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Table of Contents

Awareness of the rural elderly regarding their health and nutritional well-being.....	2
Comparative analysis of contract and non-contract broiler farmers in the Manzini Region of Swaziland	22
Conservation agriculture: Historical perspectives, challenges and opportunities	42
Conservation agriculture in an integrated crop and livestock farming system: Challenges and opportunities in Swaziland.....	69
Food aid in Swaziland: Emerging lessons and alternative strategies	91
Fostering sustainable development through the integration of agro-biodiversity, local.....	115
Involvement of women in group-based water development projects in Swaziland.....	132
Opinions of rural community dwellers regarding gender-based violence in Swaziland	156
Public awareness and involvement in the environmental impact assessment process in Swaziland..	181
Sustainability of rural agricultural development projects undertaken by non-governmental organizations in Swaziland.....	203



Awareness of the rural elderly regarding their health and nutritional well-being

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ABSTRACT

The purpose of the study was to describe the awareness of rural elderly people regarding their health and nutritional well-being. The specific objectives were to: describe demographic characteristics of elderly people, identify their health problems, assess their nutritional knowledge, describe their socio-economic characteristics and identify their perceived barriers to nutritional well-being. It involved 29 purposively selected elderly people and utilized personal interviews for data collection. The findings revealed that a slight majority of the elderly were widowed, with a minority still married. The majority suffered from, at least, one chronic disease, and some visited a health facility, at least, once a month. They were within 1-3 km from rivers as sources of water which was unfit for human consumption. They normally ate local vegetables but seldom ate meat, fish, eggs and dairy products. While the majority were breadwinners, they had no formal education, no jobs, depended on quarterly grants for income and produced their own food, although some always ran short of food or sometimes lacked it. They lacked nutritional knowledge and cited poverty and ignorance as barriers to their nutritional well-being. They suggested an increase in and monthly



disbursement of their grants, provision of food aid, provision of elderly nursing homes and mounting of nutritional education programmes in effort to address their problems.

Keywords: Rural elderly, nutritional well-being, nutritional knowledge.

INTRODUCTION

Background

Community development is a structured intervention that gives communities greater control over the conditions that affect their lives. This does not solve all the problems faced by a local community, but it does build up confidence to tackle such problems as nutrition as effectively as any local action can. Community development is a skilled process whose approach is partly based on the belief that communities cannot be helped unless they themselves agree to this process. Besides participation in community development, there is increasing evidence that good nutrition is an important lifestyle factor essential to the health, independence and quality of life of older adults and one of the major determinants of successful aging (Amarantos, Martinez and Dwyer, 2001).

To create a successful multi-generation society, the goal is to extend the health span not just the lifespan. It is about keeping people healthy and productive longer. Diet, exercise, weight control and stress management, along with a sense of meaning and purpose play a significant role in determining health span (Public Agenda, 2005). At all stages of life, healthy individuals feel connected to others and relevant in a family and community. Successful aging and community attachment are strongly linked (Tabloski, 2006).



The World Health Organization (WHO) has traditionally used the age group of 65 years and above to designate the elderly.

Most households are headed by elderly people who are charged with the responsibility of ensuring that there is, at all times, adequate food for the family. However, many of elderly people exist in a nutritional twilight zone, grappling with the daily challenge of eating and often not eating well-balanced meals or any meal at all. Major health concerns are very important and there is increasing evidence that good nutrition is important to the health of an individual. Thus, nutritional deficits place individuals at higher risk for health problems. Rural elderly are mostly at high risk than urban elderly due to characteristics of the rural environment and they tend to have lower incomes, lower quality housing and poorer health, and tend to be nutritionally illiterate (Pollina and McKee, 2000). Worst of all, elderly people are left alone with their grandchildren who are mostly HIV positive.

Rural households in Swaziland are vulnerable to food insecurity and health problems. Many of the diseases affecting them have either a dietary cause or could be, at least, partly alleviated by dietary change. More than two thirds of the elderly are at high risk of malnutrition (Wendland, 2003). Hope for better health in old age will come from maintaining the body in better shape, eradicating the diseases to which the ageing body is prone and replacing defective organs (Bates and Benton, 2002).

The elderly suffer more from chronic illnesses than younger people, require more frequent hospitalization and remain in the hospital longer than younger people. Energy needs at this time in life are lower because of decrease in metabolic rate and physical activity. Although less consumption of food is needed to maintain body weight, it is still very important to eat a variety of foods that are nutrient dense. Foods high in



sugar, fat, or alcohol should be used in moderation due to their low nutritional value. Because of their lower energy needs, protein-containing foods should be of high quality (WHO, 2002).

Besides good nutrition, the problems of the aged are heavily focused on the necessary financial resources to meet their needs. Elderly people are deprived of many means of controlling their environment due to loss of their work role following retirement, lowered income, physical problems, departure of children and, sometimes, institutionalization. One consequence of inadequate income and poor health is that older people may feel that they lack control over their lives. According to Help Age International (HAI) (2000), the absence of economic well-being seems to have a statistical relationship with the absence of personal well-being. Suicides, arrest, mental hospitalization and death all increase in times of economic hardship.

Traditional respect for older people ensures their status and role in the community (HAI, 2000). Many cultures have traditions of giving respect to elderly people, which makes them proud to belong to society. Young children are brought up to treat older people with special care and respect. In the fast changing world with shifts in economic, social, and cultural norms, elderly people can find themselves left out of community or household decisions, either deliberately or accidentally, because younger people see the ideas of the elderly as old fashioned or do not realize that older people have much to contribute. While some people may be of the view that elderly people should sit and rest and be looked after, this would imply denial of their right to take part in community and family activities, leading to isolation and deteriorating health due to lack of stimulus. The wish of most people of any age is to continue to take part in whatever is going on, and to go on making a contribution, particularly to their families (HAI, 2000).



Purpose of the study

Since most rural elderly in Swaziland are illiterate, the question that arises is whether they have adequate knowledge of the need for good health and proper nutrition for themselves. A study was, thus, conducted in Ebenezer community to establish whether rural elderly people were aware of aging well with good nutrition. The specific objectives were to: describe the demographic characteristics of elderly people in Ebenezer community, identify their health problems, establish their nutritional knowledge, describe their socio-economic characteristics, and identify their perceived barriers to the nutritional well-being of rural elderly.

METHODOLOGY

The study was conducted in Ebenezer community in the Shiselweni Region of Swaziland and employed a descriptive design. The target population was all elderly people in the community. The respondents were all 29 people who were 65 years old and above. The list of respondents was obtained from the Inkhundla, which is the one used in distributing quarterly elderly grants. The study utilized an interview schedule for data collection. The interview items were specifically developed for the purpose and focused on: demographic data, health problems, socio-economic data, perceived barriers to proper nutrition and proposed solutions for improving their nutritional well being.

The interviews were conducted in the homesteads of the respondents in order to provide opportunity for the researchers to observe the true picture or real life situation of the elderly. It also allowed the researchers an opportunity for in-depth probing on the areas of interest to the study. The data were analyzed using the



Statistical Package of Social Sciences Version 10 and were presented in the form of frequencies and percentages.

FINDINGS

Demographic status

In this study, about 72.4% of respondents were females and the reason could be that, generally, women have longer life expectancy compared to men, so more women were alive in that age group than men. In Swaziland, the life expectancy at birth is 62 years for females and 60 years for males (Europa Encyclopaedia, 2000). According to the findings, most of the elderly were widows, which could be a result of the fact that males tend to have a shorter life expectancy and that they marry younger women than themselves. The man will, therefore, die earlier than the woman.

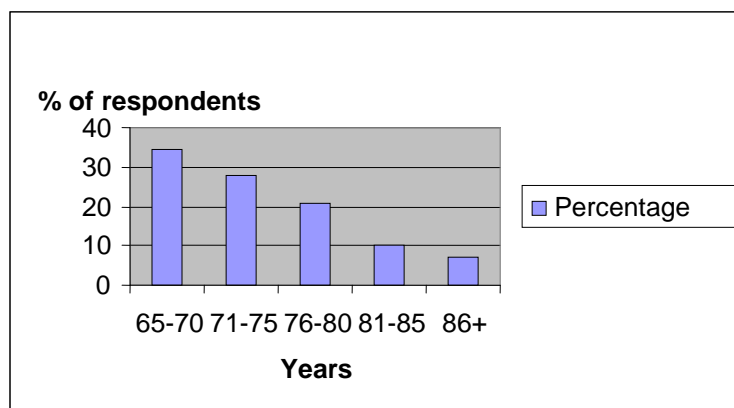


Figure 1. Age distribution of respondents



Most of the respondents were in the age category of 65-70 years and their numbers decreased with increasing age due to mortalities (Figure 1). Many of the respondents lived with their children (who were mostly in their working age group) and grandchildren. The respondents mostly lived with more than four grandchildren in the household and this contributed to a high number of members per household. When the number of inhabitants per household is high, resources become limited and the most important requirement, which is food, will not be enough for everyone and the quality will not be good (Fodds and Bigman, 2001).

A slight majority (55.2%) of respondents were widowed whilst 41.4% were still married and 3.4% were divorced. A relatively large proportion (48.3%) of respondents had more than five children, while 20.7% had four children and another 20.7% had three children. Only 3.4% had two children, while another 3.4% had one child and another 3.4% did not have any child at all. The findings also revealed that 44.8% of the respondents indicated that all their children were still alive, whilst 37.2% indicated that only some of their children were alive and 17.5% indicated that all their children were dead. Of those who had some children alive, 6.9% indicated having only one, 10.3% having two, another 10.3% having three, 6.9% having four and another 6.9% having five.

It is evident from the findings that, like other developing countries, Swaziland is characterized by the extended family system with the family being the most important social institution in an individual's social experience. The family has enough authority to force situations, for example, obliging a head of the homestead to sell livestock if found not to be taking enough steps to care for his homestead and its members (Sithole, 2000). The family is slowly changing its traditional values as more young people leave agriculture, receive an education enter the wage economy and migrate to urban areas (Adamshak *et al.*,



2001). Because of the disintegration of the extended family system in the more developed countries, publicly supported programmes for the elderly have emerged. In developing countries, particularly rural areas, the aged do not have the resources of formal support systems to fill the gap left by the decline of family support (Adamshak *et al*, 2001).

Health problems of respondents

The study revealed that the respondents did have health problems which include chronic diseases, such as diabetes, hypertension sensory and visual impairments, and heart diseases. According to WHO (2002), with increasing age there is a higher risk of the development of age-related pathologies. Byrne and Padfield (2000) stated that chronic diseases cannot be expected to contribute to a sense of well-being on elderly people. While only 24.1% indicated that they did not suffer from any of the identified diseases, the majority (75.9%) of respondents reported to be suffering from, at least, one chronic disease and to be taking medication. Of the latter, 10.3% suffered from heart disease, 20.7% suffered from visual and sensory impairment, 27.6% suffered from diabetes and 17.2% suffered from hypertension.

Most respondents (55.2%) visited a hospital or clinic, at least, once a month and they were not that much far from these health institutions. However, the majority (79.3%) sometimes faced some financial problems which reduced their number of visits to health institutions. It should be noted that 6.9% of the respondents indicated that they never went to a hospital or clinic because of self treatment.



Many of the respondents (72.4%) had to walk a distance between 1-3 km for water and 93.1% used rivers as a source of water, which they indicated to be not that much clean for human consumption as they often had to share it with livestock. Given that water is vital for life, the importance of accessibility to clean water cannot be overemphasized. This could reduce sicknesses associated with contaminated water like cholera thereby reducing expenditure on medication. As noted by Davies (2003), illnesses or accidents in old age are usually a starting point to rapid deterioration; hence they must be treated seriously even if, at first, they might seem trivial.

The eating habits of the respondents varied. While 69% said that they normally ate *umbhidvo* and *ligusha*, which are common Swazi vegetables, 55.2% indicated that they seldom ate foods like meat, fish, eggs, dairy products and beverages. The fact that a majority of respondents ate vegetables and seldom ate meat, fish, eggs and dairy products was largely a reflection of their poor social and economic status. Some respondents (41.4%) indicated that they took alcohol which, in most cases, was in the form of local brew.

Socio-economic characteristics of respondents

The majority (72.4%) of respondents never had formal education, while 24.1% had primary education and only 3.4% had secondary or higher education. All respondents had no job qualification except for one. Only 24.1% had retired while the majority (75.9%) never had jobs. Most respondents (69%) depended on quarterly grants as their source of income, while 13.8% relied on farming, 6.9% were self-employed and another 6.9% relied on income from their working children and 3.4% relied on both farming and quarterly grants.



A majority (69%) of respondents were breadwinners, with 86.2% of them generally getting food by producing their own through farming. Many respondents (58.6%) had two meals per day, while 37.9% had three meals and only 3.4% had more than three meals per day. About 31.0% of the respondents indicated that they always ran short of food, while 27.6% indicated that they sometimes lacked food. However, 17.2% indicated that they rarely lacked food, while 24.1% said that they never ran short of food. About 55.2% of the respondents complained that the situation obtaining at the time was not the same over the past five years. For example, 69.0% of said that they did not have money to buy fertilizers, 20.7% complained of getting no production and 10.3% indicated that they only got of little production.

The majority (86.2%) of the respondents indicated that they did not get assistance from the community when they needed food as they had to pay for it, while 13.8% did have assistance from the community. In order to ensure that they never ran short of food, the majority (62.1%) of respondents indicated that they cooked fewer meals per day while 31% cooked small meals. The findings also revealed that 48.3% of the households did have members who migrated to urban areas to seek for jobs, while 51.7% of the respondents did not have such members. However, of those households that had members who migrated to seek jobs, only 27.6% indicated getting assistance from the migrated members and only 10.3% got such assistance monthly, while 17.2% rarely got such assistance.

These findings demonstrate the existence of a natural link between the level of educational attainment, the type of employment which follows and the level of income brought by this employment. In simple terms, better educated people move into higher status and more lucrative employment (alternatively, it may still be



the case that those in higher social classes have better educational and career opportunities). Their food habits are then a function of their wealth and class status. Several studies bear out this correlation between education and diet and class/income and diet (Fusillo and Beloian, 2002).

The findings also revealed the fact that the elderly are generally poor and have to depend on social grants as well as help from children and relatives for their survival. They also had developed some coping mechanisms to ensure that whatever little food they had could stretch out a little longer.

Nutritional knowledge

The study sought to establish the level of awareness of respondents regarding nutritional knowledge. The findings pertaining to the respondents' possession of nutritional knowledge are summarized in Table 1. They reveal that the majority (75.9%) of respondents had no premeditated way of telling which food was the right one to buy and simply took any that they found. Only 24.1% attributed their choice of food to advice originating from mass media.

All (100%) of the respondents admitted that they never read labels on food items. While 48.3% attributed this to the fact that they were illiterate, 31.1% attributed it to not having noticed any labels, 10.3% indicated that they did not know that reading labels was useful and another 10.3% were of the opinion that reading labels was not important.



Table 1. Distribution of respondents by possession of knowledge on nutrition

Aspects of knowledge on nutrition	Frequency	Percentage
1. How do you tell whether this is the right food to buy?		
a) I just take any	22	75.9
b) I listen to advice from mass media	7	24.1
2. Do you normally read food labels?		
a) No	29	100
b) Yes	0	0
3. If you do not read food labels, why not?		
a) I am illiterate	14	48.3
b) I do not take notice of the labels	9	31.1
c) I did not know it is useful	3	10.3
d) It is not important	3	10.3
4. Which of the following is a balanced diet?		
a) Porridge and spinach	2	6.9
b) Porridge and bean stew	3	10.3
c) Rice and soup	2	6.9
d) Porridge, chicken and spinach	1	3.4
e) All of the above	5	17.3
f) Do not know	16	55.2
5. What is the function of fruits and vegetables in your body?		
a) Protection	5	17.3
b) Body building	3	10.3
c) Do not know	21	72.4
6. Which of the following falls under body building foods?		
a) Beans	1	3.4
b) Meat	20	69.0
c) Beans and meat	8	27.6



Only 3.4% of the respondents actually knew what a balanced diet was. The majority (55.2%) indicated outright that they did not know, while the rest gave responses that were wrong. The majority (72.4%) of the respondents indicated outright that they did not know the function of fruits and vegetables in their bodies, while 10.3% gave the wrong response. Only 17.3% knew the function of fruits and vegetables in the human body. The majority (72.4%) of the respondents did not actually make the right choice of food category, among those provided as falling under body building foods, with 69% indicating meat and 3.4% indicating beans. However, only 27.6% correctly indicated that beans and meat as a combined category of body building foods.

It is evident from these findings that the respondents generally did not have good knowledge on nutrition. These findings are in line with observations by Le.Clerc and Thornbury (2002) that the higher the general educational attainment of a subject, the greater their nutritional knowledge. In a study of people in Cardiff, they noted a consistent association between the level of nutritional knowledge, dietary quality and an intention to make positive dietary changes. At a population level, they observed that, at least, there was a definite association between healthy behaviour and knowledge. Probart *et al.* (2000) backed this up by suggesting that those people with comparatively high levels of knowledge are more oriented towards seeking out further information from both traditional sources (medics, dieticians, published literature) and other sources. They then showed a tendency to use this information to purchase more healthy foods. However, on the other end of the scale, there is a relationship between low knowledge, a tendency to seek information from non-traditional sources (chiropractors, naturopaths and health food shop personnel) and a higher acceptance of misinformation. The cycle of disadvantage, therefore, appears to be quite potent – those who start off with little knowledge approach less well-used sources of information; are more likely to



believe incorrect information and, as a result, are less well-equipped to adopt healthy eating habits (Probart *et al.*, 2000).

Perceived barriers and proposed solutions for improving their well-being

Table 2 summarizes the findings on perceived barriers to attainment of proper diet and good state of well-being and proposed solutions. The majority (65.5%) of the respondents indicated poverty as the problem that they had encountered as they sought to attain proper diet, while 43.5% indicated ignorance as the problem. The distribution of respondents according to problems they encountered in seeking to attain their well-being was as follows: lack of proper care and medication (38.0%), lack of food (13.8%), Lack of proper housing (10.3%), lack of proper storage facilities for food (10.3%) and all the above (27.6%).

The perceptions of respondents regarding the solutions to the barriers identified varied. While 38.0% opted for increased quarterly grants, 17.2% suggested the establishment of nutritional education programmes for elders in communities, 17.2% suggested the provision of food aid, at least once a week and 27.6% opted for a combination of all the above.

The findings on barriers are in line with those of Heaney and Thornbury (2006) that the needs of elderly people are poverty related and include a variety of needs ranging from nutritional, physical, health, economic and social. For example, those with no proper housing pointed out that their houses were in very poor condition since they were initially built from poor material and, over the years, they had not been properly maintained as they needed to be renewed now and then. The majority also complained about their



health which affected their daily activities which are necessary for sustaining life. According to WHO (2002), the chronic disability conditions can be prevented or delayed not only by medical interventions but more effectively by social, nutritional, and economical interventions.

