HORTICULTURE IN SAARC COUNTRIES

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ABSTRACT

SAARC, a regional cooperation organizationestablished in 1985 with its headquarter in Nepal, consists of eight member countries namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. It aims at working together in a spirit of trust and friendship for accelerating socio-economic development in member countries. These countries have their own natural topographical and climatic conditions based on which a number of horticultural crops such as fruit, vegetables, roots and tubers, ornamental, medicinal and aromatic plants, plantation crops, spices and others are grown. This region has enormous opportunity to grow tropical, sub-tropical and sub-temperate to temperate horticultural crops of commercial importance. All these countries are trying hard to improve the income, nutritional, financial and food security of millions of poor people. Horticulture could be a vital sector to bring positive change in the socio-economic life of the millions of people living in SAARC countries. However, there are still numerous problems being faced by these countries and they have not been able to fully exploit the enormous potentiality of horticultural development in the region, and with the development of regional co-operation among each other, there is every chance to increase the productivity of commodities to a substantial amount. Therefore, there is an urgent need to deal with cooperative activities in the following fields: i) exchange of new germplasm in developing new crop varieties; ii) seed policies to facilitate the development and importation of hybrid seeds; iii) exchange of experts in different fields; iv) joint ventures in seeds and planting material production; v) joint ventures in processing industry; vi) exchange of technologies in production of farm machinery and equipment; vii) training programs on hybrid seed production, post-harvest handling, processing, socio-economic data collection and analysis; viii) setting up of a regional information network, etc.

BACKGROUND

The South Asian Association for Regional Cooperation (SAARC) is an organization established in 1985 with the objectives of providing

platform for the peoples of South Asia to work together in a spirit of friendship, trust and understanding. It aims to accelerate the process of economic and social development in Member States (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka). While poverty and hunger remain one of the major challenges before the region, agriculture remains the predominant sector of the region's economies. The region is home to 1.567 billion people (23.7% of global population). The principal reason for high incidence of poverty in the region is low per capita income and inequitable distribution of income: with 23.7% share in global population, the region has only 2.62% share in global income. A vast majority of population in the region lives in rural areas and depends upon agriculture for livelihood and sustenance. Agriculture development is, thus, very critical to reducing poverty, improving nutrition and food security and promoting sustainable and inclusive growth of the regional economies.

Per capita Gross National Income (GNI) in the eight Member States ranges from $345 to $3,277: lowest GNI is in Afghanistan while the highest is in Maldives. Per capita GNI in India and Pakistan is around US$ 1,000. Low level of income is one of the primary reasons for wide prevalence of poverty and severe under-nutrition. Poverty in the region varies between 21% - 53% while 17% - 30% of population in different countries does not consume minimum level of globally recommended dietary energy (SAARC agriculture vision 2020, SAARC Agriculture Center).

Agriculture farming in South Asia is dominated by small land holdings i.e. average size is below 0.5 ha in Bangladesh, below 1.0 ha in Sri Lanka and Nepal. Theaverage farm size is 1.41 ha in India and 3 ha in Pakistan. Except in Pakistan, holdings below one hectare account for more than 60% of total farm holdings. Farmers in the region depend heavily on rain-fed agriculture. Of arable lands, irrigated land is around 33% in India, 39% in Sri Lanka, 47% in Nepal, 56% in Bangladesh and 90% in Pakistan (SAARC AGRICULTURE VISION 2020, SAARC Agriculture Center).

However, new opportunities are arising on account of choice of technology, change in demand patterns, surge in value chains and

supermarkets, revolution in information and communication technology, institutional innovations, and globalization. Trade based on comparative advantage is also offering many opportunities. Agriculture research is getting increasingly capital intensive. These necessitate sharing of technology and resource in research, extension and infrastructure. Opportunities are also unfolding in green energy and bio-fertilizer. No productive activity can be sustained in the long run by overlooking the health of the production base and the producers. The Region thus needs to focus on farmers and natural resource system or, agriculture production base i.e. land, water, and vegetation. Policies focused on farming ignoring their implications on the farmers are not sustainable. Growth and development of farming therefore must improve welfare of farmers.

