Coffee Production in Kigoma Region, Tanzania: Profitability and Constraints

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Abstract

Coffee is a major source of income for millions of smallholder farmers worldwide and is a significant source of export earnings to many nations including Tanzania. Coffee is one of Tanzania's primary export crops representing about 5% of total export, 24% of traditional crops and generating exporting earning averages US$ 100 million per annum over the last 30 years (TCB, 2011). Smallholder coffee farmers in Tanzania are constrained with different production and marketing problems which lower farmers` profit. This paper evaluates the profitability of coffee production as well as constraints that farmers face during the production process. The paper makes use of data collected from a sample of 122 farmers. The data were analyzed using the gross margin approach and the results were summarized using descriptive statistics such as frequency distribution, percentage, means, minima and maxima. The results show that farmers in Kigoma Region earned a gross margin of Tanzanian shilling 730 per tree per annum. Farmers processed at CPU gained about TZS 1350/kg as coffee improvement gain. Coffee production contributed about 39% of the total household income in the region. Input prices, taxes, research contribution and Central Pulpery Unit tax, shortage of extension services, unreliable markets and low coffee price, low quality of coffee, transportation and delayed payment constituted the major problems that faced coffee producers. The paper recommends that different stakeholders have to take actions that make coffee sector more profitable to improve the livelihood of the growers. Also availability of capital strengthened economic activities diversification to reduce risks of crop failure. Lastly, Farmers should be encouraged and facilitated to use CPU effectively to improve coffee quality.

Key word: gross margin, quality improvement, Kigoma

Introduction

Coffee is a major source of income for millions of smallholder farmers worldwide and is a significant source of export earnings to many nations including Tanzania. Coffee is one of Tanzania's primary export crops representing about 5% of total export earnings in the country. It accounts for about 24% of the value of Tanzania`s traditional cash crops and it has been generating export earnings of about US$ 100 million per annum over the last 30 years (TCB, 2011). The coffee industry provides direct income to more than 450,000 farm families and also benefits indirectly the livelihoods of 2.4 million Tanzanians through marketing and value addition. The major arabica coffee growing regions are Arusha, Kilimanjaro, Mbeya and Ruvuma Robusta is mainly produced in the Kagera region. Other arabica coffee growing regions include Kigoma, Iringa, Tanga, Morogoro, Manyara, Rukwa, Mwanza and Mara. Robusta coffee is only produced in Kagera region (TCB, 2011). Arabica coffee covers about 80% of the approximately 200,000 ha of land under coffee production and represents 70% of output (URT, 2008).

According to TCB (2011), the Arabica coffee yield in Tanzania is estimated to be 200-300 kg/ha while robusta is 750 kg/ha. Mwakalobo

(1997) explains that potential yield of arabica coffee is about 1,250kg/ha while Panyatona and Nopchinwong (2005) contend that globally potential yield of robusta coffee is 1,500kg/ha. Regardless of varietal differences between arabica and robusta, productivity is very low because of different constraints smallholder coffee farmers face.

