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Socio-economic Factors Influencing Participation of Households in Farming as a Livelihood Strategy in Nyandeni Local Municipality

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ABSTRACT Farming is the livelihood strategy with great potential to address food insecurity and poverty, especially in rural areas. However, participation in farming is declining from year to year. Therefore, the objective of this paper is to investigate socioeconomic factors influencing the participation of households in farming. The data from 176 respondents was collected using multi-stage sampling and analysed using the probit model. The descriptive results indicated that 62 percent of the households were female-headed with an average age of 55 years. Moreover, 50 percent of the respondents obtained primary education and 55 percent were unemployed. Probit model estimated that gender, age, education, employment, and income had a negative influence on households' farming while marital status, household size, farm experience, and extension services had a positive influence. Therefore, the study recommends the empowerment of women and youth in farming and promotion of farming through infrastructural development and initiation of agricultural projects.

INTRODUCTION

Farming has a significant role in the economy of many countries especially in the developing countries. Many developing countries depend on farming activities for economic development and poverty alleviation in rural areas (Truong 2018). Farming used to be the major livelihood strategy in rural areas (Heger et al. 2018). According to Ebenezer and Abbyssinia (2018) in Africa, more than 60 percent of its "rural" population used to generate their livelihoods from agricultural activities. Khumalo and Sibanda (2019) stated that farming in rural areas contributes largely to food availability, food security and poverty alleviation.

Beckman and Countryman (2021) noted that agriculture generally contributes to the GDP of the economy in many countries. According to Jayne et al. (2018) more than 32 percent of Africa's GPD is generated from the agricultural sector. Agricultural sector creates job opportunities; it has employed about 65 percent of Africa's labour force (Mkhize 2019). Statistics South Africa (2019) noted that employment in South Africa is the major challenge especially in rural areas, as it stands on 29 percent of unemployment rate. However, in 2019, agricultural sector contributed about 5.088 percent to the employment rate in South Africa (Statistics South Africa 2019).

According to Murugani and Thamaga-Chitja (2018) household farming provides some of the agricultural commodities that are required for basic food basket or consumption by the farm family usually without any significant surplus for sale. Household farming involves family labour since food produced is in small quantities and will only be consumed by the household (Truong 2018). Moreover, household farmers cannot take advantage of increased demand for their products because they only produce enough yield for consumption and therefore even if the demand of their products increases, they cannot take advantage of that, because their production is very low (Sinyolo and Mudhara 2018).

Despite such contribution of farming to rural households, household farming has not been growing instead it is declining exponentially (Khumalo and Sibanda 2019). Rural households view off-farm activities as more profitable than agriculture due to various benefits and high income. Ngema et al. (2018) discovered that rural areas are no longer dependent on agricultural activities; they have realized other sources to generate their livelihood strategies like provision of social services, economic participation, infrastructure and natural re-

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sources. There is also a shortage of labour as young people are migrating to towns to seek better employment and better standard of living. Lack of access to credit is another noticeable factor that influences rural households from practicing farming.

Participation of rural communities in agriculture could be due to some important aspects and knowing such aspects may control access to effective formulation of rural development policies. An in-depth understanding of the factors that explain farming as a rural subsistence strategy would provide a closer look at the determinants of rural household involvement in farming. Therefore, this study offers a very valuable insight into the different socio-economic factors affecting the involvement of households in agriculture.

Objective

The study seeks to investigate the socio-economic factors influencing the households' participation in farming as a rural livelihoods' strategy in Nyandeni Local Municipality.

METHODOLOGY

Study Area

The study was conducted in Nyandeni Local Municipality. NLM is situated in OR Tambo district municipality with 2 474 km² area. The population of NLM is estimated to be 313 000 people with about 61 000 households. This area has terrestrial suitability for agriculture with average annual rainfall of 700mm. The employment rate is very low in NLM; ECSECC indicated that about 21 754 individuals are employed in the region. The majority (69%) of them is formally employed and 31 percent are informally employed. Therefore, the employment rate in Nyandeni Local Municipality is relatively low for its population. The average temperature in areas close to the coast ranges from 14 to 23 degrees Celsius, while in inland areas it ranges about 5 to 35 degrees Celsius. Mean temperature varies from 8.9 degrees Celsius in the far northwest to 15.3 degrees Celsius across the south and a peak of 22.8 degrees Celsius along the south to 23.8 degrees Celsius inland.

The majority of farming households in the study area, lacks production inputs and credit, as a result, they mostly depend solely on traditional methods and indigenous knowledge for farming which limits their agricultural productivity. Due to such shortages, participation in household production is decreasing rapidly in NLM, which resulted in high numbers of people who are living in poverty (ECSECC 2018). Hence, the study was carried rural household to determine the socioeconomic factors that impede their farming as the livelihood activities.

