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Current Issues in the Farm Sector of the Tea Industry in Sri Lanka

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Abstract

Sri Lanka is a leading tea producer and exporter. The contribution of the tea industry to the country's GDP, foreign exchange earnings and employment is sizable. However, its' international competitiveness and domestic growth are threatened presently because of strong competition from emerging tea producers and exporters, and performance-related factors in the value chain and in the farm sector. Pressing issues in the farm sector are related to labour availability, high production costs, restrictive government policies, climate change and a lack of entrepreneurial tendencies. They relate to both private and estate growers and they have led to serious adverse consequences for production in the sector.

Farm-level decision-making in the green leaf production sector as a response to the emerging issues shows a reluctance by both smallholders and estate managers/company management to reinvest in their tea cultivations. This is more common in the estate sector, where reinvestment in essential field activities that are capital and labour-intensive, such as in-filling, replanting and new planting, are not done or are delayed. The same fate happens to other investment projects such as soil conservation, rehabilitation, and infrastructure development that directly and indirectly affect productivity. Accordingly, areas under cultivation are decreasing, and production is declining.

Keywords: Sri Lanka, tea industry, farm sector, private growers, estate holdings.

Introduction

Sri Lanka is a major producer of high-quality black tea (Samaraweera *et al.,* 2013; Wekumbura *et al.,* 2017). Tea production has contributed on average one per cent of annual Gross Domestic Product over the past decade (Central Bank of Sri Lanka, 2018), with 10 per cent of the Sri Lankan population directly and indirectly working in the tea industry (Sri Lanka Tea Board, 2014; Thushara, 2015; Shyamalie, 2015b). Sri Lanka is the fourth largest producer of tea in the world, accounting for five per cent of world tea production. It is the third largest exporter of tea, selling 15 per cent of world exports of tea, competing with other major tea producers and exporters such as China, India, Kenya, Indonesia and Vietnam (International Tea Committee, 2019). In recent years, tea exports have accounted for around 12 per cent of the total merchandise exports of Sri Lanka, earning more than 50 per cent of the total foreign income coming from agricultural exports (Policy and Strategic Planning, 2019).

The tea industry comprises tea growers who produce the green tea leaf (what we call the farm sector), "made" tea manufacturers, and tea traders (see Perera and Rathnayake, 2021). Intermediary green leaf dealers link and coordinate the tea growers and tea manufacturers, while tea brokers link the made tea buyers and the manufacturers. The central tea auction market in Colombo provides the platform for tea traders to purchase made tea. Tea traders purchase tea from the auction market mainly and provide secondary processing services such as tea blending, flavouring, and packaging and bagging tea (Ariyawardana, 2001) to local markets or exporting it to numerous countries.

Despite producing high quality tea and a history of growth and successful export performance, the tea industry in Sri Lanka has not shown any growth in recent years. The industry is facing numerous issues and challenges in key sectors which are threatening competitiveness in the international tea market and its domestic growth and progress. The aim in this paper is to investigate current issues in the farm sector of the tea industry in Sri Lanka and the challenges they are causing.

Current Situation of the Industry

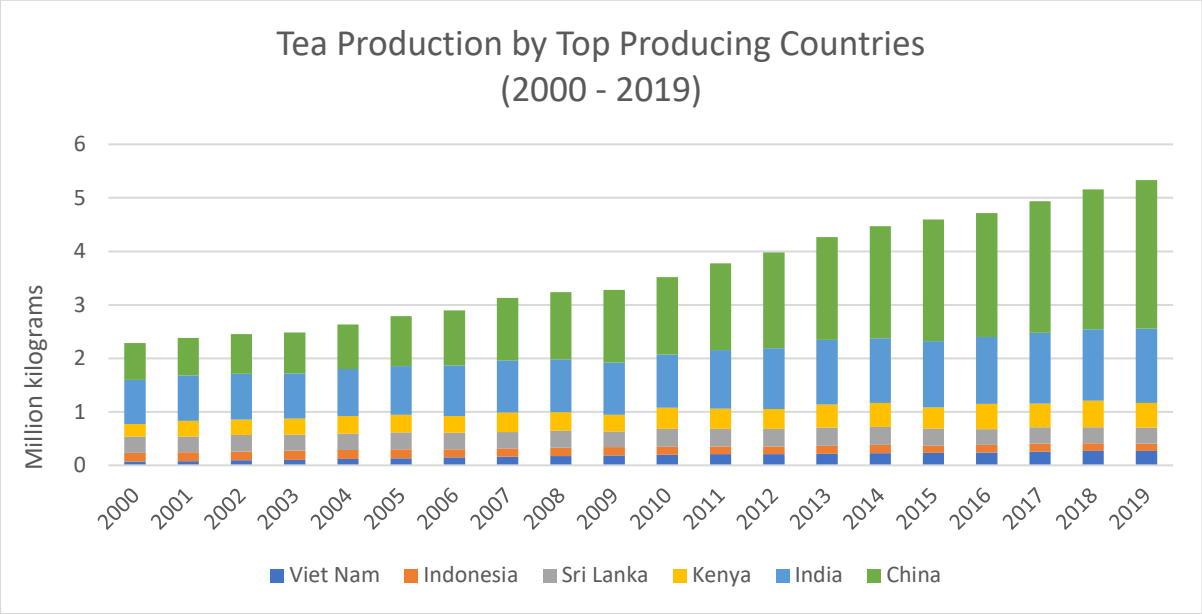
The factors that are prominent in the current unsatisfactory performance and growth of the Sri Lankan tea industry can be categorised as:

- Developments in the world market;
- Performance-related factors of the tea industry value chain; and
- Performance-related factors of the farm sector.

Developments in the world market

Tea is predominantly produced in China, India, Kenya, Sri Lanka, Indonesia and Vietnam, which collectively contribute more than 85 per cent of world tea production. China and India are the two largest tea producers, as shown in Figure 1.

Figure 1. Production of the major tea producing countries



Source: FAOSTAT (2020)