Table 2. Distribution of respondents by perceived problems and proposed solutions

Perceived problems and proposed solutions	Frequency	Percentage
1. What problems have you encountered in seeking to attain proper diet?		
a) Poverty	19	65.5
b) Ignorance	10	43.5
2. What problems have you encountered in seeking to attain your well-being?		
a) Lack of food	4	13.8
b) Lack of proper housing	3	10.3
c) Lack of proper storage facilities for food	3	10.3
d) Lack of proper care and medication	11	38.0
e) All of the above	8	27.6
3. What do you think could be the solution to these problems?		
a) Increased quarterly grants	11	38.0
b) Establishment of nutritional education programmes for elders in communities	5	17.2
c) Being given food aid, at least once a week	5	17.2
d) All of the above	8	27.6

With regard to solutions, most of the respondents felt that if their grants could be increased and disbursed monthly, this would contribute to some improvement. They indicated that, as things stood, by the time they got their quarterly grants, they would be in a lot of debts and in great need. The suggestion by some that



they be given food at least once a week could also be linked to poverty and the long time it took to get their grants. The suggestion was also intended to help those living who are often not in a position to cook. The respondents also felt that building of elderly nursing homes could go a long way in taking care of those that are living alone in helpless conditions. The recommendation to establish nutritional education programmes is quite pertinent and in response to the demonstrated lack of knowledge on nutrition on the part of the elderly. They were of the opinion that such programmes would enable them to know how they could age well with good nutrition and awareness on how to balance their meals.

Conclusions

This study sought to describe the awareness of rural elderly people regarding their nutritional well-being. It can be inferred from the findings that the elderly in Ebenezer community were mostly widowed and lived with their children and grand children. Although the majority had low socio-economic status, characterized by low income, lack of jobs and lack of education, they were still the sole breadwinners in the households. They suffered from, at least, one chronic disease, and some visited a health facility, at least, once a month. Their sources of water were rivers located within 1-3 km distance, although the water was unfit for human consumption. Due to their poor socio-economic status, they normally ate local vegetables but seldom ate meat, fish, eggs and dairy products. While they strived to produce their own food, some always ran short of food or sometimes lacked it. The elderly generally lacked nutritional knowledge and cited poverty and ignorance as barriers to their nutritional well-being. They suggested an increase in and monthly disbursement of their grants, provision of food aid, provision of elderly nursing homes and mounting of nutritional education programmes as strategies for improving their well-being.



APPLICATION FOR DEVELOPMENT

The findings point to the fact that, despite their financial and social insecurity, the elderly in Ebenezer community still serve as bread winners in their households in addition to having to cater for their own special needs. The findings also reveal that their lack of awareness of their nutritional well-being has negative implications on their health as well as that of the family members in their households. In tackling the more structural constraints on food eating habits, a more comprehensive public health approach, is needed. Until now, health education and, more specifically, nutrition education has not been directed at the elderly consumer. The findings of this study reveal that health education and nutritional education programmes are very essential for the rural elderly people. This underscores the need to pay more attention to the needs of the elderly as a way of identifying what they can do to improve their own health and nutritional well-being.

Low income has been a barrier to change even in health-conscious individuals. Intention cannot be translated into action if the resources do not exist to facilitate it. The elderly are in the unenviable position of being one of the poorest sections of society, with little disposable income for food and minimalist or monotonous diets. Thus, in providing health and nutrition information to the elderly, it is also essential to provide them with the means to change their diet. It is they that need more financial support and state services to ensure their good state of well-being.

IMPLICATION FOR POLICY AND PRACTICE



An important implication of the findings of this study is the need for a policy that addresses the needs and overall situation of the elderly. Development of such policy ought to be informed by a systematic situation analysis of the elderly in the country. The outputs of the situation analysis should, among other things, address the need to provide health and nutritional education opportunities to elderly so that they can be better empowered to deal with their own situation to the best degree possible. The situation analysis will also better inform the need for establish nursing homes to cater for the elderly, especially those living alone; the need for reviewing social grants from time to time and the role that young people and the rest of the family ought to play in meeting the social, emotional and financial needs of their elderly family members.

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Comparative analysis of contract and non-contract broiler farmers in the Manzini Region of Swaziland

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ABSTRACT

The purpose of this paper was to compare the factors affecting broiler production of contract and non-contract broiler farmers in the Manzini Region of Swaziland. The study used a descriptive qualitative and quantitative survey approach and utilized purposive sampling. The target population consisted of broiler farmers contracted to the Swazi Poultry Processors and those who were not contracted but used government abattoirs. The study used a Cobb-Douglas production function model to determine the factors affecting broiler production in the two groups of broiler farmers. The results revealed that the main factors affecting broiler production for contract farmers were quantity of feed and labour hours, while production by non-contract farmers was affected by quantity of feed and farmers' experience. Based on the findings of the study, the need to train both groups of farmers on how to allocate resources, especially feed and labour resources, efficiently was recommended.

Key words: contract broiler farmers, broiler production, poultry production, Cobb Douglas production function.



INTRODUCTION

Importance of agriculture

The economy of Swaziland is largely dependent on agriculture (Swaziland Government, 2009a). However, the Ministry of Agriculture and Cooperatives (MoAC) (2007) stated that the agricultural sector has failed to contribute meaningfully towards poverty reduction, employment, food security and economic growth. According to MoAC (2002), the share of agriculture in gross domestic product (GDP) has been declining in recent years. The contribution of agriculture to GDP in 2008 was 11.9% (Swaziland Government, 2009a). The current unemployment rate in Swaziland is 38% and 70% of the unemployed population is found in rural areas (Swaziland Government, 2009b).

Agriculture is a source of livelihood for about 70% of the population and provides 20% of all formal employment in Swaziland (MoAC, 2007). Subsistence agriculture employs approximately 70% of the population. The key challenges are poverty reduction, combating HIV and AIDS and creating employment since unemployment is very high (Swaziland Government, 2009a; 2009b; MoAC, 2007).

Poultry production and food security

According to Bonnard (2003), food security prevails when all people at all times have both physical and economical access to sufficient food to meet their dietary needs for a productive and healthy life. Food security has three distinct variables: food availability measured by food production and food supply; food access measured by the level of income; and food utilisation measured by nutrition, health and care giving.



In this study, a household was considered to be food secure if it had access to food either because it produced enough for its consumption or if it had sufficient income to purchase it.

Poultry is amongst the major agricultural commodities that have been given special attention in the country's development agenda since independence (MoAC, 2007). Commercial broiler production is one of the means of alleviating poverty since it is a source of income for small scale farmers, and providing food security as well as proper nutrition because broiler meat is rich in protein (MoAC, 2007). Poultry production has high smallholder participation in Swaziland and constitutes an expanding industry that is almost at self-sufficiency. Swazi Poultry Processors is the only major broiler contractor in Swaziland. According to MoAC (2006), the growth of the smallholder broiler production sector has continued to be realized on Swazi Nation Land (SNL), justifying the establishment of satellite rural abattoirs to facilitate timely slaughter, packing and marketing of good quality birds. The National Agricultural Marketing Board has built three satellite broiler abattoirs at Motshane, Nhlngano and Ngwempisi. The target of MoAC is to achieve, at least, 10% growth on SNL broiler meat off-take per annum and it is also planning to have satellite abattoirs for the Lubombo Region and Southern Hhohho (MoAC, 2006).

According to Vilane (2008), there are about 800 commercial poultry producers in Swaziland, ranging from small scale farmers to those supplying 20,000 chickens a week. It is estimated that about 25,000 to 30,000 broilers reach processors daily. The largest abattoir and processor supplies 60% of the local requirement. Vilane (2008) stated that the Government of Swaziland is encouraging self-sufficiency by cutting down on imports from neighbouring countries and has implemented legislation to protect producers from foreign competition. Only under special circumstances are import permits currently granted.



The MoAC has a livestock unit (poultry branch) which is responsible for: (a) liaising with financial institutions, non-governmental organizations, and other developmental agencies with the aim of ensuring that smallholder rural farmers get access to essential and required resources; (b) translation of policy guidelines to suit local needs; (c) monitoring and evaluating poultry development programmes and projects; (d) developing training programmes and materials for farmers; and (e) preparing and delivering extension programmes and messages and compiling periodic progress reports to keep the ministry informed of achievements and failures of livestock development strategies (MoAC, 2002).

OBJECTIVES

In spite of efforts by the MoAC and other organizations to help improve broiler production in Swaziland, broiler producers are complaining about thin profit margins and escalating production costs. This might be a result of poor allocation of resources in the production of broilers. More efficient use of resources by poultry producers has a better chance of ultimately impacting positively on productivity and, hence, profitability. Poultry producers need to be helped to raise their operations to higher levels of productivity and profitability through efficient use of their production resources. Since current research endeavours have not adequately dealt with the particular issue of factors affecting broiler production, this study was an attempt to fill this research gap.

Many researchers have used a Stochastic Frontier Production Function to assess the resource use efficiency of agricultural commodities (Akani and Adeokun, 2004; Alabi and Aruna, 2005; Oladeebo and Ambe-Lamidi, 2007; Chukwuji *et al.*, 2006; Inoni, 2007; Bamiro, 2008; Okezie and Bime, 2005 and Fasasi, 2006). Oladeebo and Ambe-Lamidi (2007) stated that a broiler production function represents the



relationship between output and inputs like labour, drugs and chemicals, feed and other factors like experience in chicken production and the number of birds raised.

The study sought to compare the factors affecting broiler production of contract and non-contract broiler farmers in the Manzini Region. It focused on identifying the factors associated with improvement of productivity and, hence, profitability in broiler production in the study area in particular and in Swaziland in general.

CONCEPTUAL FRAMEWORK

Contract farming

Contract farming refers to a system wherein a farmer sells the produce under forward contract to a known buyer (Key and Rusten, 1999). The buyer could be an agribusiness firm, a local processing unit or a multinational company. The contract is a commitment by a seller/farmer to supply an agricultural commodity of a particular quality, at a particular time, in requisite amount and at a pre-agreed price to the buyer. The contract system should be seen as a partnership between agribusiness enterprises and farmers whose success requires a long-term commitment from both parties (Eaton and Shepherd, 2001).

Contract farming is a way of organizing agricultural production whereby smallholders are obliged to supply produce to agro-industrial enterprises in accordance with conditions specified in written or oral contracts. These enterprises, in turn, make provision of critical resources such as credit, inputs and technical assistance as well as an assured market outlet to the farmers. The intensity of the contractual arrangement varies according to the depth and complexity of the provision of these services by enterprises and



commitment by growers to follow recommended production methods, inputs and cultivation and harvesting specifications. Minot (1986) classified contracts into the following three categories:

- i. Market specification: Contracts are pre-harvest agreements that bind the buyer and the grower to a particular set of conditions governing the sale of the crop. These conditions often specify price, quality and timing.
- ii. Resource provision: Contracts oblige the processor to supply crop inputs, extension, credit, and other specified services in exchange for a marketing agreement.
- iii. Production management: Contracts bind the farmer to follow a particular production method or input regime, usually in exchange for a marketing agreement or resource provision.

The relevance of each type of contract varies from product to product and from time to time and the contracts are not mutually exclusive (Hill and Ingersent, 1982; Key and Runsten, 1999). Whereas the first type is generally referred to as a marketing contract, the second and third types belong to the category of production contracts (Scott, 1984; Little and Watts, 1994).

Relative to independent market production, contract farming has been found to reduce the risk associated with variable farmer income. Contracts may further reduce income variability under certain specifications (Laura, 1994). This theory of contracting is based on principal-agent arrangement, where the farmer is an agent (contractee) and the firm is the principal (contractor). This type of contracting specifies the marketing and production practices. It may also require the firm to provide input into production. Contract farming arrangement has also become common with smallholder broiler farmers. Contracted farmers have producer commitment to deliver the product, thus eliminating management and marketing risks and uncertainties since the quantity of the product is pre-determined through the contract. The reduction in capital-assets ratio associated with contract farmers implies that, because of commitment and reduced



market risk, farmers can operate on a smaller equity investment compared with non-contract farmers (Sporleder *et al.*, 1988).

Main reasons for contract farming

Vertical integration via production contracts has many advantages, including the reduction of many transaction costs otherwise borne by independent farmers and allowing for economies of scale in production and marketing. The need to establish separate contracts for each input and output is reduced with contract farming. The integrated contractor provides the grower with feed, veterinary supplies and livestock. This, in turn, implies that the contractors can influence output through their actions (Laura, 1994; Hillburn, 1993). Thus, the standard principal-agent framework is modified. The price of the commodity is also determined in the production contract. Under contract farming arrangement, the grower is primarily responsible for providing only the house (building) and labour. Consequently, the capital outlays of the contractee are also reduced relative to independent production. The contractor may also assist the farmer in securing a loan for his/her production facility. Finally, since the contract farmer no longer faces input or output price fluctuations, the variability of his/her income is greatly reduced. However, the farmer is still subject to variation in input prices of water, fuel and also manure disposal. These advantages make contract farming a more attractive and efficient means of production than independent production (Laura, 1994).

Laura (1994), using simulation model and Bartlett test (Hinkle *et al.*, 1994) to test for homogeneity on income variation among contract farmers, found that relative to independent market production, contract farming reduces risk associated with variable farmer income. Rhodes and Grimes (1992) carried out a survey on reasons that make contractors and contractees enter into contracts. The five top reasons for



contracting were: contracting is less risky, it provides more income or a better cash flow, it is a way of getting started, it is liked and considered better, and it simplifies management.

Kliebenstein and Hillburn (1992), in their study on the evaluation of poultry contracts in California, reported that the two major reasons to enter contracts were financial concerns and risk reduction. In the early 1980s, three-quarters of the contractees reported their main reasons for contracting as financial motivation rather than risk reduction. By 1990s, the shifts between these two reasons varied by regions where contracting was taking place. Only one third of the contractees in the North Central region reported financial considerations as their primary reason for contract adoption. On the East Coast, only a quarter responded that financial concerns were their number one reason. Overall, the primary concern of producers and their reasons for contracting have switched to reduction, sharing or shifting of risk.

Advantages and disadvantages of contract farming

The advantages and disadvantages of contracting are different for contractors and contractees just as their reasons for contracting. For the contractee, the advantages include: reduced risk, reduced capital needs, improved technical support, more fully utilized labour and facilities, improved cash flow and simply the opportunity to produce poultry (Kliebenstein and Hillburn, 1992). Disadvantages include: loss of managerial control, the need to work with contract management, unguaranteed facility use, and limited amount of income. The aspects of risk reduction and profit potential reduction are highly correlated (Kliebenstein and Hillburn, 1992). The advantages to the contractor are: reduced capital requirement, reduced coordination of production to match input supply, improved product uniformity, and a reduction or sharing of risk (Kliebenstein and Hillburn, 1992). The risk with respect to consistent supply and quality of inputs would be



reduced. However, by offering base payment in both good and bad years to the contractees, they assume the risk associated with the volatile pricing system of the poultry open market (Zering and Beals, 1990).

METHODOLOGY

The study area and data collection

The study was conducted in the Manzini Region of Swaziland, selected because 94% of the contracted broiler producers are located in this region. The study used purposive sampling to select 18 farmers who were contracted to Swazi Poultry Processors. However, only 16 of them were included in the study since the other two declined to participate due to personal reasons. It also used 29 non-contract broiler producers who used the Ngwempisi government abattoir and were selected on the basis that they weighed their birds before selling them. The data were collected through the use of a personal interview schedule.

Data analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS version 17) programme. Descriptive statistics were mainly used to summarize some of the socio-economic characteristics of both groups of broiler farmers. The regression model was used to determine production elasticities. To obtain the returns to scale for each group, the production elasticities were summed up. The mean resource-use efficiency for contract and non-contract farmers with respect to hired labour hours and feed were then compared using the independent samples t-test.



Model for analysis

The general regression model equation for factors affecting broiler production was specified as follows:

$$Q = F(X_1, X_2, X_3) \quad (1)$$

The Cobb-Douglas production function was specified as

$$Q = \beta_0 X_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} e^u \quad (2)$$

Taking the natural logarithms on both sides the log linear form of the production model results in:

$$\ln Q = \ln \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + u \quad (3)$$

Where

$\ln Q$ = natural logarithm of output (live weight in kilograms) per 100 birds

$\ln X_1$ = natural logarithm of labour hours per 100 birds

$\ln X_2$ = natural logarithm quantity of feed (kg) per 100 birds

$\ln X_3$ = natural logarithm of years of experience in poultry production

u = random error term

The regression coefficients for the production function were expected to have positive signs.

EMPIRICAL RESULTS

Characteristics of contracted and non-contracted broiler farmers

The findings in Table 1 indicate that 93.8% of the contract farmers were heads of households, while only 55% of non-contract farmers were household heads. The majority (93.8%) of the respondents under contract farming were males, while only 6.2% were females; as compared to 79.3% of non-contract farmers who were females and 20.7% who were males.



Table 1. Characteristics of contract and non-contracted broiler farmers

Selected characteristics	Frequency	
	Contract (n =16)	Non-contract (n =29)
<i>Household status of Respondent</i>		
Head of household	15(93.8)	16(55.2)
Non-household head	1(6.2)	13(44.8)
<i>Sex of Respondents</i>		
Female	1(6.2)	23(79.3)
Male	15(93.8)	6(20.7)
<i>Educational Level of Respondents</i>		
Primary	0 (0)	1(3.5)
Secondary	1(6.2)	1(3.5)
Tertiary	15(93.8)	11(37.9)
<i>Occupation of Respondents</i>		
Farming	3(18.8)	19(65.6)
Employment and farming	13(81.2)	10(34.4)
<i>Access to extension service</i>		
Received extension service	14(87.5)	6(20.7)
Did not receive extension service	2(12.5)	23(79.3)

Note: Numbers in brackets represent percentages.

According to the results, all of the respondents under contract farming indicated that they had formal education. A majority of the respondents (93.8%) had tertiary education, while 6.2% had secondary



education. Since all farmers had, at least, secondary education, this perhaps implies that the farmers were in a better position to process information that is vital to the enhancement of their poultry production. Accordingly, only 3.5% of the non-contract farmers had primary education. Most (41.4%) of them had secondary and high school education.

The results also indicate that only 18.8% of the contract respondents were involved only in farming, while 81.2% were simultaneously involved in off-farm employment and farming. However, most (65.6%) of the non-contract farmers were in full time farming, with only 34.4% being involved in both farming and employment. It can be inferred from these results that farmers who are involved only in farming are likely to be paying more attention to their production activities and this can result in improved performance. On the other hand, those who were employed and farming at the same time were likely to boost their production financially because they would have money to buy the required inputs without necessarily relying heavily on production revenues. However, this could also imply that they are not hands-on in the production process and, as a result, production may suffer.

According to the results, 87.5% of the contract farmers received some extension service, compared to only 20.7% of the non-contract farmers. Access to extension service implies that the performance of the farmers should be better than that of those without access to extension service. Contract farmers received extension service mainly from the contractor, whereas non-contract farmers received extension service from the government extension system and from input suppliers.