Sampling Procedure and Sample Size

The study adopted the multi-stage sampling procedure. The multi-stage sampling technique involves the grouping of samples in stages. The study area was purposively selected, which is the Nyandeni Local Municipality. Out of the 31 wards in the municipality, five wards were randomly selected. Each ward consists of more than five rural areas; however, seven rural areas were randomly selected and each ward was represented in the sample. Moreover, due to financial and time constraints, the sample size that was obtained in this study is 176 respondents. This sample size still obeys the general rule of thumb for the Large Enough Sample Condition, which states that $n \geq 30$, if n is the sample size.

Data Collection

The study used primary data that was collected using a structured questionnaire. The questionnaire was administered by the interviewer in order to reduce misunderstandings and misinterpretations of questions. The respondents were asked questions directly from the questionnaire and interviewer would interpret where necessary. This method of collecting data faster and the interviewer is in a position to give clarity and ask other questions that may be important. Both open and closed-ended questions were asked. In open-ended questions, respondents were allowed to give their opinions in the context of the study. Close-ended questions were structured in a way that the responded only gives the straight answer and that minimizes time and makes it easy for the researcher to code the responses.

Data

Factors Affecting Households' Participation in Farming

Table 1 presents the expected results on factors affecting households' participation in farming.

Table 1: Hypothesised factors influencing households' participation in farming

Variables	*Description*	*Expected outcome*
Dependent Variable		
Household participation in farming	Binary variable indicating household participation in farming or not. 0= Non-participant and 1= Participant	+/-
Independent Variable		
X_1 = Gender	0=Male, 1= Female	+/-
X_2 = Age	In Years	+
X_3 = Marital status	0= Single, 1= Married, 2= Divorced, 3= Other	+
X_4 = Education level	0= Primary, 1= Secondary, 2= Tertiary, 3= No Education	+
X_5 = Employment status	0= Unemployed, 1= Employed, 2= Self-employed	-
X_6 = Household size	Individuals	+
X_7 = Household income	Total household income in Rand	+
X_8 = Participation in agricultural projects	0=No, 1= Yes	+
X_{11} = Extension service	0= No, 1= Yes	+
X_{12} = Farming experience	In years	+

Source: Author, 2019

Gender: Gender refers to the sexual type (male or female) or the role of the head of household. Ntshangase et al. (2018) observed that most households are dominated by women, as men are more likely to migrate to cities in search of employment. However, it is believed that women are more involved in farming as they comprise the majority of household heads and are always at home.

Age: It is reported that the elderly people tend to be interested in agriculture since they have inherited more information from their forefathers. Young people, however, have embraced technologies and are migrating to urban areas and suburbs to upturn their living standards. Hence, older people are expected to engage more in farming relative to young people.

Marital Status: marital status is expected to have a positive relationship with household participation in farming because a married household head has an advantage in that they have an increased labour force for farm activities as well as for the distribution of household duties.

Education Level: educated people are more likely to receive information from a wide range of sources of information compared to the less educated individuals. Additionally, trained persons are expected to obtain a formal employment. However, trained individuals are likely to be more interested in farming because they can quickly obtain and follow information from different sources.

Employment Status: Unemployment is an economic problem that has been discussed several times, often without a lasting solution. Rural households suffer from unemployment and thus suffer from hunger. It is also expected that unemployed individuals will engage in agriculture with a view to addressing hunger and food insecurity.

Household Size: Household size is the average number of people residing in a single household. The family size typically determines the household's food intake. This means that the greater the household size, the higher the household intake of food, and vice versa. As a result, households of many individuals are forced to engage in agriculture in order to improve the supply of household food.

Household Income: Income is one of the indices of household wellbeing. It is believed that high-income households can afford to purchase much of their needs from the markets, and thus, high-income households are projected to be less likely to engage in farming.

Participation in Agricultural Projects: Participating in community agricultural projects is important to rural households as it equips them with skills and knowledge in farming. Therefore, it is expected that households with a member who participates in an agricultural project will participate in farming because they have acquired some information and skills from the project.

Access to Extension Services: this refers to the transfer of agricultural information in the form of writing or training from an informed source to uninformed individuals. This helps in assisting the

farmers in improving their level of production. It is expected that individuals that get enough agricultural information from various sources will participate in farming.

Farm Experience: Farm experience decides the expertise that a person has in farming. Farming experience increases the likelihood of a person fleeing poverty. People with several years of experience in farming are more likely to engage in farming because they have greater knowledge and expertise in agricultural practices. As a result, it is expected that the more years of experience a household will have, the more it will engage in farming.

Analytical Framework

Descriptive statistics by way of means, frequencies, percentage and standard deviation were used to summarize the characteristics of household participating in farming through using Software for Statistics and Data Science (STATA 15). In particular, a probit model was used to examine the socio-economic factors that affect household involvement in agriculture as a means of subsistence strategy in NLM.

