

Agriculture in Sri Lanka: The Current Snapshot

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Abstract—Sri Lanka being an island is blessed by nature with ideal environmental factors on the field of agriculture which is being intentionally practiced towards the sustainability. The agriculture sector in Sri Lanka always acts as a major economic strength to the national economy as it ensures the food security, employment and poverty alleviation of rural communities. The sector is mainly driven by variety of distinct sub sectors which include crop cultivations such as paddy, tea, rubber, coconut, vegetables, fruits, export crops and sugar while in addition livestock and fisheries sectors also provide a substantial contribution simultaneously. Negative and positive fluctuations of each above mentioned subsector directly affects on the overall country uplift and the society wellbeing. This paper will be discussing about the present status of the agriculture in Sri Lanka in a concise manner with respect to the recently published official data by country regulatory bodies.
Keywords—Agriculture Production Index, Ceylon, Food Security, Gross Domestic Production, Zoonotic Diseases.

I. INTRODUCTION

The Democratic Socialist Republic of Sri Lanka formerly known as Ceylon is an island located just below the southern tip of India surrounded by the Indian ocean, which is having a population up to date around 21 million. By ethnicity, the majority of the Sri Lankan people are Sinhalese (74.9%) whereas the minorities are represented by Sri Lankan Tamils (11.2%), Sri Lankan Moors (9.3%), Indian Tamil (4.1%) and Others (0.5%). Buddhists are the dominant religious characters (70.1%) while Hindus (12.6%), Muslims (9.7%) and Christians with Roman Catholics (7.6%) are further represented respectively [1]. Being a tropical country, the temperature is usually constant with respect to a certain altitude and there are two monsoons which are locally called as “Maha” Season (November to February) and “Yala” season (May to September) caused by the country rainfall distribution. On this basis, the country has been divided into three climatic zones; Wet Zone, Intermediate Zone and Dry Zone.



Fig.1: Map of Sri Lanka
(Source: www.nationsonline.org)

Wet Zone receives over 2500mm of mean annual rainfall covering the south- west regions including central hill countries and the Dry Zone covers the northern and eastern parts of the country with a mean annual rainfall less than 1750mm while Intermediate Zone lies between these two zones receiving a mean annual rainfall ranging from 1750mm to 2500mm. In addition, the country has been classified into 24 agro-ecological zones based on the rainfall, soil characteristics, forestry and the land use manner and with the advancement of navel technology, these 24 agro-ecological zones have further been divided into 46 sub-regions [2]. Excluding inland waters, the land territory spreads over 62,705 km² in which the agricultural lands occupy 20.7% portion contributing around 8% to the National Gross Domestic Production (GDP) and acquiring 28.7% of employment without seconding to the other industries. Main agricultural crops in Sri Lanka are paddy, tea and rubber which consume 1,592,000 hectares [1]. Almost 75% agricultural land is

governed by smallholdings in which around 70% farmers solely practice crop production while the rest is having an integration of crop with livestock and in few cases only the livestock [3]. The livelihood of Sri Lankan people has originated with a great agricultural history dating back more than 2500 years. Persisting moderate climate with ideal temperature and rainfall patterns throughout the year, largely extended fresh water network which is consisted with manmade reservoirs, rivers and other freshwater resources along with adjacent fertile soil; the country is renowned as the Pearl of Indian Ocean. As a consequence of having ideal resource base, the agriculture sector in Sri Lanka always acts as a major economic strength to the national economy as it ensures the food security, employment and poverty alleviation of rural communities. But at present, the agriculture activities in Sri Lanka shown a substantial reduction by 4.2% in 2016 in contrast to 2015 which had 4.8% recorded growth rate. This negative growth rate has been resulted due to prevailed adverse weather conditions such as floods due to heavy rain falls and consequent drought conditions throughout the year. Although the livestock production, fishing and other beverage crops made a positive contribution towards the growth, this performance contraction has been mainly attributed by rice, tea, rubber and fruits during the year. According to the Agriculture Production Index (API) which is the tool for defining the movement of the agriculture and fisheries sector productivity, in 2016 an overall decline of 2.4% has been recorded oppose to 4.4 overall growth rate in 2015 [4].