Based on topographical and climatic suitability in these countries, a number of agricultural crops and wide varieties of horticultural crops including fruits, vegetables, roots and tubers, ornamental, medicinal and aromatic plants, plantation crops, spices and other are grown. All these countries are trying hard to improve the income,nutritional, financial and food security of millions of poor people. Horticulture could be a vital sector to bring positive change in the socio-economic life of the millions of people in SAARC countries. The country-wise present status of horticulture development in SAARC region is discussed as below.

Afghanistan:

Afghanistan lies in central Asia covering an estimated area of 647,500 square kilometers of land area and reportedly 248,187 ha of water bodies (2,482 sq km, some 1.0% of total land area). Completely landlocked, it is surrounded by Tajikistan, Uzbekistan, and Turkmenistan in the north, Iran in the west, Pakistan in the south and southwest, and China in the northeast. Its area is composed of mountainous and desert areas where the Iranian Plateau borders the mountains of Central Asia. The Hindu Kush mountain range splits Afghanistan from east to west. The country is divided into thirty provinces, each province consisting in a number of districts. Within these districts most families live within villages. Rural households make up some 80% of the total national

population of approximately 27 million.

Most of Afghanistan has a sub-arctic mountain climate with dry cold winters, except for the low lands, which have arid and semi arid climates. In the mountains and a few of the valleys bordering Pakistan, a fringe effect of the Indian Monsoon, coming usually from the southeast, brings moist maritime tropical air in summer. Annual rainfall ranges from 100 mm to 400 mm. In Afghanistan, summers are hot and winters can be bitterly cold. Summer temperatures reach as high as 490 C in the northern valleys. Mid winter temperatures, as low as 90 C, are common around the 2000m elevation level in the Hindu Kush. The climate in the highlands varies with elevation.

Agriculture has traditionally been the largest source of economic output in Afghanistan, engaging 80% of its population. Women and children as well as men have important roles in crop production, horticulture, and the rearing of livestock. Afghanistan's topography is of great influence in its agriculture, creating a large diversity of conditions for its production. Only some 12% of Afghanistan's land is arable, whereas 46% of it consists in permanent pastures and 3% of it forests and woodlands. Irrigated land is 3,300,000ha (1993 est.), equivalent to some 5.1% of Afghanistan's total land area. While landholding patterns in Afghanistan vary greatly, both between and within districts, sharecropping is common on irrigated lands.

Most farmers, an estimated 80%, own their land whereas the remaining 20% are landless but obtain a percentage of the harvest by reason of their labor. Larger land holdings can be found, however most farms are small in size and are managed at a family level. Although there are differences between provinces, farms between0.2 and 2 hectares appear to be the most common.

Horticultural crops are an important part of the agricultural sector in Afghanistan.In the late 1970s, horticulture accounted for around 40% of the country's export earnings, though occupying only 6% of the total arable land and 12% of the irrigated land. Horticultural production declined rapidly during the war years, but began to recover significantly after 1992. A 1996 FAO survey found that 40% of orchards were less

than 15 years old, indicating strong resilience among farmers, replanting and improving their orchards.A 1997 FAO Surveyindicates that an area of 140,000ha of orchards, 92,000ha of vegetables, and 5,000ha of sugar beet were planted in 1976. Horticulture crops consisted of significantareas of grapes, apricots, apples, almonds, walnuts, mulberries and melons. Raisins, driedapricots and almonds numbered among the country's major exports. Vegetables included largeareas of potato, which is a common element in Afghan diets as well as onions, tomatoes andeggplant. While horticulture crops covered only a small part of the total agricultural and irrigatedarea economically they were very important. They were primarily high value cash crops, whichat the same time broadened the nutritional base of the population.