To analyse the factors influencing the household' participation in farming, the study adopted the Probit model. A Probit model is a long-linear approach used to measure the effects of independent variables on the dependent variables. A Probit model is the statistical model with two categories in the dependent variables and this model is based on cumulative normal probability distribution (Breen et al. 2018). Probit model gives a clear indication of whether the dependent variable is affected by the independent variables or not. A Probit model is the procedure which is designed to fit a regression model where the dependent variable Y characterizes an event which presents high possibilities of binary outcomes (Boateng and Abaye 2019).

Binary dependent variables y takes on the value of zero and one. The outcome of binary dependent variables is mutually exclusive and exhaustive. Binary outcome variables are the dependent variable with two possibilities, like positive test results and negative test results. Boateng and Abaye (2019) stated that the probit model is much more applicable to handle random taste variation and also allow any pattern substitution. The Probit model also suggests that although researchers only measured the values of 0 and 1 for the dependent variable y, nevertheless, there are independent factors; the unmeasured continuous variable Y also decides the value of Y (Amrhein et al. 2018). The probit model used to estimate the factors influencing household participation/non-participation in farming and is specified as follows:

$Pr(Yi=1) = F(\chi i'\beta$ ………………………...… (1)

Where

β is a parameter to be estimated, and

F is the normal Cumulative Distribution

To proceed, the model of participation in farming can be stated in general terms as follows:

$Y=PS=f(X_1, X_2 \ldots X_n)$ ……………………....… (2)

Y is the dependent variable that captures the household participation in farming, and

X's in the model represent the set of factors affecting households' participation in farming such as socio-economic factors, extension services, etc.

$Y^* = b + b X$ ....$bkXk + \mu$ 1 2 2.…………... (3)

But the handicap is that Y^* cannot be observed in reality but can only be inferred. Determinants can only be estimated on the basis of the dummy variables constructed for this purpose which can be defined as:

$P=0$ if $p<0$………………………...............… (4)

$P=1$ if $p>0$ ………………….............................(5)

From the foregoing equations, it can be assumed that:

$Prob(P/1\text{-}P) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \cdots$ ……… $BkXk + .. + \mu$………..........(6)

The Probit regression model is based on the probability that Y equals to one (P = P1). The value of Y is assumed to depend on the value of X1................Xk.

β – Estimated parameters

μ – Error term

RESULTS AND DISCUSSION

This section reflects on the findings of the analysis on the basis of the objective stated in the introduction. This section is divided into two subsections, namely: Descriptive results and empirical results. Descriptive findings identify the characteristics of households in the study area, while empirical results estimate the factors that affect household farming in rural areas.

Socio-economic Characteristics of Farming Households

The study results reveal that 62 percent of the farming households were female-headed and simple means that many households are female head-

ed households in rural areas. These results are in line with a study of Singh (2019) which shows that many households in rural areas are headed by females because most males migrate urban areas to improve their standard of living. The study found that the average age of the household head in rural areas was 55 years. This may imply that both those that are participating in farming and not participating may be less productive because they are old. The majority of the households in NLM were married with 51 percent and most of women are not living with their spouses because they are migrant labours in other places. According to Sharaunga and Mudhara (2021), marital status influences livelihood strategies practised by rural households including farming activities, to that extent, it has implications for migratory behaviour. One of the most important demographic characteristics for decision making in farming is the level of education. The study results revealed that majority of the households in the study area were literate with majority of the households have secondary education with 10 years spent in school. This presumes that the education obtained by households is helpful in assisting households in terms of reading, writing and analyzing the improved farming techniques. The study family size was found to be 6 people per households and their household main source of income were social grants with 70 percent. The study results found that most of the households were self-employed with 62 percent while remaining amount were practicing non-farm activities and unemployed respectively.

The study results reveal that participation in farming by rural households in the NLM is minimal with 52 percent. The average mean of farming experience among the households was 12 years and they do not have any form of access to credit facilities other than using social grants as the form of credit. Most of the households have land ownership through inheritance. The study findings reveal that farming households have access to extension services about 53 percent. Majority of the households are practicing mixed farming (crop and livestock farming). The farming households have access to arable land size of 4 Ha and using communal grazing for livestock. Majority of the households have monthly income of R1000.00 to R5000.00 per month.

Contribution of Farming to Households

Livestock Farming

The results reveal that livestock production in NLM mostly contributes to household food availability and household savings with 23 percent and 12 percent, respectively. 42 percent of households are keeping livestock for household consumption, including the performance of rituals and traditions. 14 percent of households that keep livestock sell it to generate income for the household livelihood. Moreover, 9 percent of households confirmed that livestock rearing has the potential to improve their nutritional status. This may be due to the fact that they do not consume livestock regularly, but they consume once in a while and during special occasions.