II. PADDY PRODUCTION

Millions of farm families in world engage with paddy cultivation and majority of them belong to the small scale category [5]. Rice is the most important staple food crop which occupies the majority of total cultivable agricultural lands through which the livelihood activities of people are originated in Sri Lanka [6]. In Sri Lanka, although there are more than 90% of irrigated paddy lands are located in the dry zone, the majority of dry zone paddy farmers have a relatively poor economic status as they are technically inefficient of utilizing the available resources [7]. Various policies have been adapted by the government as to provide incentives to paddy farmers [8] since rice performs as a foundation to uplift the rural economy. Even though the country could achieve 4.4 million metric tons for the year 2016, the total production has declined by 8.3% oppose to the records revealed in 2015 [4].

III. TEA PRODUCTION



Fig.2: Tea Cultivation in Up Country

Tea which is having a history of more than a century; extending up to the British colonial era, plays a bigger role in national economy by obtaining export earnings as to uplift the government revenue and providing employments to people who are struggling to get rid of poverty [9]. In the case of tea, it has been reported that the revenue generated through the tea exportation had been reinvested as to compensate 71% of food import bills indicating the indirect contribution towards the food security performed by the local tea production [10]. Sri Lanka is the third largest tea producer in the world possessing a share of around 23% of the global demand. The annual tea production is around 340 million kilograms per year and the production is possible throughout the year. Ceylon tea is renowned as the best tea in the world due to its intrinsic high quality, aroma and the taste which have been caused to be unique among the other tea producing countries. Sri Lanka mainly exports about 51% of tea as value added products such as green tea, flavored tea, iced tea and so on [11]. In the year 2016, the tea production has made a substantial decline in accordance with the supply and demand. Total tea production in 2016 was reported as 292.6 million kilograms which was contradictive to 328.8 million kilograms recorded in 2015 corresponding to an overall distinct decline by 11% [4].

IV. LIVESTOCK PRODUCTION

Livestock species are the domesticated animals such as cattle, swine, sheep, goat, poultry and horses basically being reared for food purposes. Size of the farm, productive capacity of the land, technology used, financial resource available, knowledge and experiences of the operator, labor availability, location of the farm with respect to the market and the cost of inputs and its availability are the major determinant factors when choosing a livestock enterprise in general. Livestock provides quality food and well-balanced nutrition directly

to human by converting the natural vegetation, crop residues, by-products from food manufacturing, and different organic wastes whereas it also ensures indirectly the food security by increasing crop harvest through supplying organic manure and stabilizes the food supply by acting as a buffer during any fluctuation in crop production [12].



Fig.3: Intensive Cattle Farming

Although the demand for the livestock products is relatively stable in developed countries, the global livestock sector shows a dynamic nature hence there is a continuous increasing demand being performed by developing countries as a consequence of the population growth, urbanization, income growth, increase in animal number and developments of animal health care facilities. At present, many livestock production systems tend to increase their output efficiently in a sustainable manner with the aid of advanced science and technologies [13]. In the point of agriculture, the majority of the land surface has been occupied by the animal husbandry. Most of the people on the earth engage in livestock production even at small scale as livestock integration is a source of income diversification while improving the soil fertility for the crop production and providing draught power and transportation. However, as in all agricultural systems except the benefits there are negative impacts as well. Public concern towards the food safety and healthy diet has been playing a substantial role on the consumption patterns negatively on the livestock products throughout the world whereas inefficient management of farm animals is a source of emitting unacceptable amounts of greenhouse gases hence deteriorating the land and water resources by their effluents [14]. The risks associated with zoonotic diseases which can transmit from humans to animal represent a significant constraint when implementing livestock integration plans. Restrictions are being applied and indispensable health programs are being carried out in order to encourage the international trade and to assure the safety of ultimate consumers [15]. In year 2015, the livestock industry in Sri Lanka contributed a 0.6% to GDP. The cattle and buffalo

