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Assessing the Employment Creation Potential of the Tea Sector in Kenya

Kataa Samuel and Kipsaat Josphat

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Assessing the Employment Creation Potential of the Tea Sector in Kenya

Kataa Samuel and Kipsaat Josphat

**Kenya Institute for Public Policy
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Abstract

The objective of this study is to map the tea value chain in Kenya, identify constraints that hinder the growth of the tea sector, determine employment creation potential of the tea sector, and finally determine sectoral skill gaps and occupational skill gaps. This is with the aim to contribute to finding potential areas to exploit in addressing the high level of unemployment especially among the youth in Kenya. The study found the tea value chain as made up of three major segments: production, processing and marketing. Some of the constraints identified along the value chain include the following: At the production node, there is low productivity among smallholder farmers due to low access to extension services, low fertilizer application, and other field management practices. At the processing node, factories face high energy costs, high labour costs, limited value addition, and limited product diversification. At the marketing level, Kenya faces a narrow export destination and relies heavily on exports to Pakistan and Egypt, thus exposing tea exporters to external shocks due to price fluctuations. Also, there is limited local consumption of made tea in the Kenyan market, on average 95 per cent of processed tea is exported. On employment creation potential in the tea sector, the study found that a 1 per cent change in output resulted to an increase in employment by 0.11 per cent, holding all other factors constant. On skills analysis, it was found that there was a skills surplus at all the skills levels of the tea sector, specifically a surplus of about 1.4 million for those with no education, 2.2 million for primary education, and 0.8 million for secondary education. The surplus is much for less at 130,000 for diploma and certificate, and 34,000 for degree holders. The study recommends capacity building of smallscale farmers through provision of extension officers to enhance productivity; procurement and replacement of high power-consuming processing lines with more power efficient ones to cut on processing costs for the factories; and seeking new market channels for Kenya tea, including promoting a tea drinking culture in the domestic market. These interventions are meant to enhance the performance of the tea sector, leading to profitability and efficiency thus unlocking job opportunities.

Abbreviations and Acronyms

AFA	Agriculture and Food Authority
CIDP	County Integrated Development Plan
COMESA	Common Market for Eastern and Southern Africa
CTC	Cut, Curl and Tear
EAC	East Africa Community
EATTA	East Africa Tea Trade Association
FAO	Food and Agriculture Organization
GoK	Government of Kenya
GVC	Global Value Chain
ITC	International Trade Centre
KAM	Kenya Association of Manufacturers
KALRO	Kenya Agriculture and Livestock Research Organization
KETEPA	Kenya Tea Packers
KHCR	Kenya Human Rights Commission
KIHBS	Kenya Integrated Household and Budget Survey
KNBS	Kenya National Bureau of Statistics
KNOCS	Kenya National Occupational Classification Standards
KTDA	Kenya Tea Development Agency
KTGA	Kenya Tea Growers Association
MoALF	Ministry of Agriculture, Livestock and Fisheries
MTP	Medium-Term Plan
TRI	Tea Research Institute
US\$	United States Dollar

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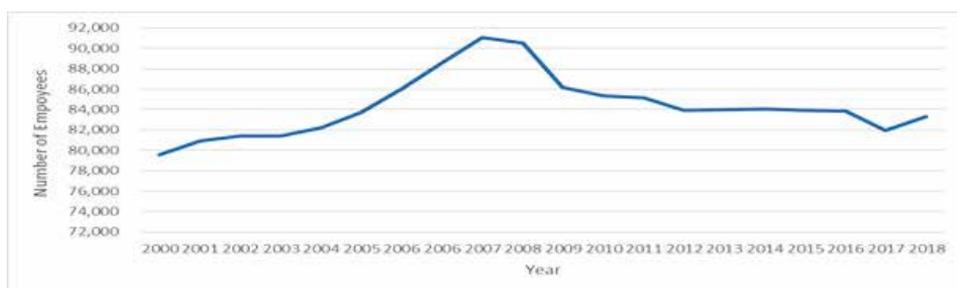
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1. Introduction

Tea is one of the most popular and low-cost beverages in the world, coming second after water in popularity (Groosman, 2011; Wachira et al., 2016; Dias, 2013). In Kenya, tea is the leading industrial cash crop contributor to Gross Domestic Product (GDP) and foreign exchange earner, accounting for 4 per cent of national GDP. Further, the country accounts for around 10 per cent of the total tea produced globally and in 2018, Kenya's tea exports accounted for 25 per cent share in the world.¹ This growth is made possible through the collaboration of Tea Research Institute and the industry by adopting improved research technologies (Bore, 2016). In 2018, tea exports earned Kenya a total of Ksh 140 billion although there was a decline in the value of tea exports to Ksh 117 billion in 2019 (KNBS, 2020).

The tea value chain is elaborate, with production, processing and marketing and distribution as the major activities along the value chain. Tea production is a labour-intensive process and employs millions of people around the world. In Kenya, the tea sector supports the livelihoods of over 600,000 Kenyans who are engaged in tea farming as smallholder farmers (KIPPRA, 2017). Focusing on tea value chain is paramount because it is a major foreign exchange earner and has high employment potential (KIPPRA, 2017). From Figure 1, it is shown that wage employment at the production node (tea growing activities) of the value chain increased from 81,958 persons in 2017 to 83,329 persons in 2018 (KNBS, 2019). Additionally, a study by the World Bank on the competitiveness of specialty teas such as purple tea in Kenya found that apart from it providing an alternative to black tea through diversification, it has the potential to create over 2000 new jobs, entry of over five innovative enterprises, increase exports to 24,000 tons, increase export earnings up to US\$ 60 million, create new investments to a tune of US\$ 10 million and improve the adoption of innovative farming and production techniques.²

Figure 1: Wage employment in tea growing activities



Source: Kenya National Bureau of Statistics (Various issues)

¹ <http://www.intracen.org/Reproducing-ITC-content/>

² <https://www.worldbank.org/en/news/feature/2017/08/29/creating-kenyas-purple-tea-market---markets-and-competition-policy-in-action>

However, KIHBS 2015/16 indicates that the age cohort 29-34 years accounted for only 2.24 per cent of the total tea farmers whereas those aged 35 years and above accounted for 76.65 per cent. This means that most of the youth are not engaged in tea growing activities. Moreover, the Kenya Youth Agribusiness Strategy (2017-2021) argues that there is high employment potential for the youth in agro-processing and value addition.

In line with this, it is expected that the youth will be attracted to the processing level of the tea value chain. However, there are several issues that act as obstacles to more employment to be realized in the tea sector. For example, from a comparative study on tea sector in Kenya done by the Kenya Human Rights Commission (KHRC) and focusing on James Finlays and Unilever, it was established that over 60 per cent of the permanent workers interviewed during the study were never issued with written contracts or letters of appointment. Further, majority of the workers had worked for more than 3 years at the plantations having not received any appointment letters (KHRC, 2008). The management response to this was the high labour costs incurred by the companies (KHCR, 2008).

In addition, the tea sector is faced with challenges that hinder its optimal performance and thereby failing to create the jobs required. In 2019, some selected crops among them tea performed dismally, and this was attributed to extreme weather conditions characterized by drought during the first half of the year, followed by high rainfall in the second half of the year. Further, tea export prices reduced by 13.7 per cent to Ksh 238.8 per kilogramme, and this was attributed to the over-production of black tea globally (KNBS, 2020). Despite the global over-production of black CTC tea, Kenya continues to produce and export 95 per cent in bulk form despite the opportunity to venture in more value addition and diversification to other specialty teas and their extracts, which have higher economic value compared to the rest of the tea varieties. This has led to decline in export prices, low foreign exchange earnings and ultimately low household earnings (KNBS, 2020).

Further, it is noted that only 14 per cent of the exported tea is value added (KIPPRA, 2017). The results of low level of value addition is the loss of approximately US\$ 12 per kilogramme of tea (KIPPRA, 2017). Despite being the leading exporter of tea in terms of volumes, Kenya receives minimal earnings compared to other tea exporting countries. For example, Kenya exported 131 metric tonnes in 2013 more than Sri Lanka but earned US\$ 0.3 billion less (KIPPRA, 2017). Additionally, diversification to specialty teas such as green, purple, white, oolong and other orthodox teas has been a challenge. Only 4 per cent of specialty tea is processed (KIPPRA, 2017). This is due to limited technical capacity in terms of production technology in the cottage tea factories (KIPPRA, 2017). Specialty

tea earns three to four times the price of black tea (Maina, 2016) and therefore there is need to address the constraints facing the cottage factories to enhance specialty tea processing. Additionally, production and energy costs continue to be high, and consequently lowering the profit margin of the producers. EATTA (2020)³ indicates that costs of production comprise of 60 per cent of the tea prices received at the Mombasa tea auction and energy costs account for 30 per cent. It is argued that reverting to hydroelectric power (HEP) energy would reduce energy costs to 12 per cent, thus increasing the profit margin for the producers.

The Government of Kenya through the Medium-Term Plan III (MTP III) and the “Big Four” agenda envisions an expansion of the contribution of the manufacturing sector to GDP from 9.2 per cent in 2017 to 15 per cent by 2022⁴. In this regard, the Government has endeavoured to enhance sector-specific strategies with an intent to create employment for the youth⁵. There are several strategies that contain specific measures such as expansion of agro-processing and value addition with a view to creating jobs for the youth. For instance, agro-processing is targeted to contribute to at least 50 per cent of total agricultural production, with the aim of accelerating economic growth, creation of employment, and poverty reduction⁶. The tea sector, which forms part of agro-processing, is one of the priority sectors earmarked to drive the growth of the manufacturing pillar of the “Big Four” agenda. Specifically, the Tea Regulations of 2020 provide for at least 40 per cent of value addition for tea exports. As such, the sector has potential to generate foreign exchange earnings in addition to employment creation.

