

The effect of infrastructural challenges on food security in Ntambanana, KwaZulu-Natal, South Africa

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Abstract

Rural infrastructural inadequacies in South Africa are well documented, but their effects on local food security remain relatively unexplored. The present study investigated the effects of insufficient infrastructural services on food security issues at household and community level in the area of Ntambanana, which is characterised as a dry environment with few water reservoir facilities effective farming. Focus group discussions were held with existing groupings of men and women, and interviews were conducted with governmental officials and community members. A questionnaire then was used to confirm responses and test the reliability of information from the interviews.

Our study found that there was poor infrastructure and inadequate support from relevant organisations; the roads were not in good condition limiting access to market facilities and other destinations and lack of an efficient and effective transportation system crippling the performance of small-scale farmers. Recommendations emerging from this study include the need for attention to be paid to address the fundamental deficiencies that hinder food security. Better infrastructure would enable rural areas to compete with the urban markets and to attract internal and external investors.

Key words: food security, infrastructural services, community, physical infrastructure.

1.1 INTRODUCTION

Statistics South Africa (2009) has estimated that 20% of all South African households have inadequate or severely inadequate access to food. The country food access problem is most serious in KwaZulu- Natal (23%). A major contributing factor for food

insecurity in rural areas is inadequate social and physical infrastructure. Devereux (2001) argues that urban food security was usually ignored on the assumption that cities and towns were better off than rural areas but there has been a swing in focus from rural food insecurity to urban food insecurity because of the growing of rural people into the cities. This means that rural

populations continue to experience inadequate physical infrastructure and lack of institutional support. Altman *et al.* (2009) suggest that food security need to be understood in conjunction with factors such as social protection, sources of income, rural and urban development, changing household structures, health, and access to land, water and inputs, retail markets, education and nutritional knowledge and other developmental factors. Fedderke *et al.* (2006) maintain that the role of the South African infrastructure is to raise the marginal productivity of capital and encourage private investment. Roads, specifically, tend to reduce the transaction cost of trading, especially in rural areas and investment in rural infrastructure has been reported to add to economic growth and, in turn, food security. Barrios (2008) argues that physical and economic infrastructure have been regarded as important, but that policies and implementation guidelines may have not evolved sufficiently to support rural development or improve conditions of rural households.

1.2 Availability of rural infrastructure support and services

Rural infrastructure is not only a key component of rural development but also critical for sustainable poverty reduction (Ahemachena & Chakwizira 2013). A major challenge is access to appropriate support and services. Infrastructure facilitates production, consumption, distribution, and trade as well as food security in the rural economy. Rural dwellers are vulnerable because of their dependence on a single-track livelihood source and income, and characteristically they face a dearth of opportunities, high transport costs and lack of information. It is widely accepted that poor infrastructural services are the major constraint to food security and rural development. Gebrehiwot (2008) argues that marketing, rural transportation, and communications are keys to household food security and reducing poverty. He adds that

traditional farming methods, poor infrastructural services, and shortage of farm land also contribute to household food insecurity. Ahemachena *et al.* (2013) point out advantages of investing in rural infrastructure: it enables economic actors such as individuals, government, and the private sector to invest further thanks to the widening economic base that provides infrastructure. It also facilitates trade and entrepreneurship, engagement with surrounding entities and integration with the larger national economy.

1.3 Road infrastructure and transport constraints

Barrios (2008) describes a South African rural road providing access from the main road network to rural communities as well as to production areas. It acts as a passage for light public vehicles carrying people and produce. Rural farm roads are mostly dirt topped with gravel and, during the reaping season, the local administration or community associations may improve such roads for this period, for example by grading, so that hauliers can get their vehicles as close as possible to the production areas. Transport limitation has been explained as one of the causes of food insecurity in rural areas, making it difficult to move food to a market or elsewhere. Roberts and Rastogi (2006) point out that, according to the country's Rural Accessibility Index, only 34% of the African rural population lives within two kilometers of rural roads by contrast with East Asia and the Pacific countries, where 90% of rural populations have access to roads.