population has shown a marked increase by 10% and 2% respectively oppose to 2014. Although there was an increase of animal number, the total milk production had decreased by 4% in 2015 as a consequence of FMD (Foot & Mouth Disease) epidemic leading a negative growth of dairy sector. Since there was a decreased international market price for milk derived food commodities, the imports of milk and milk products demonstrated a 22% increase as usual. According to the available data, chicken meat production has increased by 9% and the egg production has increased by 3% in year 2015 compared to 2014. Accordingly, the per-capita availability of eggs has increased by 1.2 kilogram per year and the per-capita availability of chicken meat has increased by 0.63 kilogram per year respectively. The goat population is around 3.5 million and the production still behaves as a traditional practice which is especially centralized in the dry zone. Meat (mutton) is the main output consumed than the milk. The mutton production was recorded as 135,000 metric tons causing per-capita consumption of 0.09 kilogram per year. Swine production is distinctly practiced along the western coastal belt of Sri Lanka. The total swine population was recorded as 94,612 and this number is corresponding to a 32% of significant increase. The estimated swine meat production was 718,000 metric tons and consequently the per-capita consumption was 0.34 kilogram per year in year 2015 [16]. In the year 2016, the local milk production has been recorded as 384 million liters with a growth of 2.6% respectively. This marked increase has been achieved by importation of productive heifers, affordable prices of raw milk for farmers, increased demand for raw milk and expanding the production capacities of milk factories. Out of total milk production, 82.8% (317.9 million liters) is accounted by cattle milk production while 4.2% (66.1 million liters) is buffalo milk. Although there is an increase in milk production, the milk powder imports were recorded as 94,011 metric tons as an increase of 15% valuing Rs. 33.6 billions. Milk production at National Livestock Development Board (NLDB) contributed 17.9 million liters while MILCO (Pvt) Ltd accounted for 70 million liters of milk collection. Government takes maximum efforts to increase the milk production in the country with an intention of achieving the self-sufficiency in milk. The chicken production showed a growth of 5.7% marked increase to 173,830 metric tons [4].

V. COCONUT PRODUCTION



Fig.4: Coconut Cultivation in Dry Zone

Coconut is a perennial crop which is grown especially in tropical regions over 90 countries. In Sri Lanka, Coconut cultivation plays a bigger role for sustaining the livelihoods of large numbers people and it ensures the food security after the paddy cultivation as coconut can withstand adverse climatic fluctuations [17]. The productivity of coconut cultivation is being improved and the emerging most problems are being eliminated by introducing new improved varieties with the help of latest scientific practices. A total of 394,836 hectare of area is under coconut cultivation. Coconut and coconut based products earn substantial amount of foreign exchange from the international market. Products included under edible category of coconut products are desiccated coconut, nuts, coconut oil, coconut water, coconut cream and coconut milk while activated carbon, coir and coir based products and crafts out of shell are classified into industrial category. The distribution of coconut cultivation is highly intensive especially in West and North Western provinces. There are three main districts under these two provinces where the coconut cultivation is obviously dominant known as the “Coconut Triangle” which includes Kurunegala, Puttlam and Gampaha districts [18]. In 2016, the supply of coconut and coconut products appeared as a deceleration. Consequently, there was a decline of 1.5% associated with the estimated value of 3,011 million nuts oppose to the values recorded in 2015. This negative production status has been attributed mainly by prolonged drought period experienced within the growing areas [4].