Estimates of broiler production function for contracted farmers

A chow test was used to assess the stability of the data and the results indicated that there was a structural break between contract and non-contract broiler farmers. To solve the problem of this instability, two options were possible: one was to separate the data into two and run two separate regressions, and the other was to use dummy variables. In this study, two separate regressions were run because the data sets (contracted and non-contracted farmers) were different.

A total of three variables were included in the production function, out of which only two were statistically significant. The production model estimation results are presented in Table 2. The Adjusted R^2 was found to be 0.60 indicating that the independent variables explain 60% of the variation in the broiler production output. The coefficient of the natural log of labour hours was positive and statistically significant ($p < 0.01$). The results suggest that a 1% increase in labour hours would increase output by 0.02%. The coefficient of the natural log of quantity of feed used by respondents in broiler production was positive and statistically significant ($p < 0.01$). It, therefore, suggests that a 1% increase in the quantity of feed used by the respondents in broiler production would increase the output by 0.11%. The coefficient for experience is not statistically significant, yet it is positive, indicating that experience in broiler production is a relevant variable. The sum of 0.144 for the coefficients demonstrates decreasing returns to scale, which indicates that, when the farmers increased all the inputs by 1%, the broiler output would be increased by about 0.144%.

Table 2. Estimates of a broiler production function for contract farmers (n = 16)

Variables	Coefficients	Std. Error	t- value
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Constant	4.475	0.172	25.987
Ln X ₁ (labour hours)	0.019	0.005	3.636**
LnX ₂ (quantity of feed in kg)	0.113	0.030	3.725**
LnX ₃ (Experience in years)	0.012	0.007	1.736
R ²	0.68		
Adjusted R ²	0.60		
F-value	8.485		
Number of observations	16		

Dependent variable: logarithm of output in kilogrammes

** Significant at 1% level

Estimates of broiler production function for non-contract farmers

Similar to the contract farmers, the production of non-contract broiler farmers was examined through the use of a Cobb-Douglas broiler production model. A total of three variables were included in the production function, out of which only two were statistically significant. The production model estimation results are presented in Table 3. The Adjusted R² was found to be 0.54, indicating that the independent variables explain 54% of the variation in the broiler production output. The coefficient of the natural log of labour hours used by the respondents was positive but not statistically significant ($p > 0.05$). The coefficient of the natural log of quantity of feed used by respondents in broiler production was positive and statistically significant ($p < 0.01$).



Table 3. Estimates of a broiler production function for non-contract farmers (n = 29)

Variables	Coefficients	Std. Error	t- value
Constant	4.115	0.273	15.062
Ln X ₁ (labour hours)	0.044	0.025	1.801
LnX ₂ (quantity of feed in kg)	0.153	0.045	3.363**
LnX ₃ (Experience in years)	0.016	0.007	2.348*
R ²	0.589		
Adjusted R ²	0.536		
F-value	11.794		
Number of observations	29		

Dependent variable: logarithm of output in kilogrammes

* *Significant at 1% level; *Significant at 5% level

The results, therefore, suggest that a 1% increase in the quantity of feed used by the respondents in broiler production would increase the output by 0.15%. The coefficient of the log of experience of respondents was positive and statistically significant ($p < 0.05$) suggesting that a 1% increase in experience would increase output by 0.02%. The sum of 0.213 for the coefficients demonstrates decreasing returns to scale. This means that when the farmers increased all inputs by 1%, broiler output would be increased by 0.213%.

CONCLUDING REMARKS

The purpose of the study was to compare the factors affecting broiler production of contract and non-contract broiler farmers. The results suggest that broiler production under contract farming is affected by



the amount of feed and labour hours, whilst broiler production in non-contract farming is affected by the amount of feed and the farmer's experience. According to the results, there is need for both contract and non-contract farmers to improve the allocation of feed and labour hours in order to improve production. Experience also plays an important role in improving broiler production of non-contract farmers.

APPLICATION FOR DEVELOPMENT

The Government of Swaziland recognizes the importance of poultry production with regards to food security since it is a source of income and broiler meat is a source of protein. This is evidenced by the establishment of satellite abattoirs in Ngwempisi and Motshane Rural Development Areas for timely slaughtering and marketing of good quality birds. The government also encourages self-sufficiency in poultry and poultry products by regulating poultry importation in order to protect local broiler producers from foreign competition.

Knowledge of the type of broiler production system and factors affecting production under the different systems makes an important contribution to efforts towards sustainable development of the poultry industry, in particular, and agriculture in general. Such development has a better chance of promoting commercialization of agriculture and, hence, improvement in food security and household income.

IMPLICATION FOR POLICY AND PRACTICE

The Government of Swaziland and non-governmental organizations involved in agricultural extension service ought to improve their extension methods targeting broiler producers through the facilitation of sustainable empowerment of broiler farmers and, hence, their development. The government ought to



consider the factors promoting and constraining broiler production as key to the achievement of the goal of commercializing agriculture. The provision of first hand information on broiler production and marketing by the extension service should go hand in hand with access to credit in order to improve production.

The need for policy that will protect farmers from unfair practices by contract processors cannot be overemphasized. This calls for the recognition and implementation of the competition law to provide for choice of contractors. At the same time, non-contract farmers ought to attend workshops on broiler production and also learn from other farmers in order to improve broiler production and, hence, food security.



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Conservation agriculture: Historical perspectives, challenges and opportunities

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ABSTRACT

Conservation agriculture (CA), also known as farming God's way or the next green revolution, is a farming system that encompasses three pillars: multiple cropping system, minimum soil disturbance and permanent ground cover. It is an old crop production practice, but was reborn about 25 years ago in response to sustainable crop production and the need to address the problems of food security and global warming. Adoption has been high in USA, Brazil, South Africa and Zambia. Today, about 116 million ha of land are under CA worldwide. Nevertheless, CA has faced some challenges over the years. These include: mindset, problem of unlearning fundamental crop husbandry and agronomy principles and practices, confusion in use of terms, weed management, competition between livestock and the need to provide permanent ground cover and lack of appropriate technology. The opportunities for promoting CA include: build-up of soil organic matter content, soil capital, reduction in labour costs, less carbon dioxide emission because of less fuel use, early planting, carbon sequestration, research and publication and business opportunities for CA tool development. Means of promoting CA include: creation of awareness, more adaptive on-farm research, training and institutionalization of CA, development of appropriate tools and provision of markets to enable CA farmers to sell their surplus produce beyond local markets.

Key words: Conservation farming, conservation tillage, direct seeding, no till.



INTRODUCTION

What is conservation agriculture?

Conservation agriculture, also known as farming God's way, conservation tillage, conservation farming, or the next green revolution (Anon., 2010; Anon., 2009; Kuepper and Gegner, 2004; Haggblade and Tembo, 2003; Sullivan, 2003; Kuepper, 2001) is a generic name for farming system that encompasses a set of three agricultural practices. These practices, as will be elaborated later, are based on three principles: (a) diversified cropping systems (that is multiple cropping); (b) permanent ground cover, and (c) minimal soil disturbance through reduced or no tillage, in order to preserve soil organic matter (FAO, 2007). Re-introduced about 25 years ago, CA is now practised on about 116 million ha of land around the globe (FAO, 2009). Like agroforestry before it, CA is an old farming practice with a new scientific approach (Edje, 1983). It is similar to organic farming, except that it permits the use of agrochemicals whereas organic farming does not (Anon., 2009).

Historical perspectives

Traditionally, farmers in the tropics were, of necessity, conservation agricultural farmers. They practised shifting cultivation, where land rather than crop was rotated. With increase in human and livestock population, the fallow land period was reduced and variants of shifting cultivation emerged. These include the *matengo* land use system in Southern Tanzania (Pike, 1938), the system in Ukara Island of Tanzania, the *mambwe* and the *fundikila* systems of Northern Zambia, the *tumbas* or mounds of the Wafipa of Southern Tanzania, the *chitemene* systems of Northern Zambia, the Chagga farming systems in Kilimanjaro, the Machobane farming system in Lesotho and the traditional cropping systems of the Ngoni-



Chewa of Northern Malawi (Allan, 1965). The farmers used very simple tools, ranging from wooden sticks to machetes and eventually to hoes, for making planting stations and sowing seeds on land with zero or minimum tillage (Edje and Semoka, 1990). The Masai of Tanzania and Kenya still practise minimum tillage and continue living in harmony with nature even in the 21st Century. Farmers in Kagera Region of Tanzania, particularly the Wahaya of Bukoba, who grow banana and beans in association (as intercrops) still plant beans through mulch in banana fields today.

Before the advent of modern agriculture, tropical farmers relied on standing vegetation for soil fertility maintenance, nutrient cycling and ground cover for erosion control (Ruthenberg, 1976). However, with the industrial revolution and the advent of the petrochemical industry, with quick fixes of pesticides, the introduction of the moldboard plough and monocropping slowed down further the development and adoption of CA that African, Asian and Latin American farmers have practised for centuries (Anon, 2009). However, it should be noted that CA was once regarded as a conservative, primitive and archaic and backward cropping system ((Ruthenberg, 1976, Edje, 1979), especially when there was no affirmation from modern agriculturalists. It suffered the same fate as agroforestry before it.

PRINCIPLES OF CONSERVATION AGRICULTURE

As indicated earlier, CA is based on three principles (Anon, 2011). This section highlights these principles, namely: (a) multiple cropping systems; (b) minimal soil disturbance through reduced or no tillage (FAO, 2007); and (c) permanent soil cover to protect the soil, increase soil organic matter content and suppress weeds.



Multiple cropping system and crop rotation

Multiple cropping system or diversified cropping system is an old and popular practice, especially among small-scale farmers, of growing two or more crops in close proximity in the same field (Figure 1) during the same growing season (Francis, 1986). In high rainfall areas, the number of crops in a field, especially near homesteads, can be as high as 10 or more if fruit trees are included. Usually, it looks haphazard to a casual observer, although the art and the science of crop combinations, time of under-sowing, planting patterns and geometry and plant densities are very complex. Types of cropping systems include: mixed, row/ridge, relay, strip and sequential intercropping (Francis, 1986). Reasons for growing crops in association include: higher combined yields, crop insurance, more efficient use of scarce crop production resources, more weed suppression, less insect and disease problems, erosion control and nutritional complementarity (Edje, 1980).



Figure 1. Multiple cropping system



Until the 1980s, multiple cropping was almost unheard of outside small-scale farmer circles, let alone being practised. It has gained revival, even with large-scale farmers in the USA and other countries, since the 1980s, as is evident from the large number of papers published on the topic in internationally refereed journals (Francis, 1986). After several decades of abandonment, multiple cropping is now one of the pillars of CA.

Minimum soil disturbance

Minimum tillage, direct seeding, planting through mulch cover, zero tillage and no tillage are often used interchangeably in CA. They all mean planting with minimum soil disturbance, with reduced traffic in the field so as to reduce soil loss through erosion, retain more organic carbon in the soil because of reduced soil oxidation and also less cost (Lal, 2005; Campbell *et al.*, 1996). Minimum soil disturbance has been practised by farmers for centuries using dibbers, and later on hoes, for making planting stations just large enough to accommodate one or three seeds/stand. Little did we know that these farmers were practising CA.

Permanent soil cover

This is the practice of protecting the soil from erosion, increasing water infiltration, reducing exposure to rain and sun and increasing microbial activities in the soil (Figure 2). Early crop production farmers might not have practised the growing of crops with permanent ground cover. However, farmers in Kagera Region of Tanzania still grow beans through grass mulch. Farmers in some Latin American countries (e.g. Costa Rica) still plant beans through tree-leaf mulch in what is known as *tapado* system of bean production.





Figure 2. Permanent ground cover with maize stover.

REBIRTH OF CONSERVATION AGRICULTURE

Conservation agriculture has its rebirth in conservation tillage (Faulkner, 1945). Conservation tillage was developed because of degradation of soil through wind and rain water impact that reduced top fertile soil and decreased soil water sources due to less water infiltration. Reducing the intensity of tillage for economic and environmental reasons also led to conservation tillage and finally to zero tillage.

The adoption rate of zero tillage has been erratic. It has worked in some countries and not so well in others (Friedrich and Kienzie, nd). However, in the last two decades, CA has gained popularity and, in the form of no-till, was practised in about 116 million ha worldwide in 2009 (Derpsch *et al.*, 2010). However, more than



85% of the total area under CA is in North and South America and only about 0.3% (368,000 ha) is in Africa (Table 1).

Table 1. Area under conservation agriculture in continents/regions

Continent/Region	Area ('000) ha	Percentage
South America	49,579	46.8
North America	40,074	37.8
Australia and New Zealand	17,162	11.5
Asia	2,530	2.3
Europe	1,150	1.1
Africa	368	0.3
Total	115,863	100.0

Source: Derpsch *et al.* (2010).

Conservation agriculture, as we know today, began in the United States of America, where consistent droughts in the 1930s converted bread baskets into dust bowls. Then in the 1950s, no-till, direct seeding was promoted as a means of combating soil erosion, low organic matter content and low soil fertility. From the United States of America, it spread to other countries, notably Brazil in Latin America and to Zambia in Africa.

Factors contributing to adoption of conservation agriculture in the United States of America

After the dust bowl of the 1930s in the United States of America, there was an urgent need to reduce tillage and build organic matter content of soils. The means of achieving these goals included minimum tillage and



the retention of crop residue in the field. The use of herbicides was very successful in meeting both objectives. This is a significant point for proponents of permanent ground cover in African countries, where the use of herbicides is not very common and the cost is prohibitive.

Factors contributing to adoption of conservation agriculture in Brazil

Conservation agriculture was reborn in Brazil in the 1960s and 1970s. The reason was that the government of Brazil wanted to shift focus from livestock-based farming system to crop-based farming system in the sloping heavy rainfall regions of Southern Brazil. Farmers responded to the initiative by ploughing down their pasture and planting soya bean [*Glycine max* L (Merrill)] instead. Poor land husbandry practices resulted in massive soil degradation with gulleys as wide as 4 m and as deep as 10 m. The reform efforts collapsed economically and ecologically as farmers were unable to pay their loans and farms were repossessed by banks. Some farmers began terracing while others decided to leave some soil cover to reduce soil erosion and yet others decided to practise minimum tillage. With technological development, no-till implements were developed which were effective in controlling soil erosion and degradation. With less erosion, there was organic matter build up, and crop yields began to increase.

Two main factors contributed to the high adoption of CA. Firstly, good rains allowed farmers to have two crops per year; and the absence of a long dry period provided ample biomass between crops. Secondly, low crop yields from soil loss served as another driving force to make farmers adopt CA. As of 2010, Brazil had about 25 million ha under CA. It took the country 20 years to develop the first million ha under no-till practice, and CA under no-till system has been expanding at the rate of six million ha per year in the last 10 years.



Factors contributing to adoption of conservation agriculture in Zambia

In the 1920s, there were dust bowls in Zambia resulting from consistent droughts. The response from the British Government was imposed mechanical soil conservation. Soil banks, ridging, terracing and contour ploughing were imposed. Other soil conservation measures, such as grass strips, were also imposed. Terracing and making ridges was hard work and farmers complained to their chiefs, who promised that there would be no imposed soil and water conservation measures after independence. And as was expected, soil and water conservation measures stopped after independence. Also, after independence, there was heavy subsidy for maize production in the form of seeds, fertilisers and other farm inputs for 30 years. These subsidies and the low price of copper resulted in the collapse of several banks. Continuous use of high input maize variety, SR 52, low rainfall, and little organic matter content in soils led to soil degradation. High nitrogen fertiliser use led to acidification, while repeated ploughing caused soil compaction. The slash-and-burn *chitemene* land use system was not sustainable as it promoted soil degradation (Haug, 1981).

In 1992, there was very severe drought in most of the SADC region. After the drought, commercial farmers, non-governmental organisations, community-based organisations, banks and other organisations pooled resources and set up a Conservation Farming Unit to address the issues of soil degradation. With user-friendly technologies developed by the Unit ranging from pitting (Figure 3) to strip intercropping, Zambia soon became one of the leading countries in Africa on CA technologies (Table 2)





Figure 3. Pitting

Table 2. Area under CA in some African countries

Country	Area (ha)
South Africa	368,000
Zambia	40,000
Ghana	30,000
Kenya	15,000
Sudan	10,000
Mozambique	9,000
Tanzania	7,500
Morocco	4,000

Source: Derpsch *et al.* (2010)



CHALLENGES IN CONSERVATION AGRICULTURE

Forty years after the green revolution, scientists still face the problem of producing enough food to meet food security needs of the teeming population. The number of people who are chronically food insecure continues to increase. There is increase in affluence with more people demanding meat products and, hence, more cereals and grain legume crops being fed to livestock, thereby further worsening the food gap. Urbanisation has reduced land available for additional food production, thus imposing more prudent use of the available arable land. Competition for production resources, such as water, has increased in recent times because of increase in human and livestock population and in industries. Fossil fuels stocks are diminishing, thus increasing production costs. The production of greenhouse gases, such as carbon dioxide, methane and nitrous oxide that contribute to global warming is increasing. All these factors suggest the need to adopt new strategies and approaches for meeting food needs in a sustainable manner. One such approach is CA.

Considerable progress has been made in the adoption of CA, especially in North and South America and, to some extent, in South Africa and Zambia (FAO, 2010). Nevertheless, adoption still faces several challenges in many countries in Africa. Challenges may be referred to as constraints, problems, disadvantages or difficulties in the adoption of CA. Some of these challenges facing promoters and practitioners of CA will be discussed below.

Mindset

Some of the principles of conservation agriculture require the unlearning of certain fundamental land and crop husbandry practices and agronomic principles that were once considered essential for successful crop



production. For example, farmers were encouraged plough down their crop residue shortly after harvest, when the soil was still moist, in what was regarded as “winter ploughing”. The rationale was to facilitate mineralisation of the crop residue in order to release nutrients in crop residue to the succeeding crop in what was known as the Birch effect (Birch, 1964) in the flush release of nutrients, notably nitrogen. Delay in ploughing down the crop residue, especially of maize stover with high lignin content, would often cause nutrient immobilisation, especially of nitrogen. Extension workers now face the problem of informing farmers not to practise “winter ploughing” because of the need to provide ground cover.

Conventional tillage

One of the most important agricultural practices adopted by farmers about 10 thousand years ago is tillage. Tillage is the practice and art of working the soil with the use of an implement powered manually, by animal or tractor. Other names for tillage include ploughing, cultivation, and digging. Most agronomy and soil science books advocate tillage following the landmark work by Jethro Tull (Ruthenberg, 1976). Some of the reasons for adopting tillage include the following: it is the first step in seedbed preparation where the soil is prepared to the required tilth for fast germination and emergence of seeds; the incorporation of bulky crop residue, manure, weeds or amendments added to the soil; it helps aerate the soil and contributes to the release of nutrients tied up in organic matter; it is a recommended practice for the control of several soil and crop-borne insect pests and diseases, since the incorporation of organic matter has been known to help alleviate the problems of over-wintering pests and diseases, including some weeds; it reduces soil compaction, a physical property that restricts root penetration, water infiltration and the yields of root and tuber crops; and the ploughed field does not look untidy (Hobbs, 2007).



