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Mainstreaming Gender and Youth in Smallholder Sustainable Coffee Supply Chain in Kenya

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Abstract
This paper presents extracts of a study and focuses on the role of women and youth in managing supply chain risks associated with smallholder coffee farming in Kenya. The paper provides elements of the linkage between gender and youth mainstreaming in managing risks related to production, quality and consistency of coffee supply. It focuses on determining gender distribution and roles at smallholder farming in the coffee supply chain in Kenya, factors militating against effective participation of women and youth, and how they can effectively participate in the coffee supply chain. The study carried out in central highlands of Kenya has shown that there are more male household heads (77.6%) but with a lower average age of 59.3 as compared to that of female household heads at 63 years in the coffee growing areas. Predominantly, coffee and land are in the hands of male household heads but only as preferred trustees on behalf of the whole household. Women and youth still provide unpaid labour in coffee production and supply, and are mainly engaged in alternative enterprises to earn income for their daily household livelihoods. However, new technologies are beginning to facilitate participation of women in coffee farming. In summary the study confirmed that successful coffee supply chains depend on the willingness of all chain actors to communicate, coordinate and collaborate, and to which mainstreaming gender and youth is crucial in ensuring sustainability.
Keywords: Coffee, Coffee Supply Chain, Sustainability, Agriculture, Mainstreaming, Women, Youth, Gender, Risk factors, Smallholder, Farming, Kenya

1. Introduction

Agriculture remains a dominant sector in most developing regions of the world (FAO, 2008), employing the majority of the labour force, a statement echoed by New Partnership for Africa's Development (NEPAD) (2013) for Africa. The sector is fundamental for poverty reduction, economic growth and environmental sustainability (World Bank, 2015). The situation is true for Kenya where agriculture contributes 34% of the country's GDP (Salami et al., 2010), of which coffee accounted for around 3% in total exports by value during the period 2005 – 2010 (ITC 2011). However, smallholder agricultural commodity supply chains face a number of varied risks (Sarris, 2010). These risks are particularly experienced for agricultural commodities such as coffee where a variety of value chain actors is involved before the product reaches the final consumer. Coffee growing in Kenya dates back to 1893 when planting of the first coffee bushes in the coastal part of the country (CRF, 2002) took place. The first introduction was the Mocha coffee variety brought from Aden through Bourbon (La Réunion) by French Missionaries. Later introductions into Kenya came from Tanzania. The commodity rapidly developed to become one of the country's economic pillars. The crop is responsible for an estimated 15% of employment in the agricultural sector, having declined from 21% in the mid-1990s (ITC, 2011). The national production landscape comprises of both smallholder and large-scale estates at 60% and 40% respectively. Current estimates suggest that there are in excess of 700,000 smallholder farmers. These smallholder farmers have an average farm size of only 0.25 ha and per hectare yield at well below 400kgs of clean coffee (CRF, 2014). At the beginning of the chain are producers, comprising both estates and smallholders. Smallholders are usually organised into co-operatives. The co-operatives are functionally mobilisation units for primary processing and marketing.

The performance of the coffee sub-sector in Kenya has been steadily declining in terms of production and quality since its peak in 1987 (Condliffe et al., 2008). Exports fell from 2.1 million to 0.9 million 60kg bags between 1987 and 2007. The declining performance has been due to bio-ecological, weather, human and market risk factors. In the 2010/11 season, Kenya recorded increased production (ICO, 2012), which could be attributed to a number of reasons, including new production regions. However, production went down in subsequent years with a projected average production of 0.75 million bags in the 2013/14 season (ICO, 2015). Given the significance of the coffee sector, disruptions in the performance of the supply chain emanating from any risk factor can have major adverse impacts on the livelihood of millions of producers, loss of markets, as well as threaten economic wellbeing of concerned households in Kenya. Farmers, who are the primary players in the supply side of the value chains, face the greatest diversity of risks (Sarris, 2010). For instance, women have less access to productive resources and services required in production (FAO, 2011) since social norms often limit the options available to them. Poor access to both general and integrated agriculture education also limits youth

participation in the agricultural sector (FAO, 2014).

According to Stecke and Kumar (2009), 'supply chains have evolved to maximise efficiency and speed, motivated by the desire of business to compete cost-effectively in today's markets. This focus on efficiency has resulted in supply chains that are more vulnerable to disruptions.' An efficient supply chain is therefore one that ensures a timely, cost effective and sustainable delivery of quality goods and services to the market.

