

The Efficiency of Robusta Coffee Marketing Channels in Karagwe District, Tanzania

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ABSTRACT

The study assessed the marketing efficiency of Robusta coffee under different supply channels in Karagwe district of Tanzania. Cross-sectional research design as well as purposive, simple random and snow ball sampling techniques were used. Primary data were collected from 120 smallholder coffee farmers, 12 village traders and 8 key informants using semi-structured questionnaire and key informants interview schedules. Secondary data were collected from relevant coffee authorities' records and reports. Various empirical approaches in evaluating coffee marketing efficiency were applied including: assessment of marketing information system, barriers of entry into coffee market, marketing channels' costs and margins, conventional (simplified) marketing efficiency method and market concentration ratio measures. Farmers selling coffee to un-registered village buyers had the lowest marketing margins of 90.37% compared to those selling coffee to registered private buyers with 93.20% and 92.90% for Rural Cooperative Societies. The results from calculated market concentration ratios were 87.5% and 90.3% and the Herfindahl-Hirschman Index of 0.29 which denotes that the coffee market is highly concentrated on few buyers who control the price. Market information system was found to be asymmetric and the existence of bureaucratic coffee buying licensing system was also prevalent in the area. It was concluded that coffee marketing system in Karagwe district was inefficient thus reviewing the existing bureaucratic licensing system, dissemination of coffee marketing information through radios and mobile phones, restructuring of cooperative societies, introduction of formal credit facilities, and the establishment of more rural coffee buying posts to reduce transportation costs are recommended.

Key words: *Marketing channel; Marketing Efficiency; Market Concentration ratio.*

INTRODUCTION

Agricultural marketing is a vital mechanism to bring about poverty reduction through enhancing agricultural growth (Thamizhselvan and Murugan, 2012). This transmission mechanism depends on the efficiency of marketing system to ensure that the benefits of agricultural growth reach the poor. However, in the developing world

especially Africa, these mechanisms fail to realize the potential contribution of marketing to poverty reduction. There are two reasons for this. Firstly, inefficient allocation of resources often leads to market failure and little growth is achieved, thus only small dividends are distributed to the poor. Secondly, transmission;

mechanisms break down when people are socially excluded from participating in marketing activities (DFID, 2004). Due to this factor the performance of agricultural marketing has long been recognized by researchers, planners, and policy makers as a critical component in the development process together with the analysis of agricultural marketing which has been an on-going assignment for decades (Scott, 1995) as cited by Mushongi (2010).

In order to address the problems associated with agricultural marketing, the government of Tanzania undertook a series of substantial marketing reforms that started in the 1980s and 1990s as part of the process of Structural Adjustment Programme (SAPs). The reforms included liberalization of export crop markets with the view to promote competition and improve the efficiency of marketing channels (Kanaan, 2000). In August 1993, the government of Tanzania liberalized coffee market by opening coffee production and marketing to private agents (producers, traders, processors and exporters) along with the cooperatives to create a competitive marketing environment that could bring about competitive prices at all levels of the coffee marketing channel (URT, 2008). On an aggregate level, the coffee marketing system has become more diversified with the entry of the private sector. However, price transmission patterns have not yet reflected those of a robustly competitive marketing system (Mahdi, 2010). Thus, this study was undertaken to assess the efficiency of Robusta coffee marketing system in Karagwe district so as to determine due policies and regulatory changes required to enhance market competitiveness and equitable benefits to all coffee market actors in the study area. The study is built on the major two null hypotheses which state that;

Ho₁: Coffee farmers' marketing margins along the different coffee marketing channels in the study area are not statistically different.

Ho₂: coffee marketing system in the study area is not efficient.

Conceptual framework linking coffee marketing channel choice decision and marketing efficiency indicators

Figure 1 shows the conceptual framework that stems on the theory of utility maximization and rational choice within a probabilistic framework which states that; *ceteris paribus*, farmers are rational producers hence they are likely to choose the marketing channel that will enable them to minimize costs and maximize net returns/ profit (McFadden, 1981).