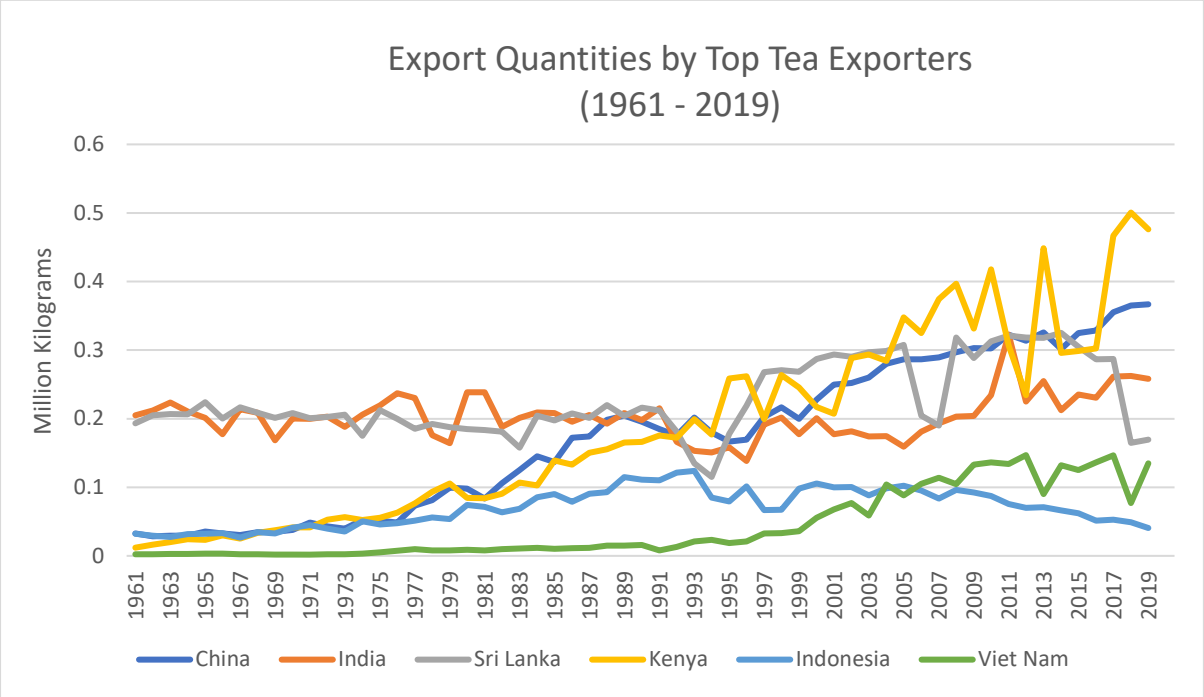
As shown in Figure 1, there has been a gradual growth in tea production by China, India, Kenya and Vietnam since 2000. Most of these countries have increased both the area under cultivation and production substantially over the years, benefitting from expanding into areas of previously

uncropped, fertile land, producing high yields with few inputs and cheap labour. Production in Sri Lanka and Indonesia has stagnated over this period.

China, Kenya and Vietnam are performing well on the world tea market, steadily building larger shares of the global market as shown in Figure 2. They are relatively recently entrants to the global tea market and have grown significantly over a few decades. For example, Kenya has become the largest tea exporter, achieving this in less than two decades. Sri Lanka was the leading tea exporter, with India, until the early 1990s and 2000s when they were surpassed by Kenya. China and India have remained leading exporters, even with a considerable share of their tea production being consumed domestically.

The growing quality competition from the newly emerging and growing exporters has exerted pressure on the Sri Lankan tea industry. One outcome is that Sri Lanka has recently lost share in the global market (Herath *et al.,* 1998; Kasturiratne, 2008) (see Figure 2), with a sharp decline since 2015/16. Sri Lanka has lost shares in traditional markets such as Pakistan and United Kingdom recently to Kenyan teas because of the high cost of production (Hilal and Mubarak, 2016).

Figure 2. Export quantities by top exporting countries in the world



Source: FAOSTAT (2020)

Keen competition from other tea producing countries has resulted in declining and unstable prices for Sri Lankan tea producers (Herath *et al*., 1998; Kasturiratne, 2008). For instance, the high-quality Sri Lankan orthodox tea that usually fetched higher prices in the global tea market is being threatened by cheaper teas of similar quality from Vietnam and Indonesia. As well, changing consumption patterns and increasing commoditisation of tea in the world market has adversely affected the Sri Lankan tea industry, which has not been able to readily cater to changing demands, consequently losing long-held earlier advantages (Kasturiratne, 2008). The most serious challenge faced by the tea industry of Sri Lanka is to enhance productivity to remain competitive with rival tea producers (Jayasuriya, 1998; Kasturiratne, 2008; Jayaratne, 2018).

Performance related factors along the tea industry value chain

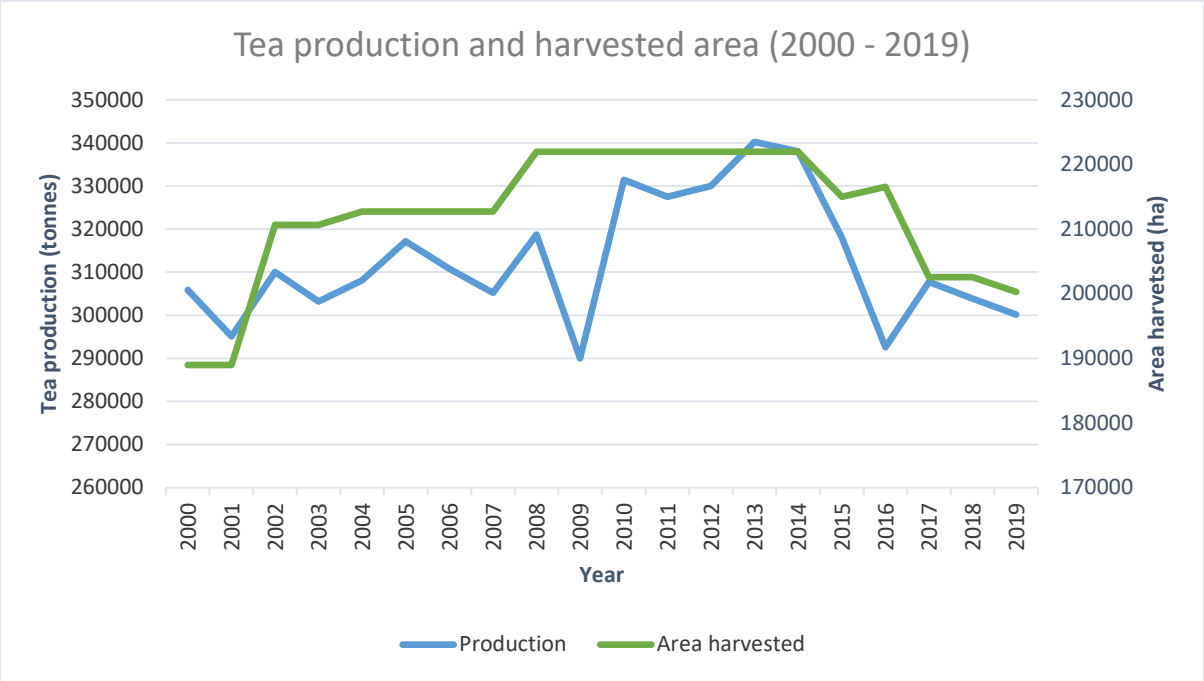
Poor performance of participants throughout the Sri Lankan tea value chain has contributed to the diminishing competitiveness and sustainability of the industry as a participant in the global tea market. The industry structure is more than 150 years old and seemingly less able to adapt to changing circumstances than newly emerging competitors (Herath *et al*., 1998; Kasturiratne, 2008). In particular, policies imposed along the value chain act as barriers to progress. The overall performance of the value chain has been affected adversely by duplicative, time-consuming and inefficient processes, such as unduly onerous quality assurance checks and barriers and burdens from excessive government bureaucracy, high and complex tax measures, and policy restrictions on tea trade and ownership (Jayaratne, 2018). These issues and challenges within the tea value chain are discussed further in Perera and Rathnayake (2021).