In most rural parts of South Africa, small-scale farmers are unable to get their produce to the market in a timely manner because of poor access to private and public transport, which results in spoilage and losses.

1.4 Storage and market facilities

Good food storage facilities are essential for long-term food security. Great losses of quality and quantity can be expected if storage conditions do not protect food products from spoilage. The right kind of storage infrastructure is necessary to benefit from agricultural produce after harvest through the rest of the year, since insufficient storage causes wastage. Local farmers as well as other businesses need the right facilities to avoid wastage and produce deterioration (Larson et al. (2013). More broadly, inadequate storage facilities in rural areas lead to products being sold directly from the field, which, during the harvest season, tends to depress producer prices, leading to loss of rural farmers' income. Inadequate post-harvest storage that causes deterioration in the quality of agricultural products depresses incomes further.

Makhura and Mokoena (2003) highlight the fact that rural markets have problems with insufficient physical facilities for fresh produce such as vegetables, in particular as do local shops. Investment in urban wholesale and retail markets is far greater and in rural areas smallholders get only a fraction of the value of their produce because of the lack of marketing infrastructure. Pereira, Cunco & Twine (2014) point out that a decline in subsistence agriculture across sub-Saharan Africa has meant an increased role for the private sector in food security strategies. Although purchasing food is an important food security strategy for the rural poor, it is constrained by severely limited access to income. The Department of Rural Development and Land Reform (2011) maintains that most small-scale farmers find it hard to deal with food-price increases by increasing their production because they lack markets, inputs and finance. Inadequate rural infrastructure services, therefore lead to poor functioning of the domestic market with little spatial and temporal integration, low price transmission and weak international competitiveness. They limit access to markets, and this,

combined with insufficient information, prevents access to both labour and capital. Employees in rural areas work for extremely low wages in the agricultural sector; whose seasonal fluctuations contribute to income fluctuations, all of which undermines rural food security.

1.5 Irrigation

Productive agriculture is thirsty. Hoekstra and Mekonnen (2012) maintain that farming is accountable for 92% of water consumption internationally. The Development Support Monitor (DSM, 2012) maintains that irrigation has the potential to contribute immensely towards rural communities' ability to generate income, create food security and reduce poverty. It brings higher earnings through high yields, cropping intensity and the ability to grow high-value crops, which in turn result in higher rural employment and reduced food prices. Hussain and Hanjra (2004) also point out irrigation benefits to the rural poor through higher production, higher yields, and lower risk of crop failure. Irrigation systems empower smallholders in adopting more diversified cropping patterns and to change from low-value subsistence production to high value market-oriented production, they add, and Increased production makes food accessible and reasonably priced for the poor people to able to buy. In South Africa, too, increased food production helps to alleviate poverty in its worst forms. It is productivity enhancing, growth promoting and food insecurity reducing. Irrigation is an important socio-economic good but poor communities with limited resources remain unable to adopt preventive or defensive measure for assuring food security.

2 RESEARCH METHODOLOGY

The research methodology section discusses the study area, sampling methods and data analysis.

2.1. Description of the study area

To explore the effects of infrastructural problems on food security issues, this study took place in the Ntambanana area, in the northern coast part of KwaZulu-Natal. It is one of the six local municipalities in the uThungulu district, Ntambanana covers an area of 1 083 km², has a population of 94 772 people and 98% of the total people. The land in Ntambanana 85% belongs to Ingonyama Trust and 15% is privately owned by commercial farmers. The municipality is rated as the poorest within the uThungulu district it solely depends on equitable share. The implementation of

property rates has set a base for revenue collection since the municipality was able to collect 2% rates from farmers in 2007/8 and 6% in 2008/9 (Ntambanana Municipality IDP, 2010/2011). Availability of water is a major problem. According to the Ntambanana Municipality IDP, 2010/2011 64% of residents within the ethnic group areas have no adequate water supply. What they have comes from boreholes. (The map in figure 1 depicts the Ntambanana Traditional Authorities areas.)