The ultimate objective of the government of Tanzania is to increase productivity and profitability in existing agricultural activities through agricultural transformation that focuses on investing in more productive technologies and efficient marketing system (URT, 2008). To achieve its goal the government has undergone series of transformation. According to Mdoe et al. (2002), before market liberalization, inefficient agricultural marketing system was observed to be a major drawback in the development of agricultural sector. These reforms include: semi-liberalization of market of non-traditional export crops in 1986, which was followed by liberalization of marketing of food crops in 1989 and finally decontrol of marketing of traditional export crops in 1993/1994. The decontrol of agricultural marketing was meant to pave the way for participation of private marketing agents (producers, traders, processors and exporters) along with the cooperatives in the marketing aspects of all agricultural crops in a competitive marketing environment that could bring about competitive prices at all levels of the marketing channel (URT, 2008). During the 1980s and 1990s, many developing countries including Tanzania adopted Structural Adjustment Programs (SAPs). These reforms were based mostly on the guidelines of international financial institutions such as; the International Monetary Fund (IMF) and the World Bank. The SAPs came as a response to the worsening economic situation in most developing countries during the 1970s and early 1980s. One important objective of SAPs was to prune the central government budget by restructuring several public enterprises. This goal was to be achieved through several measures including: liberalization of agricultural sector by allowing private enterprises to engage in agricultural production and marketing activities, and restructuring marketing boards and cooperative unions to improve their efficiency (TCB, 2011). Albeit this transformation was expected to increase the profitability of coffee and other cash crops, the situation has not improved significantly. According to International Coffee Partner (2011), coffee sector in Tanzania today is characterized by extremely low yields (with only 0.25kg per tree of green coffee; the yields are among the lowest in the world). The study conducted by USAID (2010) in Kilimanjaro and Arusha revealed that, economic viability of coffee sector is hampered by unaffordable inputs, threats posed by Coffee Berry Disease (CBD) and Coffee Leaf Rust (CLR). Although constrains existing in coffee sector in Tanzania as listed, it was worth to undertake this study in Kigoma region because allocation of production resources is determined by the given set of ecological, social, managerial and technological option for a particular point of time. Also according to Tanzania Coffee Board, (2011), coffee production in Kigoma is at a nascent stage hence requiring more information for making informed decisions.

Research Approach and Methodology

Conceptual framework

The conceptual framework is the researcher's idea on how the research problem will be explored, keeping in mind the theories put forth in the theoretical framework and it gives the direction to be undertaken by the researcher. Philip (2007) argues that the framework provides a guideline for identifying important variables for effective and efficient data collection. The objective of this study was to assess coffee production and profitability to contribute to the efforts of improving income of smallholder coffee farmers in the study area.

Socio-economic characteristics determine farmers` decisions in allocating resources economically so as to achieve profit. Governmental institutions provide framework guiding marketing of coffee beans for improvement of output and profit. Coffee marketing in Tanzania is guided by coffee industry Act (Cap 347) of 2013 and by laws existing at district levels. Tanzania research coffee institute is the government entity with role of undertaking researches for coffee improvement. The institute

has recently established its center at Mwayaya village in Buhigwe district with the aim of supplying improved coffee seedlings which are diseases resistant and produce highly compared to traditional coffee seedlings. Improved coffee increase farmers` income through reduced agrochemical application and increased productivity. According to TCB (2011), NGOs and financial institutions have extensive access to expertise, funds and dedicated resources to assist smallholder arabica coffee producer improving profitability.

Weather condition, pests and diseases influence use of agrochemicals. When there is outbreak of diseases and pests, farmers increase application of agrochemicals and therefore presence of pests and diseases lead to high cost of production and vice versa.

Information used in the gross margin analysis encompass total coffee produced, inorganic fertilizers and agrochemicals, organic fertilizers and family and hired labour and their prices enabled to determine whether the sector is profitable and hence increase income to farmers and the contribution of the sector to the economy.

Profitability is primary goal to any firm for both micro and macro levels of businesses. In the production process, there is a direct linkage between levels of farm revenue, prices of a commodity and prices of inputs and real farm income. A survey by Cole (2011) showed that, some Tanzanian coffee farmers receive as low as 50% of the auction price for the coffee that they produce. TCB (2011) reported that coffee farmers received farm gate coffee price which on average ranged between 65% and 70% of auction coffee price.

According to URT (2008), most coffee growers in Tanzania are confronted by low coffee production due to lack of improved varieties that are potentially high yielding and resistant to diseases and pests, high production costs due to application of pesticides to control diseases and pests, low coffee quality, low prices of the produce in the world markets and consequently low household incomes for the farming communities.

Also low profitability of coffee in Tanzania emanates the fact that coffee prices is determined by the international exchange markets in which Tanzania has very low share to influence high prices. (Kodama, 2009). According to FAO (2009), international coffee market situation contributes highly to lower coffee farm gate price. International coffee markets has put different conditions like quality benchmarks, failure to buy input after market liberalization and removal of subsidies, volatile and declining price. These interrelated pressure put small holder coffee farmers in a disadvantaged position in today`s economy. Figure 1 describes the conceptual framework of factors coffee production and profitability.

