Goals of Smallholder Sugarcane Farmers in Eswatini

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ABSTRACT

Establishing farmers' goals is important for increased productivity and profitability in sugarcane production. This study aimed at establishing farmers' goals and their relationship with farmers' socioeconomic characteristics for increased productivity. The study used primary data collected from 147smallholder sugarcane farmers. This study employed factor analysis to generate goal orientations of farmers. The findings of the study revealed that the majority of the farmers interviewed were females (57%), with 39% of *farmers' attained secondary education, average mean age of 56 years, farming experience of 10 years and cultivate about 4.5 hectares of sugarcane. Farmers' goal orientations generated were instrumental orientation, sustainable orientation, family and leisure orientation, expressive orientation and social status orientation. Farmers' socioeconomic characteristics including gender, age and education, occupation, farming experience and off-farm income are the major drivers of perceived farmers' goals. The study therefore recommends formulating rural development programmes and policies that target young farmers' engagement and participation in sugarcane production and consider farmers' oriented goals and socio-economic factors for increased productivity.*

Keywords: efficiency, farmers' goals, principal component, smallholder farmers, sugarcane

1 INTRODUCTION

Sugarcane production in Swaziland started in Big Bend in 1956 and has been based on sugarcane estates owned by the millers. To date, the Swaziland Sugar Association (SSA) and the Swaziland Government have established smallholder sugarcane production farms on Swazi Nation Land as means of alleviating poverty in Vuvulane, Komati Downstream Development Project (KDDP) and Lower Usuthu Smallholder Irrigation Project (LUSIP) areas with assistance from the three sugar mills existing in the country, which are Mhlume, Simunye and Big bend mills [1-4]. In 2014/15, the sugar industry accounted for 74% of total agricultural output and had contributed 16% of the total export earnings, 17% and 10% of the private and national wage employment per annum, respectively, 25% to the total manufacturing output and 13% to Gross Domestic Product (GDP) [5].

Despite an increase in the sugarcane production area by about 1.4 percent, there was a decrease in yield per hectare per annum of about one percent in 2014/15 [5]. Sugarcane productivity is greatly affected by, among other factors, labour, basal fertilizer, top dressing fertilizer and land size [2][5]. However, a body of literature suggests that agricultural productivity is influenced by farmers' goals [6-10]. Goals are considered to be specific end states toward which producers hold positive attitudes. Farmers' goals are internal representations of desired outcomes that govern individual and entrepreneurial behaviour. Thus, goals are desired individual endeavours that maximise utility [6][9]. Basarir (2002) suggested that goals other than profit maximisation compete strongly in farmers' decisions [7]. In addition, Parminter and Perkins (2001) revealed that farmers who put emphasis on goals become competitive [11]. Furthermore, Kibirige (2013) viewed farmers' goals as exerting influence on farmers' decision making strategies of which non-economic goals are a determinant to farmers' level of productivity [9]. Therefore, restricting farmers' goals and success to profit maximisation may lead to denunciation and misinterpretation of rural farmers' poor adoption of technologies and undermine rural development programmes [10]. Thus, a goal oriented farmer will use scarce resources objectively and proficiently thereby improving productivity [12].

Eradication of the EU preferential market where guaranteed Swaziland sugar price was reduced of over 30% in 2014/15 growing season was a challenge to Swazi sugar, of which now it will face the SACU, African/Regional markets which are volatile [5][13]. Furthermore, Swaziland failed to meet African Growth and Opportunity Act (AGOA) bench marks set by United States of America (USA) and this made Swaziland sugar market currently unattractive in USA [5]. In order to safeguard the sugar industry, it is paramount to explore farmers' goals so that the government of Swaziland and donors would better forecast on farmers' economic behaviour and comprehend the types of programmes that would interest farmers in order to improve productivity.

The specific objectives of the study were:

(i) To determine the socioeconomic characteristics of smallholder sugarcane farmers and also to identify smallholder sugarcane farmers' goals.

(ii) To determine the impact of smallholder sugarcane farmers' socioeconomic characteristics on the importance of goal orientations.

The hypotheses of the study were:

H_0: Smallholder sugarcane farmers' socio economic characteristics do not have an impact on the importance of farmers' goals.

H_1: At least one of the smallholder sugarcane farmers' socioeconomic characteristics has an impact on the importance of farmers' goals.