Horticultural crops represented an important source of income (gross income per unit area isthree to seven times that of wheat, which make horticultural crops a good alternative to poppyproduction). Nevertheless, there is insufficient information on the current status of horticultureproduction. According to current information provided, the orchard area had declined from140, 000ha in 1997 to 70,000ha. During this period vegetable area had remained more or less constant at 90,00 ha.The major vegetable crops in Afghanistan include melon, watermelon, onion, potato and tomato,with these five species representing 87.4 % of the total area under vegetable cultivation. Major fruit crops are grape, almond, apricot, and pomegranate andapple, which cover a total of 95.9% of all orchards/vineyards.

In 2000, horticulture in Afghanistan suffered from a number of constraints some of which are lack of irrigation, low level of farm power, low level of crop diversification, lowtechnical standards, low level of post-harvest technology, high prices of agricultural inputs, weak government extension services, lack of market information and poor marketing channels.

Table 1. Average yield and average gross income of important fruit and vegetables

Crop	Yield (kg/ha)	Gross income per ha (US $)
Almond	2415	3179
Apple	10325	1814
Apricot	8890	1423
Grape	9065	1628
Peach	7630	1275
Pomegranate	9730	1424
cauliflower	29260	1833
Watermelon	14350	792
Onion 12845	12845	1109
Potato 14175	14175	1943

Source: FAO G: DP/AFG/96/004, Field Document 3 (2000)

Bangladesh

Bangladesh has an area of 147,570 sq. km with a population of about 160 million (2013). It is located in northeastern part of South Asia. It is a country having small hills, plains, coastal, wet and marshy lands. The climate is mainly tropical with temperature ranging from 5 to 25° C in winter and 20 to 40° C in the summer. Average rainfall varies from 1450mm to 4340 mm from north to south in the country. The total cropped area of the country is 13.70 mha. There are two cropping seasons, i.e. winter and summer. Most vegetables are grown in winter, while fruits in summer.

In Bangladesh, about 90 vegetables, 60 fruits and 25 spices are beinggrown. The major vegetables include potato, tomato, brinjal, cabbage, cauliflower, bitter ground, long-yard bean,pumpkin, okra, etc. Similarly fruits like mango, jackfruit, banana, pineapple, guava, papaya, lemons, litchi, etc. are important. In spices, chili, onion, garlic, turmeric, gingers, etc. and among flowers, ornamental plants, roses, gladiolus, dahlia, chrysanthemum, marigold, jasmines, etc. are grown. Vegetables, spices and fruits play a significant role in nutritional improvement, employment of labor force, food and financial security of the people of the country.The cultivated area under horticultural crops is about 0.7 m

ha. Farmers grow horticultural crops both in homeland and farmland and the produce are sold in assembly markets, wholesale markets and retail markets. Overall the country is self-sufficient in many products but some sort of fruits and vegetables are imported from outside the country.

The following table depicts area coverage, yield and production of various horticultural crops.

Table 2. Area coverage, yield and production of spices and vegetables

Crop	2010-2011		
	Area (000 acres)	Yield (kg/acre)	Production(000 met. tones)
Spices	535	2757	1475
Winter vegetables	470	3386	1592
Summer vegetables	438	3369	1476

Source: MOA (2011)

Table 3. Area (acre) , average yield (kg) per bearing tree and production (x '000' MT)

Name of fruit	2010-2011		
	Area	Kg/tree	x'000' MT
Mango	68	69	889
Jack fruit	26	126	962
Papaya (ripe)	3	22	125
Litchi	5	60	66
Guava	12	32	271
Lime and Lemon	4	15	55
Pine-apple	37	5902 (kg/acre)	219

Source: MOA (2011)

Presently, Bangladesh is researching on a number of important vegetables especially on the areas of variety screening, variety development including the hybrids, colored vegetables, improvement of indigenous vegetables and generation of new techniques.

Bhutan

Bhutan is a small and extremely mountainous country with a surface area of 46,000 sq. km, located in the eastern Himalayas. It is bordered to the north by the Autonomous Region of China (Tibet) and to the east, west and south by India. The population is about 765432 and more than 90% of the population lives in rural communities comprising of a little over 67,000 households. Bhutan has extremely diverse agro-climatic conditions due to major differences in altitude and rainfall as well as in slope characteristics. Roughly, the country could be divided into four physiographic zones - the southern foothills, the middle river valleys, the mountain slopes and the high Himalayas. Based on temperature and rainfall the country could be further sub-divided into six agro-climatic zones - wet sub-tropical, humid sub-tropical, dry sub-tropical, warm temperate, cool temperate and alpine zones.Only about 3.4% of the land area, comprising 160,000ha, was used for seasonal and permanent crop production in 1998. Agricultural holdings are restricted to 12ha per family; almost all farm families have their own land.