Data sources and analysis

This paper makes use of data collected from Kigoma region specifically from Buhigwe and Kigoma districts. Kigoma region is located between latitudes 3.6 and 6.5 degrees South and longitudes 29.5 and 31.5 degrees east. To the North the Region borders Burundi and Kagera Region; it borders Shinyanga and Tabora to the east, Rukwa Region to the South and the Democratic Republic of Congo to the west (URT, 2008).

Coffee growing in Kigoma Region is concentrated in the wetter areas of the highland zone along Lake Tanganyika in the Northern part of the Region. Coffee production is concentrated in Manyovu and Kalinzi divisions in Buhigwe and Kigoma districts respectively. The Highlands zone has an altitude of between 1,500 and 1,700 meters above sea level with an annual rainfall of 1,300–1,650mm. A cross sectional design was used in this study. The design allows data to be collected at a single point in time and they are useful in descriptive analysis and for determination of the relationship between variables (Bailey, 1998).

Multi stage and random sampling were employed to select sample. The first stage involved purposive selection of two districts that is Buhigwe and Kigoma, then two divisions, one from each district were purposively selected. Then purposive sampling procedure was applied to obtain three wards: one from Buhigwe District and two from Kigoma District. The purposive

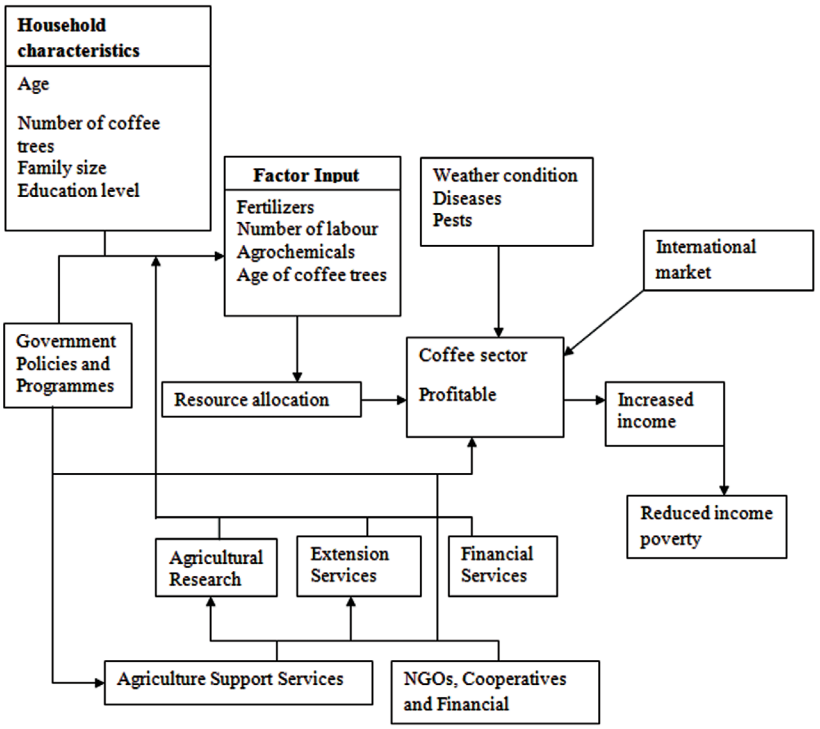

Figure 1. Conceptual framework

and multi stage techniques were applied because coffee is grown in specific districts and wards. Kigoma Region is clearly divided into three agro-economic zones, the lake shore zone, the lowlands zone and the highlands zone. Arabica coffee is grown in parts of Kigoma, Buhigwe and Kibondo districts and within each district some wards do not grow coffee. According to Bless and Achila (2006), purposive sampling is appropriate to select units that are judged to be the most common in the population under investigation, for example coffee farmers. The next stage was random selection of six villages; two from each ward.