The Kenya Integrated Household and Budget Survey-KIHBS 2015/16 estimates the unemployment rate in Kenya to stand at 7.4 per cent, out of which 85 per cent of the unemployed are below 35 years of age. The Government, through the sectoral development strategies, has acknowledged that the youth would be more attracted to sectors that embrace value addition in agricultural output⁷. Despite Government efforts to promote job creation in the tea sector, the extent of value addition has remained low at 14 per cent (KIPPRA, 2017). The youth face obstacles such as access to factors of production, including land, credit services and required skills. Further, old technologies in agricultural production are not attractive to the youth, and this has impacted negatively on productivity. As of 2019, only 83,329 people were employed in tea growing activities (KNBS, 2020). Currently, more than 1 million young people join the labour market annually, having either completed their high school education or dropped out and are not enrolled in

3 <https://www.eatta.com/the-mombasa-tea-auction>

4 Third Medium Term Three (2018-2022)

5 Sessional Paper NO. 4 of 2013

6 Third Medium Term Three (2018-2022)

7 <http://extwprlegs1.fao.org/docs/pdf/ken171450.pdf>

institutions of higher learning⁸. It is noted that to meet the employment demand, a total of 1.3 million jobs have to be generated annually. The university and college graduates often do not have the required skills that are demanded in the labour market.

By mapping out the tea value chain, this paper identified constraints to development of the sector and explored the sector's potential for job creation opportunities that could benefit the youth. In addition, a skills gap analysis was also undertaken with a focus on the youth.

The rest of the paper is organized as follows: Section 2 reviews the employment policies and policies in the tea sector; Literature review and methodology and data are reviewed in section 3 and 4, respectively; Findings and discussions are presented in section 5 while section 6 concludes and makes policy recommendations.

⁸ <http://extwprlegs1.fao.org/docs/pdf/ken171450.pdf>

2. A Review of the Employment Policies and Tea Sector Policies in Kenya

2.1 Sessional Paper No. 4 of 2013 on Employment Policy and Strategy for Kenya

This sessional paper was based on the understanding that Kenya must meet both her national goals and global commitments to achieve meaningful results in socio-economic development. In this regard, the policy document sought to enhance productivity, national competitiveness and economic growth; creation of new decent jobs; build a pool of skilled, self-reliant, adaptive and enterprising labour force; and ensure the short, medium and long-term employment creation measures are pursued⁹.

The Government of Kenya has been articulating the need to create enough job opportunities to ensure that the youth are absorbed in employment. The Government undertook both short, medium and long-term measures for employment creation. The short- and medium-term interventions included the public works programmes such as the Kazi kwa Vijana (jobs for the youth), foreign employment, and infrastructure and rural development. Other interventions to create jobs for the youth have been through the Youth Enterprise Development Fund (YEDF), Kenya Youth Empowerment Programme (KYEP), Youth Employment Scheme Abroad (YESA) and Women Enterprise Fund (WEF)¹⁰. However, these measures have not achieved the expected results as Kenya continues to face the challenges of unemployment, and under-employment. This sessional paper took a broader view of the economy to see how the Government can use various employment interventions to realize enough employment for the growing labour force. Some of the strategies include the need to cascade the Kenya Vision 2030 implementation to county levels; ensuring implementation of prudent sectoral and macroeconomic policies; enhancing use of sectoral development strategies as a means for employment creation; and mainstreaming sectors productivity in the economy.

The agriculture sector is the largest employer in Sub-Saharan Africa. However, the jobs created within the sector are low paying and cannot create enough employment unless targeted interventions are put in place. The Kenyan Government has come up with medium- and long-term measures targeting sectoral growth and development through formulation and implementation of the policies within the sector. Some of the sectoral policies include: Agriculture

⁹ Sessional Paper No.4 of 2013 on employment policy and strategy for Kenya,

¹⁰ Sessional Paper No.4 of 2013 on employment policy and strategy for Kenya.

Sector Development Strategy (2010-2020), the National Industrialization Policy for Kenya (2011-2015), Kenya National Youth Policy (2007) and Kenya Youth Agribusiness Strategy (2017-2021), which indicate that agro-processing and value addition have high potential to provide the necessary jobs for the youth. The Kenya Youth Agribusiness Strategy further advocates for agro-value chain analysis, for example the tea value chain analysis, to investigate the potential of the value chains that youth could easily engage in. It is, however, worthwhile to note that some of the employment promotion interventions have not been involving all the relevant stakeholders to ensure exploitation of synergy. For example, the Tea Regulations 2020 require tea exporters to value added at least 40 per cent of the tea to be exported. This is a challenge because the Government has not provided a conducive policy environment to achieve this directive. This is evident in the tax regime, which requires tea packers and factories engaging in value addition to pay high import duties in purchasing packaging materials, and in the purchase of machinery and equipment meant for value addition activities. This means that the much-needed jobs from value addition in the tea sector may not be realized.

2.2 Policy and Regulatory Framework

This section discusses policy and legal reforms in the tea sector with regard to employment creation.

Table 1: Policy reforms in tea sector with regard to employment creation

Policy and Legal Framework	Policy reforms
Tea Act of 1960 (Cap 343)	Kenya Tea Development Authority (KTDA) was established with a view to promoting tea growing in small farms by indigenous farmers to enhance productivity and bring new land under production. In 1963, the land under cultivation by small-scale farmers increased from 3,527 Hectares to 5,429Ha in 1965. This led to increased income and employment opportunities.

<p>Sessional Paper No. 2 of 1999</p> <p>Constitution of Kenya 2010</p> <p>The Agriculture Strategy 2010-2020</p>	<p>This was intended to liberalize and restructure the tea industry. The aim of liberalization was to generate more revenue and ensure more jobs were created, and curtail rural urban migration by bringing employment closer to the people.</p> <p>The Kenya Tea Development Authority (KTDA) was privatized and incorporated under Companies Act (CAP 486) as an independent and private tea enterprise, owned by farmers and renamed as Kenya Tea Development Agency limited</p> <p>Tea growing license was repealed and the tea planting cess removed</p> <p>The ownership of the smallholder factories was transferred to the small-scale growers</p> <p>The agriculture sector was devolved in 2010 as a result of the new constitution. This was intended to ensure increased agricultural productivity at the counties. The sector provides livelihoods, i.e. employment, income and food security to more than 80 per cent of Kenyan Population¹¹</p> <p>This strategy was intended to reduce unemployment and poverty progressively and increase food security</p>
<p>Tea Licensing, Registration and Trade Regulations of 2008</p> <p>Tea Amendment Bill of 2011</p>	<p>Major changes included the repeal of prohibition to uproot tea, introduction of green leaf supply agreements, and introduction of guidelines and clarification of roles of managing agents</p> <p>This was intended to enhance regulation of tea trade, review the composition, powers, functions and financing of the Tea Board of Kenya</p>
<p>The Tea Bill, 2018</p> <p>Medium-Term Plan Three (MTP III)</p>	<p>This bill was meant to provide for the regulation, development and promotion of the tea industry</p> <p>This identifies diversification of crop varieties and value addition as avenues to economic growth and development in the agricultural sector, with an aim of creating jobs and poverty reduction</p> <p>The crop diversification programme, which is under the MTP III advocates for distribution of assorted seedlings to farmers for purposes of replanting high yielding tea clones to increase productivity</p>

¹¹ <http://www.fao.org/kenya/fao-in-kenya/kenya-at-a-glance/en/>

The Crops (Tea Industry Regulations, 2020)	The aim of the regulations was to bring policy changes and structural reforms in the tea sector due to complaints by farmers. Some of the complaints by farmers include low prices for their produce, poor marketing strategies and lack of transparency at the Mombasa Tea Auction Some of the policy changes include: the need to do tea value addition whereby all tea buyers/exporters are required to value add at least 40 per cent of their annual tea exports, and product diversification The regulations require that a person intending to venture into the business of tea buying or exporting must show proof that the business will be able to undertake tea value addition and create employment opportunities Made changes in the operations of both KTDA and the Mombasa Tea Auction whereby the auction will be automated to ensure transparency with the intention of increasing farmers' income
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The lack of a National Tea Policy has made the tea sector to operate without a clear focus. Therefore, fast-tracking the adoption and implementation of the Draft National Tea policy to enable the tea sector to realize its full potential is paramount. Further, the tax regime acts as an obstacle to value addition and increases in consumption of tea domestically. Again, the tea packers and factories engaging in value addition pay high import duties in purchasing packaging materials and in the purchase of machinery and equipment for value addition activities. This hinders job creation for the youth.

3. Literature Review

3.1 Theoretical Literature

Theories are formulated to explain, predict, and understand phenomena and, in many cases to challenge and extend existing knowledge within the limits of the critical binding assumptions. The theoretical framework convinces readers that the study is not based on the personal instincts of the researcher but rather on established theory gathered via credible studies. This study is anchored on value chain analysis theory.

3.1.1 Value chain analysis theory

A value chain gives an outline of all activities that firms engage in to bring a product or service to the market (Tippayawong et al., 2017). The term value chain was first introduced in Michael Porter's book "Competitive Advantage - Creating and Sustaining Superior Performance" (Porter, 1985). Porter split a company's value chains into individual activities. This allows a firm to know the parts of its value chain which create value, and which do not (Cefis et al., 2006). The value chain concept is applied in understanding the roles of each activity in the company's supply chain (Tippayawong et al., 2017).

