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Full Length Research Paper

Factors Affecting Own Food Production in Rural Households in Libode, Eastern Cape, South Africa

*** Qange Siphesihle and Mdoda Lelethu**

Department of Agricultural Economics and Extension, University of Fort Hare, Private bag X1314, Alice, Eastern Cape, 5700, South Africa.

*Corresponding Author's E-mail: siphesihleqange@gmail.com

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South Africa and other developing countries experience poverty and poor rural development due to poor extension services and other means of production. Agricultural activities have an ability to reduce rural poverty and generate livelihoods. Rural households' production has declined to some extent over years. Therefore, this paper investigates factors affecting food production in rural households of Libode. Primary data was purposively collected from 120 households. Multiple regression was used to estimate factors affecting food production. From the research, most households were male headed and 70% are above 60 years of age; as a result, mostly are dependent on social grant. Many households own gardens but are not cultivating due to financial and knowledge challenges. The study reveals that age, gender, household size, educational level, extension service, farm experience, income, employment status and income source have a significant influence on food production. Thus, the study recommends the government intervention through infrastructural development, innovation of agricultural cooperatives, increase extension services and training of household in regards to farming as well as improve access to information in the rural areas.

Keywords: *Agricultural activities, Multiple regression, Own food production, Poverty, Rural households*

INTRODUCTION

In Africa, it is observed that majority of rural households generates their livelihood from agriculture and agricultural related activities (Poulsen *et al*., 2015). In fact, more than 60% of the 1.166 billion people believed to be living in rural areas of Africa's economic proceeds usually dependent on agriculture (Heger *et al*., 2018). Agricultural activities in rural households play an important role in income generation. Moreover, agriculture is considered to be a major contributor to the Gross Domestic Product (GDP) in a number of countries; both the developed and developing (Mehrara and Baghbanpour, 2016).

According to Dwesini (2015) South Africa is one of the developing countries in which agricultural production is important in poverty alleviation and can also create employment opportunities for rural people. In South African economy, agricultural sector creates job opportunities especially for rural households and it is estimated that out of 4.75 million South Africans that are employed in agricultural sector, 4 million people are engaged in subsistence agriculture (Kibirige and Obi, 2015). Agriculture in South Africa contributes around 10% of formal employment and contributing around 2.6 percent of GDP for the nation (Van der Westhuizen and Swart, 2015). Household farming is the farming method that is mostly practised in rural areas because it is cost effective as compared to large-scale farming (Tibesigwa *et al.*, 2015). Additionally, own food production only requires family labour because the food that is being produced is only for the household use and only sell their surplus (Sibhatu *et al*., 2015). Furthermore, the production equipment that is used and needed could be acquired on the local market since they are locally produced. Own food production is mostly advantageous to rural people since it does not require too much of educational

knowledge, it only needs basics of agriculture and indigenous knowledge (Aliber and Hart, 2012).

In South Africa, participation in agricultural activities, more specifically household farming, is decreasing gradually. Bedemo *et al*. (2013) reported that about 78% of the Eastern Cape population that use agricultural activities as their source of income and livelihood strategy. However, Mathebula *et al*. (2017) argued that the greater percentage of rural households' income does not come from agricultural activities, but is usually earned from other sources such social grants and migrant labour contributions, purchase and sale of goods especially consumables such as food, beverages and paraffin, the renting of animals for traction, sale of labour and off-farm full-time and seasonal employment, hence the decrease in the own food production in rural areas.

There are several factors that are reported to be influencing rural households' food production in South Africa. For instance, in rural areas, land may be available abundantly in, but lack of farming skills, leadership, capital, education, infrastructure and lack of entrepreneurial spirit in the community members may be the challenges and impediments to efficient farming (Mathebula, 2015). Consequently, poverty is more prevalent in rural areas than it is on national level. Walsh and Van Rooyen (2015) stated that rural people have realised various sources of livelihood alternatives. Rural people are now purchasing even the basic food stuff such as maize, cabbages and other field crops that they used to produce by themselves (Sibhatu and Qaim, 2018). This means that a significant number of people are no longer involved in own food production as they used to do in the past. This situation raises the question as to why circumstances have changed so drastically and what can be done to correct the situation because poverty and food insecurity is overwhelming in rural areas.

