*THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES*

# An Insight into Unprecedented Performance of Coffee Sector in Bungoma County, Kenya, 1967-1988

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***Abstract:***
*The period 1964-1988 recorded unprecedented performance of Coffee Sector in Bungoma County as witnessed by the volume of production. For instance, Kenya's coffee production and earnings grew at an annual rate of 6.6 percent per year between 1963 and 1988, with a simultaneous increase in annual yield rate of 0.9 percent. However, after 1988 production declined by 62 percent between 1989 and 2008-10 and by 5.5 percent between 1988/89 and 2009/10. This performance saw various households record favorable returns that had a positive impact on socio-economic development of the study region. The decline in coffee productivity has seen the region fall to a record relatively higher level of poverty index. For instance, Kenya County Facts Sheets (GoK, 2013) gave the poverty Index for Bungoma County as 52.9 percent against the national index of 47.6 percent. This state is a clear pointer that Bungoma County significantly contributes to the national poverty index. It is against this background that this study undertook a historical analysis of the performance of the coffee sector in the period 1963-1988 with the purpose of providing an insight into circumstances that led to the unprecedented performance of the coffee sector in the study period purposed to guide reforms in the coffee sector so that the sector could regain its lost glory. The study was guided by Diffusion of Innovation Theory (DIT). The study adopted a descriptive survey design. The target population consisted of:*

- *7304 coffee farmers spread across,*
- *39 coffee factories in Bungoma County,*
- *39 chairmen of coffee factories as representatives of the management,*
- *6 Agricultural Officers of the Sub-Counties in which the factories are found, and*
- *An informed elderly local leader with a wide knowledge of economic activities to offer real testimony on issues that may have been witnessed*

*The study utilized both primary and secondary data. Primary data were collected through interviews and questionnaires. The study established that the high productivity of coffee during the study period was promoted by farmer support programs such as the provision of farm inputs, support education programs, and attractive global coffee prices. The study recommends restoration of the same programs if coffee productivity is to be improved.*

***Keywords:*** *Insight, performance, poverty index, socio-economic development, unprecedented*

## 1. Introduction

Coffee has been known due to a number of benefits associated with its usage. According to Floor (2004), the filtered beverage is known to assist in getting rid of tiredness and enhances sleeplessness. Individuals such as long-distance travelers may prefer taking coffee occasionally to control their ability to fall asleep during their movement. Teketay (1998) observes that Oromos, one of the ethnic groups in Ethiopia, are reported to have had a special diet with a coffee base for use on long safaris. The roasted and finely ground coffee was mixed with butter or other edible oil. It was then formed into oblong lumps about the size and shape of almonds, and these were eaten as a source of concentrated energy.

Contributing to the benefits of coffee usage, Huffnagel (1961) observes that coffee fruits are cooked in butter to make salted flat cakes rich in energy-yielding properties. The green cherries are roasted, ground, salted, and mixed with butter for the same purpose, and the ground roasted seed is used in desserts. Coffee was also used in early religious and

marriage practices in Africa. For instance, in Ethiopia, coffee drinking is ceremonious. Its ceremonious drinking is a time to exchange news and well-wishing with friends and relatives and to express respect to guests and elders.

Similarly, Davis, Gargiulo, Fay, Sarmu, and Haggar (2020) contend that coffee has medicinal value as it is used to comfort the brain, against pains in the head, lethargy, and cough, useful against rheumatism, gout, intermittent fevers, worms (for children) and it was considered a strong antihypnotic. Coffee encompasses several important nutrients, such as Pantothenic Acid, Riboflavin, Potassium, Manganese, Magnesium, and Niacin, and such Coffee usage is likely to reduce one's risk of getting Risk of Type II Diabetes, a disease characterized by high blood sugars in the environment of insulin confrontation or an incapacity to discharge insulin. This makes one's taking a coffee drink to have a significant reduction of risk of getting type 2 diabetes. Research has shown that individuals who take coffee have a 23-50% lower risk of getting infected with this disease (ibid).

Because of the benefits that accrue from coffee usage, coffee farming is one of the greatest global industries making it critical in promoting social and economic development. In recent years, a connection has developed between greater levels of spending on farming and advancement toward attaining the Millennium Development Goals. Among the major agricultural activities, coffee plays a crucial role in the livelihoods of millions of rural households in developing countries, where it is one of the major cash crops (Chokera, 2011).

