3 | 353.9 | -353.5 |
| Pakistan | 55.9 | 190.7 | -134.8 |
| Sri Lanka | 4.7 | 516.9 | -512.2 |
| Maldives | 0.0 | 29.6 | -29.6 |
| Nepal | 26.6 | 30.3 | -3.7 |

Source: FAOSTAT

Like wheat, sugarcane production and trade in India and Pakistan show large fluctuations and a situation of sometime exporting and sometime importing. In year 2007 India exported 4.9 mt of sugar which plummeted to less than 44 thousand tonne in year 2009. On import side, the quantity of import of sugar by India was 2.6 mt in 2009 and it was just 25 thousand tonne in 2007. During the 3 years period of the study India's exports were close to 3 times than its import with a net trade of 1.8 mt. Average export of sugar from Pakistan was 117 thousand tonne and imports were at 290 thousand tonne. Sri Lanka imported more than half a million tonne of sugar. Sugar imports of Nepal were 27 thousand tonne. Three years average of trade data shows that India's net export are almost same as the total net import of other South-Asian countries. Thus, at regional level there is a perfect balance between import and export. However, what needs to be done to meet deficiency of some countries from surplus of other countries, is smoothening year to year fluctuation in production and trade.

**Table 22: Export, import and net trade in vegetable oils and sugar in South Asian countries, 2007-2009, thousand tonne**

| Country | Vegetable oils | | | Sugar | | |
|---|---|---|---|---|---|---|
| | Export | Import | Net trade | Export | Import | Net trade |
| India | 388.7 | 6737.7 | -6349.0 | 2814.0 | 1001.9 | 1812.1 |
| Bangladesh | 1.0 | 1265.3 | -1264.2 | 0.0 | 1281.9 | -1281.9 |
| Pakistan | 39.3 | 1888.6 | -1849.2 | 117.2 | 289.7 | -172.5 |
| Sri Lanka | 41.5 | 188.2 | -146.7 | 0.4 | 559.4 | -559.1 |
| Maldives | 0.0 | 7.7 | -7.7 | 0.0 | 11.2 | -11.2 |
| Nepal | 45.7 | 161.8 | -116.0 | 5.8 | 26.8 | -21.0 |

Source: FAOSTAT.

**India's Food Export to South Asia and World**

India’s position in the region is very strategic because of (a) size of the country, population, and economy and (b) because of its geographic contiguity with SAARC countries. No two countries except India in South Asia share common land border. India is closest to Sri Lanka which does not share land border with any other country. Therefore, in terms of geography, India has a strong advantage over other countries in South Asia for intra regional trade. Level of surplus and net trade in various agricultural products from India shows that India can meet present level of deficit in supply over demand in South Asia for most of the products (see Table 23).

The Table presents India's agricultural exports to world and south Asian countries during three years period from 2008-09 to 2010-11. It reveal the potential for meeting regional deficit of food and improving food availability through intraregional trade. India's average rice export during this period was 2.3 mt out of which 0.26 mt was exported to South Asia. South Asia imported 0.66 mt of course grain, mainly maize, out of 3.37 mt of export from India. Eventhough India itself is largest importer of pulses in the world, it also exports some pulses. Out of total export of 147 thousand tonne of pulses from India, 39 per cent were exported to South Asia and about 80 per cent of it was imported by Pakistan. Some countries in South Asia import large quantity of fruits and vegetables, sugar and dairy products from India. Despite this, South Asia's share in total export of these products from India remain less than 45 per cent. Bangladesh imports 810 thousand tonnes of fruits and vegetables and 428 thousand tonne of sugar from India. India is major supplier of these products to Pakistan, Sri Lanka and Nepal. By importing 5.7 thousand tonnes of dairy products Bangladesh constitutes about 12 per cent of total overseas supply of dairy products from India.

