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# Kila Wakati ni Wakati wa Chai: Mapping the Regional Commodity Chain of Tea in the Village of Sagara

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**Kila Wakati ni Wakati wa Chai:  
Mapping the Regional Commodity Chain of Tea in the Village of Sagara**



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**Spring, 2016**

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## **Abstract**

Tracing the commodity chain of tea from leaf to cup is a complex process that involves many actors at the production, distribution, processing and consumption levels. This study focuses on the regional tea commodity chain in the village of Sagara in the West Usambara Mountains of Tanzania in order to help explain the change in livelihood of tea as a cash crop. Semi-structured interviews with tea farmers were used to gain perspective on the nuances of the regional tea commodity chain at the production level. Several external actors, including Tanzania Smallholder Tea Development Agency (TSHTDA) and the Tea Research Institute of Tanzania (TRIT) were analyzed in addition to a regional tea-processing factory, Herkulu Estates Ltd., to capture the interactions among local actors and examine how the tea industry functions in Sagara village. It was found that the production of tea in Sagara among smallholder farmers has decreased due to the lack of market access for green leaf product. The closure of the Mponde Tea Factory, coupled with the low capacity of the only other regional factory, Herkulu Estates Ltd., leaves farmers with limited markets for tea crop. Assistance from external organizations, like NGOs and government agencies, does not directly address these market failures, but rather helps farmers expand tea production by providing inputs like fertilizers and herbicides, and providing access to new seedlings from tea nurseries. In the regional tea industry, this assistance does not align with farmers' current needs because there are no opportunities for these inputs to become lucrative.

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## Introduction

The tea sector plays an integral role in the Tanzanian economy, which as the fifth largest export crop after coffee, cotton, cashews, and tobacco contributes \$30 million to Tanzania's export earnings (Baffes, 2004). All tea (black, green, white) comes from the plant, *Camellia sinensis*, which flourishes in high altitude regions with humid climates (Loconto, 2010). The deep roots of the plant are resistant to erosion and allows tea to be grown on steep, mountainous slopes. Unlike other crops, tea can be harvested year-round with the highest rates of production coinciding with the long rains spanning from mid-March to May. Tea production is labor intensive and plots must be regularly weeded, pruned, and plucked in order to harvest the highest quality product (Loconto, 2010). The green leaf is plucked from the plant every 7-10 days and is sent directly to a processing factory. After the green leaf is plucked, it must be processed within a 12-hour window (Carr et al., 1992). This has important implications, as it ties tea farmers directly to processing factories and also limits competition for green leaf product to factories located within a close geographic range of the tea plots.

In Tanzania, the majority of tea is processed with the Cut-Tear-Curl (CTC) method, a cost and time effective means to produce black tea (Loconto, 2010). The process begins as freshly plucked leaves are spread out to wither, which releases chemicals to give the tea its distinct flavor characteristics. The leaves are then cut and curled into fine pieces and fermented under controlled temperature until fully oxidized. When oxidization is complete, the leaves are dried at temperatures ranging from 90°C - 130°C, after which they can be sorted according to grade and packaged. The finished product – dark, dried leaf - is suitable for tea bags and can be easily transported (*How is Tea Made*, 2016).

One fifth of Tanzanian tea is sold through private contracts with buyers and blenders, where it is consumed domestically. The rest of the tea is sold internationally through private contracts or blended with other teas at the Mombasa auction in Kenya (Loconto, 2010). Market prices at the Mombasa auction are fixed weekly, which in April 2016 averaged \$2.07 per kilogram (*Africa Tea Brokers Ltd*, 2016). The main destinations for Tanzanian tea sold internationally are Egypt, England, Pakistan and Sudan (Carr, 1992).

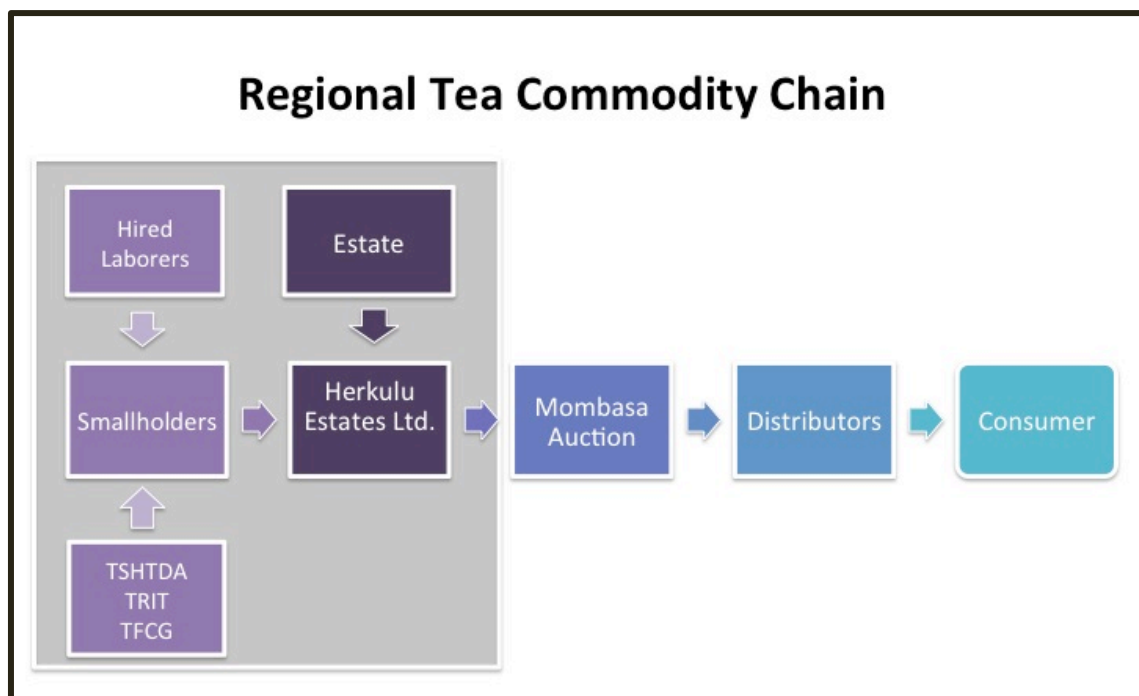
## ***Historical Context***

From 1881 – 1918, what is now Tanzania was part of German East Africa. The German state introduced market-focused agriculture and various cash crops including coffee, sisal, tea, sugarcane and cloves. In 1904, the first colonial experimentations with tea began in Tanzania at the Agricultural Research Station in Amani and Rungwe (Baffes, 2004). Tea was grown on large estates, owned and managed by foreigners, which often spanned a few hundred hectares (Jensen, 2009). Commercial tea production expanded under the British mandate, and by the 1930s three regions, Iringa, Mbeya and Tanga, became hubs of tea cultivation.

Tanzania's independence in 1961 and subsequent policy reforms legitimized and encouraged an additional system of tea cultivation: smallholder production, which before this time had been outlawed by colonial governments. Under the smallholder system, large estates were broken down into individual plots owned and maintained by small-scale farmers (Loconto, 2010). By 1985, smallholder tea production accounted for nearly 30% of all tea exports in Tanzania (Carr et al., 1992). Smallholders harvested the green leaf product, which was transported directly to a centralized factory and then sold in international markets. Contemporary tea production in Tanzania remains under one of the two systems: either cultivated by smallholders on individual plots or harvested from large-scale estates (Loconto, 2010).