Crop Farming

Results indicated that 28 percent of the rural households in NLM believe that crop production alleviates poverty. Kamara et al. (2019) agreed that farming plays a substantial role in economic development and the alleviation of poverty. Moreover, 26 percent of the households stated that farming increases their food availability. Household food availability is when the household has enough food on a consistent basis (Khumalo and Sibanda 2019). Rural areas are characterised by food insecurity; however, 19 percent of the farming households believe that farming improves households' food security. Ngema et al. (2018) said that the majority of households derive their livelihoods from agriculture and agriculture related practices to boost their food security. Farming in rural areas is very important because most people in rural areas are unemployed, and depend on the social grant for income. 14 percent of the farming households agreed that farming assists them in generating income since they usually sell their surplus. Mango et al. (2018) supported that farming tends to positively influence rural households' welfare. Vegetable or crop production is well known for improving the nutritional status of households. Supporting this, 13 percent of the farming households agreed that participation in farming improves their nutritional status.

Challenges That Are Faced by Households in Farming

The rural households that are rearing livestock in NLM are facing challenges during their farming

process. All households that are keeping livestock are having troubles with diseases. Their livestock is dying due to disease outbreaks, tick-borne diseases and other contagious diseases. Furthermore, many of the households complain of livestock theft due to poor management since they are farming extensively. Consequently, 91 percent of the households that are keeping livestock are suffering from uncontrollable livestock theft. Moreover, it has also been found that financial issues are one of those challenges; they claim that they need funds to buy medication for their livestock when they are infested. Without funds, their number of livestock is decreasing more rapidly especially when there is a disease outbreak. Water is not really an issue; only 47 percent of the households complained about water being a constraint to their farming practice. Livestock get water from the rivers and dams, and households also supply water when there is a need, for instance, when it is dry. Climatic conditions are most conducive for agricultural activities in the area; it is only during heavy rains that cause floods when livestock are affected due to a lack of proper infrastructure. Moreover, in the area, it has been found that there is a trend of domestic predation. About 84 percent of the households reported dog-sheep predation. Domestic predation is mostly because of extensive farming since there is no proper management and sometimes it is caused by poor infrastructure.

Based on the results obtained, 28 percent of the households that are producing crops are affected by poor infrastructure. The infrastructure they are most affected by is poor fencing and that result in their products being damaged by herbivores. 28 percent of farming households complain about pests and diseases; rural households mainly fail to control pests and diseases because they lack the knowledge and they have no money to buy relevant plant protection products. Water is one of the basic resources of farming, and 27 percent of the households that plant crops in the study area are suffering from water shortages, which leads to their participation rate in farming deteriorate. Climatic conditions are not a common challenge to households and only percent complained about the climate. Generally, the climatic conditions are favourable for agricultural activities in the study areas. Very few individuals are affected by climate but that depends on geographical location. Lastly, 7 percent of the households that plant root vegetables are affected by moles. Moles are small, furry animals that usually dig tunnels, live underground, and have special feet and claws for digging. Some people are able to prevent moles by using mole repellent products prescribed by crop scientists; however, these are not common in rural areas.

Empirical Results

Factors Influencing Households' Participation in Farming

This section analyses factors influencing rural households' participation in farming. To analyse this objective, the probit regression model was used, taking the 2018/2019 production year as a reference. Table 2 reveals that certain explanatory variables have a major effect on the participation rate of rural households in agriculture, and the approximate coefficients are largely in line with the predicted relationship. The Pseudo R^2 is 78 percent, which falls to an appropriate level, which means that the estimates match the results. The R^2 is 62 percent with a p-value of 0.000, suggesting that the calculated variables have a major effect on the involvement of households in agriculture. The econometric results from the orderly probit regression calculation are in Table 2. The explanatory variables estimated in the model were found to be statistically significant at 1 percent and 5 percent significance level.

Participation and non-participation of rural households in farming were significantly influenced by gender, education, employment, age, marital status, participation in agricultural projects, household size, income, access to extension services and farming experience. These variables were statistically significant at 1 percent and 5 percent significance level.

