

Coffee Production and Its Implications on Livelihoods among Small Scale Farmers in Hai and Arumeru Districts, Tanzania

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Abstract: Coffee production has much potential in improving livelihood capabilities among small scale coffee farmers in coffee growing areas. However, scholars debate on the importance of coffee production for the livelihoods of small scale coffee farmers are of no doubt. As a response to the debates, this paper analyzes coffee production and its implications among small scale farmers' livelihoods in Hai and Arumeru Districts, Tanzania. Specifically, the paper was intended to: examine the effect of socio-demographic characteristics on coffee production among small scale farmers, assess coffee production fluctuations among small scale coffee farmers and determine the influence of attitudes of small scale coffee farmers on coffee production. The paper adopted a cross-sectional study design in collecting primary and secondary data whereby, 250 small scale coffee farmers and 12 key informants (agricultural officers and ward executive officers) were interviewed. Data were analyzed using descriptive statistics and principle component analysis. The results showed that coffee production among small scale coffee farmers had been dwindling from time to time and therefore affecting the livelihoods of small scale coffee farmers particularly in acquiring basic human needs of the required quality and quantity. It was also found that proper performance in coffee production was closely linked to proper performance of other sectors in the economy among small scale coffee farmers. In addition, it was found that small scale coffee farmers' attitudes have a direct implication on the amount of coffee to be produced. It is recommended that coffee production has to be improved by putting more emphasize on youth participation on coffee production so as to pave way for the improvement of livelihoods among small scale coffee farmers due to its importance in their daily lives.

Keywords: Small scale, Coffee farmers, livelihoods, Coffee production, Hai and Arumeru Districts.

1. INTRODUCTION

Globally, coffee is one among the prominent cash crops for the nations and the livelihoods of the famers. According to the recent statistics, coffee is estimated to be produced in more than 70 countries world-wide with Brazil, Vietnam, Colombia, Indonesia and Ethiopia being the main five global producers (ICO, 2015). Coffee in many parts of Africa and Tanzania in particular was originally cultivated by missionaries and later on in the mid-1920s by small scale farmers. Thus, in the mid-1920s and 1930s, local small scale production was linked to the co-operative movement involving native cultivators (Mhando *et al.*, 2013). According to Kana (2012), coffee is mainly produced by small scale farmers in most of the developing countries, including Tanzania. Karanja and Nyoro, (2002) pointed out that coffee production in Tanzania has always been fluctuating mainly to the negative side due to internal and external problems. For example, in 1980 Tanzania produced 19,168 tons of coffee; in 1990 13,890 tons of coffee were produced, while in 2000 production was 5,207 tons of coffee; and in 2010 only 1,536 tons of coffee were produced. Worse enough, the decline in quantity produced was also associated with a sharp decline in price for more than 30% which finally affected the livelihoods of small scale coffee farmers by incapacitating them from acquiring basic human needs due to the decline in income from coffee.

In Tanzania, coffee is the top ranked agricultural export product providing direct income to more than 400,000 households which support the livelihoods of some 2.5 million individuals and generate between USD 150 and 225 million per year of foreign exchange earnings (Tanzania Coffee Board-TCB, 2017). It accounts for nearly one-fifth of Tanzania's foreign exchange earning followed by cotton, cashew nuts, tobacco, tea and sisal in that order. In the 2015/2016 agricultural season, the price for one kilogram of coffee ranged from TZS 2,500 to 3,200 (TCB, 2017). Coffee has played a significant role to the livelihoods of small scale farmers' households. It has been a source of income for paying school fees, house construction, food, medical services and other socio-economic activities (Bates, 2003; Diyamett, 2007; ICO, 2002).

Studies on livelihoods among small scale coffee farmers have become topical in the contemporary time. Livelihoods refer to the ability to acquire different basic requirements, to convert income and commodities into valuable achievements and how people are able to function well with the goods and services at their disposal (Sen, 2002; Welch, 2002). Small scale coffee farmers in the Tanzania's context refers to farmers cultivating farmland of the size between 0.9 to 3 hectares per household, and this accounts for a larger share of the farm output (URT, 2013). From the early 1960s to the mid 1980s, coffee contributed significantly to the socio-economic wellbeing of the coffee growers hence acting as a source of livelihood support for the majority of producing areas (Ludi, 2006). This implies that the livelihoods of small scale coffee farmers in Tanzania had a direct linkage with coffee production. Unfortunately, studies such as by Mussanto *et al.*, (2011) have revealed that there is a very high degree of deterioration of the small scale farmers' wellbeing in terms of livelihoods.

Coffee production in Tanzania has encountered different problems both locally and internationally. These problems are assumed to have affected the livelihoods of small scale coffee farmers due to close linkage between livelihoods and coffee production (Baffes, 2003; Ponte, 2004; Brandley *et al.*, 2005; Ludi, 2006; Ikeno, 2007; Makene, 2012). According to Mhando *et al.*, (2013), the introduction of economic liberalization policy in the 1980s went hand in hand with the removal of subsidies in the agricultural sector. Consequently, since then, some small scale coffee farmers could not afford to have adequate and quality coffee production inputs. According to URT (2012) and Maghimbi (2007), coffee is the main cash crop in both Hai and Arumeru districts, grown mainly on the highland zone intercropped with banana. Its production can be traced far back in the late 19th century during German rule in East Africa. Coffee production has been falling in the recent years in many parts of the country including Hai and Arumeru districts due to factors such as high incidence of diseases, climatic change, falling coffee prices, unfavourable agricultural policies and youth being not interested in agriculture. Other factors include land tenure system in Hai and Arumeru districts, lack of improved varieties and high production costs due to the removal of subsidies in agriculture.