Today, tracing the commodity chain of tea from leaf to cup is a complex process and involves many actors, both on the domestic and international scale. This study focuses primarily on the early levels of green leaf cultivation, transportation, and processing that occur within a single region. Different individuals and organizations are involved at each level of production. For the purposes of this study, which focuses only on the section of the commodity chain occurring in the Lushoto District, the main actors are as follows: firstly, smallholder tea farmers or landowners who own and maintain tea plots ranging from 0.25 acres to 4 acres in size. Landowners often employ hired laborers from surrounding villages for at least part of the year to help with harvesting or maintaining tea plots. Three main external organizations operate within the study area, including the Tanzania Smallholder Tea Development Agency (TSHTDA), a government agency formed in 1997 to promote the interest of smallholders; the Tea Research Institute of Tanzania (TRIT), a nonprofit organization that supports research and technology development for both small and large-scale tea producers; and the Tanzanian Forest

Conservation Group (TFCG), a nongovernmental organization focused on the conservation of natural forests that works with farmers to promote sustainable agriculture practices. The next level of the commodity chain consists of tea processing factories. This study focuses on Herkulu Tea Estates Ltd., a tea fermenting and processing factory located in Bumbuli and partially owned by the Indian company, *Bombay Burmah Trading Corporation Limited*. The only other regional factory, called Mponde Tea Estates Ltd., was commissioned in 1973 and sourced green leaf product largely from smallholders in Sagara, but closed three years ago thus decreasing the local market availability for tea. Figure 1 summarizes the various actors involved in the regional commodity chain.



**Figure 1: Regional tea commodity chain for the village of Sagara highlighting the main actors. The gray box contains the section of the commodity chain examined in this study. (April 2016)**

This study examines the regional commodity chain of tea in the village of Sagara and highlights the perspectives of each of the major actors: smallholder farmers, government agencies, NGOS, and staff from a tea-processing factory, on the change in livelihood of tea as a cash crop. This study explores the role of tea in the local economy and utilizes semi-structured interviews with each of the major actors to analyze how patterns of tea cultivation have changed in recent years.



## Study Site Description

The village of Sagara is situated in the West Usambara Mountains in Northern Tanzania. The region is densely populated, with approximately 80% of the population of the Lushoto District residing in the West Usambara Mountains (Mowo, et al., 2002). With elevations ranging from 900-2250 meters above sea level, the rainy sub-tropical climate is ideal for tea production (Wagner et al., 2011). As illustrated in Figure 3, there are three main forests that surround the village of Sagara, which protect the water resources the community depends on for drinking, livelihood and agriculture (TFCG, 2011).

The Shambaa peoples are the dominant ethnic group in the West Usambaras. The Shambaa began growing crops for subsistence in 500 AD and utilized different agricultural practices to grow and harvest crops on the steep mountainous slopes (Campagnola, 2009). However, proximity to the Indian Ocean and accessibility to coastal ports (Figure 2) made the West Usambaras in particular an attractive region for foreign investment, as illustrated by the introduction and cultivation of cash crops on large estates during the colonial era (Loconto, 2010).

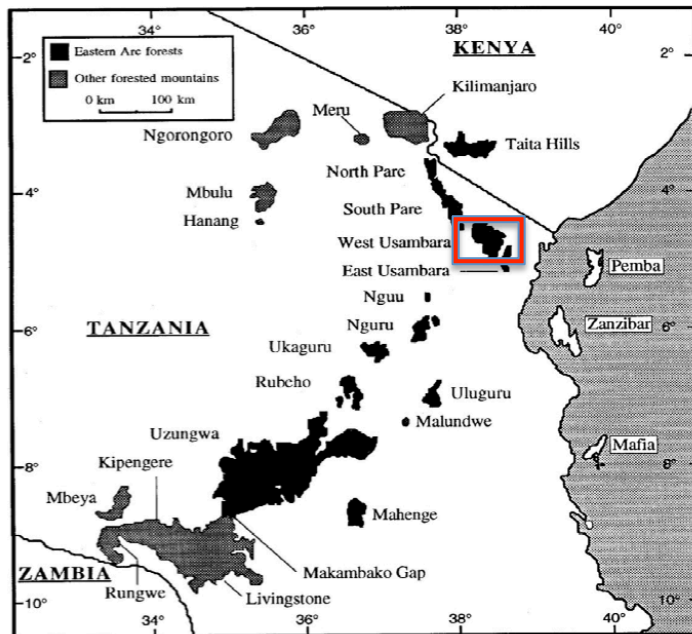


Figure 2: Map of Eastern Arc Mountains, Tanzania, specifically highlighting the West Usambaras with the study area outlined in red. Adapted from Beymer, 2010.

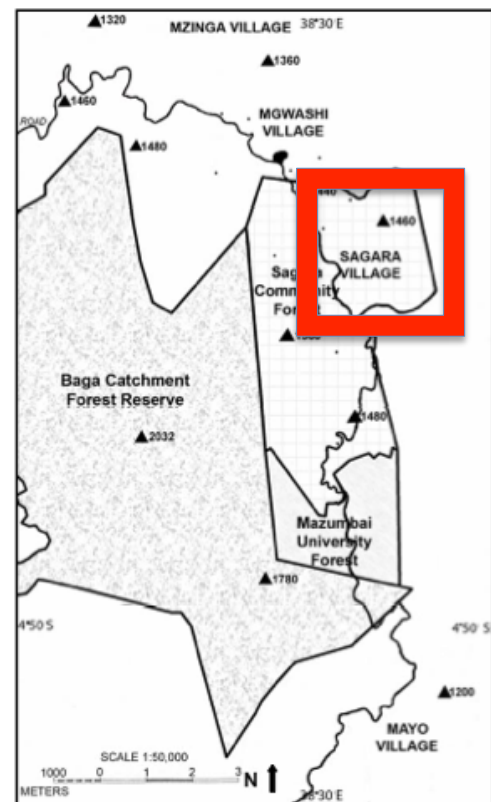


Figure 3: Map of Sagara Village and surrounding forests with study area outlined in red.

Today, agriculture plays an important role in the village, where approximately 80% of the total 2,408 villagers farm for subsistence or to generate income (village chairman, pers. comm., 2016). The main cash crops are tea, coffee, sugarcane and vegetables. Tea is an integral component of the local economy and is often more profitable than other cash crops due to the climatic conditions that are conducive to tea growth and the market conditions that have the infrastructure in place to transport and process green leaf product (Kiparu, pers. comm., 2016).

Farmers have been growing tea commercially in the region for over 70 years. In 1946, a Swiss businessman named Hugo Tanner moved to what is now known as the Mazumbai Hamlet of Sagara and established large estates of coffee and tea. Tea plants thrived in the subtropical climate and Tanner subsequently expanded tea production from 55Ha to 130 Ha in the following decades (Jensen, 2009). In 1964, Tanner's son inherited the estate and formed Sagara Limited, a cooperative tea company managed jointly by shareholders and Tanner. Laborers became owners of small tea plots and sold green leaf to a centralized processing factory. However, the state of the economy and Tanner's decision to leave Tanzania in 1982 caused a decline in tea production from the estate. Despite efforts to collectively manage the company, many farmers abandoned their tea plots. By 1992, after nearly a decade of decline, shareholders decided to dissolve the company completely and instead applied to become associated with Sagara village, thus forming the Sagara Group (Campagnola, 2009). The smallholder tea production model, first introduced in the region by Tanner and later adopted by the Sagara Group, is still practiced in the community today.