Gender was found to be strongly significant at 5 percent significance level. The relationship between gender and participation in farming is negative, deduced by the negative coefficient. The negative relationship between these variables implies that gender negatively influences the household participation in farming. This means that a unit increase of 1 percent in gender would decrease the possibility of the household to participate in farming by 52 percent. Male-headed households usually participate more in farming compared with female-headed households. Patil and Babus (2018)

Table 2: Factors influencing households' participation in farming

Participation/ Non-participation (1/0) in Farming	*Coefficient*	*Standard error*	*z*	*P>|z|*	*[95% Conf. Interval]*	
Constant	1.6313	1.4172	1.15	0.250	- 1.1463	4.4090
Gender	- 0.5175	0.2473	- 2.09	0.036**	- 1.0024	- 0.0327
Age	- 0.3021	0.2919	- 1.03	0.031**	- 0.8742	0.2700
Marital status	0.1895	0.2379	0.80	0.026**	- 0.2768	0.6558
Education level	- 0.5660	0.4228	- 1.34	0.041**	- 1.3947	0.2626
Employment status	- 0.7352	0.3423	2.15	0.032**	0.0642	1.4063
Household size	0.1597	0.0946	1.69	0.042**	- 0.0258	0.3453
Income	- 0.3727	0.1328	- 2.81	0.005***	- 0.6331	- 0.1123
Participation in agric. project	0.4298	0.5867	- 0.73	0.064**	- 1.5798	0.7200
Access to extension services	0.6188	0.3982	4.06	0.042**	0.8382	2.3993
Farming experience	0.0797	0.01738	4.59	0.000***	0.0456	0.1138
Regression Information: Probit Regression						
Number of observations = 176		LR chi2(13) = 186.38		Prob > chi2 =	0.0000	
Log likelihood = -28.622837		Pseudo R^2 = 78%		R^2 = 62%		

Note: ** p < 0.05; *** p < 0.01
Source: Field survey, 2019

also found that households that are mainly headed by females are less likely to participate in farming because females have many responsibilities in the household. Moreover, males tend to migrate to urban areas and cities to look for jobs, leaving women to head the household and that reduces the labour force for agricultural activities to be productive in rural areas (Yeboah et al. 2019).

The age of the household head was observed to have a negative coefficient and was statistically significant at 5 percent. The likelihood of engaging in farming falls by 30.2 percent with each additional year added to the age of the household head. It can be concluded from the finding that older household heads were more interested in farming than younger household heads. Older householders, however, typically face health problems that restrict them from continuing to participate in farming, and then use social grants to feed their families, which are the reason why engagement in farming is declining (Ngema et al. 2018). This could suggest that household heads are less likely to continue to engage in farming as age rises. Secondly, farming is threatened by various challenges that need the adoption of some modern technologies in order to succeed, so older household heads may not have the motivation to continue in farming as the levels of adopting new farming technologies decline with age. The results are consistent with Yigezu (2018) who found that as age increases, the probability of household heads to participate in farming decreases. However, the findings are contrary to Gomiero (2018) who stated that young people, even though they have energy and knowledge of new innovations in agriculture, still migrate to cities and urban areas for better livelihoods as they believe that agriculture is for old people and it does not make a significant income.

Marital status had a positive coefficient and was statistically significant at 5 percent level. The empirical results suggest that marital status has an influence on households' participation in farming. A unit of 1 percent increase in marital status will significantly increase households' participation in farming by 18.95 percent. The marital status allows an individual to have more access to information and resources. This means that there are more labourers available to assist and improve productivity which increases yields and results in surplus produce. As expected, household heads that are married form the biggest sector participating in farming. Gomiero (2018) observed that marriage enhances the interest of a farmer for household welfare and food security, and is also likely to have a favourable influence on the decision to engage in an agricultural project and activities. Khumalo and Sibanda (2018) highlighted that a married household head has the opportunity to distribute the household's activities among the members of the household. This means that the labour force for agricultural activities is increased and an increased la-

bour force would mean better productivity in agriculture (Gomiero 2018). The results are also in line with the study conducted by Murugani and Thamaga-Chitja (2018), which found that marriage usually determines the household stability and that increases the probability of the household to participate in farming to sustain the food availability and food security of the household.

The education level achieved by the household head had a negative coefficient and was significant at 5 percent significance level. A unit increase in the level of education significantly decreases the likelihood of households to participate in farming by 56.6 percent. This means that a higher level of education is associated with a decrease in the probability of participating in farming by households. According to Sinyolo and Mudhara (2018), most household heads that are educated are likely to migrate from rural areas to cities where they are employed in industries. When they are employed, they tend to neglect agricultural activities and invest more time in their jobs. However, the household heads that are not well educated have less opportunity to access relevant information from various sources that may help in improving the productivity and new innovations discovered (Rabbi et al. 2019). Therefore, education sometimes brings a negative influence on household participation in farming even though other studies may have a positive response. Abegunde et al. (2020) further stated that households that are literate may result in an increased participation in farming given that education increases their knowledge of agricultural practices. These results are in line with the findings of Patil and Babus (2018), which stated that education provides household heads with a wide range of opportunities to be formally employed and that could result in a reduced labour force for agricultural activities, especially at the household level.