**Table: India’s agricultural exports to South Asian countries during 2008-9 to 2010-11, metric tonne**

| Country | Rice | Coarse cereals | Pulses | Fruits and vegetables | Sugar | Poultry | Meat | Dairy product |
|---|---|---|---|---|---|---|---|---|
| Bangladesh | 203.0 | 483.5 | 0.0 | 809.8 | 427.8 | 1.8 | 0.1 | 5.7 |
| Bhutan | 4.1 | 1.3 | 0.0 | 0.3 | 3.1 | 3.2 | 0.1 | 0.5 |
| Maldives | 16.8 | 0.1 | 0.0 | 16.6 | 7.2 | 61.3 | 0.4 | 0.0 |
| Nepal | 24.7 | 70.4 | 0.2 | 191.6 | 12.9 | 0.5 | 0.1 | 2.6 |
| Pakistan | 1.0 | 64.9 | 43.7 | 190.3 | 338.9 | 65.6 | 3.1 | 0.7 |
| Sri Lanka | 14.7 | 43.5 | 13.6 | 170.2 | 190.9 | 6.2 | 0.0 | 0.6 |
| South Asia | 264.3 | 663.6 | 57.6 | 1378.9 | 980.8 | 138.6 | 3.8 | 10.1 |
| World | 2309.1 | 3371.3 | 147.6 | 3115.1 | 2205.8 | 897.7 | 590.9 | 47.1 |
| South asia share % | 11.45 | 19.68 | 39.00 | 44.27 | 44.46 | 15.44 | 0.64 | 21.44 |

Export to South Asia constituted 11 percent to 45 per cent of India's total export of cereals, pulses, fruits and vegetables, sugar, poultry and dairy products. South Asia is the final destination for close to one fourth of India's agricultural (excluding fish) exports. As this share is very small, India can easily meet substantial increase in import demand from South Asian countries.

## VIII. Price Integration

Price and market integration in South-Asian countries was studied by examining association between producers prices expressed in US$ during last 10 years covering the period 2000 to 2009. Producers prices represent overall price situation for the whole country and are thus not restricted to a single market.

There are several ways to study integration. This paper examines market integration by estimating simple co-relation between producer prices between various pairs of countries in South-Asia. It is important to mention here that prices expressed in US$ did not show any common trend between two countries. Nor do they exhibit rising or falling trend in most cases when these prices are expressed in US$. For this kind of data series, simple co-relation can be used to find out existence and strength of market integration.

Co-relation coefficient between price series of various items in South-Asian countries is presented in Table 23. The critical value of co-relation below which it is not statistically significant is 0.73 at 1 per cent of level of significance and 0.60 at 5 per cent of level of significance. The first panel in the table provides correlation coefficient for prices of rice. The table shows that producer prices of rice in all South-Asian countries were strongly correlated. The degree of correlation was more than 0.85 in most cases. Except correlation between Sri Lanka and Nepal prices, all other price series were statistically significant either at 1 per cent or 5 per cent level. Among different countries, rice prices in Bangladesh showed strongest relation with prices in other countries. These results can be used to infer that rice markets in South-Asia in terms of producers prices are strongly integrated.

The results for wheat are presented in panel 2 of the table. Like rice, producers' price series of wheat also show significant positive correlation across countries. Except the pair of Pakistan and Nepal wheat prices were statistically significant in all other pairs. Producers prices of wheat in Nepal showed correlation of 0.99 with wheat prices in India. Similarly, wheat prices in Bangladesh -India and Bangladesh- Nepal were also strongly integrated.

The results for maize price are presented in panel 3. Like rice and wheat, maize prices also show significant positive correlation in prices prevalent in various countries. Except the correlation between Bangladesh and Pakistan, price series in all other countries showed significant correlation.

Price data for chickpea was available only for Bangladesh, India, Nepal and Sri Lanka. Among these 4 countries only Bangladesh and Nepal market showed significant correlation. The correlation between prices in India and Bangladesh and India and Nepal was close to zero.

Data on groundnut prices was not available for Nepal. Among other countries Sri Lankan and Indian prices alone showed significant correlation which was more than 0.9. The results show that there was no integration in groundnut markets in South Asia except for Sri Lanka and India.

Correlation coefficient for onion prices are presented in panel 6. Onion prices in Bangladesh showed either negative or close to zero correlation with prices in other countries. This indicates that onion market in Bangladesh did not have any integration with markets in other countries in the region. In contrast to this, onion prices in India – Nepal, India – Pakistan, India – Sri Lanka, Nepal – Pakistan and Nepal - Sri Lanka were significantly correlated. Onion prices in Sri Lanka and Pakistan showed positive but non-significant correlation.

Like onion, potato prices in Bangladesh did not show significant correlation with prices in India, Pakistan and Sri Lanka. However, potato prices in Bangladesh has a very high correlation with potato prices in Nepal. Potato prices in Sri Lanka also did not show any significant correlation with other countries in the region (Table 23). The correlation matrix of potato prices show that Bangladesh-Nepal and India-Pakistan markets have significant correlation.

Producer price data for mustard was available only for Bangladesh, Pakistan and India. Prices of mustard in Bangladesh showed significant correlation with Pakistan but not with India. Mustard prices in Pakistan and India were much more strongly correlated.

Correlation coefficient between milk prices in different countries indicate that Bangladesh prices were not linked to any of the country in the region. Milk market in India - Nepal, Pakistan - Nepal, Sri Lanka – Nepal, India – Pakistan, and India – Sri Lanka were strongly integrated.

