



Influence of Online Apps in Fostering Agri-Enterprise Development along the Agricultural Value Chain in Kenya

Joram Ngugi Kamau^{1*} and Patrick Mutwiri Karitu²

¹Lecturer, Department of Agricultural Economics and Agribusiness Management; Egerton University-Kenya.

²Lecturer, Department of Agribusiness Management and Agricultural Education; Chuka University-Kenya.

ARTICLE INFO

Article history:

Received: 20210801

Received in revised form: 20210815

Accepted: 20210815

Available online: 20211015

Keywords:

Agricultural enterprises ;

Online applications;

Multinomial logistic regression.

ABSTRACT

This paper analyzed how the sampled farmers use online applications to exploit the opportunities along the agricultural value chain. More specifically, the study considered how access to digital credit, online market platforms, youtube tutorials and the social economic characteristics of the sampled farmers influence their agri-enterprise development at the various stages of the agricultural supply chain. Multinomial logistic regression was employed as the regress and was a categorical variable consisting of three mutually exclusive choices. The study identified gender, online tutorials and household income as the key variables towards the development of different agricultural enterprises along the agricultural supply chain. With agricultural processing reporting the highest audience in the online tutorials, value addition of agricultural produces would be a milestone in agricultural industrialization. While the multiplier effect of value addition cannot be underestimated, the direct impact of this is a catalyst towards a turnaround investment in agriculture and agricultural technological innovations.

2021 Sciforce Publications. All rights reserved.

*Corresponding author. E-mail: ngugij88@gmail.com

Introduction

According to Okello (2017), agricultural enterprises (agri-enterprise) are businesses which derive most of their revenue from agricultural based activities either directly or indirectly and they include; farmers, individual traders, shops and kiosks, brokers, processors, marketers and input firms among others. With the advancement in technology and intelligence based production techniques, the survival of agriculture in Kenya relies on how actors will integrate modern technologies in the entire value chain.

Agribusiness innovations in Kenya are emerging albeit marred by various challenges. Like any other enterprises, entrepreneurs in the agricultural value chain find challenges in accessing capital to venture into marketing and value addition of agricultural commodities. A study by Okirigiti and Raffey (2015) on entrepreneurship challenges in Kenya found that one of the major challenges towards innovations is the start-up capital. Such capital would be expected to come in the form of a loan. Mwangi and Ouma (2012) notes that to qualify for a loan in a commercial bank in Kenya, one needs collateral or a pay slip from a reputable

organization where one needs to have worked for a minimum of six months.

In the adoption of digital credit, the perceived ease by borrowers in accessing credit as opposed to traditional methods has increased the rate of borrowing. The time involved before getting a loan from a commercial bank has also acted as a catalyst to drive thousands away. Banks in Kenya often require the borrower to offer them security and have a sound financial record as an assurance that they will be able to service the loan if granted (Gichukiet *al.*, 2014).

For agri-enterprise development in the country, startup capital is a prerequisite. Accessing this has been revised through digital credit where no collaterals and securities are required. The obstacles towards accessing loans have been minimized through digital lending and therefore providing lucrative opportunities for the youths who previously had been disadvantaged when accessing loans due to lack of collaterals and other securities.

Social media and online platforms have captured the youths by blast where millions engage without realizing the potential of this blossoming sector. Facebook, twitter, whatsapp, youtube and other online platforms provides an easy market for both raw and final agricultural products. A study by Kibet *et al.*, (2018) indicates that over 2 million youths Kenya have access to online platforms at the palm of their hand on a daily base.

This study conceptualized agri-enterprise development at two stages in the agricultural value chain; marketing/broker and value

addition/processing. Marketing in this study was conceptualized as the process in which the individuals link the producers with the final consumers of agricultural products. In other words, these stakeholders are deemed to create a career from buying the raw produces from the farmers and selling the same product to the final consumer in the value chain. Processing was conceptualized as any action that increases the value and the shelf life of raw agricultural products

Conceptual Framework

This describes how credit access, online marketing, YouTube tutorials, and the social economic characteristics of the youths influence enterprise development along the agricultural value chain.