Global value chain (GVC), on the other hand, describes a value chain that takes place across national borders (Kano et al., 2020). GVCs often take advantage of specific comparative advantages that exist in each location of the production process. In addition to production of a product to final consumption, GVC's also incorporate final disposal of a product (Kaplinsky and Morris, 2001). Production and trading of agricultural products often adopt a global value chain approach, as countries possess comparative advantage in the production of a given commodities occasioned by favourable climatic conditions, availability of labour, and policy interventions (Mohan, 2018).

It is argued that the supply chain management will identify both internal and external factors that could affect the value chain. The theory segments activities that generate value into primary and support activities. Primary activities comprise a set of activities that contribute to the creation of value in a direct manner. Support activities consist of functions and tasks intended to give support to the primary activities (Porter, 2011).

To put it in the context of this study, primary activities consists of inbound logistics, which involve receiving the tea leaves from the fields for processing;

operations at the factories which involve transforming tea leaves into finished goods; outbound logistics associated with warehousing and distribution of tea products; marketing and sales, which refers to the choice and implementation of marketing strategy to convey the marketing message to the target customer segment and sales generation. Further, support activities in detail involve human resource management, which entails a wide range of activities related to employee recruitment and selection, training and development, appraisals, motivation and compensation; technology development entails use of technology to increase the effectiveness of primary activities in terms of value creation; and procurement relates to purchasing practices of raw materials, tools and equipment (Ireland et al., 2009).

In this study, tea value chain is segmented into three major categories: tea production, processing, marketing and distribution which are analyzed using the value chain analysis. The value chain is elaborate with several actors such as producers, green leaf collectors, traders/brokers, warehousemen, transporters and auctioneers. The value chain with several activities and stakeholders entails transforming tea leaves into a beverage for both domestic and international consumers (Tippayawong et al., 2017). However, transforming the tea sector into a sustainable economic sector poses a challenge to all stakeholders. It is therefore paramount to enhance cooperation among producers, government, traders, processors, wholesalers and retailers. This will ensure optimal performance of the tea sector. The aim of a well-organized value chain is to maximize value creation and at the same time minimizing costs, where all the activities are linked efficiently together (Ireland et al., 2009). This theory is relevant in this study because value chain analysis is a concept that will help in the identification of the constraints facing the tea sector at every node of the value chain, skills requirements and the employment creation across the nodes of the value chain.

Some of the advantages of value chain analysis include: plays an instrumental role in the detection of organizational issues in the firm, it assists firms to appreciate potential sources of competitive advantage and the framework also can be applied to any type of business regardless of the industry and the size of the business¹². However, value chain analysis has got some demerits, including the difficulty in finding all the required data to conduct the analysis in an appropriate manner; the framework assumes that it is possible to separate company operations into different primary and support activities, which may not be the case in real life due to the increasing level of complexity of business operations and that the application of the tool can be overly time consuming due to the fact that it requires a comprehensive analysis of all business operations¹³.

¹² <https://research-methodology.net/theory/strategy/value-chain-analysis-2/>

¹³ <https://research-methodology.net/theory/strategy/value-chain-analysis-2/>

3.2 Empirical Literature

The tea sector provides jobs for millions of people worldwide. For example, the tea sector in India is the second largest in terms of employment in the manufacturing sector, employing 1,258,800 people in the tea estates with almost equivalent number of people employed as casual workers (Van der wal, 2008). Additionally, in countries such as Indonesia and Vietnam, more than 350,000 and 400,000 people are employed in the tea sector, respectively (Van der Wal, 2008). Further, in Kenya, the sector supports more than 600,000 farmers and over 5 million Kenyans who are directly or indirectly involved in tea value chain (Government of Kenya, 2020).

Mohan et al. (2017) used a combined value/supply chain and lifecycle analysis to examine the sustainability (economic, social and environmental impact) of tea manufacturing in Sri Lanka, which is a major export earner and employment creating commodity. They found that cultivation and processing stages of the value chain, of the low grown orthodox tea was the most efficient in terms of labour use, energy use and carbon emissions. Additionally, more employment opportunities were created at the production stage of the value chain. Also, the high labour use at this stage led to high operational costs.

Boulanger et al. (2018) in their study used linear multipliers, value chain participations and key sector analysis to determine which value chains in Kenya had the greatest effect in terms of employment, output and value added. Regarding the capacity to create new jobs, they used employment multiplier analysis which showed that agricultural and livestock sectors, in general, had multiplier values above the Kenyan economy. Further, they established that large farms accounted for a larger share of employment generation, notably in relation to agricultural products for export. In terms of direct comparability measure among the sectors on the capacity and potential to create output and value added, food crops such as maize, fruit and vegetables showed values above average, together with cash crops such as tea and coffee (Boulanger et al., 2018). This meant that the value chains could generate more employment.

A study conducted in Egypt on aquaculture value chain found that the value chain provides huge employment creation opportunities for the youth. In particular, the authors analyzed data from surveys in hatcheries (N=40), feed mills (N=14), fish farms (N=234), and fish trading and retailing (N=182) as a proxy of employment generation patterns for the entire sector (Ahmed Nasr-Allah et al., 2020). They found that aquaculture generates 19.56 Full Time Equivalent (FTE) jobs per 100 tonnes of produced fish along the entire value chain. Nonetheless, the jobs were mostly generated for males over 30 years of age, with few jobs for younger people.

Notably, females got more jobs at the retailing stage of the value chain ((Ahmed Nasr-Allah et al., 2020).

Digal, (2016) conducted a study using the value chain analysis on employment creation potential of the Cavendish value chain in Philippines and found that a total of full-time jobs estimated for the province of Davao del Norte reached more than 77,000 and about 183,000 for the entire island of Mindanao.

In terms of skills required for one to be employed in the tea sector, Tsalwa et al. (2016) performed a regression analysis and found that personnel skills had significant influences on value addition to tea. This concurs with results from previous researchers who found that business entities, and tea exporters are staffed and managed by persons who are technically competent to discharge duties expected of them. Staff training and competence is essential in meeting consumer's satisfaction (Cole, 2002) for any business venture. Further, well trained staff would provide multi-skilled contribution to enable an organization to achieve its full potential. The employees are thus trained and encouraged to maximize their potential so that firms can maximize their effectiveness.

Further, some of the factors found to be inhibiting optimal performance of tea trade value chain included market destinations, strategic decisions and personnel skills, and existing government policies. As such, market destinations were indicated to be the main inhibitor of tea exports in value added form (Tsalwa et al., 2016). This calls for stakeholders to diversify to new markets that would allow tea exports in value added form.

Kapsos (2005) defines employment elasticities as the percentage change in the number of persons employed in an economy with the associated percentage change in economic output measured by GDP. Further, Fox et al. (2013) notes that estimation of employment elasticities is a popular methodology among researchers in estimation of sectoral employment potential.

Additionally, studies have shown that firms should invest more in controlling the marketing constraints to monitor the flow of the products they offer to the marketplace while coordinating the people constraints (Nyaoga et al., 2015). Further, Gupta et al. (2008) found that managing the organizations' constraints leads to better utilization of the available capacity in the organization, thereby improving the overall performance. This empirical evidence gave a clear indication that constraints management is a significant predictor of the firm's capacity utilization. This further backed up by (Inman et al., 2009) that there are numerous beneficial effects of constraints management in improving the firm's performance that have been reported in both manufacturing and services.

In addition, Nyaoga et al. (2015) pointed out that there are three types of constraints that have a strong positive effect on tea processing firms' capacity utilization, which include market constraints, people constraints, and equipment constraints management. Further, Cyplik et al. (2009) argued that contrary to conventional thinking, the theory of constraints (TOC) views constraints as positive not negative, something that should force management to think smarter and be more innovative and they get challenged to achieve more with fewer resources in improving their level of capacity utilization. It is also argued that once the tea factory managers are able to manage constraints affecting their production systems appropriately, they will be well suited to utilize their capacities well and be in a position to contribute to the general economic growth as a result of increased foreign exchange and employment creation (Nyaoga et al., 2015).

3.3 Overview of Literature

The tea sector is one of the important sectors in various countries such as India, Sri Lanka, Vietnam, China, Kenya, among others. This is because it has proven to be a source of revenue generation and employment creation. Value chain and key sector analysis in Kenya have shown that large farms account for a larger share of employment generation, notably in relation to agricultural products for export. Also, previous studies comparing the Kenyan sectors directly on the capacity and potential to create output and value added have shown that cash crops such as tea and coffee, food crops such as maize and, fruit and vegetables had values greater than average. This meant that the value chains had greater potential to create employment opportunities. Additionally, studies have also shown that more employment is created at the production and processing nodes of the tea value chain, for example in Sri Lanka. Further, value chain analysis on employment indicates that the jobs mostly generated along the value chain were very few for younger people. Studies have also shown that personnel skills are critical for one to be employed in the tea sector. This is because skills level has significant effects on tea value addition. It is also noted that value chain analysis plays a critical role in the detection of constraining issues in the firm and also aid the firms to appreciate potential sources of competitive advantage. Value chain analysis informs this study, such that all the objectives are dealt with at the major nodes of the tea value chain; that is production, processing and marketing nodes.

4. Methodology and Data

4.1 Mapping out the Tea Value Chain and Constraints Analysis

To understand the job creation activities, we first map out the tea value chain. The value chain identifies all the activities that industry engages in up to putting a product or service to the market. The tea value chain encompasses the design, production, marketing, distribution logistics, and other support activities. To identify constraints in the tea sector, this study reviews literature from reports and published papers.

