

Full Length Research Paper

Factors affecting household access to enough food in the Eastern Cape Province of South Africa

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South Africa is experiencing rapid increase in food prices while household income is increasing at a slower rate. This antagonistic state has positioned ordinary South Africans, at present struggling to meet their basic household requirements, more vulnerable to food security. The objectives of the study were to determine factors that affect household access to enough food in Eastern Cape Province of South Africa and to determine the role played by agriculture and fisheries in enhancing household access to enough food. Data were collected from 159 households using a questionnaire as the main instrument. Most households interviewed were male headed (50.3%). Unemployment level was high with 73.6% of the interviewed household heads being unemployed. On average, households had five members and range from 1 to 13. The average age of household heads was 59 years. Most of the household heads owned home gardens and had access to arable land though the majority did not cultivate their land (83%). Poultry and livestock production were practiced by 61.6 and 52.8% of the households, respectively. Government grants were the main source of income for the majority of households. The mean household income for all households was ZAR2 987. From the 159 respondents only 29 had access to enough food. Access to enough food was affected by gender of head of household, household size, education level of household head, agricultural training, poultry production and monthly total income. Most of the interviewed households depend mostly on food purchases rather than own production. This therefore mean that the people in the area to do not explore agriculture up to its potential.

Key words: Food security, garden, household, income, land access, livestock.

INTRODUCTION

Despite the political and economic advances made since 1994, South Africa continues to experience major challenges of poverty, unemployment and, more recently, steep increases in food and fuel prices, and energy tariffs. These adverse conditions have placed ordinary South Africans, already struggling to meet their basic household needs, in an ever more vulnerable situation (Labadarios et al., 2009). In most of the developing countries, including South Africa, agriculture is an essential sector of

the proportion of the economic activities that take place in rural areas. However, agricultural activities are vulnerable to climate change and this put the lives of the poor in developing countries at risk (Fraser et al., 2003). In the Eastern Cape province of South Africa, climate change is seemingly increasing the vulnerability of the households to income losses; poverty and food insecurity and this is becoming increasingly visible in most of the rural communities in the province (Bank and Minkley, 2010).

Programmes implemented to solve the problem of poverty and food security in the Eastern Cape are continuously failing to produce the desired results, the hectareage of abandoned farmlands is increasing every year and the abandonment of agricultural projects is

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common across the province (Hebinck and Lent, 2007; Hall and Aliber, 2010; Bank and Minkley, 2010). In the province, extreme weather events like droughts and floods, gradual increases in temperatures and increased variability in annual rainfall appear to be common. These changes are seemingly having a damaging effect on the rural poor (Hall and Aliber, 2010). Official statistics suggest that conditions of the poor have worsened, and that poverty levels in the Eastern Cape have deepened five years after the inauguration of the first democratic government, especially in rural areas, where 65% of the province's 6.3 million people live (ECSECC, 2000).

This paper seeks to provide socio-economic factors that are affecting household access to enough food¹. Household sources of food are also explored in this paper. This will enable us to assess the causes of households not having access to food and this will in turn help policy makers in designing policies that could enhance household access to food.

MATERIALS AND METHODS

The study area

The study was conducted in Ngqushwa Local Municipality, one of the eight municipalities that fall under the Amatole District Municipality located in the Eastern Cape Province of South Africa. The municipality is composed of one hundred and fourteen rural villages and two towns namely, Hamburg and Peddie. With its natural beauty and character (especially in the coastal areas), Ngqushwa is a wonderful tourist attraction that prides itself in its rich history and heritage. It is bounded on the East by the Fish River and on the South by the Indian Ocean and has 118 villages under its jurisdiction and a population of 84,234 made up of 20,757 households. The municipality has a climate which varies with the elevation from cool humid sub-topical at the coast to hot and sub-arid inland. The climate is characterized by variable moderate to low rainfall ranging between an annual average of 700 mm at the coast and 400 mm in the inland with about 60% of rainfall occurring in summer and peaks being in October and February. The natural vegetation has been heavily transformed by grazing and other land use practices. Even though certain parts of the vegetation have been degraded especially with the presence of alien plants, a greater portion of the region is still favorable for livestock production.

