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Market Cost Factors Affecting Marketing of Small Holder Coffee Producers in Rwanda

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Abstract: ***Coffee is the world's most consumed drink next to water and second most traded commodity to oil. It is first GDP earner and employs over 65% in Rwanda. Coffee production is dependent on various factors. This study examined market cost factors affecting small scale coffee production in Nyaruguru district, Rwanda. The establishment under study was small-scale coffee farmers in Nyaruguru District. A multi stage sampling techniques were employed to select respondents. Primary data was collected using structured questionnaire where as secondary data included review of reports and publications. The sample size was 194 respondents and data analysis comprised both qualitative and quantitative using econometric models and descriptive statistics. The key findings from the study revealed that the cost of transportation, distance to road, distance to coffee washing station and revenues from coffee production statistically affected market access of coffee producers at 5% significant level. As recommendations, Ministry of Agriculture and Animal Resources, Stakeholders and Cooperative societies involved in coffee value chain need to improve the variables that affected market access in the study area.***
Key words: Marketing costs, coffee production, small scale farmers, Nyaruguru District, Rwanda

I. BACKGROUND OF THE STUDY

Coffee production in Rwanda dates back to 1904 with its first export occurring in 1917 (Boudreaux & Ahluwalia, 2008). Since its introduction into Rwanda, coffee has played an important role in the economic development of the country. For many years, coffee has been the major source of foreign currency in Rwanda (Elder, Zerriffi, & Le Billon, 2012). Coffee in Rwanda is commonly produced in all provinces of Rwanda but high production is found along the shores of Lake Kivu in the western part of the country, as well as in the central and southern provinces of the country (Rukazambuga, 2008). Coffee is one of Rwanda's most important official sources of foreign exchange and an important source of income among smallholder farmers approximately 500,000 smallholder farmers grow Arabica coffee on a total area of 33,000 ha, each owning less than one hectare of land (OCIR-Café, 2008). Rwanda posses excellent agro-ecological conditions for cultivation of Arabica coffee of bourbon and typica species (Issa, 2014). According to statistics from the National Agricultural Exports Board (NAEB), in 2014 Rwanda fetched $59.68 million from coffee exports, up from $54.9 million in 2013 from an annual coffee production between 18000T to 21000T per year. According to USAID, approximately 50,000 rural households have seen their incomes from coffee production more than double, and some 2,000 jobs have been created in coffee-washing stations as a result of the reforms. Coffee growing is mainly a smallholders" activity. Smallholders are mainly poor people who work in small and fragmented plots, other actors in the sector include private traders, hulling and exporting companies, government institutions.

Coffee is the greatest share of the exports, by accounting for 60 percent of Rwandan coffee exports (Mutandwa et al., 2009).Rwandan government in order to improve coffee production in terms of quantity and quality, farmers are encouraged by the government to form and join cooperatives so that they can increase their bargaining power and earn higher prices for their produce. Cooperatives are established for multiple purposes.

They are involved in the provision of services to growers, accessing and managing inputs and monitoring their use; and production of high-quality coffee through processing at washing stations. Though coffee farming has been an important economic activity in Rwanda contributing in creation of employment, income earning to about 45% of the country's population and in earning foreign exchange (Chiuri & Taku, 2015). However coffee sub sector is faced with challenges in its marketing and production like absence of long-term vision and global market knowledge, low skills, minimal technology adoption and a lack of coordination among actors along the value chain, insufficient quantities of coffee cherries to attract significant demand from off takers, inadequate quality of coffee to attract a premium price from global buyers. According to statistics from the National Agricultural Exports Board (NAEB),

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in 2014 annual coffee production between 18000T to 21000T per year was produced which is below the target levels of 28000-34000 tons by 2014.

The low production levels is thought to be contributed to factors that affected small scale farmers such as marketing factors, financial factors, government policies, physical and human factors (Gathura, 2013). However different scholars have contradicting views on factors affecting production of coffee producers like demographic factors, social economic factors and environmental factors (Namwata, Mzirai, & Lwelamira, 2010).This conducted to confirm which of the above raised factors affect production. Therefore, the study was to fill this gap by assessing the factors which has perennially hindered farmers from realizing optimal production potential.

II. EMPIRICAL STUDIES

According to Ferris et al. (2014b), there are numerous marketing factors that affect performance of coffee production including market location, access to infrastructure, agricultural services, organization of the farming community, limited information on the coffee market and existing member associations are structurally weak to act as feedback mechanism to farmers. The inspection, grading and auction sale of coffee is located very from the supply centers at only two central places. Thus, it has been many times criticized for being highly centralized and located far apart from the major producing areas, with little improvements from time to time. The central market is entirely auction based which have several drawbacks. Some of these are warehousing problems, improper sampling and quality inspection, problems associated with brokers and suppliers, poor processing, high transportation cost, inadequate coffee market financing and unfair distribution of marketing margins (Gabre-Madhin, 2012).