4.2 Assessing the Employment Creation Potential

To assess the employment potential of the sector, we estimate employment elasticities of the tea sector. Employment elasticities measure the responsiveness of employment to the value-added growth (Mbaye et al., 2019). Employment elasticities are computed using the following methods: arc-elasticity, estimation of point elasticity and computation of Labour-valued ratios.

Arc elasticity

Equation 1 gives the specification of Arc-elasticity as adopted by Kapsos (2005).

$$\varepsilon = \{(E_1 - E_0)/E_0\} / \{(Y_1 - Y_0)/Y_0\} \quad (1)$$

Where ε is the arc elasticity, E_1 is the employment level in period 1, and E_0 is the employment level in period 0; the numerator therefore gives percentage change in employment in period 1 and 0. The denominator gives the percentage change in output in the two periods, with Y_1 being the output in level 1, and Y_0 being the output in period 0. To compute the arc elasticities of the tea sector in Kenya, we use data from the KNBS Statistical Abstracts and the Economic Survey for various years. One of the major weakness of this methodology is sensitivity on the selection of the start and end periods (Islam and Nazara, 2000). The other method of computing elasticities is the point-elasticity method.

The point elasticities method, also known as the regression approach, involves the estimation of a double-log linear equation relating employment and the sectoral value-added to GDP. Estimation of point employment elasticity requires a time series of the sectoral contribution to GDP at time t , and the number of persons employed in the sector at time t . The coefficient of the value-added gives the point employment elasticity. The equation for estimating point employment elasticity is

given as follows:

$$\ln (E_{-t})=\beta_{-o}+\beta_{-t} \ln (GDP_t)+\varepsilon_{-t} \tag{2}$$

E_{-t} gives the tea sector employment level in Kenya for a given number of years, GDP_t gives the tea sector contribution to GDP for a given number of years. β_{-t} gives the sectoral employment elasticity on which further employment projections can be undertaken.

Due to a limitation in the data points on the tea sectors’ value-added, this study adopts the sectoral output as a proxy for the value added, this is based on the modern employment theory, which stipulates that an increase in production is associated with a growth in employment (Wilson, 1960). Equation 2 is therefore slightly modified by proxying value added with sectoral output (y), all other variables remain the same. The equation is therefore specified as follows:

$$\ln (E_{-t}) = \beta_{-o} + \beta_{-t} \ln (Y_{-t}) + \varepsilon_{-t} \dots\dots\dots(3)$$

4.3 Skill Gaps Analysis

This paper presents a methodological framework for assessing the skills and occupational skills gaps that exist in the tea sector and if addressed, will be key in unlocking the tea sector potential. To fulfil this objective, we determine the sectoral skills demand/requirement, skills supply, and undertake occupational skills gap analysis.

On the demand side, we determined the skills that the tea sector requires for it to achieve its potential; on the supply side, we explored whether the stock of skills required in the tea sector can be found in the target population (unemployed youth), and if not, what are the gaps. We analyzed two types of skill gaps which include: sectoral skills gap, which is the gap between the set of skills available in the population and the set of skills demanded by the sector, and occupational skills gap, which compares the existing stock of skills for the target population against the minimum requirements for a given occupation (Bhorat et al., 2020).

We used the Kenya National Occupational Classification Standards (KNOCS) to map out the various occupations that exist in the tea sector. KNOCS classifies occupations into nine major categories as follows: Legislators, administrators and managers; professionals, technicians and associate professionals; secretarial, clerical services and related workers; service workers, shop and market sales

workers; craft and related trades workers; plant and machine operators and assemblers; elementary occupations, and armed forces.

Sectoral skills gap compares the skills available in the target population (unemployed youth), against the existing skills in the tea sector (skills requirement). Skills are measured by the level of education attained by the youth disaggregated into various age cohorts. Skills gap is given as:

$$\text{Skills gap} = \text{Skills supply (S)} - \text{Skills requirement (D)} \quad (4)$$

A limitation of computing sectoral skills gap is that it tells us whether the stock of skills required in each sector exist in the total population, but it does not inform us whether these skills can be attracted to the tea sector-as other sectors compete with the tea sector for these skills. To determine whether the existing skills in the target population can be attracted to the tea sector, we compute the skills availability ratio. A skills availability ratio less than 10 tells us that the existing stock of skills in the target population may not be attracted to the tea sector (Bhorat et al., 2020). It is given by:

$$\text{Skills availability ratio} = (\text{Skills supply}) / (\text{Skills requirement}) \quad (5)$$

To compute the occupational skills gaps, we compare the modal education levels attained by the target population (unemployed youth)-obtained from the Labour force survey (Y), and the modal years of education one should attain to be employed in a given occupation, obtained from the O*Net database (R). O*NET links occupations to information such as knowledge, skills, abilities, and education requirements of workers employed in those roles. We map out the specific occupations in the tea sector from the labour force survey (KIHBS). Occupation skill gap is given as:

$$\text{Occupational Gap} = Y - R \quad (6)$$

A positive value implies that the target population has the skills required for a given occupation, whereas a negative value implies that the unemployed youth do not have the skills required to be employed in a specific occupation.

4.4 Data Sources

This study uses secondary data extracted from KNBS Statistical Abstracts, Economic Surveys, O*Net database, and International databases such as the International Trade Centre.

The KIHBS 2015/16 data was collected by the Kenya National Bureau of Statistics in 2015 from 21,773 households across Kenya. Key variables from the KIHBS database for this study include: years of schooling, labour force participation, and economic activities undertaken-specifically on whether one undertakes tea farming.

O*Net is a free online database sponsored by the United States' Department of Labour. It maps out occupational requirements that a worker should fulfil to undertake a given role; specifically, it outlines the minimum education requirements for a given role, and the required occupational skills set personal attributes such as required interests and values, identifies activities undertaken, and remuneration brackets. The database is updated frequently to match the dynamic nature of the labour market.

This study also used secondary data obtained from KNBS Statistical Abstracts, the Economic Survey (various issues), and reports from Agriculture and Food Authority. Data collected from these sources related to tea production, tea exports-value and destination, tea unit prices-auction prices, sectoral value added, and local tea consumption. In addition, this study used secondary data from the International Trade Centre (ITC), specifically on tea production in other tea producing counties, and the international commodity prices.

5. Findings and Discussions

In this section, we present the study findings and discussions of the same.

5.1 Descriptive Statistics

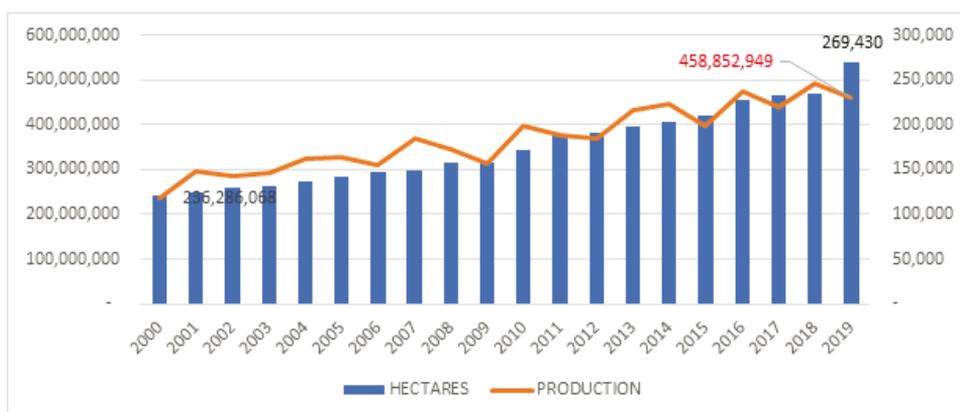
5.1.1 Production stage

Tea planting in Kenya is undertaken by small, medium and large-scale farmers. The classification into small, medium or large is based on the land size under which tea is planted. Small-scale farmers own 0.2 hectares of land and below and account for 71 per cent of the total tea farmers. Large scale farmers constitute those farmers with more than 10 hectares of land (KIPPRA, 2017). Small scale farmers are organized under the Kenya Tea Development Agency (KTDA), which collects, processes and markets their tea. KTDA is owned by the small scale farmers and manages 69 factories spread out across the country. In addition to processing and marketing the tea, KTDA is involved in the supply of fertilizers, provision of extension services, inspection, and collection of green leaf. Smallholder farmers account for 60 per cent of the total tea production in Kenya (EATTA, 2018). Large scale producers are organized under the Kenya Tea Growers Association (KTGA), which advocates for good industrial relations and better wage policies for their workers. It comprises 45 members who operate 39 factories and constitutes mainly of private firms and multinational firms such as James Finlay Company Limited, Eastern Produce Company Limited, Williamson Tea Company Limited, Sasini Tea and Coffee, among others. There exists, however, a group of independent tea producers whose overall tea production is estimated at 8 per cent (KIPPRA, 2017). Tea growing is also undertaken by the Government through the Nyayo Tea Zones Development Corporation which owns 3,488 hectares of land. Nyayo Tea Zones promotes protection of water catchment areas, and prevents human encroachment to forests (KIPPRA, 2017).

Land area under tea cultivation in Kenya has been increasing gradually and stood at 269,400 hectares in 2019, an increase of 15 per cent from 234,300 hectares in 2018 (KNBS,2020). This increase in total hectareage is attributed to sustained promotion by the Government on the need to expand the tea sector given the critical role it plays in the economy as outlined in various policy documents such as Medium-Term Plan III, and CIDPs. The total tea volume produced over the years has also been on an upward trend; however, production fluctuates across the years mainly due to weather variabilities such as periods of drought, hailstones and frost which affect overall productivity. In 2019, for instance, there was a decline in total tea volumes despite an increase in land area under tea. As shown

in Figure 2, tea production declined by 6.9 per cent from 492.99 tonnes in 2018 to 458.5 tonnes in 2019. This decline is attributed to low rainfall experienced during the first quarter of 2019 (KNBS, 2020).