So far, the government of Tanzania has taken several initiatives to improve agricultural production and livelihoods among small scale farmers. The efforts include establishment of policies, strategies and programmes such as Agricultural Sector Development Programme, 2003, establishment of the National Coffee Research Institute, 2000, Tanzania Agricultural Policy, 1997 and Co-operative Development Policy, 2002. These efforts were envisaged to help improve farm production and the livelihoods of both coffee and non-coffee small scale farmers (Brandley *et al.*, 2005; Karanja, 1998 & 2001). Unfortunately, these government's efforts have not performed well as farmers still face several challenges including climate change, lack of subsidies as well as inadequate access to farm inputs (URT, 2009). The difficulties are assumed to have dragged small scale coffee farmers to resort to various coping strategies for their livelihood support (Babatunde & Qain, 2009). For more than three decades, coffee production in many parts of the country has diminished. As a result, the income obtained by small scale coffee farmers dropped for almost 80% (Maghimbi, 2012). This result is assumed to have hampered the livelihoods' capabilities of the small scale coffee farmers in terms of on-farm, non-farm and off-farm activities (TCB, 2012). Therefore, the study on which this paper is based was intended to analyze coffee production and its implications among small scale farmers' households' livelihoods in Hai and Arumeru Districts, Tanzania.

Among small scale farmers, coffee was pivotal to their livelihoods. Coffee has been a source of socio-economic requirements such as shelter, food, clothes, education and major source of employment in Tanzania (Temu, 1999 and Parrish *et al.*, 2005). In Tanzania, about 90% of coffee farms are owned by smallholder farmers while the remaining 10% is owned by estates' growers (TACRI, 2013). Coffee industry employs about 2.5 million people directly and indirectly (Ludi, 2006). However, the significance of coffee dates back to 1929 during the establishment of co-operatives in Tanzania. From the early 1960s to the mid-1980s coffee contributed significantly to the socio-economic well-being of coffee growers (Ludi, 2006). This signifies that coffee is a source of livelihood for the majority of small scale farmers'

households. From 1985, coffee production trends have not been impressive thus affecting the majority of small scale farmers' livelihoods particularly in acquiring basic needs such as education, health services and decent housing due to their socio-economic importance (Hoyt and McMillan, 2004). Despite the government's efforts in improving coffee production and small scale farmers' income, livelihoods of small scale coffee farmers is still an issue to be resolved.

Some studies in Tanzania have been conducted on coffee production including the effects of agricultural policies, agricultural marketing reforms, analysis of agricultural marketing, coffee sector and coffee industry (Diore, 1998; Bates, 2003; Mmari, 2012; Maghimbi, 2012; Mhando, 2013; ICO, 2002 and 2005). Unfortunately, there is inadequate information on coffee production trends and their implication to the livelihoods among small scale coffee farmers. Moreover, most of these studies have produced contradicting results making the debate about the outcomes of coffee production trends against the livelihoods capabilities among small scale coffee farmers inconclusive, particularly where the link between coffee production and its implications among small scale coffee farmers livelihood capabilities is inseparable, which this paper address.

The major research objective in this case is to assess the coffee production in the study area and its implications among small scale coffee farmers' livelihoods. Specifically, the paper was intended to: examine the effect of socio-demographic characteristics on coffee production among small scale farmers, assess coffee production fluctuations among small scale farmers, and determine the implications of attitudes of small scale coffee farmers on coffee production. In order to achieve the above research objectives, the following research questions were answered; (1) How do socio-demographic characteristic of respondents affect coffee production trends among small scale farmers?

(2) How has coffee production fluctuated over time and its implications to small scale farmers? and (3) What are the implications of small scale coffee farmers' attitudes on coffee production? The findings from this study are expected to add to the stock of knowledge on coffee production among small scale coffee farmers to be used by researchers, academicians, policy makers and community at large. On the other hand, the findings shall act as a source of literature review on the same or related matter in future and elsewhere in Tanzania. Furthermore, the findings will be of vital use to the agricultural policy makers and hence be beneficial to small scale farmers' households particularly those who are engaged in coffee production by addressing contemporary challenges in coffee production and livelihood maintenance.

In addition, the findings are expected to contribute information which is important for poverty reduction efforts in line with Sustainable Development Goals (SDGs), National Strategy for Growth and Reduction of Poverty (NSGRP), Second Five Years Development Plan (FYDP II) and Tanzania Development Vision 2025 (TDV 2025). Moreover, the findings are expected to be useful in addressing different challenges facing small scale coffee farmers' households in the process of maintaining their livelihoods. The findings from this study are expected to generate empirical information for further study on the same or related aspects in future. Finally, the findings are also expected to be of vital use for academic achievement of Doctor of Philosophy (PhD) in Marketing from the Sokoine University of Agriculture (SUA).

This paper is based on the Farm Household Production Theory which is reviewed hereunder. Farm Household Production Theory tries to examine the policy implication on production among small scale farmers and different interventions that seek to increase the outputs of the agricultural sector (Schultz, 1964). This is done by raising farm output prices or by lowering the cost of variable inputs and hence predicting profit to be accrued to a given production activity among small scale farmers. The theory explains that smallholder farmers produce under a high level of uncertainty induced by natural hazards and man-made factors. According to Schultz (1964) and Taylor and Adelman (2003), there is a general perception that small scale farmers in developing countries are very poor and inefficient in economic production related activities. As a result, for them to produce better and improve their general livelihoods, they have to be motivated in different dimensions. Evidence from different countries such as Ethiopia and Zambia shows that the majority of small scale farmers have limited knowledge, capital, poor assets endowment and limited formal protection which limits their capability to invest (Taylor & Adelman, 2003).

The Farm Household Production Theory has proved to be useful in analyzing production, market, profitability, price and general sustainability among small scale farmers in different developing countries such as Ethiopia and Zimbabwe (Murphy, 2010; Proctor & Lucchesi, 2012; Huang *et al.*, 2012; Hooton & Omore, 2007). In this respect, the theory can explain about the implication of coffee production among small scale coffee farmers' livelihoods who are involved in the production process in order to meet their basic needs. Low income from coffee production among small scale farmers is

attributed to low production, inability to acquire different human basic needs, unemployment among coffee producing households, loss of interest in coffee production and general deterioration in the livelihood status among small scale coffee farmers. Therefore, the farm household production theory is useful in analyzing the coffee production among small scale coffee farmers and their implication to the livelihoods in ensuring sustainable development.