A study was conducted on finding out the determinants of coffee production in the Kenyan economy Kuguru (2016), he used a Nerlovian model to estimate supply response of coffee to these determinants and found out that there was appositive relationship between price and coffee 7 output, output and rainfall, output and hectare planted and coffee output and price of input. High transaction costs, relate to the lack of sufficient market coordination between buyers and sellers, the lack of market information, the lack of trust among market actors, the lack of contract enforcement, and the lack of grades and standards, implies that buyers and sellers operate within narrow market channels, that is, only those channels for which they can obtain information and in which they have a few trusted trading partners (Meijerink, Alemu, van der Mheen-Sluijer, & Wijnands, 2010).

Markets are good for efficiency, and much progress has been made in market development, especially under private sector leadership (WBR, 2008) cited by (Girma Nigussie, 2011). However further efficiency gains will need public sector support to bring the necessary public goods, foster institutional innovation, and secure competitiveness. With this fact, the ECX market operation do not always secure socially desirable outcomes, complementary polices are often needed to ensure smallholder participation. A huge need remains to improve the performance of the marketing systems in smallholder sector.

Public investments to expand access to rural infrastructure and services-such as rural roads and transport services, physical markets, telecommunications, and electricity- will be essential to reducing transaction costs and physical losses and to enhancing transparency and competitiveness in traditional markets (WBR, 2008) adapted by (Girma Nigussie, 2011).

III. METHODOLOGY

A. Research Design

Kikwasi (2013), defines research design as the scheme, outline or plan that is used to generate answers to research problems. It is an arrangement of conditions of data collection and analysis. The study embraced a cross section survey design to examine factors behind the marketing of coffee production. It employed the use of interviews and administration of questionnaires to a sample of individuals in Rwanda. The study used both primary and secondary data.

B. Study Area

The study will be done in the Southern province of Rwanda. The southern province is identified as one of the biggest producers of coffee in the country. Nyaruguru district will be chosen among others because it is ranked the first district affected with coffee plantations.

C. Target Population

The target population for the study were all the small scale coffee producers in Rwanda, due to their large number in different regions of the province. Nyaruguru district was selected as the accessible population since all the coffee producers there produce in small scale. The accessible population will be 194 coffee farmers out of 380 coffee producers.

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D. Sampling Techniques

The sampling was done using the purposive simple random sampling where by the district was selected based on the fact that it is first district producing coffee in southern district, and finally a proportionate random sampling technique was done to select respondents that is farmers were having equal chances of selection. The list of total household heads in the selected sectors was obtained from the sector office and coffee industry. Using the formula of (Kothari et al., 2008).The sample size was determined based on number of coffee farmers.

E. Instruments of Data Collection

The data was collected using questionnaires, interview schedules and focus groups. The questionnaires was prepared and administered on respondents by the researcher through face-to face method. The questionnaires was both open ended and closed questions included marketing cost factors and production cost factors. Data collection was using a questionnaire through a face-to-face interaction ensured that the questionnaires was filled by the right people (coffee farmers).The questionnaire interview was conducted by the researcher and enumerators trained for the purpose.

F. Data Processing and Analysis

The questionnaires collected, they scrutinized to ensure that they are dully filled and consistent. They then numbered and checked to see that all the items was answered according to instructions in order to reduce errors and maintain the validity of the data. The researcher analyzed the quantitative data by tallying the responses of the close ended questions. The data was coded and entered into the computer for analysis using SPSS and STATA version 13. It presented in the form of tables. The collected data was carefully analyzed quantitatively and qualitatively and presented in form of frequency, percentages and tables for ease of presentation and discussion. The study adopted the ordinary least-squares (OLS) model and descriptive design. The reason for choice of OLS is that, it's a linear modeling technique used to model multiple explanatory variables. Therefore, it well fitted this study in that it could relate the dependent variable Y (coffee production) with its independent variable Xi (factors of coffee production).

IV. RESULTS AND DISCUSSIONS

In this sub-section we analyzed the factors influencing marketing costs affecting coffee marketing among small scale coffee producers in Nyaruguru district using a multiple linear regression model through ordinary least square. In order to identify factors affecting marketing costs affecting coffee marketing among small scale coffee producers we run OLS regressions.. The results from OLS revealed that only four factors such as cost of transportation, distance to road, distance to coffee washing station and revenues from coffee production were statistically significant the marketing factors affecting coffee production at 5% significant level.