Use of terms

There is confusion regarding the use of terms. For example, who is a CA farmer? Does a CA farmer need to adopt all three principles in order to be regarded as a CA farmer? The majority of CA farmers in the United States of America practise no-till or zero tillage without necessarily adopting the other two pillars of crop diversity and permanent ground cover. If only one criterion can qualify a farmer as a CA farmer, then the farmers who practise multiple cropping (crop diversity) in African countries should be classified as CA farmers, implying that their percentage would be much higher than 0.3%, perhaps even much more than 50%. Some countries insist on all three principles, while others emphasise permanent ground cover, even under conditions where the livestock population makes it impossible to achieve permanent ground cover. In any case, it is not clear how much of the ground (%) should be covered. Thus, the ambiguity in the use of terms makes it difficult to obtain accurate data on farmers practising CA, particularly when such information is needed for acquiring grants for CA initiatives.

Confusion is also often caused with regard to the use of the terms “cover crops”. In most small-scale agriculture in the tropics, the words “cover crop” may not exist. If they do, they generally refer to a non-food crop. Therefore, when farmers are requested to plant cowpeas [*Vigna unguiculata* L (Walp)] and other food legume crops as cover crops, the adoption rate will be very slow. What is evident from this confusion is that terms ought to be used in the context of the prevailing cropping system in order to facilitate adoption of any technology. This is one of the basic principles of on-farm research and extension.



Competition between livestock and need for permanent ground cover

The concept of ground cover is generally accepted because it protects the soil from water and wind erosion, increases water infiltration rate, reduces fluctuation in soil temperature, increase organic matter content, increases chelating properties of soils and increases nutrients in soils. However, permanent ground cover may be difficult to achieve in situations where cattle and goats rely on crop residue as fodder. For example, there are about 639,718 cattle, 480,208 goats and 19,208 sheep in Swaziland (CSO, 2008) and these animals rely on crop residue as fodder. While it might be possible to split the crop residue between cattle and ground cover, the concept of “feeding” the soil and starving the animals is quite alien. It has been suggested that CA farmers should fence their fields to protect cattle and goats grazing on crop residue left to “cover” the ground. In effect, the advocates of such a practice are implicitly saying that CA farmers should provide ground cover for their fields while they leave their cattle to die of starvation. Until CA farmers practise stall feeding and provide fodder, as is done by other farmers in Northern Tanzania, for livestock feed, the adoption of CA based on permanent ground cover could be a mirage.

In some countries, one crop cultural practice of controlling a troublesome maize disease, grey leafspot (*Cercospora zea maydis*), is to leave no maize stover on the ground after harvest. In the absence of tolerant maize varieties, leaving the crop residue would mean no maize crop in the succeeding years. The disease could, therefore spread very fast from hotspots to other areas very rapidly.

One possible means providing fodder for livestock, while retaining maize stover as ground cover or vice versa, is to grow a fodder crop in association with maize (Dlamini, 2010, Edje and Ossom, 2011). The fodder can be cut, dried and baled as hay, while the maize stover is left as ground cover in a fenced maize field. Or a non-food crop, sunnhemp (*Crotalaria juncea*) can be intercropped with maize (Edje and Ossom,



2010). The maize stover can be fed to livestock, while the sunnhemp is left as a cover crop in a fenced field.

Weed control

Weeds are generally a problem in a small-scale farming system, even with conventional tillage. For example, there have been cases where, within two to three weeks of abandoning a groundnut (*Arachis hypogaea* L.) field, the grain legume crop was overgrown by weeds. Similar incidences have been observed even in maize (*Zea mays* L.) fields, where the competitive ability of maize conferred on it by its size and frame should have been an advantage in suppressing weeds. This may explain why farmers generally ensure that their crops are planted in weed-free fields because of the rapid rate of weed growth following the “grass rains” and the release of nutrients as a result of the Birch effect. Therefore, weed management does pose a threat to CA adoption. It should be noted that one of the main factors that contributed to the fast adoption of CA in the USA was the use of herbicides. In most African countries, herbicides are not used for various reasons, including technological-know-how, cost and availability. Even if herbicides were available at affordable cost, their use would be contradictory to millennium development goal number seven, which seeks to ensure environmental sustainability (UNDP, 2009) in crop production.

Termites and rodents

The problems of termites and rodents are generally high in fields where there is ground cover from crop residue. This may explain why some farmers in Malawi leave weeds in furrows instead of piling them along the base of the maize crop as a diversionary tactic for the control of termites in maize fields. Poor plant



stand, resulting from termite damage has been known to increase the incidence of groundnut disease (rosette) and overall yield.

Land tenure

Initial investments in CA, for example, on soil ripping, acquisition of appropriate equipment, fencing and other farm improvement measures could be high. Therefore, where land tenure rights are not clear, farmers will be reluctant to invest in CA initiatives.

Research and extension gaps

There are research gaps in CA technology. Extension workers and farmers do not have adequate knowledge and skills for CA adoption. In some instances, promoters of CA have left farmers and, ironically, themselves, very confused, indicating that the benefits of CA might have been over-blown or over-sold. Part of the problem arises from the fact that some CA packages that are being promoted are not appropriate to farmers' circumstances. A classical example is where farmers are required to fence their fields to preserve crop residue as ground cover, in a farming setting where it is traditional for livestock to feed on the crop residue in the field. There is no doubt that the technology of leaving the crop residue in the field as ground cover as a component of CA might have been successful in situations where livestock are stall-fed or where there is little or no livestock production.



Other challenges

Farmers who have tried CA generally agree that it increased crop yields. However, the cost of inputs promoted with CA, the labour involved, the opportunity costs of crop residue in dry season, the low esteem associated with small-scale agriculture are a challenge to CA adoption. Also, there are often different goals held by farmers on the one hand and promoters of CA on the other.

Currently, there is about 40,000 km of grass strip in Swaziland. With conventional tillage, the width of the grass strip is kept in check. With no-till technology, grass strip may grow wider and encroach on “arable” land, thus reducing land available for crop production. Reduction in farm land area could lead to less adoption of CA.

OPPORTUNITIES IN CONSERVATION AGRICULTURE

Opportunities of CA may refer to advantages, merits, prospects and benefits of adopting CA practices. Some of these opportunities are highlighted in the sections that follow.

Build up soil organic matter content

One of the main factors contributing to the reduction of crop yields, especially in smallholder agriculture, is low organic matter content and low soil fertility. It has been reported that about 300 to 400 million tonnes of soil is lost annually from soils in South Africa, most of which is top soil that is rich in nutrients. Buresh *et al.* (1997) reported that in sub-Saharan Africa, an average of 660 kg/ha nitrogen, 75 kg/ha phosphorus and 450 kg/ha potassium were lost over a 30-year period from about 200 million ha of cultivated land in 37



African countries. One means of replenishing the lost organic matter content is through CA which promotes ground cover. The increase of soil fertility and crop yields, through the use of organic manures, has been reported (Edje and Mabuza, 2008).

Organic matter serves as a source of energy for both macro- and micro-organisms. The number of bacteria and fungi, which play vital roles in the health of the soil, are affected by the amount of humus in the soil. Earthworms and other micro-organisms are affected by the type and amount organic matter in the soil. The physical aspects of organic matter in the soil include the promotion of good tilth, aeration, buffering capacity and exchange capacity of the soil (Hobbs, 2007). The availability of plant nutrients through mineralisation by soil micro-organisms is also affected by organic matter (Anon., 2006).

Reduction in labour cost

Land preparation is expensive. The costs of fuel, tractor hire service and labour are continuously increasing while market prices for farm produce remain the same, if not falling. Research at the University of Swaziland (Magagula, 2011) showed that labour for using sunnhemp (*Crotalaria juncea* L.) as mulch, CA practice, was about three times cheaper than when sunnhemp was incorporated into the soil using hoe, conventional tillage practice. However, yield differences between mulching and soil incorporation were not significant between both methods, being 3504 and 3321 kg/ha for soil incorporation and mulching. Similar results have been reported by Rautray (2003) on wheat yield after rice crop. Thus, CA can serve as a vehicle for reducing production costs.



Early planting

Tractor-hire services are available for land preparation in some countries in the SADC region. However, there are generally delays in land preparation because tractors are few and quite often they are not in good working condition for various reasons, including lack of spare parts and poor service records. The introduction of CA, which advocates minimum tillage and the availability of implements like job planter, has been reported to facilitate early planting. Instead of relying on tractor-hire services, some farmers are using simple tools for early planting with high crop yields. Some entrepreneurs have emerged who have bought several job planters and trained itinerant planters who plant maize and other crops using job planters for a fee. While tractor drivers have to wait for the rains to soften the soil “sufficiently” before ploughing and causing further delays, farmers with job planters do not have to wait.

Carbon sequestration

The three greenhouse gases that contribute to global warming are carbon dioxide, methane and nitrous oxide. Ground cover with mulch or crop residue has been reported by Balota *et al.* (2004) to sequester (capture or trap) more carbon than in conventional tillage when the crop residue was incorporated into the soil (Table 3). Most of the carbon was captured on the surface, where the mulch was. Thus, CA offers an opportunity for mitigating the adverse effects of global warming through carbon sequestration.



Table 3. Total soil carbon and microbial bio-carbon under different crop rotations with conventional and no tillage in an Oxisol in Brazil

Crop rotations	Total carbon (mg/g)		Microbial bio-carbon ($\mu\text{gC/g}$)	
	Conventional tillage	No tillage	Conventional tillage	No tillage
Depth (0-50 mm)				
Soybean/wheat	15.3	20.6	177	347
Maize/wheat	14.7	22.4	185	367
Cotton/wheat	13.9	20.6	206	326
Mean				
Depth (50-100 mm)				
Soybean/wheat	13.4	17.3	194	280
Maize/wheat	15.3	19.0	209	322
Cotton/wheat	13.2	19.7	140	232
Mean				
Depth (100-200 mm)				
Soybean/wheat	14.4	16.3	192	214
Maize/wheat	15.6	17.2	182	272
Cotton/wheat	13.8	16.2	163	204
Mean				

Source: Balota *et al.* (2004).



Research and publication

The absence of appropriate technology on CA presents a huge opportunity for research and publication of scientific papers. It also offers great opportunity and scope for the preparation of extension leaflets and guidelines.

Other opportunities/benefits

There are other opportunities and or benefits for CA. First is that, with minimum tillage, CA uses less diesel and, hence, costs less. This will also result in less carbon dioxide emission. Second, weeds have been reported to germinate less because of less soil disturbance. Third, there is more biotic diversity in CA fields than in non-CA fields because ground cover provides a more favourable environment for biotic activities. Fourth, no-till soils produce healthier root systems and synergistic association with biological organisms, some of which are antifungal and, through territorial and microbial competition, maintain a balance that stabilises the population; and lastly, there is opportunity to develop simple farm tools for CA farmers.

CONCLUDING REMARKS

It is evident that CA is an old crop production practice with a new scientific approach. It was reborn about 25 years ago in response to sustainable crop production and the need to address the problems of food security and global warming. The practice was once regarded as a conservative, primitive, archaic and backward cropping system, especially when there was no affirmation from modern agriculturalists. In this sense, it suffered the same fate as agroforestry before it.



With about 116 million ha of land currently under CA worldwide, the adoption has been high in USA, Brazil, South Africa and Zambia. It is a farming system that encompasses three pillars: multiple cropping system, minimum soil disturbance and permanent ground cover. Over the years, CA has faced challenges, including mindset, problem of unlearning fundamental crop husbandry and agronomy principles and practices, confusion in use of terms, weed management, competition between livestock and the need to provide permanent ground cover and lack of appropriate technology. However the opportunities for its promotion have included: build up of soil organic matter content, soil capital, reduction in labour costs, less carbon dioxide emission because of less fuel use, early planting, carbon sequestration, research and publication and business avenues for the development of tools for CA.

Means of promoting CA include creation of awareness, more adaptive on-farm research, training and institutionalisation of CA, development of appropriate tools and the provision of markets to enable CA farmers to sell their surplus produce beyond local markets.

APPLICATION FOR DEVELOPMENT

Like agroforestry before it, CA is an old farming practice but a new scientific field. Kang *et al.* (1984) developed an alternative sustainable system to shifting cultivation referred to as alley cropping. As would be expected, adoption was slow at first but increased rapidly in some countries more than in others. With increase in knowledge, advances in appropriate technology when knowledge gaps were filled, coupled with development of tools and the acquisition of skills, adoption rates increased further and gains were realised. However, not much is heard of alley cropping or farming these days. What happened? Are there any lessons to learn from alley cropping? What became of the green revolution? Why did it change India from a



food insecure nation to an exporter of food? Why were the gains of the green revolution in Asian countries not replicated in Africa?

Conservation agriculture has been hailed as the next green revolution. Is it? Or is it being over-sold? Do African countries have the commitment (economic, political, social, institutional, and other resources) to make it work? As attempts are being made to promote CA, there should be caution to avoid the cut-and-paste syndrome of CA technology from one region to another because crop husbandry and production packages are generally location-specific. Available evidence shows that CA is more than just increasing crop production and putting more food on the table. It could be a major remedy for the ills that affect our livelihoods today if it receives the attention and the resources that can drive it to success.

IMPLICATION FOR POLICY AND PRACTICE

With the prevailing harsh farming conditions and global warming, there is no doubt that the principles and practices of CA have a role to play in addressing the issues of food insecurity and global warming. Some means of accelerating the adoption of CA include the creation of awareness about CA with emphasis on the economic, social and environmental benefits; conducting more adaptive research, with provision for validation of results given that CA technologies have environmental effects; making provision for long-term planning in terms of resources (human, land and finances); providing opportunities for the promotion and support of training and institutionalization of CA by governments, non-governmental organizations, community-based organizations, faith-based organizations, parastatals and individuals; Encouraging the development of tools and equipment for CA; and including provision for farmers to sell surplus produce beyond local markets as a way of promoting CA.



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Conservation agriculture in an integrated crop and livestock farming system: Challenges and opportunities in Swaziland

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ABSTRACT

Erratic and poorly distributed rainfall, land degradation, deteriorating natural rangelands, low soil fertility, high costs of inputs, late planting and HIV and AIDS are contributory factors to the poor realization of reasonable farming returns in the smallholder farming sector of rural Swaziland. Agricultural production in the country is on an alarming downward trend, with reduced yields and even total crop failure having been recorded in some parts. Increasing numbers of livestock further compromise the sustainability of the already fragile environment. Soil erosion is evident in communally grazed areas. To alleviate the imminent food security crisis, the Government of Swaziland introduced conservation agriculture (CA) in 2002 as an option to improve and sustain food security. However, the adoption of CA by farmers has been sluggish over the years, one of the likely contributing factors being the failure of CA extension packages to address the needs of crop and livestock enterprises in a mixed farming system. Unless crops and livestock are managed in a coordinated manner, chances of improving agricultural productivity in the smallholder sector will remain remote. There is need to judiciously adopt and adapt CA techniques that promote mutual production of crops and livestock enterprises without putting the environment at risk. This paper attempts to analyze various components of mixed farming in Swaziland



and suggest possible interventions in the context of CA. Technologies that conserve soil moisture and improve soil fertility, as well as those that mobilize animal feed resources accessible to farmers are discussed. There are opportunities to reduce the workload on draught animals, increase crop diversity, improve existing management of grazing rangelands, utilize non-traditional animal feed resources and increase farmer income. The need for enabling policies cannot be overemphasized, with the key to effective adoption of CA being partnership with farmers, local leadership and other relevant development agencies. Chiefs and their traditional leadership structures have to be convinced that CA is, indeed, a technology that brings more benefits to farmers than conventional tillage practices for them to engage actively in implementing policies that govern management of cattle grazing in arable lands.

Key words: Conservation agriculture, land degradation, mixed farming, overgrazing.

INTRODUCTION

Smallholder agriculture in Swaziland

Smallholder farming systems in Swaziland are characterized by a complex interaction of human population dynamics and culture, crop cultivation, livestock rearing, management of land resources, environment, markets and government policies. The continuing human population growth and increased market demand for farm produce are putting a lot of pressure on land resources. More people demand land for agricultural use and settlement, thus compelling individual farming households to cultivate smaller and smaller plots, or to expand onto marginal lands, putting fragile soils at risk of erosion.

Crop production



Maize is the most important food crop and the staple cereal of the country. Over 90% of smallholder farmers devote an estimated 60,000 ha (FANRPAN, 2003) of the potential 80,000 ha (NEPAD/FAO, 2005) to maize production. However, the area put under maize (Table 1) and the average yields (1.5 to 2.5 t/ha) have been drastically declining over the past years (FANRPAN, 2003).

While most farmers grow maize, other crops grown include cotton, beans, cowpeas, groundnuts, sorghum, bambara nuts (jugo beans), pumpkins and sweet potatoes. Maize is often intercropped with legumes and pumpkins to maximize use of land and increase crop diversity.

Table 1. Area planted under maize, 2002/03 - 2007/08 (ha).

Agro-ecological zone	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Highveld	16 700	17 236	15 340	13 713	14 682	18 349
Middleveld	22 940	23 642	21 840	19 114	16 645	21 824
Lowveld	22 142	11 064	15 730	11 320	13 331	15 863
Lubombo Plateau	5 900	2 528	3 355	2 826	2 751	4 319
Total	67 682	54 470	56 265	46 973	47 409	60 355

Source: FAO/WFP, 2008.

Increased frequency of droughts, fluctuating rainfall patterns, floods, increased ambient temperatures and shifting of growing seasons experienced over the past 15 years have seen the country battling with food shortages (FAO/WFP, 2007). The effects of unfavourable weather on crop production have been exacerbated by inherent low soil fertility, crop pests and diseases, high costs of inputs, lack of draught power, delayed planting, soil degradation and loss of labour due to HIV and AIDS (Government of



Swaziland, 2005; Masuku, 2006; Mabuza *et al.*, 2008). Cereal production dropped to 60% in the 1990s and was estimated at 40% of the country's potential in 2005 (Government of Swaziland, 2005).

Livestock production

Livestock form an important component of the agricultural industry in Swaziland (Rwelamira, 2000). About 11,630 km² (67%) of the total land area is used specifically for livestock grazing during the cropping season. In the dry winter months, arable lands (cultivated, fallow and filter grass strips) are made available for livestock grazing, availing an additional 2,509 km² (14.4 %) of grazing area (SEA, 2002). A majority of farmers raise farm animals such as cattle, goats, sheep, poultry, pigs and equines (Dlamini, 2000).

Swazis are predominantly cattle-raisers, with cattle ownership being a symbol of wealth, particularly among smallholder farmers who derive satisfaction from numbers and cash value of the cattle they own (Doran *et al.*, 1979). The dominant cattle breed, the Nguni, has an important role in Swazi culture and customs. Other animals (donkeys, mules and horses) provide draught power but are better suited for transport and lighter field operations, such as planting and cultivation.