The employment status of the household head had a negative coefficient and was significant at 5 percent significance level. The relationship that exists between employment and participation in farming was found to be negative. This implies that a unit increase of 1 percent in employment results in a decrease in households' participation in farming by 74 percent. These results are in line with (Sharaunga and Mudhara 2018) that employed household heads can afford to buy most of the products from the market therefore they neglect agricultural activities. Van der Werf et al. (2020) also highlighted that employed individuals tend to neglect agricultural activities, and invest more of their time in their jobs and non-farm activities. It sometimes happens that those who participate in farming while being employed are often those who are casual and/or informal employees or those that are employed in agricultural sectors.

Household size significantly affects rural households' participation in farming positively and was significant at 5 percent significance level. This means that a unit increase of one additional member in household size significantly increases the possibility of the household's participation in farming by 15.97 percent. The large household size is associated with an increase in household participation in farming as it assists with the provision of family labour (Murugani and Thamaga-Chitja 2018). It is stated that household consumption is determined by the household size. This simply means that a large household consumes more and is likely to participate in farming to supplement the household food availability and household welfare. This is in line with the study that was conducted by Beckman and Countryman (2021) which states that increased household size means an increased labour force for the household and that raises the likelihood of the household to participate in farming.

Household income was found to significantly influence rural household participation in farming negatively and was statistically significant at 1 percent significance level. Moreover, there is a negative relationship that exists between household participation in farming and income. The negative relationship implies that a unit increase of 1 percent in household income will result in a decrease in participation in farming by 37.27 percent. This means that the increase in household income reduces the household's participation in farming as they tend to invest their money in off-farm activities. Sinyolo and Mudhara (2018) suggest that households with higher incomes tend to behave like their urban counterparts; they purchase more food from the markets than they would produce for themselves because they can afford to and invest their money in non-farm activities.

The participation of the household head in agricultural projects had a positive influence on household participation in farming and it was significant at 5 percent significance level. The posi-

tive relationship means that the more the household head participates in agricultural projects, the more the household tends to participate in farming. Patil and Babus (2018) stated that household heads that participate in agricultural projects are likely to obtain farming experience and they practise or implement it on their homesteads. Khumalo and Sibanda (2019) further stated that it is easy for the individual to put into practice farming knowledge that they have acquired practically. Rogan (2018) also highlighted that people who participate in agricultural projects are mainly those who have a passion for agriculture and they are likely to invest more of their time in utilising the knowledge they have on farming. Agricultural projects in other areas are not effective, resulting in other individuals not participating in any project. These results are also in line with the findings of Sharaunga and Mudhara (2018) which indicated that households who are in agricultural projects were likely to participate in farming.

Access to agricultural extension services was found to be affecting participation in farming positively and was significant at 5 percent significance level. A unit increase of 1 percent in access to extension services, significantly increases the possibility of participation in farming by 61 percent. Households that have access to extension services are likely to participate in farming because they are equipped in terms of agricultural knowledge and further assistance such as training (Ntshangase et al. 2018). According to Mdoda (2017), access to extension services plays a crucial role in equipping rural households on agricultural practices and how to overcome farming challenges. Lilenstein et al. (2018) stated that extension officers are equipped with new skills and innovations in the agricultural sector, so households that can easily access extension services are likely to be productive in farming activities. Myeni et al. (2019) also agreed that extension services are likely to improve agricultural productivity and the probability of participating in farming.

Farm experience was strongly found to be statistically significant at 1 percent significance level and the relationship between farming experience and participation in farming was found to be positive. The positive relationship implies that a unit increase of one additional year in farm experience significantly increases the likelihood of participation in farming by 7.97 percent. The results suggest that households with more experience in farming have a higher probability of participating in farming compared with low experience households. Paumgarten et al. (2018) stated that there are individuals who inherited farming knowledge from their forefathers and foremothers, and have been farming for a long period of time are the ones who are likely to still be participating in agricultural activities because they have knowledge and experience. Lyne et al. (2018) further noted that experience tends to be a tool that usually encourages households in farming because their knowledge assists them in being productive and knowing how to overcome certain challenges that they encounter.

CONCLUSION

Farming in rural areas plays a significant role as it holds the welfare of rural communities. It contributes largely to poverty alleviation and employment. Farming contributes to household welfare through income earned from agricultural activities. Farming activities used to be the main livelihood of many rural areas especially in developing countries. However, that has significantly changed. Rural households participate increasingly in non-farming activities compared to farming activities and that has resulted in a decline in agriculture. A decline in agriculture threatens the future of the economy because agriculture is the sector that contributes a large proportion to the GDP of the economy. Moreover, a decline in agriculture discourages rural development. However, there are major factors that disturb farming practices in rural areas, and these include poor extension services, poor agricultural infrastructure, lack of inputs and lack of finance. These factors divert the livelihoods of many households because although there are households with great potential and experience in farming, they opt to invest in other activities. Farming holds the wealth of many households and therefore it must be promoted in possible and sustainable ways. Rural households are still interested in farming but they are constrained by the abovementioned factors hence their livelihoods have diverged to a greater extent.