**Table 23: Correlation coefficient between producers prices in South Asian Countries**

| Commodity | Country | India | Nepal | Pakistan | Sri Lanka |
|---|---|---|---|---|---|
| I. Rice | Bangladesh | 0.89 | 0.84 | 0.89 | 0.85 |
| | India | | 0.67 | 0.74 | 0.88 |
| | Nepal | | | 0.8 | 0.56 |
| | Pakistan | | | | 0.65 |
| II. Wheat | Bangladesh | 0.88 | 0.88 | 0.73 | |
| | India | | 0.99 | 0.61 | |
| | Nepal | | | 0.58 | |
| III Maize | Bangladesh | 0.61 | 0.63 | 0.53 | 0.86 |
| | India | | 0.74 | 0.76 | 0.85 |
| | Nepal | | | 0.73 | 0.75 |
| | Sri Lanka | | | 0.6 | |
| IV. Chickpea | Bangladesh | -0.04 | 0.92 | | |
| | India | | -0.13 | | 0.13 |
| | Sri Lanka | | | | |
| V. Groundnut | Bangladesh | 0.11 | | 0.21 | -0.1 |
| | India | | | 0.36 | 0.91 |
| | Sri Lanka | | | 0.22 | |
| VI. Mustard | Bangladesh | 0.44 | | 0.64 | |
| | India | | | 0.92 | |
| VII. Onion | Bangladesh | -0.28 | -0.43 | 0.07 | -0.46 |
| | India | | 0.91 | 0.74 | 0.69 |
| | Nepal | | | 0.66 | 0.89 |
| | Pakistan | | | | 0.49 |
| VIII. Potato | Bangladesh | -0.33 | 0.95 | 0.4 | -0.14 |
| | India | | -0.3 | 0.62 | 0.05 |
| | Nepal | | | 0.42 | 0 |
| | Pakistan | | | | 0.06 |
| IX. Cow Milk | Bangladesh | -0.2 | -0.25 | -0.17 | -0.15 |
| | India | | 0.73 | 0.85 | |
| | Nepal | | | 0.74 | 0.84 |
| | Sri Lanka | | | 0.53 | |
| X. Eggs | Bangladesh | 0 | -0.27 | -0.1 | 0.16 |
| | India | | 0.92 | 0.94 | 0.95 |
| | Nepal | | | 0.81 | 0.82 |
| | Sri Lanka | | | 0.88 | |

Source of basic data: FAOSTAT

Egg market in India, Nepal, Pakistan and Sri Lanka were strongly integrated. The correlation between producer prices in these countries ranged between 0.81 and 0.95. However, egg prices in Bangladesh did not show any significant association with other countries.

It is concluded from correlation matrix in price series that rice, wheat and maize market in South Asian countries are strongly integrated with each other. The integration was selective and generally missing in the case of chickpea and groundnut. Onion prices were integrated except with Bangladesh. Potato markets were integrated only in a few cases. Milk and Egg prices are integrated across countries except with Bangladesh markets which does not show any co-movement with prices in the region.

## IX. Trade Liberalisation: Potential and Constraints

Regional integration in trade and investment has become an increasing feature of world trade and globalization. Particularly after WTO agreement, it was expected that regionalism bill gradually give way to multilateralism. However, the number of regional trading agreement/ preferential trading agreement have seen explosive growth instead of diminishing after WTO (Chand 2006 p. 16). Even those countries which adopted cautious approach in regionalism are gravitating towards regional integration and seeking deeper integration with neighboring countries. South Asia is the least integrated region in Asia. Some progress to liberalize trade in South Asia has been made after signing of SAPTA in 1993. Due to limited coverage of products, the trade in the region could not achieve much expansion.

Recently, SAARC countries have moved further to liberalize trade and investment in the region and they have signed "South Asia Free Trade Agreement" in January 2004. It includes 8 members including Afghanistan and came into force in January 2006. SAFTA mandates member countries to review barriers in agriculture and manufacturing trade between member countries. Presently intra-regional trade in South Asia constitutes 5 per cent of total trade in the region. After signing of SAFTA, share of SAARC countries in world export has increased from 1.3% in 2005 to 1.7% in year 2009 (Table 24). However, share of intra-regional trade of South Asia in the same period show a decline. This implies that total trade from south Asia has increased at a faster rate than the growth in world trade after 2005, however, trade within the South Asian block has increased at a lower rate than trade with rest of the world. There is a need to examine reasons for slower growth in intraregional export as compared to interregional growth despite creation of SAFTA.