METHODOLOGY

The study was conducted in Karagwe District, one of the

eight districts of Kagera Region in the North-Western Tanzania. The district is the leading producer of Robusta coffee in Kagera region (TCB, 2012). The data for this study were collected from June 2013 to August 2013 followed by data analysis from September 2013 to May 2014. This study was carried out through a cross-sectional research design whereby data from household's respondents were collected at a single point in time period without repetition from the representative population. The study employed both judgmental/purposively, simple random and snow ball sampling techniques. In the first stage, purposeful sampling technique was used to select 6 villages from 5 wards which were among the leading producers of coffee in the study area as directed by the district agricultural and livestock development officer (DALDO). The villages include; Runyaga, Chanika, Katembe, Nyabwegira, Chonyonyo and Kamagambo. In the second stage, simple random sampling technique was used to select a sample size of 120 households, 20 from each village on the basis of proportionate sampling frame of 22 838 coffee growing households' population within 6 surveyed villages. A sampling frame is a list that identifies the target population (Kothari, 2004). The sampling frame for this study was obtained from (DALDO). Finally, a snowball sampling technique was employed to obtain 12 un-registered village coffee traders.

Field data collection involved two stages. The first stage employed checklist to interview 8 key informants such as district agricultural and livestock development officer (DALDO), Karagwe district coffee inspector, Karagwe district cooperative union (KDCU), Karagwe Estates Ltd (KEL) Karagwe development and relief services (KADERES), Tanzania coffee board (TCB), Tanzania coffee research institute (TACRI) and Maruku research institute (MARI) officers. In the second stage, a semi-structured questionnaire with both closed and open ended questions was administered to collect data from 120 coffee farmers and 12 village traders. Data were analyzed using descriptive statistics and quantitative analytical methods such as estimations of marketing channels' costs and margins, conventional (simplified) marketing efficiency method, the market concentration ratios and the Herfindahl-Hirschman Index (HHI).

Marketing margins (MM) analysis

This study carried out gross marketing margin percentage analysis in order to make comparison of prices received and costs incurred by farmers along different coffee marketing channels in the study area as applied by Tesfaw and Alemu (2013).

$$GMM = \frac{\text{Selling Price} - \text{Marketing costs}}{\text{Selling Price}} \times 100 \quad (1)$$