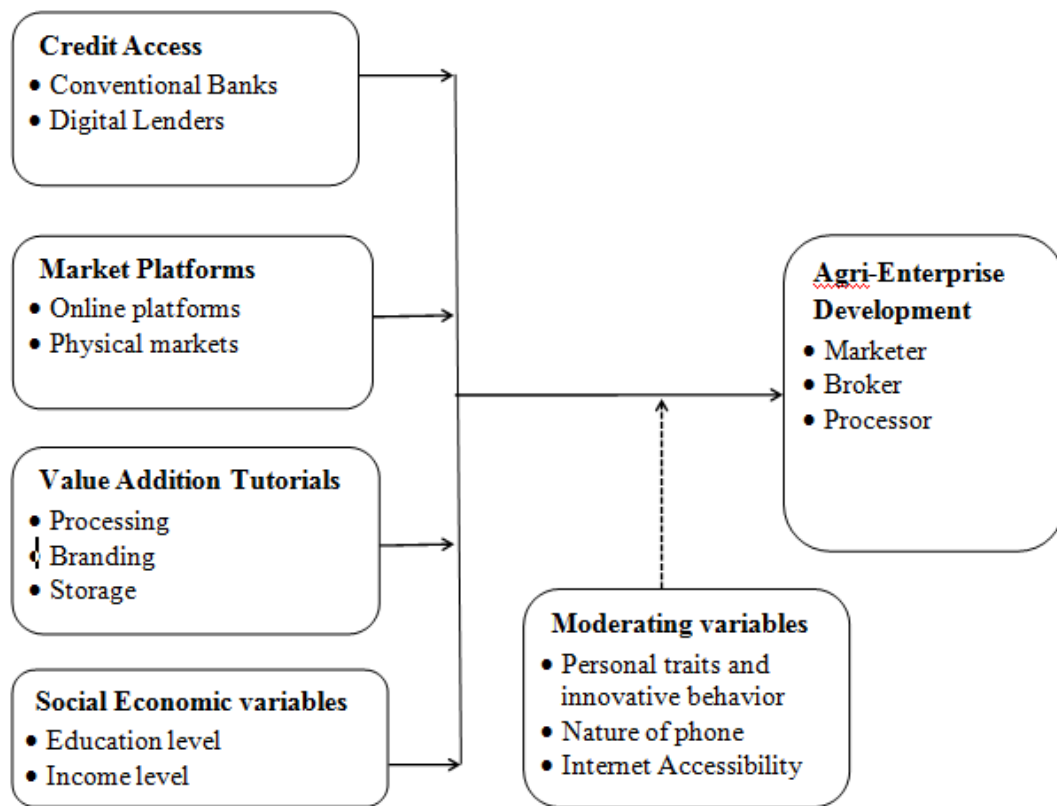


Figure 1: Authors’ Conceptualization

Materials and Methods

To achieve the research objectives, both primary and secondary data were used to answer the research questions. Primary data collection was done using questionnaires as this is an efficient and convenient way of gathering the data within the resources and time constraints. Questionnaires consisting of structured and non-structured questions were used to collect data from the farmers and actors along the agricultural value chain in Tharaka-Nithi County, Kenya. Structured questions were used to

collect quantitative and qualitative data from a sample size of 357 farmers. A multinomial logistic regression (MNL) was used to predict the impact of mobile online applications (independent variables) on agri-enterprise development (dependent variable). The choice of MNL was as a result of dealing with dependent variable that is categorical or dichotomous in nature as adopted from Wooldridge (2015). The primary question that this model answers is how the chooser’s characteristics affected their choosing of a particular alternative in the given sets of alternatives in the dependent variable.