## Methods

Data was collected for this study between April 4<sup>th</sup>, 2016, and April 20<sup>th</sup>, 2016, in the village of Sagara in the West Usambara Mountains. This study was conducted within three hamlets of Sagara village: Mazumbai, Handei and Kweshashi, and focused on three sample populations within the regional tea commodity chain. Working in order of increasing scale, the three sample populations were as follows: smallholder tea farmers and laborers; a government agency called the Tanzanian Smallholders Tea Development Agency (TSHTDA) and a nonprofit organization called the Tea Research Institute of Tanzania (TRIT); and a local tea processing factory, Herkulu Tea Estates Ltd., located in Bumbuli.

Three key informant interviews conducted from March 6<sup>th</sup>, 2016, to March 9<sup>th</sup>, 2016, provided historical and demographic context for the study and helped identify the main actors in the regional tea commodity chain. The interviewees were as follows: Mr. Saidi Kiparu, current Mazumbai forest manager, who provided historical context about Sagara village; the current village chairman of Sagara, who provided demographic information about the village; and Leonard Mshakangoto, a representative from the nonprofit TFCG, who provided insight into the regional tea industry.

In-depth, semi-structured interviews were conducted with a total of 78 smallholder tea farmers and laborers who own and maintain tea plots within Sagara to gather quantitative data on farm size, economic revenue and agricultural yields, as well as descriptive information on farmers' overall perceptions on tea cultivation (Appendix A). With the assistance of a local translator, questions and answers were translated between English and either Kiswahili or Kishambaa, depending on the preference of the interviewee. The sample frame consisted of all farmers who maintain tea plots in Sagara village; however, due to time and budgetary restrictions, the sample population consisted of 78 of the total farmers who cultivate tea in the study area. The data thus reflects a non-representative population of tea farmers, non-randomly sampled from Sagara village.

The second sample population consisted of two external actors, TSHTDA and TRIT, who provide extension services for smallholder tea farmers and maintain seedling nurseries in Sagara village. TSHTDA works exclusively with small-scale tea farmers, providing inputs like fertilizers, fungicides, pesticides and materials like watering cans and tubes, while offering

educational seminars on topics ranging from soil conservation to tea harvesting techniques. The agency also builds and maintains seedling nurseries in conjunction TRIT, which sells tea seedlings for farmers replacing old plants or expanding production (TSHTDA, pers. comm., 2016). An in-depth interview was conducted with a regional staff member of TSHTDA to collect both quantitative data about the agency, as well as insight into the challenges that local tea farmers' face within the industry. This interview was supplemented with a day of site-visits to three of the local seedling nurseries, including one that is under construction in the Mazumbai hamlet.

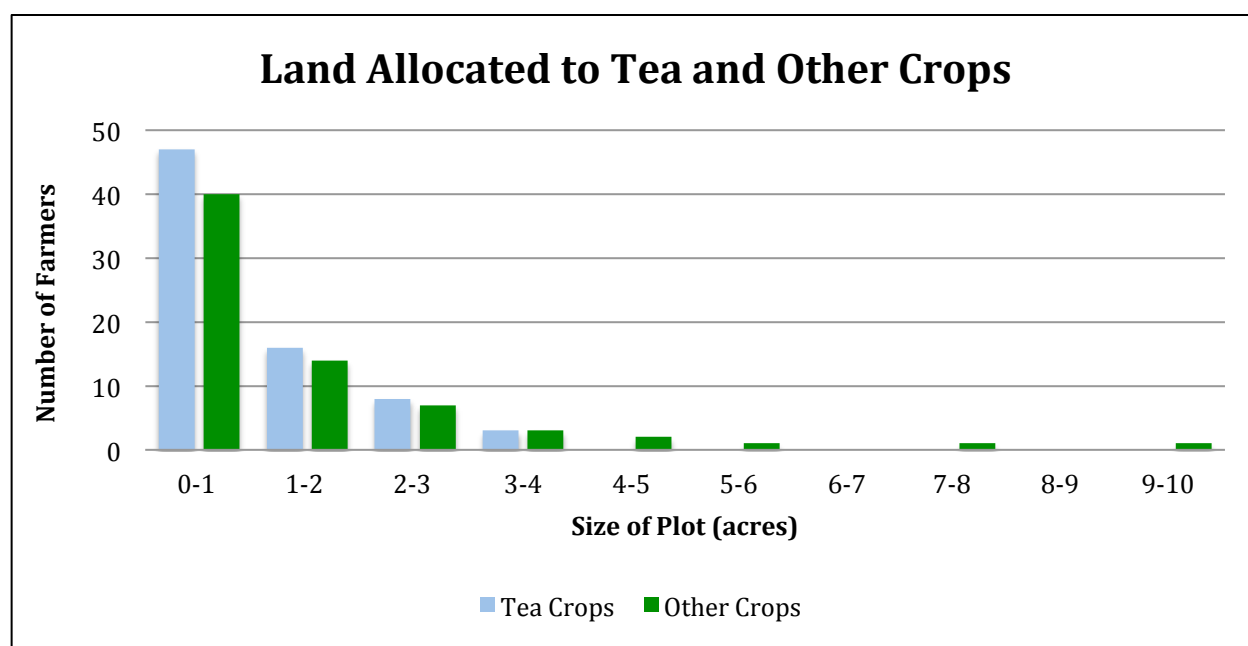
The third sample population, and the last leg of the regional tea commodity chain, includes the tea processing factories. Due to the closure of the Mponde Tea Factory in 2013, the only remaining processing factory within a close proximity to Sagara village is the Herkulu Tea Estates Ltd. One hundred (100%) of the tea farmers interviewed sell their green leaf to Herkulu. A short opportunistic interview with factory staff was conducted on-site. However, due to permit and application limitations, an interview with upper-level factory management was denied. Personal observations were recorded on the factory and estate operations from the site visit, and logistical information was collected from a short-interview with a Herkulu tea tractor driver on-route in Sagara.

Data from all three-sample populations is analyzed with descriptive statistics to evaluate the role that each of the local actors plays in the regional tea commodity chain. Data collection at each level of green leaf production, including seed distribution, seedling transplantation, tea cultivation and harvesting, product transportation, and processing, will be examined within the context of Sagara village.

## Results & Discussion

### *Smallholder Demographics and Patterns*

Sagara village is composed entirely of smallholder tea farmers, defined as farmers cultivating tea on land 4 acres or less in size. Of the seventy-eight farmers interviewed, the average total farm size, which included land for tea, subsistence crops and other cash crops, totaled 3.05 acres, with the smallest farm at 1.25 acres and the largest farm at 12 acres. For each individual, total farm size was broken down into land used exclusively to grow tea and land used to grow all other crops. Tea plots averaged 1.41 acres and ranged from 0.25 acres to 4 acres. Land allocated for other crops averaged 1.60 acres and ranged from 0.25 – 10 acres. The distribution of farm size and land allocated to tea and other crops is mapped in Figure 4.