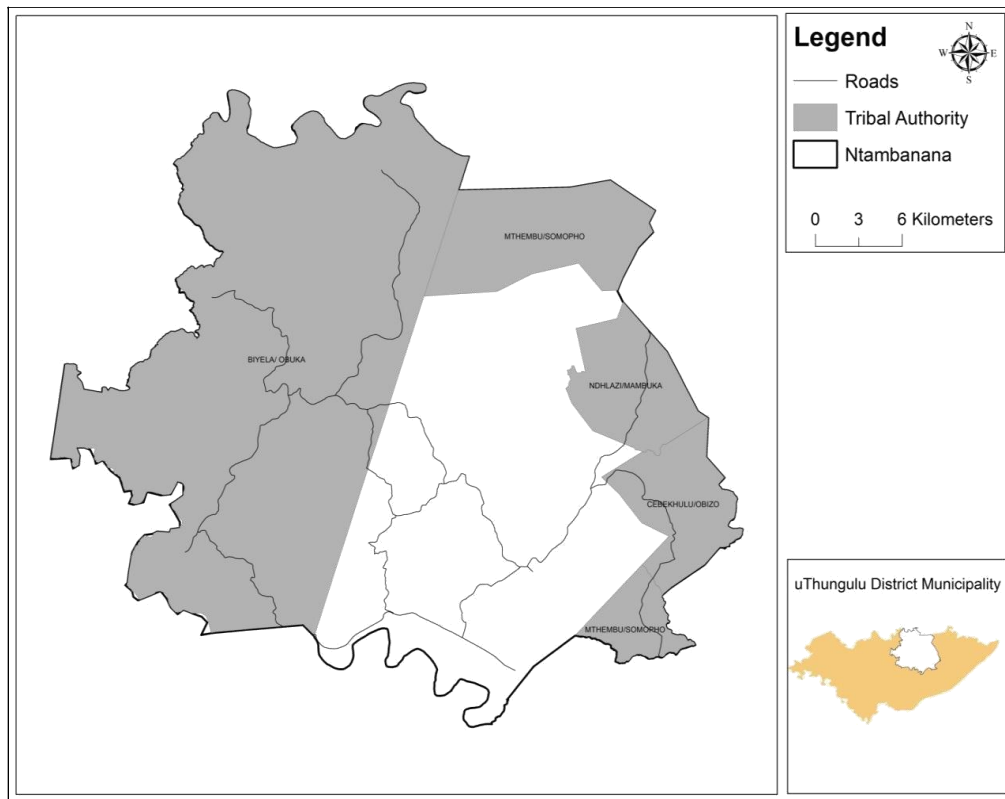


Figure 1: Map of the Ntambanana Traditional Authorities Map

Ntambanana is predominantly rural with no formally established town and settlement pattern. It is largely defined as 'rural scattered,' an extremely sparsely populated settlement pattern for which it is difficult to provide infrastructure. The largest proportion of the total population in the Ntambanana municipal area is based in the

traditional authority areas (Ntambanana Municipality IDP, 2010/2011).

The municipality has 36.7% pensioner-headed households and most households in the area seem to depend on the government pension grant for survival, since there is still a high percentage of

unemployment in the area. Of the population in the ethnic group areas 64% receives no formal income. As much as between 68% and 84.6% of the adults have no formal income in the Obizo, Mambuka, Somopho North, Somopho South and larger proportions in the southern area of Obuka. (Ntambanana Municipality IDP, 2010/2011).

2.2 The method of sampling

A sample was drawn from the population of Ntambanana area at Obizo, Obuka, Somopho and Mambuka Traditional Authorities, respondents were selected as key elements in qualitative data gathering. We used convenience sampling to select stakeholders involved in issues of food security including, non-governmental organisations, community leaders (Amakhosi and Izinduna) and community based organisations in the area. We used focus groups and individual interviews to gather information.