Sampling procedure

Ngqushwa Local Municipality was randomly selected from the eight municipalities that fall under the Amatole District Municipality. The municipality has a diverse range of economic activities which include agriculture, tourism and fisheries. During this study, 159 randomly selected households in Ngqushwa were interviewed at their homesteads by trained enumerators under the supervision of the researcher in January 2012 using a questionnaire as the main household heads, any adult member of the household was inter-

viewed. The questionnaire consisted of both open-ended and closed questions, in order to improve the quality of data collected. Open-ended questions gave the respondents greater freedom of expression as they offered respondents an opportunity to qualify their answers thus reducing bias due to unlimited response ranges. The fear of researcher/interviewee bias from using only open ended questions, the questionnaire was balanced with closed ended questions. Data on household socio-economic characteristics, agricultural systems, household income, household expenditures and access to food and clean water were comprehensively collected.

Data analysis and description of variables used in the analysis

Descriptive statistics was applied to the basic characteristics of the sampled households. This employed both frequency and means to describe the data which included data related to gender, marital status, age, education level, occupation of head of household, monthly average household income and access to food, water and land.

Household from the area of study differ on how they have access to enough food. Some households have access to enough food while others do not have access to enough food. Therefore, this implies that the problem that needs to be analysed needed a method that was able to explain a binary endogenous variable (yes /no) by a set of covariates that determine the outcome of the decision. A typical method used to analyse such dichotomous variables is the logistic regression (Hosmer and Lemeshow, 2000). According to Kleinbaum (1994), there are two main reasons for using logistic regression in economics research. Firstly, the logistic function is flexible and easily applicable, and secondly the interpretation of the results is straight forward and meaningful. The logistic model also imposes for threshold and interaction effects and allows for examination of social interaction (Musemwa et al., 2010).

Following Gujarati (2003), the cumulative logistic distribution function for factors affecting access to enough food was specified as

$$P = \frac{1}{1 + e^{-z}} \tag{1}$$

Where P is the probability of a household to have access to enough food, e is the error term and Z is a function of explanatory variables (X) and was expressed as

$$Z = B_0 + B_1X_1 + B_2X_2 + \dots + B_mX_m \tag{2}$$

The probability of not having access to enough food was given by

$$1 - P = \frac{1}{1 - e^z} \tag{3}$$

The conditional probability of the outcome variable follows a binomial distribution with probability given by the conditional means P_(i). The logistic model in terms of logs is

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_kX_k \tag{4}$$

Where

$$\log \frac{p}{1-p} = Z$$

¹Household's ability to provide future physical and economic access to sufficient, safe, and nutritious food that fulfills the dietary needs and food preferences for living an active and healthy lifestyle.

Table 1. Characteristics of household heads.

Characteristics	Frequency (%)
Gender	
Male	50.3
Female	49.7
Marital status	
Married	58.5
Single	25.7
Widowed	14.5
Divorced	1.3
Education level	
None	3.1
Primary	5.1
Secondary	72.3
Tertiary	19.5
Employment	
Employed	26.4
Unemployed	73.6

The log of odds ratio is not only linear in X but also linear in the Bi variable and as a result, OLS is used. Taking the stochastic term μ into account, the logit econometric model to be used will be

$$Z = B_0 + B_1X_1 + B_2X_2 + \dots + B_mX_m + \mu \quad (5)$$

This econometric model was used and treated against the potential variables, which are assumed to affect household access to enough food. Potential variables which may influence access to enough food were obtained from Alaimo et al. (2001), Fraser et al. (2003). Variables included in the model are shown in Table 2.

RESULTS AND DISCUSSION

Farmers' socioeconomic profile

The domination of males in the rural areas of South Africa is still common (Montshwe, 2006). Most households interviewed were male headed (50.3%) and 49.7% were female headed. This indicates that the effect of rural-urban migration, where the males go to urban areas in search for employment is minimal in the study area. The number of household heads that were not employed was 73.6% as shown in Table 1. Those (26.4%) who were employed work in low income jobs. On average, households have five members but sizes range from 1 to 13. A larger family size means that the required labour for agricultural production as well as fishing is provided, however pressure is set on consumption. The average age of household heads was 59 years. The youngest household head was 21 years old while the oldest was 98 years old. The majority of the household heads were married (58.5%) and 25.7% were single household heads. Widowed household heads constituted 14.5% and

divorcees constituted the least proportion of household heads (1.3%).