**Figure 4: The distribution of plot size, broken down into land used for tea crops and land used for all other crops. Data collected from semi-structured interviews (n=78).**

Today, most smallholders cultivate tea on plots less than one acre in size, but interviewees noted that this size has decreased over time. When the company Sagara Limited was dissolved in the 1990s, tea plots were divided into varying sizes, most averaging around 2 hectares or 4.8 acres (Campagnola, 2009). The process of dividing land amongst family members as part of an inheritance may explain why current plots are smaller today than in the past. Eighty-five percent (66/78) of current tea farmers also had parents who grew tea in

Sagara. Of this eight-five percent, 68% (45/66) of farmers said they inherited their current tea plots from family, while the remaining 32% (21/66) of farmers bought land with matured tea plants or planted new seedlings themselves. Four individuals who have grown tea for more than 50 years had acquired land and their current tea plot from the former Tanner estate. Approximately half of the total tea farmers (40/78) purchased additional seedlings both to replace old plants and to expand the size of tea plots in order to maximize yields. Five sources of tea seedlings were mentioned by farmers: the Mponde factory, the Mazumbai Group, Sagara Limited, TRIT or other local tea farmers. According to TSHTDA, each seedling costs 400Tsh or \$0.18 USD (TSHTDA, pers. comm., 2016).

| <b>Frequency of Non-Tea Crops</b>  |                        |                          |                               |                    |
|--|------------------------|--------------------------|-------------------------------|--------------------|
| <b>Non-Tea Crop</b>  | <b>Total Frequency</b> | <b>Income Generating</b> | <b>Individual Consumption</b> | <b>Both</b>        |
| <b>Maize</b>   | <b>95%</b>             | <b>3% (2/74)</b>         | <b>75% (56/74)</b>            | <b>22% (16/74)</b> |
| <b>Beans</b>   | <b>86%</b>             | <b>49% (33/74)</b>       | <b>27% (18/67)</b>            | <b>24% (16/67)</b> |
| <b>Banana Trees</b>  | <b>46%</b>             | <b>33% (12/36)</b>       | <b>48% (17/36)</b>            | <b>19% (7/36)</b>  |
| <b>Tomatoes</b>  | <b>23%</b>             | <b>90% (16/18)</b>       | <b>5% (1/18)</b>              | <b>5% (1/18)</b>   |
| <b>Cassava</b>   | <b>19%</b>             | <b>20% (3/15)</b>        | <b>47% (7/15)</b>             | <b>33% (5/15)</b>  |
| <b>Coffee</b>  | <b>18%</b>             | <b>93% (13/14)</b>       | <b>7% (1/14)</b>              | -                  |
| <b>Peppers</b>   | <b>17%</b>             | <b>92% (12/13)</b>       | <b>8% (1/13)</b>              | -                  |
| <b>Fruit Trees</b>   | <b>12%</b>             | <b>78% (7/9)</b>         | <b>22% (2/22)</b>             | -                  |
| <b>Spinach</b>   | <b>9%</b>              | <b>43% (3/7)</b>         | <b>43% (3/7)</b>              | <b>14% (1/7)</b>   |
| <b>Avocado</b>   | <b>9%</b>              | <b>57% (4/7)</b>         | <b>14% (1/7)</b>              | <b>29% (2/7)</b>   |
| <b>Sugarcane</b>   | <b>8%</b>              | <b>100% (6/6)</b>        | -                             | -                  |
| <b>Cabbages</b>  | <b>7%</b>              | <b>100% (6/6)</b>        | -                             | -                  |
| <b>Potatoes</b>  | <b>5%</b>              | <b>25% (1/4)</b>         | <b>75% (3/4)</b>              | -                  |
| <b>Cloves</b>  | <b>5%</b>              | <b>100% (4/4)</b>        | -                             | -                  |
| <b>Yams</b>  | <b>4%</b>              | -                        | <b>100% (3/3)</b>             | -                  |
| <b>Sweet Potatoes</b>  | <b>4%</b>              | <b>33% (1/3)</b>         | <b>33% (1/3)</b>              | <b>33% (1/3)</b>   |
| <b>Onions</b>  | <b>3%</b>              | <b>100% (2/2)</b>        | -                             | -                  |
| <b>Table 1: Frequency of non-tea crops grown, broken down into (1) income generating, (2) individual consumption, or (3) both income generating and individual consumption. (n=78)</b> |                        |                          |                               |                    |

Maize and beans are the most common crops grown other than tea, with 95% and 86% of total interviewees growing each crop (Table 1). However, the two crops differ in their purpose: the majority of maize produced was used for individual consumption whereas beans were used mainly as a cash crop. The next most common cash crops were tomatoes (23%),

coffee (18%) and peppers (17%). Individuals noted that these additional cash crops were often sold in local markets, such as Mgwashi or Bumbuli, to supplement income. The next most common subsistence crops were banana trees (46%), cassava (19%) and potatoes (5%). It is important to note that many crops (maize, beans, banana trees, cassava) are used both for subsistence and as a source of income. The diversity in both crops grown and their purposes, as illustrated in Table 1, suggests that income from tea alone cannot sustain a livelihood.

Tea collection occurs twice a week in Sagara when a tractor with a total capacity of 4,000kg is sent from the Herkulu factory to collect green leaf from smallholders (Herkulu Staff, pers. comm., 2016). Prior to the closure of the Mponde Factory in 2013, there were three days of harvest and pick-up in Sagara. Today, farmers have only one market for green leaf, and are therefore highly dependent on the Herkulu Factory for transportation of product. Tea harvest for smallholders' ranges from 30kg – 300kg per week, and varies seasonally. Data suggests that the amount of tea harvested per week is correlated to tea plot size meaning farmers with the largest size tea plots tend to harvest the most tea per week. During the long rains when levels of precipitation are high, fields can be plucked every 5-7 days. Most farmers noted that yields are lower during the dry season and periods of prolonged drought. In general, younger tea plants produce higher yields than older plants, which may also explain the wide range of kilograms harvested per week. Farmers noted that removing and replacing dead plants with new seedlings helped boost yields in following years. Lastly, additional inputs such as fertilizers, herbicides and fungicides can help tea plants regenerate new green leaf product faster. Such inputs are costly, but readily available at local *dukas* for purchase. All of these factors contribute to varying green leaf yields per week.

Tea cultivation is time consuming and labor intensive. Fifty-three percent (53%) of landowners employed laborers for at least part of the season, which often correlated to the rainy season when yields were highest. Laborers hired to pluck green leaf are paid half of the total amount received per kilogram of tea, which ranges from 50Tsh/kg - 75Tsh/kg (\$0.02 - \$0.03 USD). Laborers hired to weed, cut or prune tea plots are paid approximately 4,000Tsh (\$2.00 USD) per day. Landowners utilize laborers from local villages, who, in some cases, also own and maintain tea plots of their own. This illustrates that the fluctuation and/or decline of tea prices impacts more than just farmers, but also the laborers they employ.

### ***Smallholder Perceptions on the Tea Industry***

Interviewees were asked a series of questions about the strengths of the local tea industry, as illustrated in Figure 5. Thirty percent (30%) of farmers stated that despite receiving low prices for green leaf product, tea provided a dependable source of weekly income. Farmers also mentioned that tea had an advantage over other cash crops, notably coffee and sugarcane, in three ways: firstly, tea plants are long-lasting crops that, if cared for properly, can be harvested for more than 70 years (26%); secondly, tea is a non-seasonal crop that produces green leaf product all year (13%); and thirdly, tea plants are comparatively resistant to disease and drought (5%). Tea product also has livelihood benefits. Processed tea from the Herkulu Factory is sold back to farmers in Sagara. Eleven percent (11%) of respondents mentioned that gaining access to processed tealeaves for drinking was an external benefit for farmers. Similarly, 13% of farmers mentioned the overall developmental benefits of tea product, which indirectly supported the improvement and construction of local infrastructure, schools and houses with the influx of cash into the local economy.