1.1 Gender and Youth Participation

Traditionally, coffee in Kenya is considered to be a 'man's crop' (IWCA Kenya, 2012). Women and youth participation is limited to the supply of unpaid labour. Their involvement in the decision-making on growing coffee, and how returns from the crop are used is thus insignificant. In a study by Liaison Consulting (2011), it was observed that over 95% of coffee farms are owned by men, and women and youth were found to provide the bulk of labour used in coffee production (table 1).

Table 1: Gender Roles in the Coffee Sector in Kenya

Gender Roles	Participation in the roles (% ratio)			
	Men	Women	Children	
			Boys	Girls
Cultivating	5.4	74	9.3	11.3
Picking	7.1	54.4	18.5	20
Sorting at home	3.6	60	7	29.4
Sorting at the factory	9.3	45	14.3	31.4
Taking to the factory for processing	7.1	44	22.2	26.7
Taking to the market	32.7	54.3	5	8
Collecting money from beans sales	87.4	12.6	0	0
Owning coffee farms	95.2	4.8	0	0

Adapted from Liaison Consulting (2011)

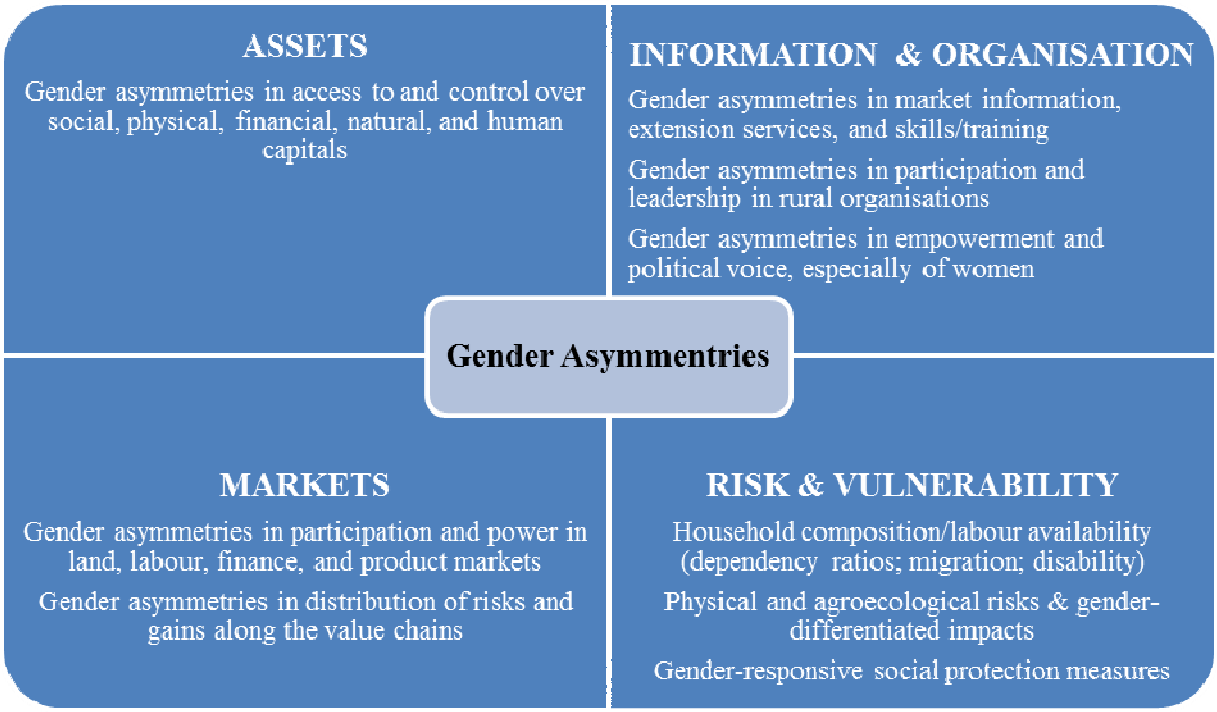
In summary, the groups who have the role of coffee production in Kenya have little or no access to the income from the commodity. This has created apathy among women and youth in respect to active and voluntary engagement in coffee production.

According to IWCA Kenya (2012), improving the status of women has a positive effect on the economy of the communities in Kenya. One of the principles from the United Nations Economic and Social Council (UN-ECOSOC) (1997) states that, 'gender mainstreaming also requires that every effort be made to broaden women's participation at all levels of decision-making'. However, women have minimal access to the income from coffee sales, a situation aggravated by a number of historical socio-cultural norms in smallholder communities, where men, except in cases where the male head of the household dies, historically own land. Promoting gender equality is thus good for women since it ensures equal access to resources and opportunities to be more productive (FAO, 2011).