According to Whelan and Newsom (2021), coffee is one of the most globally transacted tropical agricultural products, a commodity nurtured in about 70 countries generating employment opportunities for more than 25 million people in fields linked to coffee processing, trading, transport, and marketing. For instance, Coffee farming is one of the major cash crops in Columbia, generating at least 12.4 percent of the country's agricultural Gross Domestic Product (GDP). The country provides employment opportunities to 29.5 percent of the country's rural population, with over 570,000 farmers directly employed in coffee production (Ibanez & Blackman, 2015).

Columbia's coffee is regarded as one of the best in the world, a situation that has triggered a high demand for the same in the global market. As a way of providing incentives to farmers to engage in coffee production, the government has set up a fund to cushion farmers against price fluctuations, with earnings realized being ploughed back in the form of other development programs in coffee-growing regions such as healthcare development, electrification, and transport infrastructure. This situation has encouraged coffee production, making Columbia the second-best global producer of coffee coming after Brazil (Setoyama, et al., 2013). Similarly, eco-friendly practices and skills like soil conservation measures, usage of organic fertilizers, harmless pest management practices reforestation are practiced as a way of promoting the sustainability of coffee farming (Ibanez, 2010).

Coffee was introduced into the Tanzanian region from modern-day Ethiopia in the 16th century. Coffee was not really brewed in the region but was used as a stimulant. The tribe boiled the Robusta beans, steamed them with various herbs, and chewed on the mixture as a stimulant. The coffee industry of Tanzania is the 19th largest producer of coffee in the world. In 2006, Tanzania produced over fifty-five million pounds of coffee beans. Exports of coffee bring in over $60 million dollars each year to the Tanzanian economy (Yukaze, 2019).

In Kenya, coffee farming was introduced by white settlers in 1893, whose farming was a reserve for settlers, and Africans offered forced labor. Studies by Stichter (1982) and Kanogo (1987) reveal how colonial labor and agrarian demands transformed the pre-colonial economies of Kenyan societies and how Africans responded creatively to the new colonial opportunities and constraints. Introduction of coffee farming in Kenya among the natives was achieved when a pro-African Governor called Sir Joseph Baryne took over the administration of the colonial state. Though initially, Colonial Office in London supported African empowerment through activities such as coffee farming, the same was frustrated by Colonial state governors who were majorly in support of settlers (Ochieng, 1989). For instance, despite the above argument about the involvement of Africans in coffee farming, Barnes (1976) observes that the major reason behind restrictions on Africans from engagement in coffee farming was due to the fear of losing scarce laborers on European farms due to economic alternatives that were likely to be created by African coffee farms as well as protection of monopoly enjoyed by white settlers on the global market.

According to Makana (2007), two major events in 1930s and 1940s triggered the colonial government in Kenya to reconsider the denial of Africans' involvement in economic activities such as coffee farming. These events were the Great Depression and the Second World War, which saw the colonial government face great financial challenges that made it difficult for the government to meet its programs. The colonial government was in dire need of revenue, food, and other products to meet its obligation, a state that had been worsened by the Great Economic depression of 1920s. This is how economic activities, such as coffee farming, were introduced in regions such as Bungoma in 1937(Ibid).

As a way of accelerating agricultural productivity, the colonial government came up with an agricultural policy called the 'Swynnerton Plan' in 1954. It was a plan mooted by Roger Swynnerton, an official in the Department of Agriculture, that was aimed at intensifying the development of agricultural activities of natives as an avenue of enhanced productivity. Under this plan, necessary support programs such as education on better husbandry, provision of farm inputs, credit facilities, and infrastructural development were given priority by the colonial government (Anderson, 2005). This situation has contributed to the livelihood of more than 700,000 smallholder farmers representing approximately 3.5 million families that were involved in coffee farming. Coffee production saw an improvement in the socio-economic status of various households in Bungoma County, particularly from 1967 to 1988. However, the period after 1988 saw the trend in the coffee sector assume a downward trend with negative consequences on the socio-economic status of various households. For instance, Kenya County Facts Sheets (GoK, 2013) gave the poverty index for Bungoma County as 52.9 percent against the national index of 47.6 percent. This state is a clear pointer that Bungoma County significantly contributes to the national poverty index. The diminishing productivity of coffee productivity and resultant socio-

economic consequences called for an investigation to establish the circumstances that could have contributed to the historical performance of the coffee sector so that it could have a lesson for informed reforms for the restoration of lost glory.