After establishment of sampling frame in each village, the last stage involved random selection of households from each village to make a sample size of 122 respondents. . The structured questionnaire was used to collect data on the size of farm owned, size of land under coffee production, type of labour used in production, number of coffee trees, amount of coffee harvested, prices of fertilizers and agrochemical and, family size and yield. Moreover, information on the sex of respondent, age, marital status and formal education levels were also collected. The questionnaire contained questions that were intended to solicit data on as access to support services, including financial credits, access to extension services, and access to markets. In addition, information on prices of clean coffee and incomes earned from various economic activities was collated together with information about the constraints that face coffee farmers.

The study also used secondary data obtained from the Manyovu, Mahwenyi, Kalinzi, Mkibanda, Mukigo, Rumako and Kanyovu cooperatives, specifically data which enabled the analysis of Central Pulpery Unit taxes and contribution for coffee research, taxes and processing costs.

Gross margin analysis was employed to establish amount that coffee farmers earn from the sale of their clean coffee before the deduction of any selling and administrative expenses and fixed costs. The gross output was calculated as a product of output multiplied by selling price. In order to analyze profitability of coffee sector

in Kigoma region, Gross Margins analysis was carried out to determine Gross Margins (GM) of clean coffee produced. Gross Margins (GM) are calculated to provide relative margins for all farmers in the production season (Izamuhaye, 2008). According to Ferris and Malcolm (2000), the gross margin analysis has the limitations such as: GM is not a profit figure since the fixed costs have to be covered by the gross margin before arriving at a profit figure. Ayoola (2012), small scale traditional farms have negligible fixed costs and so GM is a good approximation of net farm income. Different scholars have used the gross margin analysis to determine profitability of the farms. Gabagambi (1998) used the gross margin analysis to determine profitability of paddy and cotton production in Shinyanga. Mutayoba (2005) used the technique in vanilla, coffee, tea, banana and maize farming systems to establish the relative economic profitability of these farming systems in Bukoba district. GM analysis was therefore used to estimate income from coffee production in the study area.

In this study gross margin approach is used to provide valuable information on the profitability of coffee sector, specifically in Kigoma region and helps to make the case for continued efforts in supporting coffee farmers. The variable costs were calculated as products of quantity of variable inputs like fertilizers, agrochemicals, cost of labour used in production, transport costs, sorting, curing, sacks packaging and their respective unit prices. Gross Margin (GM) is expressed as:

$$GM_I = \sum TR - \sum TVC \quad (1)$$

Where: GM_i = Gross margin (TZS/tree),
TR = Average total revenue (TZS/tree) and
TVC = Average total variable costs (TZS/tree).
Descriptive statistics such as gross margin and average gross margin were computed using Microsoft excel to determine coffee production profitability. Also mean, minimum and maximum were used to assess contribution of difference income sources to household income. In addition, mean, minimum and maximum were used to assess constraints that smallholder coffee farmers face coffee production in coffee marketing.

Results and discusion

Profitability of coffee production

The results indicate that coffee production is profitable whereby by smallholder coffee farmers achieved profit of about TZS 730 per tree. Also there was profit difference between Kigoma District and Buhigwe District. On average coffee farmers in Kigoma District earned higher profit than coffee farmers from. The profit gained from coffee farming was TZS 810 and TZS 651 for Kigoma District and Buhigwe District respectively. Profit difference is contributed by productivity differences whereby per tree productivity was 0.635kg and 0.52kg in Kigoma District and Buhigwe District respectively. Also coffee from Kigoma was priced higher than coffee from Buhigwe District. It was revealed that low price of coffee from Buhigwe District was due to poor quality resulted from poor handling at Central Pulpery Units. The average profit in study area which was TZS 730/tree was relatively lower than other coffee producing farmers in other regions. For example, in 2010 the GMs for smallholder coffee producers in Kilimanjaro and Arusha were TZS 952/tree and TZS 938/tree respectively (USAID, 2010).