Results in table 1 indicated that cost of transportation was statistically significant the marketing factor affecting the marketed coffee production at 5% level of significance. The analysis of OLS (Table 1) for the regression analysis yielded an F-value of 23.6367, with a p-value of 0.000, indicating that the model was statistically significant even at the 5% level. The coefficient of determination (R^2) was 0.6831, meaning that approximately 68.31% of variability of the dependent variable (yields) was accounted for by the explanatory variables in the model. Thus the regression model was adequate since in determining model adequacy, features such as the R^2 and the F-value are observed (Gujarati, 2007) cited by (Minai et al., 2014).The remaining 32.69% could be due to measurement errors or factors not accounted for in the model such as soil and climatic factors.

Increased transportation cost reduces the probability of quantity supplied to markets as well as the number of participants attended the markets. Unexpectedly in our study findings, the results indicated positive relationship between cost of transportation and quantity of coffee produced. One unit increased to cost of transport, the expected quantity of coffee production shifted to 0.75 percent of coffee and our findings are similar to the results of Aragie (2018) in their study on identification of opportunities for value chain development in the Kenyan coffee sector by adoption of a modeling approach.

The results in table 1 also indicated that distance from farm to nearest road was statistically significant the marketing factor affecting the marketed coffee production at 5% level of significance. Unexpectedly, distance to the main road had a positive relationship between coffee production and significant influence on coffee production, given that proximity to good roads can reduce the cost and difficulty of transporting produce to market. Each additional kilometer from the household to the main road increases the probability of producing coffee by 53.85 percent, which may also be a result of easier access to farm inputs such as seeds and fertilizer and our findings are supported by the results of Tunde and Adeniyi (2012) in their study of impact of road transport on agricultural development: a Nigerian example.

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In addition, the results in table 1 also indicated that distance from farm to coffee washing station was statistically significant the marketing factor affecting the marketed coffee production at 5% level of significance. Unexpectedly, distance to nearest coffee washing station had a positive relationship between coffee production and significant influence on coffee production, given that proximity to nearest coffee washing station can increase the number of coffee produced by small scale coffee producers. Each additional kilometer from the household to the coffee washing station increases the probability of producing coffee by 29.04 percent, which may also be a result of easier access to physical infrastructures like coffee washing stations, storage and other farm inputs needed for coffee production like seeds, fertilizer and pesticides and our findings are supported by the results of Mitiku, de Mey, Nyssen, and Maertens (2017) in their study on comparison of different coffee certification schemes in Ethiopia.

Results from OLS model showed that revenues from coffee production were statistically significant the marketing factor affecting the marketed coffee production at 5% level of significance. Revenues from cash crop like coffee production is expected to serve the farmer to purchase the inputs like fertilizers, pesticides and to pay additional transactional cost like labor cost accrued in coffee production. Expectedly, there is a positive relationship between revenues from coffee production and coffee production and one unit increase in revenues increases the coffee production by 0.04 percent of the harvested coffee in the study area (Maniriho & Bizoza, 2013).

Table1: Marketing cost factors affecting coffee marketing

Total coffee production	Coef.	Std. Err.	T	P>|t|
Coffee profitability	-164.118	147.614	-1.11	0.271
Price of coffee	-5.181	3.653	-1.42	0.162
Cost of transportation	0.075	0.007	10.87	0.000*
Distance to road	5.385	2.398	2.25	0.029*
Distance to coffee washing station	2.904	1.360	2.13	0.037*
Distance to financial institution	-0.638	0.486	-1.31	0.195
Revenues from coffee production	0.004	0.000	17.17	0.000*
Revenues from other crops	0.000	0.000	-0.14	0.893
Revenues from Livestock	0.000	0.001	0.52	0.603
Revenues from off farm activities	0.000	0.000	1.51	0.138
_cons	1450.396	979.232	1.48	0.144

Sample Size =64; Wald Test=141.8201 | P-Value > Chi2(6) = 0.0000; F-Test= 23.6367| P-Value > F(6 , 57) = 0.0000; (Buse 1973) R^2= 0.7133 | Raw Moments R^2= 0.8388; (Buse 1973) R^2 Adj =0.6831 | Raw Moments R^2Adj=0.8218; Root MSE (Sigma)=241.4506 | Log Likelihood Function = -438.2520

V. RECOMMENDATIONS

To enlarge the income based on agricultural activities and the sources of cash, farmers should be encouraged to diversify by having other enterprises such as dairy, bananas and macadamia as income generating enterprises after coffee production. The government should also endeavor to have at least one coffee extension officer per sector to cover the entire district to enhance provision of coffee extension services as well as to boost the coffee production at district level and the country s whole. The government needs to streamline provision of credit to make it accessible.