VI. RUBBER PRODUCTION

The demand for the natural rubber has been increased substantially due to rapid increase in demand for Natural Rubber (NR) in the world thus, investments on rubber sector is said to be highly profitable. Rubber goods have a large market potential in the world. The opportunities should be optimized to encourage the growth of rubber downstream industries to meet the anticipated growth in the industry [19]. The history of Sri Lankan Rubber industry originated in 1876 with establishing of the first rubber trees in Henerathgoda Botanical Gardens located at Gampaha. At present, the majority of manufacturing firms are scattered in South West of the country. Since 1876, Sri Lankan natural rubber has a higher demand due to its popular premium quality in the world especially on type called Lanakprene which is having distinguishable intrinsic characteristics such as odorless nature, light colored and clean ideal for producing better rubber derived products. In year 1950, the rubber industry was led by tire re-trading and rapidly expanded due to introduction of free trade policies to the nation in the year of 1970. Since two decades, the country produces ranges of large numbers of value added rubber products such as rubber bands, tires, tubes, industrial components, auto parts, carpets, footwear, bottles, gloves etc. Major markets for manufactured rubber products are USA, Germany, Italy, Belgium, & UK [20].



Fig.5: Rubber Plantation

In 2015, the total rubber production and total exports recorded as 885700 metric tons and 103700 metric tons respectively in which the export value was 3548 million rupee. The local consumption of rubber showed with a value of 1,274,200 metric tons whereas the cost of production per kilogram was Rs. 170.00. Government has already taken up the steps to be achieved in order to

ensure the growth, competitiveness and the sustainability of the rubber industry in Sri Lanka as to capture the global market against its competitors by formulating and introducing a comprehensive strategic plan known as Sri Lanka Rubber Industry Master Plan (RMP) validated for stakeholders which was supported by Asian Development Bank (ADB) and variety of multidisciplinary field experts. This plan is consisted a detail of value chain analysis encouraged with prospective strategies, goals and action procedures and will be worthy up to 2026 with the commencement of the master plan in the year 2017 [21]. It has been recorded that in year 2016, the rubber production showed a significant declined growth rate by 10.7% (79.1 million kilograms) reported in the past 50 years performed especially by the smallholder sector due to reduction of the tapping days as a response to the lower prices [4].

VII. MINOR EXPORT CROPS & OTHER FIELD CROPS

Minor export crops also play a substantial contribution towards the national economy through the agriculture and provide livelihoods for people. Areca nut, betel, cardamom, cinnamon, citronella, clove, cocoa, coffee, ginger, goraka, lemongrass, nutmeg, pepper, turmeric and vanilla are the main minor export crops grown in different locations under varying climates in Sri Lanka. Majority of these are freely available and can be grown easily in villages thus performing a vital role even in Sri Lankan village economy [22]. The production of minor export crops in 2016 declined by 9.5% compared to 12.9% growth which was reported in 2015 and the production status of Other Field Crops (OFCs) also showed a simultaneous contraction by 6.4% corresponding to 339,253 metric tons in 2016 from 362,452 metric tons in 2015 due to adverse weather conditions and prevailed fluctuations of seasonal patterns [4].

VIII. VEGETABLE & FRUIT PRODUCTION

As a mean, Sri Lanka produces around 1,250,000 metric tons of vegetables and fruits annually (around 710,000 metric tons of vegetables and 540,000 metric tons of fruits) through already identified 80 different vegetable and fruit varieties grown under varied agro-climatic conditions throughout the island. Temperate vegetables and fruit crops such as leeks, beet, carrot, bean, salad cucumber, tomatoes, bell pepper, tomatoes, Chinese-cabbage, cabbage, strawberries, sukini, salad leaves, cauliflower and cherry are extensively cultivated especially in the hill country as its climate is obviously ideal whereas tropical fruits and vegetables such as green chili, gherkins, lemon, pumpkin, papaya, mango, melon, red onion, bitter gourd, banana types and queen pineapple are broadly cultivated in low country and dry wet areas of

the country. Indigenous yam types such as kiriala (*Xanthosomasagittifolium*) and innala (*Lecranthus*), Underwater stems of *Lasiaspinoso* (kohilaala) and *Nymphaea lotus* (nelumala), bread fruit, drumsticks (murunga) and young jak fruits are also popular commodities derived from fruits and pods of perennial crops.