## 2. Theoretical Framework

The study was guided by, Diffusion of Innovation Theory (DIT) developed by Everett M. Rogers in 1962. This theory helps explain how farmers adopt agricultural innovations. Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. This theory advances that agricultural progress is pegged on the pragmatic scrutiny of extensive differences in labor and land output among farmers and regions. One of the greatest advantages of DIT is that it explains the rate at which consumers will adopt a new product. Therefore, agronomists and farmers understand how trends occur, which helps them assess the likelihood of success or failure of their new introduction.

## 3. Methodology

The study adopted a descriptive survey design. According to Creswell (2008), descriptive survey design is most fitting in social studies that seek to establish the attitude, opinions, and characteristics of a given population. Briggs, Coleman, and Morrison (2012) advance the adoption of survey design due to its ability to enhance the collection of standardized data from large numbers of respondents aimed at generalizations. Since the study was concerned with the establishment of the impact of the rise and fall of coffee production on the socio-economic performance of households in Kenya on the basis of evidence from Bungoma County during the period of 1967-202, this design was found to be more appropriate.

Data to address the study was captured from several positive statements put to farmer respondents, chairmen of coffee co-operatives, and agricultural officers of study Sub-Counties. A questionnaire was used to capture information from farmer respondents. The questionnaire Items in the questionnaire modeled on Likert scale using (1) for Strongly Agreed running up to (5) for Strongly Disagree aimed at collecting quantitative data from farmer respondents. However, qualitative data were captured through interviews with chairmen and Sub-County Agricultural Officers whose responses have been fused in comments frequently made by the researcher on the basis of study findings and field experiences.

## 4. Results

The study sought to establish reasons for the enhanced performance of the coffee sector in the period of 1967-1988 in Bungoma County. This section presents the findings of the study.

### *4.1. Level of Involvement of Farmers in Coffee Farming*

The study sought to establish the level of involvement of farmers in coffee farming. A positive statement that many farmers were involved in coffee farming during the period of 1967-1988 was put to Learner respondents and scored. From the responses, it was found that 121(32%) respondents strongly agreed, 247(65.3%) agreed, and 10(2.6%) remained undecided on the positive statement that postulated that many farmers were involved in coffee farming during the period 1967-1988. This implies that the majority (over 95%) of farmers agreed that many were involved in coffee farming in the period under consideration. This position was confirmed by one Sub-County Agricultural Officer who had this to say:

> *During the colonial period, indigenous farmers were restricted from engaging in some activities, such as coffee farming. However, when independence was attained, many farmers entered into activities as part of their freedom. Of course, it takes about 4-5 years before fruition; hence, the period starting in 1967 was an indicator of the start of production of the initial harvest of post-independence plants.*

This is likely to account for a marked increase in the productivity of coffee in Kenya during this period.

These findings are in agreement with earlier studies. Karanja (2001) established that Kenya's earnings from coffee farming were placed 4$^{th}$ in the ranking, coming after tea, tourism, and horticulture. In the year 2000, earnings from coffee amounted to 10 percent of the gross export in 2000 and 6 percent in 2001. This situation was attributed to over 600,000 small-scale farmers who were involved in coffee farming. However, coffee productivity assumed a downward trend after 1987/88. For instance, while coffee productivity stood at 130,000 metric tons, by 2000, the country's production averaged 77,514 tones representing 40 percent drop in view of the output of 1987/88. This implies that the nation was only utilizing 60 percent of the 987/88 capacity. This situation was linked to a drop in small scale in the number of scale coffee farmers, whose decline stood at 47 during the period (ibid).

### *4.2. Provision of Farm Inputs during the Period of 1967-1988*

The results of the response to the support statement on the farmer support program during the period 1967-1988 are shown in table 1.

| Response | Frequency | Percentage |
|---|---|---|
| SA | 109 | 28.8 |
| A | 230 | 60.8 |
| UD | 21 | 5.6 |
| D | 10 | 2.6 |
| SD | 8 | 2.1 |
| Total | 378 | 100.0 |

*Table 1: Farmers response on Provision of Farm Inputs during the Period 1967-1988*
*Source: Field Data, 2021*

The findings established that 109(28.8%) of the respondents strongly agreed with the positive statement, 230(60.8%) agreed, 10(2.6) were indifferent, and 8(2.1%) strongly disagreed with the statement. Therefore, the findings reveal that majority of farmers (over 85%) respondents agreed or strongly agreed that there was aggressive support for farmers during this period.