2. METHODOLOGY

2.1 Study Area and Justification for its Selection:

The study was conducted in Arumeru District in Arusha Region and Hai District in Kilimanjaro Region. The major economic activity in the study area is agriculture, mainly coffee production. Other activities include livestock keeping, vegetable production, banana production, Irish potatoes and maize production. The selection of the two districts considered their geographical location, culture/history of the coffee farmers, climatic conditions and their long involvement in coffee production. Other reasons are sharp decline in coffee production to about 20% in 2010 when compared with 1985 production and deterioration of the small scale coffee farmers' households' livelihoods for three decades (TCB, 2017 & Maghimbi, 2012). Another reason is the importance of coffee to the livelihoods of the small-scale farmers in the two districts, whereby more than 50% of the population depends on coffee for their survival and other socio-economic developments and at the same time Kilimanjaro and Arusha regions coffee production has been badly affected compared to other regions (DFID, 1997; URT, 2013).

2.2 Study design, sampling procedures and sample size:

A cross-sectional research design was used in this study. This research design enables data collection from different groups of respondents at a time. The method gives room to make comparisons among different groups of respondents to see how the dependent variable relates to independent variables. It further ensures a high degree of precision, reliability and validity on the data to be collected and at the same time, the method saves time and other resources required to accomplish the study.

The study population comprised small scale coffee farmers in Hai Arumeru Districts. According to URT (2013), Arumeru District has 37,667 small scale coffee farmers while Hai District has 29,058 small scale coffee farmers. Therefore, the total population in the two districts is estimated to be 66,725 small scale coffee farmers. Hence 66,725 was the population that was studied. A total of 250 small scale coffee farmers were the sample size as obtained by using Saunder *et al.*, (2009) formula. Both men and women were represented in this study. The essence of ensuring both men and women participated in this study was to capture opinions, perceptions and visions from both of them with regard to coffee production trends and their livelihoods implications among small scale coffee farmers. Furthermore, the participation of men and women in this study was necessitated by the effect coffee production has on the livelihoods of the entire community members. In each district; 2 wards were picked and in each ward 3 villages were purposively picked. After the sample size was determined, simple random sampling technique was used to obtain the respondents from specific household which was the unit of analysis in this respect.

2.3 Data Collection Methods:

Both qualitative and quantitative data were collected. The qualitative data collected included information such as attitudes, perception and quality of life among small scale coffee farmers. In general, data collection methods included both structured and semi-structured interviews (in-depth and key informant interviews), focus group discussions, direct observation and documentary review. Data were mainly collected from small scale coffee farmers. In order to validate the findings, key informants like extension officers, village leadership officials, Tanzania Coffee Research Institute-TACRI, Tanzania Coffee Board and co-operative unions' officials dealing with coffee were also interviewed.

2.4 Data Processing and Analysis:

The study used primary and secondary data to analyze coffee production and their implications among small scale coffee farmers' livelihoods. Primary data were collected from small scale coffee farmers mainly and in various institutions dealing with coffee in the country such as Tanzania Coffee Board-TCB and Tanzania Coffee Research Institute-TACRI. The study also relied on the data base and reports from TCB, World Bank and official government sources and

publications in order to obtain information and data on various aspects related to coffee production over different years. Thereafter, data from each questionnaire copy were cleaned, coded and entered in the Statistical Package for Social Sciences (SPSS) computer software. Descriptive statistics and Principal Component Analysis were computed in order to show about coffee production and their implications to small scale farmers' households' livelihoods. Secondary data were used for showing the trends of coffee production over different periods of time. In particular, descriptive statistics such as percentages, mean, frequencies and cross-tabulation were computed to analyze data. Finally, presentation of the findings was done by using tables, figures and graphs.

2.5 Validity and reliability:

In order to ensure the validity of the data collected, the pre-testing of questionnaire was done on 5 respondents in one ward for each district a month before actual data collection. The pre-testing was done in order to test the data collection instruments, assess time for data collection, check availability of the study population, see how research teams work together, test procedures for data processing and analysis and check if the findings were sensible. Reliability of the data collected was determined by calculating the Cronbach's Alpha which is a measure of internal consistence that is how closely related a set of items are as a group. Cronbach's Alpha is considered to be a measure of scale reliability. In this case, the reliability coefficient is **0.7674=76.74%** meaning the information collected was reliable because the optimum value is between 0.65 (65%) to 0.8 (80%) and the obtained reliability coefficient is within the acceptable range.

3. FINDINGS AND DISCUSSION

This paper focused on different parameters like socio-demographic characteristics of the respondents particularly age, sex, marital status, educational level and the type of the household. Other issues discussed for specific objective include nation-wide coffee production trends, Kilimanjaro and Arusha coffee production trends, major livelihood occupations, land ownership, farm equipments for coffee production, small scale coffee farmers attitudes towards coffee production, amount of coffee produced and sold, sources of farm inputs for coffee production, varieties of coffee seedlings planted, credit input for coffee production and perception on the price offered among small scale coffee farmers.

3.1 Socio-Demographic Characteristic of Respondents:

With regard to the socio-demographic characteristics of respondents, different variables such as age, sex, marital status, educational level and the type of the household were examined in relation to coffee production and their implication among small scale coffee farmers in both Hai and Arumeru Districts (Table 1).