Performance-related factors within the farm sector

Many recent studies conducted on tea industry performance and reports of government institutes working with the Sri Lankan tea industry have highlighted the current and potential problems and challenges faced by the tea grower sector. The competitiveness of the industry is declining because of shrinking productivity levels and high production costs (Ganewatte and Edwards, 2000; Hilal and Mubarak, 2016).

Stagnant or shrinking areas under tea cultivation, low land productivity, low labour productivity, labour shortages, high costs of production, low reinvestment rates, land degradation, constantly shrinking profit margins, and climate change are the key issues in the farm sector (Jayasuriya, 1998; Ganewatte and Edwards, 2000; Jayasuriya, 2003; Kasturiratne and Poole, 2006; Samansiri *et al.,* 2011; Wijayasiri, 2013; Thushara, 2015; Shyamalie, 2015a; Shyamalie, 2015b; Gunarathne and Peiris, 2017; Wekumbura *et al*., 2017).

Figure 3. Tea production and harvested area



Source: FAOSTAT (2020)

As shown in Figure 3, the tea harvested area in Sri Lanka increased by about 10 per cent in 2002, then remained relatively steady until the onset of a downward trend in 2014. Tea production fluctuated around 31,000 tonnes until 2014 but then declined in parallel with the drop in harvested area. The highest average national yield of 1.53 tonnes of made tea per hectare during the past decade was recorded in 2013. Since then, yields have dropped to 1.35 and 1.49 tonnes of made tea per hectare in 2016 and 2019, respectively. Some long-term issues and challenges such as extreme climate events and labour issues were already faced by the farm sector, but most of the other issues arose during the period since 2014.

According to Shyamalie (2015b), during the last few decades there has been a slight decline in the tea area of the estate sector and a significant growth of the tea smallholder sector. Accordingly, the smallholder sector has shown better performance than the estate sector in terms of area and production (Basnayake and Gunaratne, 2002). Yet, the smallholder sector has not reached the target productivity levels required to have a substantial impact on national production (Samaraweera *et al*., 2013).

Emerging Issues in the Farm Sector

The structure of the farm sector of the tea industry

The farm sector of the industry consists of two types of tea growing entities, based on the scale of operation and management structure. In Sri Lanka, approximately 60 per cent and 40 per cent are grown and managed by the private and state-owned estate sectors, respectively (Sri Lanka Tea Board, 2017). The farm sector produces tender tea shoots also called green leaves harvested from tea bushes that are used in manufacturing made tea in processing factories.

The private tea landholding/grower sector operates under private ownership of tea lands and mainly comprises tea smallholdings with tea cultivation extending up to 10 acres (4 ha), and medium scale tea growers/proprietors owning landholdings larger than 4 ha. The tea smallholder sector supplies nearly 75 per cent of output, while 25 per cent of tea comes from the estate holdings (Sri Lanka Tea Board, 2015; Sri Lanka Tea Board, 2016b). The smallholder sector plays an important role in the tea industry and its performance.

The state/estate sector mainly includes tea estates over 100 ha, managed by Regional Plantation Companies (RPCs). There are 20 such RPCs and, while the sole ownership of such lands is held by the government, the management was transferred to independent management agencies, large companies and conglomerates under a management contract of 50 years in 1992 (Herath *et al*., 1998; Samansiri *et al*., 2011).

The remainder of the tea estates are owned and managed by state-owned companies such as the State Plantation Corporation, Janatha Estate Development Board and other entities such as the Tea Research Institute of Sri Lanka, Tea Small Holders Factories Ltd, Tea Shakthi, Elkaduwa Plantations Co. and Kalubowitiyana Tea Factories Co. (Tea Small Holdings Development Authority, 2018). The contributions of these different sectors to total output is shown in Table 1. Most national production is provided by the private tea grower sector and the RPC-owned estates.

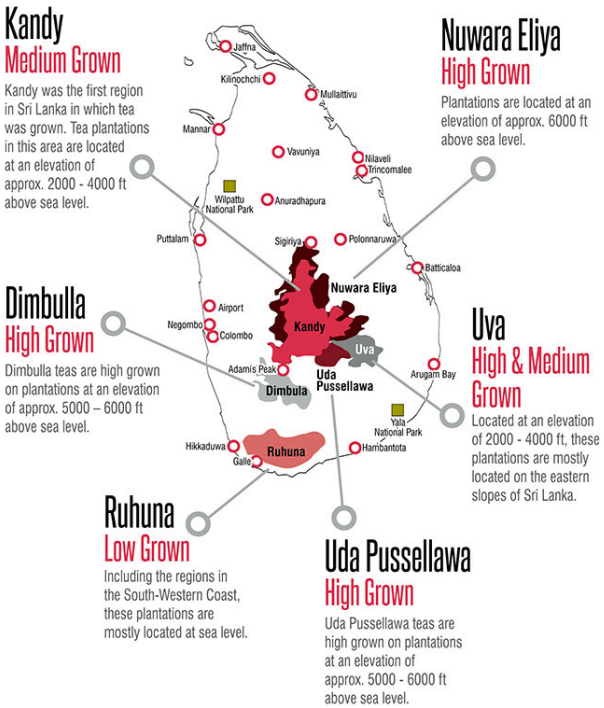
The first commercial tea plantation was established in the mid-country 150 years ago. Later, tea cultivation spread into the hill country, the high- and mid-country, and the Uva region (part of the mid-country), (see Figure 4) replacing coffee plantations (Ganewatte and Edwards, 2000).

Table 1. National tea production in Sri Lanka by management institutions, 2017 and 2018

Management Institutions	Tea production in metric tons			
	2017	%	2018	%
Private sector (tea smallholding sector and medium scale landholdings)	232,417	75.5	228,049	75.0
Regional Plantation Companies	73,079	23.8	73,540	24.2
Janatha Estate Development Board State Plantation Corporation	1,483	0.5	1,699	0.56
Tea Shakthi Tea Small Holders Factories Ltd. Tea Research Institute of Sri Lanka Elkaduwa Plantions Co. Kalubowitiyana Tea Factories Co.	741	0.2	656	0.22

Source: (Tea Small Holdings Development Authority, 2018)

Figure 4. Tea growing regions in Sri Lanka



Source: http://www.jcexport.com/our-subsidiaries-2/pure-ceylon-tea/

Following the nationalisation of tea lands owned by British companies in 1971 and 1972, tea smallholder tea cultivation began with the distribution of small pieces of land among peasants (Herath and Weersink, 2007). Over time, tea cultivation gained popularity especially in the low country among small farmers. Thus, many smallholdings were concentrated in the low country region.