Figure 2: Production of tea in tonnes versus the total land area under tea in hectares



Source: Agriculture and Food Authority, Tea Directorate

An analysis of tea productivity computed using yields per hectare as a measure of tea productivity shows that tea estates have a higher productivity (an average of 2350.8 kg/ha) compared to the smallholder category (1852.28 kg/ha) in the period 2015-2019 (KNBS, 2020). This could be attributed to different plucking regimes adopted by these producers; estates use tea plucking machines, which result to higher tea volumes (EATTA, 2018). On average, a tea plucking machine plucks 1,200 kgs of tea in a day whereas a manual worker pluck 32 kgs of tea in a day (KIPPRA, 2017). Other factors for the varying productivity include: better field management practices such as weed management, higher fertilizer application rates, better access to extension services, and higher mechanization (EATTA, 2018). Table 2 shows the average yield/ha for the period 2015-2019.

Table 2: Tea productivity/ha by type of grower 2015-2019

Average Kg/Ha	2015	2016	2017	2018	2019	Average
Smallholder	1926	2086.4	1744	1922	1583	1852.28
Estates	2459	2909	2115	2383	1888	2350.8

Source: KNBS (2020), Economic Survey

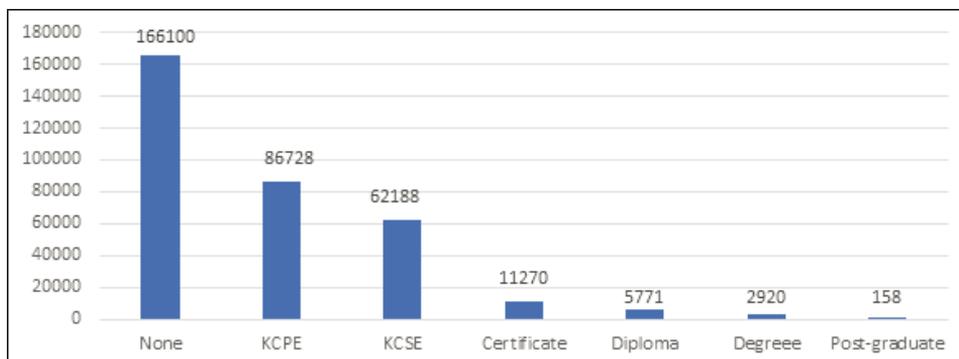
At the production node of the tea value chain, tea plucking is a major employer (employed 106,675; male 40,902, female 65,863-KIHBS 2015/16) and accounts

for a larger proportion of total operational costs. In 2015, the total labour costs were 68 per cent of the variable costs, and tea plucking accounted for 82 per cent of the variable costs (KIPPRA, 2017). Due to the high labour costs, producers especially tea estates have adopted a mechanized tea picking regime to cut labour costs, enhance efficiency, and increase profitability. This, however, has been challenged by workers unions citing job losses with the adoption of tea plucking machines. Tea stakeholders (based on discussions with tea stakeholders during a workshop), however, note that mechanized plucking of tea has led to a decline in the quality of tea due to non-selective picking. This decline in quality was reflected in differences in price fetched by smallholder producers and the tea estates. For instance, in 2016, smallholder farmers earned Ksh 303.71 per kilogramme whereas tea estates earned Ksh 163.23 per kilogramme. The journey to increased mechanization, however, must continue through research and development, the youth being tech-savvy can be engaged in developing state-of-the-art tea plucking machines that are more selective than the ones in the market. The youth can also utilize their skills in repair and maintenance of the machines, and supplying the machines to tea producers. These opportunities, however, require substantial capital investment and call for enhanced credit access to the youth. Modernization of the tea sector will help increase the participation of the youth in the tea sector, which is currently low at 76.65 per cent of tea farmers being above 35 years old (KIHBS, 2015/16).

Labour force characteristics of tea producers

Education level

Based on the KIHBS 2015/16, 49.5 per cent of tea producers have no education, 25.8 per cent have primary education, and 18.5 per cent have secondary school qualification. With increasing years of schooling, the participation rate in tea growing declines; for instance, only 2,920 (0.87%) and 158 (0.047%) of the people engaged in tea growing have a degree and post-graduate degree, respectively, as shown in Figure 3.

Figure 3: Education levels attained by tea growers

Source: KIHBS 2015/16

The inverse relationship between participation in tea growing and increase in education is mainly attributed to behavioural perceptions by the population on tea growing, that once a person attains a higher education level it is expected that they move to urban areas in search of jobs and hence no longer participate in tea production.

Youth participation rates in tea growing

Small scale farmers in Kenya undertake tea growing alongside other activities such as livestock keeping and production of other crops such as bananas and maize. Table 3 presents age distribution of tea farmers disaggregated into their various age cohorts to determine the rate of youth participation in tea growing activities (the percentages in parentheses give the participation rate of the specific age group). The age cohort 15-19 years who grow tea on a pure stand account for 1.69 per cent, 20-24 years account for 8.26 per cent, 20-25 years 11.16 per cent, 30-34 years 2.24 per cent, persons aged above 35 years account for the highest share of tea growing at 76.65 per cent, and youth participation is therefore low. We also note that a majority of farmers produce tea on pure stand. Land ownership rights is a major factor for the low participation of youth in tea growing as they do not own land and have little control over land use and decision making. The youth are therefore delinked from active participation in tea growing and decision making, and this has led to low uptake of technology as older farmers are less likely to adopt modern farming methods (FAO, 2014)¹⁴.

¹⁴ FAO. (2014), Youth and agriculture: Key challenges and concrete solutions. Geneva: Food and Agriculture organization.

Table 3: Distribution of tea farmers into age cohorts and land use patterns

	15-19 years	20-24 years	25-29 years	30-34 years	35+
Tea and Coffee	0	0	235 (9.94%)	379 (16.03%)	1,749 (74.03%)
Tea and Maize	0	408 (4.67%)	1,226 (14.03%)	137 (1.56%)	6,975 (79.75%)
Tea and Bananas	0	232 (9.75%)	0	0	104 (100%)
Tea and Livestock	0	0	0	583 (24.47%)	1,568 (65.78%)
Tea Only	375 (1.69%)	1,831(8.26%)	2,473 (11.16%)	496 (2.24%)	16,993 (76.65%)

Source: KIHBS 2015/16

Key constraints at the production node

- Low productivity among smallholder farmers due to low access to extension services, low fertilizer application, and other poor field management practices.
- High labour costs; an example is the high cost of tea picking.
- Extreme weather such as hailstones and frost, which affects overall productivity and quality of green leaf.
- Low participation of the youth in tea growing activities.
- High replacement costs for farmers wishing to switch to higher yielding tea clones, or other tea varieties such as purple tea which fetch higher prices.

5.1.2 Processing level

Once tea leaves are plucked, they are delivered to the tea factories in specialized gunny bags that allow circulation of air to preserve green leaf quality. Tea processing is undertaken by either KTDA-affiliated factories, KTGA factories, and privately-owned cottage tea factories. Cottage tea are licensed to process low volume, high value specialty teas (Crops Act. 2013). Currently, there are 106 KTDA factories spread out across the country, 38 KTGA factories, and 7 licensed cottage tea factories.

The KTDA model specifies that factories process tea sourced from its catchment area to ensure that factories have enough raw material to process and run optimally. Smallholder farmers, therefore, sign green leaf agreements with a

specific factories to supply green leaf. Tea estates, on the other hand, process green leaf sourced from their own-farms, and from contracted outgrowers. To track quality and profitability, tea estates often process tea sourced from their own farms and the one sourced from outgrowers separately (EATTA, 2018). The transformation of green leaf into made tea requires many inputs such as labour, factory equipment, water and energy. Energy requirements and labour costs are often high and influence the overall profitability of the factory. It is estimated that energy costs and labour costs account for 50 per cent of the total direct processing expenses (EATTA, 2018).

Tea factories use electricity and wood fuel to power processing machinery. Wood fuel is mainly used for heating the boiler to generate steam for firing tea. Factories mainly source electricity from the national grid; however, a few factories have set up solar plants and hydro-electric plants to complement power sourced from the national grid to reduce energy costs. An example is Imenti tea factory which set-up a 1 MW hydroelectric plant and consumes 50 per cent of the total output and supplies the other half to the national grid (EATTA, 2018). Wood fuel is sourced from own woodlots and from contracted suppliers. It is critical to note that tea factories are required to maintain a ratio of 4:1 of tea planted to woodlots to ensure sustainable use and avoid adverse effects of deforestation. To meet this criterion, most tea factories have invested in acquiring additional land for planting trees or resorted to leasing land. KTDA factories incur higher energy costs (60% of total processing costs) compared to estate factories whose total energy costs are 30 per cent (KIPPRA, 2017). The disparity in energy consumption is mainly driven by the differences in technology of the processing machines; tea estates have invested in advanced energy efficient processing machines. Other than high energy costs, factories also face high labour costs due to labour unions agitating for better remuneration for the workers. Other than high labour and energy costs, some factories' profitability/capacity has also been affected by incidences of tea hawking.