Table 1: Socio-demographic characteristics of respondents

Variable	Category	Frequency (n=250)	Percent (%)
Type of Respondent	Coffee Producer	236	94.4
	Spouse of Coffee Producer	14	5.6
Sex	Female	166	66.4
	Male	84	33.6
Age	Minimum	31	
	Mean	55.4	
	Maximum	86	
Marital Status	Married	207	82.8
	Single	5	2.0
	Divorced/Separated	11	4.4
	Widow	21	8.4
	Widower	06	2.4
Education Level	No formal Education	29	11.6
	Primary Education	136	54.4
	Secondary Education	59	23.6
	Diploma Education	12	4.8

	University Education	14	5.6
Type of Household	Nucleated	206	82.4
	Extended	41	16.4
	Polygamous	03	1.2

According to the findings, the type of respondents who participated in this study were coffee producers (94.4%) and spouses of the coffee producers who accounted for 5.6% of the respondents. It was important to know the type of respondents involved in this study so as to later on determine how the type of respondents influenced coffee production among small scale coffee farmers either positively or negatively. During focus group discussions in both Hai and Arumeru Districts the discussants had the following opinions:

“The type of respondents determine coffee production in particular area. Coffee farms which are under coffee producers themselves perform better than those which are under spouses of the coffee producers. As a result, better performance in coffee production is found to have a direct implication on the entire livelihoods among small scale coffee farmers in meeting our daily socio-economic requirements” (Discussants, Nkwarisambu villages, 28th July, 2016).

It was also found that, the majority of the respondents who took part in this study were men (64.4%) while women constituted 33.6% of the respondents. The general assumption here is that, if coffee production does well in the farms and in the market then definitely the livelihoods among small scale coffee farmers for both men and women will automatically improve, but if coffee production does not perform well then the livelihoods of men and women who depend on coffee production as their major economic activity will be greatly affected.

In terms of the ages of respondents who participated in this study, the minimum age for someone to be actively participating in coffee production was found to be 31 years old. Below the age of 31 years, very few participated in coffee production. Of course the participation in coffee production is tied up to the cultural norms in Hai and Arumeru Districts whereby, a child is given a plot of land after marriage but also the other good observation as to why individuals below 31 years of age did not actively participate in coffee production is due to the fact that the majority of young men and women seemed to be less interested in coffee production and they considered it as a last option after all other options had failed. This was revealed in both Hai and Arumeru Districts during focus group discussions and direct observation. In some instances, participants who took part in this study were of advanced ages up to 86 years.

During the interview, it was revealed that these old men and women were still controlling their coffee farms hence denying the right of young men to actively participate in coffee production. During a focus group discussion in Nkwarisambu village in Arumeru District, one old man of about 80 years old, when asked as to when he was expected to retire from coffee production and leave the land with his children, said:

“Whatever the little amount of money I am getting from coffee production, it is far better than begging from my children, so the children will get the coffee farms after my death and not otherwise” (Discussants, Nkwarisabu Village, 20th June, 2016).

In the same scenario, it was found that the majority of community members who participated in coffee production were above 50 years of age. Some of these individuals were found to be those who had never been in school or with little level of education or retired people from public or private sector employment. With regard to marital status of respondents, 82.8% were married. This implies that community members of different marital statuses participated in coffee production among small scale coffee farmers basically due to the importance of coffee for their daily livelihood requirements. Small scale coffee farmers have economic, social, and cultural needs which require money in one way or another, and one way of getting money is through producing coffee. In order to get money to offset different requirements they have to produce coffee. Small scale coffee farmers in Hai and Arumeru Districts pointed out that, from historical perspective coffee production has been the major economic activity, and community members have relied on it as a major source of households' income. That is why it was found that community members, regardless of their marital status, were taking active part in coffee production so as to get income for their livelihood requirements.

Respondents in this study were in five different categories of education whereby some had no formal education, primary education, secondary education, diploma education and the rest had university education. In terms of percentages and frequencies of the respondents with regard to their education level the majority of respondents (54.4%) had primary

education and only 5.6 % had university education. This implies that there is a very close connection between someone’s education, coffee produced and other households’ assets such as houses. It was furthermore revealed that the majority of small scale coffee farmers were found to have double income; income from coffee and income from other different sources. By being economically capable implies they were in a position to take all the necessary measures to ensure high production from their coffee farms irrespective of different coffee production related problems such as diseases, soil infertility and climate change. Of course, there were some few cases amounting to 16% whereby coffee productivity was not directly linked to the level of education possessed.

With regard to type of households, in both Hai and Arumeru Districts, households were not homogeneous whereby, some households were nuclear while others were extended family types and the remaining ones were polygamous in nature. According to the findings, it was found that 82.4% of all respondents were nucleated households’ families with father, mother and possibly a child or children while 16.4% were of extended households’ families with father, mother, children, grandmother, grandfather, grand children and other close relatives. It was important to know the types of the households’ families because the size of the family has an implication on coffee production, particularly in terms of labour power and coffee plot size. It may be argued that the more the family members, the less the farmland for coffee production and vice versa. If, for example, a family has two wives, it is expected that each wife will have her own home which means the land for cultivation will automatically be reduced to pave way for house construction.

It was revealed during focus group discussion in Roo village Hai District that having many wives has a multiplier effect on land or coffee farms in terms of number of children to be reproduced later on because when they grow up they would be in need of land for house construction as well; the discussants argued as follows:

“Many wives mean many women which implies continuous reduction of the same piece of land for different purposes hence reducing the area for coffee production” (Discussants, Roo, 24th June, 2016).

This would reduce the land set aside for coffee production. That is why it was found that in both Hai and Arumeru Districts, one among the factors for the decline in coffee production is pressure on land for other usages such as settlement establishment. This is because the same land inherited from the ancestors is annually undergoing re-distribution among the family members.

3.2 Coffee production trend among small scale coffee farmers in Tanzania:

3.2.1 National-wide coffee production, export sales and price from 2008-2017:

Coffee production national-wide has been fluctuating from time to time in all production zones in Tanzania. According to a TCB (2017) report on coffee production in Tanzania, the variation in production from time to time is quite clear, (Figure 1).

