International Journal of Development and Sustainability
ISSN: 2186-8662 – www.isdsnet.com/ijds
Volume 4 Number 7 (2015): Pages 825-839
ISDS Article ID: IJDS15040101

Agro-entrepreneurship readiness model: An empirical investigation in Kenya

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Abstract

Kenya is considered a middle income country and is among the top ten economies in Africa, yet she is experiencing a problem of food security and limited value addition. The small scale farmers are the backbone of the Kenyan economy and few are adding value to their primary agricultural produce. Adding value is an agro-entrepreneurial process that creates wealth for both the farmers and the country's economy at large. This study investigated the factors that affect agro-entrepreneurship on small farms in Kenya and attempted to develop an agro-entrepreneurship readiness model informed by theoretical and empirical evidence. The study used a cross-sectional survey research design and a multi-stage sampling technique to identify the 15 locations from the study area of Kiambu and Murang'a counties where the samples were drawn from. Line transect sampling technique was employed to pick the 388 farms. Qualitative and quantitative descriptions were used to measure the extent of agro-entrepreneurship among the small farms, while correlation analysis was used to estimate the association of readiness factors with agro-entrepreneurship on the small farms. The study reveals that Kenya's agrarian economy is suffering from limited agro-entrepreneurship as the statistics show that only 6% of small farmers were adding value to their agricultural produce. It was discovered that farm sizes are negatively correlated with agro-entrepreneurship. The study shows that the further the farmers are from the local markets, the more likely they are to add value to their primary agricultural produce. Loan accessibility is highly correlated with value addition among the small scale farmers. Agro-entrepreneurship readiness model is rooted in personal & social factors, work experience, cultural, and economic environment of the small farmers. The policy makers therefore, should come up with incentive to motivate small farmers in practicing agro-entrepreneurshipby establishing financial institutions which can lend money at reasonable interest rates.

Keywords: Agro-Entrepreneurship, Entrepreneurship Readiness Factors, Middle Income Economy, Small Farm, Value Addition.

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1. Introduction

Agro-entrepreneurship is the process of backward or forward value addition whereby farmers use creative ways of improving the quality and quantity of agricultural produce or get involved in agro-industry activities (Jaffee and Morton, 1994). The Kenyan government initiatives meant for the improvement of rural livelihoods include: i) Arid Lands Resource Management Project (ALRMP) whose main objective is to enhance food security and reduce livelihood vulnerability in drought prone and marginalized communities; ii) Eastern Province Horticulture and Traditional Food Crops Project (EPHTFCP) that aims at increasing incomes of small scale farmers and ensuring food security through increased production, processing and marketing of horticultural and traditional food crops; iii) Kenya Agricultural Productivity Programme (KAPP) which aims at improving the livelihoods of Kenyans through reforms in the agricultural sector; iv) Arid and Semi-Arid Land (ASAL) is a based livestock and rural livelihood support project whose objective is to improve incomes and reduce poverty through better marketing of livestock; v) Aquaculture Development program whose overall goal is to convert aquaculture from subsistence to commercial activity for income generation and food security. This project involves rehabilitation and operationalisation of fish farms; and vi) Micro, Small and Medium Enterprises Competitiveness (MSME) Project has an overall objective of increasing growth and competitiveness of MSME. It also has an aim of strengthening enterprise management skills and market linkages. Furthermore, it addresses value addition in coffee, pyrethrum, cotton and leather sectors as a way of contributing to poverty reduction and improved livelihoods (Republic of Kenya, 2008).

The key agro-entrepreneurship policy areas of concern presented by Alila and Atieno (2006) are: i) Increasing agricultural productivity for small-scale farmers; ii) Encouraging diversification into non-traditional agricultural products and value addition to reduce vulnerability; and iii) Enhancing food security and poverty reduction. It should be noted that policies mentioned above are silent on portfolio diversification, that is, diversification of small-scale farmers into non-agricultural enterprises. Ochango (2007) says that the current doubt about the viability of small scale farmers needs to be overcome and there is evidence to show that the small scale farmers are unable to perform commercially and consequently ignored on the value supply chain. However, attempts have been made by the Kenyan government, the private sector and civil society to improve the livelihoods of the small scale farmers, but the impact is yet to be felt because of lack of political will & commitment, appropriate political environment, adequate infrastructure, institutional innovations and public-private sector partnerships. Most governments in the third world countries tend to either neglect or fail to avail the necessary resources to small-scale farmers who are the backbone of their economies (Mburu and Massimos, 2005). Value addition in this paper is the process of aligning and controlling different levels of agricultural production and marketing system under one farm. The factors aligned and controlled are price, distribution, promotion, quantity, quality and the agricultural produce for exchange.