2 Theoretical and Conceptual Framework

2.1 Theoretical Framework

Most studies have fundamentally used the neoclassical traditions and rational choice models to ascertain constraints faced by farmers, but had been proven inadequate in explaining the large number of uncertainties. The notions of bounded rationality allow for more flexible modelling. The most common assumption is that the goal of the producers is profit maximisation. However, it is believed that the objectives and goals of the producer are intertwined with farmers' psychological makeup [14]. Therefore, this study is based on assumption by Padilla-Fernandez and Nuthall (2001) that smallholder producers aim at minimising input subject to existing constraints. Sugarcane production is a dependent variable (productivity) because its production varies as a result of the independent variables (goal and value orientations and socioeconomic variables). The desire to satisfy the independent variables creates tension in the farmers, and the tension motivates them to be involved in sugarcane farming.

2.2 Conceptual Framework

Farmers articulate their values through a range of individual farming goals. Therefore, they are more open to transform their existing farming practices. Many farmers' behaviours and management styles may be associated with goal orientations. The conceptual framework illustrates how government policies can influence the farmers' goals, aspirations, entrepreneurial spirit, sugarcane yields and productivity. It is the relative ordering of values orientations which determine how sugarcane farmers decide to act and perform.

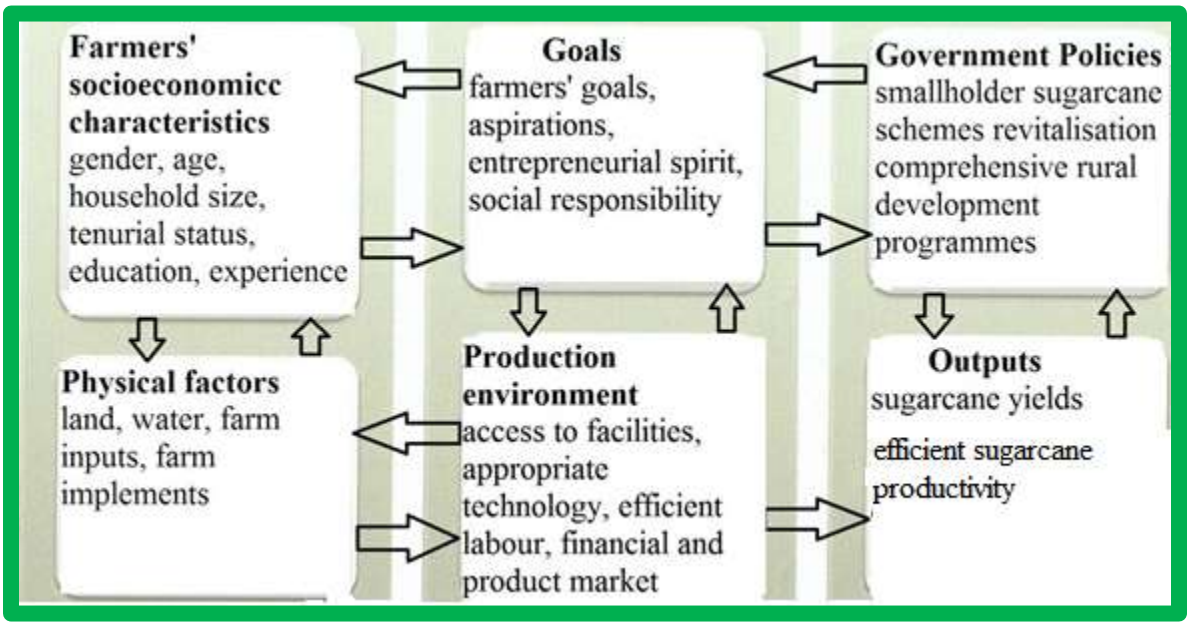

Figure 1: *Conceptual framework* **Source**: [9][11]

The comprehensive rural development programmes provide easy availability and farmer's accessibility to productive assets like land, water and implements which in turn are utilized given a favourable environment for sugarcane production. The environment for sugarcane production is thought to entail appropriate education, efficient financial and product markets, availability of appropriate technologies and efficient and flexible labour markets. The goals for increased sugarcane productivity are influenced by gender, age, tenurial status and experience of the smallholder farmer. Increased yields of smallholder sugarcane farmer is anticipated to improve household wealth and livelihood, improve food security and health, provision of employment and reduce poverty levels among rural communities. The conceptual framework proposed is presented in Figure 1.

3 METHODOLOGY

3.1 Study Area

The study was conducted in Lubombo and Hhohho regions. Currently sugarcane is grown on over 11100 hectares in LUSIP and Poortzicht and over 6500 hectares in KDDP and Vuvulane of irrigated farms [4].

3.2 Research Design

The study was a cross sectional research, which used descriptive, qualitative and quantitative research design. The design revealed the relationship between farmers' socioeconomic characteristics and the rating of the importance of farmers' goals.