The smallholding sector individually operates with small land units under tea cultivation. The small areas under cultivation mean that tea smallholdings originally relied on family labour for tea growing, harvesting and management operations. At that time smallholders cultivated tea on a full-time basis and family members contributed to farming activities. However, with the development of the Sri

Lankan industrial sector, tea cultivation for smallholders became a part time occupation with growing off-farm income, causing an increasing tendency to use hired labour for field activities.

Each plantation company in the tea estate sector usually owns several estates in different parts of the country. Each estate ranges from 240 ha to 400 ha on average and has its own factory for made tea manufacturing and a hierarchical labour management system. There is a separate labour force living on the estate with facilities such as housing, hospitals, schools, and place of worship provided. These residential labourers are descendants of immigrants who were first imported from South India during the British colonisation of Sri Lanka (1891 – 1911) to engage in the labour work in tea plantations (Herath *et al*., 1998). There is a labour union representing this labour force advocating welfare and rights of labourers. Thus, labourers in estates are paid daily wages by the company management in addition to the provision of welfare facilities.

The management of tea areas, including input usage, labour allocation, and cost structures, are better organised in the estate sector than in the private tea landholding sector.

The private tea grower sector usually does not have made tea manufacturing facilities; thus, their harvest is sold to nearby tea manufacturing factories.

The government policy framework for the tea industry focuses on the tea growers. The sector receives assistance from a range of government bodies such as the Tea Small Holdings Development Authority (TSHDA), the Sri Lanka Tea Board (SLTB) and the Tea Research Institute of Sri Lanka (TRI). These bodies engage with tea smallholders, medium-scale tea growers and the corporate sector (RPCs and state-owned plantations), respectively.

The SLTB, being the main body responsible for regulation and administration of the tea industry in Sri Lanka, performs a wide range of operations in collaboration with the rest of the government institutes and private organisations to achieve recognition and reputation for Sri Lankan tea in the global market. The TRI is responsible for conducting research and generating new knowledge for the benefit of the stakeholders in the entire industry. The TSHDA works closely with tea smallholders providing extension services, government subsidised inputs and support required for productivity enhancement.

There are several field rehabilitation and development subsidies available for green leaf producers, both private and estate tea growers, for enhancing production and maintaining sustainability and good farming practices in tea cultivation. They include re-planting, in-filling and new-planting support programs. Furthermore, a fertiliser subsidy program is offered by the government to provide fertiliser for tea smallholders at a subsidised price aiming to reduce input costs, enhance production capacities, income, and eventually uplift rural development and national economic development (Shyamalie *et al.,* 2011).

Even with these numerous support systems provided to the grower sector, national tea productivity since the 2000s has declined, with a negative annual growth rate of productivity in the estate sector and only a small positive annual growth in productivity in the smallholder sector (Shyamalie, 2015b). The performance of the green leaf production sector has been declining, threatening the sustainability of the industry.

Labour issues

Tea cultivation relies heavily on labour as scale economies are not present in green leaf production (Herath and Weersink, 2006). Almost all field operations in tea cultivation are labour-intensive. Green

leaf harvesting uses the highest amount of labour in tea production. Selective plucking of green leaves is done manually to ensure the best and finest quality of the final product.

Shortage of labour is one of the most common and pressing issues in the smallholder and estate sector (Wekumbura *et al*., 2017). Labour out-migration from the tea cultivation sector is the main reason for this labour scarcity (Dharmadasa and De Zoysa, 2012), so there is a current shortage of labour willing to work in the industry (Thushara, 2015). Most of the next generation are not willing to continue operating tea cultivation inherited from the family. Even in plantations, younger generations of residential labourers are moving away from labouring work. Regardless of the type of labour (either residential or casual), the main driving force for the propensity to migrate for non-agricultural employment is the higher income that can be earned in alternative activities (Dharmadasa and De Zoysa, 2012).

Labour productivity in the estate sector has been found to be sub-optimal because of low land productivity and inefficient labour use (Ganewatte and Edwards, 2000). A reduction in the available supply and quality of labour is common in most tea estates. Therefore, family, hired or residential labourers who are retained and engaged in tea cultivation in both producer sectors are mostly older. This has created a common problem for both the tea smallholding sector and the hired labour and estate sector, significantly impacting labour productivity.

Labour movement and associated inefficiencies have contributed to overall productivity losses in the green leaf production sector. Low labour productivity results in low yields and higher costs of production (Ali *et al.,* 1997; Ganewatte and Edwards, 2000).

Recently there has been a sharp rise in wages, both in the plantation sector, as a result of successful unionised activity of estate labourers, and in hired labour in tea smallholder areas, due to government policies related to minimum labour wages. Increases in labour wage rates have raised costs (Wijayasiri, 2013), especially in the tea smallholder and estate sectors. Casual wage rates of tea farm activities have increased by more than ten per cent during the past few years (Central Bank of Sri Lanka, 2019). Even the estate labour force has been able to increase their daily wages from Rs. 620 to Rs. 730 between 2016 and 2018 as a result of labour union actions (Thibbotuwawa *et al.,* 2019). Continuously escalating wages is an issue for tea growers regardless of the scale of operation. At the same time, there have not been increases in the productivity of labourers corresponding to the wage improvements. Furthermore, estate labourers in RPC tea fields are paid a fixed daily rate and resist the incentive-based piece-work conditions of casual labourers (Wijayasiri, 2013).

There has been a series of labour unrests/strikes/'go slow' actions led by organised labour in 2016 and 2018 in pursuit of better wages and conditions in the estate sector (Sri Lanka Tea Board, 2016a; Sri Lanka Tea Board, 2018). The limited supply of casual labourers in villages places casual labour hired by tea smallholdings in a strong bargaining position and tea landholders pay them more than the minimum wage rates, often also providing transport facilities to bring them to the tea field.

High cost of production of green leaves

Low land and labour productivity and associated relatively high cost of production are closely related. Higher costs of production can make an industry less-competitive in the global market (Ali *et al*., 1997; Ganewatte and Edwards, 2000) and less profitable (Shyamalie, 2015b). Sri Lanka has the highest cost of production in comparison with other tea producing countries, in turn affecting its competitiveness (Ganewatte and Edwards, 2000; Munasinghe *et al.,* 2017). For instance, the cost of production of green leaves in the smallholder sector has risen by 34 per cent from 2014 to 2018 (Tea Small Holdings Development Authority, 2014; Tea Small Holdings Development Authority, 2018).

As noted above, an increase in labour wage rates has led to a significant rise in the cost of production in the labour-intensive activities of growing and harvesting green leaves. Labour requirements for plucking tea leaves account for more than 70 per cent and 60 per cent of total labour costs in the smallholding and estate sectors, respectively (Shyamalie, 2015b).

Fixed labour costs in a production process also heavily influence the cost of producing green leaves (Ali *et al.,* 1997). Family farms/smallholdings that use family labour have a comparative advantage over the large plantations using residential labour because of the substantial recent increases in wages (Herath and Weersink, 2006). The cost of production of green leaves in the estate sector is also higher than that of the smallholding sector because of supervision costs of field managers and welfare costs incurred for the residential labour force (Herath *et al*., 1998). Meeting ethical tea production and fair-trade criteria in the global tea market requires that proper welfare facilities are provided to the labour force.