A total of 43 households were included in our sample for data on food security at household level. Two governmental officials were interviewed for their perceptions as well as for information about local government activities and policies related to food security at municipal level. A fewer (18) small-scale farmers were interviewed to ascertain production levels for both commercial and household consumption and for future in-depth understanding of livelihood generation and the extent to what they produce contributes to food security in the immediate vicinity. Focus group discussions were held with existing groups of men and women, and interviews were conducted in their gardens as well as on farms. The groups were targeted for of their involvement in gardening projects, and as a source of information about the extent to which the garden projects contributed to food security.

2.3 Data analysis

The Microsoft excel programme was used to capture and analyse the quantitative data. Content analysis was used to analyse the qualitative data after themes were captured from the questionnaires and focus group discussions, in which respondents had the opportunity to express their experience as well as their feelings about the operation of small-scale farming in their area. Qualitative data were recorded in the form of interview transcripts collected from research participants or other identified texts that reflect experientially on the topic of study (Maree, 2007).

3. RESULTS and DISCUSSION

The availability of infrastructure for rural development is regarded as fundamental to social and economic infrastructure and integrated economic activities that have been acknowledged as being inter-related and mutually supportive. Our study presents and analyses the availability and challenges related physical infrastructural facilities as experienced by the respondents who were heads households and emerging or smallholder farmers, municipal officials and extension officers in the Ntambanana area.

3.1 Availability of storage and packing facilities

The findings in the study area showed insufficiencies of storage facilities to be a major problem as storage facilities are integral for assuring domestic food supply. Focus group discussions revealed that storage and packaging facilities were also inadequate, especially to those who are practising farming. The respondents indicated absence of such facilities for some, and those who had them indicated that the facilities did not meet the required standard.



Figure 2: Inadequacy of proper storage facilities

Ntambanana women storing a crop of potatoes in buckets. This is the only facility available to them, and is inadequate for commercial purposes. Inadequate storage facilities reduce produce prices. Furthermore adequate storage is important in stabilising food supply at household level by smoothing out the irregularities associated with seasonal food.

3.3 Access to road and challenges

In general, our study found the condition of rural roads always poor, with limited access affecting food security badly. The poor road network and transport facilities meant that farmers, local business and households had difficulty delivering the goods and products to their markets and dilapidated roads are also in dilapidated are hard on vehicles. The shortage of roads is in the northern area of Obuka, south –western area of Obuka and eastern area of Obizo and residents have to walk more than 5 km to reach a local road (see roads indicated in the map in figure 1).

The focus groups indicated that their main problems were the poor quality and high cost of basic infrastructure, including roads. The respondents pointed to roads as a cause of weak markets and food insecurity.

The majority (72%) of respondents commented that they were too far from the Empangeni town and markets. The gravel roads to town made setting there time consuming and transport was too expensive. Nearly one-third (28%) of respondents were satisfied with the road network because of the one main gravel road that links them to market in Empangeni. The respondents reported that the municipality was aiming to develop a road network to service all its communities and people to ensure that they need not walk more than 5 km to reach a primary road or district road and this road would link Richards Bay with Ulundi and further north communities.

3.4. Transport facilities and system

The present study revealed ways in which South African rural communities experience inadequate public transport badly affecting food security and rural development. The respondents indicated that transport is crucial to Ntambanana people because of them work and shop outside the area and (6%) of their employment is from this sector. Figure 3 depicts source of the transport problems.