The average price of coffee from Kigoma District was TZS 4,810/kg while their counterpart farmers in Buhigwe District the price was TZS 4,540/kg. The average revenue per tree was higher for farmers in Kigoma District (TZS 2,955) than those in Buhigwe (TZS 2,238 per tree). The average total variable costs were TZS 2,145/ tree and TZS 1,587/tree for coffee farmers in Kigoma and Buhigwe Districts respectively. Of all variable costs, the mean cost for labour was the highest averaging at TZS 712 and TZS 433 per coffee tree for Kigoma and Munanila respectively. Generally the gross margin per hectare in Buhigwe and Kigoma districts were TZS 365,560 and TZS 453,600 respectively. The mean GM per hectare in the study area was estimated to be TZS 408,800. The average number of coffee per acre was 560 trees and analysis and discussion for the study based on per tree because of high variation of number of tree per acre due to inter cropping farming systems existence.

In addition, the average gross margin was about

28% of average revenue earned by coffee farmers in the study area. Farmers in Kigoma earn less revenue compared to other smallholder coffee producers within and outside the country. For example, according to Match Maker Associates Limited (2009), coffee farmers in Ethiopia have GM of about 52% of average revenue. Also according to Ayoola (2012), smallholder coffee farmers in the Nigerian states of Kogi and Ogun receive gross margin of about 44% of average revenue. Therefore coffee production in Kigoma is very high and hence low profitability.

Furthermore, the distribution of levels of income earned from coffee shows that about 50% of the farmers in the study area had GMs which were less than TZS 200,000 per season. Farmers with income between TZS 200,000 and TZS 400,000 accounted for about 14% of the farmers in the study area. About 7% of the respondents gained income from coffee sales between TZS 400,001 and TZS 600,000 and 29% of the farmers in the study area had GMs which were above TZS 600,000 per year.

Coffee quality improvement gains

The present study found coffee processing is done either at home and is referred home processed (HP) or at Central Pulpery Units (CPU) and is referred to CPU coffee. The study found three scenarios: first about 27% farmers processed their coffee at household level (HP), second was that about 32% processed their coffee at CPU and the last one was that about 41% processed coffee at both home and CPU. The study found that there was price difference between HP coffee and CPU coffee. Table 2 shows that CPU coffee fetched about TZS 5,653/kg while HP received about TZS 3,625/kg making a difference of TZS 2,028/kg. Transactions costs associated with CPU processing were: transportation, expected losses and processing cost. The analysis found that improvement associated costs was TZS 678/kg. The price difference minus quality improvement costs here referred to Quality Improvement Gains (QIG) was TZS 1,350/kg. Response from farmers on why they didn't send their coffee to CPUs was because CPU is far from coffee field. Also price difference between HP and CPU for

Table 1: Gross margin analysis results for 2011/12 season

District	Kigoma (n=89)	Buhigwe (n=39)
Total coffee output (kg) (a)	12,280	8,752
Number of trees (b)	19,171	16,975
Output (kg/tree) (c) =a/b	0.635	0.52
Average price (TZS/kg) (d)	4,810	4,540
Revenue (TZS/tree) (e) =c*d	2,955	2,238
Average revenue (TZS/tree)(f)=(∑e/2)	2,596	
Cost of fertilizers TZS/tree (g)	499	424
Cost of manure (TZS/tree) (h)	104	107
Total agrochemicals cost (TZS/tree) (i)	403	299
Cost of labour (TZS/tree) (j)	712	433
Sacks TZS/tree (k)	30	30
Sorting (TZS/tree) (l)	5.5	5
CPU cost (TZS/tree) (m)	291	289
Total variable costs (TZS/tree) (n)	2,145	1,587
Gross margin (GM) (TZS/tree) (o)(e-n)	810	651
Average gross margin (TZS/tree) (p)=(∑o/2)	730	
Proportion of GM to average revenue (p/f)%	28	

2010/2011 was not as high as reported price, hence farmers decided not to send their produce to CPUs. Quality improvement gain was about 39% of price of home processed coffee implying that farmers whose coffee was processed at CPU achieved high cash income compared to those who opted to process coffee at household level.

was from bananas whose average contribution was about 45% of total earning.