Increasing cost of inputs including fertiliser and agrochemicals also contributes to the relatively high cost of production of green leaves in plantations compared with domestic and international competitors (Shyamalie, 2015b; Wekumbura *et al*., 2017). Tea smallholdings usually produce green leaves at a cheaper cost than large plantations because of the fertiliser subsidy program which has been made available by the government for small-scale farmers over the years (Tea Small Holdings Development Authority, 2016). The commercial cost of inputs such as fertiliser and chemicals used in the estate sector increases the cost of green leaf production.

With the increasing cost of production of green leaves, and associated decreasing profit margins in businesses, tea growers have, to the extent it is possible, adapted techniques that demand less labour and fewer inputs such as chemical weeding, even at the cost of human health and environment. Even so, because of increasing production costs and low profit margins from green leaf sales, most tea landholders or estate managers have been reluctant to invest in new techniques, and in essential field activities such as soil rehabilitation and replanting that require extra capital (Munasinghe *et al*., 2017). This in turn affects the field productivity of cultivations. The reported average yields of made tea by the smallholder sector for 2015, 2016 and 2017 were 2,059 kg/ha, 1,820 kg/ha and 1,991 respectively. The estate sector reported 1,575 kg/ha, 1,324 kg/ha and 1,412 kg/ha/year of made tea for the same years (Ministry of Plantation Industries, 2018). These reports reflect stagnant yields in both sectors. The national yield of made tea in Sri Lanka has dropped from 1,532 kg/ha/year in 2013 to 1,498 kg/ha/year in 2019 (Food and Agriculture Organization of the United Nations, 2020).

Government policy barriers

Recent government agricultural policy decisions have adversely affected the entire tea industry, with a major impact on the tea grower sector. In 2014, the Government of Sri Lanka took actions to restrict the use of weedicides with the active ingredient Glyphosate, and in 2015 introduced an island-wide ban on the use, sale and import of weedicides containing Glyphosate (Registrar of Pesticides, 2014; Registrar of Pesticides, 2015).

The main reason for the government policy to ban Glyphosate was the socio-political pressure created in the country based on the hypothesis that Glyphosate could be a causal factor for the non-communicable disease prevalent in the dry zone of Sri Lanka known as Chronic Kidney Disease of Unknown Etiology (CKDu).

The tea industry, with tea cultivations concentrated in the wet zone of the country, used the largest share (36 per cent) of total Glyphosate imports in 2014 (Marambe, 2018). According to TRI, more than

50 per cent of smallholders and all major tea plantations relied on Glyphosate for weed control (Marambe and Herath, 2019).

The ban was relaxed after three years for the main plantation industries, including tea, because of the adverse economic impacts. For example, at the farm level, there were significant reductions in the income and profit from green leaf sales in tea smallholdings, and some estates reported a threefold increase in the labour costs of weed control (Abeywickrama *et al.,* 2017). The increased cost of production resulting from the ban on Glyphosate severely affected profit margins of tea growers as they had to use labour, which is scarce, a cost exacerbated by increasing wage rates for labour weed control in the absence of viable alternatives. In addition, some tea growers from the tea smallholder and estate sectors abandoned their unproductive tea fields because of the increased cost of weed control. As well, delayed weeding or not weeding at all resulted in worker inefficiency, delayed plucking and fertiliser applications that eventually affected the overall yield and productivity of cultivations. National-level cost estimations of the ban showed a 33.2 million kg/year reduction in tea production without weed control, and a Rs.26.7 billion/year reduction in export earnings (Marambe and Herath, 2019). Thus, those who have been seriously affected from the ban in the farm sector were mainly tea estates and smallholders experiencing labour shortage who used Glyphosate for weed control.

Because of the small scale of production in the smallholder sector, the impact of the ban on weeding was managed, to some extent, by those who have used Glyphosate before the ban by using alternative chemicals such as MCPA, illegal chemicals and mechanical techniques even though they are not as effective. Similarly, the entire estate sector also has attempted to control weeds in their estates using alternative and illegal chemicals.

The TRI recommended alternative herbicides to Glyphosate such as Glufosinate ammonium, Diuron, 2,4-D and MCPA for effective control of weeds during the ban (Silva, 2015). Ineffective use of MCPA on weeds eventually led to detection of the maximum residual limits being exceeded in made tea consignments exported to Japan and Europe, and shipments being returned, incurring a cost of nearly US $5.6 million (Fernando, 2018; Marambe and Herath, 2019).

Another critical issue that arose during 2015–2018 was that the ban paved the way for smuggled/illegal Glyphosate channels into the country (Abeywickrama *et al*., 2017; Marambe and Herath, 2019). These chemicals were sold as the same brand name of Glyphosate in the black market but without any labels or prescriptions, but they were highly concentrated and toxic, with instances of damaged tea bushes and soils resulting from their use.

Another policy change implemented in the agriculture sector in 2016-2017 was changing the price subsidy on fertiliser to a cash voucher system with the intention of reducing the chemical fertiliser use in agriculture (Wijetunga and Saito, 2017). This policy adversely affected the productivity of tea cultivations as tea smallholders reduced recommended frequencies and/or quantities of fertiliser because of its high price in the open market. This in turn caused yield declines.

Climate change

Green leaf production is highly dependent on weather conditions. Rainfall and temperature are important determinants of productivity (Wijeratne *et al.,* 2007). Extreme weather and weather-related events such as heavy rainfall, floods, landslides, protracted droughts and increasing temperatures are outcomes of global warming. During the recent past, 2016 and 2017 have been years with extreme weather events which have affected tea production (Wijeratne *et al*., 2007; Sri Lanka Tea Board, 2016a, 2017). Tea crop production is also affected by drought due to the lack of

optimum moisture required for tea bushes for shoot generation and physiological activities (De Costa *et al.,* 2007). Heavy and protracted rainfall resulted in high weed growth, high labour requirements and delayed field operations such as plucking and fertiliser application (Gunathilaka *et al.,* 2018). It also reduced the rate of bud growth of tea bushes, because of inadequate sunlight (Wijeratne, 1996; De Costa *et al*., 2007; Gunathilaka *et al*., 2018). High intensity rainfall is the major factor behind soil erosion in tea cultivations, as well as landslides in steep areas of cultivation. Eventually the effect is reduced crop yields and total production.

Green leaf price instability

Another problem faced mostly by smallholders recently is the frequent fluctuation in green leaf prices received (Priyanath *et al.,* 2018). There have been price drops in the world market for Sri Lankan tea recently (Kasturiratne, 2008; Gunarathne and Peiris, 2017) due to reduced market share and emerging competition from other producer countries (Kasturiratne and Poole, 2006). The years 2016 and 2019 have been the worst in terms of average prices received at auction for made tea, and that affected prices received for green leaves (Tea Exporters Association Sri Lanka, 2020). Green leaf prices in the first half of 2019 dropped by 30 per cent compared to 2018 (News 1st, 2019). It is a major concern for smallholders as insufficient income/profits from green leaf sales, which often do not even cover the cost of production, have threatened the sustainability of their livelihoods (Munasinghe *et al*., 2017).