1.2 Gender Asymmetries

Women comprise on average 50% of the agricultural labour force in sub-Saharan Africa (FAO, 2011), and the figure is much higher in the coffee sub sector in Kenya as shown in the table 1 above. The study adopted a gender lens (figure 1) to assess the implications for women and men in accessing and benefiting from economic and societal resources in the selected counties in central Kenya.

Figure 1: Gender Lens



Adapted from FAO (2009 p5).

Figure 1 presents a framework of analysing sustainable livelihoods through a gender lens. The goal of mainstreaming gender equality is the transformation of unequal social and institutional structures into equal and just structures for both men and women. The framework assumes men and women are full partners in their homes, community and society (Mailloux et al., 2011).

However, women currently hold only 15% of leadership positions (Cheruiyot, 2015) in coffee cooperatives. This is also true in access to finance where women are slightly over 17% of total borrowers from the Commodity Development Fund (CoDF), and only account for 7% of total amount borrowed. Nevertheless, women borrowers have a better repayment rate than men at 90% and 78% respectively (ibid). Access to information, cultural beliefs and collateral challenges are some of the other barriers women face in the coffee sector financing, but increasingly women are coming together in groups to try to bridge this gender gap. According to Bentley and Van Mele (2011), women groups are common and accessible in the farming communities. Many women are organised into existing women groups, which are stable and outlive most projects and initiatives, but are largely unsupported. Directly involving women in production initiatives has the potential to increase such production. For example, giving women farmers in Kenya the same inputs and education has the potential to increase production by at least 20% (FAO, 2009 & 2011).

According to Angela et al. (2011), youth categories determined by chronological age, vary across space and time. For example, the UN General Assembly defines youth as individuals between 15 and 24, the World Health Organisation (WHO) have an age bracket between 10 and 15, and the Commonwealth have it between 15 and 29. On the other hand African Union (AU) have it between 15 and 35, while the Kenyan constitution refers to the youth as all individuals in the republic who have attained the age of 18, but not reached 35 (ibid). For ease of global comparison, the study confines its definition to that of the UN General Assembly, while coffee data analysis computed based on the Kenyan definition, and that youth are not married.

It is estimated that by 2050, the world population will be 9 billion with the youth (aged 15 – 24) accounting for about 14% (FAO, 2014), and 18% out of a population of 85 million in Kenya (Angela et al., 2011). Economic stagnation, particularly for those living in developing countries remains a big challenge for the youth due to insufficient access to knowledge, information and education (FAO, 2014). Demographic studies show that elderly men dominate the coffee sector in Kenya and the youth are hardly involved (IWCA Kenya, 2012). Youth groups are less common (Bentley et al., 2011). The youth are equally less interested in drudgeries, instead preferring to work in offices. It follows that the coffee sector is thought to be headed for disaster without active involvement of the youth (IWCA Kenya, 2012), and unless the situation is corrected.

According to ICO (2015), a sustainable coffee economy is one where the well-being of all actors in the chain, where their long-term economic, social and environmental goals met and they are able to compete effectively. Indicators of sustainable coffee sector are in table 2.

Table 2: Indicators of sustainable coffee sector

Economic Indicators	Social Indicators	Environmental Indicators
Adequate income for farmers Improved farm productivity	Gender equality in coffee farming Improved living conditions	Adoption of Good Agricultural Practices A non-harmful soil fertility management
Farming profitability	Adequate farm working conditions	An integrated pests & diseases management
Access to market & transparency Quality product & traceability	Improved farmer skills Food security	Adequate water management Waste management
Access to finance	Healthy farming practices	Conservation of biodiversity
Diversified income generating activities	Effective farmers' organisations & positive impact on their communities	Land protection (forest)

Adopted from ICO (2015).

From table 2, gender equality in coffee farming is important to sustainability. However, this is a complex issue in the context of African society (ICO, 2015) and a lot more change is required to reduce the gender gap in the coffee sector in Kenya.

The study was therefore aimed at providing the linkage between gender and youth mainstreaming in managing risks related to production, quality and consistency using a case study research approach to generate an in-depth, multi-faceted understanding (Crowe et al., 2011) of the coffee smallholder households in their real-life situations.