Small business contributed about 8% of total cash income earned by coffee farmers in the study area. Horticulture, formal employment and animal keeping contributed 3%, 3% and

Table 2: Coffee processing, prices and quality improvement gain (QIG) for 2011/2012 season

District	CPU Processed (kg)	Price	Home Processed (kg)	Price
Kigoma (n=83)	350,770	5,699	303,599	3,599
Buhigwe (n=39)	132,177	5,563	118,092	3,677
Total	482,947		489,047	
% of CPU of total coffee produce		50		
Mean price		5,653		3,625
Quality Improvement Gains for coffee processed at CPU				
Transaction costs				
CPU costs (TZS/kg)		472		
Expected loss (0.001*Price) (TZS/kg)		6		
Transport mean cost (TZS/kg)		200		
Total costs (TZS/kg)		678		
QIG (TZS/kg)		1,350		

Contribution of various sources of cash to household income

Table 3 shows the contribution of various income generating economic activities to household income in the study area. Comparatively, the contribution of coffee is higher in Kigoma (40%) than in Buhigwe (37%) district. However, the differences in the contribution of different sources of income was not statistically significant at p=0.05 (p statistic=0.137). Overall, across the two districts, only 39% of cash income was derived from coffee. The contribution of coffee to cash household income is consistent with the findings by USAID (2010) that on average coffee contributes about 37% of total cash income. The average cash earning from coffee production was TZS 770,548 and maximum was TZS 3,485,446. The largest contribution to household income

2% of total cash income respectively. Formal employment, small business and animal keeping contribute proportionally high amount of household income but are they are very limited in the study area.

Constraints faced by smallholder coffee farmers

Few and distant located central pulpery units

Quality improvement requires a well prepared area for cleaning, cheering out, drying transport and storage. Primary cooperatives CPUs have designed to offer environment for developing high quality coffee. Table 3 shows that Kanyovu Cooperative collected about 482,947kg prepared at cooperative`s CPU while about 489047kg was from home processing. Home processed coffee was about 50.3% of total clean coffee auctioned.

Table 3: Proportionate contribution of all sources of income in Buhigwe and Kigoma districts for 2011/2012 season

District	Statistic	Coffee	Bananas	Horticulture	Employment	Animal	Business
Kigoma (n=83)	Mean	819 006	343 792	118 450	4 200 000	626 666	945 384
	Minimum		60 000	20 000	2 400 000	500 000	230 000
	Maximum	333 4647	1 125 000	450 000	6 600 000	750 000	3 600 000
	%	40	44	3	4	3	8
Buhigwe (n=39)	Mean	819 006	343 793	118 450	4 200 000	626 666	945 385
	Minimum		60 000	20 000	2 400 000	500 000	230 000
	Maximum	333 4647	1 125 000	450 000	6 600 000	750 000	3 600 000
	%	37	53	3			6
Sample (n=122)	Mean	770 548	342 754	73 972	4 200 000	626 667	855 263
	Minimum		20 000	12 000	2 400 000	500 000	230 000
	Maximum	3 485 446	1 125 000	450 000	6 600 000	750 000	3 600 000
	%	39	45	3	3	2	8

Home processed coffee from both districts received lower price than CPUs processed coffee. Table 3 shows that CPU processed coffee fetched higher price with the mean price of TZS 5,653/ kg while the price for home processed coffee was TZS 3,625/kg. Kigoma District received higher prices from both coffees than Buhigwe District as shown in table 3. Farmers have failed to adhere to good agricultural post harvest practices and improvement because of few and distant located central pulpery units. During the interview, about 67% of the respondents reported that distant and few CPU centres pose a big challenge to coffee improvement. In spite of the current situation of coffee processing in Kigoma, the status is relatively more impressive than the country CPU processing level. According to URT 2011, average CPU coffee processing is about 35%.

Cost of inputs

The result shows that about 97% of respondents perceived high costs of inputs bottleneck coffee production. Cost of fertilizers per bag of 50kg was between TZS 65,000 and TZS 90,000. Types of fertilizers used includes: Urea, CAN and DAP. Agrochemicals are highly used because the area suffers from diseases and pests. Agrochemicals which frequently used include Byton, Thiodan, Selecton, Blue Copper, Sumithion, Red Copper, Cobox, Dusban, linkon, Dume and Banko. About 96% of the respondents see access to inputs being the first bottleneck to increasing coffee production. High cost incurred in purchasing inputs made some farmers to purchase less inputs and hence poor coffee harvest.

