

## **Entrepreneurial Personality Traits of Tree Farmers in Lari District Who Have Planted Improved Varieties of Eucalyptus Varieties**

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### **ABSTRACT**

The forest sector plays vital roles in the livelihood of the Kenyan population through provision of invaluable forest related goods and services. Forests are important for conservation of biological diversity, supply of various wood and non-wood products, regulation of water supplies, carbon dioxide sequestration and are a major habitat for wildlife. It is estimated that 80% of the population use biomass energy while urban development and hydro energy rely heavily on water. In addition, the increasing population and poverty continue to exert pressure on the country's forest resources. Kenya is internationally considered to be a low forest cover country as it has less than 10% of its total land area classified as forest. There is urgent need to put in place measures to significantly increase the area under forest cover, with the aim of attaining at least 10% within the next decade. This paper articulates that entrepreneurship driven by personality traits of the smallholder forest farmer is one of the interventions that can contribute to commercial forestry. Gender, age, level of education, years of previous employment, number of years in agro forestry, farming acreage, information sharing, farmer's capital access from financial institution and investment were noted to be some of the personality trait factors that significantly influence exploitation of the commercial opportunities in forestry by smallholder farmers through planting improved varieties of eucalyptus varieties.

**Keywords:** Improved seedlings, Agro-forestry, Entrepreneurship, Forest, Smallholders, Innovation.

### **INTRODUCTION**

The government needs adequately information on the characteristics of smallholder farmers' availability and how these characteristics determine the adoption of forestry innovations and viability.

Far-reaching changes are taking place in the social, political, and economic systems in the world with possible consequences on farm forestry and its institutional arrangements, particularly in developing countries like Kenya. These changes include an increase in the country's population and a rise in forest related activities. According to the 2009 population census, Kenya's population stood at 38.6 million people (Government of Kenya, 2010). The increasing population will continue to exert pressure on the forest resources through a growing demand for forest products, services, and land for alternative uses.

The inability of government department to benefit the rural poor and address the continuous destruction of the remaining patches of trees has led individuals and groups pursuing active planting and managing of trees on either communal or privately owned land and chosen to devote labour, financial capital, and time in growing trees.

There is little work describing entrepreneurial opportunities and exploitation. It is also glaring to note that conceptual theories on entrepreneurship have been contributed mainly by scholars from the western developed countries whose reasoning could be largely shaped by their different individual, institutional support and socio cultural experiences. This could rather make their theories unsuitable to emerging economies such as Kenya as entrepreneurship or opportunity creation could not be judged in isolation of its environments. In summary, the review of literature demonstrates that there is a

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significant gap in knowledge on issues associated with entrepreneurship and entrepreneurial opportunity. Despite the conceptual and empirical analysis, the debates on the whole idea of entrepreneurial opportunity has yet to produce a complete and fully developed alternative framework (Alvarez & Barney, 2007).

Studies from Kenya on the processes and critical factors that enhance the opportunity and exploitation of entrepreneurial opportunities among smallholder farmers have not been systematically researched and documented. To fill this gap, the study sought to examine the improved eucalyptus entrepreneurial opportunity exploitation process by tree growers in Lari District and factors influencing it.

It is projected that on current trends, the demand for wood in the high potential and medium potential districts will increase from 15.1 million m<sup>3</sup> in 1995 to 30.7 million m<sup>3</sup> in 2020 (Government of Kenya, 1994). Wood fuel (firewood and wood for making charcoal) which accounted for 86 percent of the total wood demand in 1995 will increase to 89 percent in 2020 (Selenwa *et al.*, 2004).

Enhancing the uptake of improved tree species is therefore an option that policy makers have to consider if this demand is to be met. In order to meet future demand of forestry products in Kenya, planting rates need to be increased to between 60-200 million seedlings per year (Wakhusuma and Kanyi, 2002). Policy options that can be used to enhance the adoption of improved tree seedlings by smallholder farmers in Kenya are not clearly understood.