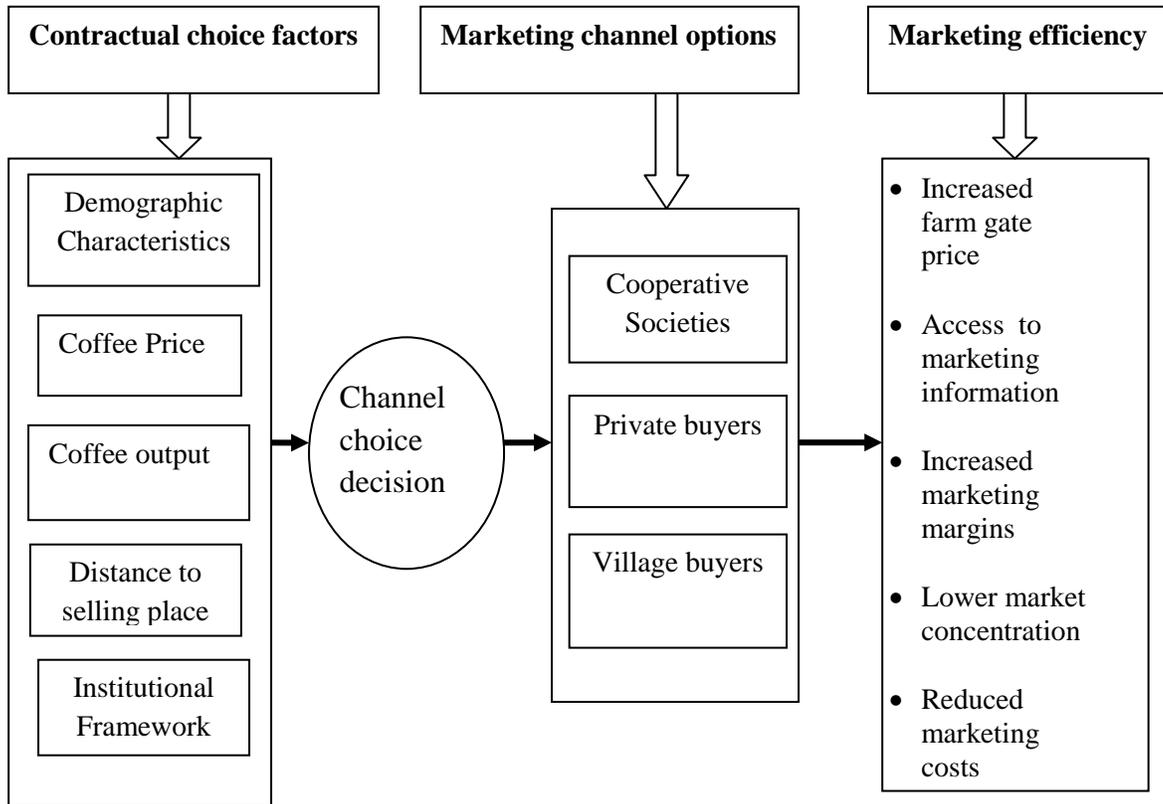


Figure 1: Conceptual framework of the study

Estimation of marketing efficiency

Marketing efficiency measures the extent to which the price increment is just high enough to cover the cost of marketing a product (Scarborough and Kydd, 1992). This study evaluates marketing efficiency using a conventional (simplified) method as applied by Anyaegbunam and Nto (2011).

$$\text{Marketing efficiency (ME)} = \frac{\text{Gross Marketing Margin}}{\text{Total Marketing cost}} \dots\dots\dots (2)$$

Measurement of market concentration ratio (CR)

Market concentration ratio is a measure that is used as a proxy for the level of market competition (Holck, 2010). This study used concentration ratio of four and five largest firms (CR4 and CR5) due to their ability to capture structural features of a market competition (Kloosterman, (HHI) 2011). was also applied so as to reduce serious

Alternatively, the Herfindahl-Hirschman Index

shortcomings that may be associated with using a single measure.

Market concentration of four/ five biggest firms (CR4 and CR5)

The market concentration ratio is the percentage share of volume of commodity handled by the few largest firms, usually four or five (CR4 or CR5) to the total volume handled by all firms in the market (Kabungo, 2008). Market concentration ratio can be computed as follows:

$$C = \frac{LV}{TV} \times 100 \dots\dots\dots (3)$$

Where:

- C = Concentration ratio
- LV = Volume of coffee (kg) purchased by four or five biggest buyers (CR4 or CR5)
- TV = Total volume of coffee (kg) marketed by all 14 buyers in the study area.

As a rule of thumb, a ratio approaching 100% denotes a pure monopoly market, while a ratio approaching 0%