During the interview, all chairmen (100%) respondents agreed that farmers were supported to acquire farm inputs like fertilizers, Knapsacks, and chemicals for pest control. One chairman had this to say:

> *Productivity of any crop depends on management, such as the usage of fertilizer as well as pest and disease control. Therefore, in the event of a farmer lacking capacity to acquire these inputs, you obviously do not expect such a farmer to have the maximum harvest. With this understanding, factories used to acquire inputs and advanced the same to farmers in the form of soft loans to support their farming activities.*

These findings agree with an earlier study by Rugendo (2005), who found that usage of fertilizers had a greater impact on coffee productivity in Kenya. In another similar study, it was established that a Plan to Fast-tracked Sustainable Development program was aimed at ending poverty (2005/06-2009/10), with emphasis on the commercialization of farming and integration of farmers with markets. This program saw farmers supplied with agricultural inputs like fertilizers, improved seeds, and pesticides, which enhanced productivity substantially (Bogale & Korf, 2009). When farmers are supplied with farm inputs, farmers experiencing financial challenges are empowered to ensure that their level of productivity is not compromised through the usage of inferior quality resources or failure to undertake production due to a lack of relevant production resources.

Dari, Chan, and Del Re (2021) established that Supportive policies are critical in the stimulation of agricultural productivity and other income diversification schemes. The author observed that limitations like deprived land quality, limitation of financial markets, and climate erraticism cannot be developed by farm operatives at the domestic level. However, such constraints can be addressed through policy interventions that should aim to empower farmers.

*4.3. Provision of Education on Better Agrarian Practices by Agricultural Extension Officers*

The study sought to establish if agricultural officers played any role in empowering farmers with relevant information by providing extension services that enhanced coffee productivity, as witnessed during the period under investigation. A positive statement postulates that 'Agricultural Officers always organized for and visited farmers to teach them about best Management Practices'.

Findings revealed that over 95 percent of farmer respondents agreed that during the period 1967-1988 that saw high productivity of coffee, there was an extensive farmer support program of education by agricultural Officers on how best farmers were to undertake coffee farming to receive better returns. This is revealed in the level of agreement that saw 110(29.1%) and 258(68.3%) strongly agreeing and agreeing, respectively, with only 10(2.6%) remaining undecided. This is likely to be one of the reasons that saw high production of coffee.

Affirming the same position, all agricultural officers (100%) and chairpersons of various factories interviewed (100%) agreed that after independence, there was an extensive agricultural support program for farmers through agricultural extension services meant to empower farmers with relevant information on various farming practices.

These findings are in agreement with the findings of Wambugu et al. (2011) in their study of factors that increase milk production, where it was established that factors like better animal husbandry activities and veterinary care that are promoted by agricultural officers are critical in the promotion of milk productivity. Ani (2007) observes that Education is an endless issue and a long-life course, an enabler, a key tool in determining people's life and making life significant, even at a mature age. It has been established that there is a positive correlation between education and human existence. As such, adult education turns out to be a tool for the agricultural improvement process with increased agricultural productivity grounded majorly on the capacity building of rural farmers to enable them to understand and embrace the compound technical variations which may be challenging for illiterate rural farmers to comprehend. Onwubuya (2005) contends that increased productivity among rural farmers cannot be achieved without the provision of adult education.

Writing on the importance of education in productivity, a study funded by the United Nations Development Program (UNDP) in Nigeria established that 60-80 percent of the agricultural labor force was composed of women whose productivity was two-thirds of the food crops (World Bank, 2003). However, despite their contribution to growth, African women continue to suffer from indiscernibility, poor health, low levels of education, earnings, and inadequate access to infrastructural growth.