Agriculture is the main source of livelihood for 69% of the population. Majority of Bhutanese farmers are small holder with an average farm size of 3 acres and practice a self-sustaining subsistence integrated farming systems. Despite its small size, the agro-ecology is diverse due to the large variation in altitudes. In agriculture, there are three key distinct farming systems which are the rice, maize and potato based system. Multiple cropping is a common feature of the small farmers. Citrus (Mandarin orange) plantation in the lower altitude and cardamom in the higher elevations are the main cash crops. In the sloppy dry land agricultural areas, maize, millet, mustard, several types of legumes, ginger and vegetables are the predominantcrops.A variety of vegetables are cultivated in the country mostly on subsistence level.Areas close to urban or accessible to motor roads produce substantial amount ofvegetables for sale. Some of the major ones are chilli, radish, turnip and potato. Vegetables have a comparative advantage as an off-season crop for theneighboring markets in India and Bangladesh.Potato cultivation has spread to all parts of the country and has become an important source of cash income to the farmers mainly in the west, central andin the east.

The total production of the potato for the year 2005 was 53,594 MT in which 23,766.54MT was exported.

Table 4. Fruit production and yield in kg per tree

Type of fruit	Production (m.ton)	Yield in kg per bearing tree
Apple	20752	37
Mandarin	60993	35
Peach	1649	39
Pear	1354	49
Plum	565	39
Walnut	474	24

Source: Bhutan RNR Statistics 2012, MoAF

Harvesting of fruit starts with the early variety of cherry (Seneka) by the end of May. Next are the early varieties of peach in June, followed by the Japanese pear variety Hosui. The earliest variety of apple to be harvested is the Japanese variety Hana-iwai in July followed by Nebuta. The main apple harvest season starts from August and extends up to October. The last varieties of apple to be harvested are the Japanese varieties Mutsu and Fuji and Delicious varieties.

The exploitation of the full potential of deciduous fruit cultivation in the country has not been possible due to the following constraints:

- Lack of clear-cut horticulture development policy and strategy in the past
- Inadequate transportation network, including lack of feeder roads to production areas.
- A weak horticulture research and extension system.
- Limited farmer knowledge of fruit production systems.
- Insufficient market information and market facilities.
- Low yields and poor quality fruits due to low level of management practices.
- Poor post-harvest practices and lack of storage facilities.
- Lack of small-scale processing facilities.

India

India is a big country with an area of about 31, 16,683 sq. km. It has a wide variety of climates and soil on which a large range of horticultural crops such as fruits, vegetables, ornamentals, medicinal and aromatic plants, spices, cocoa, etc. are grown. The fruit industry in India has made remarkable progress during the last 3 decades. The five fruits, i.e. mango, banana,citrus, guava and apple account for about 75% of total fruit production in the country. Other important fruits are grapes, papaya, pomegranate, ber, aonla, sapota, bael, and custard-apple. India has also made pivotal progress in the production of vegetable, tuber, ornamental, medicinal and aromatic plants. In addition, plantation crops and spices have also touched commercial values and India exports substantial quantities to foreign country. Overall, India has made a remarkable progress in the field of horticultural industry.

India with diverse soil and climate comprising several agro-ecological regions gives encouragement to horticulture crops where more than 28.2 million tones of fruits and 66.0 million tons of vegetable are produced that ranked next after Brazil and China in the World. Occupying 10% cropped area out of whole cropped area by horticulture ranked 2nd in the world for fruit and vegetable production. The share of India in the world fruit production is 10% and vegetable for 13.28%. Contribution of horticulture to GDP of agriculture is estimated to be more than 24.5%. Horticulture sector established in improving productivity of land generating employment, improving economic conditions of the farmers and entrepreneurs, enhancing export and provide nutrition security to the people. Food security which is the main objection the national agenda and this can be attained with providing nutritional and balance diet to population. Recommendation dietary allowance as per ICMR is 120g fruits and 250g vegetable per person per day. The availability of only 83g and 185g of fruits and vegetable respectively which is below the target level (Jadhav, 2013).