1.1. Small-scale farming in Kenya

Farming is the backbone of the Kenyan agrarian economy, whereby 75% of the Kenyan population is directly or indirectly employed in small scale farming (Kimenye, 1995). Ntale (2013) recommends that the

government should play an active role in value addition in order to create employment in the rural areas. Furthermore, the government should invest more in agro-entrepreneurship projects like MSME, ALRMP, EPHTFCP, KAPP and ASAL, because it is through such projects that the farmers will be trained to add value to their agricultural produce and also be sensitized in commercial farming (Ntale et al., 2013). They continue to say that research is needed to address the issue of limited agro-entrepreneurship among the small farmers in Kenya. (Braganza, 2014) stated that Kenya has moved from a third world country to a second world country quicker than anticipated in Vision 2030. This means that the Gross Domestic Product (GDP) of Kenya has improved significantly according to international standards. However, Kenya vision 2030 and the middle income tag will be meaningless unless farmers add value to their produce as they are the backbone of the economy (Ntale et al., 2013).

The agricultural sector in Kenya comprises of crop farming, forestry, livestock, wild life and fisheries. Most farmers are low income earners and operate on small farms with farm sizes ranging from a fraction of an acre to ten acres. The Kenyan farmers are involved in crop and animal farming regardless of the scale. Horticulture (pineapple, mangoes, avocados, passion, and flowers), tea, sugarcane, and coffee are among the many cash crops grown on the small farms (Republic of Kenya, 2010). Ntale (2013) observed that, the majority of small scale farmers in Kenya are vulnerable since they practice rain-fed agriculture which is susceptible to erratic climatic conditions. He further argues that agro-entrepreneurship can provide a solution to the vulnerability of the small-scale farmers. The farmers are encouraged to add value to guard themselves against climatic shock (Republic of Kenya, 2005; Republic of Kenya, 2007; Ellis and Mdoe, 2003).

1.2. Entrepreneurship foundation

Entrepreneurship is the process of identifying a human need and be able to satisfy that need at a profit. The foundation of the process is based on the diverse and complex motivations. Although there is no conclusive description of what entrepreneurs are made of this paper attempts to suggest an entrepreneurship readiness model to give some ideas on the building blocks of entrepreneurship. Based on the practice and literature, the predictor model for entrepreneurship readiness can be proposed as a function of personal and social characteristics, work experience, culture and economic environment as expressed below.

$$Y = b_o + b_1PS + b_2W + b_3C + b_4E$$

where Y = entrepreneurship readiness, PS = personal and social characteristics, W = work experience, C = culture and E = environment.

Entrepreneurship readiness is composed of the elements that predispose and prepare a person to think or to have business ideas. McCormick (1996) and Scott and Twomey (1988) used the term predisposing factors instead in their entrepreneurship model. They defined predisposing factors as personal background, personality traits, and business perceptions that develop over several years. They include an individual's role model, education, work experiences, one's self image, entrepreneurial personalities and discernment of various types of organizations. Macke and Markley (2003) refer to predisposing factors as readiness factors which are prerequisites for entrepreneurship. They identified six readiness entrepreneurship factors that

can lead to successful development programmes in a community. The readiness factors are willingness to invest, leadership team, viable business idea, entrepreneurial programmes, openness to entrepreneurship and going beyond the town borders.

Education - Schultz (1980) says that education plays a big role in entrepreneurship as it enables the entrepreneur to deal with the disequilibria. According to Global Entrepreneurship Monitor (GEM) report of 2007 low level of education in South Africa contributed to lack of mind set and skills of entrepreneurship. Lack of quality education is responsible for the low levels of creativity and innovation as Minniti and Nardone (2007) argue that quality education empowers individuals with sound knowledge to perceive opportunities in the environment. Lack or little education constrains individuals from dealing with complex life optimally for wealth creation (McCormick, 1996).