Taxes and other deductions

The present study observed that the direct tax burden and other deductions in coffee is high hence reducing farmers' income. About 78% of the farmers interviewed expressed that taxes were key to reducing their income. Taxes include: VAT, collateral and contribution on research which sum up to TZS 270/tree. In GM analysis it showed that, on average the gross margin per tree was TZS 757 and total taxes were about TZS 227/tree. Comparing mean GM with taxes, then tax burden is about 30%. The tax burden higher that of other coffee producing areas. According to World Bank Group (2009), average tax burden to coffee producers in Arusha and Kilimanjaro was 5%. Therefore taxes contribute much reduce farm gate price and hence low household income.

Other challenges encountered in coffee production

Table 4 presents a summary of other challenges

encountered by smallholder coffee farmers in their day-to-day farming activities. About 71% of the respondents reported lack of extension services as an important obstacle to their farming activities. About 62% of the respondents reported transport as bottleneck to coffee marketing. It was reported that transportation cost to Moshi auction was about TZS 250/kg and transport cost to CPU was TZS 200. . It was noted that about 50% of the interviewed producers of coffee expressed their concerns about high interest rate. The interest rate is payable from the first installment that farmers are paid after clean coffee shipment to the port or auction in Moshi.

Furthermore, Table 4 shows that about 79% of the respondents reported payment delays as an important challenge. In 2011/12 production season, last auction sale was in November 2012 but final payment was made in March 2013. About 74% of the respondents reported unknown and unstable coffee market and their wish was coffee buyers to visit them and negotiate price unlike the prevailing system whereby the apex cooperative negotiate on behalf of the primary cooperatives.

cash income. Banana production leads followed by coffee and then horticulture. Formal employment and animal keeping contribute highly to household income but very few people respondents are involved.

Moreover, the present study identified the main constraints encountered by farmers in the study areas. The main challenges which were reported by farmers include: high prices of inputs, taxes and other deduction, shortage of extension services, unreliable markets and low coffee price, few and distant located central pulpery units, transport problem, payment delay and high interest rate. The large proportions of farmers reported these challenges make it reasonable to conclude that they are among the main challenges encountered by the producers of arabica coffee in Buhigwe and Kigoma districts.

Recommendations

The present study recommends that different stakeholders have to take actions that make coffee sector more profitable in the study area to improve the livelihood of the growers. This can be achieved through reducing taxes, improving

Table 4: Other challenges encountered in coffee production for 2011/2012 season (n=122)

Challenge	Respondents (%)
Extension services	71
Transportation	62
High interest rate to first installment	50
Payment delay	79
Unknown and unstable market of coffee	79

Conclusions

The results from the present study make it reasonable to conclude that coffee production is profitable and contributes significantly to household cash income. The mean gross margin per tree was TZS 730 which is a good indicator for sectoral profitability.

Coffee quality contributes highly to high price and hence household income. Therefore the present study conclude that increasing processing units (CPUs) is very crucial, otherwise smallholder coffee farmers will continue hearing about good coffee prices and not accessing them.

Crop production contributes much to household transportation, provision of disease-resistant varieties. Disease resistant varieties will reduce costs of agrochemicals and possibility of reduced quality due to heavy agrochemical applied. Also good husbandry practices, intensified extension services, access to credit including inputs and capital investment.

Second, it is recommended that initiatives that seek to increase access to capital for small holder coffee farmers need to be strengthened to enhance diversification and open up other opportunities like small business and animal keeping to avoid risks of crop failure. Also training to enhance skills and opportunities will enable farmers to do

better in non crop farming jobs.

Lastly, Farmers in Kigoma should be encouraged and facilitated to use CPU effectively. This could be one way of increasing household income and therefore reduce poverty among small holder coffee farmers in Kigoma region. The fact that about 50% of coffee was CPU processed gives a positive indication of quicker uptake quality improvement. The government and other coffee stakeholder have to make CPUs available to farmers.

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