3.3 Sampling Method

Currently there are 596 individual farmers and 99 farmers' associations. The sampling frame was 6326 individual farmers. Sample size was determined using formula [15] as shown below:

$$n_0 = \frac{N}{1+N(e)^2} \quad \text{..... (1)}$$

Where: n_0 = sample size
N = population size
e = margin of error (10%)

Thus, a sample size of 147 respondents was obtained. Purposive sampling was applied in selecting Hhohho and Lubombo regions as the sugarcane growing regions. Then smallholder sugarcane farmers were stratified according to individual farmers and farmer companies and according to milling companies. The respondents were randomly selected.

3.4 Data Collection and Analysis

Demographic characteristics of the farmers input and output data and rating of the importance of the farmers' goals were collected through use of a structured questionnaire. In order, to produce means, frequencies, standard deviation, minimum and maximum values, and percentages a statistical analysis was carried out using Statistical Package for Social Sciences (SPSS version 20). Factor analysis method was employed to analyse smallholder farmers' goal orientations using the principal component analysis model. To analyse the relationship between farmers' socioeconomic characteristics and farmers' goal orientations (principal components) an Ordinary Least Square regression (OLS) model was employed [16].

3.6 Analytical Framework and Variable Measurement

The study used a 4 point Likert scale and rating order to solicit farmers' goals with 1 = not important to 4 =very important. The factor analysis method was used to analyse smallholder farmers' goal orientations using the principal component analysis model. The principal components were generated using factor analysis and then an average mean score for each component was established. The goals were clustered into principal components. Principal Component Analysis (PCA) is a dimension-reduction instrument that can be used to condense a large set of variables to a small set that still consists of most of the data in the large set. Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity tests were used to ascertain greater factoring ability and sampling adequacy[6][8-10][12][17]. An Ordinary Least Square (OLS) regression model was employed in order to ascertain impact of farmers' socioeconomic characteristics on farmers' goal orientations (principal components). Farmers' socioeconomic characteristics used are explained in Table 3 based on the hypothesised impact of the extracted principal components of the farmers' orientations.

Table 1

Empirical model variables and their hypothesised signs

Variable	Description	Unit	Hypothesized sign
EDUC	Educational level of respondent	years	+
EXPE	Farming experience of respondent	years	+
AGE	Age of the respondent	years	+
HHSZE	Size of household	number	+
GNDR	Gender of the respondent (female = 1, male = 0)	Dummy variable	+/-
OCCUPTN	Occupation of respondent (farmer = 1, otherwise = 0)	Dummy variable	+
Off-farm	Duration of off-farm work	years	-

3.7 Principal Component

The farmers' goals were ordered and factors were subject to Varimax rotation performed by Principal Component Method [7][12]. The Principal Component could take different forms of measurements and these included continuous variables, quantity of related products of values that make up a component and weighted values (generated values) from the component loading.

Principal component equation is written as follows:

$PC_1 = \alpha_{11} X_1 + \alpha_{12} X_2 + ...\alpha_{1j}X_j$..... (2)

Where: PC_1 = first principal component. X_1 and X_2 are first and second independent variables of PC_1. a_{11} and α_{12} are coefficients associated with X_1 and X_2 variables.

3.8 Impact of Farmer Characteristics on Goal Orientations

Ordinary least square (OLS) linear regression model was used to establish the impact of farmers' socioeconomic characteristics on goal orientations as shown below:

$\theta = s_0 + p_1$ HHSZE + p_2 GNDR+ p_3 AGE + p_4 EDUC + p_5 EXPE + p_6 OCCPTN+ p_7 Off-FARM + U*..... (3)

Where:

s_0 = Constant or intercept
U* = error term
p_1- p_7 = Unknown scalar parameters to be estimated

HHSZE = Size of household of the respondent

GNDR = Gender of respondent (1 = female, 0 = male

AGE = Age of respondent in years

EDUC = Level of education of the respondent

EXPE = Farming experience in years

OCCPTN = Occupation of respondent (1 = farmer, 0 = otherwise

OFF-FARM = Number of years in off-farm employment

θ = Instrumental orientation ($GOAL_1$), Sustainable orientation ($GOAL_2$), Family and leisure orientation ($GOAL_3$), Expressive orientation ($GOAL_4$) or Social status orientation ($GOAL_5$)

4. FINDINGS AND DISCUSSION

4.1 Socioeconomic Characteristics

Table 2 reveals household heads were mainly "husband" (42.2%), "wife" (51.7%) and "child" 6.1%. Fifty seven (57.1%) percent of the respondents were females while forty three (42.9%) percent were males. This implies that there were more females than males in sugarcane production. Men were engaged in off-farm work. There were 87.1% married, 9.5% widows and 4.5% single household heads. All of the respondents had formal education with the majority having attended secondary school (38.8%), primary school (30.6%) and high school (23.8%) and a few tertiary levels (6.8%).