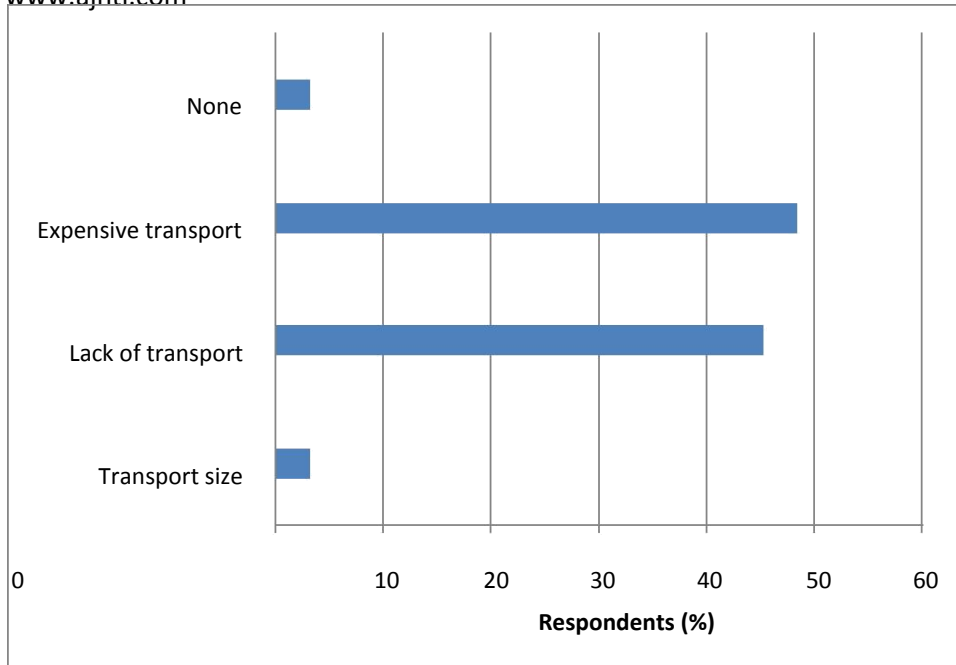


Figure 3: The general problems on transport

It shows that (48%) of respondents the major problem was expensive transport while (45%) found that transport was insufficient and (3%) complained that available transport was too small to carry themselves together with their goods. Respondents clearly understood that shortage of transport and its high cost creates and leads to produce spoilage. Only (3%) said they were not affected by the lack of transport. The respondents revealed that the available transport involved the use of bakkies, although illegal in terms of South African legislation and are used to transport people and goods in the far outskirts areas where other land transport is not feasible.

3.5 Irrigation facilities and system

This study discovered that there is inadequate water supply and that constrains farming activities. Agriculture is a major source of local economic development; Ntambanana people depend on farming activities for their food security. The findings shows that people of Ntambanana area suffers from drought and this affects the

community as livestock and crops are destroyed, suggesting that the means of survival for the traditional community and their lives are adversely affected, due to droughts.

The key informants show that the irrigation system is a major problem and causes food insecurity in the area. It was reported by the key informants that the submissions was made to the Provincial government to assist with construction of dams and the local department of agriculture is in the process of reviving dams in the community. It was further reported that shortage of irrigation systems have negative impact to the Ntambanana farmers because their main source of income is subsistence farming and they use traditional methods to watering vegetables. Focus group discussion indicated that there is no reliable source of water in the area and they are not allowed to use community tap as the source of water for farming activities.

Furthermore, the focus group revealed water from boreholes in most municipal

wards is not appropriate for human consumption due to unacceptable waste disposal system of Ntambanana municipal areas. The respondents indicated that their major problem is the scarcity of water to use

for agricultural and non-agricultural purposes. The graph below depicts the sources of water by respondents.