Agricultural production in Eastern Cape, especially in Libode predominantly depends on rain fed agriculture and less resource base for food production which leads to low productivity (You *et al*., 2010). With climate change, these problems are intensified and the vulnerability of the country, especially those farming households whose means have never been comfortable in the best of times, will be even more prominent. In the province, extreme weather events like droughts and floods, gradual increases in temperatures and increased variability in annual rainfall appear to be common as result of climate change. These changes are seemingly having a damaging effect on the rural poor (Hall and Aliber, 2010). Dealing with these issues will remain major concerns. But the precise nature of the vulnerability of the rural communities to these problems has not been systematically studied in recent years. The yield level of major crops has declined or remained the same and is failing to meet the population growth rate and decline in own food production. However, the depletion and degradation of land and water pose serious challenges to producing enough agricultural products meet the growing demand brought by rising population (Ndabeni, 2016). This means food production has to improve using the same or fewer natural resources.

The decline in own household production is mainly due to many factors such as institutional and technical factors. However, farming under the farming household system is characterised by low levels of production technology and small-sized farm with production largely for subsistence purposes, leaving little marketable surplus (Govendor*et al*., 2016). The decline is mainly due to lack of supportive organizations that represent (such as Extension services), serve them and their infrastructure is poorly developed. In addition, access to affordable credit is one of the most important factor affecting production and therefore income of the farming households. Farming households still do not have access to affordable credit for investment in the technology imperative for increasing and escalating agricultural production or diversification of production into high value crops. The poor access to agrarian and support services are one of the challenges faced by these farmers in institutions which weaken farmers' market participation.

Thus, this study documents a continuing trend where people in rural areas are no longer participating at a high rate in farming but choose to purchase food from the markets. Therefore, there is a need to investigate factors affecting own food production in rural areas. This will enable us to assess the causes and factors affecting households not continue having their own food production and this will in turn help policy makers in designing policies that could enhance household own food production.

METHODOLOGY

Study area

Libode is the small town that is situated on the R61 road from Port St Johns to Mthatha and serves as the administrative seat of the Nyandeni Local Municipality, which is part of the OR Tambo District Municipality. Libode have an annual rainfall of 693mm. There are many rural areas that fall under this town. The study only took place on the following rural areas: Moyeni, Mhlanga and Mphangane.