2. Need for Present Study

Coffee export in Kenya is a vital contributor to the country's foreign exchange earnings, and accounts for a significant proportion of tax income and the gross domestic product (ITC, 2011). Coffee production therefore has significant potential for enhancing income generation at the household level among smallholder farmers in Kenya (ICO, 2010 & 2015). However, the full realisation of this potential has remained elusive due to several risk factors at different stages of the coffee supply chain. In the case of coffee production and supply in Kenya the major risks relate to quantity, quality and consistency of which gender and youth mainstreaming are crucial elements in ensuring sustainability in households' income and overall livelihoods. According to the World Bank (2010), smallholder farmers in developing countries are often least able to manage risk, while agricultural supply chain risks continue to play a dominant role in vulnerability profile for these countries. Whereas risks and uncertainties are ubiquitous and diverse in the agricultural supply chain (CRMG, 2008), previous studies, particularly in Kenya, show little or no in-depth risk analysis and scope for mitigation in the smallholder coffee sub-sector. As a result, smallholder coffee farmers' preferences toward risk and risk-return trade-offs have had major effects on their daily decision-making. Evaluating the effectiveness of different risk management strategies and tools thus require an understanding of the household and the socio-cultural dynamics and risk-return trade-offs (World Bank, 2010) of the individual or groups of smallholder farmers. It is only after the evaluation that a comprehensive risk management strategy (Sadler, 2012) for smallholder coffee farming in Kenya is developed, setting out actions and responsibilities. This paper thus attempts to provide elements of the linkage between gender and youth mainstreaming in managing risks related to production, quality and consistency of coffee supply in Kenya.

3. Materials and Methods

In this research, a single-case study is used. The study collected information related to social issues and habits using a survey-based research design. The research included both quantitative household assessments and qualitative key informant interviews. The smallholder coffee producers in Kiambu, Kirinyaga, Murang'a and Nyeri counties in central Kenya constituted the population for this study. This region covers the three agro-ecological zones of coffee in Kenya, and the study assumes that the main risk factors are representative of other coffee growing areas. There may however, be slight variation in cultural norms and behaviours, which have an impact on risk factors and risk mitigation options.

The sample size for this study was arrived at using the Cochran (1977) formula:

$$n_0 = \frac{Z^2 pq}{e^2}$$

where n_0 is the sample size, Z^2 is the table value for the normal curve that cuts off an area at the tails, ***e*** is the desired level of precision, ***q*** is 1-***p***, and ***p*** is the estimated proportion of an attribute that is present in the population, which is then adjusted by considering the population size **N** as follows:

$$n_1 = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

From the sampling frame, the total number of farmers and the proportion of farmers are set and included in the calculation formula as ***p***.

According to database for Coffee Marketing Co-operatives, the population of selected active farmers from the co-operatives in the four counties is 15,115, (Table 3), (CRF, 2014). In the sample equation, e = 0.05, p = 0.5 and q = 0.5. From the equation, the derived sample size for the study was 375 smallholder farmers, with the sampling units distributed across the targeted counties in proportion to the number of registered-active farmers (representing households) in each of the selected wet mills. The study used simple random sampling in a multi-stage approach where stage 1 involved random selection of at least one wet mill per county to represent the agro-ecological zones, and stage 2 involved randomly selecting the required number of farmers from the list in each of the wet mills selected in stage 1.

Table 3: Sample distribution for household assessments

County	Number of Co-operative Societies	Selected Number of Active Farmers	Agro-ecological Zone	Distribution Ratio (%)	Sample Distribution
Kiambu	20	3,610	UM1	30%	27
			UM2	70%	63
			UM3	0%	0
Kirinyaga	16	3,225	UM1	35%	28
			UM2	44%	35
			UM3	21%	17
Murang'a	43	4,830	UM1	19%	23
			UM2	66%	78
			UM3	15%	18
Nyeri	17	3,450	UM1	35%	30
			UM2	65%	56
			UM3	0%	0
TOTAL	**96**	**15,115**			**375**

In these counties, coffee grows in three agro-ecological zones, namely the Upper Midlands (UM) 1, 2 and 3. Household data collection was by structured questionnaires administered through farm visits. The questionnaire was initially pilot tested for relevance of questions, completeness and to level enumerators' skills. The enumerators were field staff from Coffee Research Foundation (CRF) currently Coffee Research Institute (CRI). A checklist guided key informant interviews.

Table 4: Summary of data collected

Activity	Data to collect
Farm survey	Producer profile, gender distribution and roles, resources & ownership, coffee production, husbandry practices, prices & income, farm expenditure, infrastructural, logistical support, constraints & proposed mitigation
Key Informant Interviews	Types of services, the cost of services, governance structures, producer participation, the quality of services, challenges & proposed mitigation

The study used a normative interview approach and a fixed time interview protocol designed to address the specific research questions. The interview questions were a mixture of open and closed ended. Data analysis involved developing summaries and descriptive statistics, identifying patterns, and applying formal statistical techniques, and with the results presented using tables and charts.