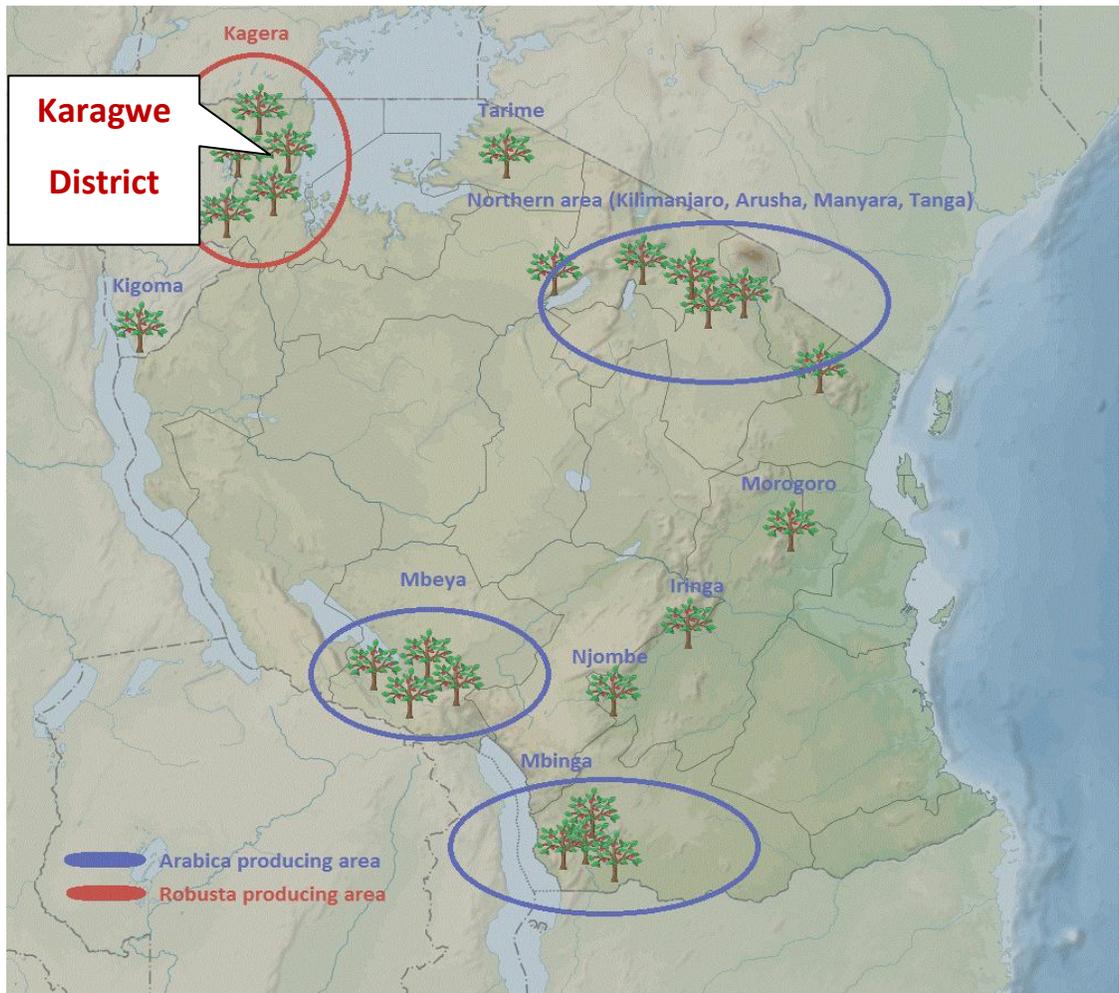


Figure 2: A map of Tanzania showing main coffee producing areas

denotes a perfectly competitive market. Whereas, a ratio of 50% or more is an indication of a strong oligopolistic industry, a ratio ranging between 33%-50% indicates a weak oligopoly, and less than that, implies an unconcentrated industry (Kohls and Uhl, 1990).

Concentration Ratio using The Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman Index (HHI) was estimated by squaring the market shares of 14 buyers in the coffee market and then summing their resulting values.

$$C_i = \sum_{i=1}^r S_i^2 \dots\dots\dots (4)$$

Where: C = Coffee market concentration ratio
 Si = sum of the squared market share of ith coffee buyer and
 r = the number of largest coffee buyers (which were 14 buyers).
 As a rule of thumb, the Herfindahl-Hirschman Index (HHI)

above 0.18 indicates a highly concentrated market, between 0.10 and 0.18 denotes a moderately concentrated and below 0.10 implies an unconcentrated market (Modern Business Analysts, 2011).

RESULTS AND DISCUSSIONS

Organization of Coffee Marketing System in the Study Area

Table 2 presents the main coffee marketing channels identified in Karagwe district. The findings show that some of respondents (46.7%) sell their dried coffee cherries to the registered private coffee buyers' posts (PCBs) or through their commission agents who collect coffee from farmers' households (homestead) while other respondents (35%) sell their coffee to the rural primary cooperative societies (RPSs) which are the agents of the Cooperative Union (KDCU). The rest of the respondents



Figure 3: Participatory group discussion with coffee farming household in the study area

(18.3%) sell their coffee to un-registered Village buyers (*abayeki*) who buy coffee at farmers' homestead then resale it either to the registered private coffee buyers (PCBs) or to rural primary cooperative societies at higher price. In some instances, Village buyers pay farmers a few months before coffee harvest (forward sale) with condition that farmer is obliged to sell to them certain portion of coffee produce (*Obutura*) at a prior-agreed price.