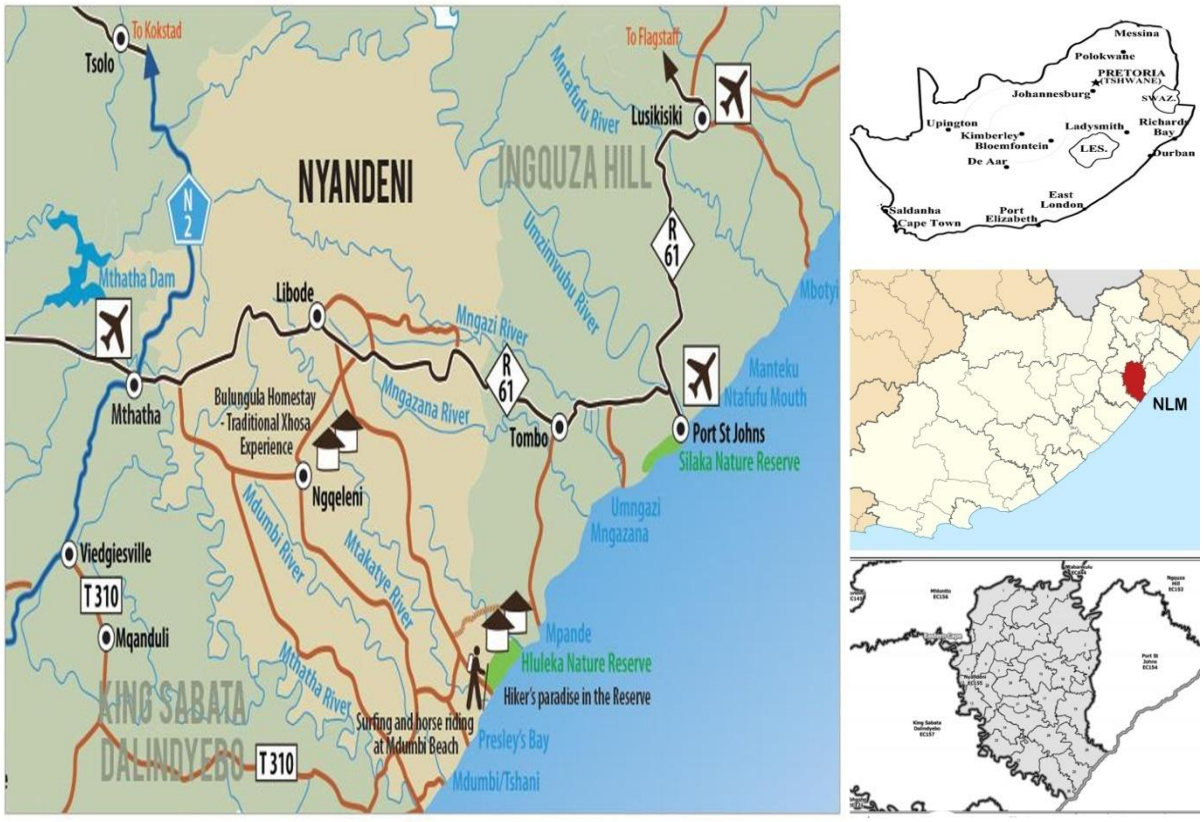

Figure 1: The map showing NLM,

Source: Eastern Cape Socioeconomic Consultative Council, 2017.

The study was conducted in rural areas of Nyandeni Local Municipality. The estimated population of this area is 313 000 people. This area is selected with the aim of finding out the factors affecting own food production in rural households. It has been discovered that in this area, the participation in household production is decreasing; as a result, there are many people who are living in poverty (ECSCC, 2017). Furthermore, employment is relatively scarce in Nyandeni Local Municipality. IDP (2015) indicates that there were 21 754 people employed in Nyandeni's economy. Of these, 14 919 people (69%) were employed in the formal sector and 6 835 people (31%) in the informal sector.The municipal area is considered generally a high average rainfall area estimated to be above 700mm per annum. Minimum temperatures range from 8.9 degrees Celsius in the high lying north – West to 15.3 degrees Celsius along the coast with the maximum estimated at 22.8 degrees Celsius along the coats to 23.8 inland. These moderate climatic conditions provide favorable conditions for agricultural development. However, the agricultural potential of the area can also be hindered by the steep nature of the land.

Data Collection

The study was undertaken in rural areas of Libode in the Eastern Cape Province of South Africa. Purposive sampling procedure was employed and within which 120 food plot-holders were enumerated in rural areas of Libode. Both primary and secondary data were employed. For the secondary data, consultations were held at the provincial level with officials of the Department of Agriculture, Extension officers, Farm Organizations and Chiefs. These consultations were of huge help in accessing previous studies conducted in the study area, on related subjects, as well as gaining understandings into current and prospective policy initiatives for the area and the sector as a whole. Overall, data and information obtained at this stage were supportive for outlining and gaining a deeper understanding of the study area.

For the purpose of collecting primary data, the study implemented a systematic and multipronged data collection procedure. Primary data was collected through household's survey using structured questionnaire. Demographic, production and farming information that varied from household to household

was collected. The questionnaire was structured in such a way that the first part covers the socio-economic variables like age of the household head, size of the household, off-farm income and gender etc. The second part of the questionnaire dealt with the factors of production such as, land, labour, cost of tractor hours and materials use such as fertilizer and seed. Third part of the questionnaire dealt with own production factors, agricultural systems, household income and household expenditures. Group meetings and focus groups were also conducted to generate community-level data as well as supplement information obtained from the extension personnel and official sources in respect to broader patterns and trends that have implications for the agricultural sector in general.