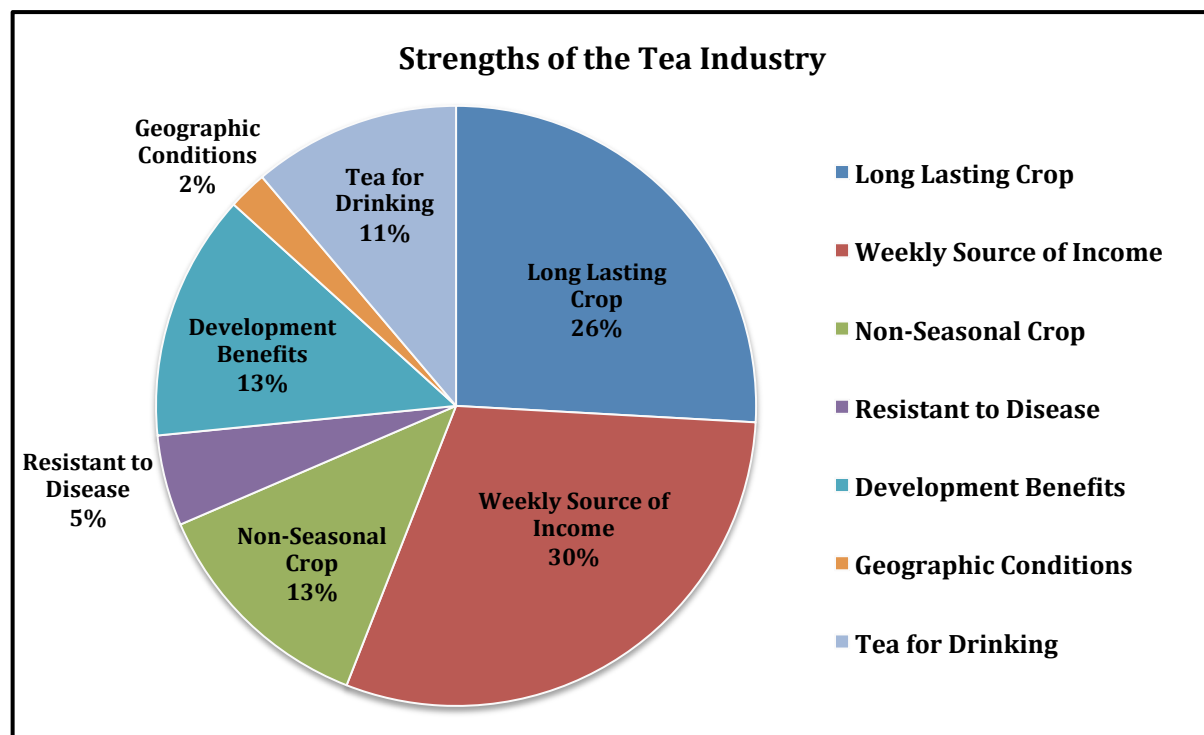


Figure 5: Frequency of responses to the strengths of the tea industry. Results from interviews with small-scale farmers from Sagara village (2016). The open-ended question allowed interviewee to respond with multiple answers. (n = 78).



Interviewees were also asked a series of questions about the weaknesses of the local tea industry, as illustrated in Figure 6. Over half (59%) of the farmers mentioned market limitations, including the closure of the Mponde Factory (25%), receiving too low a price for green leaf product (24%), and the low capacity of the Herkulu factory (10%) as the main challenges of the local tea industry. Up until its closure, the Mponde Factory was the primary center for regional tealeaf processing. Farmers received higher prices per kilogram from both factories when Mponde was still in operation (200/kg compared to 150/kg today). This suggests that with the closure of the only other regional competitor, the Herkulu Factory was able to decrease prices for raw products. The capacity of the Herkulu Factory to source tea from smallholders is limited. The factory is situated on a 603Ha estate, of which 230Ha is used exclusively to grow tea. The rest of the estate is used to grow eucalyptus wood for fuel and housing for Herkulu employees (pers. obs. / Herkulu pers. comm., 2016). The majority of tea-leaf that is processed at Herkulu thus comes from the estate itself, rather than from smallholders. Tea collection tractors come twice a week with one truck that can accommodate 4,000kg of tealeaf. When the truck is filled, excess product is discarded and farmers do not collect any money for the product they pluck. Because green leaf must be processed within 12 hours and there are no other markets to sell green leaf, the product is wasted, which 11% of farmers cited as a challenge of cultivating tea. During the rainy season, the dirt roads leading to the village can become nearly impassible, which complicates the collection schedule. During the study period, trucks from Herkulu rescheduled three times due to weather conditions. Without a reliable means of communication in place, farmers are left with little time and often find that the product they have harvested goes to waste. Other challenges, such as the inability to afford expensive inputs like fertilizers, herbicides and pesticides (12%) and labor demands (12%) suggest that the price that farmers receive per kilogram is not sufficient to cover the costs of production and harvesting (Figure 6).