RECOMMENDATIONS

The Government must supply farming resources to rural households to encourage them to be-

come self-employed and avoid their dependency on the Government. Many households avoid farming because they lack the money to buy inputs as they are mostly unemployed, and they are reluctant to invest their money in agriculture. Many households are risk-averse; they are afraid to use the little money they have on agricultural inputs. Therefore, since rural development encourages economic development, the Government must meet half way with rural households with the means to combat rural poverty.

The Government must introduce and develop agricultural projects in rural areas with monitoring and management by the agricultural departments (such as DAFF, DRDAR and DRDLR) to ensure their efficiency. Community agricultural projects play an important role in improving farming in rural areas. In some areas, there are agricultural cooperatives that are founded by community members. The Government can expand programmes from those cooperatives and allocate extension officers to manage and evaluate their effectiveness; this will also create job opportunities especially for young people.

Focus groups must be formulated in rural areas to discuss and develop strategies in making agriculture the livelihood strategy with the support of government- and non-government organisations. In agriculture, there are always new strategies that are developed by the existing farming individuals and therefore creating more focus groups or associations will give opportunities to the members to present their ideas that may help agricultural development within their communities.

Youth involvement in agriculture must be encouraged in many ways. Youth projects in rural areas must be formulated and young people must be given financial support as the majority have acquired agricultural knowledge but lack the funds to implement their theoretical knowledge. There are thousands of unemployed agricultural graduates in the country and the Government should invest in them as they have the theoretical and practical skills that are needed and which will result in economic development through increased employment rates and poverty alleviation at the same time.

Extension services in rural areas must be improved; rural people are mostly uneducated and it is hard for them to access various sources of information. Therefore, extension services in the form of practical training can be very effective. Each village must be allocated an extension officer who will ensure that everyone who is interested in farming gets an opportunity. Information is key; some people lack agricultural information and hence opt for other sectors in which to generate their living.

REFERENCES

Abegunde VO, Sibanda M, Obi A 2020. Determinants of the adoption of climate-smart agricultural practices by small-scale farming households in King Cetshwayo District Municipality, South Africa. *Sustainability*, 12(1): 195.

Amrhein V, Trafimow D, Greenland S 2018. Inferential Statistics as Descriptive Statistics: There is No Replication Crisis if we do not Expect Replication. The American Statistician. From < https://www. researchgate. net/profile/ Valentin_Amrhein/publication/328520089_ Inferential_ statistics_as_descriptive_statistics_there_is_no_ replication_ crisis_if_ we_don't_expect_replication/links/5bd87 6da299bf1124fae1db2/Inferential-statistics-as-descriptive-statistics-there-is-no- replication-crisis-if-we-dont-expect-replication.pdf> (Retrieved on 17 September 2018).

Beckman J, Countryman AM 2021. The importance of agriculture in the economy: Impacts from COVID 19. *American Journal of Agricultural Economics*, 103(5): 1595-1611.

Boateng EY, Abaye DA 2019. A review of the logistic regression model with emphasis on medical research. *Journal of Data Analysis and Information Processing*, 7(4): 190-207.

Breen R, Karlson KB, Holm A 2018. Interpreting and understanding logits, probits, and other nonlinear probability models. *Annual Review of Sociology*, 44: 39-54.

Eastern Cape Socioeconomic Consultative Council 2018. Nyandeni Local Municipality Socioeconomic Review and Outlook. ECSECC. From <https://www.ecsecc.org/documentrepository/informationcentre/nyandeni-local-municipality_42470.pdf> (Retrieved on 21 September 2018).

Ebenezer M, Abbyssinia M, 2018. Livelihood diversification and its effect on household poverty in Eastern Cape Province, South Africa. *The Journal of Developing Areas*, 52(1): 235-249.

Gomiero T 2018. Agriculture and degrowth: State of the art and assessment of organic and biotech-based agriculture from a degrowth perspective. *Journal of Cleaner Production*, 197: 1823-1839.

Heger M, Zens G, Bangalor M 2018. *Does the Environment Matter for Poverty Reduction? The Role of Soil Fertility and Vegetation Vigor in Poverty Reduction.* The World Bank.

Jayne TS, Chamberlin J, Benfica R 2018. Africa's unfolding economic transformation. *The Journal of Development Studies*, 54(5): 777-787.

Kamara A, Conteh A, Rhodes ER, Cooke RA 2019. The relevance of smallholder farming to African agricultural growth and development. *African Journal of*

Food, Agriculture, Nutrition and Development, 19(1): 14043-14065.