The group meetings and focus groups were guided by specifications and conversation points developed on the foundation of preliminary situational surveys, literature reviews and personal experience. Special arrangements made to improve interview effectiveness and data accuracy included prior intensive training of the enumerators and the use of local guides wherever necessary. Within the communities, meetings were held with the village chiefs during which they were fully briefed about the purpose of the study and their approval obtained well in advance. At the end of the study, before the departure of the team from the district, feedback sessions were also held in the villages. Data entry, data cleaning, management of missing data and descriptive analysis were done using SPSS software and assessment of technical efficiency was done using STATA software.

Model

The study made use of multiple linear regression model to estimate the factors affecting rural households' own food production in rural areas.Pandis (2016) stated that as a predictive analysis, the multiple linear regression is used to explain the relationship between one continuous dependent variable and two or more independent variables. The multiple regression modelthatwas used in this study can be describedas follows:

$Y=\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon$

Where:

Y = dependent variable (Household production status)

X_1 toX_n = independent variables (household size, gender, age, level of education, farm experience, extension service, income, source of income and employment status.)

β_0= the value of Y when all of the independent variables are equal to zero

β_1 Toβ_n = the estimated regression coefficients

ε = the accepted error.

NB: Each regression coefficient represents the change in Y relative to a one unit change in the respective independent variable.

1.1 Data

Table 1: Factors affecting own food production

Dependent Variable	**Definition**	**Hypothesized Relationship**
HHPS	Household Production Status	
Independent Variable	**Definition**	
GEN	Gender of the household head	+/-
AGE	Age of the household head	+/-
FARMEXP	Farm Experience	+/-
EXTSERV	Access to extension services	+
HHSIZE	Household size	+/-
EDULEV	Education Level	+/-
INC	Income	+/-
EMP	Employment status	+/-
SINC	Source of Income	+/-

Source: Household Survey, 2017.

GEN: this variable measures the gender of the household head. It is stated that most households are female headed, because males tend to migrate to cities to look for jobs. However, females are expected to participate more on own food production since they are mostly household heads and are always at home.

AGE: Age of the household head is measured in years. It is stated that old people tend involve themselves in agricultural activities because they have knowledge that they inherited from their forefathers. However, youth adopted technology and is migrating to urban areas and cities to improve their standard of living. Therefore, it is expected that old people produce more of their own food than they would purchase from the markets.

FARMEXP: Farm experience determines the knowledge you have in farming. Farming experience extends the chances of an individual to escape from poverty. People with many years of experience in farming have courage to use their knowledge efficiently. Thus, it is expected that the many the years of experience, the more household will produce its own food.

HHSIZE: Household size is the total number of individual living within one household. Household size usually determines the food consumption of the household. This means that the larger the household size, the more household food consumption increases and vice versa. Therefore, it is anticipated that household with many people will produce more of its own food so to increase household food availability.

EDULEV: Education level determines the literacy rate. Educated people have many chances of getting information from a wide variety of information sources as compared to less educated individuals. Furthermore, educated people are likely to secure themselves a formal job. However, it is expected that educated people produce food for themselves because they know and understand better the benefits of fresh food.

INC: Income is one of the indicators of household welfare. It also determines the expenditure of the household per month. It is assumed that household with high income spend more than those with les income. Therefore, it is expected that high income earning households do not produce their own food because they afford to buy from the markets and low income earning household produce more of their own food so to increase household food availability.

EMP: Unemployment is the economic issue that has been addressed many times but no permanent solution. Rural households are suffering from unemployment and consequently, they suffer from poverty. Therefore, it was anticipated that unemployed individuals produce their own food to fight against poverty and food insecurity.

SINC: Rural households earn income from different sources like formal employment salary, social grant, remittance and some are selling on the streets. Source of income usually determines the income level of the household. It was then expected that households with no reliable income source produce more of their own food as compared to those who are earning salaries on a monthly basis

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RESULTS AND DISCUSSION

Socioeconomic characteristics of rural households

The socioeconomic characteristics of rural households under study are summarized in the table below.