Kenya is internationally considered a low forest cover country as it has less than 10 percent of its total land area classified as forest (Senelwa *et al.*, 2004, Government of Kenya, 2007). The Government of Kenya has put in place measures to significantly increase the area under forest cover as stated in the draft Sessional Paper Number 1 of 2007 on Forestry Policy (Government of Kenya, 2007). To increase the forest cover, the Government proposes to promote farm forestry, intensify dry land forest management, involve the private public partnerships in the management of industrial plantations, and promote community participation in forest management and conservation. Development of farm forestry is a key goal of this policy document (Government of Kenya, 2007).

The way forested farms are managed is therefore expected to shift from a traditional view of a raw material supplier to an entrepreneurial provider of a multitude of services (Remetsteiner and Weiss, 2004; Government of Kenya, 2007). Developments in forestry technologies and information technology are also expected to result in considerable organizational changes in the administration of farm forestry (Remetsteiner, 2000). There is therefore an urgent need to back up an improved supply of good quality planting materials of desirable species with the transfer of appropriate knowledge and better management practices (Remetsteiner, 2000).

The demand for wood and *Eucalyptus* is high. The total area under eucalypts is estimated at 100,000 ha comprising 15,000 ha in gazetted forests, 35,000 ha on private land owned by large companies and 50,000 ha on land owned by individual farmers and local authorities. The demand for wood product articulates mainly around timber, poles, and fuel wood (KFS, 2009). 70% of national energy is met by fuel wood and in rural areas dependence on fuel wood for cooking and lightning is almost total. In order to ensure a sustainable supply of timber, it is necessary to extend the timber production horizons beyond the state forests and include tree farmers and the private sector (KFS, 2009).

The introduction of improved *Eucalyptus* trees varieties to Kenya in 1997 from Mondi Forests in South Africa by Tree Biotechnology Project (TBP) has rekindled tree-planting culture. Millions of seedlings have been distributed across the country. It is estimated that from 2001 to 2011, the project had distributed 22.8 million seedlings nationally with smallholder farmers taking largest percentage. For example, in 2007 a total of 2.9million seedlings were distributed with smallholder farmers taking 73.1% (2,120,524), private/corporate bodies 21.9% (634,825) and organized groups 5% (144,429) (Tree Biotechnology Project communication).

The key problem is why there is a slow uptake of the improved *Eucalyptus* and if entrepreneurship can be one of the drivers to accelerate the rate of uptake. The study hence seeks to establish if the *Eucalyptus* tree growers are entrepreneurial in character and the factors that influenced them to take up the growing of the trees. Based on Shane and Venkataraman's (2000) suggested key questions for entrepreneurship research this study sets out to determine why some smallholder farmers and not others identify improved varieties of *Eucalyptus* trees as an entrepreneurial opportunity for economic gain.

## MATERIALS METHODS

The data collected using questionnaires and entered into spreadsheets cleaning, analysis preparation and storage. Analyzed was done using Statistical Package for Social Scientists (SPSS) version 20. The descriptive and exploratory results were summarized using tables and for inferential statistics crosstabs and probit Analysis. The study assumed that the intensity of exploitation is a linear function of another set of farmer and opportunity characteristics, which

may be the same or different from the set represented by the covariates  $x_i$ . Specifically, using  $v_i$ ,  $i = 1, 2, \dots, N$  to denote quantities, the intensity of exploitation is specified as:

$$q_i = x_i \beta + u_i \quad (1)$$

The General linear model was used to regress the independent variables on the dependent variable in multiple regression equation leading to the Analysis of Variance (ANOVA). The p-value was used to test the significance of the independent variables used in the model of analysis. In this procedure, it is assumed that the probability of an event is related to the predictors through the probit function. Using a general functional form  $F(\cdot)$ ,

$$p(x) = \Phi(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k) \quad (2)$$

## RESULTS AND DISCUSSION

### Entrepreneurial Personality Traits of the Farmers

This section presents the characteristics of personal traits of individual farmers. They include; gender, age in years, level of education and whether they had been employed before. The rationale behind inclusion of these attributes in the analysis is that they help to shed some light on the type of farmers the research is dealing with.