Personal characteristics of an individual are the personality perspective of entrepreneurship which examine the internal characteristics of the entrepreneurs. This internal viewpoint of an individual include, internal locus of control, calculated risk taking, high need for achievement, problem solving, innovation and creativity perception. Drucker (1985) explained that entrepreneurs are the agents of change and usually bring about this change through technology. It is important to note that the entrepreneurs are not necessary to be the originators of technology but, they exploit it to their advantage. On the other hand, Schumpeter (1934) acknowledged that innovation and creativity are at the centre of entrepreneurship. He went on to describe entrepreneurs as individuals who add value to their economic activities. This study therefore, is largely informed by the Schumpeterian school of thought as value addition is considered an entrepreneurial activity that leads to economic development of the small farmers. (Rotter, 1989) developed the concept of 'locus of control' based on the mindsets of an individuals who believe that individuals have the potential to determine their destiny. So Success or failure in life depends on the individual, while external locus of control concept advocates that success or failure in life depends on the external forces outside the individual's sphere of influence. Individuals with a mindset of internal locus of control are more likely to become entrepreneurs, than those of external locus of control. (Timmons and Spinelli, 2007) describe entrepreneurship as a way of thinking, reasoning, and acting that is opportunity directed, and leadership balanced. They acknowledged that entrepreneurship personality can be acquired and/or can be inborn.

From the sociological perspective, family background is very important in the formation of entrepreneurial personality as individuals tend to take on their parents' traits - 'like father, like son' (Hisrich et al., 2008; Kets de Vries, 1985). Scott and Twomey (1988) found out that children of entrepreneurs were more likely to have a business idea than those whose parents were not entrepreneurs. (McClelland, 1961)'s identified personal traits such as determination, perseverance, high need for achievement, and desire for independence as key entrepreneurial characteristics. Empirical research shows that certain entrepreneurial traits in young people are highly correlated with possession of business ideas (Scott and Twomey, 1988). Traits like a high need for achievement, the capacity to take risks, ability to innovate and ability to identify profit opportunities are highly associated with having business ideas (McClelland, 1961; Casson, 1982; Hisrich et al., 2008).

Work experience is a very important ingredient in entrepreneurship as Scott and Twomey (1988) discovered that students with work experience were three times more likely to have a viable business idea than those who have no business experience. Research studies revealed that most small-scale business owners had gained business experience before they started their own businesses (McCormick, 1996).

Culture - (Weber, 1930) in his academic treatise on the relationship between the "protestant ethic" and capitalism discovered that the cultural issues for European countries influence entrepreneurial behavior of the business people. Protestant ethic and capitalism encourage entrepreneurship while communism or socialism constrains entrepreneurship. In the same context of culture, (Ndemo, 2005) discovered that Maasai community was resistant to livelihood activity diversification due to strong attachment to their culture and limited level of education.

Entrepreneurship environment is composed of factors that influence economic activities and hence increase or reduce entrepreneurial activities in any given economy. Entrepreneurship environment can precipitate entrepreneurial activities. The motivation may come as a result of frustration or opportunity identification. When entrepreneurs identify opportunities in the environment, they come up with bright ideas to exploit the opportunity and make profit. When individuals are frustrated in one way or the other, they tend to come up with business ideas to solve the problem. The triggering factors can either push or pull individuals into entrepreneurship (Drucker, 1985; McCormick, 1996). Individuals who are pushed into entrepreneurship are reluctant entrepreneurs while those pulled into entrepreneurship are willing entrepreneurs. For example, Bill Gates willingly dropped out of University to start a business while Hong Kong Billionaire Li Ka-Sing was forced into entrepreneurship when he lost his father at an early age. People in either situation either pulled or pushed can be successful entrepreneurs (Giddens and Griffiths, 2006).