The majority of the interviewed household heads had secondary education (72.3%) whereas 19.5% had qualifications from tertiary institutions.

The problem of household heads having never attended school is diminishing quite significantly over the years as access to education is improving significantly in rural areas (Nkhori, 2004) this is evidenced by only 3.1 and 5.1% of household heads having no education and primary education respectively. Many of the existing household heads are elderly and today's youths will have had considerably more basic education by the time they become household heads as the youths have better access to education nowadays. However the problem may be that most of the youths may be employed in the formal sector and other informal sectors in urban areas where there are bright lights as most of them view agriculture as a dirty business and backward (Musemwa et al., 2007).

Land ownership

An important area of focus when addressing the problem of food insecurity in remote areas where employment opportunities are minimal is how to improve household's access to food production on land. Figure 1 shows land ownership patterns for households of Ngqushwa Local Municipality.

The majority of households interviewed did not have access to arable land (69.8%) while only 30.2% had access to arable land. Most of the interviewed household heads had home gardens (59.1%) while only 40.9% did not own gardens.

Agriculture and land use

Agriculture play vital roles of enhancing food security of household located in remote areas as it is the backbone of the economies of these areas. It plays a direct role through providing food to the household and an indirect role through providing households with income from sales of agricultural produce. Poultry and livestock production was practiced by 61.6 and 52.8% of the households interviewed, respectively. Livestock and poultry meet multiple objectives that are desired by resource-poor households (Musemwa et al., 2007; Coetzee et al., 2004; Chimonyo et al., 1999). People keep livestock and poultry for provision of draught power, manure, cash sales, among other socio-economic functions. Most of the poor resource households keep livestock and poultry because their land is largely marginal and not suitable for cropping. The erratic rainfall and high incidence of droughts in the Eastern Cape, therefore, makes a large majority of the

Table 2. Factors influencing access to enough food.

Analysis of maximum likelihood estimates				
Parameter	Estimate	Error	Chi-Square	P-value
Intercept	1.796	4.564	0.155	0.694
Gender	0.728	0.547	1.772	0.038*
Age	0.011	0.016	0.450	0.502
Marital status	-0.020	0.400	0.002	0.961
Household size	-0.158	0.113	1.962	0.031*
Employment	-0.235	0.596	0.155	0.694
Education	0.758	0.482	2.470	0.016*
Own residential site	-0.111	1.044	0.011	0.915
Garden ownership	0.679	0.744	0.833	0.361
Use garden	0.629	0.740	0.721	0.396
Access to arable land	-0.820	0.725	1.279	0.258
Cultivate arable land	0.060	0.573	0.011	0.917
Agricultural training	0.856	0.962	0.792	0.047*
Grow fruit trees	0.049	0.612	0.006	0.936
Preserve vegetables/fruits	-0.850	0.554	2.356	0.125
Poultry ownership	1.802	0.655	7.563	0.006*
Livestock ownership	0.631	0.547	1.332	0.248
Monthly total income	0.458	0.184	6.166	0.013*
Main source of income	0.000	0.000	0.972	0.324
Food from fishing	0.884	0.629	1.976	0.160
Food shortage times	-0.183	0.641	0.081	0.776
No. of meals per day	0.176	0.397	0.197	0.657
Water supply	0.217	0.316	0.470	0.493

*Significant at 5%.