**Table 1.** Distribution of farmers by their gender

	Frequency	Percent
Male	254	66.0
Female	125	32.5
No response	6	1.6
<b>Total</b>	<b>385</b>	<b>100.0</b>

Source: Field Data, 2011

The distribution of the respondents per gender indicated that the majority of the farmers (66.0%) were male and 32.5% of them were female table 1. The result shows there are more male farmers involved in farming of trees than their female counterparts in the region as the males are assumed to be the family heads. This is evident in the General Entrepreneurship Monitor (GEM) Report on Women and Entrepreneurship (Allen et al. 2007) that examined the rates of entrepreneurship in 43 countries and in all these countries the rates of women's entrepreneurship were lower than men's. Women in poor countries, it seems, are more influenced by "push" than by "pull" factors. These findings reinforce the explanation for women's entrepreneurial inferiority as resulting from social and economic exclusion and lack of equality. The results agrees with Allen et al. (2007) who argued that examined the rates of entrepreneurship in 43 countries and showed that in all these countries the rates of women's entrepreneurship were lower than men's. Women in poor countries, it seems, are more influenced by "push" than by "pull" factors. These findings reinforce the explanation for women's entrepreneurial inferiority as resulting from social and economic exclusion and lack of equality.

### Age of Farmers

The age distribution of a population is not only an important issue for the rate of potential entrepreneurs, but also how age distribution interacts with individuals' perception of desirability and feasibility towards entrepreneurship.

**Table 2.** Distribution of farmers by their age

	Frequency	Percent
Below 25 years	9	2.4
26-35 years	49	12.7

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36-45 years	163	42.3
Above 45 years	164	42.6
<b>Total</b>	<b>385</b>	<b>100.0</b>

Source: Field Data, 2011

The farmer’s age distribution from table 2 indicates that majority of the farmers (84.9%) were aged between 36 years and above while 12.7% of them were aged 26-35 years and 2.4% were aged below 25years. Levesque and Minniti (2006) noted that age is a triggering factor of entrepreneurial behaviour as it is a crucial characteristic in the thought decision-making process. Sequeira et al (2007) findings indicated individuals’ age have significant and positive relationship with start-up intention. Some authors have found that younger workers’ technology usage decisions were more strongly influenced by attitude toward using the technology, while older workers were more strongly influenced by subjective norm and perceived behavioural control. Indeed, changes in individuals’ characteristics due to their ongoing lifespan development should influence their attitudes, abilities and motivation towards entrepreneurship.

### Level of Education of the Farmers

According to Lazear (2005), entrepreneurship requires general knowledge and the formal education system normally increase this, particularly at the lower levels that are most common in developing countries. As generally, success of entrepreneurship increases with education but this might stem from the fact that more talented individuals are both more successful and more educated Van der Sluis et al (2007). This study sought to identify the level of education the farmers had attained. The results are as show in Table 4.3.

**Table4.3.** Level of education of the farmers

	<b>Frequency</b>	<b>Percent</b>
Primary	129	33.5
Secondary	180	46.8
Tertiary	63	16.4
University graduate	6	1.6
None	2	0.5
No response	5	1.3
<b>Total</b>	<b>385</b>	<b>100.0</b>

Source: Field Data, 2011

Most of the respondents had attained secondary education level at (46.8%), 33.5% of the farmers had primary level of education, 16.4% had tertiary level, 1.6 % University graduates and the respondents without any form of education were at 0.5%. It was noted that direct education impact differ across occupations and influence the initial choice of occupation. Education improves the entrepreneurial ability, but not the productivity of an individual, education will increase both the likelihood of becoming an entrepreneur and the performance of the entrepreneur. The Lari study concurs with those of van der Sluis et al (2005) in their review of studies from developing countries, whose findings were that more educated individuals have more chances to become wage earners and/or entrepreneurs and the women are more likely to become wage earners when education increases.

### Employment of Farmers before Venturing into Agro Forestry

Other than agro forestry some of the farmers in Lari had been employed in other professions. This would then mean that this may have been as a result of what they either did before or their passion for becoming farmers. Hence this study sought to establish from the farmers whether they had been employed before venturing into agro forestry. The results are as shown in Table 4.