Lack of managerial skills and entrepreneurial attitudes

Many tea growers operating on a small scale have poor skills in managing their business. They often have little grasp of the detail of expenses, green leaf sales and income of their business, relying on the information about their operation from their green leaf dealers. Lack of managerial and entrepreneurial skills in the business is a weakness that eventually affects the performance of the business. On the other hand, the information asymmetry between green leaf buyers and smallholders creates inefficiencies and provides scope for exploitation.

A considerable number of smallholders who do not have green leaf processing facilities depend on private green leaf collectors/dealers to pick up their leaf and deliver their harvest to factories. Other smallholders transport the green leaf harvest themselves to factories. In both these situations, smallholders are open to being exploited by private green leaf dealers or tea factory dealers paying relatively low rates for the green leaf, or understating the true weights of bags, or claiming dubious quality deficiencies and excess moisture content and so on (Wekumbura *et al*., 2017).

The adoption of labour-saving mechanical technologies in field operations is limited among both the smallholder and the estate sector in Sri Lanka (Herath and Weersink, 2007). Even though numerous attempts have been made by the TRI and government institutes to introduce machinery into field operations, especially mechanical harvesters for green leaf harvesting, they have not been successful. Such techniques are alternative solutions for labour shortages and increasing labour wage rates, yet only a few estates and smallholders have adopted them over years. Risk averse behaviour, incomplete knowledge and awareness, and misconceptions about machinery usage have deterred most tea growers from using machinery for field operations. The sometimes steep terrain and the capital cost of the machinery are also factors influencing non-adoption.

Poor agricultural practices

The sustainability of tea cultivation predominantly depends on good agricultural practices. An inability to maintain good conditions for growing tea because of poor management affects the yield. Not following recommended practices in the field such as underuse and overuse of fertiliser and

agrochemicals is widely seen in tea smallholders unless they have been registered in a certification scheme. The fertiliser subsidy has encouraged smallholders to use fertiliser in excessive amounts, thus leading to environmental issues such as water and soil pollution and threatening biodiversity. Overuse of agrochemicals can also affect adversely the health of tea bushes, as well as the environment and biodiversity. Better prices can be ensured for made tea at the auction when good agricultural practices are adopted that results in high quality of the green leaves (Karunathilaka and Samaraweera, 2017).

Implications of These Issues in the Green Leaf Production Sector

The issues observed in the green leaf production sector noted above have affected farm decision-making and eventually led to serious adverse consequences for production in the sector. Accordingly, lower production levels and areas under cultivation can be observed, as demonstrated in Figure 3.

Farm-level decision-making in the green leaf production sector as a response to the emerging issues shows a reluctance by smallholders and estate managers/company management to reinvest in their tea cultivations. This is common in the estate sector, where reinvestment in essential field activities that are capital and labour-intensive, such as in-filling, replanting and new planting, are not done or are delayed. The same fate happens to other investment projects such as soil conservation, rehabilitation, and infrastructure development that directly and indirectly affect productivity.

Operating as business entities, RPCs are highly profit-oriented, and their estates operate under a limited budget allocated by the company management. This has restricted estate managers from making decisions beyond the scheduled cost structure, and to managing budgets at least possible cost. There is less scope to manage production costs based on unanticipated events affecting crop production, while issues in the sector exacerbate the situation.

On the other hand, RPCs do not own the estates they manage, and the lease period on these lands will be expiring soon. Hence, there is little motivation for the management of RPCs to invest in long-term development projects.

The situation in the smallholder sector is not as severe as in the estate sector. Still, there are smallholders who are not motivated to reinvest and expand cultivation amidst all the issues and challenges faced.

The recent low crop production also reflects the stagnant and/or shrinking area under tea cultivation. The area under tea cultivation has been static over the last decade as there has not been any significant area of new lands added to the national tea plantation sector through tea replanting and new planting.

Replanting is delayed in most tea cultivations especially in the estate sector. Replanting of vegetative propagated (VP) tea varieties must be practiced when the tea bushes are more than 15 years old. The rates of replanting over the years is unsatisfactory and far less than the expected rate (Samansiri *et al*., 2011). For example, replanting in the RPC estates has been only 0.7 per cent per year which is below the recommended minimum rate of two per cent (Wijayasiri, 2013). Timely replanting is of national importance as it provides the basis for improving or at least maintaining national productivity. Additionally, it helps maintain soil nutrition condition at a good level and a better crop yield from new plants because the procedure focuses on soil rehabilitation.

Many vacant areas can be seen in most tea plantations with seedling tea cultivation. Vacant areas in tea fields lowers the density of tea bushes, in turn lowering the productivity. In-filling must be carried out during every pruning cycle to maintain the proper tea bush stand. Weed growth in tea fields with

too many vacant areas is high because of the ground exposure and open canopies. Lack of information provided to the tea growers (both estate owners and smallholders) and the high capital and labour costs for the activity have led to low in-filling rates in tea fields.

Furthermore, the yield of seedling teas is relatively lower than the yield of VP teas that are grown from leaf cuttings of tea varieties with favourable traits such as high yields and disease/weather resistance (Wijayasiri, 2013). The extent of VP tea in the estate sector is comparatively low. Most estates in RPC-owned plantations in the up- and mid-country tea growing regions have a higher share of seedling tea fields (63 per cent of tea bushes in a plantation) that are also comparatively older; more than 100-years old tea bushes since commercial tea cultivation began, with less yield potential (Ganewatte and Edwards, 2000; Samansiri *et al*., 2011; Wijayasiri, 2013; Shyamalie, 2015b). These lands have not yet been replanted with high yielding VP tea varieties; hence, yields are lower than those which could have been achieved with VP teas. Such older tea fields, which are also often steeply sloped, have deteriorated over time resulting in eroded and nutritionally poor soils (Jayasuriya, 1998). This lack of soil rehabilitation and conservation activities has led to reduced crop production.

In addition, the threat of narrowing profit margins from green leaf sales with all these issues faced means there is potential in the green leaf producer sector for gradual diversion to other less risky and less maintenance-intensive crops, or non-agricultural employment (Herath and Weersink, 2007).

Conclusion

The Sri Lankan tea industry is at a critical juncture with its competitiveness in the global tea market and domestic growth and progress under threat. Factors affecting the performance of the tea industry are related to the world market, to the performance of the tea value chain, and to the performance of the farm sector. Sri Lanka is losing its shares in the international tea market due to competition from recently emerging tea producers and exporters. Performance of the value-chain has been affected adversely by onerous policy measures of the government on different sectors. Competitiveness of the industry is declining because of shrinking production and increasing production costs.