4. Results

4.1 Household Characteristics

This section presents the gender and age distribution of household heads in the four counties.

Table 5: Gender distribution of household heads

County	Gender Distribution (% ratio)	
	Male	Female
Kiambu	84.3%	15.7%
Kirinyaga	80.0%	20.0%
Murang'a	72.5%	27.5%
Nyeri	75.6%	24.4%
Total	77.6%	22.4%

Table 5 shows that more than three-quarters (77.6%) of the households surveyed were headed by men, women only accounting for 22.4%, with a higher proportion of women found in Murang'a. There is no significant difference on gender distribution between the counties (Pearson $X^2 = 4.54$, df = 3, $p>0.05$).

4.2 Age of household heads

The age of the household heads in the four counties ranged from 28 to 93 with a mean of 60.2 (table 6).

Table 6: Age of household heads by gender (years)

County	Gender	N	Mean	Minimum	Maximum	Std. Deviation
Kiambu	Male	74	58.2	30	90	14.0
	Female	14	63.2	42	78	12.5
	Total	88	59.0	30	90	13.8
Kirinyaga	Male	60	56.5	28	87	15.3
	Female	16	66.4	40	86	14.6
	Total	76	58.6	28	87	15.6
Murang'a	Male	86	61.9	33	93	13.9
	Female	33	63.6	30	85	13.4
	Total	119	62.4	30	93	13.7
Nyeri	Male	65	59.9	30	93	12.1
	Female	21	59.3	37	80	11.8
	Total	86	59.7	30	93	11.9
Total	Male	285	59.3	28	93	13.9
	Female	84	63.0	30	86	13.1
	Total	369	60.2	28	93	13.8

Although the youngest and the oldest household heads were men, the average age of male household heads was 59.3 years and that of female household heads 63 years (charts 1-3).

Chart 1: De-trended Normal Q – Q Plots

Chart one show that the mean average and median values for female is higher than that of male household heads.

Chart 2: Normal Q – Q Plot for male household heads

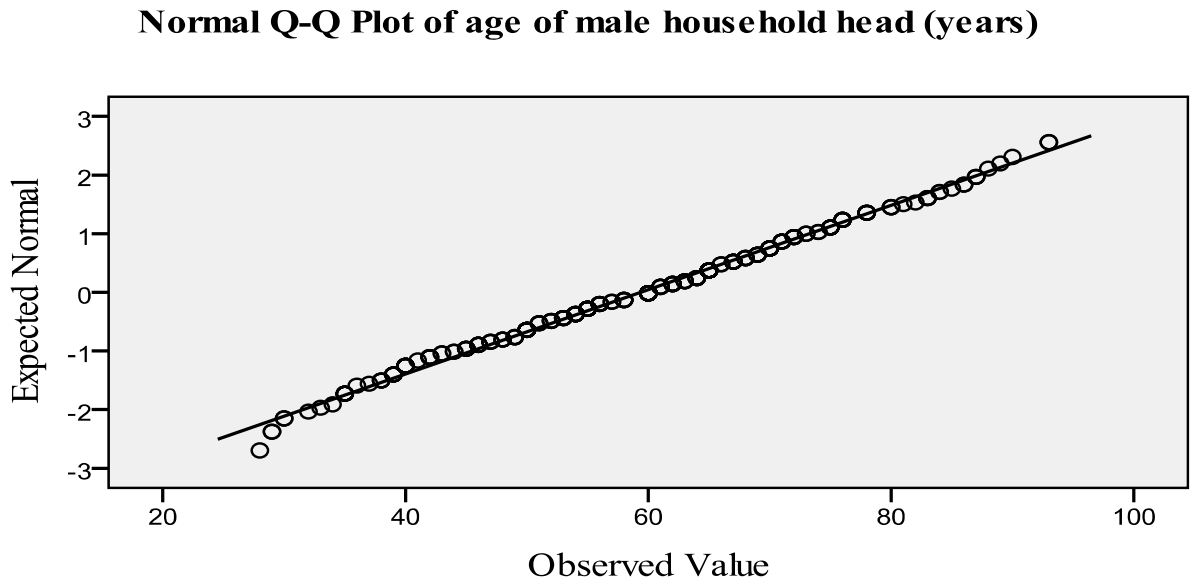


Chart two shows that the age of male household heads as normally distributed around the mean and median values.