The primary challenge in livestock production is overstocking that leads to shortage of feed, particularly in the winter months. The stocking rate in the country was estimated at 2.6 ha per livestock unit in the 1990s and believed to be among the highest in Africa (Osunade, 1993; CSO, 1999). As a result, natural rangelands, on which smallholder livestock farmers heavily depend, have deteriorated badly in both nutritional value and quantity, and tend to get poorer as the seasons progress into winter (Ocen and Dlamini, 2002). There are evident signs of overgrazing, loss of natural biodiversity, prevalence of invasive



plant species (Dlamini *et al.*, 2000) and severe erosion and bush encroachment (SEA, 2002). Land degradation is most severe around watering points and dip tanks (Government of Swaziland, 2005). It is, therefore, a norm for farmers to graze cattle on crop residues left in the fields after harvesting to supplement natural pastures. However, the nutritive value and palatability to ruminants of crop residues, particularly stovers from cereal crops, are relatively low. Most crop residues contain high fibre, low levels of crude protein (Pearson and Smith, 1994; Smith, 2002; Ocen and Dlamini, 2002), low metabolizable energy and low mineral nutrients (Jayasuriya, 2002). Although it is possible to supplement mature working animals on maize stover alone without compromising draught output (Kossila, 1984), the animals are expected to lose weight (Pearson and Smith, 1994) during the dry months. Oxen are more often in poor physical condition at the beginning of the ploughing season, resulting in late planting (Rwelamira, 2000).

This paper analyzes the state of the crop-livestock farming system being practised in the country. It identifies CA components that may be applied to create some synergy between the two co-existing enterprises. It highlights the emerging challenges and opportunities for adoption of CA in the country.

CROP-LIVESTOCK PRODUCTION SYSTEM

Operating a combination of crop cultivation and livestock rearing on the same farm is typical of smallholder farmers in Swaziland and many places in the world. The crop-livestock farming system evolved over many years as a survival strategy to maximize returns from limited land and capital, minimize production risk, increase diversity of income sources, provide food security insurance and increase productivity. The success of mixed farming lies in the cyclic utilization of by-products of one component in the production activities of the other (Van Keulen and Schiere, 2004; IFAD, 2009). For example, animals supply power for tillage and manure to enhance crop production while, in return, crop residues are a useful source of



supplementary feed for ruminant livestock in the dry seasons. In Swaziland, cattle mainly graze on natural rangelands between October and March and in arable fields for the rest of the year (Mkhabela and Ogwang, 1990). The animals intensively graze on stover, weeds, fallow land and grass strips between May and July (Table 2). They leave dung as they graze, partly replenishing soil fertility and improving soil structure.

Table 2. Grazing pattern of cattle in the middleveld of Swaziland

Months	Mean grazing time (hours/day)	Mean crop residue grazing time (hours/day)	% Time spent grazing in the fields
March	9.1	0	0
April	8.8	0.2	2
May	9.3	3.1	33
June	9.2	6.5	71
July	8.4	4.6	55
August	8.7	1.7	19
September	9.2	0.5	5
October	9.4	0	0

Source: Mkhabela and Ogwang (1990).



CONSERVATION AGRICULTURE

In response to the imminent food security crisis, the Government of Swaziland advocated adoption of CA to alleviate poverty and ensure food security among the less privileged farmers (Mlipha, 2010). This was introduced in 2002 by the Ministry of Agriculture (MOA) in collaboration with the Food and Agriculture Organization (FAO) and the Cooperation of the Development of Emerging Countries (COSPE). However, the adoption of CA has been sluggish over the years, partly due to the failure of CA extension packages to address the needs of a crop-livestock farming system. Smallholder farmers in Swaziland need innovations that improve production levels of both crop and livestock components, while concurrently conserving the environment that supports farming (Dumanski *et. al.*, 2006; FAO, 2008).

The concept of CA as promoted by the Government of Swaziland seems to offer sustainable options for improving food security compared to predominantly practised conventional agricultural practices. There is, however, limited information on best CA practices that can be applied in mixed crop and livestock production systems. Grazing cattle on crop residues is one of the major conventional farming practices in smallholder mixed farming, but extensive use of this practice is at variance with expressed CA principles. While CA encourages retention of crop residues to form a permanent soil cover that conserves soil moisture, improves soil stability and suppresses weed seed emergence (Maskina *et al.*, 1993), farmers need the same resource to feed animals. Radford *et al.* (2008) reported that stubble grazing in wet soils had the risk of compaction by animal hooves, leading to higher draught requirements at planting and reduced yields of subsequent crop. Animals also export soil nutrients and organic matter from arable land. In some cases, resource-poor farmers collect the dung dropped in the field for composting, and this may further contribute to negative soil nutrient balance in the grazed field. Unless CA technologies promoted in



the country improve the cycling efficiency of resources between crop and livestock production, investing in smallholder farming will remain less economic and unattractive in the foreseeable future.

OPPORTUNITIES FOR IMPROVEMENT

The risk of producing rain fed crops and maintaining large numbers of livestock in the smallholder farming sector of Swaziland is apparent. However, despite their magnitude, the challenges encountered in mixed farming are not insurmountable as there are opportunities to adopt crop and livestock production techniques that promote the mutual existence of each enterprise without putting the environment at risk of degradation. Appropriate technologies are those that conserve soil moisture and improve crop performance and mobilize animal feed resources accessible to farmers, which, in essence, is the basis of CA. The potential points of intervention are: improving existing management of grazing rangelands, mobilizing non-traditional animal feed resources, improving management of manure, adopting reduced soil tillage techniques and increasing crop diversity.

Improving management of grazing rangelands

Dlamini *et al.* (2000) attributed the poor conditions of natural rangelands and subsequent low performance of livestock to poor management rather than drought and other vagaries of climate, and suggested the adoption of rotational grazing to restore natural pastures and improve livestock performance. This system involves the periodic movement of animals from one grazing site to another to allow vegetation to recover and regenerate. This may mean subdividing grazing land into paddocks, providing watering points, monitoring grazing duration (Beetz, 2004) and adjusting stocking rates to match carrying capacity (Dlamini



et al., 2000; Beetz, 2004). Once grazing is controlled, pasture quality could be improved by introducing forage tree and grass species, thus reducing demand for crop residues.

Adopting reduced tillage techniques

Reduced tillage – better known as zero-tillage, no-till or direct seeding – is a land preparation technique in which the soil is disturbed as little as possible, essentially by not ploughing the entire field. Minimum soil manipulation is only done to condition crop residues and prepare a planting hole or furrow for seed and fertilizer placement and coverage (Phillips *et al.*, 1980). This technique can be more profitable because it saves labour, draught power, time and money for field preparation (Singh *et al.*, 2005). Tilling the soil in the conventional way has been found to lead to conditions that are unfavourable to plant growth, such as soil compaction and the formation of plough pans, soil dehydration, reduced infiltration, degradation of soil structure, soil erosion and redistribution of soil mineral constituents (Sullivan, 2004). It also leads to loss of soil carbon (Reicosky and Denmead, 2003), putrefaction of organic matter and disruption of soil microbial activity (Sullivan, 2004).

Lessons can be drawn from Zambia, where ripping and sub soiling animal-drawn implements have been developed and tested. The implements only break up and loosen the soil where seeds will be placed, a task that requires low draught force compared to conventional ploughing, and is completed quickly, thus improving timeliness of subsequent operations. The ripped lines collect and concentrate runoff from the adjoining undisturbed soil, increasing the water available to the plants (Chelemu and Nindi, 1999).



Improving utilization of crop residues

Crop residues available to farmers in Swaziland include maize stover, haulms of beans and groundnuts, sugar cane tops and sweet potato vines. Maize stover is the most abundant and, more often, the only animal feed resource available to smallholder farmers during the dry winter months. On-station research conducted in the late 1980s indicated average maize stover yields ranging from 4.7 to 11.8 t/ha depending on crop variety. Most of the residues are left in the field after harvesting and animals are allowed to graze them *in situ*. However, stubble grazing is inefficient and some scientists argue that substantial amounts of residue remain in the field since the animals actually consume less than 50% of the available stover as high losses occur from animal trampling, soiling, and termite damage (Munthali *et al.*, 1991).

Farmers in Swaziland can adopt the cut-and-carry system practised in other countries in the region (e.g. Zimbabwe), sometimes called 'zero grazing', if carried out the whole year round. Crop residues are collected from the field and stored at homesteads. The feeding of animals is then controlled and, at times, done selectively, giving priority to draught animals, pregnant and lactating cows and sick ones. Providing supplements to draught oxen by means of restricted quantities of crop residues throughout the dry season has been reported to improve their work output and efficiency (Francis and Ndlovu, 1993).

Techniques to increase the intake, digestibility and feed value of the residues are well documented and ought to be tailor-made to suit the needs, resource endowment and aspirations of local farmers. Some of the options that can be applied in Swaziland include stover treatment with sodium hydroxide, ammonia and urea (Mkhabela and Ogwang, 1990; Smith 2002), molasses (Mkhabela and Ogwang, 1990), poultry manure (Ocen and Dlamini, 2002), brewers grain, and cotton seed cake (Ocen and Dlamini, 2002). Ammonia (Ammonium nitrate) and urea are readily available non-protein nitrogen sources and farmers are



familiar with them as fertilizers (Smith, 2002). Molasses is a by-product of sugar processing whose average annual production in Swaziland is about 190,000 tonnes (Swaziland Sugar Association, 2010).

Improving productivity of grass strips

The concept of leaving grass 'filter' strips approximately 2-4 m wide between ploughed lands was introduced in the 1940s as a soil conservation strategy (Manyatsi, 1998). About 113,780 km of grass strips were established between 1949 and 1960 (Osunade, 1993) and this translates into about 34,134 ha of grassland. Preservation of grass strips seems to have paid dividends, as there is minimum soil erosion occurring on arable land compared to unprotected grazing rangelands. The grass strips also serve as grazing sites for livestock in the dry winter months. However, the dominant grass species on the strips, mainly *Hyparrhennia* species and *Cynodon dactylon*, are fibrous and devoid of proteins, energy, minerals and vitamins and are relatively less palatable to livestock.

Planting leguminous fodder trees/shrubs and grasses in the grass strips can boost the forage feed quality and overcome livestock nutritional deficiencies in the winter months and still meet the original objective of preventing soil erosion. Studies have shown that fodder legumes enhance the digestibility of fibrous crop residues in ruminants (Masiwa, 1998). Farmers in Swaziland are already familiar with some of the potential fodder trees and shrubs such as *Leucaena leucocephala*, *Acacia* sp, *Sesbania sesban* and *Cajanus cajan*. A grass species like *Pennisetum purpureum* (elephant grass) is readily available in the country and can be a reliable forage bank for livestock (Elbasha *et al.*, 1999). Fodder trees are important sources of protein for livestock and, unlike grasses, their protein content does not seem to change with leaf age (Devendra, 1997). Since the trees are perennial and deep rooted, they are unlikely to suffer from slight climate variations compared to grasses so that they can potentially supply fodder even in times of drought (Kulich



and Kalumba, 1984). Besides ensuring provision of much needed livestock feed, selection of fodder plants should also take into cognizance their contribution to soil fertility, prevention of soil erosion and compatibility with field crops.

Promoting multiple cropping systems

Crop rotation and intercropping main crops with complementary minor crops are known techniques for reducing soil erosion by maintaining soil surface cover. Traditionally, crop rotation practices are meant to conserve soil nutrients, control pests and diseases, control soil erosion and maintain yield. In fragile environments, such as Swaziland, control of soil erosion is important. Lal (1985) reported that two crops of maize grown on a 6% slope resulted in a soil loss of 7.2 t/ha, whereas a crop of maize followed by one crop of cowpeas, with no tillage, reduced soil loss to 0.2 t/ha. Growing pasture grasses in rotation with cereal crops was observed to increase soil carbon over time (Tyson *et al.*, 1990). Pasture grasses also improve soil structure, increase water infiltration and provide livestock feed. When well managed, crop rotation has potential to increase farm productivity without exposing soils to erosion (Morgan, 1995).

Intercropping cereal crops with pumpkins, sweet potatoes and legumes such as cowpeas, beans and bambara nuts (jugo beans) is a well known practice in Swaziland. Having a wide variety of crops in the field averts risk of loss and adds variety to the farmer's diet. In addition, legumes improve soil fertility and maintain crop yields with minimal application of inorganic fertilizers. The choice of crop combinations in intercropping is, however, more often based on direct human food needs, giving little attention to livestock. Mixed farming has the potential to broaden the scope of intercropping by integrating fodder crops with cereal and other food crops for humans. Practical examples for Swaziland include intercropping forage legumes (lucerne, silver leaf), shrubs (*Sesbania sesban* and *Cajanus cajan.*) and tree legumes (*Leucaena*



leucocephala, *Acacia* sp.) with cereal-based cropping systems. Such combinations can control soil erosion, improve soil water conservation, suppress weed growth, accelerate nutrient cycling, enhance soil productivity, and provide food, fodder and wood ([Nair et al., 1999](#); [Tarawali et al., 2002](#)) without compromising food crop yield. Dzowela (1987) reported research done in the 1970s that did not show significant maize yield reductions when maize was intercropped with forage legumes. The residue provided by a cereal-legume intercrop is also known to provide extra dry matter and crude protein essential for improved intake and digestibility by animals.

Utilizing sugar cane tops and molasses

Sugar cane is widely grown by both smallholder farmers and large conglomerate estates in Swaziland. The major post-harvest and processing by-products of sugar cane are tops and molasses, respectively. Sugar cane tops and molasses form important components of commercial livestock feed, although the cane tops, like any other cereal residue, are very low in essential nutrients for ruminant livestock (Ocen and Dlamini, 2002). Molasses, on the other hand, is highly palatable, rich in energy and readily digested. Mixing molasses with fibrous residues such as maize stover and sugar cane tops improves the palatability of the whole diet (Mkhabela and Ogwang, 1990). Molasses is also used to manufacture molasses/urea blocks which are an excellent combination of readily degradable protein and fermentable energy for large ruminants.

Improving utilization of animal manure

Low soil fertility is one of the major constraints limiting crop production in Swaziland, partly due to the continued mining of crop nutrients through monocropping and inadequate application of fertilizers (Kimbi



and Semoka, 2004). It is difficult for smallholder farmers to buy adequate quantities of fertilizer due to prohibitive prices. There is dire need, therefore, to identify alternative plant nutrient sources that farmers can explore to replenish soil fertility. Use of animal manure is one familiar option that can be developed.

Animal manures are basically a mixture of partly decomposed animal bedding (grasses, straw), where used, and animal waste (dung/droppings and urine). Further mixed with garden and household wastes, such manures are also referred to as 'compost'. Farmers can harvest grass from roadsides and strips between arable fields for use as animal bedding, thus improving the quality of compost. Besides providing essential plant nutrients, manure application to the soil also modifies soil biological, chemical and physical properties (Shongwe, 2010). It is now debatable whether it is best to refer to animal manure as a fertilizer rather than as 'soil amendment'.

Strategies to improve effectiveness of manure as a source of plant nutrients as well as a soil amendment ought to be examined. The suggested cut-and-carry system for crop residue collection improves the quality of manure, as the left-over feed mixes with dung and absorbs animal urine, as does bedding. Inclusion of legumes in cropping systems and grazing rangelands is also likely to improve the quantity and quality of dung. Manure processing techniques, such as storing in pits to reduce nutrient leaching and promote anaerobic decomposition (Mugwira and Murwira, 1997), and strategic application methods like banding or spot application, ought to be promoted to enhance nutrient accessibility for plants.

Conclusions

Adoption of CA in Swaziland has been sporadic, mainly because of the failure of CA extension packages to satisfy the needs of crop and livestock components in a mixed farming system. The bone of contention is



the use of crop residues to maintain a permanent soil surface cover vis-à-vis feeding livestock. The combination of crops and livestock in smallholder farming systems in the country is an old tradition with strong customary linkages that cannot be easily broken. Unless researchers and extension agents develop CA management systems that strike a balance between crop and livestock components, chances of adoption will remain remote. Success lies in technologies that conserve soil moisture and improve crop performance and also broaden the animal feed resource base.

APPLICATION FOR DEVELOPMENT

Some of the possibilities that can be examined to maximize land productivity and minimize environmental degradation in CA systems are to: improve recycling of nutrients between crop and livestock components, improve the existing management of grazing rangelands, explore utilization of non-traditional animal feed resources, improve management of manure, adopt reduced soil tillage techniques, increase crop diversity, particularly when legumes are included in the cropping pattern, and improve soil quality. However, it must be noted that farmers adopt technologies that are economically viable and are within their capacity to provide labour; hence, due attention must be given to the costs involved in new technologies.

IMPLICATION FOR POLICY AND PRACTICE

It is essential for Swaziland to invest in agricultural research and development and implement policies that encourage production, while protecting the environment. Crop residues are an important component of CA, as they protect the soil, add organic matter, and conserve soil moisture. Livestock, as an integral component of smallholder agriculture, graze on arable land during the dry seasons. Individual fields are



often not fenced and the expectations of communities are that all arable fields should be made available for winter grazing (except irrigated gardens). The traditional structure provides direction on when livestock can be allowed to graze on arable fields during the start of the dry season, and when they should be removed from arable fields, at the start of the rainy season. It is, thus, imperative that chiefs understand and buy into the concept of CA to ensure their participation in implementing strategies to control grazing in arable fields. In that way livestock could be controlled from selected arable fields, which could be fenced off for that purpose.

Since it takes several years to realize the benefits of CA, there is need for local government and support agencies to fund a long term programme from which the benefits could be realized, with participating farmers gaining confidence in the practice and passing on the knowledge to others. The curricula for agricultural training institutions ought to be reviewed and updated from time to time to adequately address new farming technologies, such as CA. In order for the CA practice to be sustained, there is need to equip extension officers with relevant knowledge and to provide farmers with access to appropriate tools and advice. Since basic tools, such as ox-drawn rippers and no-till and jab planters, are not readily available from farm equipment dealers, there is need to ensure that dealers are aware of the requirements for CA tools so that they can keep them in stock. The government should take a leading role by including CA land preparation operations in the tractor hire service package.

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Food aid in Swaziland: Emerging lessons and alternative strategies

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ABSTRACT

The persistence of the food crisis in Swaziland has prompted concerns that prolonged provision of food aid could be developing dependency tendencies. The study examined perceptions regarding food aid and opinions regarding its impact, and identified alternative strategies for effective intervention. It utilized qualitative and quantitative techniques and involved food aid recipients and their leaders, selected food providers and policy makers. The findings indicated that food aid was perceived both as a temporary emergency intervention and as a free-for-all public good and entitlement. The study revealed the emergence of a tactical dependency mentality among some food aid recipients and of fatalism and apathy among others. It also revealed that food aid had impacted positively on recipients in the sense of fulfilling the purpose for which it was introduced, and negatively through the creation of dependency and the distorted notion that it is a right rather than a critical emergency response. It had also impacted positively through women's empowerment, enhancement of grassroots cohesion and participation; and negatively through emerging misunderstandings in families, men's cheating, mistrust by traditional authorities, and jealousy and exaggerated expectations among community members. The food-for-work approach and cash and cash/food transfers were identified as case examples of effective emergency intervention strategies that ought to be up-scaled.