Fig. 4 depicts the patterns of coffee marketing channels in the study area commencing from the household level to various destinations particularly at the coffee auction operated by TCB. According to the existing literature (Gabagambi, 2011), a portion of Robusta coffee produced in Karagwe district is often smuggled to Uganda where it is assumed to be sold at relatively higher price.

Coffee Farm Gate Prices with respect to different marketing channels

Table 1 indicates that respondents sold their coffee at varying prices. It was remarkable to observe a wide range of coffee farm gate price between farmers selling in different market channels (TShs 500-TShs 1 300 per kg). This is due to the fact that village buyers often purchase 10 buckets of Wet coffee beans each of 20 kilogram at a price between 40 000 and 65 000 TShs. After drying 10 buckets of Wet coffee beans they remain with 7

buckets of dried cherry coffee each weighing about 12 kilograms. Thus, 7 buckets of dried cherry (7 x 12) is equivalent to 84 kilograms. By dividing the average price paid for 7 buckets of dried cherry (40 000 – 65 000 TShs) to the average weight of 7 buckets (84 kilograms) it results to 500-750 average TShs per kilogram.

Accessibility to Coffee Marketing Information in the Study Area

The performance of any agricultural industry depends largely on how well and efficiently is supported by agricultural marketing information (Mawere, 2008). Fig. 3 depicts various types of information received by coffee farmers associated with coffee marketing in the study area. Fig. 5 presents various sources from which coffee farmers in the study area receive various information pertaining to coffee marketing. Therefore from the results in Fig. 5 and 6, it could be concluded that the asymmetric of marketing information was among institutional challenges facing smallholder coffee farmers in the study area. This situation is likely to reduce their efficiency (increase costs) in marketing their coffee in the prevailing liberalized economy