*4.4. Attractive Prices of Coffee and Increased Productivity*

Studies have attested that motivation can go a long way in the motivation of one's behavior. A positive statement stating that attractive coffee prices that prevailed during the period of 1967-1988 could have contributed to increased productivity. Response to the positive statement on whether the attractiveness of coffee prices could be an indicator of marked productivity in the coffee sector saw over 90 percent of farmer respondents either agree or strongly agree with the positive statement. During the interview, one chairman (O I 9th September, 2021) had this to say:

> *The period from 1976 to around 1980 saw farmers reap big from coffee farming. This was the period when the trade embargo had been placed on Uganda by America. It was the period of booming coffee business where even coffee from Uganda could be smuggled through Kenya through the Chepkube market. These attractive prices saw many farmers in Bungoma County embrace coffee farming.*

Writing on the influence of pricing on coffee productivity, Muriithi, and Matz (2014) observe that World market prices have a greater impact on sustainability, development, and growth of the Kenyan coffee export sector as a devaluation of conversation rate leads to more earnings for farmers which positively influences coffee export volumes.

Yami et al. (2011) fluctuating goods prices directly disturb the incomes of farmers. In the event of lower prices, sustained lower commodity prices, and possibly lower profits, producers might need to make certain practices in their adjustments, like cutting down wage rates, delaying machine overhaul and maintenance, or restraining borrowing for farm processes and reduction on farm investment in the long term. Such adjustments have a negative influence on the volume of productivity and food security in the long run.

*4.5. Adequacy of Land and Coffee Productivity*

Land is the main factor of production. In a situation where land is limited, competing claims for the same may limit the availability of land for the production of the same commodity. A statement was, therefore, developed seeking to establish whether the adequacy of land could have led to increased coffee productivity.

Findings reveal that 204(54%) of respondents strongly agreed, 36(9.5%) agreed, and 23(6.1%) were indifferent to the positive statement that during the period of 1967-1988, many households had adequate land. This shows that over 85 percent of the respondents attributed high coffee productivity during the period of 1967-1988 to the adequacy of land among various households, a situation that made them reserve a reasonable portion of coffee farming. This situation is likely to imply that where competing claims for land, such as for subsistence farming, productivity for coffee was likely to be affected as less land is likely to be set aside for coffee farming, leading to a reduction in productivity.

Land adequacy of productive land has been identified to be crucial in determining productivity. However, adequacy is affected by socio-economic factors such as growth in population and rural-urban migration. Growth in population leads to land fragmentation due to the creation of room for settlement, reducing the volume of land due to settlement and mechanization, which is critical in determining the volume of productivity (Grigsby, 2002).

*4.6. Usage of Organic Manure*

The usage of organic manure has been identified to be very crucial in the promotion of crop production due to its ability to retain minerals as it is more resistant to leaching. A positive statement postulating that many farmers used organic manure to support coffee farming was put to farmer respondents and scored.

On whether the usage of organic manure has the ability to increase coffee productivity, the responses reveal that 100(26.5%) respondents strongly agreed, 240(63.5%) agreed, 17(4.5%) remained undecided, 11 disagreed, and 10(2.6%) strongly disagreed with the positive statement. Therefore, the majority of farmer respondents (over 85%) agreed with the positive statement that the usage of organic manure by the majority of farmers led to an increase in the productivity of coffee during the period of 1967-1988.

During the interview with chairpersons of coffee factories, 10(76.9%) were in agreement with this finding, the position that is best summarized by one chairman (Joseph Wanjala) (OI 12th August, 2021) who had this to say:

> *You cannot compare the richness of minerals in organic manure with artificial fertilizers. During those days, there was a lot of land with many households keeping animals such as cattle. Grazing was not challenging as you could graze animals anywhere on many large fields, which needed not be yours. These animals produced organic manure, which was used for farming activities such as coffee farming. Artificial fertilizers easily leach very fast with rainfall as opposed to organic manures.*

Therefore, it could be reasonably concluded that coffee production, just like any other crop or investment, is pegged on the quality of inputs used in the production process, with inferior quality leading to inferior output and superior inputs yielding superior output. According to CRF (2008), coffee needs good nourishment to promote its vigorous growth as it lessens vulnerability to pests and infections. Such nutrients are mainly found in manure which is less prone to leaching.