According to Eggleston et al. (2002) lack of information and communication technologies (ICTs) in any given environment is a constraint to economic development. Information can empower rural communities to become entrepreneurial by enabling them to participate actively in decision-making and to exchange ideas with others who are miles far apart. They empowered the poor to use their own knowledge and strengths to improve their livelihoods. These technologies also have an influence on the quality of economic activities, employment and accessibility to credit (Mcquaid, 2002). Low rural income can be largely attributed to lack of information and knowledge that could improve earnings potential (Kenny, 2002). According to McCormick (1996) legal environmental frameworks that do not provide enabling business environment discourage entrepreneurship. She suggests the enactment of laws that protect intellectual property as a fundamental incentive for entrepreneur to innovate. Nevertheless, too many bureaucracies and too many regulations are likely to influence entrepreneurship negatively (Simeon et al., 2005). McCormick (1996) and Macke and Markley (2003) noted that small weak markets are also an obstacle to entrepreneurial activities because of the limited business opportunities they offer. Nee et al. (1991) suggest that the government and other regulating bodies should protect local entrepreneurs with serious challenges that could ruin their enterprises. They go on to say that entrepreneurship environment ought to play an important role in the entrepreneurship readiness.

1.3. Readiness agro-entrepreneurship factors

Readiness factors are the preparations for entrepreneurship to take place. There are divergence views on the science agro-entrepreneurship (Barnett, 1993). Jennings (1994) suggests that scholars should come up with novel concepts that suit their investigations. The entrepreneurship readiness model attempts to bring a unity in diversity in the understanding of the predisposing elements of entrepreneurship. Scott and Twomey (1988) analyzed the precipitating entrepreneurial aspirations of students using a regression model. Their model shows that personal characteristics, triggering factors, and business ideas are the functions of entrepreneurship. McCormick (1996) revised Scott and Twomey (1988)'s regression model by stating that total supply of entrepreneurial events depends on predisposing, triggering and constraining factors. She further said that lack of financial resources, information, and appropriate education, some cultural practices, legal systems that fail to protect innovations, small weak markets, and excessive stringent regulations, are some of the factors that precipitate or frustrate the implementation of business ideas into reality. Casson (1982) points out that limited financial resources is a major constraint to entrepreneurial activity. The problem is very much experienced in nascent enterprises whose business ideas are new and never been tested.

1.4. Agricultural SMEs

Small and Medium Enterprises (SMEs) are very important in the economic progress in most developing countries. Agricultural SMEs have made significant contributions to Africa in terms of employment, rural urban migration and wealth creation (Doran et al., 2009). The importance of agricultural SMEs to developing countries is not well documented and studied. Enterprises in agriculture value chains have the potential to create sustainable economic development (McNellis et al., 2010). However, the market conditions are not conducive for productivity. It is imperative for development partners to adapt existing SME programs and initiatives to meet the needs of farmers to add value to their agricultural produce, and invest in new interventions targeted for value addition for rural development (Digal, 2007). On other hand, world leaders are concern about food security and sustainable value addition in agricultural practices. Development organizations can empower small farmers in agricultural value addition to ensure prosperity in agriculture and food security, by creating strong, investable SMEs that can spar economic development in the rural areas (Amanor-Boadu, 2003; Doran et al., 2009)

1.5. Kenyan economy

Kenya is ranked a lower middle income economy and is among the top ten economies of Africa (Braganza, 2014). Iraki (2015) observed that rebasing the economy gave the Kenyan government a better debt to GDP ratio and hence a rank of a middle income economic status. Nevertheless, Opalo (2015) stated that Kenya is going through hard economic times, but the situation can be made worse by cynicism, uniformed bluster, or sheer misinformation. This can eventually cost the country the hard-worn economic status of middle income. He went on to say that skeptics are of the opinion that the Kenyan economy is not as good as it is portrayed

because the government of today is in denial and is cooking figures to show that all is well yet the reality on the ground is different. He further observed that the economic situation has been aggravated by cash flow hiccups at the Kenyan national treasury which has ignited the debate about the stability of the Kenyan economy. The debate has been marked by gross misinterpretation of the facts and confusion over the real situation of the Kenyan economy. The optimists say that fundamentals of the Kenyan economy are strong and that the trend lines inspire confidence in the overall stability of the economy. According to Iraki (2015) high interest rates being experienced in Kenya means that farmers find it hard to borrow in order to invest in processing machineries which lead to a slowdown in the agricultural economic growth. He reiterated that if the government can lower the interest rates then the farmers would be in a position to borrow and add value to their agricultural produce.