Fig.6: Banana Cultivation

Generally, the land extent for cultivations has not exceeded beyond a hectare since most of such vegetables or fruits growers are small level producers or home gardeners. The export market for processed/ value added and fresh fruits & vegetables has been identified as a sector with an extreme potential for further progressive future due to increasing demand coming from international markets. Approximately 65% of fresh vegetable and fruit products are exported to the Middle East and the Maldivian market while 90% of processed vegetable and fruit products are targeted to European market. Saudi Arabia, United Kingdom, Germany, Pakistan, Kuwait, India, Maldives, United Arab Emirates and Qatar are the top fruit & vegetable importing countries from Sri Lanka [23]. In 2016, the total annual vegetable production performed a marginal increase by 1.3% to 1,648,501 metric tons relative to 1,627,592 metric tons reported in 2015. The annual fruit production status demonstrated a marked reduction by 6% in 2016 irrespective to the arising demand posed by exporters, after 15.6% decline observed in 2015 [4].

IX. SUGAR PRODUCTION

Sugar production in 2015 increased by 7% to 55,982 metric tons due to increased extent of cultivation and higher purchase price for sugarcane, blessed by favorable environmental conditions around the country. Out of the total production, about 27,612 metric tons (53.7%) was accounted by Pelwatte sugar factory which is the pioneer of providing domestic sugar requirements to the nations

while SuduOya, Sevenagala and Gal Oya sugar factories were responsible for compensating the rest. Kantale sugar factory has been engaging for cultivation of sugarcane with an intention of recommencing its manufacturing operations in the near future. Although there was an uplift of the production, the sugar recovery rate which indicates the productivity had declined to 7.5% in 2015 from 8% recorded in year 2014. Nevertheless, the overall production in 2015 was quite enough to recover 10% of the total sugar requirement of the country. The sugar imports had been increased by 20.1% to 623,971 metric tons in year 2015 due to low sugar prices showed in international market thus indicating to take sufficient actions for expanding the potentials of the sugar industry as to reduce the amount of foreign exchange incurred in importing sugar [24]. In year 2016, the sugar production in the country showed a marked increase of 10.9% to 62,048 metric tons which was encouraged by cultivation of high yielding sugar cane varieties, irrigation systems, extended planting activities and better field maintenance [4].

X. FISHERIS SECTOR

Food security and nutrition has become a global challenge since hunger, poverty and malnutrition still remain among most of the people in world. The fishing sector worldwide plays a considerable role as a basis of livelihood especially in developing countries for alleviating the poverty, hunger and malnutrition thus ensuring the food security, nutrition of millions of people as well as building up the economic viability among communities. It has been proven that there are about 30,000 fish species living on Earth's hydrosphere and around hundreds of species are caught commercially. Fish contain Omega-3 fatty acids which can reduce the blood pressure and other associated cardiovascular disorders thus avoiding the risk of deaths linked with heart failures. Eating fish may even cause to lower the depression, risk of stroke and mental retardations. Fish intake is very much important especially for mothers who are pregnant or breastfeeding hence it supplies DHA which is a specific type of mega-3 fatty acids beneficial for the brain development of infants [25]. According to the FAO (Food and Agriculture Organization of the United Nations), it has been recorded that more than \$50 billion is wasted in each year especially from the marine fishing sector due to numerous malfunctions, around 20-30% of wild fish harvested are used in aquaculture as fishmeal and being consumed by coastal communities. Fish has been classified as the most largely traded food commodity in world of which 50% is represented by developing countries [26]. The fisheries sector in Sri Lanka which is comprised with three main subsectors namely coastal; offshore and deep sea; and inland and aquaculture, acts as an essential source of

animal protein and plays key economic activities among coastal communities [27].