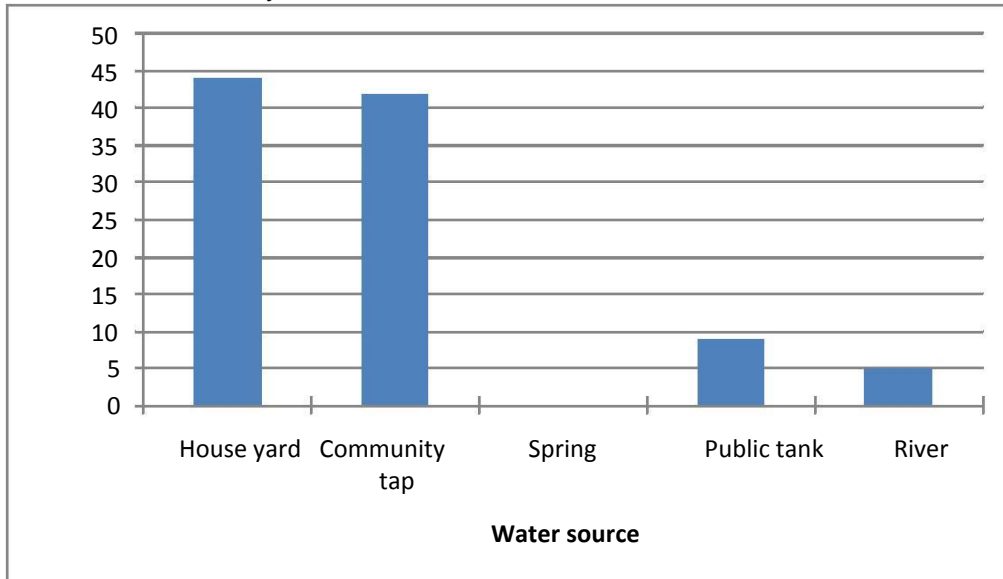


Figure 4: Sources of water

Forty four percent of respondents stated that water pipes have been installed into their yard and (42%) used public or community tap water for only consumption because they are prohibited to use it for farming purposes. Nine percent of respondents show that they depend on community or public tanks as a source of water and 5% of respondents stated that their source of water is river.

The small-scale farmers also indicated vividly that it is difficult to have proper irrigation system as the catalyst for smooth farming because it lack harvest water management. In general, Ntambanana lack water harvesting that causes for the household food insecurity while water harvesting is considered as the means to increase agricultural produce and alleviate water shortage in the drought areas of the study area. The small-scale farmers indicated that there are no small dam based irrigation program that is in place to address

the shortage of water and increase to agricultural productivity.

3.6. Markets and constraints

The focus group indicated that the availability or access to the market is a major problem for the community and contributes to food insecurity. The availability of market is more important in development and sustainment of local economy especially in rural areas. The key informants reported that informal markets are more dominant because it where people generate their livelihood.

Focus group discussion showed that their major problem is an access to market and physical market, and it was reported that there is no formal physical market to sell the produce; the majority sell from homes, gardens and farm gate. In addition, the key informants indicated that in the state of the

province address in Pietermaritzburg stated that all district councils including uThungulu had been directed to set up a vegetable hub within the next six months and people were encouraged to grow their own vegetables. It was noted by the province that many communities who produce vegetables lack markets to sell them.

In focus group discussion revealed that private traders dictate the prices of the produce and this left with no profit.

Furthermore, informal markets are a part of everyday life and household survival strategies in rural and urban areas. The informal markets are suggested as helping smallholders to generate incomes and offer the best solutions to decrease rural poverty and food insecurity. The key informants indicated that very few people who have access to formal markets in agriculture are described as those governed by high quality and food safety standard and where the activities of the companies are monitored.

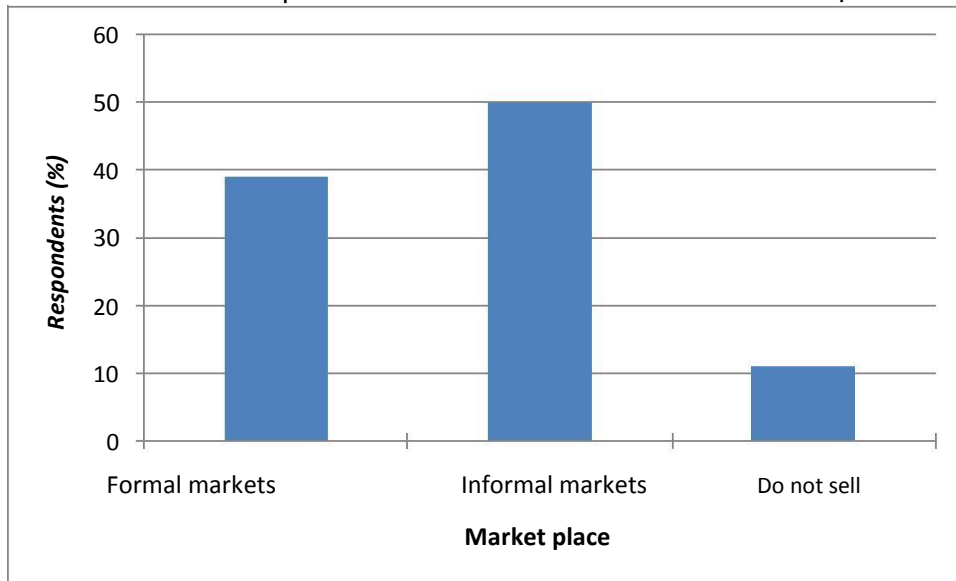


Figure 5: The informal and formal markets

Fifty percent of the respondents indicated that they participate in informal markets because they lack access to formal markets attributed to inadequate information and poor infrastructure such physical markets in the area.