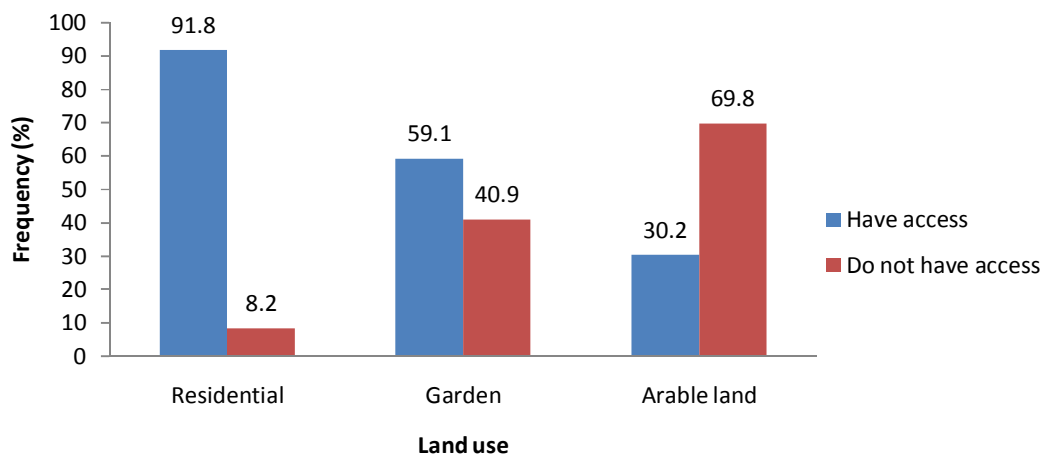


Figure 1. Households' access to land in Hamburg community.

population depend on livestock for their livelihoods.

Crop and vegetable production also play a role in supplementing household food requirements. Most of the interviewed households grow vegetables which included mostly cabbages in their gardens (51.6%). Due to bad

climatic conditions in the Ngqushwa Local Municipality which hinders crop production, the majority of the households (83%) interviewed in the area did not cultivate their land. Only 11.5% cultivate all their arable land while 5.7% cultivate part of their arable land. Maize is the main

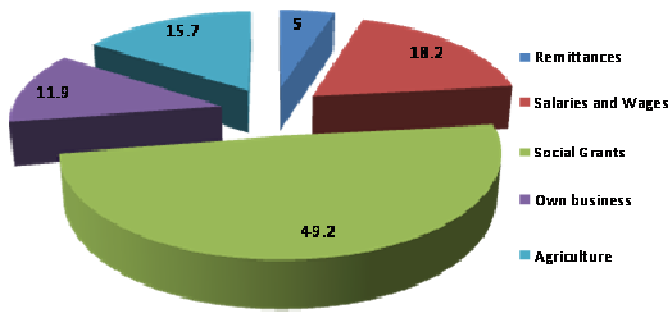


Figure 2. Household main source of income for the Hamburg community.

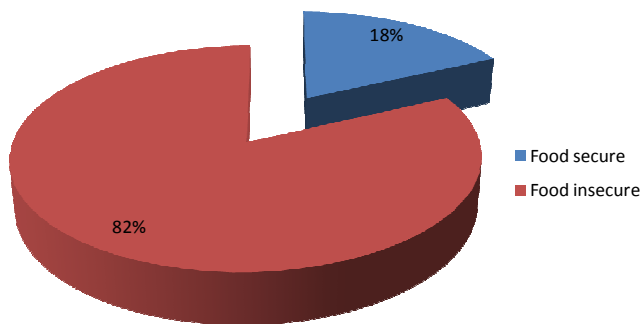


Figure 3. Households' access to enough food.

crop that the households grow. The majority of the households do not have fruit trees on their homesteads (74.8%) while only 25.2% had fruits trees. Fruits play an important role in the dietary requirements of human beings. They provide micro nutrients which are essential in human beings. Fifty five percent of the households preserve vegetables and fruits through freezing and drying while 44.7% do not preserve fruits and vegetables. Preservation helps in improving household access to food throughout the year. Agricultural products are mostly seasonal, therefore preservation helps households in keeping vegetables and fruits in seasons were there are available in abundance in the market. It is at this time that vegetables and fruits would be cheaper. During off season, vegetables and fruits would not be available in some extreme cases or expensive if available due to poor supply.

Fisheries

Ngqushwa Local Municipality is bounded on the East by the Fish River, on the South by the Indian Ocean and other numerous dams; rivers and streams provide plenty of opportunities for fishing. However most of the interviewed household did not use this opportunity. Only 15.7% of the households obtained some of their food from fishing. Fish are an important resource worldwide,

especially as food. Fish has been an important source of protein for humans throughout recorded history. Research over the past few decades has shown that the nutrients and minerals in fish, and particularly the omega 3 fatty acids found in pelagic fishes, are heart-friendly and can make improvements in brain development and reproduction. This has highlighted the role for fish in the functionality of the human body.