Barriers to Entry into the Coffee Market in the Study Area

A barrier to entry into a market reduces the threat of

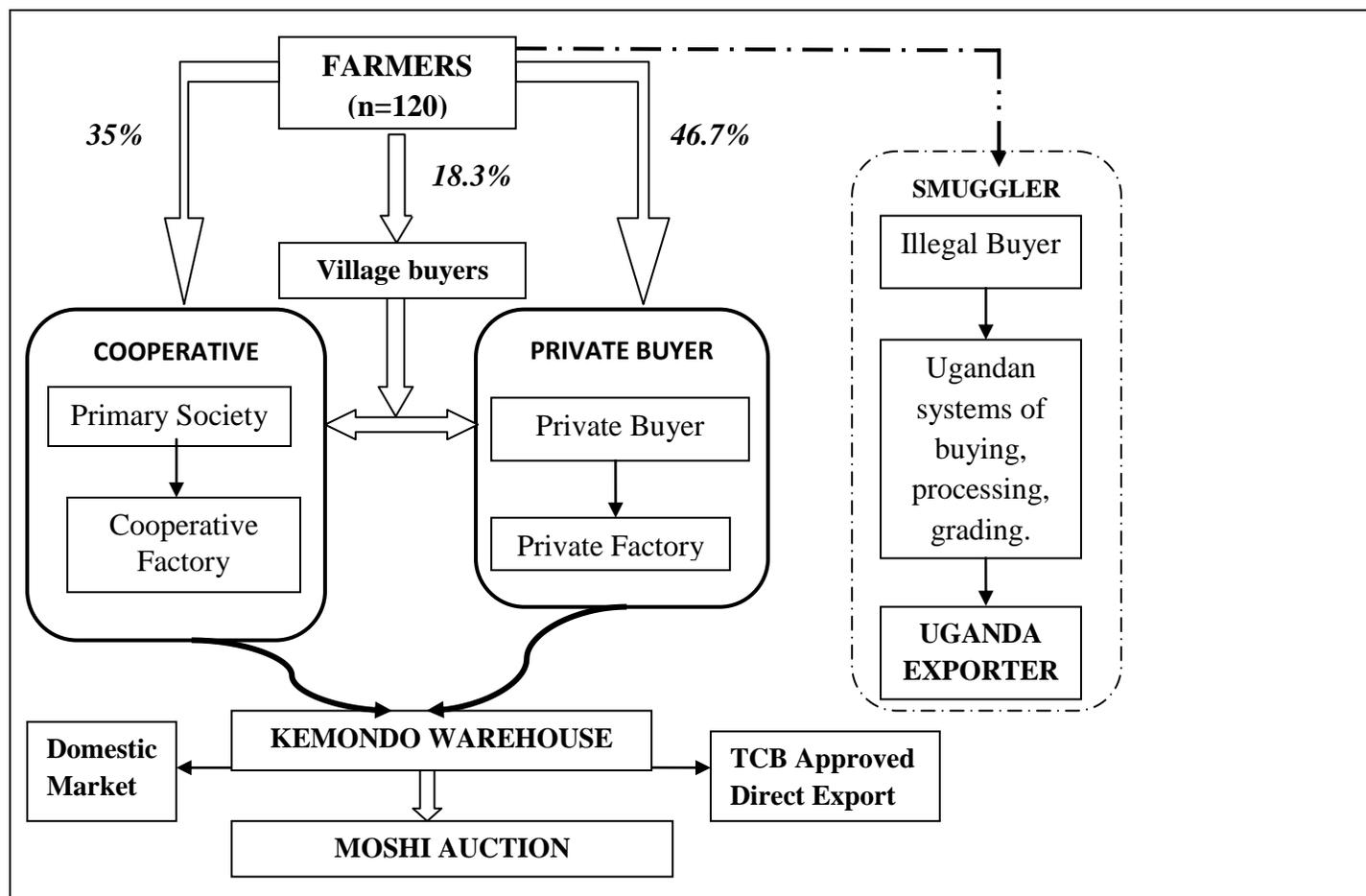


Figure 4: The patterns of coffee marketing channels in the study area

potential competition and therefore impedes marketing efficiency (Eskola, 2005). During 2012/2013 coffee marketing season, the Karagwe district council passed about 20 market entry and conduct requirements to be complied by any new trader who wants to invest in coffee market. Failure to adhere to these regulations would lead into the withdrawal of coffee license and fine payment. In addition, there was a bureaucratic licensing system and overregulation (e.g. several checkpoints) into coffee marketing. These acted as disincentives and created uncertainty to new entrants due to shortage of capital/credit facilities for purchasing coffee in the peripheral villages, payment of district cess/levies (5% of farm gate price per kilogram), transportation costs and construction of warehouses. Thus, it can be concluded that strict entry requirements into the coffee market was the most significant institutional challenge that acted as a major barrier to business expansion and therefore impeded competition in the study area. This was empirically proved by the existence of high market concentration

ratio (CR) of 87.5% and 90.3% as well as the Herfindahl-Hirschman Index of 0.29.

Market Competition in the Coffee Industry in Karagwe District

This study used structural measures of market concentration such as market concentration ratio for the largest four and five buyers (CR4 or CR5) and the Herfindahl-Hirschman Index (HHI). This is due to their ability to capture structural features of a market and linking marketing concentration to competition (Holck, 2010). The results in Table 2 and 3 show that the coffee marketing system in Karagwe district is highly concentrated with CR4 and CR5 of 87.5% and 90.3% respectively and the Herfindahl-Hirschman Index of 0.29. These results imply that the coffee marketing system in Karagwe is characterized by strong oligopsonistic behaviours which impede marketing price competition and consequently restrains marketing efficiency.

Coffee Marketing Channel					
Price of Coffee (TShs/kg)	Cooperative	Private buyers	Village buyers	Total	%
	0	0	19	19	15.8
500	0	9	2	11	9.2
750	3	2	0	5	4.2
900	0	7	1	8	6.7
1000	19	6	0	25	20.8
1100	4	0	0	4	3.3
1150	15	13	0	28	23.3
1200	1	8	0	9	7.5
1250	0	11	0	11	9.2
1300					
Total	42	56	22	120	100

Table 1: Coffee Farm Gate Prices with respect to different marketing channels

Marketing Costs, Margins and Marketing Efficiency across Marketing Channels in the Study Area