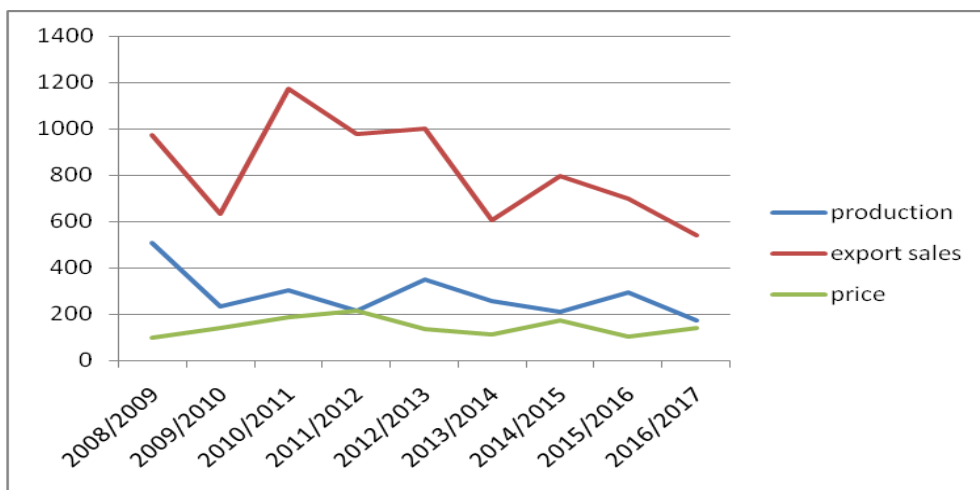


Figure 1: National-wide coffee production trend from 2008/2009-2016/2017 season

Source: TCB, (2017)

Figure 1 depicts that, national-wide, the highest coffee production occurred in the 2012/2013 agricultural season when 351,133,000 kg of coffee were harvested while the lowest production occurred in 2016/2017 with a total of 5,090,000 kg. With regard to export revenues obtained, the highest amount was marked in the 2010/2011 agricultural season when \$1,174,902,000 were obtained and the lowest revenues were obtained in 2016/2017 amounting to \$542,689,000. Furthermore, it was also found that the highest price was obtained in 2011/2012 amounting to \$214 per 50 kg and the lowest price was obtained in 2008/2009 amounting to \$99.39 per 50 kg. Generally, the fluctuation in coffee production, export sales and price offered over time affects the livelihoods of small scale coffee farmers in both Hai and Arumeru Districts due to close linkage between coffee production and smallholder farmers' daily lives. It was revealed that small-scale coffee farmers in the study area depend on income from coffee to cater for different requirements and, therefore, once production and price fluctuate to the negative they affect prior plans of the respective households. As a matter of fact, that is why there has been a nation-wide outcry from small-scale coffee farmers, mainly due to the deterioration in price and outputs.

3.2.2 Coffee production, export sales and price trend among small scale coffee farmers in Arusha and Kilimanjaro Regions

With regard to Arusha and Kilimanjaro Regions, coffee production has been fluctuating from time to time like in other regions of Tanzania, (Figure 2).

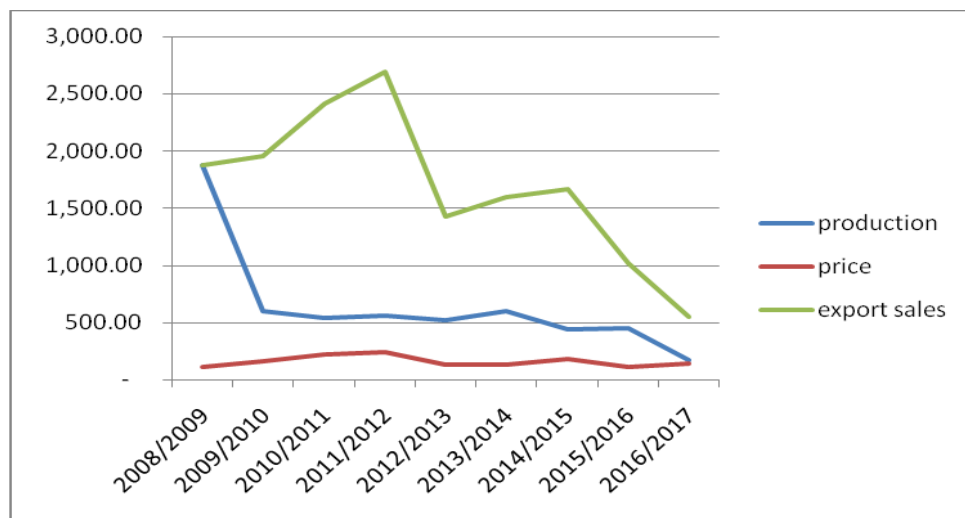


Figure 2: Coffee production, export and price trends from 2008/2009-2016/2017 for Arusha and Kilimanjaro Regions

Source: TCB, (2017)

According to TCB (2017) report on coffee production in Arusha and Kilimanjaro Regions, it was revealed that the highest coffee production in these two regions took place in the 2008/2009 agricultural season with a total of 1,874,000 kg while the lowest production occurred in the 2016/2017 agricultural season when 172,000 kg of coffee were harvested. With regard to export revenues obtained, the highest occurred in the 2011/2012 crop season when \$2,874,000 were obtained and the lowest export revenues were obtained in the 2016/2017 crop season when \$551,000 were obtained from sales. In this scenario, the highest price offered was \$240 per 50 kg of coffee in the 2011/2012 crop season while the lowest price was marked in 2008/2009 and 2015/2016 when \$112 per 50 kg of coffee were offered. The above description shows how production, export and price have been changing from time to time in Hai and Arumeru Districts as a result affecting the livelihoods of the small-scale coffee farmers. These changes have, therefore, been affecting small-scale coffee farmers in one way or another. For example, if the output and price increase then the livelihoods of small-scale coffee farmer will improve, but if vice versa is true then the livelihoods of small-scale coffee farmers will be worse. Therefore, regular fluctuation in production, price and export have so far affected the livelihoods of small-scale coffee farmers in Hai and Arumeru to an extent of some community members failing to take their children to secondary schools as they used to do in the past or failing to acquire different households' needs.