Table 2

Status and educational backgrounds of farmers (n = 147)

Farm/farmer characteristics	Description	Frequency	Percentage
Position of household head	Husband Wife Child	62 76 9	42.2 51.7 6.1
Gender	Male Female	63 84	42.9 57.1
Marital Status	Married Widow Single	128 14 5	87.1 9.5 3.4
Level of education	Primary Secondary High school Tertiary	45 57 35 10	30.6 38.8 23.8 6.8

The study further revealed that the average age of respondents was 56 years, household size of about 10 people and 9 years in formal school as indicated in Table 3. The age of a

household head represents general decision making ability [17]. The results further established that farmers had 10 years of farming experience cultivating on 4.5 hectares. The average farming experience indicated that most of the sugarcane growers had relatively sufficient experience in sugarcane production. Tew (2010) noted that smallholder sugarcane farmers were likely to set realistic goals as a result of varsity experience [8].

Table 3

Farm and farmer characteristics (n = 147)

Farm/farmer characteristics	Mean	Standard Deviation
Household size	9.63	4.976
Age	56.47	9.394
Years in school	8.82	3.819
Farming experience	10.04	5.588
Land size	4.456	6.429

The majority of the farmers (87.1%) in Table 4 were allocated land by Chiefs with 4.8% farmers having purchased the land on which they are growing sugarcane while farmers (8.2%) inherited land from their parents. This implies that the majority of the smallholder farmers were producing sugarcane on Swazi Nation land where there are no Title Deeds [18]. The study further revealed that eighty two (81.6%) percent of the farmers indicated that rules regarding land access were set by traditional community and eighteen (18.4%) percent reported that rules were set by the government.

Table 4

Land acquisition (n = 147)

Access to land	Description	Frequency	Percentage
Who set rules about land acquisition	Traditional Community Government	120 27	81.6 18.4
How you accessed land under cultivation	Allocated by chief Purchased Inherited	128 7 12	87.1 4.8 8.2

Table 5 reveals that 100% of the respondents had access to facilities like credit, extension services, accounting services, soil analysis and water testing services. In a study carried out by Dlamini and Dlamini (2012), it was revealed that seventy eight (77.5%) percent of the smallholder sugarcane farmers had easy access to service facilities [3]. The current results show that there was great stride in improving easy accessibility to service facilities

by the government of Swaziland and private sector. Furthermore, sugarcane in the study area was grown using overhead (86.4 %) and furrow (13.6 %) irrigation systems. Regarding sugarcane varieties, forty nine (49%) percent of the smallholder farmers indicated that they were growing N25. Very few respondents (8.1%) reported that they were growing N19 with about forty three (42.9%) growing N23.

Table 5

Facilities, irrigation and cultivars (n =147)

Facilities/irrigation	Description	Frequency	Percentage
Access to facilities	Extension	147	100
	Credit & Accounts	147	100
	Soil & water testing	147	100
Irrigation	overhead	127	86.4
	furrow	20	13.6
Sugarcane cultivars	N19	12	8.10
	N23	63	42.90
	N25	72	49

The study further revealed that smallholder farmers obtained an average sucrose yield of 90.69 tonnes per hectare per annum as indicated in Table 6. This is less than what SSA (2015) obtained, which was 101 tonnes per hectare per annum. The SSA (2015)'s findings were inclusive of large scale sugarcane estates which were more efficient. Regarding labour, the study revealed an average of 33.05 man days per hectare per annum [5]. In a study by Dlamini and Masuku (2012) labour was reported to be 31.25 days per hectare per annum among sugarcane farmers which is less than what was found in the study [3]. On average a smallholder farmer used 15543.92 m^3 of water to irrigate one hectare of sugarcane per annum. Fertilizer (basal & urea) share in the production of sugarcane constitutes a mean of 654.1 kilogrammes (kg) per hectare per annum. The study further revealed that on average a farmer used 12.07 litres of herbicides per hectare per annum. Dlamini and Masuku (2012) reported that smallholder farmers used 14.3 litres of chemicals (herbicides) per hectare per annum which is more than what was found in the study [2]. On average, smallholder farmer used 1.27 litres ripeners per hectare per annum.