India serves as the home of various kinds of vegetables, fruits and holds a vital position in the field of production of fruits and vegetables amidst different countries of the world. Around 10% of the world production of fruits is accounted by India and leads the worlds in the

production of Mango, Banana, Sapota and Acid lime, Grapes etc. Mango is the most important fruit in the country and banana comes in next. There is about 39% of mangoes production in India compared with the whole world production and with 23% of banana production India ranks first in world. Besides, India has leaped high in production and export of cashew in the world. Following table shows the statistical data of area under the cultivation of horticulture crop and production of horticulture crop of last four years.

Table 5. Area and Production of horticultural crops

Crops	2009-2010	
	Area(ha in)000	Production(m.ton in 000)
Fruit	6329	71516
Vegetables	7985	133738
Aromatic	509	573
Dry fruit	142	193
Spices	2464	4016

Source: NHB, www.nhb.nic.in/statistic

Some problems and constraints that exist in India are:

- Inadequate availability of disease free, high quality planting material.
- Slow dissemination and adaptability of improved high yielding cultivars/ hybrids.
- Lack of post harvest management technology and infrastructure.
- Weak database and poor market intelligence.
- Instability of prices, with no support price mechanism.
- Inadequate technical manpower / human resource in farming system.
- Poor credit supply, high rate of interest coupled with inadequate crop insurance scheme.
- Poor linkage between R and D sectors, industries and farming communities.
- Late implementation of government policies and schemes
- Absence of horticultural crop suitability map of India based on

agro-climatic conditions depicting most suitable areas for optimum productivity of a particular crop.

India has started improvement programs such as 1. Improving production, 2. Improving productivity, 3. Reducing cost of production, 4. Improving quality of products for exports, 5. Value addition, 6. Marketing and Export, 7. Price stabilization, 8. Strengthening of organizational support, 9. Human Resource Development and10. Addressing relevant policy issues.

Maldives

The Maldives Islands are an archipelago in the Indian Ocean with an agriculture land of 70 sq. km. and arable land of 4000ha with about 393988 populations. Maldives is the second smallest country in Asia and consists of 1087 islands in 19 atolls, of which only about 200 islands are inhabited. All of the islands are small and vary from tiny banks to islets, none exceeding 5 sq. miles (13 sq. km) in area. The Maldives climate is hot and humid with a mean temperature of about 27°C. Annual rainfall in the south averages 3807mm and in the north 2538mm. Agriculture is an important means of livelihood and for the island economies of the Maldives. The growing of crops in the home garden is an all year activity. Field cultivation is usually seasonal. The agriculture crops are mainly rainfed and a wide range of crops are grown in the country. The main fruits are bananas, papaya, mango, lime, guava, custard apple, pond apple, star apple, pomegranate, passion fruit, and water melon.Similarly, vegetables likechillies, brinjal, pumpkin, cabbage, tomato, grounds and leafy vegetables are grown.Plantation crops such as coconuts, bread fruit, and areca nut are also grown in the different islands (Maldives Agriculture statistics: Nationmaster.com).