Key words: Food aid, food security, alternative strategies, dependency.



INTRODUCTION

The Kingdom of Swaziland is a landlocked country with a total land area of 17,364 sq km with a population of about one million (Food and Agriculture Organisation and World Food Programme, 2008). It is a predominantly rural and subsistence society, with a dual land tenure system consisting of Swazi Nation Land (SNL), which constitutes about 60% of the total land area that is held in trust by the King and allocated to households by chiefs, and Title Deed Land (TDL) that is freehold.

Swaziland is classified as a lower middle-income developing country with gross domestic product (GDP) estimated in 2000 as US\$ 1,350.00 (Swaziland Government and United Nations Country Team, 2003). The contribution of agriculture to GDP is currently estimated at around 8.5%, of which TDL contributes 60% and SNL 40%. While the economy performed very well during the 1980s, a sharp decline in growth was experienced since the 1990s, averaging 3.4% over the 1992 – 1997 period compared to about 9% in the 1980s. The income distribution is skewed, with an estimated 20% of the population accounting for more than 50% of national income. An estimated 43% of the population lives in extreme poverty and 76% of the poor live in rural areas (FAO and WFP, 2008). Thus, while SNL constitutes about 60% of total land area, it is the destiny of all recipients of food aid in the country.

The country is divided into four agro-ecological zones, namely the Highveld, the Middleveld, the Lowveld and the Lubombo Plateau. The Highveld, which occupies about 33% of the surface area, is a rugged terrain with an altitude of over 900m above sea level. It is characterised by high rainfall of between 1000 and 1500mm per annum, and generally cooler temperatures. The Middleveld lies between 450 and 900m above sea level and receives between 750 and 1000mm of rainfall. It has lush fertile valleys and is generally referred to as the grain basket of Swaziland, with maize being the main staple crop. The Lowveld covers



about 31% of the country and is the driest, with rainfall ranging between 500mm and 750mm per annum. It is prone to drought and, therefore, ideal for drought resistant crops and for cattle because of its palatable and sweet grasses. The Lubombo plateau is situated to the east of the country and has a steep escarpment bordering the eastern Lowveld and a gradual deep slope descending east, with many of its features being similar to the Middleveld (The Food Security and Rural Development Consortium, 2004).

One of the major challenges to the eradication of extreme poverty in the country is how to improve agricultural productivity. Some of the constraints to agricultural productivity are: reoccurring drought, absence of an agriculture policy, inadequate extension services, lack of credit facilities for SNL farmers, poor infrastructures, limited opportunities for product marketing and out-of-date technology (Swaziland Government and United Nations Country Team, 2003).

Drought situation and food aid in Swaziland

Domestic agricultural production is the main source of food only in the agro-ecological zones that are suited for crop production. However, even in these areas, it accounts for a maximum of only 40% of total food requirements (FAO and WFP, 2008). This is because the mean annual rainfall ranges from 1450mm in the Highveld to 550mm in the Lowveld, and conditions vary considerably from year to year. Years with lower than normal rainfall occur frequently, especially in the Lowveld, leading to droughts. Over the years, Swaziland has been receiving below average rainfall, necessitating emergency food aid to assist the most vulnerable. Of particular concern, are mid-season droughts in December and January, a critical period for maize flowering and tussling.



Significant food aid in Swaziland started in 1992 during the first drought declaration, following the massive drought of 1991/1992. This drought affected the Lubombo Region and left many areas in the whole of the Lowveld and some parts of the Middleveld with food shortages and some dried up rivers, springs, dams and boreholes. At the onset in 1992, the food crisis was thought to be a passing phenomenon, and the number of beneficiaries was quite low. However, the situation has persisted and, for a while, it seemed to recur after every two years (Swazi VAC, 2006).

Between 1990 and 2000, the area under maize, which is the main cereal crop, fell by 40% and, even though average yields increased, the net effect was that production in 2000 was down by 10% of what it was in 1990 (Swazi VAC, 2006). The national average yield for maize on SNL for 2001/2002 was 1.08 t/ha and the Lowveld is reported to have received only 21% and 24% of its long-term average rainfall for February and March, respectively, in 2002 (The Food Security and Rural Development Consortium, 2004).

The number of drought victims has been increasing at an alarming rate. By April 1994, when the country was in the grip of a continuing drought crisis, an estimated 15,000 homesteads and approximately 90,000 individuals were in danger of facing severe food shortages. The peak of food aid beneficiaries in April 2003 was 279,000, consisting of 100,000 from the Lowveld and 179,000 from the dry Middleveld and the Lubombo Plateau. In March 2004, the Swaziland Vulnerability Assessments Committee (Swazi VAC) reported figures of up to 348,000 potential food aid beneficiaries with food/income deficiencies of up to 23,000 metric tonnes (The Food Security and Rural Development Consortium, 2004). During the 2006/2007 farming season, the country experienced one of the worst crop failures due to prolonged dry spells, high temperature and drought that destroyed the maize crop at a critical stage of development. This resulted into the country's lowest annual harvest ever on record (Swazi VAC, 2007), leading to some



650,000 people having to rely on emergency food relief during the drought season of 2007/2008 (Food and Agriculture Organization and World Food Programme, 2008).

The drought situation has made Swaziland one of six beneficiary countries of the World Food Programme (WFP) Southern Africa Food Crisis Response. Intervention by WFP in the country started in July 2002. The original aim was to reach 144,000 people for the period July through November, 2002; about 231,000 in December, 2002 and 265,400 from January through March, 2003. Late rains during the 2003/2004 rainy season saw the extension of food relief into 2004 and the extension of the Protracted Programme for Relief Operations into the 2004/2005 rainy season (The Food Security and Rural Development Consortium, 2004).

The food security crisis escalated in recent years, with about 400,000 people, which is almost half the country's population, being in need of food aid or other means of survival, thus prompting the use of food relief as a major intervention. The drought relief programme embarked on providing free food to deserving beneficiaries selected on the basis of agreed-upon criteria.

The implementation of food aid under the drought relief programme has been spearheaded by the National Disaster Task Force (NDF), which has recently been transformed into the National Disaster Management Agency (NDMA). Nine non-governmental organizations (NGOs) that have been jointly involved in implementing the programme constitute the Food Security and Rural Development Consortium. This organ serves to enhance members' shared vision and objectives and to coordinate their efforts towards drought relief. Each member organization, except CANGO, has been designated to operate in specific areas, catering for about 274,244 beneficiaries.



Innovations in provision of food aid

An important feature of the drought relief programme in the early stages of its inception was the use of food-for-work strategy. This provided opportunity for a member of each of the eligible households to work for, at least, three days a week to qualify for rations for his/her family of about six members, with each member receiving 400grams of maize and 30 grams of pulses per person per day (Nsibandze, Undated). However, elderly, disabled and indigent drought victims received free food. Under the food-for-work strategy, drought stricken communities were given opportunity to decide on the type of self-help projects that they wished to undertake. In this way, the strategy, not only provided beneficiaries with needed food, but also cultivated the spirit of self-reliance and teamwork through involvement in genuine community development work. Some of the projects undertaken under the supervision of NGOs were in the areas of water development, soil conservation, health and sanitation and construction of infrastructure.

In recent years, one innovation that has been implemented on a relatively small scale is the delivery of half the aid in food and the other half in cash transferred into beneficiaries' bank accounts. This innovation was carried out by Save the Children during the period November, 2007 to April, 2008 and involved 45,000 people. It was deemed to be in accordance with international best practice on how to work against the negative consequences of growing dependency on food aid (Beswick, Undated).

Statement of the problem

This paper is based on a study on the Impact of Food Aid As A Social Protection Mechanism (Keregero, 2008) that was commissioned by World Vision Swaziland (WVS) and the Coordinating Assembly of Non-governmental Organizations (CANGO). It was prompted by concern that the prolonged supply of food aid,



while viewed as an emergency intervention, could be leading to the creation of dependency tendencies among recipients. This concern was based on the fact that some communities and families in drought stricken areas have been receiving food aid for the past 17 years continuously, and on reports that some families have become dependent on aid to the extent that they have stopped ploughing.

The study was prompted by concern that the prolonged supply of food aid, while viewed as an emergency intervention, could be leading to the creation of dependency tendencies among recipients. The specific objectives of the study upon which this paper is based were to: describe the perceptions of respondents regarding food aid in Swaziland, describe opinions of respondents regarding the impact of food aid as an intervention in Swaziland, and identify alternatives that could be explored to make food aid an effective intervention in Swaziland.

METHODOLOGY

The study was descriptive and employed qualitative and quantitative procedures. The target population was recipients of food aid from the different *tinkhundla* centres and their leaders (N = 274, 244) as well as food providers and policy makers in Swaziland. The frame of food aid recipients was provided by NGOs. A probability representative sampling procedure, using Krejcie and Morgan (1970) formula for determining sample size was utilised, which resulted in a required minimum survey sample size of 391. The sample was stratified by number of recipients serviced by NGOs in each of the *tinkhundla* centres as follows: World Vision (72), Save the Children (57), Baphalali Swaziland Red Cross (51), Adventist Development and Relief Agency (51), Swaziland Farmers Development Foundation (48), CARITAS (43), Africa Cooperative Action Trust (42) and Lutheran Development Services (26). The sample was also stratified by type of household headship, with the majority (288 or 74%) being



from female-headed households, while 93 or 24% were from male headed households and 10 or 2% from child-headed households.

Data were collected using focus group discussions and personal interviews. The focus group interview method involved 72 selected relief committee members and took place at the following *tinkhundla*: Nkwene, Dvokodweni, LaMgabhi and Timphisini. Personal interviews involved 391 respondents involving food aid recipient heads of households and community leaders.

The personal interviews for community leaders involved 28 *tindvuna* and chiefs in all the *tinkhundla* that were purposively selected for the study. The personal interviews for food aid providers and policy makers involved 10 officers drawn from Coordinating Assembly of Non-Governmental Organizations, Adventist Development and Relief Agency, Africa Cooperative Action Trust, CARITAS, Save the Children, United Nations Children's Fund, World Food Programme, Swaziland Farmers' Development Foundation and the National Disaster Management Agency.

The instruments for focus group interviews, unstructured interview schedule for officials responsible for food aid delivery and policy-making and that for traditional leaders in communities consisted of open-ended questions. However, the interview schedule for selected heads of households consisted of open-ended and close-ended items and was checked for validity and reliability and found suitable. Household interviews were carried out with the help of nine (9) research assistants, who also interviewed traditional leaders (chiefs and *tindvuna*). They were trained prior to the assignment. Focus group discussions and unstructured interviews were conducted by the researcher.



Qualitative data analysis followed narrative descriptions, summarized through content analysis, inductive categorization of issues, and formulation of themes, in order to facilitate interpretation. Data from close-ended questions were summarized in the form of frequencies, percentages and means. The Statistical Package for Social Sciences (SPSS) PC+ v10 2000 was used to analyze the data.

FINDINGS

The major focus of the paper is on: food aid as an intervention, perceptions regarding food aid, impact of food aid, and effective alternatives that could be explored.

Perceptions regarding food aid in Swaziland

Food aid providers, policy makers and food aid recipients generally acknowledge that drought had caused poor harvests and subsequent food shortage and that farming as a means of survival was under threat in drought-prone areas. While some community leaders described food aid as “God’s intervention through NGOs”, public perceptions reflected inadequate awareness. For example, it was commonly expressed that food aid was being sourced by His Majesty the King from his various contacts outside the country in an effort to provide relief to his people. Respondents considered “Mshamndane” (Dr. Ben Nsibandze, the Chairperson of NDTF and NDMA) as the key official responsible for actualising food distribution once it is donated by good Samaritans to His Majesty for his people (“*Kubuya etinini teNkhosi*”).

In the context of this notion, respondents perceived food aid supply to be unlimited and free, and were of the opinion that all His Majesty’s subjects deserved and were entitled to it (“*Sonkhe sibeNkhosi, sinikeni lokudla*”). Those who subscribed to this notion regarded the use of criteria to identify deserving food aid



recipients to be outright divisive rather than rational and reasonable. They blamed relief committees for not serving as true “people’s representatives” who ought to distribute food to all (*Wakhetfwa ngitsi kutsi umelele tsine sonkhe*). Adherence to this notion has created a tactical dependency mentality in that some people considered food aid as a right of everyone. For example, those who were denied food aid because their children were civil servants complained of being unfairly treated, arguing that they too belonged to the same King and, hence, deserved food aid as well (*SibeNkhosi yinye sonkhe, asikutfole lokudla*). Even people living in places with good rains and favourable crop production conditions considered it their right to receive food aid.

Those who subscribed to the view that everyone should be given food aid generally advanced weak arguments. These include the following: since the drought situation touches on everyone in the country, all people deserve food aid; providing food to a few will destroy the Swazi spirit of communal living and sharing; political harmony will be maintained if everyone gets food aid; for the sake of peace and tranquillity in the community, all people should get food aid; and all are King’s people after all. It is evident that the arguments in favour of food aid for all were based on sentiments and considerations other than those of abject poverty, hunger and disadvantage that are stipulated by the Food Security and Rural Development Consortium. They are more about “fairness” that is erroneously interpreted to mean “giving everyone a chance to get what is viewed to be their entitlement of public good”. Thus, although people are quick to state that it is un-Swazi to receive free handouts, they are driven by a false sense of entitlement to demand food aid.

The tactical dependency mentality is pregnant with great expectations and anticipation, as people take it almost for granted that, if it does not rain, relief will be forthcoming. So, their preoccupation is more with the arrival of food aid than with planning strategies of producing their own food. When asked what their reaction



would be if they heard that “Mshamndane” had been seen somewhere in their community one evening, members of one relief committee responded that they would be excited and happy since they know that he usually comes along with food for them. They associated his presence with the opportunity to have three meals a day instead of going the whole day without food. Almost in chorus, the members said “*kusa sibuka*” (we will be so excited that we won’t sleep that night) and “*singahlala lilanga lonkhe aze afike*” (we can wait the whole day till he comes).

According to some NGOs, the growing dependency mentality makes it increasingly difficult to introduce initiatives that have a chance of leading people towards self-reliance. As one official put it, “*Sebetayele kudvwejelwa tinhlanti abayifune lena labatatidvwebela yona*” (People are now used to eating fish that has already been caught for them, they do not want to catch their own!).

The perceptions of people regarding food aid are diverse, as revealed in Table 1 reflecting opinions of respondents from selected households. For purposes of interpretation of the findings, means below 2.5 were taken to imply agreement and those from 2.5 and above to imply disagreement. According to the findings, the respondents agreed that: those given food aid should be assisted to produce their own food as soon as possible; all people in areas that fail to get rain deserve food aid; food aid should be given to deserving people only on the basis of the set criteria; having a household member on food aid benefits the whole household; all able-bodied food aid recipients should work for it; food aid reflects governments’ goodness to its people; and that food aid will be there as long as government is there. They also agreed that food aid is free food, so everyone should get it; it is a great achievement to be on food aid; once on food aid, you will want it every year, and that food aid will be there as long as NGOs are there.



Table 1. Opinions of respondents regarding food aid

Aspects Pertaining to Food Aid	Means
Those given food aid should be assisted to produce their own food as soon as possible.	1.5897
All people in areas that fail to get rain deserve food aid	1.6530
Food aid should be given to deserving people only on the basis of the set criteria.	1.7969
Having a household member on food aid benefits the whole household.	2.0617
All able-bodied food aid recipients should work for it.	2.1154
Food aid reflects government's goodness to its people	2.1902
Food aid will be there as long as government is there	2.2409
Food aid is free food, so everyone should get it.	2.2641
It is a great achievement to be on food aid.	2.2974
Once on food aid, you will want it every year.	2.3057
Food aid will be there as long as NGOs are there.	2.3264
The criteria for selecting food aid recipients are fine.	2.4820
There is nothing wrong with being dependent on food aid.	2.5359
Those receiving food aid should be assisted forever.	2.5769
Food aid is the only source of food.	2.8359
Households on food aid do not have to farm anymore.	3.1234

Rating Scale: Strongly Agree = 1, Agree = 2, Disagree = 3, Strongly Disagree = 4.

These views reflect two inclinations – food aid as a temporary emergency intervention and food aid as an entitlement for free-for-all donation. The former acknowledges that deserving people ought to be supported up to a point that they can be able to stand on their own feet. It also acknowledges and supports the use of



transparent criteria for identifying deserving cases, and endorses the idea of having able-bodied recipients work for food rather than relying on handouts. However, the latter acknowledges government and NGO benevolence more or less as *raison d'être* for the intervention. This inclination is characterized by the populist view that all people in areas that fail to get rain deserve equal assistance without having to use selection criteria. Those holding this view consider being on the food aid list as an achievement that ought to be sustained. This view is, clearly, a reflection of an evolving tactical dependency mentality.

The findings in Table 1 also reveal that respondents disagreed that: the criteria for selecting food aid recipients are fine; there is nothing wrong with being dependent on food aid; those that are receiving food aid should be assisted forever; food aid is the only source of food, and that households on food aid do not have to farm anymore. These findings reveal dissatisfaction with the merits of using selection criteria, partly because of their distorted view of food aid, inadequate involvement in the setting of these criteria and their inadequate awareness of the rationale for their use. However, the findings also reveal that respondents saw something wrong with dependency on food aid and did not see it as everlasting or as a relief from farming. It would, thus, appear that, deep down, they were aware that they should not depend on food aid. This lends credence to the view that the dependency mentality is a disguised tendency arising from the misguided notion that food aid is a public good to which every Swazi is entitled.

An analysis of the perceptions revealed that, while NGOs, the government and other partners might be clear about the place, role and intentions of food aid as an emergency intervention, food aid recipients and their leaders are far from clear, with some subscribing to the perspective that it is free-for-all. In part, this is because of the lack of a coherent policy on food aid and the almost exclusive focus of the intervention on food delivery without due regard to the developmental and empowerment processes that ought to



accompany this drive. The lack of funding to support such developmental processes and lack of time and expertise have been cited as constraints by NGOs responsible for food delivery.

Impact of food aid in Swaziland

The opinions of respondents regarding the impact of food aid are presented in Table 2 and indicate that food aid has had both positive and negative impact on recipients. The positive aspects have been in the form of: saving lives, helped people living with HIV/AIDS to take ARVs, bringing food on the table, rescuing people from vulnerability to diseases and preventing malnutrition. Positive impact was also viewed in terms of protecting vulnerable people from engaging in distress coping mechanisms (e.g. forced child marriages, prostitution, dropping out of school and selling of assets), giving status to members of relief committees, giving women more say in food affairs and humbling some men to accept the reality of their inability to feed their households.