During focus group discussions held in both Hai (Sawe and Mbweera villages) and Arumeru (Nkwarisambu and Akyeri villages) it was found that coffee production had declined tremendously. It was pointed out that, in the previous years (before 1995), in one hectare a producer was able to harvest more than 10 bags of clean dry coffee which is equivalent to 600 kg. But in the contemporary time, on the same land (one hectare), a producer can harvest only about 4 bags of coffee which are equivalent to 240 kg. The decline in coffee production after 1995 is linked to the removal of subsidies and other supports among small scale coffee farmers. These results concur with the Theory of Farm Household Production by Shultz, (1964) which explains that small scale farmers are poor and inefficient and for them to produce better they have to be motivated in terms of inputs, capital and extension services because of having limited capital, knowledge, assets and formal protection.

They also went further by looking into the price offered per kilogram of coffee whereby in 1995 one kilogram of coffee was sold between TZS 1500 and 2500, but surprisingly, in 2015 (almost 20 years later) the same, one kilogram of coffee was sold for TZS 2000 to 3500. One can strongly argue that, for a period of 20 years (1995-2015), the price of coffee did not increase while the inputs required for coffee production and costs of living in general had changed nearly 10 times. Based on the above observations, small scale coffee farmers had different opinions with regard to the current coffee production situation in Tanzania (Figure 3). As pointed out earlier by Shultz (1964) and Adelman (2003) in the Theory of Farm Household Production, small scale coffee farmers are no longer producing the same way as they used to produce after the removal of subsidies in the Agricultural sector. Most of them are demoralized or disinterested in coffee production contrary to the previous decades such as 1960s, 1970s and 1980s when they used to receive support of different kinds.

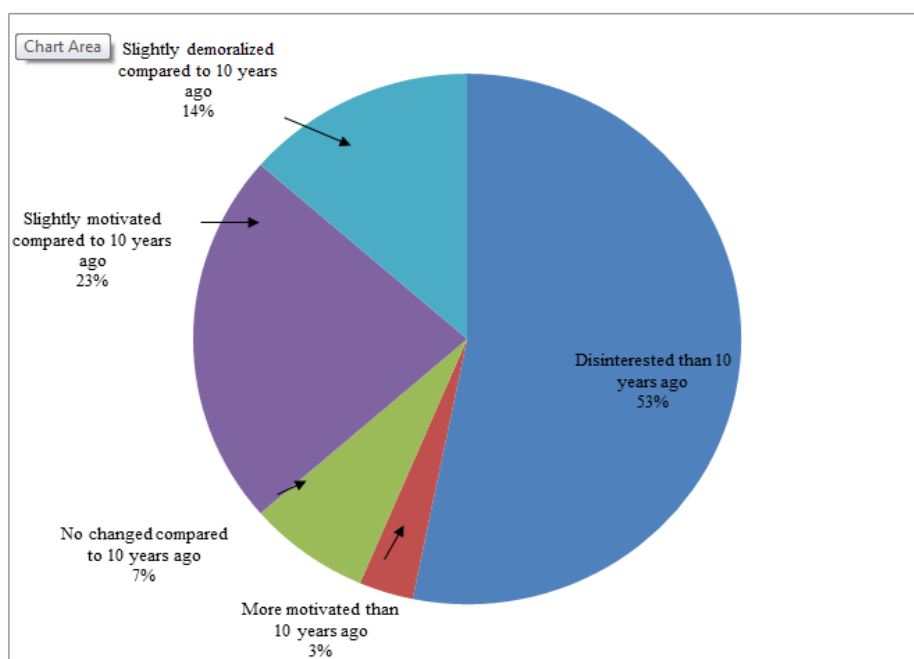


Figure 3: Small scale coffee farmers’ opinions on coffee production

Therefore, when small scale coffee farmers were asked to give their opinions with regard to coffee production for a period of 10 years previously, 53.2% of the total respondents said that they were less interested and demoralized with coffee production as a viable economic activity for households’ livelihoods’ dependency than 10 years previously. They further narrated that, for the time being they could hardly emancipate themselves from socio-economic constraints through coffee production and that is why the majority of young generation are hardly interested in producing coffee. Out of the total respondents, 3.2% said that they were more motivated today particularly on the existing freedom (free market for their coffee) than the way it used to be in the past when all coffee produced in all villages had to be marketed through specific primary co-operative societies in the respective villages and not otherwise. This category also composed of youth who have just entered in the coffee production industry.

With regard to the land size, status and ownership of land under coffee production, it was revealed that, currently, the majority of the small scale coffee farmers in both Hai and Arumeru Districts produce coffee on the land size ranging from 0.25 to 2.0 hectares. This was a result of over fragmentation of land through inheritance and diversification of land use in terms of growing other crops which are said to pay better than coffee such as tomatoes, vegetables and Irish potatoes. This was noticed during direct observation in both Hai and Arumeru Districts. In terms of ownership of land, 94.3% of the total land used for coffee production is individually owned and acquired through traditional practices of land inheritance while 5.7% of the total land has been acquired through legal procedures, (Figure 4).

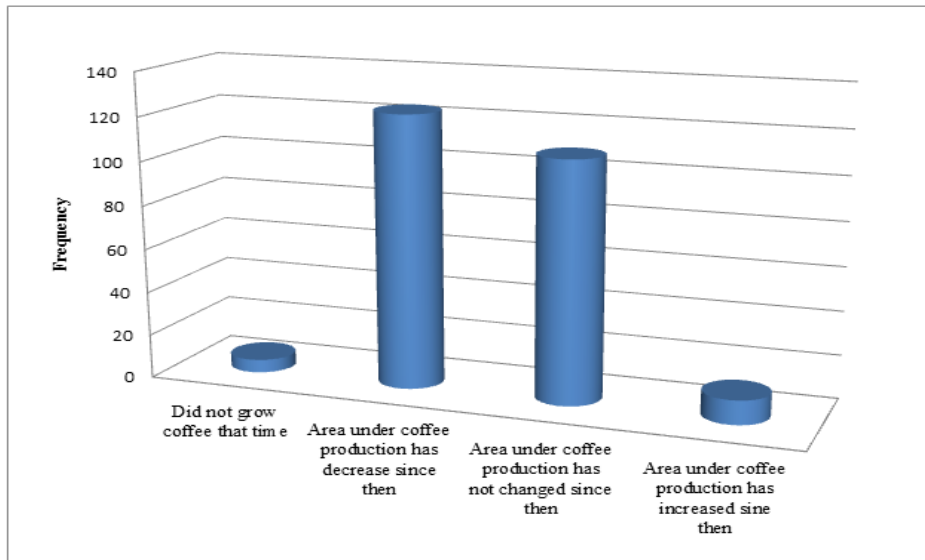


Figure 4: Status of land under coffee production among small scale coffee farmers