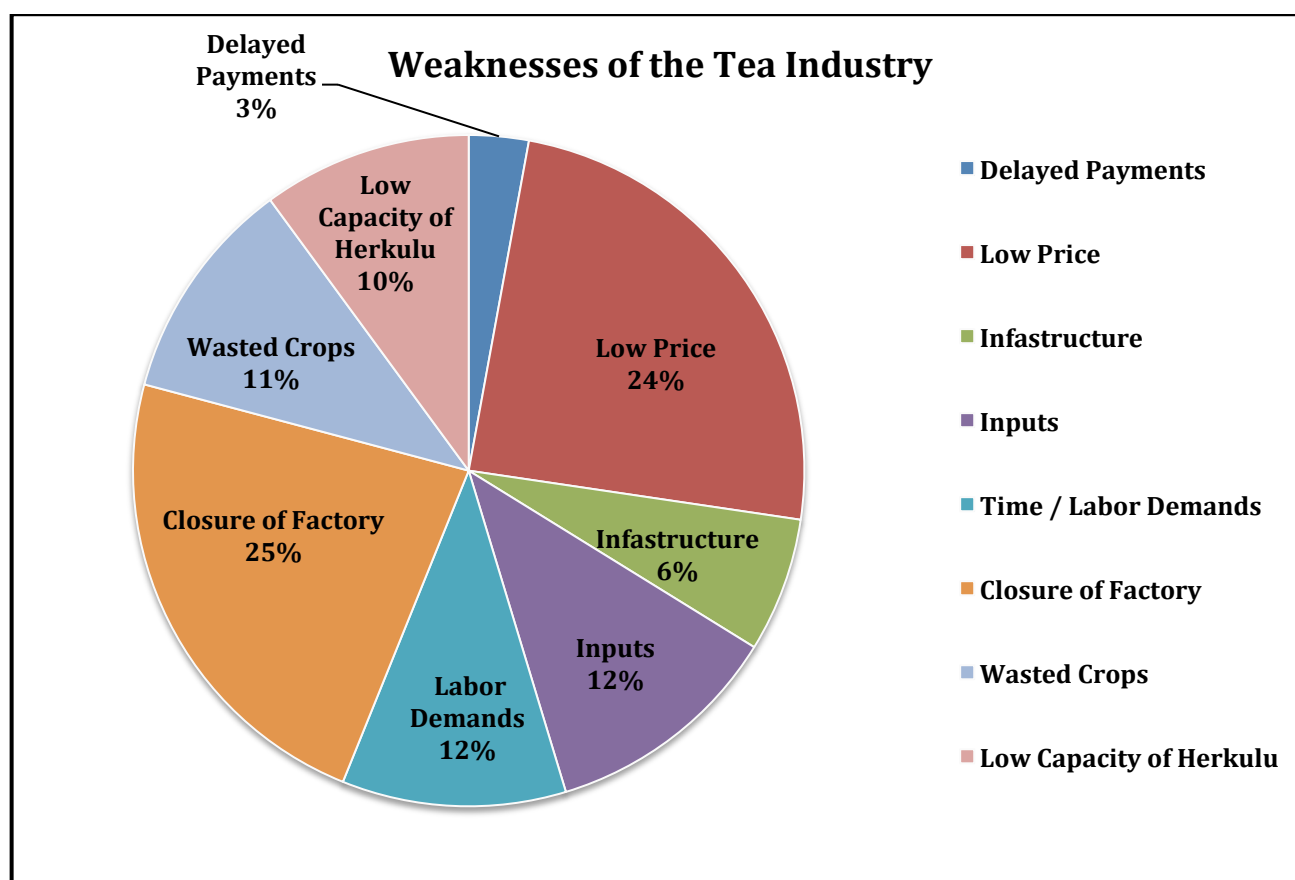


Figure 6: Frequency of responses to the weaknesses of the tea industry. Results from interviews with small-scale farmers from Sagara village (2016). The open-ended question allowed interviewee to respond with multiple answers. (n = 78).

A limited market for green leaf product leaves farmers in Sagara with very little agency in determining how, when, and to whom their product is sold. Tea farmers are completely dependent on a single local factory with no outside competition to transport, process and pay for their product. All of the factors listed as weaknesses of the industry were concentrated in the economics of tea production.

### **External Actors**

There are many external actors, including government agencies, nonprofits and nongovernmental organizations engaged in tea cultivation in the village of Sagara. These organizations each play a unique role in the production of green leaf; however, most services are centered on enhancing and expanding tea seedling growth and transplantation.

The government agency, TSHTDA, works in conjunction with the nonprofit TRIT to build and maintain seedling nurseries in areas with high levels of tea cultivation and access to water

(TSHTDA, pers. comm., 2016). There are currently 30 nurseries in the Lushoto District and as of Spring 2016, TSHTDA is in the process of building a large seedling nursery in the Mazumbai Hamlet of Sagara village (Figure 7). There are two methods for tea propagation utilized by TSHTDA: planting from seeds or from cuttings (TSHTDA, pers. comm., 2016).

Propagation from seed, rather than cuttings, is a significantly longer process that takes approximately 2-3 years until the plant can be harvested. Seeds are often planted in small starting containers or pots with fertilized soils. New seeds require approximately 2.5 cm of soils, frequent watering, and shade. After the seed begins to sprout, the plants are gradually exposed to sunlight. The roots of the plant develop slowly, but after about a year, plants can be moved from the containers to prepared plots of land. However, it takes at least another year before the plant is mature enough to be plucked (*How is Tea Grown*, 2016).

Propagation from cuttings has significant advantages, including a uniform population of seeds, less weeding, and faster development and growth. Cuttings should be taken from strong, healthy plants that have not been pruned in 4-9 months. Cuttings must be taken from a plant with primary shoots (e.g. the bud that would be plucked) and must extend into the middle portion of the branch, where the shoot is neither too tender nor too woody. The cutting is then planted in a nursery with adequate shade and moist, fertilized soils. The cutting requires moisture for the first 3-4 weeks, so newly planted shoots are typically covered with plastic to trap moisture and aired out for a few hours each day. After 3-4 months, the seedlings have developed roots and can gradually be exposed to sunlight. After 10-12 months in the nursery, seedlings have developed strong root structure and can be transplanted to tea fields.



**Figure 7: Photo of the construction of a tea seedling nursery built and maintained by TSHTDA and TRIT. (April 2016)**

In addition to building and maintaining tea seedling nurseries, TSHTDA, TRIT and TFCG also provide educational seminars for local farmers on topics concerning agriculture and sustainable land-management practices. The topics of the seminars range from soil conservation and health to water efficiency and forest use (TFCG, 2016). These seminars aim to provide local farmers with knowledge and background about the ecological conditions of the region. TSHTDA works exclusively with smallholder tea farmers to provide education on efficient tea production. TSHTDA recognizes that smallholders face significant constraints and challenges within the industry, with smallholder yields continuing to decrease, while estate tea production continues to increased production and profit. TSHTDA acknowledges many issues that may contribute to comparatively lower smallholder yields, including a dependence on public infrastructure, lack of funding for tea research and limited capital to purchase equipment and inputs like fertilizers (Tanzania Smallholder Tea Development Agency, 2009). However, there are also regional circumstances that add additional constraints on the smallholder sector in Sagara. The closure of the Mponde factory, transportation, and low capacity of the Herkulu Factory were stated as the major challenges unique to tea farmers in Sagara, which non-

coincidentally, aligns with the challenges as stated by smallholder farmers. However, the solution, according to TSHTDA's perspective, is to help smallholders *scale-up* in order to maximize yields from a single plot. The money that any producer (approx. \$0.09/kg - \$0.10/kg) receives for green leaf product is roughly the same. Therefore, it is the scale of the farm and subsequent harvesting potential per plot, not price per kilogram, that allows some producers (e.g. large tea estates) to turn profit, while others (e.g. smallholders) struggle to break-even. The solution, according to TSHTDA, therefore lies in helping small-scale tea farmers' harvest more so their plots become more economically viable per acre (TSHTDA pers. comm., 2016). This aligns with the services that TRIT and TSHTDA offer to smallholders: access to hybrid seedlings that can replace dead or diseased plants or expand tea production, fertilizers that maximize growth and yields, herbicides that kill weeds and increase quality of green leaf product, and educational seminars on the proper methods to increase harvest and decrease time between plucking.

| <b>Tanzanian Smallholders Tea Development Agency (TSHTDA)</b>   | <b>Tanzanian Forest Conservation Group (TCFG)</b>  | <b>Tea Research Institute of Tanzania (TRIT)</b>  |
|---|--|---|
| <b>1991</b>   | <b>1985</b>  | <b>1996</b>   |
| <ul style="list-style-type: none"> <li>• Works exclusively with smallholder tea farmers.</li> <li>• Offers extension services including educational seminars on soil health and effective tea harvesting techniques.</li> <li>• Builds and maintains local tea seedling nurseries.</li> </ul> | <ul style="list-style-type: none"> <li>• Nongovernmental organization focused on forest conservation.</li> <li>• Works with farming communities to develop sustainable agriculture techniques.</li> <li>• Provides extension services and educational seminars for farmers.</li> </ul> | <ul style="list-style-type: none"> <li>• Nonprofit research organization dedicated to improving tea cultivation for both small-scale and large-scale tea estates.</li> <li>• Builds and maintains seedling nurseries in areas of high tea cultivation.</li> </ul> |

**Table 2: Highlights three external actors in tea production in Sagara and outlines organizational goals and services offered to farmers in Sagara.**

When smallholders were asked about the services they received from external parties, none of the respondents mentioned any direct government assistance in tea production, but approximately half (48%) of the farmers' received assistance from one of the three organizations listed in Table 2. The type of assistance at the production level focused primarily on seedling growth and transplantation, which aligns directly with the missions of TSHTDA and

TRIT. Of the farmers that did receive assistance from external organizations, TRIT was the most common source of assistance with 82% of respondents utilizing their services (Figure 8). Smallholders mentioned that TRIT provided tea seedlings at an affordable price and held educational seminars on proper transplantation and harvesting techniques.