2. Methodology

A cross-sectional survey research design was used and a sample of 388 small farms was drawn from Gikumari, Mugutha, Kalimoni, Juja, Biashara, Makongeni, Mutumbiri, Ngelelya, Ithanga, Kakuzi, Mukarara, Kihumbuini, Kariara, Kiriaini and Kigio locations of Murang'a and Kiambu counties of Kenya. The multistage sampling technique was used to identify the 15 locations. Line transect sampling technique was used to identify the respondents of the study. Qualitative and quantitative descriptions were used to estimate the extent of value addition to the primary agricultural produce of the small farmers. Correlation analysis was used to estimate the association of agro-entrepreneurship readiness factors with value addition on the small farms. The correlation coefficients were estimated using the following formula:

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{[n(\sum x^2) - (\sum x)^2][n(\sum y^2) - (\sum y)^2]}}$$

Where:

r = Sample correlation coefficient

n = Sample size

x = Value of the independent variable

y = Value of the dependent variable

3. Data analysis

3.1. Qualitative description

The agricultural activities observed in Kiambu and Murang'a counties were food and cash crop farming, forestry, livestock, wild life and fisheries. However, there are many non-agricultural activities taking place in

the area such as trading in various merchandises, operations of Jua kali artisans and Boda boda riders (motor cycle taxis). As a matter of environmental concern, some of the economic activities are polluting the environment. For example, welding of metallic doors and windows, intensive use of chemicals and fertilizers on agricultural farms, and littering of polythene papers at trading centres. The counties under study were found to house large manufacturing processing companies which provided employment to the locals and buy primary agricultural produce from the small scale farmers. These factories heavily rely on the smallholder agriculture for their supply of primary products.

3.2. Descriptive statistics

The study found out that the average education level of the respondents was 8 years, ranging from no education at all to 22 years of schooling. About 12% of the respondents had more than 12 years of secondary education while 6% had no education at all while 22% of those in portfolio diversification had post secondary education. However, only 11% of those who had post secondary education, had diversified. 92% of those with post secondary education were practicing mixed farming while 83% of those with no education were practicing mixed farming. It was noted that none of the respondents who had never gone to school was adding value to agricultural produce. However, 12% of those with no education were in portfolio diversification that is, running non-agricultural businesses. The average age of the respondents was 49 years, which ranged from 20 years to 90 years. It was found that 3% of the farmers were below the age of 25 years while 18% of the respondents below the age of 25 years were doing non-agricultural businesses and none of them was adding value to his/her agricultural products, 73% of the respondents in this category were practicing mixed farming.

Value addition on a small farm is an economic activity whereby the farmer adds value to the primary agricultural produce by processing, packaging and storing. Vision 2030 and MDGs 2015 advocate for value addition as a strategy for improving livelihoods of farmers (Republic of Kenya, 2005, 2007). The study findings indicate that 6% of the farmers were adding value by storing their products in granaries. This indicates that the entrepreneurial intensity is limited among the small scale farmers. According to Hoogland and Holen (2005) granaries increase food security of households; they also make it possible for those who grow more than what they need for consumption to sell the extra grain at higher prices in later periods. Furthermore, granaries decrease the negative effects of dependence on self produced foods. Processing of agricultural products requires technology and electricity which many of the farms did not have access to. Only 29% of the respondents had electricity on their farms.

The study established that none of the respondents in Gikumari, Juja, Kakuzi, Kalimoni, Mukarara, Mutumbiri and Ngelelya locations add value to their agricultural produce. These findings show that small-scale farmers in these locations are omitted from the value supply chain. This justifies the concern of Ochango (2007) that small-scale farmers are unable to perform commercially. In contrast, 61% of the respondents in Biashara location are adding value but mainly in storage of their products in granaries. In Mugutha location 18% of the respondents add value while the rest of locations had less than 1% of the respondents who added value.