The negative impact of food aid was viewed in the context of creating dependency among beneficiaries, creating divisions among people through the use of criteria to identify deserving recipients and perceived tendency to distort local business and markets. It's being misinterpreted by local leaders as a source of parallel power structures that tend to sideline them, and it's being perceived as fuelling chieftdom rivalries and conflicts, creating room for abuse and exploitation by politicians and creating the notion that food aid is a right rather than an emergency response were also considered as impacting negatively.

These findings indicate that food aid has impacted positively on recipients in the sense of fulfilling the purpose for which it was introduced. At the same time, it has had the negative effect of creating some degree of dependency and the distorted notion that it is a right rather than a critical emergency response.



Table 2. Opinions of respondents regarding impact of food aid in Swaziland

Opinions Regarding Impact of Food Aid	Mean
It has saved lives.	1.2879
It has helped people living with HIV/AIDS to take ARV.	1.3990
It has brought food on the table.	1.4731
It has rescued people from vulnerability to diseases.	1.5143
It has prevented malnutrition.	1.5474
It has protected vulnerable people from engaging in distress coping mechanisms.	1.6114
It has created dependency among beneficiaries.	2.0052
The use of criteria to identify deserving recipients has created divisions among people.	2.0846
It has given status to members of relief committees.	2.1839
It has given women more say in food affairs.	2.2124
It has had a humbling effect on men who have had to accept the reality of inability to feed their households.	2.2765
It has distorted local business and markets.	2.3051
It has been interpreted as introducing parallel power structures and sidelining community leaders.	2.3959
It has fuelled chieftdom rivalries and conflicts.	2.3928
It has created room for abuse and exploitation by politicians.	2.4333
It has created the notion that food aid is a right rather than an emergency response.	2.4373
It has removed beneficiaries' incentive to work.	2.4730
It has made people too lazy to think of self-reliance.	2.4768
It has led to people refusing to do tribute labour just because they were not selected for food aid.	2.5077
It has led people to disengage from farming.	2.6108

Rating Scale: Strongly Agree = 1, Agree = 2, Disagree = 3, Strongly Disagree = 4.



According to the findings, food aid has also impacted both positively and negatively on social, cultural and economic structures in communities. Positive impact has been demonstrated in the dominance of women as members and chairpersons of relief committees, which has given them a great voice in decision-making in matters dealing with the food situation. Since people associate power and authority with food aid, the women involved in relief committees are now considered to wield substantial influence in communities. Furthermore, in communities where traditional structures have embraced citizen's choice of relief committee members, there has been enhanced grassroots cohesion and participation, with less complaints and bickering. In some communities, relief committees have, in fact, relieved *bandlancane* (chief's inner council) the burden of having to fend for the hungry, especially orphans and vulnerable children and elderly, living it instead to "Mshamndane" (*Labalambile uyabondla "Mshamndane"*).

Negative impact on social, cultural and economic structures in communities has taken various forms, including misunderstandings in the family, men's cheating, mistrust by traditional authorities, and jealousy and exaggerated expectations among community members. Misunderstandings in the family have arisen in situations where some women involved in relief committee work come back home empty-handed contrary to the expectation of their husbands that they would bring some food home. These have, subsequently, been denied permission to continue in this role. In some households where husbands have failed to fulfil their traditional role of breadwinner, the ability of women members of relief committees to bring food home has been viewed as humiliation to their husbands and a source of family squabbles. Cheating has been reported in relation to some men who exchange food aid for money, which they have then spent on drinking while the family starves. Others have taken donated food to homes of their concubines and girlfriends who do not deserve.



Mistrust by traditional leaders has manifested itself in different ways: some chiefs view relief committees as parallel structures and, hence, a threat to their authority. Some are unhappy that they were not made to preside over the process of identifying food aid recipients and are uncomfortable with having to abide by decisions of relief committees. Others are unhappy that food distribution has enhanced the status of relief committee members, who are praised and given credit for being helpful to the people. Such leaders would have preferred such accolades to be directed to them instead. Some chiefs who have been unable to feed their people feel humiliated and helpless in the eyes of their subjects when they see committee members being praised for doing a good job of availing food to the people. Some traditional leaders and influential people (including politicians and witchdoctors) who consider the criteria for selecting food aid recipients to be divisive have put relief committees under pressure to include undeserving individuals in the list of beneficiaries for their own personal and political ends.

Food aid has also created enmity and jealousy among community members as the people feel that they all deserve the free food, which is from the King. In an affront to Swazi custom, some jealous and disgruntled community members have argued that only beneficiaries of food aid should do tribute work since they are the ones receiving an incentive. It is, thus, not uncommon to hear the following sentiments: those who received the food aid should be the ones to go (*abaye labamukelako*); only the true Swazis should do the tribute work (*awaye emaSwati cobo*); the chief's kraal belongs to the few and not all of us (*umphakatsi walabalindlanzana, hhayi sonkhe*).

Exaggerated expectations for food have made community members more responsive to food aid meetings than any other. This has translated into low turnouts to ordinary meetings convened to discuss development issues in communities. Closely associated with this is the increasing tendency by community members, when summoned to the chief's kraal, to bring bags in the hope of receiving some food in the end.



Such people usually get very disappointed when it turns out that the meeting was all about developmental projects and not a forum for distributing food aid.

The findings from the household survey generally concurred with those from discussions with relief committees and food aid service providers and policy makers who also identified both negative and positive contributions on livelihoods of recipients. However, in contrast to the views of some food aid providers and policy makers, household survey respondents disagreed that food aid has: removed beneficiaries' incentive to work, made people too lazy to think of self-reliance, led to people refusing to do tribute labour just because they were not selected for food aid and led people to disengage from farming. The differences in opinion could, in large part, be attributed to the fact that food aid providers and policy makers generally subscribe to the perspective of food aid as a temporary emergency intervention, while beneficiaries tend to hold the notion of food aid as a free-for-all donation.

Alternatives that could be explored

The strategy of delivering free handouts to able-bodied drought victims is prone to abuse and contributes to the creation of apathy, fatalism and tactical dependency tendencies. While it has been effective as an emergency intervention to put food on the table, it has not enabled recipients and food service providers to address drought relief as a development concern.

Effective alternatives are those that ought to be geared towards building the capacity of people to produce their own food and become increasingly self-reliant. At the core of these alternatives is the need for a policy on food aid that focuses on community and people's empowerment in a holistic manner along with implementation strategies that are geared towards capacitation, animation, facilitation and self-liquidation.



Capacitation is the process of building up in people the power of containing, receiving, experiencing or producing. It consists of three inter-related actions: development of intellectual skills and a knowledge base, development of abilities for self-organization and management of development actions, and gaining access to material resources to develop the productive base. Animation is the process of assisting people to build up the intellectual abilities and knowledge base to think and act creatively to transform their reality. Facilitation is the process of assisting people to acquire practical skills to improve their access to material resources and to create space for people's actions by playing an enabling, nursing and protective role. Self-liquidation is the deliberate choice of conscious efforts and initiatives that ensure that food service providers become progressively redundant in the face of food aid recipients becoming increasingly self-reliant and independent.

Two alternatives that have been implemented in the country and have demonstrated potential for success are the food-for-work approach and cash and cash/food transfers. The food-for work strategy was adopted by the drought relief programme in the early stages of inception. It provided opportunity for each member of the eligible households to work for, at least, three days a week to qualify for rations for a family of about six members. Under this arrangement, each household member received 400 grams of maize and 30 grams of pulses per day (Nsibandze, Undated). However, the elderly, disabled and indigent drought victims received free food. Drought stricken communities were given the liberty to decide on the type of self-help projects they wished to undertake. This provided beneficiaries with needed food and an opportunity to engage in genuine community development work based on the spirit of self-reliance and teamwork. Some of the projects undertaken under the supervision of NGOs were in the areas of water development, soil conservation, health and sanitation, and construction of infrastructure.



Another alternative is that of using cash transfers or a combination of cash and food transfers. This is the latest innovation that has been implemented in the country on a relatively small scale by Save the Children. The strategy involved the delivery of half the aid in food and the other half in cash transferred into beneficiaries' bank accounts. The innovation, which involved 45,000 beneficiaries, has been hailed as an example of best practice on how to work against the negative consequences of growing dependency on food aid (Beswick, Undated).

It must be emphasized that these alternatives do not necessarily constitute a panacea. In the final analysis, enabling people to produce their own food must be seen as a development issue that ought to be pursued by the people themselves. In this context, it is important for the Food Security and Rural Development Consortium and its partners to engage the government with a view to addressing the challenges to food production. Given that farmers are, generally, not unwilling to engage in food production, efforts to empower them could be greatly enhanced through: construction of dams; provision of agricultural equipment, inputs and supplies; rehabilitation of the agricultural extension service to make it a truly proactive educational agency; rehabilitation of the agricultural research service to generate innovations on agriculture in drought-prone areas; and provision of adequate supportive funding.

CONCLUSION

Food aid has been an effective emergency intervention in as far as putting food on the table is concerned. However, the strategy of delivering free handouts to able-bodied drought victims has been prone to abuse and has contributed to the creation of apathy, fatalism and tactical dependency tendencies. While food aid providers and policy makers embrace food aid as an emergency response, recipients and members of the public do not have a coherent understanding of the source and supply of food aid, its rationale, as well as



entitlement criteria and access to it. This has led to the emergence of two operational perspectives – food aid as a temporary emergency intervention and food aid as a free-for-all donation, with the latter having led to tactical dependency that is rooted in the desire to participate in sharing public good. Since food aid beneficiaries are not unwilling to engage in food production for their own survival, there is need to embark on initiatives that can enable them to address and cope with their own reality. The food-for-work approach and cash and cash/food transfers are two case examples in the right direction. However, the success of these and other alternatives will depend on the availability of appropriate material conditions for effective rural development. These include: construction of dams; provision of agricultural equipment, inputs and supplies; rehabilitation of the agricultural extension service to make it a truly pro-active educational agency; rehabilitation of the agricultural research service to generate innovations on agriculture in drought-prone areas; and provision of adequate supportive funding.

APPLICATION FOR DEVELOPMENT

It is evident from the conclusions that the food aid strategy of delivering free handouts to able-bodied drought victims as currently implemented in Swaziland has contributed to the creation of apathy, fatalism and tactical dependency tendencies and is, therefore, unsustainable. There is, thus, need for the use of strategies that have a better chance of empowering recipients so that they can, ultimately, stand on their own feet. Since food aid beneficiaries are not unwilling to engage in food production for their own survival, there is great scope and opportunity for the introduction of the food-for-work approach and cash and cash/food transfers on a larger scale. These strategies facilitate capacity building within families and communities to undertake development activities that guarantee their emancipation from poverty and dependency.



IMPLICATION FOR POLICY AND PRACTICE

The adoption of empowering strategies for sustainable development highlights the need for a food aid policy to guide the provision of food aid as an emergency intervention. The policy should seek to create awareness about the role, importance and consequences of food aid as an emergency intervention. It should emphasize the use of a holistic approach, rather than the ongoing standalone food aid strategy, and a shift from an emergency to a disaster preparedness *modus operandi*. It should address the challenges undermining the effectiveness of efforts to avail food aid to deserving recipients. These include: use of subjective rather than objective social criteria; existence of different and often conflicting and inconsistent approaches of providing food aid; political influence and interference in recipient selection and food distribution processes; and uneasiness on the part of traditional authorities and influential others regarding role of relief committees, and on the part of local food traders and business groups that consider free food as undermining business.

The study has revealed the combination of resistance to switch from growing maize and outright aversion for trying out drought-tolerant crops and innovative strategies that are self-empowering, and the existing sense of apathy, fatalism and helplessness among some food aid recipients as constituting extension challenges. These and the generally positive attitude of the majority towards change should be seen as providing a valuable extension opportunity that ought to be exploited. They point to the need for the development of extension programmes that are directed at educating people on community and people's development in a holistic manner, the importance and limitations of food aid and the contribution of recipients towards self-sustaining food production.



In light of revelations from crop and food supply assessments that, if the right conditions were available, crop yields would be higher; it is imperative that the government sets out to improve these conditions, in the long run. Needed improvements include: construction of dams; provision of agricultural equipment, inputs and supplies; rehabilitation of the agricultural extension service; and provision of adequate supportive funding.



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Fostering sustainable development through the integration of agro-biodiversity, local knowledge, gender and food security

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ABSTRACT

This paper presents a synopsis of experiences learnt from LinkS, a Food and Agriculture Organization (FAO) regional project that was implemented in Swaziland from 2002 to 2005. Through a three-pronged approach, the project worked with extension workers, researchers and policy makers to raise awareness on the linkages between local knowledge systems, food provision, gender and the conservation and management of agro-biodiversity. The paper first discusses the concepts of agro-biodiversity, local knowledge and food security and then presents the highlights of key findings from selected LinkS research activities. Drawing on lessons learnt from the approach itself, and from the several studies that were facilitated by the project, the paper concludes that conventional approaches and development processes do not, as a rule, validate and build on existing farmers' knowledge. The local knowledge is marginalized and communities' resilience in coping with disasters is compromised, which traps people in a vicious dependency cycle where drought and illness automatically imply food assistance from outside the community. Recommendations made include the need for mainstreaming the concepts of local knowledge in various policy instruments and programmes, upscaling the utilization and production of indigenous foods, in-service capacity building on participatory approaches, and filling in the knowledge gaps through further research.

Key words: Agro-biodiversity, food security, indigenous knowledge, LinkS, local knowledge



INTRODUCTION

The LinkS project (Local indigenous Knowledge System) was a Food and Agriculture Organization (FAO) regional project on “Gender, Biodiversity and Local Knowledge Systems to Strengthen Agriculture and Rural Development”. The project evolved from the realization that rural people’s traditional practices and knowledge systems were being marginalized in rural development programmes and that they were at risk of being lost. Rural people have gendered knowledge and understanding of their ecosystems, and development practitioners ought to acknowledge and value this knowledge for attainment of sustainable solutions to environmental management and food security (Lambrou and Laub, 2006). The project explored the linkages between local knowledge systems, food provision, gender and the conservation and management of agro-biodiversity. The main aim was to raise awareness through training, research and communication.

The project, which ended in 2005, led to a number of lessons and implications for sustainable development. The paper presents an overview of the three concepts of agro-biodiversity, local knowledge and food security and their linkages, and then highlights selected LinkS activities. It finally draws lessons learnt over the duration of the project that have implications for sustainable development efforts in Swaziland.

AGRO-BIODIVERSITY

According to the 1992 Convention of Biodiversity (UNEP 2006), biodiversity means the variability of living organisms from all sources, including terrestrial, marine and all other aquatic systems, and the ecological complexes of which they are a part. The term comes from “biological diversity” and, in simpler terms, it is



the variety of life on earth. Agricultural biodiversity or agro-biodiversity is a component of biodiversity, and refers to the genetic resources for food and agriculture. Agro-biodiversity has been defined by FAO as:

The variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals (FAO, 1999 page 5).

From time immemorial, people have depended on the management of agro-biodiversity for their food, nutrition and livelihood security. However, over the past century, there has been a significant loss of plant and animal genetic diversity. According to estimates by FAO, about 75% of plant genetic diversity has been lost and close to a third of livestock breeds are at risk of extinction as genetically uniform high yielding varieties have steadily replaced local varieties and landraces. This has resulted in the narrowing of the food base as the world's food supply depends on a relatively limited number of plant and animal species.

About 75% of the global intake of plant-derived calories comes from only 12 plants, namely: maize, rice, wheat, bananas, beans, cassava, potatoes, sorghum, soya, sugarcane, millet and sweet potatoes; and more than 95% of global animal protein comes from three sources, namely: poultry, cattle and pigs (IUCN/DFID, undated). Agro-biodiversity translates into dietary diversity and better nutrition. The narrow food base renders many diets deficient. The staple crops and animals may be adequate in protein and energy requirements but deficient in other nutrients that are derived from edible wild plants and domesticated green leafy vegetables. All over the world, edible wild plants are a standard component of human diets and are, indeed, a critical part of the diet during the hungry season preceding the harvest of domesticated field crops (Grivetti and Ogle, 2000). In recent years, even these famine foods have disappeared and the knowledge of identifying them is eroding, leading to increased reliance on outside assistance to stave off famine. This genetic erosion makes farming communities less resilient and more vulnerable to food insecurity.



The replacement of local varieties with improved or exotic varieties and species is often cited as the main driver of the loss of agro-biodiversity. Other factors that have facilitated loss of agro-biodiversity include: changes in farmers' and consumers' perceptions, tastes and preferences; great pressure on the land leading to the disappearance of wild food supplies; loss of forest cover, coastal wetlands, other 'wild' uncultivated areas and destruction of the aquatic environment; marginalization of small-scale, diverse food production systems that conserve farmers' varieties of crops and breeds of domestic animals; and reduced integration of livestock in arable production, which reduces the diversity of uses for which livestock are needed (FAO, 2005). Many economically important agricultural systems are based on 'alien' crop or livestock species introduced from elsewhere, promoting mono-cropping, and diversification coming as an after- thought.

Traditional farming practices were characterized by farmers ensuring that they save seeds from their harvest, replant, and exchange them among one another at local level, which enhanced the development of landraces which are adapted to local conditions (UNCTAD, undated). When commercial varieties are promoted and introduced in a traditional farming system, typically the number of varieties is reduced. The traditional livelihoods of the people of Swaziland are no different – food, fodder, medicine and other field products have been the drivers of the traditional economy of rural communities.

LOCAL KNOWLEDGE

The concepts of local knowledge, traditional knowledge and indigenous knowledge are very often used interchangeably. The concept of local knowledge is normally preferred because it is broader and more encompassing as it includes traditional and indigenous knowledge.



Local knowledge is a collection of facts and relates to the entire system of concepts, beliefs and perceptions that people hold about the world around them. This includes the way people observe and measure their surroundings, how they solve problems and validate new information. It includes the processes whereby knowledge is generated, stored, applied and transmitted to others.

The concept of **traditional knowledge** implies that people living in rural areas are isolated from the rest of the world and that their knowledge systems are static and do not interact with other knowledge systems.

Indigenous knowledge systems are often associated with indigenous people, thus rather limiting for policies, projects and programmes seeking to work with rural farmers in general. Furthermore, in some countries, the term *indigenous* has a negative connotation, as it is associated with backwardness or has an ethnic and political connotation.

Source: FAO, 2005).

Communities possess a rich body of knowledge amassed through centuries of observation and experimentation with the diversity of organisms and species (Shepard, *et al.*, 2001; Kikula, 1997). Mthembu (2005) noted that local knowledge about the specific properties of plants is often reflected in the common names assigned to them, with names derived from cultural beliefs and knowledge systems of the communities in which they occur. For example, *livikandlala*, a variety of pigeon peas, literally means protection against hunger.