Tea hawking comes about when producers supply green leaf to tea factories whom they have not signed green leaf agreement with. This leads to raw material shortage in some factories, leading to low operating capacity, and hurting its overall profitability (EATTA, 2018). Tea hawking results mainly from competition for green leaf especially during the dry season. Incidences of tea hawking have also spiked with the introduction of cottage tea factories, which have lower nucleus estate requirement - 20ha of planted tea against 250 ha for tea factories (EATTA, 2018). With a lower nucleus estate requirement and fluctuation in production due to weather changes, incidences of tea hawking come about. The Tea Regulations of 2020,¹⁵ however, provide that smallholder farmers sign green leaf agreement

¹⁵ The Crops (Tea Industry) Regulations, 2020: Ministry of Agriculture, Livestock and Fisheries.

with a specific tea factory, which they own to supply green leaf exclusively to ensure factories always operate at full capacity. It also provides that in the event a factory has excess supply of green leaf, they should notify the Tea Directorate to authorize supply of green leaf to another factory that may be receiving lower supply of green leaf in a bid to curb incidences of tea hawking. The Tea Directorate should therefore ensure strict compliance of this regulation and foster a healthy business environment among tea factories.

Kenya has a competitive advantage in the production of black CTC; 96 per cent of green leaf supplied to the tea factories is processed into black CTC, the remaining 4 per cent is processed into specialty teas - Oolong, white, green, and orthodox teas (KIPPRA, 2017). There is need, however, for factories to increase specialty tea processing, as specialty teas fetch higher prices compared to black CTC, For instance, in 2019, purple tea fetched Ksh 2,400 per kilo¹⁶, whereas black tea fetched Ksh 238.8 per kilo¹⁷. Revenue from the sale of specialty teas will therefore augment the earnings from the sale of black tea, and hence enhance profitability. Factories should therefore introduce additional processing lines to process specialty teas leading to more diversification. Diversification to other tea types will open new markets given that consumer preference differs across the world. Americans, for example, prefer specialty teas whereas Pakistani and Egyptians prefer black tea (FAO, 2018). Diversification and targeted marketing will lead to new destinations for tea, given that Kenya is currently pursuing a Free Trade Area agreement with the United States, an opportunity to establish a specialty market in the US can be achieved.

Key constraints at the processing node

- High energy costs among KTDA factories.
- High labour costs among factory workers.
- Low value addition and minimal diversification into processing of specialty teas.
- Incidences of tea hawking, which leads to under-utilization of capacity in some of the tea factories.

5.1.3 Marketing and distribution

Processed tea in Kenya is sold in the following channels: direct sales to the export market (15%), factory gate sales (3%), Kenya tea packers (7%), and the tea auction in Mombasa (75%) (Wanjiru et al., 2015). Once tea is processed, tea destined for the

¹⁶ Retail price by Tumoi Industries retrieved from <https://www.teasoko.com/product/tumoi-purple-tea>.

¹⁷ KNBS (2020), Economic Survey.

export market is packed into 50-70 kg packets and exported in bulk, with minimal value addition. Given the high quality of Kenyan tea, international buyers often blend Kenyan tea with teas sourced from other regions of the world, repackage it and market it using their company brands and thus fetching higher prices. Kenya therefore loses out in benefitting from high prices fetched by value added teas (KIPPRA, 2017). Compared to other tea producing countries such as Sri-Lanka and China, the level of value addition of Kenyan tea is minimal, accounting for an average of 14 per cent. Sri-Lanka, for instance, value adds 50 per cent of its tea (ILO, 2018). Rising incomes in China, India and Russia have led to an increased demand for value added teas, more so flavored tea, iced tea, and ready to drink tea (RTD). This shift in demand is mainly driven by consumers seeking to replace carbonated drinks with tea fusions and gain from the health benefits of drinking tea (FAO, 2018). Kenya, therefore, needs to step up the proportion of value added tea to match up with the changing market requirements. Cognizant of this, the Tea Regulations of 2020 provide that factories should value add at least 40 per cent of their tea before export.

Tea destined for the domestic market is mainly sold by the Kenya Tea Packers (KETEPA), a limited company owned by Kenyan tea farmers through KTDA (83%), KTGA (12%) and other stakeholders (5%) (EATTA, 2018). Factories send processed tea to KETEPA where it is repackaged, blended, and distributed across the country to wholesalers and retailers (FAO, 2015). However, domestic consumption of tea is low in Kenya. This low consumption is also mirrored in other tea producing countries in Africa. In 2018, for instance, Kenyans consumed 7.7 per cent of total tea produced, with a per capita consumption of 0.6 kg/head, whereas China has a per capita consumption of 1.5 kg/head (FAO, 2018). The low consumption is attributed to lack of tea drinking culture in Kenya. Presence of low grade tea in the market is also another factor (KIPPRA, 2017). Figure 4 shows the proportions of total production against domestic consumption and exports of tea.

Figure 4: Proportions of total production against domestic consumption and exports of black tea



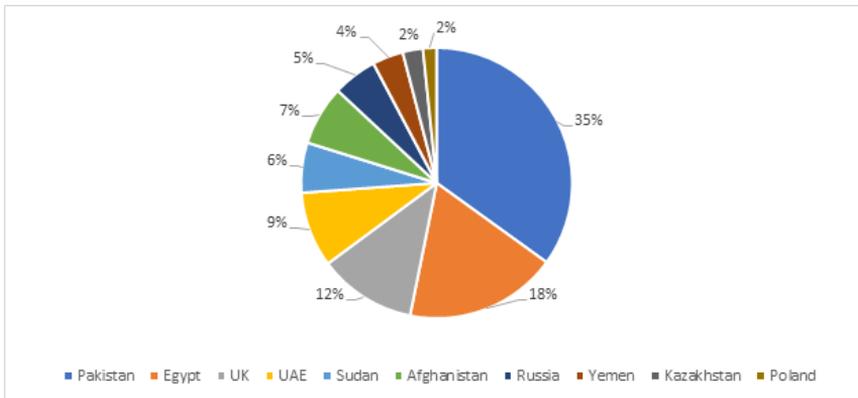
Source: Agriculture and Food Authority, Tea Directorate

From Figure 4, we note that there are instances where the proportion of tea exported exceeds the total quantity produced. This comes about when there is over-production in a given year and the prevailing prices are low, thus tea is stored in warehouses and sold in the next year when prices are much favourable. This was the case for the period 2008 to 2016, with 2012 being the highest at 116 per cent.

Globally, tea is mainly traded in auctions. The main auction centres are in India (Kolkata and Kochi), Sri Lanka (Colombo) and Kenya (Mombasa). Mombasa Tea Auction facilitates export of tea sourced from different African countries, e.g. Malawi, Uganda, Tanzania, Mozambique and Burundi. Mombasa Tea Auction through which most of the Kenyan tea is traded is owned and operated by the East Africa Tea Traders Association (EATTA), which facilitates trading of tea by bringing together producers, brokers, buyers and warehousemen. It also compiles statistical information, sensitizes stakeholders on market trends and is also involved in advocacy.

Kenyan tea is exported to various countries across the world, with Pakistan being the leading export destination for Kenyan tea (exports to Pakistan accounted for 35% of total exports for the period 2014-2018). Other key export destinations include Egypt, United Kingdom and United Arab Emirates. Figure 5 gives the top 10 export destinations for Kenyan tea for the period 2014-2018. A look into the export destinations reveals that Pakistan, Egypt, and United Kingdom (UK) are the major importers of Kenyan tea. There is need therefore to maintain these markets and at the same time seek entry into new destinations to ensure steady income flow in instances of political and economic distress in the main tea export destinations.

Figure 5: Kenyan tea export destinations 2014-2018



Source: EATTA, 2018

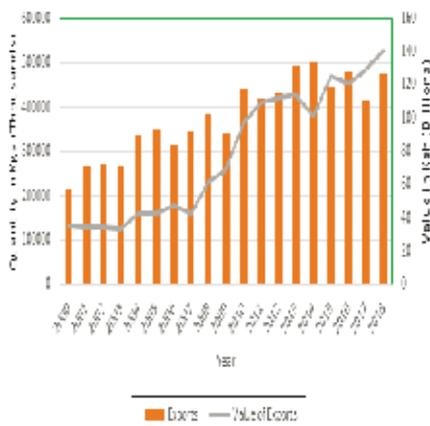
Marketing of made tea by cottage tea factories

Marketing of tea by cottage tea factories is often an independent venture. Once cottage factories process their tea, they brand it and sell it to the market individually. Currently, the tea auction in Mombasa is only limited to marketing black tea; however, there are plans to introduce specialty tea auction. Cottage factories popularize their tea and seek customers by participating in trade fairs (domestic and international) where they exhibit the range of products they produce; they also engage marketing agents to popularize their brands through advertising. To meet the domestic demand, cottage factories sell their tea directly to supermarkets, wholesalers and retailers. Distribution costs are financed by the factories themselves. For the international market, most cottage factories sign contracts with customers and supply them with an agreed quantity of specialty tea over time. Cottage factories often agree on the quality of tea they supply to their customers; this is the case with purple tea exported to Japan and the United States (this is based on conversation with a cottage factory owner).

Trade statistics of Kenyan tea

In this section, we present some of the marketing trends that relate to tea exports, production and auction prices (Figure 6).