Table 1. Descriptive Statistics

Variable	Number of Observation	Mean	Std. Dev.	Min	Max
Size of the farm (in acres)	388	1.770619	.60699	<= 1	10
Number of employees	388	1.146907	1.351262	0	10
Housing (1 = Permanent house)	388	.5025773	.5006389	0	1
Water supply (1 = having tap water)	388	.5360825	.4993403	0	1
Electricity supply (1 = connected to electricity)	388	.2938144	.4560961	0	1
Education level (in years)	388	8.489691	4.049104	0	22
Gender (1 = male)	388	.4948454	.500619	0	1
Marital status (1 = married)	388	.9201031	.2714836	0	1
Age of respondent (in years)	388	49.41237	13.27993	20	90
Agro-entrepreneurship (1 = farmer adding value to farm produce)	388	.0618557	.2412043	0	1
Desire for food security (1 = farmer diversifying for food security)	388	.9458763	.2265538	0	1
Financial security (1 = farmer diversifying for financial security)	388	.935567	.2458397	0	1
Competition (1 = farmer diversifying for competition)	388	.5592784	.4971147	0	1
High cost of farming (1 = farmer diversifying for cost of farming)	388	.5902062	.4924305	0	1
Agricultural extension services (1 = farmer diversifying through motivation from agricultural extension officers)	388	.4896907	.5005391	0	1

Variable	Number of Observation	Mean	Std. Dev.	Min	Max
Land acquisition (1 = Purchased land through economic diversification)	388	.2474227	.4320716	0	1
Permanent house (1 = Built permanent house through agro-entrepreneurship)	388	.3685567	.4830362	0	1
Livestock (1 = Purchased livestock through agro-entrepreneurship)	388	.7293814	.444853	0	1
Television set (1 = Purchased TV set through agro-entrepreneurship)	388	.3505155	.4777475	0	1
Possession of motor vehicle (1 = Purchased motor vehicle through agro-entrepreneurship)	388	.1056701	.3078118	0	1
Sacco membership (1 = became Sacco member through agro-entrepreneurship)	388	.5309278	.4996869	0	1
Education of dependants (1 = educated dependants through agro-entrepreneurship)	388	.8530928	.3544705	0	1
Health care (1 = pay medical bills through agro-entrepreneurship)	388	.9329897	.2503627	0	1
Income (average income earned in a month through agro-entrepreneurship)	388	9942.268	13139.15	500	100000
Identification of business opportunity (1 = if identification of business opportunity motivated agro-entrepreneurship)	388	.6391753	.4808598	0	1
Desire for independence (1 = farmer diversifying due to desire for independence)	388	.8221649	.3828675	0	1
Need for achievement (1 = farmer diversifying due to need for achievement	388	.7963918	.4032009	0	1
Government initiatives (1 = farmer motivated by government initiative to diversify)	388	.2989691	.4583974	0	1
NGO	388	.056701	.2315691	0	1

Variable	Number of Observation	Mean	Std. Dev.	Min	Max
(1 = farmer motivated by NGO to diversify)					
CBO (1 = farmer motivated by CBO to diversify)	388	.0438144	.2049463	0	1
Weather conditions (1 = weather conditions motivated agro-entrepreneurship)	388	.8994845	.3010743	0	1
Animal and crop disease (1 = animal and crop disease motivated farmers to diversify)	388	.5798969	.4942125	0	1
Competition (1 = competition motivated agro-entrepreneurship)	388	.5592784	.4971147	0	1
Cost of farming (1 = cost of farming motivated agro-entrepreneurship)	388	.5902062	.4924305	0	1
Unfavourable government regulation (1 = legal regulations motivated agro-entrepreneurship)	388	.5231959	.5001065	0	1
Insurance (1 = insurance motivated agro-entrepreneurship)	388	.3453608	.4760997	0	1

Source: Ntale (2013)

3.3. Correlation analysis

The correlation coefficients given in this section are prima facie evidence that there is a relationship between value addition and the variables indicated in table below. Correlations are used as guidelines in formulating models for estimating the effect of entrepreneurship on livelihood outcomes. The study correlates value addition with selected variables. The table below shows the correlation coefficients (r) of value addition with selected farm attributes personal & social characteristics, motivation and environmental factors.

The results show that a 10% increase in the proportion of farmers having electricity in their farms is associated with 16.35% increase in the probability of value addition among framers. Similarly, a 10% increase in value addition is associated with 16.35% increase in the probability of farmers having electricity. A 2.3% increase in value addition is associated with 1% increase in the probability of a farmer buying an

extra acre of land. In other words, 1% increase in probability of a farmer purchasing an extra acre of land is associated with a 2.3% increase in the probability of value addition. Results also show that a 1% increase in value addition is associated with a 1.32% increase in the probability of a farmer buying an extra livestock. A 1% increase in value addition among the farmers is associated with 1.55% increase in the probability of farmers buying motor vehicles. Similarly, 10% increase in the proportion of farmers buying motor vehicles is associated with 1.55% increase in the chance of farmers diversifying vertically. 13.2% increase in the farmers income is associated with a 10% increase in the probability of farmers diversifying vertically. On the other hand, a 13.2% increase in value addition is associated with the probability of income rising by 10%.