The farm sector comprises both private and estate tea grower sectors. Pressing issues experienced currently by the farm sector are labour shortages because of labour outmigration, continuously increasing production costs mainly because of labour wage increases, and policy restrictions implemented by the government affecting tea production. Furthermore, changing climate, fluctuations in green leaf prices, poor agricultural practices, and poor entrepreneurial and managerial skills have affected the performance of the sector adversely.

One major consequence is that there has been a reluctance by both smallholders and estate managers/company management to reinvest in their tea cultivations. This is more common in the estate sector, where reinvestment in essential field activities that are capital and labour-intensive, such as in-filling, replanting and new planting, are not done or are delayed. The same fate happens to other investment projects such as soil conservation, rehabilitation, and infrastructure development that directly and indirectly affect productivity. Accordingly, areas under cultivation are decreasing, and production is declining.

The support and involvement of policymakers from the administration level and decision makers from the farm level is vital in addressing the impediments noted above. Strategies to popularise labour-saving technologies, good agricultural practices, climate change adaptation activities and proper planning of field activities are required. Incorporating these changes into farm decisions should

achieve healthy tea production levels at a lower cost of production and ensure premium prices are obtained for Sri Lankan tea in world markets.

References

Abeywickrama, L.M., Sandika, A.L., Sooriyaarachchi, P. and Vidanapathirana, I. (2017), *Impacts of Banning Glyphosate on Agriculture Sector in Sri Lanka: A Field Evaluation*, Faculty of Agriculture, University of Ruhuna: Mapalana, Kamburupitya https://www. croplifeasia. org/wpcontent/uploads/2018/04/Impacts-of-Banning-Glyphosate-on-Agriculture-Sector-in-Sri-Lanka-A-Field-Evaluation. pdf Accessed in April 2019.

Ali, R., Choudhry, Y.A. and Lister, D.W. (1997), "Sri Lanka's tea industry: succeeding in the global market", in Bank, T.W. (ed.), *World Bank Discussion Paper No. 368*. The World Bank, Washington, D.C., pp 150.

Ariyawardana, A. (2001), Performance of the Sri Lankan Value-Added Tea Producers: An Integration of Resource and Strategy Perspectives, Doctor of Philosophy in Agribusiness, Massey University.

Basnayake, B. and Gunaratne, L. (2002), "Estimation of technical efficiency and it's determinants in the tea small holding sector in the Mid Country Wet Zone of Sri Lanka", *Sri Lankan Journal of Agricultural Economics* 4, 137-150.

Central Bank of Sri Lanka (2018), National Output, Expenditure and Income, *Annual Report 2018*. Central Bank of Sri Lanka, Colombo, pp 40.

Central Bank of Sri Lanka (2019), Economic and Social Statistics of Sri Lanka. Central Bank of Sri Lanka, Colombo, pp 194.

De Costa, W., Mohotti, A.J. and Wijeratne, M.A. (2007), "Ecophysiology of tea", *Brazilian Journal of Plant Physiology* 19, 299-332.

Dharmadasa, R. and De Zoysa, M. (2012), "The determinants of labor outmigration in tea plantation sector in Badulla district", *Proceedings of International Conference on Business Management on Capacity Development in a Post-war Context*. Citeseer, pp 1-8.

Fernando, N. (2018), "Ceylon Tea risks losing Japanese market", *Daily Mirror Online*, (Serial online 2/5/2018). Available from URL: http://www.dailymirror.lk/149375/Ceylon-Tea-risks-losing-Japanese-market [accessed 17/08/2020].

Food and Agriculture Organization of the United Nations (2020), FAOSTAT. Food and Agriculture Organization of the United Nations, Rome.

Ganewatte, G. and Edwards, G.W. (2000), "The Sri Lanka Tea Industry: Economic Issues and Government Policies", paper presented at the 44th Annual Conference of Australian Agricultural and Resources Economics Society, University of Sydney, Australia.

Gunarathne, A.D.N. and Peiris, H.M.P. (2017), "Assessing the impact of eco-innovations through sustainability indicators: the case of the commercial tea plantation industry in Sri Lanka", *Asian Journal of Sustainability and Social Responsibility* 2, 41-58.

Gunathilaka, R.P., Smart, J.C., Fleming, C.M. and Hasan, S. (2018), "The impact of climate change on labour demand in the plantation sector: the case of tea production in Sri Lanka", *Australian Journal of Agricultural and Resource Economics* 62, 480-500.

Herath, D. and Weersink, A. (2007), "Peasants and plantations in the Sri Lankan tea sector: causes of the change in their relative viability", *Australian Journal of Agricultural and Resource Economics* 51, 73-89.

Herath, D.P. and Weersink, A. (2006), "Structural Changes in the Sri Lankan Tea Industry: Family Farms vs. Plantations", *International Association of Agricultural Economists Conference*, Gold Coast, Australia, August.

Herath, S., Sugiyama, M., Oguri, K. and Arahata, K. (1998), "Consequence of the Policy Changes on the Plantation Agriculture", *Japanese Journal of Farm Management* 36, 137-142.

Hilal, M.I.M. and Mubarak, K.M. (2016), "International Tea Marketing and Need for Reviving Sri Lankan Tea Industry", *Journal of Management* 9 (1), 14.

International Tea Committee (2019), Supplement, *Annual Bulletin of Statistics*. International Tea Committee, London, United Kingdom.

Jayaratne, P. (2018), "Effect of governance and policy on the management of a sustainable agri-supply supply network: an example from the Sri Lankan tea industry", *2018 IEEE International Conference on Service Operations and Logistics, and Informatics (SOLI)*. IEEE, pp 196-201.

Jayasuriya, R. (1998), Technological change and scarcity of soil in the tea sector of Sri Lanka, Doctor of Philosophy, School of Business, Faculty of Law and Management, La Trobe University, Victoria, Australia.

Jayasuriya, R.T. (2003), "Economic assessment of technological change and land degradation in agriculture: application to the Sri Lanka tea sector", *Agricultural Systems* 78, 405-423.

Karunathilaka, D.U. and Samaraweera, G.C. (2017), "How Good Manufacturing Practices (GMP) Shapes the Selling Price of Ceylon Tea", *International Journal of Research and Innovation in Social Science (IJRISS)* 1, 2.

Kasturiratne, D. (2008), "An overview of the Sri Lankan tea industry: an exploratory case study", *The Marketing Review* 8, 367-381.

Kasturiratne, D. and Poole, N.D. (2006), "Creating value for competitive advantage in supply chain relationships: the case of the Sri Lankan tea industry", *99th EAAE Seminar 'Trust and Risk in Business Networks'*, Bonn, Germany, pp 9.

Marambe, B. (2018), "The glyphosate story – CKDu, food security and national economy", *Daily FT*, (Serial online). Available from URL: http://www.ft.lk/columns/The-glyphosate-story-%E2%80%93-CKDu--food-security-and-national-economy/4-653490 [accessed 03.03.2019].