Chart 3: Normal Q – Q Plot for female household heads

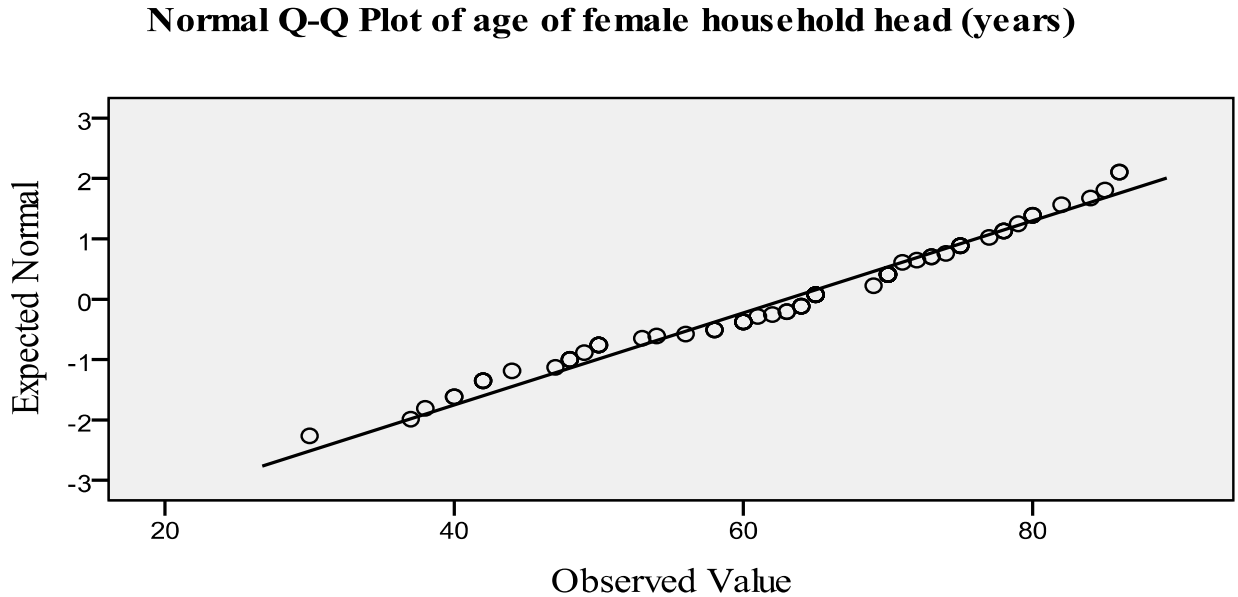


Chart three shows that the age distribution of female household heads as negatively skewed (-0.390).

4.3 Factors affecting participation of women and youth in smallholder coffee farming

The study has shown that largely, men own land across the four counties with the highest proportion being in Kirinyaga (59.5%).

Table 7: Land Ownership

County	Male Household Head	Female Household Head	Joint Household	Joint (Youth)
Kiambu	49.4%	18.1%	28.9%	3.6%
Kirinyaga	59.5%	15.2%	20.3%	5.1%
Murang'a	49.0%	16.7%	32.3%	2.1%
Nyeri	39.0%	16.9%	42.9%	1.3%
Total	49.3%	16.7%	31.0%	3.0%

Results from the study also indicate that inheritance (76.6%) is the main way through which women acquire land. Advanced age and demise of the male household heads mainly instigate inheritance as seen in most counties. A significant proportion of women acquire land through direct purchase as indicated by 23.4% of the respondents, and 36% of these purchases are through common interest groups. In the few cases where youth own land, it is largely due to inheritance (73.1%).

A large number of the respondents (68.3%) feel that it is normal for women to own coffee. Conversely, majority of respondents (68.5%) indicated that it is not usual for the youth to own coffee in their counties for fear that they would most likely sell the land. While coffee is the main income generating activity in the counties, alternatives are available to women and youth. Results from the study show that 78.7% and 76.4% of women and youth respectively are engaged in alternative enterprises (charts 4 and 5).