While a 10% increase in the proportion of men is associated with 4.54% increase in the probability of a farmer adding value to their primary agricultural products. Similarly, a 10% increase in value addition among farmers is associated with 4.55% increase in the proportion of male farmers. 10% increase in value addition is associated with 9.2% increase in the probability of a farmer building a permanent house. Likewise 10% increase in the proportion of farmers building permanent houses is associated with 9.2% increase in the probability of value addition.

10% increase in value addition is associated with 8.04% increase in the proportion of farmers buying T.V. sets or 10% increase in the purchase of T.V. sets is associated with 8.04% increase in the probability of value addition. 10% increase in value addition is associated with 0.4% decrease in the probability of a one year decrease in the average age of farmers or 0.4% decrease in value addition is associated with 10% increase in the average probability of one year increase in age of farmers.

4. Conclusion and recommendations

Limited agro-entrepreneurship has been blamed for poverty in Kenya and this has triggered a public debate about the Kenyan economy riddled with skepticism and optimism. The optimists are of the view that Kenya's economic performance is satisfactory despite headwinds rising from volatility in global market and domestic security challenges, while the pessimists feel that the government is fooling the public that all is well with economy yet the reality on the ground is different. The Kenyan economy is the framework within which small farmers operate and are major players of the economy. If the economy is volatile, the farmers are affected adversely. Farmers who invest in value-added agriculture cause the market to become more vertically integrated and consequently, affect the economy positively. An integrated agriculture system can provide consistent quality from the field to the consumer, minimizing the need for middlemen and lowering prices of the agricultural produce. Vertical integration downstream towards consumers by farmers commonly involves an equity investment for processing, packaging, marketing, storage and branding which is good for the economy. Farmers who are positioned uniquely for further integration in value addition are the entrepreneurs who are responsible for economic growth. The success of this agro-entrepreneurship hinges on best management practices plus the conducive economic environment.

Agro-entrepreneurship readiness model therefore, provides a promising framework for agro-entrepreneurship readiness precipitated by economic progress. Policy makers and researchers need to

understand the model because there is a high correlation between agro-entrepreneurship and the economic environment. The suggested model of this study is rooted in personal & social factors, work experience, cultural and economic environment. An appropriate mix of the entrepreneurial readiness factors lays a good foundation for agro-entrepreneurship to take place. Practicing agro-entrepreneurship is the prime mover of economic development. There is a bidirectional effect between agro-entrepreneurship and agricultural economy of the country brings benefits to farmers, and also the general economy of the country. The analysis of value chains in food processing, packaging, marketing and storage shows a limited entrepreneurial intensity in the Kenyan agricultural sector. Due to the features and challenges pertaining to heterogeneity of Kenyan agricultural sector, it is hard to come up with clear policies to facilitate the participation of value addition among the farmers. However, this study recommends that agro-entrepreneurship should be used as the best policy, principle and practice to increase the chances for small farmers to play an important role in the Kenyan economy by:

i) The government coming up with a policy to ensure that financial institutions lend small scale farmers at lower interest rates.

ii) Encouraging partnerships in agribusiness value addition.

iii) Strengthening relationships among the public sector, research institutions, the private sector, SACCOs and civil society in order to promote value addition.

iv) Promoting the entrepreneurial spirit and skills of small farmers in value addition by providing technical assistance in terms of training farmers in both business and entrepreneurial skills.

v) Stimulating markets to create more job opportunities within agro-entrepreneurship by providing credits, subsidized agricultural inputs and government extension services to the farmers.

vi) Encouraging cooperation among NGOs, the government and the private sector to initiate development programmes to support agro-entrepreneurship.

vii) Discouraging small farmers from further partitioning of farm land for purposes of commercial farming.

viii) Providing running water, electricity and good road network among others to facilitate value addition.

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