Marambe, B. and Herath, S. (2019), "Banning of Herbicides and Its' Impact on Agriculture-The Case of Glyphosate in Sri Lanka", *Weed Science* 68, 246-252.

Ministry of Plantation Industries (2018), Progress Report 2018. Ministry of Plantation Industries, Colombo, Sri Lanka, pp 111.

Munasinghe, M., Deraniyagala, Y., Dassanayake, N. and Karunarathna, H. (2017), "Economic, social and environmental impacts and overall sustainability of the tea sector in Sri Lanka", *Sustainable Production and Consumption* 12, 155-169.

News 1st (2019), "Tea leaf prices continue to go down", (Serial online). Available from URL: https://www.newsfirst.lk/2019/07/12/tea-leaf-prices-continue-to-go-down/ [accessed 15/12/2020].

Policy and Strategic Planning (2019), Export Performance Indicators 2009-2018. Sri Lanka Export Development Board, Colombo, pp 286.

Priyanath, H.M.S., Premaratne, S., Yoosuf, A. and Maurice, D. (2018), "Technical efficiency for tea smallholder farmers under UTZ certification system in Sri Lanka: a stochastic frontier approach", *SEISENSE Journal of Management* 1, 1-19.

Registrar of Pesticides (2014), The Gazette of the Democratic Socialist Republic of Sri Lanka: Extraordinary. Registrar of Pesticides, Peradeniya, Kandy, Sri Lanka, pp 1.

Registrar of Pesticides (2015), The Gazette of the Democratic Socialist Republic of Sri Lanka: Extraordinary. Registrar of Pesticides, Peradeniya, Kandy, Sri Lanka, pp 1.

Samansiri, B., Rajasinghe, J. and Mahindapala, K. (2011), *Agronomic Profile of the Corporate Sector Tea Plantations in Sri Lanka; A Diagnostic Study in the Corporate Tea Sector*. Advisory and Extension Division, Tea Research Institute of Sri Lanka, Tea Research Institute of Sri Lanka, Talawakelle.

Samaraweera, G., Ping, Q. and Yanjun, L. (2013), "Promoting tea business in the tea smallholding sector in developing countries through efficient technology transfer system: Special reference to Sri Lanka", *African Journal of Business Management* 7, 2186-2194.

Shyamalie, H.W. (2015a), "Cost Analysis of Weed Management in Tea Lands", *231st Meeting of the Experiments and Extension Forum* Thalawakelle, Sri Lanka, pp 56-61.

Shyamalie, H.W. (2015b), *An Economic Analysis of Sri Lankan Tea Industry,* Agricultural Economics Division, Tea Research Institute of Sri Lanka, Talawakelle, pp 12.

Shyamalie, H.W., Prasanna, R.V. and Dharmasena, S. (2011), "Economic impacts of fertilizer subsidy on small-scale tea growers in southern province of Sri Lanka", *Sri Lanka Journal of Tea Science* 76, 33-39.

Silva, M.S.D.L.D. (2015), "Integrated Weed Management in Tea Lands Alternatives for Glyphosate", *231st Meeting of the Experiments and Extension Forum*, Thalawakelle, Sri Lanka, pp 48-55.

Sri Lanka Tea Board (2014), Annual Report 2014. Sri Lanka Tea Board, Colombo, Sri Lanka, pp 96.

Sri Lanka Tea Board (2015), Annual Report 2015 Sri Lanka Tea Board, Colombo, Sri Lanka, pp 115.

Sri Lanka Tea Board (2016a), "Adverse Weather and Wage Hike Threatening on Ceylon Tea", *Tea Market Update*. Tea Promotion Division, Sri Lanka Tea Board, Colombo, Sri Lanka, pp 8.

Sri Lanka Tea Board (2016b), Annual Report 2016. Sri Lanka Tea Board, Colombo, Sri Lanka.

Sri Lanka Tea Board (2017), Annual Report. Sri Lanka Tea Board, Colombo , Sri Lanka, pp 124.

Sri Lanka Tea Board (2018), "Government may Intervene in Estate Worker Wage Hike", *Tea Market Update*. Tea Promotion Division, Sri Lanka Tea Board, Colombo, Sri Lanka, pp 8.

Tea Exporters Association Sri Lanka (2020), "Monthly Tea Auction average price movements for three elevations in SL. Rs. per kg. in Lanka", *Tea Prices*. Tea Exporters Association Sri Lanka, Colombo, Sri Lanka.

Tea Small Holdings Development Authority (2014), Annual Report 2014. Tea Small Holdings Development Authority, Colombo, Sri Lanka, pp 101.

Tea Small Holdings Development Authority (2016), Annual Report 2016. Tea Small Holdings Development Authority, Colombo, Sri Lanka, pp 121.

Tea Small Holdings Development Authority (2018), Annual Report 2018. Tea Small Holdings Development Authority, Colombo, Sri Lanka, pp 110.

Thibbotuwawa, M., Jayawardena, P. and Arunatilake, N. (2019), "When Tea and Sympathy is not Enough: A Living Wage for Sri Lanka's Plantation Workers", *Talking Economics*, (Serial online)16/12/2019). Available from URL: https://www.ips.lk/talkingeconomics/2019/12/16/when-tea-and-sympathy-is-not-enough-a-living-wage-for-sri-lankas-plantation-workers/ [accessed 06/07/2020].

Thushara, S. (2015), "Sri Lankan Tea Industry: Prospects and Challenges", *Proceedings of the Second Middle East Conference on Global Business, Economics, Finance and Banking (ME15Dubai Conference)*, Dubai-UAE, pp 28.

Wekumbura, W.G.C., Mohotti, A.J., Frossard, E., Kudagammana, S.T. and Silva, K.D.R.R. (2017), "Prospects and issues related to tea cultivation in mid country homegarden based tea smallholdings in a selected village in Sri Lanka", *Tropical Agricultural Research* 28, 15.

Wijayasiri, J.Y. (2013), Food standards and governance in the tea industry in Sri Lanka; A value chain analysis, Doctor of Philosophy, Department of Management, Faculty of Business and Economics, Monash University, Australia. Retrieved from https://bridges.monash.edu/articles/thesis/Food_standards_and_governance_in_the_tea_industry_in_Sri_Lanka_a_value_chain_analysis/4697047.

Wijeratne, M., Anandacoomaraswamy, A., Amarathunga, M., Ratnasiri, J., Basnayake, B. and Kalra, N. (2007), "Assessment of impact of climate change on productivity of tea (Camellia sinensis L.) plantations in Sri Lanka", *Journal of the National Science Foundation of Sri Lanka* 32, 119-126.

Wijeratne, M.A. (1996), "Vulnerability of Sri Lanka tea production to global climate change", *Water Air and Soil Pollution* 92, 87-94.

Wijetunga, C.S. and Saito, K. (2017), "Evaluating the Fertilizer Subsidy Reforms in the Rice Production Sector in Sri Lanka: A Simulation Analysis", *Advances in Management and Applied Economics* 7, 31.