Household income

In rural areas of South Africa where in most cases employment opportunities are minimal, the main sources of income of households are government grants, remittances and agriculture. Agriculture especially livestock production, is the main economic activities that take place due high incidents of droughts and poor soils which make crop production impossible. The government grants include child support, disability and old age pension grants. Figure 2 illustrates the distribution of households according to main source of income. In the area studied, 49.2, 18.2, 15.7, 11.9 and 5.0% household main source of income were grants, salaries and wages, agriculture, own business and remittances, respectively. Access to food is primarily determined by income since the majority of the households in rural areas of South Africa do not practice agriculture and depend on purchasing food instead of production. Most of the food consumed by the all the interview households were purchased from shops. Household income for January 2012 ranged from 0 to ZAR26 280 with the mean household income of ZAR2 987 considering that the mean household size was 5 members per household, meaning that on average each household member had an average of ZAR600 which is below the poverty datum line and this value is US\$2 per day per person.

Access to food

From the 159 respondents, only 29 households had access to enough food while the majority did not have access to enough food. This distribution of access to enough food is shown in Figure 3.

Escalating food prices, particularly of maize and wheat which are the staple diet of the poor in South Africa, pose serious problems for the urban and rural poor as most are net buyers of food. Recent information from the Food and Agricultural Organization (FAO, 2009) supported by independent sources (Heady and Fan, 2008) suggest that food prices will increase steadily over the next decade even if there are some fluctuations and occasional drop in prices (Evans, 2009). Domestic electricity supply constraints and rising oil prices are examples of important factors driving the cost of food. The price of electricity in

South Africa almost doubled between 2008 and 2011. Petrol and diesel prices could spike to highs of around R16 per litre in South Africa under a worst case scenario as tensions between the United States of America and Iran rapidly become a key concern for global markets. The majority of the households had had 3 meals per day (67.3%). Only 1.3% of the household had only 1 meal per day while 11.9 and 19.5% had 2 and varying number of meals per day, respectively. Food shortages were experienced mainly towards the period when households receive grants, remittances and salaries (93.7%). Only 1.9% of the households experienced food shortages all the times while 4.4% of the households experienced food shortages irregularly.

Supply of clean water was very reliable to 74.8% of the households and unreliable to 25.2% of the households. In October 2010, the UN Human Rights Council affirmed that the right to safe, clean drinking water and sanitation is contained in existing human rights treaties and that states have a primary responsibility to ensure the full realisation of this and all other basic human rights. Food and water security are complex sustainable development issues, linked to health through malnutrition, but also to sustainable economic development environment and trade. Food and water security are an aspiration for all and their absence is an affront to human dignity. A major contributor to lack of access to clean water is obviously climate change and although it is impossible to halt its relentless progress, by becoming more environmentally aware at least we can help to slow it down.

Factors influencing access to enough food

There is a positive and significant relationship between the probability of a household accessing enough food and gender of head of household. In this study, descriptive statistics also confirm these findings. The majority of the food secure households were male headed whereas the majority of the food insecure households were female headed. This result is in line with the priori expectations. According to Musemwa et al (2010), females are normally involved in many household activities and most of them in the rural areas are not employed hence they do not have any other source of income. This therefore limits their access to enough food as most of the households in South Africa depend on food purchases. Past cultural practices also hindered women in going to schools. As a result, most women are not qualified to do professional jobs that generate high incomes hence low purchasing power and thus have limited access adequate food (Quisumbing 1996). In many developing countries, according to Udry et al. (1995) land is predominantly owned by men and transferred intergenerationally to males. Therefore women may lack access to land, water rights and livestock. In addition, even when women are

able to access land, lack of ownership creates a disincentive to invest time and resources into sustainable farming practices, which in turn lowers production and results in less income and limited access to enough food for the household.

Household size, according to Montshwe (2006), is a useful unit of analysis given the assumptions that within the household resources are pooled, income is shared, and decisions are made jointly by responsible household members. Household requirements are many and one person in most case cannot handle them alone. In this study, there was a significant and negative relationship between household size and access to food. This is in line with the findings of Ankomah (2001). He found that the size of a household also influences the amount spent on food. Household food expenditure peaks at a household size of 4 and decline with an increase in household size beyond 4. In addition, large households have the lowest incomes in society. These groups of households are therefore more vulnerable to food insecurity and malnutrition.