Chart 4: Women income generating activities

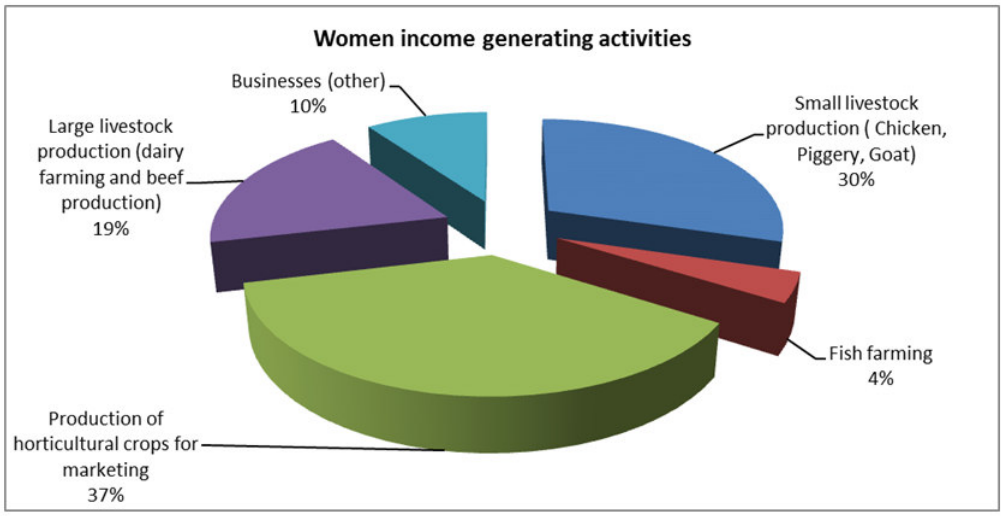


Chart four shows that production of horticultural crops for marketing is the main income generating activity undertaken by women in the four counties.

Chart 5: Youth income generating activities

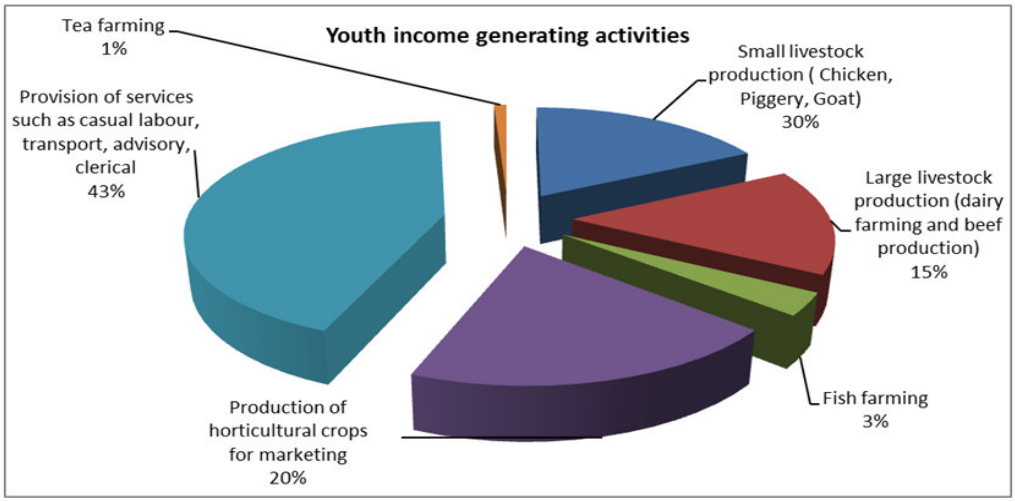


Chart five shows that provision of services such as casual labour, transport, advisory and clerical activities is the main income generating activity undertaken by youth in the four counties.

Ownership of coffee farms had changed hands over the past 10 years according to 47.6% of the respondents. In cases where these changes occurred 81% were from men, 14% from women, 3% from male children and 2% from joint ownership. The highest contributor to changes in ownership is due to the demise of male household heads (45.5%). Voluntary transfers of coffee farms to women exist (14.5%), which most attributed to either advanced age of male household heads, the need for equality in the households, adoption of new coffee varieties, and/or the need to have peace and harmony in the households.

The main factor militating against women participation in coffee farming is lack of start-up funds (55.9%) to invest in farming activities, whereas this is a second impediment for youth (27.8%). According to 40% of the respondents, male household heads made decisions on coffee income use in the households. On the

other hand, 41.7% of the respondents reported joint decision-making whereas 17.5% of the respondents indicated that the female head of the households made the decision (most being those households headed by the female), and only 0.8% cases were involving the whole family, including the youth. Male households only made decisions in 20% cases on income from alternative farming. Female members of the household are at 27% whereas joint decisions making dominate at 53%, a clear indication that women do not have a stronghold in making decisions on alternative income sources as well.

The study has shown that only 16.9% of female household heads compared to 40.9% of male counterparts have attained high school and college level education. At 41%, inadequate skills are a major factor militating against women effectively undertaking alternative economic activities. On the other hand, lack of appropriate skills as indicated by 41.7% of the respondents is a major impediment to youth diversification.