Table 2: Socioeconomic characteristics of rural households

Variable	Frequency	Percentage
Gender: Male	72	60%
Female	48	40%
Household size: 1-6	76	63%
7-15	44	37%
Age: 20- 40	14	12%
41- 59	22	18%
60-69	58	48%
>70	26	22%
Access extension service: Yes	17	14%
No	103	86%
Level of education: Primary	40	33%
Secondary	34	28%
Tertiary	18	15%
No education	29	24%
Employment status: Employed	46	38%
Unemployed	74	62%
Income: 0-R1 000	25	21%
R1 001 – R3 000	43	36%
R3 001 – R7 000	19	16%
R7 001- R10 000	10	8%
>R10 000	23	19%
Farm Experience: 0-9 years	68	57%
10-15 years	34	28%
>16 years	18	15%

Source: Field Survey, 2017

The Table 2 shows that the majority of households in the study area were male-headed (60%) and 40% female headed. Gobena (2012) also found that in most rural areas, many households are headed by males. Many households have at least attained some primary and secondary education, very few went

to tertiary. This could be true due to the fact that the country's literacy rate is estimated to be at 94.37% (Statista, 2015). Literacy level of rural people is very important as it allows for better flow of information and agricultural knowledge (Musasa et al., 2015). The average age of the household heads varied among the surveyed rural areas and most households are headed by people above 60 years (70%). It has been also identified that there are very few households that are headed by young people in the age category 20-40 years (12%). These results may be true due to the fact that young people in rural areas tend to consider rural-urban migration as the key factor that can reduce rural poverty (Bhandari and Ghimire, 2016). Youth believe that they have to be close to the cities in order for them to get proper education and jobs (Mashamaite, 2014). The most household size is comprised of about 1-5 individuals per household as they stand on 63%. Most people in rural areas are unemployed (62%); as a result, most rural people are dependent on social grant for the income to sustain their livelihoods.

Factors affecting rural households' own food production

The multiple regression results for factors affecting own food production are presented in Table 3. The dependent variable in the multiple regressionis household production status. The direction of influence of the variable is shown by the signs of the coefficients. A positive sign of the coefficient implies that the particular variable has no influence on the household production and a negative value on the coefficient shows that the particular variable has influence on the household production. Table 2 shows the estimated coefficient, standard error and significance value of the variables in the model.

Table 3: Factors affecting rural households' own food production

Variables	***Coefficient***	***Standard Error***	***Significance value***
Age	*-0.490*	*0.602*	*0.001***
Gender	*-0.446*	*0.387*	*0.037***
Household size	*0.052*	*0.406*	*0.000****
Educational Level	*-0.075*	*0.760*	*0.023***
Extension Service	*-0.229*	*1.034*	*0.021***
Farm Experience	*0.253*	*0.354*	*0.034***
Income	*0.229*	*0.460*	*0.000****
Employment status	*-0.978*	*0.568*	*0.042***
Constant Coefficient=1.201 LR Chi Square= 56.681 Observations= 120 R Squared= 0.354Adjusted R-Square= 0.107			

Note: Asterisks denote the level of significance * *= 5%, while * = 1%**

Source: Computed from Field Survey, 2017

Age of the household head has influence on household food production, understanding that household activities are controlled by household head. When the household head gets old, that means he/she is likely to suffer from health issues and that may result to households' activities being neglected. From the results, age has a negative coefficient, meaning that age has negative influence on household production status. That clearly means that, the more people get older, they participate less in agricultural activities. Age can be the one of the determinants of productivity in agricultural production, understanding what age implies on physical health (Mashamaite, 2014). Furthermore, young people do not invest their time on agricultural activities; they migrate to urban areas or cities to search for jobs. So, it is clear that age has a negative effect on agriculture.

Most households were found to be male headed with 60%. However, the negative relationship between gender and household production exist, hence the negative coefficient at 1% significance. This implies that the more the household are headed by males, the more the household food production decreases by 2.446 units. This may be true, due to the

fact that other studies reveal that most households that are headed by females participate more on agricultural activities. Understanding that females are less likely to be employed as compared to males; males invest more of their time on jobs that are non-agricultural, whilst females like to take part in agricultural activities.