Studies on marketing costs and margins are important, for they reveal many facets of marketing and the price structure, as well as the efficiency of the system (Dastagiri *et al.*, 2010). Table 4 presents coffee marketing costs, margins and marketing efficiency analyses at farm level due to failure of obtaining the marketing costs incurred by coffee buyers in the study area despite of repeated humble requests. Marketing margins percentages and efficiency were computed where channel II indicated higher margins of (93.20%) compared to (92.90%) and (90.37%) for channel I and III respectively. Similar results were obtained for higher marketing efficiency in channel II (13.70), followed by channel I (13.08) and lowest in channel III (9.38). These results imply that the respondents who sell coffee through Village buyers (channel III) are paid lower price not sufficient enough to cover their total marketing costs as compared to their counterparts who sell coffee through private buyers' and cooperative societies' channels.

CONCLUSION AND RECOMMENDATIONS

The study hypothesized that *"coffee farmers' marketing margins along the different coffee marketing channels in the study area were not statistically different"*. The

analysis revealed that coffee producers selling coffee through private buyer (channel II) recorded higher marketing margins percentage of 93.20% followed by 92.90% for the farmers selling coffee through cooperative society (channel I) and lastly 90.37% by farmers selling coffee through Village buyer (channel III). Thus, the study results showed sufficient empirical evidence to reject the null hypothesis (Ho1).

Secondly, it was further hypothesized that *"coffee marketing system in the study area was not efficient"* The analysis indicated that coffee farmers selling coffee through Village buyers characterized by lower marketing efficiency measure (9.38) compared to those selling coffee through private buyer (13.70) and cooperative society (13.08). Moreover, the study found that the coffee market concentration in Karagwe district measured 87.5% and 90.3% concentration ratios and the Herfindahl-Hirschman Index (HHI) of about 0.29. According to the established rule of thumb, these values characterize the highly concentrated market with few dominant traders who often tend to exercise oligopsonistic behaviours which impede marketing price competition and thereby suppressing the bargaining power of coffee sellers (farmers). In that respect, there was adequate evidence to fail to reject the null hypothesis (Ho2).

The study concludes that coffee marketing system in the study area is inefficient thus; it recommends the reviewing of the existing bureaucratic licensing system to

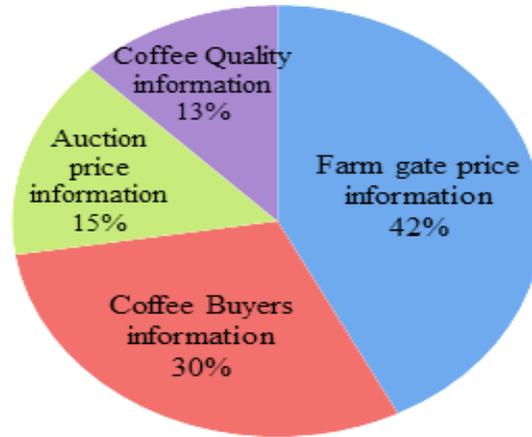


Figure 5: Typology of marketing information accessed by coffee farmers in the study area

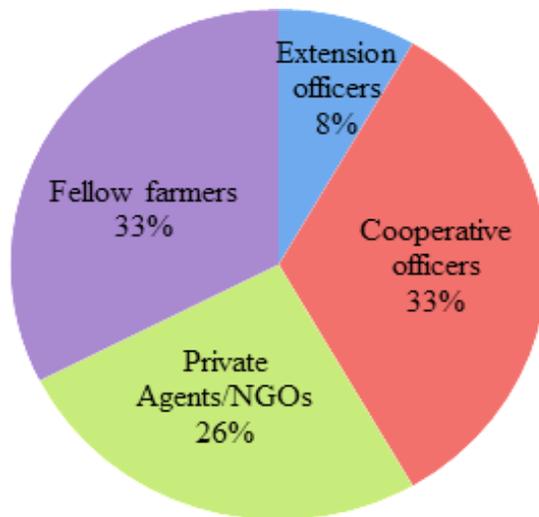


Figure 6: Sources of Marketing Information in the study area

encourage freer entry of more coffee buyers in the coffee market in Karagwe district, which will reduce market concentration, promote price competition and consequently widen marketing opportunities to coffee farmers. In addition, the study recommends the dissemination of coffee marketing information through radios and mobile phones, restructuring of cooperative societies so as to check corruption, delay of payments, measurement malpractices and unfair deductions; the introduction of formal credit facilities such as Savings and Credit Cooperative Societies (SACCOs) and Village Community Banks (VICOBA) to provide favourable credits to farmers and stop them from selling coffee unprofitably, and the establishment of more rural coffee buying posts to reduce transportation costs. However, the study recommends further comparative research to find out the economical and technical reasons to why some coffee farmers and traders