Women can be managers as supported by 18% the respondents. However, results from key informants, i.e. the primary co-operatives and their factories, CRI and Coffee Board of Kenya (CBK) currently Coffee Directorate (CD) produced mixed results. Women comprise on average 30% of the labour force in the key informant institutions. However, at managerial levels women only hold on average 2% and 5% of management and supervisory committees within the 8 co-operatives interviewed, a position made worse in the 12 factories interviewed where no woman was in management. It is only at CRI and CD where 17% of management were women.

At 68.7%, lack of interest is a major factor leading to the absence of youth in coffee farming. Further, the study shows that in 21.7% of the cases, the parents were unwilling to bequeath to or share land and coffee with the youth since they feared that once the titles are in the hands of the youth, they would most likely sell the land. This study has also shown a high ratio of women (78.7%) and youth (76.4%) in alternative enterprises. Historically, the role of women in coffee is the provision of labour. Youth engagement is further limited due to the small land holding (4.8%) making subdivision nonviable. At 4.8%, low and infrequent returns were other limiting factors to youth participation in coffee farming.

5. Discussions

Joint household land ownership is highest in Nyeri (42.9%) and women ownership highest in Kiambu (18.1%), despite the fact that historically when it comes to ownership of production resources women are disadvantaged. This could be an indication that the mind-set of the coffee growing communities is changing, with more men willing to bequeath to or share land with women and youth.

This study has also shown that coffee is actually a crop for the whole family and not necessarily a man's crop as generally perceived. Gender roles in the communities show that male heads of households only act as the preferred trustees of the crop on behalf of the whole household. In the event that the male household head is no longer there to discharge this duty due to old age, sickness or demise then the trustee role passes onto the female household head. The women are responsible for the day-to-day wellbeing of the households: balancing the family food basket and ensuring sufficiency in their daily food needs. For this reason, women are inclined to farming activities which facilitate continuous cash flow or which directly provide food to the household. The existence of competing alternatives to coffee could be a risk to coffee farming. Low and infrequent returns is a challenge inherent in the coffee itself, given the long duration between flowering and harvesting, thereby making coffee farming unattractive to the youth since they require continuous cash flow to meet their financial obligations. However, new technologies are beginning to facilitate participation of women in coffee farming, and particularly with the introduction of new coffee varieties.

Women and youth still provide the most labour usually unpaid, which creates an imbalance in the dependency ratio. The youth therefore grow viewing coffee farming as a form of punishment. Coffee farming areas are remote from urban centres and the areas lack basic social amenities, which can be patronised by the youth. The youth are therefore naturally attracted to the urban centres where such amenities are available. Animosity between the youth and the elders, where the youth feel they are not trusted enough to own land and run the coffee farms further precipitates their move to urban. Coupled with the lack of skills base and access to financing, the study has shown that the apparent absence of the youth in coffee farming may largely be due to perception and lack of opportunities.

6. Conclusions and Recommendations

The coffee supply chain in Kenya is not dynamic and lacks in innovation and modernisation. There should be transformation into value adding enterprises with meaningful returns to all players in the chain. This calls for gender parity within the supply chain and inclusion of the youth who hold an important part in ensuring sustainability. Despite the significant contribution of coffee to the economy, coffee does not have a special place in the curricula of the country's learning institutions. The study recommends that practical training on coffee farming begin in the early stages e.g. in secondary schools so that the youth entrench it from the beginning. The transformation should then continue to incubation centres where youth mentoring and business innovation

nurturing takes place. It is also necessary that the private sector take a lead collaborating with research institutions to support and provide the youth with required innovation platforms.

Access to productive assets is required to make women and youth to meet conditions set by service providers, including financial services. It is commendable what Commodity Development Fund (CoDF) and other financial institutions are already doing in Kenya but a lot more is required for women and youth to access adequate financing and to use these resources. The study recommends developing and promoting alternative collateral, reducing inherent risks associated with coffee and developing guaranteed market information and linkages. Formation of strong and bankable common interest groups will make it easy to access and facilitate group trainings before giving such funds to the groups that at the same time serve as alternative collateral. Infrastructure in rural areas is also unattractive and this motivates the youth to move to urban neighbourhoods. Improved rural electrification and county road networks will thus encourage the youth to stay in the villages and inspire them to participate in post-harvest coffee value chain activities. However, there must be community trust and cultural mind-set change; the youth need support and trust to be effective participants in the coffee value chain in Kenya, and there must be a mind-set change where gender equality and empowerment, especially of women is realised.

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