**Table4.** Responses of farmers on whether they had been employed before venturing into agro forestry

	<b>Frequency</b>	<b>Percent</b>
Yes	119	30.9
No	266	69.1
<b>Total</b>	<b>385</b>	<b>100.0</b>

Source: Field Data, 2011

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Majority of the farmers (69.1%) had not been employed before venturing into agro forestry and 30.9% of them said they had been employed before venturing into agro forestry which shows that the 30.9% of the respondents were practicing coffee, tea and mixed farming. The employed indicated their profession, as doctors, librarians, secretaries, teachers and self-employment who had have been working for between 1- 30 years in their careers and turned to agro farming.

### Number of years in Agro forestry

The interviewee's number of years they had been in agro forestry was sought with indications they had varied reasons for investing in agro-forestry that are as shown in Table 5.

**Table5.** Number of years in agro forestry

	Frequency	Percent
1-5years	159	41.3
6-10 years	170	44.6
11-15years	24	6.2
16-20years	18	4.7
21-25 years	14	3.6
<b>Total</b>	<b>385</b>	<b>100.0</b>

Source: Field Data, 2011

Most farmers (44.6%) had been practicing agro-forestry for 6-10 years and 41.3% of the farmers had 1-5 years. About 6.2% of them had 11-15 years, 4.7% of them had 16-20 years and 3.6% of them had 21 and above years if agro-forestry. This shows that generally the majority of the farmers had been in farming for between 1-10 years. The experiences gained from previous career experiences can be expected to be a significant determinant of both the ability to better recognize and act on opportunities as well as to organize and manage new ventures as Shane and Khurana, (2003) noted. The empirical findings indicate that different types of career experience lead to different types of entrepreneurial knowledge, and that the knowledge developed also depends on the entrepreneurs' preferred mode of transforming experience into knowledge. This implies that the simple participation in an event is not sufficient for entrepreneurial learning to occur, as something must be done with this experience. Literature provides some empirical support for that the gaining of new experiences and the development of knowledge should be understood as a process where experiences become transformed into knowledge (Shane and Venkataraman, 2000). This supports the importance of taking the transformation process into account for explaining the development of entrepreneurship.

### Farming Acreage

66.0% of the farmers had 0.1-2 acres of land. The results agree with those of Singh (2013) who observed that new technologies are neutral to scale/farm size but certainly not neutral to resources, even a small farmer operating 2 ha of land having higher access to irrigation facilities and improved farm practices with entrepreneurial ability can earn higher income than a small farmer with same size of holding without other facilities. Slightly below half (49.8%) of the small scale farmers had 1-50 trees while 26.2% of them had 51-100 trees.

### Information Sharing

72.5% small scale famers indicated that they were not visited by an extension officer in the past one year due to lack of availability of extension officers that forced farmers to lack to adapt to new improved methods of farming and use of variety of methods since they are not able to have officers to demonstrate. About 36.9% of the farmers had attended training regarding management of agro-forestry for between 1-5 times and the majority (63.1%) of the farmers had not attended any training other than the information gotten in a public Baraza initially.

### Farmer's Capital Access from Financial Institution and Investment

Majority of the small scale farmers (99.0%) indicated that they had not borrowed money for farming in the last one year and only 1.0% of them had borrowed money. The respondents 92.7% indicates that personal saving were the main source of finance for improved *Eucalyptus* tree seedlings. 60.8% of the farmers had initially invested between Kshs 100-3000 and approximately 85.6% of the farmers were engaging between 1-3 members of the family.



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Insufficient planting materials, dry spells and weed control sometimes is a constraint (Mwangi Njuru, 2011). Majority of the farmers were also (63.6%) had complied to quality highly with improved *Eucalyptus* tree seedlings enterprises.

The study also revealed that majority of the small scale farmers (64.2%) indicated that they had experimented with new ideas or used knowledge during the past year especially on a new variety of crop and new farming techniques. When farmers compared tea and coffee to agro forestry they felt that agro-forestry was making more money compared to the later. Some of the challenges the farmers had were small areas of planting, bad climate conditions, wrong information, lack of funds, none availability of the extension officers, government regulation to stop cutting trees, fake seedlings, hard labour, lack of government support, lack of enough knowledge, poor land terrain and theft of the seedlings.