Table 6

Farmers' inputs into sugarcane production (n =147)

Variable	Mean	Standard Deviation
Quantity of sucrose (Tonnes/hectare)	90.69	15.822
Labour in man days/hectare	33.05	5.764
Quantity of water (m3/hectare)	15543.92	1961.774
Quantity of fertilizer (kg/hectare)	654.1	117.241

Quantity of herbicide (litres/hectare)	12.07	2.603
Quantity of ripeners (litres/hectare)	1.267	0.6567

4.3 Farmers' Goals

The farmers' goals were solicited using the 4 point Likert scale where "1" was extremely not important and "4" was extremely important. The respondents were implored to rate the rank of 20 out of 22 attitudinal statements pertaining to smallholder sugarcane farmers' goals. The goals were then clustered into five orientations called principal components based on ideal research evidence [10][19-20]. The five goal orientations generated include Instrumental orientation (GOAL 1), Sustainable orientation (GOAL 2), Family and leisure orientation (GOAL 3), Expressive orientation (GOAL 4) and Social status orientation (GOAL 5) as indicated in Table 9.

The instrumental orientation in Table 7 was considered most important with a total mean value of 3.73. The goal that scored highly in this component was "increase standard of living" (mean = 3.82, SD = 0.422). The other goals were "it is important to maximise profit" (mean = 3.74, SD = 0.484), "increase maximum farm income" (mean = 3.72, SD = 0.465), "keep debts as low as possible" (mean = 3.7, SD = 0.59) and "expand farm business" (mean = 3.66, SD = 0.543). These respondents were concerned about sugarcane farming as a business with maximisation of utilities. The expressive orientation component involved respondents who were aspiring for recognition, prestige and excellence. It is composed of four goals with an average mean value of 3.48. The goals were as follows: "recognised as top producer" (mean =3.6, SD = 0.637), "recognised as owner of land" (mean = 3.63, SD = 0.653), "recognised as technology adopter" (mean = 3.28, SD = 0.757) and "recognised as sugarcane farmer" (mean = 3.4, SD = 0.791). The respondents were concerned about their own welfare and survival and future financial situation of the sugarcane business.

Table 7

Analysis of farmers' goals (n =147)

Farmers' goals	Mean	Standard Deviation
Instrumental Orientation (GOAL 1)		
It is important to make maximum profit	3.74	0.484
Expand farm business	3.66	0.543
Increase maximum farm income	3.72	0.465
Keep debts as low as possible	3.70	0.590
Increase standard of living	3.82	0.422
Average	**3.73**	**0.501**
Sustainable Orientation (GOAL 2)		
It is because parents were farmers	2.55	1.304
Provide employment to rural people	2.87	0.931

Leave business for next generation	3.11	1.014
Being able to arrange hours of work	3.24	0.791
Doing work you like	3.23	0.713
Average	**3.00**	**0.951**
Family & Leisure Orientation (GOAL 3)		
Avail time to spend with family	3.23	0.703
Have more leisure time	3.58	0.618
Involve family in decision making	3.37	0.653
Self-employment and independence	3.60	0.659
Average	**3.45**	**0.658**
Expressive Orientation (GOAL 4)		
Recognised as a top producer	3.60	0.637
Recognised as owner of land	3.63	0.653
Recognised as a technology adopter	3.28	0.757
Recognised as sugarcane farmer	3.40	0.791
Average	**3.48**	**0.710**
Social Status Orientation (GOAL 5)		
To be in contact with people & share information	3.61	0.726
Belong to farming community	3.12	0.784
Average	**3.37**	**0.755**

Based on the analysis results, family and leisure orientation comprises of four goals with a total mean value of 3.45. The component had respondents that were concerned about leisure, family and independence. The goals in this category were as follows: "avail time to spend with family" (mean = 3.23, SD = 0.703), "have more leisure time" (mean= 3.58, SD = 0.618), "involve family in decision making" (mean = 3.37, SD = 0.653) and "self-employment and independence" (mean = 3.6, SD = 0.659). In the social status orientation category, the respondents were concerned with welfare of other farmers and sharing of information with them. The social status orientation consists of two goals with a total mean value of 3.37. The goals were "to be in contact with people and share information" (mean = 3.61, SD = 0.726) and "belong to farming community" (mean = 3.12, SD = 0.784).

The sustainable orientation principal component had the least total mean value of 3.00. The goal that scored lowly was "it is because parents were farmers" (mean = 2.55, SD = 1.304). The other goals were "provide employment to rural people" (mean = 2.87, SD = 0.931), "leave business for the next generation" (mean = 3.11, SD = 1.014), "being able to arrange hours of work" (mean = 3.24, SD = 0.791) and "doing work you like" (mean = 3.23, SD = 0.713). Therefore, the smallholder sugarcane farmers farm in order to satisfy their instrumental (business), expressive (prestige & excellence), family and leisure (self-esteem & independence), social status (information sharing & sense of belonging) and sustainable (welfare of future generation) related demands. This implies that smallholder farmers had confidence and interest in farming resulting in high productivity levels of

individuals. This is anticipated to improve livelihood and reduce hunger and poverty among the rural sugarcane farming communities.