It is further recommended that the Rwandan government should enhance market policy strategies enabling farmers to gain higher returns from the costs of producing coffee. To strengthen this policy, there is a need to focus on building/availing feeder roads in all agricultural regions in order to help farmers easily access markets and financial institutions. It is also recommended to policy makers to design policies of facilitating farmers to regularly have access to market information so that they could sell their produce when market prices are advantaging.

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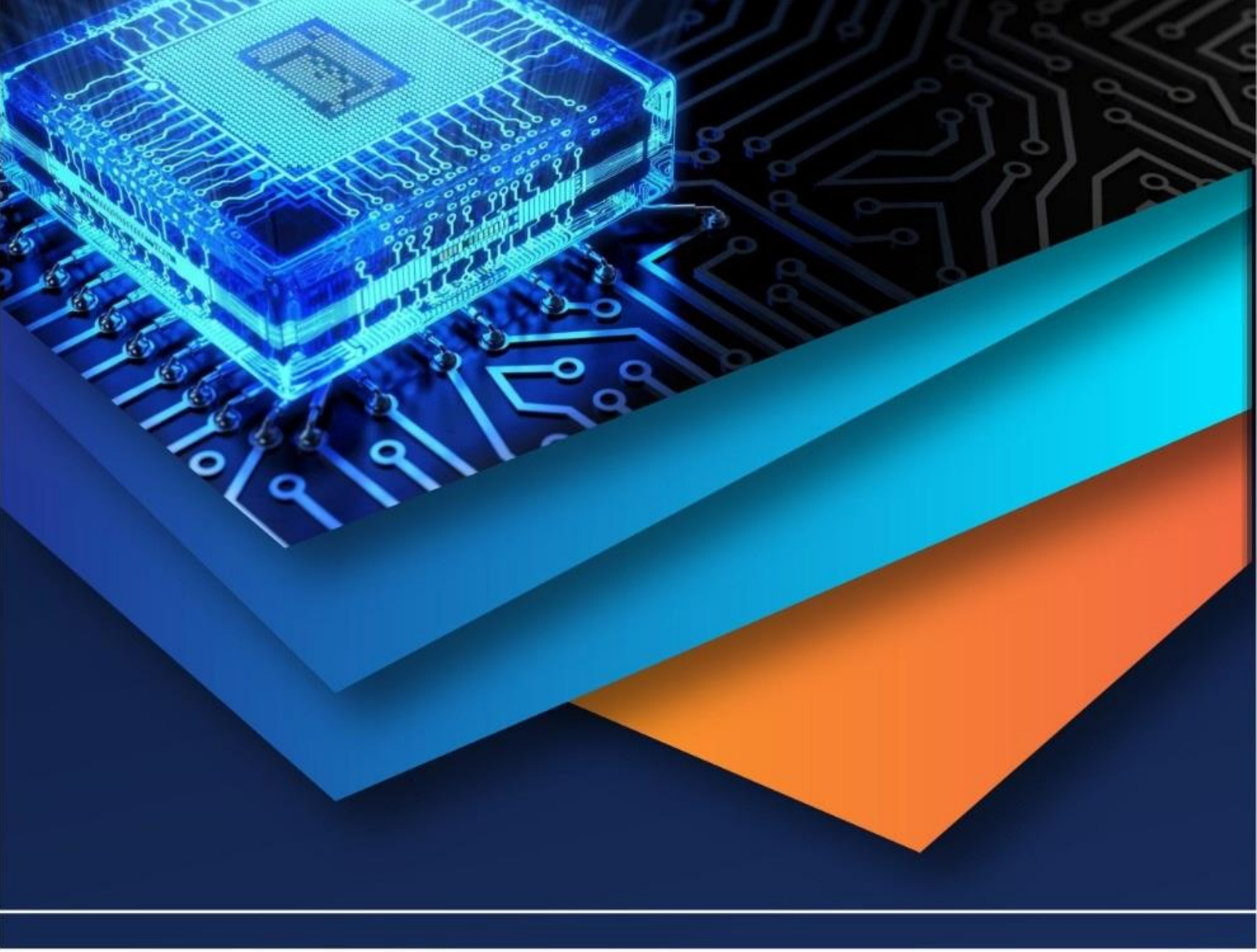
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