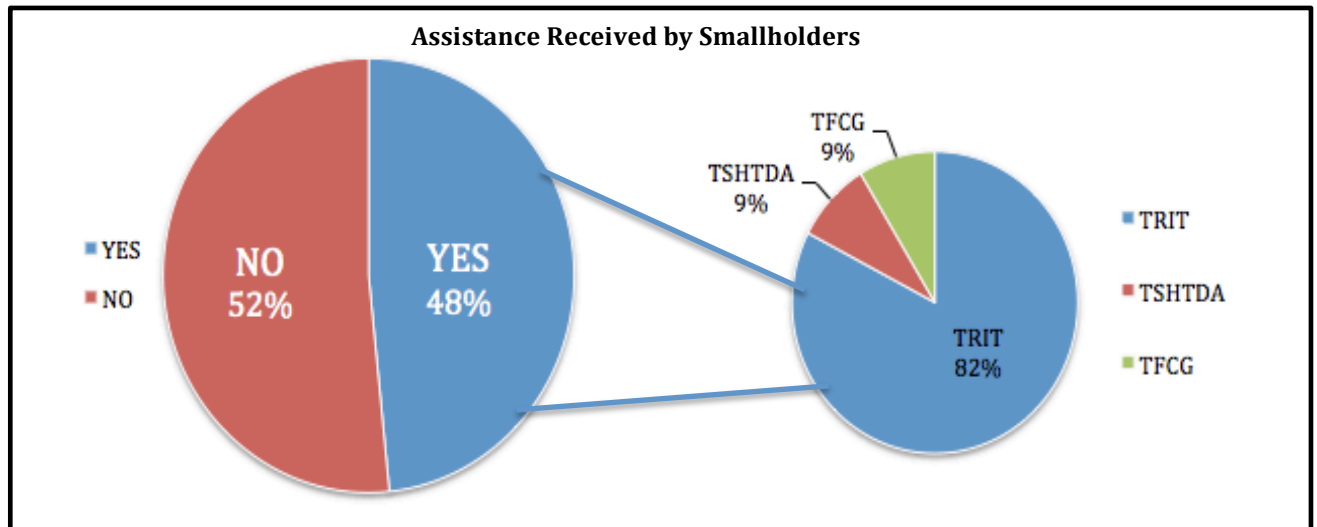


Figure 8: Frequency of organizations offering assistance as received by smallholders in the Sagara region. (n=78)

The service(s) that external actors are providing to smallholders in Sagara does not address the challenges - unique to the economic conditions of the region- that farmers discussed. External actors are focused on expanding tea production, whereas smallholders themselves already face significant constraints in finding markets for the yields they currently produce. As discussed, the closure of the main tea factory in the region and low capacity of the Herkulu Factory limits the access to markets for smallholders and often results in the destruction or waste of product. However, external organizations are pushing services that help farmers increase yields, while offering little to no assistance in terms of increasing the capacity of regional processing factories or ensuring that farmers receive a fair price for green leaf product.

### ***Herkulu Factory***

The Herkulu Factory is now the only tea-processing factory in the region. As discussed, tea differs from other crops in that the 12-hour window from when the leaf is plucked to when it is processed is crucial. This alone limits competition for green leaf product, as farmers' are

completely dependent on a local processing factory to determine the price and amount of green leaf harvested. One hundred percent (100%) of interviewees sell their tea to the Herkulu Factory. However, 89% of farmers sold their tea to the Mponde Factory in the past. Furthermore, the prices/kg that farmers' receive in 2016 are *lower* than prices/kg they received in the past. Today, farmers' receive 150Tsh/kg if paid in cash or 176Tsh/kg if paid on credit. In the past, farmers' received 200Tsh/kg. These patterns may suggest two things: firstly, the Mponde Factory offered higher prices per kg of green leaf product and with its closure caused farmers to receive less today than they did in the past, or that with the closure of its only other competitor, the Herkulu Factory was able to decrease prices per kg of green leaf.

Another likely explanation for the low prices per kilogram of green leaf may be that the Herkulu Factory is situated on an estate of 603 total hectares, with 230 of the total hectares dedicated exclusively to tea (Bombay Burmah, 2016). The tea grown on the estate is harvested by laborers and processed directly at the factory. This decreases costs associated with the pick-up and transport of the product. During the rainy season, when harvests are highest, the roads leading from the factory in Bumbuli to Sagara are nearly impassable. Depending on the amount and intensity of rainfall, the tea tractors cannot navigate the roads, leaving farmers with wasted product. Furthermore, the means of communication between factory staff and smallholders is inefficient and largely ineffective causing confusion when the scheduled pick-up days change (Herkulu, pers. comm., 2016). This presents an economic benefit for Herkulu to source directly from the estate, but limits markets for smallholders in Sagara.

Lastly, the capacity of the Herkulu Factory to source from smallholders is comparatively lower than that of the Mponde Factory. With a large estate adjacent to the factory, Herkulu enjoys diverse sources of product and does not need to source solely from smallholders. Furthermore, the relative size of the factory and total processing capacity cannot match the production of green leaf by farmers in Sagara and surrounding villages, resulting in the factory attaining a significant economic advantage.

## **Limitations and Recommendations**

### **Biases**

- Data collection began at the start of the long rains, and after days of heavy rainfall, the gravel roads became nearly impassable for tea collection tractors. This changed the schedule for tea collection, and farmers would often be at their shaambas during the time of interviews. This limited the amount of farmers I could speak to per day.
- By mid-morning many farmers had left for their shaambas, which were not located near their houses and made locating / interviewing farmers difficult.
- As with any translator, many responses could have been limited and understanding could have been skewed, despite careful crafting of interview questions. Questions were also translated between three languages (English, Kiswahili, Kisambaa) which could have limited the understanding / responses of the interviewees.

### **Limitations**

- The study period (3 weeks) was simply too short to gather an in-depth understanding of such a complex and nuanced commodity chain.
- The farmers' interviewed resided in only village – to collect a more complete perspective, it is important to include smallholders from other villages / regions that cultivate tea in other economic, social and geographic conditions.
- As mentioned, we did not have the proper qualifications / permits to interview management staff at the Herkulu factory, which limited the amount of data I could collect about an important part of the regional commodity chain.

### **Recommendations**

- Explore the perspective of smallholder farmers on government agencies, like TSHTDA, and analyze the knowledge, resources and materials these agencies provide to local farmers.
- Map the changes in individual tea plots within a 5-10 year range, as well as how farmers' predict their plots will change in the future, especially in anticipation of the Mponde Factory re-opening.