4.3.1 Principal Components of Farmers' Goals

Factor analysis was used to approximate the principal components of the farmers' goals. In this study 20 goal statements were condensed into fewer explained goal orientations. During the analysis, all goal statements were taken into consideration and were congruent with the minimum Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value of 0.60. The KMO of the current study was 0.813 and passed the Bartlett's Test of Sphericity with no autocorrelation among variables. Furthermore, the Eigen value proportions of variance for the selecting optimal number of principal components were above the recommended value of 1. The entire twenty goals related statements passed the mandatory tests and were considered in the factor loading statistical measurement process. The goal statements generated five principal components with 60% of variation in the explanatory variables. Kibirige (2013) and Padilla-Fernandez and Nuthall (2001) inscribed that any estimated coefficiency score greater than 0.3 of a goal is considered significant for that goal to belong to a principal component [6][9]. The five principal components generated were instrumental orientation (PC1), sustainable orientation (PC2), family and leisure orientation (PC3), expressive orientation (PC4), and social status orientation (PC5).

The first principal component (instrumental orientation) in Table 8 exhibits a variation of 29.12% in farmers' rating of their goals. The principal component was best described as instrumental, business or developmental oriented goals. There were five farmers' related goals that had estimated coefficients above 0.3 and defined this principal component. The farmers were interested in creating maximum profit and income, increasing standard of living, expanding farm business and reducing debts. The business ego goals may be of great necessity to farmers for better performance as they strive to accomplish these ambitions. In support Kibirige et al. (2016) noted that farmers' business goals can therefore be incorporated in rural development programmes for improved smallholder farmers' incomes and general livelihood [10].

Table 8

Principal components of farmers' goals (n = 147)

	Instrumental	Sustainable	Family & leisure	Expressive	Social status
Proportion of variance (%)	29.120	9.872	7.798	7.102	6.072
Eigen values	5.824	1.974	1.560	1.420	1.214
	Factor Loadings				
Farmers' goals	**PC 1**	**PC 2**	**PC 3**	**PC 4**	**PC 5**
It is important to make maximum	**0.858**	0.105			0.160

profit					
Expand farm business	**0.820**	0.149	0.164		
Increase maximum farm income	**0.767**	0.223	0.136		
Keep debts as low as possible	**0.725**		0.101		0.245
Increase standard of living	**0.583**	0.189	0.287	0.163	-0.127
It is because parents were farmers		**0.837**		-0.157	
Provide employment to rural people		**0.673**	0.215		0.405
Leave business for next generation	0.181	**0.652**	0.166	0.227	**0.366**
Being able to arrange hours of work	0.233	**0.619**	**0.303**		
Doing work you like	0.254	**0.533**			
Avail time to spend with family	0.125	0.250	**0.829**		
Have more leisure time		-0.112	**0.679**	0.116	**0.371**
Involve family in decision making	0.296	0.195	**0.63**		-0.149
Self-employment & independence	**0.344**	0.153	**0.473**	0.193	
Recognised as a top producer				**0.721**	
Recognised as owner of land		-0.146		**0.684**	
Recognised as a technology adopter	0.243	**0.390**	0.179	**0.592**	
Recognised as sugarcane farmer	0.284	**0.302**	0.150	**0.474**	0.228
To be in contact with people & share info					**0.776**
Belong to farming community	**0.351**	**0.372**	0.145		**0.655**
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy = 0.813 Bartlett's Test of Sphericity: Approx. Chi-Square = 1048.573 Level of Significance = 1%					

The second principal component accounted for 9.87% variations in the explanatory variables and mainly comprises of the sustainability aspiration. This principal component includes five goals which were parents were farmers, providing employment to rural people, leaving business for next generation, being able to arrange hours of work and doing work you like. Although most smallholder sugarcane farmers did not inherit their business they aspire to pass on their enterprises to the next generation. They desire the farm business to continue into the future and augment livelihood of their children and the community. They also aspired to do work they like and freely schedule their work. Therefore for continuity purposes, programmes that encourage participation of farmers' children (especially young people) should be established.

The third principal component generated revealed 7.8% of variations in the explanatory variables and mainly composed of independence, family and leisure goals. This principal component included four aspirations which were availing time to spend with family,

having more leisure time, self-employment and independence and involving family in decision making. Farmers viewed farming as source of family congregation, personal freedom, independence and leisure time. Family gatherings provide opportunities for sharing farming experiences and new ideas by older and educated members respectively. Moreover, more leisure time, self-employment and independence enhance farmers to participate in social gatherings. Kibirige et al. (2016) noted that the majority of rural population in developing countries engages in smallholder farming as major source of livelihood and self-employment. This attribute can be enhanced by promoting smallholder farming as business and source of self-employment among rural sugarcane communities [10].