The respondents indicated that insufficiency of storage facilities and transports this denies them to sell fresh produce and attract formal markets such as supermarkets in nearby urban suburb and governmental institutions (schools and hospitals). It is correctly noted in poor road conditions that lead to high transport costs and isolated markets have been regarded as factors that slow down the development of market access for local people to create

food security. It was clearly indicated by the respondents that the issue of inadequate market information is caused by poor communication systems amongst them and governmental institutions such as local municipality and local department of agriculture. The respondents stated that their main problem is that they do not understand procedures and processes to participate in formal markets due to illiteracy. However, (39%) of respondents show that they have limited access to formal markets because of being registered as cooperatives which make them to be recognised as formal organisations in terms of legal processes.

The group which is small-scale farmers who produces sugarcane indicated that they do not have the problem of access to market because they have contractual agreement with one of the big companies in the sugarcane industry, but the problem is poor infrastructure due to bad roads conditions and the transport is very expensive. The key informants indicates that during the state of the province address of 2013 by KwaZulu-Natal Premier in Pietermaritzburg it was stated that rural vegetable hubs will enter into an agreement with the Minister of provincial education and health who will guarantee to purchase all the available produce for the school feeding scheme and various hospitals under the provincial government.

The focus groups who produce vegetables stated that it is difficult to find markets that led to spoilage of vegetables and reported that the local department of agriculture local organise market week at Mthonjaneni where they get an opportunity to sell their products. Focus groups indicated that unavailability of markets lead to food insecurity and do not promote or creates opportunities for entrepreneurship.

4. Summary and conclusion

The study illustrated clearly that, in order to obtain food security, infrastructural issues are crucial and regarded as the way to minimise food insecurity especially in undeveloped and developing areas such as South Africa's rural areas. The study confirmed that there is poor infrastructure and lack of support from various organisations; it suggests that more attention should be paid to address these deficiencies that hinder food security. However, there are challenges which continue to affect the progress of rural development that also contribute negatively to sustainable food security.

The insufficiency of storage facilities raise several issues, that leads to spoilage and

the local farmers or small scale farmers are discouraged to produce which contributes to food insecurity. However, the availability of appropriate storage and packaging facilities can play an important role in ensuring food security. The rural farmers can generate more income as well as being able to compete in a market.

The results indicate that the roads are not in good conditions which are an indication of poor basic infrastructure that create limited access to market facilities or any destination. There is poor road network and one main gravel road which link to the area to a nearby town (Empangeni) which creates transport constrains such as expensive transport costs and time consuming for travelling, and it has negative impact on attracting the market as well as sustaining food security. During summer season sometimes there are rains most of gravel roads are muddy that makes difficulty for vehicles to have access to the area.

The most common transport mode that is available in Ntambanana, is public transport mainly buses that are transporting people and the kind of transport is regulated according to certain hours which inconvenience people. Due to limited transport facilities the community to use bakkies as means of transport that people have at their disposal and these are very expensive and not reliable because of issues of permit and regulations as indicated by the Department of Transport. The major challenge is that Ntambanana area is characterised as dry environment which makes population to struggle to have much produce and practice smooth farming as well for non-farming projects such as housing projects and other projects. The inadequacy of water in Ntambanana has been proven in the study by the very high percentage of people who are not supplied with water and mainly relied from boreholes as the source of water. Achieving food security in Ntambanana means to overcome limited access to markets and build physical markets for local people. The results

indicate that causes for limited access to markets are created by the following factors: poor rural transport, marketing of rural products, inadequate of communication among stakeholders and lack of physical structures in the community and these factors contributes to food insecurity within the study area. The lack of or poor storage and packaging facilities are also linked to markets constraints. Government has to put the interest of the rural people first through speedy up the rural development processes and use local development as the vehicle to overcome rural problems.