**Table 24: Trade share of South Asia**

| Trade particular | 1995 | 2005 | 2009 |
|---|---|---|---|
| Share of South Asia in world export % | 0.9 | 1.3 | 1.7 |
| Share of intra regional export in total export % | 4.5 | 6.6 | 5.4 |

Source: 2011 World Development Indicators, Ch. 6, World Bank, 2011, Washington DC.

The major factor for low volume and low share of intra-regional trade seems to be the poor trade facilitation for intra-regional trade, like efficiency of custom, other border procedures, quality of transport and IT infrastructure etc. Asian Development Bank has prepared a very valuable report on intra-regional trade and investment in South Asia which has quantified impact of logistics on trade in these countries. The report prepares logistics index based on existing customs procedures, infrastructure and timeliness to analyse impact of these factors on trade. The results of the study show that effect of importers trade facilitation on trade was quite significant whereas the effect of exporters trade facilitation was non significant. Further, effect of trade facilitation factors was much stronger on agriculture trade than trade in manufacturing, textile and clothing and automobiles. Another very interesting result of this study was that affect of tariff on agriculture trade was much smaller than the effect of trade facilitation factors (ADB 2009, Table 2.5). Trade facilitation is also found to be a major factor in growth of intra regional and total trade from South Asia, by other studies [Jain and Singh 2009; Wilson and Otsuki 2006]

Using a CGE model, the ADB study estimated direct and indirect impact of enhancing trade facilitation on trade in South Asia as well as with the rest of the world. The result show that trade facilitation has very large impact on trade flows. The estimated effect for agriculture is presented in Table 25. The study projects 20 per cent increase in inter-regional trade and 63 per cent increase in intra-regional trade. Distribution of intra-regional trade over different countries show more than doubling of trade in respect of Bangladesh. India is projected to witness 66 per cent increase in intra-regional trade and 5 per cent increase in inter-regional trade. Pakistan shows higher increase for inter-regional trade than intra-regional trade. The results for Sri Lanka are mixed - decrease in inter-regional trade and increase in intra-regional trade in agriculture. Rest of South Asia is showing about 50 per cent increase in both types of trade. Similar results were reported by Wilson and Otuski (2007) who projected a gain of $ 2.6 billion fin intraregional trade from capacity development in trade facilitation. The gain was $ 1224 million due to service infrastructure, $712 million due to port efficiency, $429 million due to custom modernisation and $278 million due to regulatory reforms.

**Table 25: Macro-economic effect of trade facilitation reforms obtained from CGE**

**model: change in trade volume %**

| Country | Agriculture | | All sectors | |
|---|---|---|---|---|
| | Intra regional | Inter regional | Intra regional | Inter regional |
| All South Asian countries | 63 | 20 | 75 | 22 |
| Bangladesh | 109 | 102 | 103 | 62 |
| India | 66 | 5 | 75 | 14 |
| Pakistan | 32 | 57 | 97 | 33 |
| Sri Lanka | 7 | -27 | 38 | 17 |
| Rest of South Asia | 50 | 49 | 60 | 39 |

Source: ADB (2009), Table 2.9.

There seems to be tremendous potential to raise intra regional trade in agriculture and food. It is shown above that some countries are surplus and some deficit in same products. Similarly, some countries are net importer and some are net exporter of same product. Trade in sugar, vegetables, fruits and milk can be increased by simply synchronizing deficit and surplus in SAAARC countries. The second source for increase in intra regional trade is to meet shortages and demand and supply imbalances arising out of seasonal or year to year fluctuations from within the region. Seasonal shocks in supply of various food products are being experienced frequently. Neighbourhood trade is very efficient and time effective source for moderating effects of such shocks. Thirdly, improvement in per capita income brought by growth of these economies will accelerate dietary diversification and changes in consumption pattern. This will create demand which may not be economical to meet from domestic production. Harnessing this potential for intra-regional trade will depend upon trade facilitation, FDI, dismantling of non tariff barriers and elimination of negative list in SAFTA. Out of these, some progress is on the way for improving trade facilitation and removing tariff and non tariff barriers but there is hardly any focus on regional FDI in agriculture and food sector.

India's expanding domestic market and the rapid growth of organized retail in the country have created great potential for sourcing from within the SAARC region to meet the opportunities created by growing local demand. This requires efficient value chains. The existing agricultural marketing system in the whole region is very inefficient, fragmented, and outdated. It neither serves the interest of producers nor consumers. Modernisation of agricultural marketing supply system requires development of new supply chains and production networks in the region. This is not possible without investment by organized private sector. Regional FDIs can play an important role in this. As south Asian countries have lot of similarities in production portfolios, the regional FDI can also serve as an instrument for transfer of technology in the region.