Nepal

Agriculture sector has been playing dominant role in Nepal in providing national income and employment. It is the agriculture sector that acts as a single source for 65.6% of Nepalese people to provide them livelihood and earning. The contribution of agriculture sector in

the national GDP is 38% in which contribution of horticulture sub-sector is estimated at 14% and out of this 14% fruit contributes 7%. The total area of Nepal is 147181 sq. km. of which cultivated agriculture land is 3091000ha and population is 26494504. In case of fruit crops, Nepal is bestowed upon by nature with varying agro-ecological situations that allow cultivating different types and cultivars of fruits successfully ranging from tropical to temperate fruits. Mango and bananas are the established commercial tropical fruit in country's hot valleys and plain areas, whereas citrus and apples are the prime commercial fruit of mid-hill areas and high mountain regions respectively. Especially, in Western and Mid and Far Western regions, Jumla and Mustang apples have made their specific identity for their qualitative characters like size, color, flavour, juice, crispiness and sweetness. Similarly, lime, suntala (citrus reticulata) and sweet oranges are extensively grown all over the mid-hill areas of Nepal for home and commercial consumption. Likewise peaches, plums, pear and walnut are the other deciduous fruit that grow extensively as wild and homestead garden fruit in hill and mountain areas all over the country including the Kathmandu valley. Persimmon and kiwi fruit are also showing commercial promise in certain districts. However, these fruits have not been exploited to their full potentiality to give expected income to fruit growers involved in their farming.

Fresh seasonal and off-seasonal vegetables have been categorized as high value crops and promotion of commercial production of fresh vegetables are essential for increasing the income of farmers, providing them with employment opportunities including the women farmers, and enhancing their accessibility to food security. Hence, in Nepal vegetables are specific agricultural commodity and its promotion could significantly drive rural growth in market accessible areas all over the country. The country has also laid emphasis on production of off-season vegetables exploiting the agro-ecological areas and adopting innovative technologies for producing and supplying different types of vegetables like cauliflower, tomato, cabbage and cucumber all the year round in city markets including the capital city Kathmandu. A large quantity of these vegetables used to enter from India to Nepal a decade ago, but now the situation has reversed. Besides fruit and vegetables, spice crops such as

ginger, cardamom, garlic and turmeric are also grown. Oranges, some fresh vegetables, ginger and cardamom are export commodities also.

Table 6. Area (ha), production (mt) and yield (mt/ha) of different horticulture crops

Crop	Area	Production	Yield
Fruit	101480 (prod.area)	938731	9.25
Vegetables	246392	3301684	13.400
Potato	197234	2690421	13.641
Spices	47768	345252	7.23

Source: GON, MoAD (2013)

The above table depicts that horticultural crops of Nepal have considerably low productivity and reasons for this are attributed to various factors, some important ones are noted as lack of specic policies related to high value crops, poor private sector friendly environment, organizational weakness, lack of coordinati,lack of monitoring and evaluationl ,inadequate investment, lack of insurance policy, lack of mechanization, increase in cost of production, lack of competitiveness skill, weak value chain, climate change effect, poor research and extension support and weak infrastructures.

Pakistan

Agriculture constitutes the largest sector of Pakistan's economy. Majority of the population directly or indirectly depend on this sector. It contributes about 24 percent of gross domestic product (GDP) and accounts for half of employed labor force and is the largest source of foreign exchange earnings. It feeds whole rural and urban population. Realizing its importance, planners and policy makers are always keen to have reliable area and production statistics of agricultural crops well in time. Policy makers primarily need accurate and timely statistics for the important crops such as wheat, cotton, rice, sugarcane, maize etc. However, in recent years, due to persistent hikes in the prices of essential commodities like pulses, onions, potatoes, chillies and tomatoes these crops have also gained in economic importance. Pakistan offers variety in

its landscape from the bread taking beauty of the high mountain ranges of the Himalayas of the North to the colorful intermountain valleys, rich irrigated plains, stark deserts and impressively rugged plateaus of Baluchistan. Pakistan has a total geographical area of 79.61 million ha out of which cultivated area is 21.41 million ha and population is 191.71 million. Pakistan is a sub-tropical and semi-arid country. The total water supply available in Pakistan is met from three main sources: rainfall, surface water and ground water. The mean annual rainfall varies from less than 100mm in the Sindh to more than 75mm in the foot-hills and northern mountains. About 60% of this rainfall comes during the monsoon season. Of the total 15.3 mha irrigated area, about 75% is irrigated through canals, 19% through tube-wells, 4% canals, 2% through wells and other sources.