From Figure 4, fifty percent (50%) of the respondents contended that area under coffee production had not been the same compared to 10 years previously. This implies that the area under coffee production has drastically declined to even less than half of the level at which it had been 10 years previously due to different land uses such as house construction for new homes and even abandonment of the coffee farms for different reasons such as old coffee trees and economic incapacitation. During direct observation in Hai and Arumeru Districts, it was noticed that there were good numbers of abandoned coffee farms which were previously used for coffee production.

There were also few cases (4.4%) of the respondents who pointed out that the area under coffee production had increased, mainly due sensitization from the government and non-governmental organizations on the essence of growing coffee (Nation-wide Coffee Revival Strategy 2011-2021). This was noticed in Akheri Ward in Arumeru District where there are some NGOs such as Feed the Future which support small scale coffee farmers by providing them with inputs and extension services in order to enable them to participate actively in coffee production and at the same time to attract new generation to take part in coffee production industry.

The amounts of coffee produced in Hai and Arumeru Districts vary significantly, (Table 4).

Table 2: Amount of Coffee produced, sold and sales income in Hai and Arumeru Districts

District		Frequency	Minimum	Maximum	Mean
Hai	Amount of Coffee produced in Kg	144	5	600	138.77
	Amount of Coffee sold in Kg	144	5.00	600.00	138.7708
	Amount of money obtained from sales	142	10000.00	1500000.00	342368.3099
Arumeru	Amount of Coffee produced in Kg	104	10.00	400	131.84
	Amount of Coffee sold in Kg	104	10.00	400.00	134.2212
	Amount of money obtained from sales	98	30000.00	1600000.00	380590.8163
Total	Amount of Coffee produced in Kg	248	2	600	135.86

Production and Sales	Amount of Coffee sold in Kg	248	5.00	600.00	136.8629
	Amount of money obtained from sales	240	10000.00	1600000.00	357975.8333

As it can be visualized in Table 4, in Hai District in the contemporary time, the minimum amount of coffee produced and sold per household is 5 kg, and the maximum is 600 kg while the minimum amount of money obtained per household is TZS 10,000 and the maximum is TZS 1,500,000. But, in Arumeru District, the minimum amount of coffee produced and sold per household was 10 kg and the maximum was 400 kg while the minimum money obtained is TZS 30,000 and the maximum was TZS 1,600,000. From the literature, like Bates (2007) on Tanzania’s coffee sector, it was pointed out that Tanzania exports about 95% of its total coffee produced and consumes only less than 5% contrary to Ethiopia which consumes 95% and exports about 5%. Therefore, a country which produces and consumes larger percent of its products creates possibility for production improvement as well as market expansion and vice versa. Hence, it can be argued that low production and low price per kilogram affect small scale coffee farmers in both Hai and Arumeru Districts in the sense of not being able to acquire various basic requirements.

3.3 Attitudes of small scale coffee farmers towards coffee production:

For almost three decades, coffee production in general and more specifically coffee production among small scale coffee farmers has not been impressive due to several reasons, among other reasons being change in attitudes among small scale coffee farmers. Some small scale coffee farmers (Table 3) say that it is impossible to produce coffee now compared to the past while other small scale coffee farmers say for different reasons they do not like the coffee production activity. The attitude aspect among small scale coffee farmers and its influence on coffee production was measured by using Principal Component Analysis (PCA). The PCA was used in order to show the interrelationships in the set of attitudinal statements in order to identify the underlying structures of those attitudinal statements. Principal Component Analysis was used therefore in order to identify attitudinal factors among small scale coffee farmers which has affected coffee production.

Factor analysis was performed based on the important scores on attitudes towards coffee production. Hence Bartlett’s Test of sphericity was performed and the results were found to be statistically significant ($X^2_{255}=686.736$; $p\text{-value}<0.001$). The Keyzer-Meyer-Olkon’s (KMO) overall measure was 0.589, suggesting that data were appropriate for Principal Component Analysis.

Bartlett Test of Sphericity

Chi-square = 686.736

Degrees of freedom = 91

P-value = 0.000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) = 0.589

Table 3: Attitudes of small scale coffee farmers towards coffee production (n=250)

Factor and item description	Factor loading	% variance explained
Factor 1: Perception		0.1558
Impossible	0.5422	
Don’t like	0.7839	
Increases poverty	0.7534	
Wrong judgment	0.3524	
Factor 2: Uneconomical		0.1498
Do not like coffee production	0.5301	
No livelihood change	0.7902	
It is helpless	0.6655	
Risky business	0.5762	
Male dominated	0.3831	

Factor 3: Conditions		0.1242
Extension service not encouraging	0.5790	
Corruption	0.5472	
Poor coffee market	0.8548	
Factor 4: Interest		0.0921
Don't produce coffee	0.8225	
Coffee production discourages	0.4244	
Factor 5: Inputs		0.0750
Favouritism in input provision	0.9062	

Total percent explained 0.5929

Five factors were reduced from the PCA. The first factor "perception" consisted of the questionnaire items related to impossible to grow coffee, don't like coffee production, coffee production increases poverty and wrong judgment from the community members indicated how respondents perceive coffee production in relation to their livelihood capabilities. The factor explained 15.6% of the variance, four attitude variables concerning coffee production loaded on factor 1 with cross-correlation coefficient of 0.5422, 0.7839, 0.7534 and 0.3524 respectively. The factor was termed perception because it involved how someone perceives coffee production, and it loaded higher than any other factor. Higher scores and positive responses on this factor revealed a general opinion that it is important to consider how small scale coffee farmers perceptions' affect coffee production.