The household size has a positive coefficient with 1% significance, which implies a positive relationship that exist between household size and the household production status. This simply means that the more the household size increases, the more the household production will also increase. Davis *et al.* (2017) also agreed that the large household size result to an increase on food consumption. Then participating in own food production becomes a necessity as it will increase the food availability for the household, so that every member will be satisfied.

Education plays an important role in agriculture as it makes the flow of information easier and accessible. However, the more people get educated, the more they will find jobs from the cities and adopt technology (Sihlobo and Nel, 2016). Consequently, educated rural people tend to neglect agriculture as a livelihood strategy; they behave like their urban counterparts. Therefore, the negative relationship that is indicated by the model implies that the more people get educated the more their participation in own food production decreases, hence the negative coefficient at 5% significance

Extension service indicated a negative relationship to the household production status at 5% significance level with a negative coefficient. This implies that lack of extension service especially in rural areas result to a decrease in households' participation in own food production. Extension service is necessary especially in rural areas because they have less access to agricultural information and training. Similar studies reveal that access to extension service encourages people to participate more in agricultural activities. According to Baiphethi and Jacobs (2009) is an aspect of education received by a farmer affects market information interpretation and thereby influencing their market participation level of the farmers.

Farming experience is always an advantage to the individuals that part-take in agricultural activities. The positive coefficient 0.253 indicates a positive relationship between farming experience and household food production status. The positive relationship means that the more people have farming experience the more likely they will participate in agricultural activities. These results are also in line with the study that was conducted by Mathebula (2015) which states that farming experience is important in influencing households to participate in agricultural activities.

The results reveal a positive relationship between income and household food production status, hence the positive coefficient and significance level of 1%. This implies that the more people have income, the more they tend to participate in agricultural activities because they afford to buy agricultural inputs. The model estimates that an increase in income leads to an increase by 0.229 units in household food production, when all other variables are equal to 0. People with no income are reluctant to spend the little money they have, they rather invest it on buying food items that they are in need of. However, Mashamaite (2014) states that the income in most cases is not sufficient enough to meet the required food expenditure, so there is a need for people to be engaged in agricultural activities. Thus income has a positive influence in households' decision to participate in own food production.

Employment status has a negative coefficient at 5% significance level. This simply indicates a negative relationship that exists between employment status and household food production status. This shows that the probability of household heads which are employed especially in non-agricultural sectors decreases household participation in agricultural production. Participation in non-agricultural employment leads to a decline in agricultural production because of changes in labour supply in the households. Mashamaite (2014) also states that most residents are either unemployed or underemployed, and they relying on government grants to meet their daily food requirements rather than farming activities.

CONCLUSION

Rural households are no longer participating in agricultural activities as they used to do in the past; they behave like their urban counterparts becausethey purchase more of their food from the market.It has been found that most households are male headed and most household heads are above 60 years of age. The majority of households have household size that ranges from 1 to 6 people and majority at least attained primary school. There is poor extension service in rural areas even though some people have basic farming knowledge and experience that they acquired from their forefathers and other relevant sources. Moreover, the model reveals that age, gender, household size, educational level, extension service, farm experience, income, employment status and income source have a significant influence on household food production. Age, gender, education, extension service and employment status have negative influence on household food production. The study concludes that extension service is the major factor that influences the performance of agricultural production in rural areas. Rural people would have much interest in producing their own food if they would get enough information and support. However, education also influence

household food production, extension service may be inefficient especially if people are illiterate.

RECOMMENDATIONS

The study then recommends that extension service must be a priority in rural areas; so to enhance the understanding of participating in agricultural activities in rural areas. The government must promote own food production within rural areas by introducing agricultural projects. These projectswould enable a large number of community members to participate in farming activities. The youth must also be encouraged in farming because youth suffer from unemployment. If youth can be encouraged in farming through youth agricultural programs, that would mean an improvement in unemployment rate and improved economy.

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