Agriculture is now receiving renewed importance and emphasis globally and in almost all the countries. This is because of several reasons. The global food crisis of

2007-08 has awakened the world from the complacence about adequacy of food to meet demand. Contrary to their historical behaviour and defying several predictions, agri-food prices have been increasing in real terms and they have not returned to pre 2005 level. Global community is seriously concerned about meeting future growth in agri-food demand. There is rising preference towards bios' – bio energy, bio-pesticide, bio medicine, bio-cosmetics, bio fertiliser, bio-remediation. A lot of new opportunities in commerce, trade and manufacturing are building around agriculture, considering plant as a factory for future. Addressing various challenges in agriculture sector and harnessing of emerging opportunities require investments in various spheres of agriculture spanning from inputs to output supply to consumers. No single country in the region has expertise or comparative advantage in all the areas of agriculture. Therefore cross border investments in the region are needed for harnessing potential of agriculture in the region.

## X. The way forward

SAFTA had been in operation for over 5 years. Intra-regional trade during this period has increased at snail's pace. Trade data show that per cent of total block export has increased from 4.6 per cent in 2000 to 5.4 per cent in 2009 and there is a small decline in share of block trade after 2005. According to the trade statistics reported in WDI, share of block export in total export of the block was 6.6 per cent in 2005 but it has declined to 5.4 per cent in 2009. This shows that after signing SAFTA, intra-regional trade has grown at a lower rate than inter-regional trade. The primary reason this is that though SAFTA resulted in bringing down of tariff but it could not achieve much progress in improving trade facilitation for regional trade.

There is large scope for extending regional trade in food and agriculture and promoting investment in this sector in South Asia. There is also a large volume of informal trade in the region which reflects the need for increasing formal trade. Economic gains from regional integration are generally complemented by buildup of political goodwill which helps in creating a stable environment. India being a large country and having dominant economic position in the region has a special responsibility to consolidate South Asian economic integration. This requires action to improve trade facilitation through improved linkage through road, rail, air and shipping, better connectivity like providing land locked Nepal with transit facilities to facilitate their trade. South Asian countries can enhance their growth and development through trade promotion strategies. This require action in following areas:

- Trade facilitation
- Reducing barriers to foreign direct investments
- Further lowering of tariff
- Pruning negative list

- Removal of non-tariff trade barriers

Out of all the above mentioned areas trade facilitation in the form of simplification of custom and other border formalities; transport linkages; transparency of regulation; improved logistic for rail, road, air and maritime transport; information network etc. is most important for increasing intra regional trade. Improved trade facilitation and logistics will reduce transaction cost of trade which is more significant than tariff. South Asian countries must promptly take up measures individually and as a group for achieving higher trade facilitation.

Reducing barriers to regional FDI and trade facilitation are complementary to each other. Thus, alongwith trade facilitation, there is a need to provide liberal and conducive environment for FDIs in the area of food chain development and food processing. These will be beneficial for producers as well as consumers and for improving food security.

Due to year to year fluctuations in production at country level, surplus in a south Asian country is not considered reliable source of supply to meet deficit and import demand by other country. This needs to be overcome by building regional stocks of food under SAFTA. SAFTA could also be used as an appropriate forum not only to address intra-regional trade disputes but also for taking collective stand on agriculture and food security related issues in WTO.

## References


Asian Development Bank (2009), *Regional Cooperation Strategy and Programme*, South Asia (2006-08), ADB.

Chand Ramesh (2006). *Free Trade Area in Asia*, Academic Foundation, New Delhi.

Chand Ramesh and Bathla Seema (2005). WTO Agriculture Negotiations and South Asian Countries : Concerns, Viewpoints and Consensus, *South Asia Economic Journal*, Sage Publications Pvt. Ltd., New Delhi, 6(1): 1-22

Jain Rajeev and Singh J. B. (2009). Trade Pattern in SAARC Countries: Emerging Trends and Issues, Reserve Bank of India, *Occasional Papers*, Vol. 30, No.3, Winter 2009.

SAARC (2012). *South Asia Free Trade Area*,
http://www.saarc-sec.org/areaofcooperation/detail.php?activity_id=5/

Wilson, John S. and Otsuki, Tsunehiro (2007), "Regional Integration in South Asia: What Role for Trade Facilitation?" *Policy Research Working Paper,* No. 4423, Development Research Group, the World Bank, December.

World Bank, World Development Indicators, Online Database.

World Bank (2004), Trade Policies in South Asia: An overview, Report No. 29949, Volume I: Operational Summary.