Watheri (2014), in a study entitled 'Factors Influencing Coffee Production by Small-scale Farmers of Tetu Constituency in Kenya', traced quantitative and qualitative barriers to coffee productivity to pest and disease control measures. The study established that there is a high correlation between most of the factors apart from a correlation between fertilizer application and improved variety and pests and diseases and manure application. Pearson correlation was highest between the influence of pests and diseases and fertilizer use at 0.717. This construes that 71.7 percent of pests and disease cases were traced to low usage of fertilizer, as 29.3 percent of pests and disease incidences were due to other factors.

## 5. Conclusion and Recommendation

*5.1. Conclusion*

The study sought to establish the impact of rise and fall of Coffee Production on the Socio-economic Development of Bungoma County from 1967-2020. The following conclusions were drawn:

Increased coffee production during the period of 1967-1988 was due to a supportive environment to enhance farmers' ability to undertake production. From the study, it was established that the majority of respondents were in agreement that high productivity was occasioned by many farmer involvements in production (97.4%), Support through the provision of farm inputs (89.7), attractive coffee prices (83.9%), relevant farming practices through agricultural extension services (97.4%), adequate land (88.1%) and usage of organic manure that is rich in the mineral that supported coffee productivity. This implies that the high productivity of coffee during the period of 1967-1988 was due to a supportive environment that favored its production.

*5.2. Recommendations*

Based on the findings of this study, it recommends intensified farmer support programs such as education by agricultural officers on better farming practices, reduced prices of farm inputs, and enhanced credit facilities to make farm inputs affordable. These moves will enhance farmers' ability to generate more income for investment in socio-economic development activities.

## 6. References


i. Chokera, V. N. (2011). *Challenges affecting coffee marketing by coffee firms in Kenya* (Doctoral dissertation, University of Nairobi).
ii. Davis, A. P., Gargiulo, R., Fay, M. F., Sarmu, D., & Haggar, J. (2020). Lost and found: Coffea stenophylla and C. affinis, the forgotten coffee crop species of West Africa. *Frontiers in Plant Science*, *11*, 616.
iii. Floor, W. (2004). Tea consumption and imports into Qajar, Iran. *Studia Iranica*, *33*, 47-111.
iv. Teketay, D. (1998). History, botany, and ecological requirements of coffee. *Walia*, *1998* (20), 28-50.
v. Huffnagel, H. (1961). Agriculture in Ethiopia. *Agriculture in Ethiopia.*
vi. Ibanez, M., & Blackman, A. (2015). Environmental and economic impacts of growing certified organic coffee in Colombia. *Environment for Development (February 2015)*.
vii. Ibanez, M. (2010). Adoption of certified organic technologies: the case of coffee farming in Colombia.
viii. Iwasa, K., Seta, H., Shimizu, H., Fujimura, Y., Miura, D., & Nakahara, K. (2013). High-throughput metabolic profiling of diverse green Coffea arabica beans identified tryptophan as a universal discrimination factor for immature beans. *PLoS One*, *8*(8), e70098.
ix. Iwasa, K., Seta, H., Shimizu, H., Fujimura, Y., Miura, D., & Nakahara, K. (2013). High-throughput metabolic profiling of diverse green Coffea arabica beans identified tryptophan as a universal discrimination factor for immature beans. *PLoS One*, *8*(8), e70098.
x. Makana, N. E. (2007). Increased Agricultural Production in the Midst of Escalating Ecological Distress: Bungoma District in the 1930s & 1940s. *African Economic History*, *35*, 105–129. https://doi.org/10.2307/25427037
xi. Muriithi, B., & Matz, J. (2014). Smallholder participation in the commercialization of vegetables: Evidence from Kenyan panel data. *Available at SSRN 2405462*.
xii. Setoyama, D., Iwasa, K., Seta, H., Shimizu, H., Fujimura, Y., Miura, D., & Nakahara, K. (2013). High-throughput metabolic profiling of diverse green Coffea arabica beans identified tryptophan as a universal discrimination factor for immature beans. *PLoS One*, *8*(8), e70098.
xiii. Sites, W., Chaskin, R. J., & Parks, V. (2007). Reframing community practice for the 21st century: Multiple traditions, multiple challenges. *Journal of Urban Affairs*, *29*(5), 519-541.
xiv. Yami, M., Solomon, T., Begna, B., Fufa, F., Alemu, T., & Alemu, D. (2013). Source of technical inefficiency of smallholder wheat farmers in selected waterlogged areas of Ethiopia: A translog production function approach. *African Journal of Agricultural Research*, *8*(29), 3930-3940.