The fourth principal component factored in, can be best defined as farmers' expressive, feeling or prestigious goals and was explained by 7.1% of variations in the explanatory variables. The principal component comprised of goals like recognised as top producers, recognised as owner of land, recognised as technology adopter and recognised as sugarcane farmer. The farmers desired excellence among peers to own land and perceived as being prestigious and powerful to belong to sugarcane farming community (Padilla-Fernandez & Nuthall, 2001; Basarir, 2002; Pereira, 2011) [6-7][21]. Therefore, programmes that reward and appreciate individual efforts should be put in place. The last principal component generated revealed 6.07% of variations in the explanatory variables and was explained as farmers' social status and sense of belonging. The fifth principal component comprised of goals like belonging to farming community and being in contact with people and share information. Community gathering provides opportunity for smallholder sugarcane farmers to share information about farming. Furthermore, sugarcane farmers desire to get along with their peers (Pereira, 2011) [21].

4.3.2 Farmers' Goals and Socioeconomic Characteristics

In order to determine relationships between farmers' goals and farmers' socioeconomic characteristics a multiple regression analysis model was used. Analysis of results in Table 9 has established a significant relationship between the farmer characteristics and farmer‘s goals. The regression model related to farmers' goals of instrumental orientation (GOAL 1), sustainable orientation (GOAL 2), family and leisure orientation (GOAL 3), expressive orientation (GOAL 4) and social status (GOAL 5) were significant at 1% level respectively. There was low extent of autocorrelation registered within the regression model since results exhibited a Durbin-Watson statistics greater than 1 [6][9-10].

The study revealed that instrumental orientation (business) was positively and significantly related to gender at 1% significant level. This implies that female farmers are more oriented to business goals than males do. The results are not in line with Basarir (2002)'s findings which revealed that males were more business oriented than females in beef production. Age and education were positively and significantly related to instrumental (business) orientation at 1% and 10% significant levels, respectively. This implies that a year increase in age and educational level of the farmer, improves the instrumental (business) goal. This means old and educated farmers view farming as a

business. This is in conformity with Pereira (2011)'s findings where age and educational levels positively influenced business oriented goals [21].

The study further revealed that occupation is positively related to instrumental orientation at 5% significant level. This implies that those engaged in farming, as a major occupation, were for increased output. This results in increased income, high standard of living and accumulated wealth [1]. Off-farm work is positively related to instrumental (business) orientation at 5% significant level. This implies that off-farm income complements the farm business. The study results are in line with Pereira (2011)'s findings where off-farm work was positively related to instrumental (business) orientation. This means that off-farm work is for financing farming business. Surprisingly, farming experience is negatively related to instrumental orientation at 1% significant level [21]. This is contrary to Padilla-Fernandez and Nuthall (2001)'s findings where farming experience was positively related to instrumental orientation [6]. This means experienced farmers no longer view farming as means of obtaining income and security but rather an enjoyable part of lifestyle [20].

Basing on the study results, gender is positively and significantly related to sustainable orientation at 5% significant level. This implies that female sugarcane farmers perceive sustainable orientation important more than male sugarcane farmers do. Female sugarcane farmers would likely improve sustainable orientation goals. Furthermore, age is positively and significantly associated with sustainable orientation at 10% significant level. This implies that an increase in age of a farmer will improve sustainable orientation. Older farmers may likely want to pass farming operations to future generation. The old farmers put more attention on preserving land for future generation and view farming business as a secure retirement option [6-7][21]. Farming as a major occupation has a positive and significant impact on farmers' sustainable goals at 1% significant level. This implies that smallholder producers whose major occupation is farming consider sustainable orientation goals important. Thus, an indication that considering farming as a major occupation improves farmers' confidence to do work that he/she like to do, improve the farm for future generation and spend more time on farming activities [9].

Table 9: Impact of farmers' characteristics on goals (n = 147)

Variable	Instrumental		Sustainable		Family & leisure		Expressive		Social status	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Size	0.015	0.180	0.021	0.213	-0.005	0.677	-0.001	0.938	0.020	0.217
Gender	1.320***	0.000	0.796**	0.032	1.515***	0.000	1.204***	0.000	1.393***	0.000
Age	0.026***	0.000	0.014*	0.059	0.024***	0.000	0.026***	0.000	0.021***	0.003
Education	0.100*	0.095	0.111	0.215	0.114*	0.087	0.101	0.120	0.004	0.957
Experience	-0.034***	0.001	-0.009	0.543	-0.013	0.253	-0.029***	0.008	-0.024*	0.089
Occupation	0.619***	0.003	1.220***	0.000	0.419*	0.064	0.699***	0.002	0.868***	0.003
Off-farm	0.041**	0.030	0.073***	0.010	0.039*	0.065	0.041**	0.045	0.040	0.130
D-Watson	1.781		1.691		1.877		2.065		1.678	
Adjusted R^2	0.982		0.938		0.973		0.975		0.957	
F-Value	782.787		221.805		540.158		575.410		324.434	
P-Value	1%		1%		1%		1%		1%	