- Compare the tea commodity chain to other cash crops, especially vegetables such as tomatoes or pili pili – it would be interesting to compare / contrast the commodity chain of a regional cash crop (vegetables) and one that is sold in international markets (coffee / chai).
- According to its website, the Herkulu Factory is “fair-trade certified.” I think it would be interesting to examine the commodity chain through a value-certification lens, like fair-trade, or collect farmers’ perspectives on fair-trade and contrast with factory benefits

## Conclusion

Most of the extension services and resources for tea farmers are offered at the production level and are aimed specifically at helping farmers expand production and harvest more efficiently. However, this did not seem to be the problem in the village of Sagara. Most farmers mentioned that markets and low prices are the biggest challenges in the industry, not issues related to soil fertility, seedling transplantation, or production itself. Interviewees highlighted the closure of the Mponde Factory three years ago and the low capacity of the Herkulu Factory as limiting markets. Furthermore, the price for green leaf – which has decreased in recent years– is simply too low and thus contributes to a decline in production. However, there is a disjoint in the resources offered to smallholders and the actual services needed by smallholders. As government agencies continue to build local seedling nurseries in an effort to expand smallholder tea production in the region, many farmers are choosing to leave healthy fields unmaintained and harvest less tea than previous times because there are simply no markets to sell green leaf product. Plucking high quality green leaf product requires significant time and labor demands, which, with the limited capacity of the only regional processing factory, leaves tea farmers with very little choice but to harvest less today than in the past. Government agencies, nonprofits, and NGOS that offer support and services to enhance the smallholder tea sector offer limited assistance in ensuring that farmers are paid a fair, and livable, wage for the product they produce. Low prices for green leaf product, limited processing capacity, and unreliable means of local infrastructure and pick-up create significant economic barriers to the smallholder tea industry in Sagara village.

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## Appendix A: Questions for Smallholders

1. Do you grow tea as a cash crop?
  - a. How much land is allocated to tea? **[Acres]**
  - b. How much land is allocated to crops other than tea? **[Acres]**
  - c. Has this changed in the past 5 -10 years?
    - i. If yes → what are the reasons? **Explain.**
2. What crops, aside from tea, do you grow on your shamba?
  - a. Which of these crops are for subsistence and which are sold as cash crops?
3. How many years have you grown tea?
4. Did your parents grow tea?
  - a. If yes → did you inherit tea plants from your family?
    - i. If no → did you plant new seedlings?
      1. Where did you buy tea plants / seedlings?
5. How many days per week do you spend on your tea plot?
6. Do you hire labor to help you cultivate (*only*) tea?
  - a. If yes → are these laborers seasonal or year-round? What do they get paid? (TSH)
7. Where do you sell your green tea leaf?
8. How much is your tea sold for per kilo? **[TSH]**
  - a. Has this price changed in the past 5 – 10 years?
9. How much tea do you harvest per week? **[kg]**
  - a. Has this amount changed in the past 5 – 10 years?
    - i. If yes → **Explain.**
10. How much of your income comes from chai cultivation? **[Percentage]**
  - a. Has this changed in the last 5-10 years?
  - b. If yes → what are the reasons? **Explain.**
11. Have you received assistance from an NGO or any other organization with tea production?
  - a. If yes → Name of organization? In what ways? **Explain.**
12. Have your neighbors received assistance from an NGO or any other organization with tea production?
  - a. If yes → Name of organization? In what ways? **Explain.**
13. Have you received any assistance from the government with tea production?
  - a. If yes → when? In what ways? **Explain.**
14. How have you seen the tea industry in your village change in the past 5 – 10 years?
15. Why do you choose to grow tea as a cash crop?
  - a. **Explain.**

16. What do you see as the strengths of the tea industry?
  - a. **Explain.**
17. What are the biggest challenges you face as a *chai* farmer?
  - a. **Explain.**

## **II. Questions for the Tanzania Small Holders Tea Development Agency**

1. When did TSHTDA begin working in the Lushoto agricultural district?
2. Can you explain the mission of TSHTDA?
3. What types of services does TSHTDA provide to farmers?
4. Have you noticed any changes in *chai* cultivation in this area in the past 5-10 years?
  - a. Have you seen tea cultivation increase or decrease in recent years?
5. What do you think are the biggest challenges the small-scale tea farmers face within the industry?
6. What do you think are the benefits of cultivating tea in this region?
7. How many seedling nurseries have been built in this area?
  - a. Who uses the tea seedlings in the nursery?
  - b. How much does each seedling cost?
8. Where does funding for TSHTDA come from?
9. Have you noticed tea cultivation increase or decrease in recent years?

## **Mahojiano Kwa Wakuli Ma Wa Chai**

1. Unalima chai kama zwa la biashara
2. Mazao gani mengine ambayo unalima kwanye shamba lako kwa sasa?
  - a. Shamba lako ni kubwa kiasi gani?
3. Umelima chai kwa muda gani / miaka mingapi?
  - a. Wazazi wako walikuwa wakulima wa chai pia?
4. Unahitaji shamba kubwa kiasi gani ili kuwa mkulima wa chai?
  - a. Unafikinini ukubusa au udogo wa maShamba ya cha umebadilika kwa miaka ya hivi karibuni?
  - b. Kama ndiyo, kwanini? Elezea.
5. Unauza wapi majani ya chai unayo lima?
6. Unauza majani chai shilingi ngapi kwa kilo moja?
7. Chai inachangia mapato yako kwa kiasi gani?
  - a. Kuna mabadiliko ya mapato haya kwa miaka 5-10 iliyopita?
  - b. Kama ndiyo, kwanini? Elezea.
8. NGO TSHTDA, imechangia kwa njia yoyote katika kilimo chako cha chai?

9. NGO TSHTDA imesusasaidia wanakijiji kwa njia yoyote njia gani?
10. Kuna mabadiliko katika kilimo cha chai hapa kijini ai gani?
11. Kuna ukuaji kwenye kilimo cha chai kwa ujumula. Elezea.
12. Kuna chaugamoto gani unazopitia kama mkulima wa chai? Elezea.

#### **Maswali kwa Tanzania Small Holders Tea Development Agency**

1. TSHTDA ilianza kufanya kazi hapa Lushoto Lini?
2. Lengo la TSHTDA ni nini hapa?
3. TSHTDA inatoa hunduma gani kwa wakulima
4. Kuna mabadiliko yoyote uliyoyanona kwawakulima katika miaka 5 – 10 iliyopita?
  - a. Umeschuhudia kupanda au kusuka kwa kilimo cha chai miaka ya hivi karibuni?
5. Wakulima wadogo wa chai usanapitia changamoto gani?
6. Kuna manufaa yoyote katika kilimo cha chai hapa, ni gani?
7. Kuna vitalu vingapi uya chai hapa kijijini?
  - a. Nani anayenunua / anayetumia miche ya chai?
  - b. Mche mmjoa ni shilingi ngpai?
8. TSHTDA wanapata wapi pesa za kujiindesha
9. Kuna ukuaji / kudidia kwa kilimo cha chai kwa miaka ya hivi karibuni?

#### **Appendix B: List of Interviewees**

- 78 tea farmers / hired laborers from Sagara Village
- Representative, Tanzanian Smallholders Tea Development Agency
- Tractor Driver, Herkulu Estates Ltd.
- Employee, Herkulu Estates Ltd.
- Village Chairmen, Sagara Village
- Manager, Mazumbai Forest
- Secretary, Sagara Group