The second factor "uneconomical" consisted of the questionnaire items do not like coffee production, coffee production cannot change my livelihoods, coffee production is a helpless economic activity, coffee production is a risky business and coffee production is male dominated. The factor explained 14.9% of the variance, five attitude variables concerning coffee production loaded on factor 2 with cross-correlation coefficients of 0.5301, 0.5301, 0.6655, 0.5762 and 0.3831 respectively. This second factor was termed uneconomical because it involved how small scale coffee farmers conceptualize the economic values of coffee production, and it loaded second higher compared to other factors. It tries to give out the general views on how it is important to consider economic factors when embarking on coffee production for the livelihoods of small scale coffee farmers.

"Conditions mainly necessary for coffee production" was considered to be factor 3, and this consisted of the questionnaire items extension services are not encouraging, existence of corruption and poor coffee markets. The factor explained 12.4% of the variance, three attitude variables concerning coffee production loaded on factor 3 with cross-correlation coefficients of 0.5790, 0.5472 and 0.8548 respectively. The factor 3 condition was considered to be very fundamental in determining whether one can embark on coffee production or not, giving other factors constant. These factors concurred with the Farm Household Production Theory which states that small scale farmers are inefficient because of low capital, knowledge and other conditions which inhibit them from active participation in production activities.

The 4th factor was "preference" in producing coffee among small scale coffee farmers which consisted of the questionnaire items don't produce coffee and coffee production discourages small scale farmers. Preference as a factor in this case accounted for 9.2% of the total variance with cross-correlation coefficients of 0.8225 and 0.4244 respectively. When they see coffee production is not economically paying, they may decide not to produce it and instead embark on other economic activities which appear to be encouraging by paying better than coffee.

Factor 5 was labelled "input" with a cross-correlation coefficient of 0.9062. This statement was labelled input and accounted for 7.5% of the total variance. The implication for this factor input is that, given other factors, constant input is a very essential determinant of coffee production among small scale coffee farmers. Input availability determine the quality and quantity of coffee produced by small scale coffee farmers. The findings from the 5th factor corresponds to the Farm Household Production Theory which explain that small scale farmers do not produce adequately because they lack the required farm inputs.

4. CONCLUSION AND RECOMMENDATIONS

This paper examined coffee production and their implications on livelihoods among small scale coffee farmers' households in Hai and Arumeru Districts. The findings conclude that, social demographic characteristics of small scale coffee farmers to a large extent determine the amount of coffee to be produced and sold. In particular, education level of respondents, marital status and age of respondents do determine the amount of coffee produced in a given household. The study also concludes that, in the contemporary time youth participation in coffee production is on the increase compared to the previous decades due to sensitization from the National-wide Coffee Revival Strategy and this has increased the amount of coffee produced in the respective households.

Furthermore, the study concludes that coffee production generally has not been constant; production has been varying from time to time due to several factors such as removal of subsidies among small scale coffee farmers, unreliable coffee markets and climate change. Funny enough, the fluctuations in coffee production have been going down for more than three decades to date as a result, impairing the livelihoods of the small scale coffee farmers. Due to the decline in coffee production, majority of small scale coffee farmers have been unable to acquire quality basic needs as they used to in the past and others have abandoned coffee production and resorted into other agricultural activities.

The other important aspect to note is the implication of attitudes among small scale coffee farmers on coffee production. It was concluded that the attitudes of small scale coffee farmers in terms of their perceptions and preferences on coffee production over other economic activities hence assuming coffee production uneconomical has attributed to the general decline in coffee production as well as declining in the livelihoods' capabilities among small scale coffee farmers in both Hai and Arumeru Districts. Majority of small scale coffee farmers are currently disinterested with coffee production leading to almost permanent negative trend curve of coffee production. Though, interestingly in the contemporary time there is a positive move among the youth towards coffee production which creates positive prospects for future coffee production and livelihoods improvement among small scale coffee farmers.

Based on the findings obtained, the study recommended the following in order to improve the coffee production among small scale farmers; there is a need to put more emphasize on youth participation in coffee production. In the contemporary time old age small scale coffee farmers are incapable to produce quality and quantity coffee and therefore deliberate efforts are to be directed to youth by stakeholders like Tanzania Coffee Board, Agricultural Marketing Co-operative Societies dealing with coffee, Tanzania Coffee Research Institute and the Ministry of Agriculture at large. Youth cultivating coffee should be assisted to form clubs and the club members could be assisted to move around and sensitize other youths on the economics of coffee production. The Tanzania Coffee Board could come out with an appealing slogan to entice youth to move into coffee production. In this scenario there should be a long term farm development loans or special loan fund similar to the Small Enterprise Loan Fund (SELF) for funding youth coffee production projects. By doing so it is possible for coffee production curve to change from negative to positive and in a larger spectrum the livelihoods of small scale coffee farmers be improved.

Also the study recommended that with regard to the coffee production fluctuations attributed by factors such as removal of subsidies among small scale coffee farmers and unreliable coffee markets: It is recommended to the Ministry of Agriculture, Fisheries and Food Security to subsidize farm implements as it used to be in the past simply because under normal circumstances, small scale coffee farmers are unable to keep the money from when they harvest their crops to when needed for buying inputs let's say five months later. Furthermore, AMCOS have the role of sensitizing small scale coffee farmers on how to improve coffee production, how to acquire best inputs and reliable market for their produce.

In addition, the study recommended that the attitudes among small scale coffee farmers in terms of perception, preferences and thinking that coffee production is uneconomical has to change in order to improve coffee production among small scale coffee farmers. So far small scale coffee farmers in Hai and Arumeru Districts have highly been demoralized by lack of agricultural inputs, extension services and reliable market. This has made them to develop negative attitudes towards coffee production under the allegation that coffee production is no longer a paying economic activity. Therefore, the study recommended deliberate efforts to be undertaken by the government so as to build trust (positive attitudes) among small scale coffee farmers in Hai and Arumeru Districts hence improving coffee production and livelihoods of small scale coffee farmers.

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