The horticulture is a highly important sub-sector of Pakistan's economy. It covers fruits, vegetables, flowers and ornamental plants. The fruit crops include mango (Langra, Dasehri, Chousa, Sindhri, Anwar Ratol, Beganpali and Desi/Local varieties), citrus (Kinnow mandarin, Red Blood, Mausambi, Feutrel Early), grapefruit (Marsh Seedless, Shamber), lemon (Nrika Jaad, Kagfi lemon), dates (Asil, Fasli, Begum, Jungi, Mozawati,Ddhaki, Halini and Hussaini), apples (Golden delicious, Red delicious, Mashdi, Khamiri, Ambri), pomegranate (Gandahari, Bedana), guava (Sufaida, Allahabali), apricots (Abdullah Khani, Charmaghzi), peaches (Peshawar Local, Alberta, Robin, Early Ground, Florida King), plums (Fazal, Mannani, Santa Rosa, Stanley), and almond (Kaghzi, Non Peril, Besta). Some new crops are asparagus, kiwi, persimmon, ber (jujube), coconut, strawberry, cherry, and chicku (sapota).

Table 7. Area (ha), production (mt) and yield (kg/ha) of different horticultural crops

Crop	2010/2011		
	Area (ha in 000	Production (mt in 000	Yield (kg/ha)
Vegetables	252	3126.8	Not given
Fruit	836	6926.7	Not given
Potato	159.4	3491.7	21905.3
Tomato	52.3	529.6	10126.2
Onion	147.6	1939.6	13140.9

Source: Crop reporting services of Provinces

Sri Lanka

As per the National Income Estimates for the year 2009 the agriculture sector contributes about 13 percent to GDP and nearly half of the country's labor-force is engaged in agricultural activities. Sri Lanka has implemented agriculture based economic development policy in order to address the issue relating to the global economic slowdown and subsequent price hike in food commodities. A number of measures are being taken for developing agriculture sector particularly domestic food production, floriculture and export crop sectors for the purpose of achieving self-sufficiency at national level and ensuing food security.Sri Lanka is situated in the extreme south of India in the Indian Ocean. It covers an area of 65,610 square kilometers with population of 20359439. The horticultural sector of Sri Lanka normally deals with two important areas, i.e. crop and ornamental sectors. The production of fruits, vegetables, roots and tubers fall into the crop sector. The ornamental sector is concerned with the production of live plants, cut-flowers, leaves, bulbs, corms and tubers. The cultivation is mostly dominated by about 35 tropical, sub-tropical and temperate fruit cultivars (coconut, mango, avocado, pineapple, guava, papaya, wood apple, citrus, pears and passion fruit) and about 40 species of vegetables and root and tubers (bean, egg plants, pumpkin, beet root, cucumber, raddish, leaf vegetables, potato, sweet potato and tomato). The current average yields of most of the horticultural crops are very low in Sri Lanka compared to many other

developing countries. The post harvest losses of fruits and vegetables are estimated to be around 30-40 %, which contribute to the high market prices. Reduction of post harvest losses reduces the unit cost of production, lower the prices and increase the farmer's income.

Table 8. Area and production of different horticultural crops

Crops	Area in Ha (2013/2014)	Production in Met.ton (2013/2014)
Fruit	104707	1296525
Vegetables	42921	620470
Potato	4105	67870

Source: Department of Census and Statistics, Sri Lanka, 2014.

It was concluded from foregoing discussion that each member of SAARC country has its own technology of horticultural advancement in terms of production of fruits, vegetables, floriculture and medicinal plants. However, with the development of regional co-operation among each other, there is every chance to increase the productivity of commodities to a substantial amount. Therefore, there is an urgent need to deal with cooperative activities in the following fields: i) Exchange of new germplasm in developing new crop varieties; ii) seed policies to facilitate the development and importation of hybrid seeds; iii) exchange of experts in different fields; iv) joint ventures in seeds and planting material production; v) joint ventures in storage and processing industry; vi) exchange of technologies in production of small farm machinery and equipment; vii) training programs on hybrid seed production, post-harvest handling, processing, socio-economic data collection and analysis; viii) setting up of a regional information network, etc.

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