Fig.7: Marine Fisheries Sector

The sector has been classified as one of main potential areas that can be expanded as to uplift the national economy. Currently, the sector is capable of providing 560,000 employment opportunities directly and indirectly which sustain around 2.6 million people aiding for generating income, foreign exchange and supplying the regular required nutrition in an affordable manner. Being an island, Sri Lanka is rich with aquatic resource bases viz. Exclusive Economic Zone (EEZ) which extends 517,000 km² as the marine territory and mainly identified 45 lagoons and estuaries. In addition 489,000 ha is represented by inland water resources such as villus, irrigation reservoirs, seasonal and perennial tanks possessing a greater inland fish mass that is even possible to be expanded. The Sri Lankan fisheries sector contributes around 1.7% for the National GDP. In year 2015, the total fish production was reported as 384,610 metric tons in which 334,390 metric tons were accounted by marine fish production while 50,220 metric tons donated by inland fisheries. The total fish export value was quantified as Rs. 18,458 million and the quantity exported were reported as 12,982 metric tons respectively. Since Sri Lankan people can obtain acceptable protein requirements through intake of fish as a food in an affordable manner, the government of Sri Lanka has already taken steps to increase the national fish production up to 685,700 metric tons as to ensure per capita fish consumption of 22 kilogram per year [28]. In year 2016, the growth of the fisheries sector showed a moderate expansion by 2.1% over 2015 to 530,920 metric tons [4].

XI. ISSUES & CHALLENGES

At present, the country confronts many challenges in the field of agriculture. Many of such challenges and issues are increase of demand on food due to uninterrupted population growth, wasting large amount of money for importing different food commodities which even can be produced locally, Non-adherence of young generation for agricultural practices, economical imbalance of farm households, harmful environmental impacts due to extensive use of agrochemicals, land fragmentations and competition for land with other industries, lack of exposure for applying appropriate latest technologies for food production, export failures caused by malfunctions on complying with international standards, issues resulted on low quality food products, food safety and food security, sudden climatic fluctuations, lack of a consistent and efficient national agricultural policies, No appropriate subsidy schemes for farmers, issues with disseminations of agricultural information, inefficiency of land use patterns and developments, inadequate enforcements of already defined legal frameworks, lack of coordination among other allied organizations and industries, insufficient amount of vital resources such as workable human resources, infrastructures and finance, inadequacy of effective extension services, research and development processes, and proper well-updated databases, High involvement of middlemen, post harvest wastages, lack of good quality raw materials, inadequacy of suitable machineries, poor genetic crop varieties and animal breeds, high costs on labor wages, poor practices on soil conservation, water and land pollution, natural disasters and hazards, poor and inefficient modes of waste management practices, conflicts with wild animals, malfunctions of irrigation systems, poor marketing activities and market access for rural farmers, lack of proper insurance schemes, instability of market demand, supply and prices, No effective coordination among buyers and producers, disease outbreaks and poor early responses and preparations, Inadequacy of awareness program especially on Good Agricultural Practices (GAP) and organic certification, food habits and perceptions on foods of the traditional publics, inadequate linkages between famer based communities, researchers, extension approaches and farmers and so on [29].

XII. CONCLUSION

The overall performance of the agriculture sector in Sri Lanka has shown a negative growth rate in year 2016 with respect to 2015. This decline has been mainly attributed by the changes of anticipated favorable weather patterns prevailed while other existing issues and challenges also affected on the same scenario simultaneously. Although adverse weather effect is not under the human control, appropriate well-established

strategic approaches should be applied in order to minimize the negative influences posed by such already identified existing issues and challenges. Policies, regulatory frameworks and guidelines, value chains, farm inputs and logistics, natural resource management, financing, marketing, data availability and its accessibility and reliability, knowledge and awareness on information and services must be well defined and applied in a responsible and applicable manner for the sector efficiently. The authorities which are obviously responsible for uplifting the agriculture sector must attempt to achieve the self-sufficiency of each sub sector as to save the foreign exchange on continuous imports. Food availability should be ensured throughout the year by practicing appropriate management of buffer stocks with an intention to be used whenever necessary. Food commodities should be marketed and promoted within and outside the country through eco-friendly practices and novel innovations. Appropriate latest technologies should be introduced and communicated among all agricultural stakeholders by establishing proper coordinating mechanisms. Thus, focusing on all the potentials and alternatives for establishing a sustainable agriculture system as to uplift the socio-economic stability of the country.

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