5 RECOMMENDATIONS

The evidence from the study confirmed that there is poor infrastructure, it suggests that more attention should be paid to address these deficiencies that hinder food security. However, there are challenges which continue to affect the progress of rural development that also contribute negatively to sustain food security. Therefore the following recommendations can be made:

- The improvement of road systems linking the rural areas and town would make an easy access to markets and make transport available and reliable for the local people.
- Good infrastructure would lead to rural areas able to compete with the urban markets and also able to attracts internal and external investors.
- The study also recommends that the improvement of market system in agricultural products would be able to integrate rural and urban markets that would lead to rural economic growth.
- A well-developed road network would encourage local businesses

and entrepreneurs to produce more and be able to compete with other businesses.

References

- Ahemachena, C. and Chakwizira, J. 2013. Spatial Mapping and Analysis of Integrate Agricultural land use and Infrastructure in Mhontlo local municipality, Eastern Cape, South Africa. *Spring sciences and Business media Dordrecht 2013 D01 10.1007/978-94-007-5332-728*.
- Barrios, E.B. 2008. *Infrastructure and rural development: Household perceptions on rural development*. University of the Philippines: Publish Elsevier Ltd.
- Department of Rural Development and Land Reform. 2011. *Green paper on Land Reform*. Pretoria: Department of Rural Development & Land Reform.
- DSM [Development Support Monitor]. 2012. Unlocking the African moment rural infrastructure in Africa. <http://www.africanmonitor.org/am-dsm.html> accessed 13-12-2012.
- Devereux, S. 2001. Sen's Entitlement Approach: critiques and counter- critiques. Institute of Development studies, University of Sussex, Brighton BN1 9RE, *Oxford Development Studies*, Vol, 29, No.3, 2001.
- Fedderke, J., Perkins, P. and Luiz, J.2006. Infrastructural investment in long – run economic growth: South Africa 1875 – 2001. *World Development*, 34(6) 1037 – 1059.
- Gebrehiwot, T. 2008. Rural food security in Tigray, Ethiopia: Policy impact evaluation. Netherlands: *International Institute for Geo – information science and earth observation Ensche*

Hoekstra, A.Y. and Mekonnen, M.M. 2012. The water footprint of humanity. *Proceedings of the National Academy of Sciences* 109(9): 3232-3237.

Hussain, I. and Hanjra, M.A. 2004. Irrigation and Poverty Alleviation: Review of the Empirical Evidence. *International Water Management Institute*, Colombo, Sri Lanka: John Wiley & Sons, Ltd.

IDP [Ntambanana Municipality Integrated Development Plan]. 2010/2011 review. Ntambanana Municipal offices Bhucanana.

Larson, D.F., Lampietti, J., Gouel, C., Cafiero, C. and Roberts, J. 2013. Food security and storage in the Middle East and North Africa World Bank Econ Rev first published online June 11, 2013 doi: 10.1093/wber/iht015

Makhura, M.N and Mokoena, M. 2003. Market access for small-scale farmers in South Africa. In: Nieuwoudt L. and Groenewald J (eds), *The challenge of change: agriculture land and the South African economy*. Scottsville: University of Natal Press. P. 137-148.

Perira, L.M., Cunco, C.N. and Twine, W.C. 2014. Food and Cash: understanding the role of the retail sector in rural food security in South Africa. *Springer Science and Business Media Dordrecht and international society for plant pathology: food sec (2014)* 6: 339-357.

Maree, K. 2007. *First step in research*. Pretoria: Van Schaik Publishers.

Roberts, P., and Rastogi, C. 2006. Rural access index: A key development indicator. *Transport Papers*. World Bank, Washington DC.

Statistics South Africa. 2009. *General Household Survey: 2008*. Pretoria: STATS SA.