Another important factor to consider is the level of education of the head of household since they are the decision makers in matters concerning the expenditure on food. According to Nkhori (2004), education increases the ability of households to use their resources efficiently and the locative effect of education enhances households' ability to obtain, analyse and interpret information. Education significantly affected access to enough food positively. The more the head of household is educated the more the household is likely to access enough food. Educated household heads were more likely to be absorbed in the labour market and would get remunerations that would improve their access to enough food.

Household income is a measure of the combined incomes of all people sharing a particular household or place of residence. It includes every form of income, such as salaries and wages, retirement income, near cash government transfers like food stamps, and investment gains. Average household income can be used as an indicator for the monetary well-being of a country's citizens. Mean or median net household income, after taxes and mandatory contributions, are good indicators of standard of living, because they include only disposable income and acknowledge people sharing accommodation benefit from pooling at least some of their living costs. According to the results from the study, monthly household income significantly affected household access to food positively. Household that had more monthly income had more access to enough food. This is in line with earlier reports (Alaimo et al., 2001; Fraser et al., 2003)

Poultry ownership significantly increased household access to enough food. According to Ahuja et al. (2008), increasing the productivity of and returns to poultry birds

does not represent a pathway out of poverty for a typical rural household, unless flock size is significantly increased. According to the descriptive statistics on average, each household from the study area kept 14 non-descript low yielding local birds in the backyard. Even though the ownership of few poultry birds does not contribute substantially to food access, it provides a mechanism to improve nutrition (particularly important in children) and alleviate credit constraints faced by the majority of the rural poor. On the one hand, when rural food markets are imperfect, and the availability and prices of grains and animal proteins at marketplaces are unpredictable, poultry farming serves as an inexpensive device for households to generate highly nutritious food items at minimal cost, because of the low input requirements and the low opportunity cost of family labour allocated to poultry care (Ali, 2007). On the other hand, when financial markets are imperfect, which is often the case in rural areas, the sale of birds helps cover recurrent minor expenditures, such as school fees, and to deal with unexpected shocks, such as medical fees (Permin et al., 2001). Investment in backyard poultry farming could thus enhance household access to enough food and reduce the vulnerability of landless and marginal households.

The none or poor provision of agricultural training in rural areas is a key factor that has greatly limited agricultural development in developing countries and contribution of agriculture to food security (Bailey et al., 1999). Access to food was significantly affected by agricultural training positively. Household that had access to agricultural training had better access to enough food. Agricultural training has a direct impact on agricultural productivity and on the performance of ancillary businesses and trade. It also stimulates implementation of knowledge driven economic growth strategies and poverty reduction.

Strategies for enhancing access to enough food

Policy makers in agriculture should partner with the education department such that they design and implement a curriculum that has got a larger bias towards improving land use and productivity starting at primary level such that even if a person drops out before getting to tertiary school, the person would be having the basic needed agricultural knowledge. The curriculum should ensure that the agriculture is sustainable in terms of both productivity and intergenerational continuity. Most farmers in developing countries as also observed in the current study only have access to secondary Education. This, therefore, implies that agricultural education in the curricula should be of high quality, simple and clear as well as to make careers in farming and related branches of agriculture more striking. This can only be made possible by fine-tuning the way agriculture is presented to

students at primary level.

Promotion of small-scale agricultural production remains central to food security in most poor countries, to provide food and income for those at risk. Sustainable technology improvements in agriculture can increase the productivity of agriculture thereby improving household access to enough food. Central elements of this policy include research and extension linkages, drawing upon indigenous knowledge, and improved input supply.

Income generating projects including livestock and non-farm activities will allow rural families to use time previously spent on low productivity work to switch to jobs with higher returns. Non-farm work generates incomes not closely connected to farm income, thus helping to stabilize household incomes. Income generation is important in South Africa because families are usually more reliant on purchased foods.

Conclusion

The majority of the household in Ngqushwa Local Municipality in the Eastern Cape Province of South Africa have limited access to enough food and do not utilise the opportunity that they are located in the coast. Coastal location could enhance household access to food through venturing into activities such as fishing and also handcraft since the area is a tourist destination. In addition, all the household depend mostly on food purchases rather than own production. This therefore mean that the people in the area to do not explore agriculture up to its potential. To increase household access to food, income generating projects and the promotion of small-scale agricultural especially poultry production should be implemented. Educating rural households using informal methods is of paramount importance and should be included and prioritized as most of them are elderly and illiterate.

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