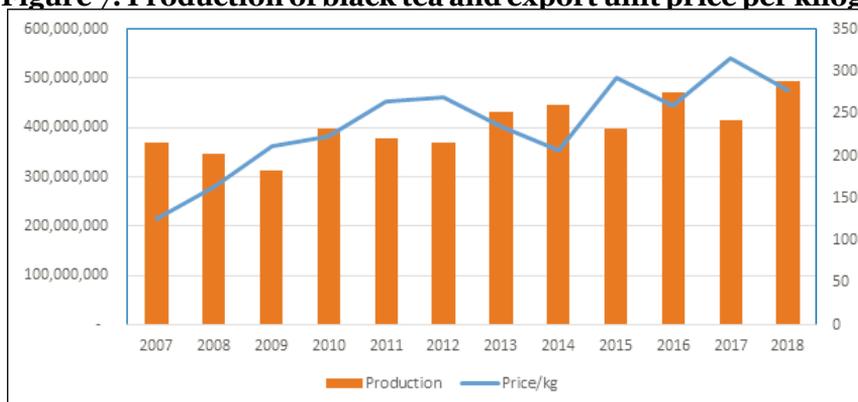
Figure 6: Quantity exported, and value of black tea exported



Source: Agriculture and Food Authority, Tea Directorate

Tea exports rose by 6.6 per cent from 415,000 tonnes in 2017 to 475,000 tonnes in 2018. Also, value from the exports rose from Ksh 129.3 billion in 2017 to Ksh 140.8 billion in 2018. Exports continued on an upward trend due to increased production, which is as a result of favourable weather conditions, and an increase in total area of land under tea growing.

Figure 7: Production of black tea and export unit price per kilogramme



Source: KNBS (2020), Economic Survey & AFA

A review of the responsiveness of the unit export price and production each year shows that export prices move in tandem with the production levels as shown in Figure 7. In periods of increasing production, the prices drop due to increased market supply and increase in periods of low production. However, the margin at which prices respond to the changes in production levels is high; for instance, in the years 2017 and 2018, production increased by 18.6 per cent while prices dropped by 12.1 per cent.

5.2 Mapping Occupations in Tea Value Chain

The tea value chain is made up of three major segments; production, processing, and marketing segments. The various segments of the value chain have unique skills requirements, ranging from unskilled to highly skilled labour. Figure 8 outlines the tea value chain in Kenya.

5.2.1 Production level

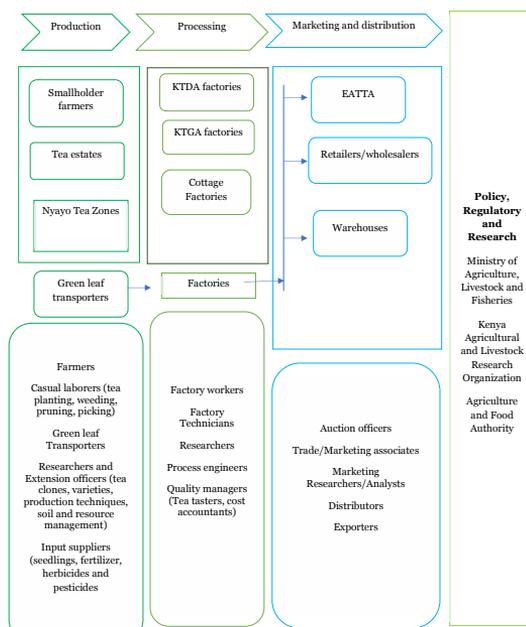
Using the Kenya National Occupational Classification Standard (KNOCS), we identified various occupations in which the youth can be employed at the production node of the tea value chain. The production node is labour-intensive and attracts employees of varying skills levels (low level of skill to high skill level). Activities such as tea plucking, field crop management workers, and tea freight handlers require minimal training, and expertise is gained through the learning curve. Some occupations, however, require high level of training and specific years of schooling and specialization. Such occupations include tea research officers, agronomists, and field extension officers. The youth with their varying skills levels (education levels) can be employed at this node either as skilled workers, low-

skilled workers or can be engaged in tea growing activities. With funding and capacity building, the youth can exploit opportunities that exist in the supply of farm inputs to tea farmers, i.e. fertilizers, and tea cultivars as 71.53 per cent of tea farmers sourced their fertilizers from private stockists, and 12.9 per cent of tea farmers sourced tea cultivars from private tea nurseries (KIHBS 2015/16).

5.2.2 Processing and marketing

Processing and the marketing segment of tea value chain also employs persons with varying skills levels. Some of the occupations on these segments include: machine operators, quality assurance officers, mechanical engineers, finance officers, accountants, marketing agents engaged in both domestic and international trade, drivers who distribute the tea across the country and to the points of exit, auction brokers, persons employed in the warehouses where the tea is kept prior to distribution, and persons employed in other activities that link directly and indirectly to tea processing and marketing. The expansion of the specialty tea market can therefore employ more marketing agents, drivers, and distributors, among others. We also expect that once the specialty tea auction is set up, more jobs will be created at the tea auctions.

Figure 8: Tea value chain in Kenya



Source: Authors' construct

5.3 Assessment of Employment Creation Potential of the Tea Sector

In determining the employment creation potential of the tea sector, we compute arc and point elasticities. The results for the point elasticity are presented in Table 4.

Table 4: Point elasticity results

Variables	Log of employment
Log of Output	0.116*** (0.0116)
Constant	10.97*** (0.0315)
Observations	33
R-squared	0.764

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The responsiveness of employment with respect to changes in output for the tea sector using point elasticity method shows that a positive relationship exists between growth in employment and growth in total output. The point elasticity for employment is significant at 1 per cent level. Given that the variables were stationary at level, we used Ordinary Least Squares (OLS) method to derive the estimates of the coefficient. The results show that a one per cent increase in total output growth of tea will lead to increase in employment by 0.116 per cent, holding all other factors constant. Further, 76.4 per cent of variations in employment are explained by variations in total output, implying that 23.6 per cent of variations in employment are explained by other factors outside the model. The constant is significant at all levels of significant with a coefficient of 10.96 per cent.

The Arc elasticities results shows the responsiveness of employment with changes in value added for one period; that is, the preceding year versus the current year as outlined in the methodology. The results for Arc-elasticity are presented in Table 5.

Table 5: Arc-elasticities for the period 2012-2018

	Employment (E)	$\Delta E/E$	Value added in Million (Y)	$\Delta Y/Y$	Arc Elasticity
2012	83,936	(0.01)	61828.89	-	-
2013	83,968	0.00	58629.22	-0.05	(0.01)
2014	84,096	0.00	52,893.60	-0.10	(0.02)
2015	83,934	(0.00)	72,973.20	0.38	(0.01)
2016	83,868	(0.00)	72,120.10	-0.01	0.07
2017	81,958	(0.02)	83,161.10	0.15	(0.15)
2018	83,329	0.02	79,093.50	-0.05	(0.34)

Source: Own compilation using data from KNBS (Statistical Abstracts)

The elasticities show a negative relationship between employment and value added in all the periods under analysis except for 2016. The employment elasticity for 2016 is 0.07, meaning that a unit change in tea value added is associated with a 0.07 growth in employment. Consequently, in 2018, the responsiveness of employment to growth in value added exhibited a negative relationship with a magnitude of -0.34. This implies that a unit change in tea value added is associated with a decline of 0.34 units in employment; it means that in this particular year, employment growth was inelastic to value added. Of interest is to note that in 2018, there was growth in employment by 1.6 per cent. This growth in employment did not, however, translate to growth in value-added, which dropped by 4.8 per cent. This implies that the marginal productivity of the new employees was low in 2018. We only obtained value added data points for the period 2012-2018, hence a limitation of the study as more data points could give us a better outlook on the employment creation potential using Arc-elasticities.

5.4 Assessment of Skill gaps in the Tea Sector

Using the KIHBS 2015/16, we identified the following occupations in the tea value chain: tea farmers, casual labourers, tea pickers, farm hand and related labourers, tea processing and related workers, field crop workers, tea transport and freight handlers, tea clerks, among others. A breakdown of the various occupations identified from the labour force module are presented in Table 6.

Table 6: Occupations in the tea sector captured

Occupation	Male	Female	Total
Production Level			
Tea and coffee farmer	721	1,642	2,363
Tea and maize farmer	5,272	3,475	8,747
Tea and banana farmer	0	105	105
Tea and livestock farmer	1,776	608	2,384
Tea farmer	10,200	11,969	22,169
Casual labourers	4,314	11,750	16,064
Tea pickers	43,756	72,061	115,817
Tea pickers (Machine)	0	941	941
Tea Picker (Own farm)	3,038	4,956	7,994
Tea pruner	132	0	132
Farm managers	583	0	583
Processing Level			
Green leaf drivers	941	0	941
Tea sorters	507	0	507
Tea spreaders	143	0	143
Tea packers	2,816	3,066	5,882
Tea buyers	118	0	118
Tea Clerks	235	0	235
Tea factory loggers	325	0	325
Machine operators	936	0	936
Factory workers	474	0	474
Marketing Level			
Tea Kiosk/vendors	235	4,568	4,803
Tea Hawker		325	325
Tea brokers	0	375	375
Total	76,562	115,841	192,363

Source: KIHBS 2015/16

Looking at the various occupations in the tea sector, we note that females have a higher participation rate than their male counterparts and account for 60.2 per cent of the sampled labour force. Tea plucking is a major employer and accounts for 60 per cent of the total work force; of the persons employed in tea plucking, 62.2 per cent are female. Women therefore play a key role in the tea sector and dominate the production and marketing segment of the value chain. However, there is low participation of females at the processing segment of the value chain, with a participation rate of 32 per cent.

5.4.1 Sectoral skills gap

Sectoral skills requirement is proxied by the level of education attained by those already employed in the tea sector. The total population of the unemployed youth, given their education levels, provides the skills supply. Table 7 presents the various occupations and computation of skills gaps and skills availability ratios of the tea sector aggregated into the nine (9) broad occupational classifications as outlined in KNOCS.