Based on the results of this study, it can be concluded that some farmers had prior knowledge before venturing into farming and others had about the improved *Eucalyptus* in public baraza. The farmers had started planting trees despite the lack of extension officers despite some farmers attending training about 1-5 times. The project was self-financed from family savings this leads to an entrepreneur factor since entrepreneurial is taking risk.

Focusing closely on the practice of entrepreneurial opportunity exploitation, the study adopted Shane and Ventakalaman’s model (2000) and derived the hypotheses on testing it’s applicability to smallholder forest growers. This concludes that entrepreneurial characteristics are identified on the level of the farmer’s entrepreneurial orientation.

From an entrepreneurship perspective, this research uses the results to build a framework of entrepreneurial opportunity exploitation in a forestry context. The focus on technology opportunities also presents a new perspective on how entrepreneurs in the smallholder farming, with fewer cutting-edge technological innovations, can still discover technological opportunities. Lastly, it provides the basis for construct development and larger sample empirical validation of the framework.

The research in a broader context for systematically mapping identifies the roots of entrepreneurship. After summarizing the literature review, the research in the cross-section of “individual” studies, namely, what empirical evidence is provided by smallholder forest growers of Lari District that could help to understand the phenomenon of entrepreneurial characteristics of smallholder forest growers that may be utilized in forest extension and other support services to enhance farm based commercial forestry.

**Probit Analysis on the Relationship Between Personality Trait and Planting Improved Eucalyptus Trees Varieties**

The dependent variable is the conditional probability that the binary outcome is equal to Probit analysis used to analyze how tree farmers demonstrate entrepreneurial personality traits in their decision to plant improved *Eucalyptus* trees varieties. The results are as show in the tables 15.

**Table 15.** Probit analysis

Regression Coeff.	Standard Error	Coeff S.E
.3364	.24090	1.33934
1.296993	.42767	3.10513
1.78424	.47526	3.75419

*Chi Square = 361.153, DF = 251, P = .000*

Since Goodness-of-Fit Chi square is significant, a heterogeneity factor is used in the calculation of confidence limits

Observed Responses	Expected Responses	Residual	Probability
1	.974	.026	.97394
2	1.895	.105	.94734
3	1.985	0.15	.99244

Probit Analysis has been used to establish the relationship between farmers’ entrepreneurial personality traits in their decision to plant improved *Eucalyptus* trees variety. This was done by testing the response of personality trait under various facts such as risk averse, prior knowledge, prior

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experience, internal locus of control, tolerance of ambiguity, need for achievement and extrovert. The response was binomial (e.g. one takes risk or no risk taking at all) and the relationship between the response and the various factors were found to sigmoid. Hence Probit analysis acted as a transformation from sigmoid to linear and then runs a regression on the relationship. The chi-square results generally shows that there is a significance difference in the model as (p-value= 0.001, df= 251, Chi Square =361.153). Further test on the specific factors there was no relationship between personality trait and the factors influencing one to plant improved *Eucalyptus* varieties.

The decision to become an entrepreneur is in essence an individual decision. It can be argued that in regions with high rates of entrepreneurship, entrepreneurial role models are abundant. These role models may serve as good examples of entrepreneurial activity and inspire individuals in the region to become entrepreneurs or attract other entrepreneurs to the region, thereby reinforcing the entrepreneurial process. Role models are important research support the idea that entrepreneur characteristics affect the value attached to specific types of role model.

## **CONCLUSION**

The decision to become an entrepreneur is in essence an individual decision. From the Probit analysis, it is revealed that prior knowledge in agro-forestry, control on production, personal degree of risk aversion and farmers who are front runners had a significant influence at varied levels on farmers' decision to embark on planting of improved trees. Interventions that can enhance these traits would increase the levels of planting of improved trees varieties by smallholder farmers.

## **RECOMMENDATIONS**

A deliberate training in entrepreneurship for tree farmers is necessary. This can be accomplished through training of extension officers and role models.

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