Khumalo NZ, Sibanda M 2019. Does urban and peri-urban agriculture contribute to household food security? An assessment of the food security status of households in Tongaat, eThekwini Municipality. *Sustainability*, 11(4): 1082.

Lilenstein K, Woolard I, Leibbrandt M 2018. In-work poverty in South Africa: The impact of income sharing in the presence of high unemployment. In: Ive Marx, Henning Lohmann (Eds.): *Handbook on In-work Poverty*. Cheltenham, United Kingdom, Edward Elgar Publishing, pp. 416-433.

Lyne MC, Jonas N, Ortmann GF 2018. A quantitative assessment of outsourced agricultural extension service in the Umzimkhulu District of KwaZulu-Natal, South Africa. *The Journal of Agricultural Education and Extension*, 24(1): 51-64.

Mango N, Makate C, Tamene L, Mponela P, Ndengu G 2018. Adoption of small-scale irrigation farming as a climate-smart agriculture practice and its influence on household income in the Chinyanja Triangle, Southern Africa. *Land*, 7(2): 49.

Mdoda L 2017. *Market Participation and Value Chain Integration among Smallholder Homestead and Irrigated Crop Farmers in the Eastern Cape Province of South Africa*. Ph. D. Thesis, Unpublished. University of Fort Hare.

Mkhize NI 2019. The sectoral employment intensity of growth in South Africa. *Southern African Business Review*, 23(1): 1-24.

Murugani VG, Thamaga-Chitja JM 2018. Livelihood assets and institutions for smallholder irrigation farmer market access in Limpopo, South Africa. *International Journal of Water Resources Development*, 34(2): 259-277.

Myeni L, Moeletsi M, Thavhana M, Randela M, Mokoena L 2019. Barriers affecting sustainable agricultural productivity of smallholder farmers in the Eastern Free State of South Africa. *Sustainability*, 11(11): 3003.

Ngema PZ, Sibanda M, Musemwa L 2018. Household food security status and its determinants in Maphumulo local municipality, South Africa. *Sustainability*, 10(9): 3307.

Ntshangase NL, Muroyiwa B, Sibanda M 2018. Farmers' perceptions and factors influencing the adoption of no-till conservation agriculture by small-scale farmers in Zashuke, KwaZulu-Natal Province. *Sustainability*, 10(2): 555.

Patil B, Babus VS 2018. Role of women in agriculture. *Int J Applied Res*, 4(12): 109-114.

Paumgarten F, Locatelli B, Witkowski ETF 2018. Wild foods: Safety net or poverty trap? A South African case study. *Journal of Human Ecology*, 46(2): 183-195.

Rabbi F, Ahamad R, Ali S, Chandio AA, Ahmad W, Ilyas A, Din IU 2019. Determinants of commercialization and its impact on the welfare of smallholder rice farmers by using Heckman's two-stage approach. *Journal of the Saudi Society of Agricultural Sciences*, 18(2): 224-233.

Rogan M 2018. Food poverty, hunger and household production in rural Eastern Cape Households. *Development Southern Africa*, 35(1): 90-104.

Sharaunga S, Mudhara M 2018. Determinants of farmers' participation in collective maintenance of irrigation infrastructure in KwaZulu-Natal. *Physics and Chemistry of the Earth, Parts A/B/C*, 105(1): 265-273.

Sharaunga S, Mudhara M 2021. Analysis of livelihood strategies for reducing poverty among rural women's households: A case study of KwaZulu Natal, South Africa. *Journal of International Development*, 33(1): 127-150.

Singh C 2019. Migration as a driver of changing household structures: Implications for local livelihoods and adaptation. *Migration and Development*, 8(3): 301-319.

Sinyolo S, Mudhara M 2018. Farmer groups and inorganic fertiliser use among smallholders in rural South Africa. *South African Journal of Science*, 114(5-6): 1-9.

Truong VD 2018. Tourism, poverty alleviation, and the informal economy: The street vendors of Hanoi, Vietnam. *Tourism Recreation Research*, 43(1): 52-67.

Van der Werf HM, Knudsen MT, Cederberg C 2020. Towards better representation of organic agriculture in life cycle assessment. *Nature Sustainability*, 3(6): 419-425.

Yeboah FK, Jayne TS, Muyanga M, Chamberlin J 2019. Youth access to land, migration and employment opportunities: Evidence from sub-Saharan Africa. *IFAD Res Ser*, 53: 50.

Yigezu YA, Mugera A, El-Shater T, Aw-Hassan A, Piggin C, Haddad A, Khalil Y, Loss S 2018. Enhancing adoption of agricultural technologies requiring high initial investment among smallholders. *Technological Forecasting and Social Change*, 134: 199-206.

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