Table 7: Assessment of skills supply gap and skill requirement for the tea sector

	No.of education (1st skill level)	2nd skill level (Primary education)	3rd skill level (secondary education)	4th skill level (Diploma and degree level)	5th skill level (degree and Post grad.)
Skills supply (S)	1,378,890	2,176,805	759,509	130,206	34,331
Skills requirement(D)	69,649	80,190	26,887	3,706	378
Legislators, administrators and managers	-	-	583	-	-
Professionals	-	-	-	-	-
Technicians and associate professionals			342	132	
Secretarial, clerical and related workers	-	-	235	-	-
Skilled farm workers	61,006	64,361	20,433	3,563	378
Craft and related trade workers	1,961	3,173	1,072	-	-
Plant and machine operators	1,519	1,299	-	-	-
Elementary occupations	5,163	11,015	4,432	143	-
Sectoral skill gap/surplus (S-D)	1,309,241	2,096,615	732,622	126,500	33,953
Skills availability ratio (S/D)	19.79	27.14	28.25	35.13	90.82

Source: KIHBS 2015/16

From Table 6, we can see that there is a skills surplus across all the education levels for the tea sector; specifically, the results indicate a surplus of 1,309,241 for no education, 2,096,615 for primary education, 732,622 for secondary education, 126,500 for diploma and certificate, and 33,953 for degree holders. The sectoral skills surplus implies that the youth possess required skills to be employed in the tea sector but are unemployed. Computation of skills gaps does not, however, tell us if the existing stock of skills can be attracted to the tea sector. To correct for this, we compute the skills availability ratio. The corresponding skills availability ratios for the various skills levels are: 19.79, 27.14, 28.25, 35.13, and 90.82 for no education, primary, secondary, certificate and diploma, and degree education levels, respectively. Degree holders have the highest availability ratio at 90.82, with no education having the lowest availability ratio at 19.79. A sectoral availability ratio of less than 10 implies that existing skills in the target population cannot be attracted to a given sector; for our case, all the skills availability ratios are greater than 10, implying that the existing skills in the target population (unemployed youth) can be attracted to the tea sector.

5.4.2 Occupational skills gap

In estimating occupations skill gap, we assess occupations mapped out in KNOCS and their corresponding modal years of education required for a worker to effectively discharge their duties using the O*Net database. We then compare the O*Net modal years of education with the labour force module modal years of education for the unemployed youth in the various youth age cohorts (15-19 years, 20-24 years, 25-29 years, and 30-34 years). A positive value implies that there is absence of occupational skills gap, whereas a negative value implies presence of occupational skills gap.

Analysis of the education levels of the occupations identified in Table 5 reveals that tea farmers, casual labourers, tea processing and related workers, and field crop workers have a modal education level of 8 years (primary education). Tea transporters and freight handlers have a modal year of schooling of 12 years (secondary education); mechanical engineers and machine operators both have 13 years of schooling (certificate education) as the modal education level attained. However, in computing occupational skills gaps, we compare the cohort's modal education against the O*Net modal education age. An analysis of occupational skills gap is presented in Table 8.

Table 8: Assessment of occupational skill gaps for various occupations in the tea sector

Occupation	Required O*Net Modal years of schooling (r)	15-19 years	20-24 years	25-29 years	30-34 years
Modal education (y)		8	8	12	0
Production level					
Tea and coffee farmer	8	0	0	4	-8
Tea and maize farmer	8	0	0	4	-8
Tea and banana farmer	8	0	0	4	-8
Tea and livestock farmer	8	0	0	4	-8
Tea farmer	8	0	0	4	-8
Casual labourers	8	0	0	4	-8
Tea pickers	8	0	0	4	-8
Tea pickers (Machine)	8	0	0	4	-8
Tea pruner	8	0	0	4	-8
Specialized farm managers	16	-8	-8	-4	-16
Processing Level					
Green leaf drivers	12	-4	-4	0	-12
Tea sorters	8	0	0	4	-8
Tea spreaders	8	0	0	4	-8
Tea packers	12	-4	-4	4	-12
Tea hawkers	8	0	0	4	-8
Tea buyers	12	-4	-4	0	-12
Tea Clerks	12	-4	-4	0	-12
Tea factory loggers	8	0	0	4	-8
Machine operators	12	-4	0	0	-12
Factory workers	12	-4	0	0	-12

Marketing Level					
Tea kiosk/ vendors	12	-4	-4	0	-12
Tea brokers	12	-4	-4	0	-12

Source: KIHBS 2015/16 and O*Net data base

From Table 8, we note that existence of occupational skills gaps varies across the various age-cohorts, with the age cohort 30-34 years having an occupational skills gap across all the occupations. The age-cohort 25-29 years has the highest modal education age of 12 years, hence absence of occupational skills gap in most of the occupations except for specialized departmental managers, which requires a modal age of schooling of 16 years. At the production level of the value chain, there is absence of occupational skills gap in most of the occupations. This can be attributed to the low level of training and specialization that is needed to undertake these tasks; rather, workers gain experience through a learning curve process. At the processing level of the value chain, the existence of occupational skills gap varies among the various tasks; for instance, an occupational skills gap exists for green leaf drivers at the age cohorts 15-19, 20-24 and 29-34 years. The existence of occupational skills gap in some of the occupations is attributed to the higher education qualifications, specializations and training required for one to effectively discharge those specialized duties.

6. Conclusion and Policy Recommendations

6.1 Conclusion

This study undertook a value chain analysis of the tea sector in Kenya and identified some of the constraints that have hindered the full growth of the sector, which if addressed will be key in unlocking the potential of the sector leading to growth and thereby creating more employment opportunities and therefore support the “Big Four” agenda. From the study, we identified the following key findings:

The productivity of small scale producers is lower compared to the one for tea estates. This is mainly driven by different farming practices undertaken by these producers. Tea estates, for instance, have: higher fertilizer application rates, more access to extension officers, have mechanized some of the field management practices such as tea plucking, and have adopted higher yielding clones that are more resistant to weather variabilities. Addressing challenges in the production segment will lead to increased productivity among small scale farmers, which will trigger a multiplier effect leading to creation of more job opportunities. For instance, assuming a competitive market price, increased productivity will lead to increased income among the small scale farmers and by extension result to increased wages to the workers, hence improving their overall living standards. Further, tea being a labour intensive process will need the employment of more workers to match the increased productivity. Skilled and unskilled workers will be needed to fill the increased capacity.

At the processing level, tea factories face high energy costs as they source most of their energy requirements from the national grid and from wood fuel. One major factor for the high energy costs is the installed technology being utilized by the factories that have a high-power requirement. There is also low diversification in processing (96% of processing is focused on black CTC), which leads to a narrow product range being supplied to the market. Also, low value addition is currently being undertaken at the tea factories as most of the tea is exported in bulk. Through diversification and value addition, we expect more jobs to be created. For instance, there is need to hire more engineers, and researchers to drive innovation on energy-efficient processing systems and at the same time install additional value addition platforms in the factories to satisfy the sectoral policy regulations.

The tea sector has the potential to create employment opportunities. From estimation of employment elasticities, we found that a one percentage increase in economic growth will lead to an increase in employment by 0.116 per cent, holding other factors constant. On skill gaps among the youth, there is absence of sectoral

skills gaps among the youth. This implies that with the expansion of the tea sector, a qualified pool of youth are available to take up these job opportunities, as shown by the skills availability ratios which are greater than ten. An occupational skills gap, however, exists among specialized managers, and in some age cohorts such as 29-34 years.

6.2 Policy Recommendations

There is need to capacity build small scale farmers by enhancing access to technical advice from extension officers. This can be mainly taken up by the National Government and the County Governments agricultural departments. Capacity building of smallholder farmers on various farming practices will go a long way in enhancing productivity among smallholder farmers. Further, smallholder producers who wish to switch to growing other tea varieties such as purple tea should be given financial incentives. Similarly, farmers wishing to switch to higher yielding clones should also be incentivized. This will lead to a diversified portfolio, making the sector more profitable given that specialty teas fetch higher prices. This will lead to increased productivity and profitability in the sector, thus unlocking more employment opportunities and thereby supporting the “Big Four” agenda.

Factories should procure and replace high power-consuming processing lines with more energy efficient ones to cut on processing costs. There is scope to mechanize some activities such as tea plucking and pruning to reduce labour costs. This can be achieved by tapping into the innovativeness of the youth through capacity building, research and development.

Factories also need to diversify their product range by increasing processing of other tea types such as specialty teas and tea extracts to earn more income as specialty teas fetch higher prices. This will augment earnings from black CTC, leading to increased profitability. It is also important to increase the level of value addition to 40 per cent as provided for by the Tea Regulations of 2020. This calls for training and employment of technical staff and specialized managers to drive the diversification process.

Kenya also needs to seek new marketing channels for its tea to cushion producers from political and economic shocks that lead to fluctuations in prices, which trickles down to a decline in earnings by producers. This to be achieved by enhancing the quality standards to facilitate penetrating high value markets. An example is through compliance to food and safety standards required by these consumers, which calls for enhanced processing standards and well-trained staff to ensure high quality product management. Adherence to the quality standards

will require more staff to be hired to undertake this process, hence unlocking more jobs in the process.

6.3 Study Limitation

One of the disadvantages of value chain analysis as earlier mentioned is the lack of data at every node of the value chain. In this study, we had three major tea value chain nodes; that is production, processing and marketing and distribution. However, we managed to get employment data at the production node, which we analyzed using employment elasticities approach. In view of this, the study required primary data for detailed analysis. We therefore recommend that further research be done using primary data to get all the required data at every node of the value chain for a more comprehensive analysis.

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