in Karagwe district smuggle Robusta coffee into neighbouring countries particularly Uganda. This will help to improve the marketing efficiency of Robusta coffee in Karagwe District and Tanzania as a whole.

Constraints /Limitations of the Study

Primary data used in this study were obtained mainly through interview with coffee farmers and traders. Unfortunately, the replies of most respondents were liable to errors due to inadequate knowledge, faulty memory, or untruthfulness. Also, some respondents were reluctant to provide sensitive details such as coffee output sold and income earned, while some respondents particularly traders were reluctant to give data on quantity purchased and income generated fearing for higher taxation. These problems were reduced by appealing to village officials to

Table 2: Market concentration ratio results

Buyer category	Volumes of Coffee	Market Share	Percentage Market Share
Big 4 coffee buyers	(kg)		(%)
KEL	23967015	0.48115	48.1149
KDCU	8470018	0.17004	17.004
OLAM (T)	6478413	0.13006	13.0057
EXPORT TRAD.	4657777	0.09351	9.3507
Total			87.48
Big 5 coffee buyers (CR5)			
KEL	23967015	0.48115	48.1149
KDCU	8470018	0.17004	17.004
OLAM (T)	6478413	0.13006	13.0057
EXPORT TRAD.	4657777	0.09351	9.3507
IRON (2011)	1404999.15	0.02821	2.8206
Total			90.2958

Table 3: The Herfindahl-Hirschman Index (HHI) results

Coffee buyer	Kilograms (kg)	Market Shares	Squared Market shares
KEL LTD	23967015	0.4811	0.232
KDCU LTD	8470018	0.1700	0.029
OLAM (T)	6478413	0.1301	0.017
EXPORT TRADING CO.	4657777	0.0935	0.009
IRON (2011) LTD	1404999.15	0.0282	0.001
ASU	1274046	0.0256	0.001
KADERES	1085543	0.0218	0.000
AMRI AMIR	842674	0.0169	0.000
SISLI LTD	731590.85	0.0147	0.000
NKWENDA	326265	0.0065	0.000
KAKAMA	259564	0.0052	0.000
NGUVUMALI	230000	0.0046	0.000
KARAGWE AGR.TRADERS	81000	0.0016	0.000
KYERWA COFFEE PRODUCERS	3156	0.0001	0.000
Total	49 812 061	-	0.289

Table 4: Marketing costs, margins and efficiency at farm level during the 2012/13 marketing season

	Marketing variable	Channels		
		I Cooperative	II Private buyers	III Village buyers
A	Farm gate price (TShs/kg)	1130	1180	500
	Marketing Costs (TShs/kg)			
B	Plastic Sheet	22.26	22.26	22.26
C	Packing sacks	21.43	21.43	21.43
D	Tel-communication costs	4.46	4.46	4.46
E	Transport to buying posts	15.65	15.65	N/a
F	Weighing charges	16.47	16.47	N/a
G	Total marketing costs (TShs/kg)	80.27	80.27	48.15
H	Marketing margins (a-g)	1049.73	1099.73	451.85
I	Marketing margins percentage (h/a) x 100)	92.90	93.20	90.37
J	Marketing Efficiency by			
	Conventional method (h/g)	13.08	13.70	9.38

Note: N/a = Not applicable; because farmers sell coffee at homestead where they neither incur transportation costs nor weighing charges.

persuade the respondents that the information required was meant for research purposes only and not otherwise. Moreover, convention of measurement units was also a problem since some farmers and traders used local coffee measurement units called “akabafu”, “endoo” and “edebe” which were not standardized. Hence, estimations were to be made to convert local units into standard units such as kilograms.

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