The MNL model was expressed as follows:

$$P(y=j/x) = \frac{\exp(x\beta_j)}{1 + \sum_{h=1}^J \exp(x\beta_h)}, j=1, 2 \dots J$$

Where, y denotes a random variable taking on the values $(1, 2, \dots, J)$ for a positive integer J and x denote a set of conditioning variables. X is a $1 \times K$ vector with first element unity and β_j is a $K \times 1$ vector with $j = 2, \dots, J$. In this study, y represents the agri-

enterprise options and x represents the online application options used and the social economic characteristics of the sampled farmers. The response probabilities $P(y = j/x)$, $j = 1, 2, \dots, J$ was therefore determined by the change in online application options and the farmers characteristics. However, since the probabilities must sum to unit, $P(y = j/x)$ will be determined once the probabilities for $j = 1, 2, \dots, J$ are known.

Results and Discussions

Descriptive statistics

Gender

The subject of gender is considered fundamental in this study largely because it could help the researcher get

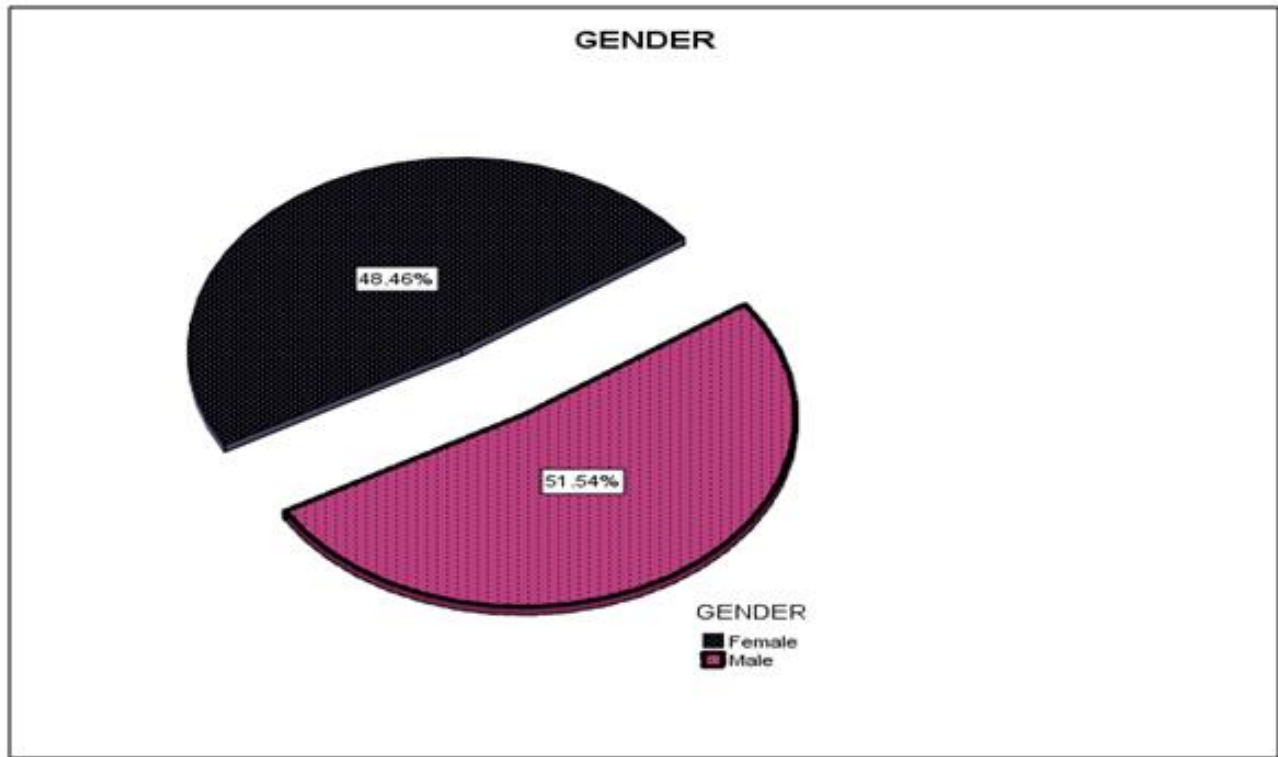


Figure 2: Gender composition of the sampled farmers

The findings imply that the views expressed in these findings are gender sensitive and can be taken as representative of the opinions of both genders.