** = 10% significant level, ** = 5% significant level, *** = 1% significant level*

Off-farm work had a positive and significant relationship with sustainable orientation at 1% significant level. This implies that an increase in one year of off-farm work will improve sustainable orientation. Income from off-farm work will be used to improve the farm for secured retirement option and preserve the farm for future generation [6-7]. Family and leisure orientation is positively and significantly associated with gender, age (1% significant level), respectively, occupation, off-farm work and education (10% significant level), respectively. This implies that female sugarcane farmers view family and leisure (independence) orientation more important than males do. A year increase in age and education level of a farmer will improve family and leisure orientation. The results of the study are in line with Kibirige (2016)'s findings which revealed that age and education were positively related to independence and leisure goals [10]. Furthermore, an increase in years of farming as a major occupation will improve family and leisure orientation. This implies that farmers perceive farming as having more freedom, independence and leisure time [6][17]. Moreover, an increase in years in off-farm work will

improve family and leisure orientation. The family and leisure activities are likely to be financed by off-farm income. The results of the study did not conform to Basarir (2002)'s findings where off-farm work was negatively related to family and leisure orientation goals [7].

Determinants of expressive orientation include gender, age, farming experience, occupation and off-farm work. Gender and age had a positive and significant impact on expressive orientation at 1% significant levels. This implies that female sugarcane farmers perceive expressive orientation more important than males do. Older farmers are into sugarcane production because it is a prestigious operation [6]. Farming experience had a negative and significant influence on expressive orientation at 1% significant level. This implies that less experienced farmers tend to perceive that farming is more prestigious. Sugarcane farming as a major occupation is positively related to expressive orientation at 1% significant level. This implies that sugarcane farmers perceive farming as a prestigious operation. Furthermore, off-farm work had positive and significant impact on expressive orientation at 5% significant level. The results of the study are consistent with Kibirige (2013)'s findings which revealed that off-farm income was positively and significantly related to expressive orientation [9].

Factors positively and significantly related to social status orientation include gender, age and occupation of the farmer at 1% significant levels and negatively related to farming experience at 10% significant level. This implies that female farmers perceive social status orientation to be more important than male farmers do. An increase in the age of the farmer will improve social status orientation. The results of the study conform to Kibirige (2013)'s findings which revealed that age had positive and significant impact on social status [9]. Farmers are interested in spending their leisure time with other farmers sharing information [7]. Therefore policies should be designed among smallholder sugarcane farmers that boost farmers' goal orientations so as to enhance productivity.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Therefore, the study concludes that smallholder farmers are engaged in sugarcane farming to accomplish instrumental (business) goals (influenced by farmers' farming experience, gender, age, occupation, off-farm work and education), sustainable (welfare) goals (these are impacted by farmers' age, occupation and off-farm work and gender), family and leisure orientation (self-esteem & independence) goals (influenced by farmers' age, education, occupation, gender and off-farm work), expressive orientation (prestige & excellence) goals (these are determined by farmers' farming experience, gender, age, occupation and off-farm work) and social status (sense of belonging& sharing information) goals (impacted farmers' farming experience, gender, age and occupation) Basing on the findings of the study, the null hypothesis **(**H_0 = Smallholder sugarcane farmers' socioeconomic characteristics do not have an impact on the importance of farmers' goals) was rejected and alternative hypothesis (H_1 = At least one of the smallholder

sugarcane farmers' socioeconomic characteristics has an impact on the importance of farmers' goals) was accepted.

5.2 Recommendations

5.2.1 Recommendation for Policy

Recommendation is made for rural development programs and policies that target young farmers' engagement and education should be catalysed through provision of more land for sugarcane production and equitable distribution of land regardless of age. Prudence should be considered that improved access to land and training as only entities may not automatically result into increased productivity but rather farmers need to be supported financially for acquisition of capital and build their aptitudes in farm management and goal orientations.

5.2.2 Recommendation for Actions

It is recommended that stakeholders in the agricultural sector should perceive instrumental (business), family and leisure and social status goal orientations important so as to enhance productivity.

5.3.3 Recommendation for Further Research

For further study, it is recommended that there is need for research to compare goal orientations and socioeconomic characteristics of smallholder sugarcane farmers in KDD and LUSIP areas.

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