Usage of YouTube tutorials

The sampled farmers were asked to indicate how they use YouTube videos to advance their knowledge in farming with three choices given. From the reported results in table 1 below, 25.8% of the farmers indicated that they use online platforms to learn how to maximize the storage of their outputs. This has a great implication to food security in the country as literature suggests

that farmers report over 33% of post-harvest losses due to lack of knowledge of the best storage practices. Processing knowledge acquisition by the farmers constituted 44.6% indicating that many farmers in the country are willing to add value on their raw agricultural products. Branding presented 29.7% indicating the desire to increase the output value of their outputs along the agricultural supply chain.

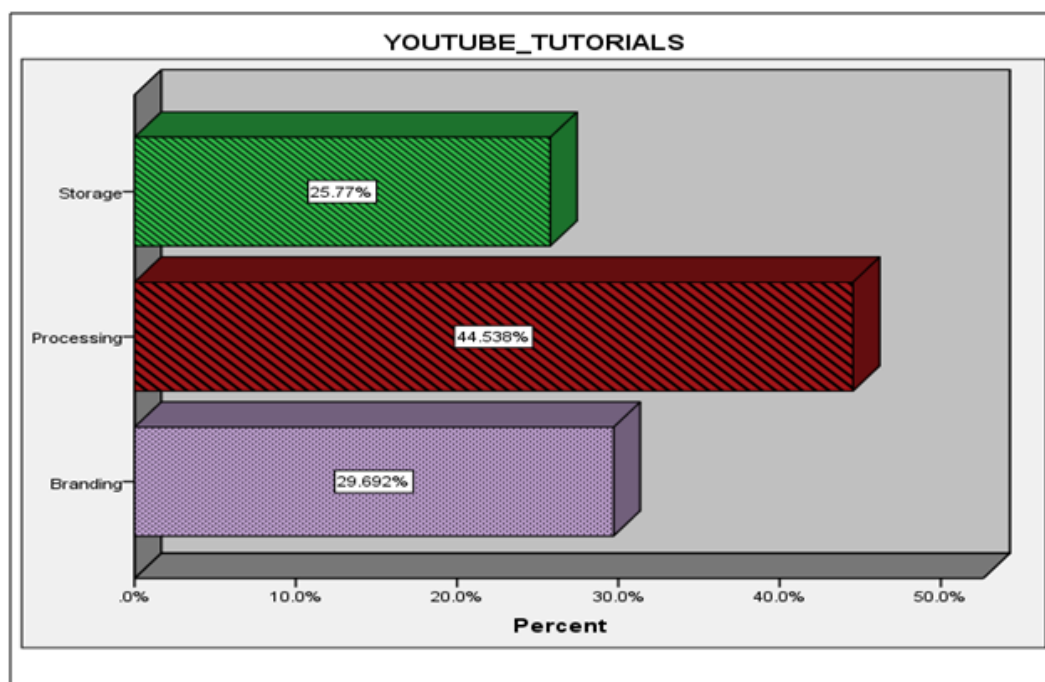


Figure 3: Online knowledge acquisition

Regression Analysis

In the study, the second category of the dependent variable, “Broker,” was taken as the baseline category, while the first category of the independent variables was taken as the baseline category and the results were interpreted accordingly. As the validity of the multinomial logistic regression model was examined with the Odds Ratio Test, the model was found to be significant for $\chi^2=57.23$ and ($p < 0.0000$) values. For each category of the models, it is seen that β coefficients take different

values and hence the odds ratios of the variables for each category varies.

The effect of each independent variable on the dependent variable in the multinomial logistic regression model is different from each other for each category. In the multinomial logistic regression model, the categories that include significant coefficients can be interpreted in terms of the how much they increase or decrease the odds ratios with respect to the second category, which was taken as the baseline category. The results of multinomial logistic regression analysis are given in **Table 1**

Table 1: Multinomial Logit Results

Agrichoices	RRR	Std. Err.	z	P> z	[95% Conf. Interval]	
Marketer						
Credit	1.240253	1735.996	0.00	1.000	0	.
YoutubeTutorials	.8465121	.1615821	-0.87	0.383	.5823123	1.230581
IncomeLevel	.9998472	.0000753	-2.03	0.042	.9996997	.9999947
Education	1.031135	.1020864	0.31	0.757	.8492653	1.251952
Gender	.4705571	.1526676	-2.32	0.020	.2491428	.8887432
Market	.6944538	.5296243	-0.48	0.633	.1557671	3.096073
_cons	2.147144	1.493082	1.10	0.272	.5494801	8.39016
Broker (base outcome)						
Processor						
Credit	6151363	5.98e+09	0.02	0.987	0	.
YoutubeTutorials	.7592437	.116069	-1.80	0.072	.5626706	1.024491
IncomeLevel	1.000119	.0000467	2.55	0.011	1.000028	1.000211
Education	1.039083	.0814537	0.49	0.625	.8910965	1.211647
Gender	1.052066	.2723044	0.20	0.845	.6334728	1.747262
Market	1.905633	1.046631	1.17	0.240	.6494318	5.591713
_cons	1.382415	.7918291	0.57	0.572	.4498643	4.248107

A positive coefficient of a regressor suggests increased odds for marketer over broker, holding all other regressors constant. Thus, from table 1 above, we observe that if the income level increases, the odds of engaging in marketing increases by 0.99 compared to being a broker, holding all other variables constant. Similarly, the significant gender variable implies that the odds in favor of being a male are greater than that of being a female when engaging in different agri-entrepise choices, again holding all other variables constant.

In the second choice, the odds in favor of YouTube tutorials and household income are higher in processing option compared to being a broker in the agricultural supply chain. These findings have a great implication in exploiting the opportunities along the agricultural supply chain. Specifically, if farmers can have access to internet, there is high marginal propensity towards self-learning on how to increase the value of the agricultural products as well as mediating between producers and the final consumers of agricultural products.

Conclusions

Agriculture in Kenya has been viewed for a long time as something that one does when he or she has nothing else left to

do. However, technological innovations have modernized agriculture along the value chain from production to Consumption. With high unemployment rate among the youths in Kenya, enterprise development in marketing and value addition can ease in pulling the unemployed and hence contributing to decreasing the alarming rate of unemployment among the youths in the country. Aligning agricultural management practices with emerging issues like ICT and Artificial Intelligence based production techniques is the next sustainable frontier in Kenyan agriculture. However, as the study indicates, one of the significant variables that complement online apps in fostering the development of agri-enterprises is the level of income. If farmers can be empowered financially, there is a possibility of exploiting the infinite opportunities along the agricultural supply chain.

References

1. Gichuki, J. A. W.; Njeru, A.; Tirimba, O. I. Challenges facing micro and small enterprises in accessing credit facilities in Kangemi Harambee market in Nairobi City County, Kenya. *International Journal of Scientific and Research Publications*. **2014**, 4(12), 1-25.
2. Kibet, Amos.; Stephen Ward. "Socially networked heterogeneity: the influence of WhatsApp as a social networking site on polarisation in Kenya." *African Journalism Studies*. **2018**, 39(4), 42-66.
3. Wooldridge, J. M. Control function methods in applied econometrics. *Journal of Human Resources*. **2015**, 50(2), 420-445.
4. Kisumu Ndogo Slums in Eldoret Municipality Kenya. *European Open Business & Management Journal*. **2015**, 1 (1),
5. Mwangi, I. W.; Ouma, S. A. Social capital and access to credit in Kenya. *American Journal of Social and Management Sciences*. **2012**, 3(1), 8-16.
6. Okello, D. O. Effect of ICT use on performance of Agri-enterprises. A case of smallholder pineapple farmers in Kiambu County, Kenya (Doctoral dissertation, Egerton University). **2017**.
7. Okirigiti, C.A. and Rafey, M. A. Challenges Facing Youth Entrepreneurs in Slums in Kenya: A Case. **2015**, 1-10.