The diversity in traditional crops and animals was the cornerstone of their livelihoods and came about as a result of many years of adaptation to the environment combined with careful selection and management based on traditional knowledge accumulated over generations. This indigenous knowledge has been passed down from ancestors to many generations down the line. The accumulated knowledge embraces information about the various cultural and social uses of the plants plus their products.

Local knowledge is the main asset that communities possess for their livelihood. However, it is widely acknowledged that it is under threat mainly from “intrusion of foreign technologies, or development concepts, that promise short-term gains or solutions to problems” (FAO 2005 p 10). When communities



lose their local practices, they also lose control of their destinies. When local knowledge is lost, the poor become more vulnerable as they depend more on skills and knowledge honed over centuries and passed on from generation to generation. According to FAO (2005), for the development process, local knowledge is of particular relevance to the following sectors and strategies:

- **Agriculture** – knowledge related to crop selection, intercropping, planting times.
- **Animal husbandry and ethnic veterinary medicine** – knowledge of breeding strategies, livestock characteristics and requirements, plant uses to treat common illnesses.
- **Use and management of natural resources** – knowledge of soil fertility management, sustainable management of wild species.
- **Health care** – knowledge of plant properties for medicinal purposes.
- **Community development** – common or shared knowledge provides links between community members and generations; and
- **Poverty alleviation** – knowledge of survival strategies based on local resources.

FOOD SECURITY

The right to food is a universally recognized basic human right. According to FAO (2005):

Households are food secure when all members have year-round access to the amount and variety of safe foods required to lead active and healthy lives. At the household level, food security refers to the ability of all household members to secure adequate food to meet dietary needs, either from household production or through purchases (page 17).

Several factors have combined to make food insecurity an ever present threat in recent years. The majority (80%) of Swazis reside in rural areas and are largely dependent on subsistence farming that is centred on rain-fed maize production. Erratic rains and natural disasters are now a yearly occurrence. The Lowveld



and dry Middleveld are so particularly drought prone that, when drought strikes, many farmers become automatic candidates for food aid. Other factors that contribute to food insecurity include: unemployment, rising food prices, unaffordable agricultural inputs, and HIV/AIDS induced morbidity and mortality.

The 2008 FAO/WFP Crop and Food Supply Assessment Mission to Swaziland estimated that some 210,000 people would be food insecure during the 2008/09 marketing year. Of these, 60,000 people were categorized as transitory food insecure, primarily due to rising food prices. The chronically food insecure were estimated at about 150,000. The Mission identified chronic food insecurity as the main problem in Swaziland rather than drought-induced transitory food insecurity. About 60% of the people in Swaziland are living below the poverty line and a significant proportion of them are, therefore, vulnerable to chronic food insecurity (Central Statistical Office, 2001).

LESSONS LEARNT

The main aim of LinKS was to raise awareness on how rural men and women use and manage agrobiodiversity, and to promote the importance of local knowledge for food security and sustainable agrobiodiversity at local, institutional and policy levels. In its short lifespan, the project worked with a diverse range of stakeholders to strengthen their ability to recognize and value farmers' knowledge and to use gender-sensitive and participatory approaches in their work. This was done through three key activities: research, capacity building and communication. This section presents selected activities undertaken during the two years of the project life and some pertinent key findings.



Study on “Impact of HIV/AIDS and drought on local knowledge systems for agro-biodiversity and food security (Hlanze Z., Gama T. and Mondlane S.)

The livelihoods approach was used in this study to highlight the effects of HIV/AIDS and drought on the local knowledge systems for agro-biodiversity and food security in Swaziland. The study utilized the following participatory rural appraisal (PRA) tools to collect data: timelines, cropping calendars and transect walks. The areas of agro-biodiversity that were examined in this study were: crop species, animal breeds, local plants and tree species.

Key findings

The following key findings were obtained from this study:

- i. There is a wealth of local knowledge about different aspects of the production and marketing of crops and this knowledge is differentiated by gender roles. For example, women typically possess knowledge about the production of legumes and small-scale vegetable production under irrigation for household consumption.
- ii. Maize was found to be the most important crop in all the studied communities, including the Lowveld, even though the yield had declined to almost zero in some households.
- iii. The production of commercial crops, such as maize and cotton, is controlled by men as they are mainly responsible for the production and marketing of these crops.
- iv. Most farmers were in favour of continuing with maize production because there was some prestige associated with one’s ability to cultivate it.
- v. In most of these communities, farmers had already lost the local knowledge on sorghum production since their forefathers had stopped growing sorghum years back.



- vi. There has been pressure exerted by extension services for farmers to grow other drought resistant crops, such as sweet potatoes, cassava, sorghum, but change was slow.
- vii. There was lack of seeds at the local level.
- viii. Due to drought and low yields, local seeds that used to be kept for planting during the next season are, regrettably, consumed owing to a lack of food for the family.
- ix. In most of the areas that were visited, there were no seeds kept for the next season as farmers were hoping to buy hybrid seeds or ask for some from neighbours.
- x. Local knowledge on keeping seeds has gradually been lost from lack of practice.
- xi. The youth did not know the local varieties of crops in their communities.
- xii. The drought has also affected wild edible plants and fruits. For example, during report-back workshops, participants mentioned some wild edible plants that were no longer available.
- xiii. Increase in morbidity results in indiscriminate exploitation of natural medicinal plants.
- xiv. Traditional healers and herbalists, particularly at Nkonka, were accused of digging and stripping off bark from certain trees which eventually wither away.
- xv. Some medicinal plants are now extinct as there is no control over how much could be taken away and no knowledge of how to preserve or domesticate the plants.
- xvi. The mortality of community members who had knowledge on management of certain tree species contributed to the decline in yield and preference of indigenous foods.

Study on “Local knowledge in sustainable grain legume crops seed production”

(Mamba Z.I., Malima C. and Mavimbela S.G.)

This case study evolved from the recognition that, even though legumes were very important for human and plant nutrition in Swaziland, their production was still far below demand. The main constraint to increased legume production was considered to be the unavailability of clean quality seeds, as it was noted



that seed companies view legume seeds as non-profitable. Legume crops are self-pollinating, which makes it possible for a farmer to buy seeds once, keep his/her own seeds from each harvest over, at least, three seasons. Drought was another cause of seed shortage due to the frequent crop failures in the past decade. It was also noted that scientists introduced new improved varieties disregarding traditional varieties and farmers' preferences. During the study, a sample of preferred traditional legume crop seed varieties was collected as a first step to a process for promoting community-based seed multiplication and dissemination.

Key findings

The following findings were obtained from this study:

- i. Farmer preference for legumes varied from area to area and from men to women within the same area.
- ii. There are a lot of traditional legume production activities going on in the study areas with groundnuts and juko beans being more popular than mung beans and cowpeas.
- iii. There is still a fair amount of seeds for the different traditional crops in the communities and there is considerable amount of informal movement of these seeds.
- iv. Farmers have wide local knowledge of seed handling and storage (see for example Figure 1); they however, lack some of the important information required in seed selection.
- v. The movement of seeds among friends and relatives in small quantities shows that farmers multiply their seeds.
- vi. Women are predominantly still the ones carrying out most of the production activities. Although some men are beginning to participate in some of the production activities, they still view their involvement as assistance to their female counterparts. In this sense, the study confirms the hypothesis that traditional legumes are women's crops.



- vii. The rural seed sector is fairly active although it is unstable and not well organized. The high demand for seeds and legumes in general calls for better organization of this sector. There is a need for a clear strategy that can be employed in improving legume seed production at community level.



Figure 1. A traditional clay container (*umphandza*) used to store legumes.

Study of indigenous food crops (Dlamini, N. and Mdziniso, P.)

An inventory of indigenous crops and wild edible species of food crops was conducted by Home Economics and Agricultural Extension Officers from the Manzini Region. The study also established time of availability (seasonal calendar), traditional methods of preparation, and documentation of crops for human consumption and medicinal purposes; and differences in use and preferences by age, gender and socio-economic status.



Key findings:

The key findings derived from this inventory were as follows:

- i. There is a notable reliance on indigenous plants for ailments, such as diabetes, high blood pressure and HIV/AIDS.
- ii. There is notable multi-purpose use of indigenous plants, for example for medicinal use, for livestock and for human consumption.
- iii. Promotion of production and consumption of indigenous crops calls for appropriate technologies because the processing of some indigenous crops is time-consuming.
- iv. Older women farmers were concerned that the younger women (daughters-in-law) had limited knowledge of indigenous foods. They encouraged the extension workers to facilitate a community field day where the older women would teach the younger women about indigenous crops.

A review of agricultural shows in Swaziland (Mthembu, L.T.)

This review was to establish the extent to which gendered local knowledge and agro-biodiversity for food security were being promoted during agricultural shows and to explore strategies for enhancing such promotion.

Key findings

The study revealed that:

- i. Farmers believe that Swaziland government policy favours trading of improved varieties and high yielding hybrids with uniform growth habits. This indirectly discourages the continued use and maintenance of diverse traditional crops and livestock genetic resources by farmers.



- ii. The agricultural show list does not promote indigenous crops and breeds. On the contrary, indigenous crops are classified under “miscellaneous”, reflecting that they are not at par with improved varieties. However, it was noted that every year there is an increase in the number of exhibits of indigenous crops.
- iii. The agricultural show list is uniform throughout the country and does not accommodate varieties of plant species and crops reflecting variations in different regions.
- iv. The quest for winning prizes at the agricultural shows encourages agricultural extension to promote the maximization of yield per land unit, uniform varieties, reduction of multiple cropping, and use of high yielding varieties and agro-chemicals.
- v. Since agricultural policies favour the use of improved varieties in order to get high yields, the production of indigenous crops and livestock gets very little attention. There is more emphasis on the staple food, which is maize, and this has led to mono-cropping.
- vi. Very few farmers still practice crop diversification/mixed cropping.
- vii. High protein legumes (sesame, mung bean) have often been replaced by maize.
- viii. The other direct effect of reduced diversity of crops is loss of indigenous knowledge on plant uses.
- ix. The agricultural show list is written in English, yet most of the participating farmers cannot read in the language. In general, information dissemination about the shows does not reach farmers on time.

The study recommended that:

- i. In order to promote indigenous crops, the prize should be higher to give farmers an incentive to produce and display indigenous crops during the show.
- ii. There is need to build upon farming systems that link biodiversity and agriculture to meet livelihood needs. Research should be conducted focusing on mixed cropping.



- iii. There is need to create a supportive policy environment that promotes the use of local varieties.
- iv. Sharing of knowledge and selling of seeds among farmers during agricultural shows should be encouraged by extending the show time.
- v. There is need to introduce seed fairs which could be run together with the shows. This will enable farmers to share, exchange information and agricultural products and sell their produce. Selling indigenous products at a higher price could be a motivation for the farmers.
- vi. Prizes for indigenous crops should be spread over different crop varieties (e.g. sweet potato and beans have several varieties) as opposed to the current situation where all varieties compete for only one prize.
- vii. The National Organizing Committee should include other stakeholders like farmers, non-governmental organizations and agricultural input dealers when preparing the show list.

CONCLUSION

Food security and the reduction of hunger constitute a major national development goal and a key Millennium Development Goal. However, food security has been an elusive goal for Swaziland. Conventional approaches for increasing agricultural production have, instead, undermined communities' resilience in coping with disasters. In recent years, the numbers of people that have required food aid has remained high.

Local knowledge in the management of agro-biodiversity is the main asset that people and communities have used as a survival strategy. Poorer farmers tend to use local knowledge more than the better off. Development processes do not, as a rule, validate and build on existing farmers' local knowledge. Instead, through technology transfer, local knowledge is marginalized and the destiny of households and



communities is left to be determined by assistance from outside the community. This traps farmers and communities in a vicious dependency cycle where drought and illness automatically imply food aid. Studies have shown that, even though agro-biodiversity and local knowledge are eroding fast, people still do use indigenous crops (domesticated and wild) to enrich their diets, to cope with drought and for medicinal purposes.

APPLICATION FOR DEVELOPMENT

A number of observations that have implications for sustainable development emerge from this project review:

- i. Local knowledge is a vital ingredient in any initiatives aimed at the transformation of farmers. Yet, while there are various policy instruments that promote biodiversity and food security, there is no policy that supports and promotes the application of local knowledge.
- ii. Consumer preferences are known to be important drivers of what farmers will ultimately produce. However, not much effort has been made to capitalize on these in order to promote the utilization and consumption of indigenous foods.
- iii. Lessons from local and regional experiences have shown that gender and age are important variables worth consideration when dealing with local knowledge and agro-biodiversity. This makes a gendered approach all the more critical.

IMPLICATION FOR POLICY AND PRACTICE

The observations and findings arising from the LinKS project point to the need for mainstreaming the concept of local knowledge in the relevant policies of government. Alternatively, developing a separate



policy would go a long way in affirming and validating. They also point to the need for upscaling programmes to promote the utilization and consumption of indigenous foods. This necessitates the creation of awareness among policy makers, practitioners and development partners on the potential of using local knowledge in agro-biodiversity management as a strategy for promoting food security.

The changing landscape in rural areas because of the combined effects of HIV/AIDS, poverty and drought on the environment and on loss of agro-biodiversity needs further analysis in terms of what strategies can be put in place to address the fast disappearance of some essential wild species. This calls for the broadening of efforts to document local knowledge and genetic resources and support for research into the nutritive value of various indigenous foods.

In light of the fact that the availability of seeds for indigenous crops is major problem, there is need for a community-based strategy for seed production that would promote agro-biodiversity and food security. This calls for the development of a policy framework to regulate Intellectual Property Rights inherent in local/indigenous knowledge. The need for a farmer-centred approach when promoting local knowledge cannot be overemphasized. Therefore, frontline extension workers from the government and non-governmental sector ought to be capacitated in the use of participatory approaches so as to empower farmers to take control of their destiny.

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Involvement of women in group-based water development projects in Swaziland

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ABSTRACT

The study examined women's involvement in group-based development initiatives of the Komati Downstream Development Project (KDDP). The specific objectives were to: assess the extent of women's involvement in group activities, identify social and economic benefits derived from their involvement in group activities, describe their accessibility to information on project implementation, and identify ways of enhancing their participation in group-based water development projects. The study was descriptive and utilized qualitative and quantitative techniques. The study found that women were greatly involved in the formation of groups, including conceptualization, monitoring and evaluation, and planning project activities. Social benefits derived from their involvement centred on learning opportunities, unity and networking, access to facilities and their recognition. Economic benefits centred on employment and business opportunities, business relationships, economic independence, financial empowerment, and improved production competence. Women had access to information on extension support, markets, business development and operations, associations and related opportunities. Women's participation in group-based water development projects could be enhanced through support in forming groups, improved assertiveness and acumen in business and entrepreneurship, and increased awareness of benefits of engaging in group projects for development. The study underscores the need for policies that entrench the creation of women's group strength to overcome status restrictions and stereotypes.

Key words: Women's participation, group-based initiatives, women's empowerment.



INTRODUCTION

Background

The Komati Downstream Development Project (KDDP) is an important component of the Komati Basin Development Project (KBDP), which is a bi-national initiative between the Kingdom of Swaziland and the Republic of South Africa. Conceived in the early 1980s to provide irrigation water for farm development in both countries, the KBDP aims at reducing poverty and unemployment through commercial agricultural development. In Swaziland, the KDDP is being implemented by the Swaziland Water and Agricultural development Enterprise (SWADE). The scheme, which covers an area of 24,000 ha, was designed to benefit 20,000 subsistence farmers in an area that has low and erratic rains and a long dry season. Dry land arable farming that has been traditionally practised yielded less than subsistence returns and was found to be unsustainable in the absence of substantial investment in irrigation.

The cornerstone of the KDDP is participation by the target population in the design and implementation of the social, legal and economic structures that are required to ensure the success of the project. The need to enhance participation of women in group-based water development projects is enshrined in the recognition of their vital role as active development partners. Participation in development projects has been generally described as constituting a fivefold continuum embodying: participation for empowerment, capacity building, increasing project effectiveness, improving project efficiency and project cost-sharing (Paul, 1987).

From a planning perspective, the involvement of women in the KDDP activities was envisaged to facilitate the improvement of their social welfare and that of families. However, in light of the socio-economic



environment in which women have traditionally been marginalized, there was need to assess the effectiveness of their involvement in the newly formed associations towards attainment of this goal. The specific objectives of the study were to: (i) assess the extent of involvement of women in the KDDP area in group activities: formation of groups, conceptualization of project activities, planning of project activities, implementation of project activities, monitoring of project activities and evaluation of project activities; (ii) identify the social and economic benefits derived by women from involvement in group activities; (iii) describe the accessibility of women to information pertaining to project implementation; and (iv) identify ways of enhancing women's participation in group-based water development projects.

LITERATURE REVIEW

The contribution of women to food security in developing countries has been increasingly recognized, with rural women being the mainstay of small-scale agriculture, the farm labour force and day-to-day family subsistence (Das, 1995; Al Zoughbi, 2008). Consequently, there has been increasing realization of the need to integrate them into mainstream development efforts, on grounds that full use of the production potential of human resources cannot be achieved if women have inadequate access to resources, productivity-enhancing inputs and services (Ray, 2007).

Prior to the United Nations Water Conference of 1977 and the International Drinking Water Supply and Sanitation Decade, the role of women as providers and managers of water was never considered by project planners, either at government or local level. Development agencies and engineers typically overlooked the fact that women are largely responsible for managing water supplies and sanitation and, instead, focused on community leaders who are usually men. Yet, in developing countries, women play a vital role both as water suppliers and water managers.



In 1980, the United Nations proclaimed the period 1981 to 1990 as the International Drinking Water Supply and Sanitation Decade, and called upon member states and specialist agencies to promote the full participation of women in the planning, implementation and application of technology for water supply projects (Dankelman and Davidson, 1988). It is usually women who have knowledge of location, reliability and quality of local water sources, as well as health and sanitation, which has been passed on to successive generations, especially through daughters and across female peers (Dankelman and Davidson, 1988; Rodda, 1993). As water managers, women have to decide: where to collect water; how to draw, transport and store it; how many water sources can be used and their quality for various purposes – drinking, washing and kitchen use; and how to purify drinking water using simple techniques (such as filtration) or materials available locally (Rodda, 1993; United Nations Human Settlements Programme (UN-HABITAT, 2006).

Whether or not participation includes an element of empowerment hinges on the distinction between means and ends (Oakley and Marsden, 1984). Where participation is a means, it generally becomes a form of mobilization to get things done, as is the case with state-directed, top-down mobilization, sometimes enforced, to achieve specific objectives; or bottom-up voluntary community-based mobilization to obtain a large share of resources. Where participation is identified as an end in itself, the objective is not a fixed, quantified goal, but a process, the outcome of which is an increasingly meaningful process (Moser, 1983; 1989).

Projects frequently rely on women's participation merely as a means to ensure project success and far less frequently recognize that, for women as much as for other groups in society, participation is also an end in



itself (Moser, 1983). The importance of the involvement of women in water development projects can be summarized as follows:

- i. Women's participation as an end in itself – whereby women as much as men have the right and duty to participate in the execution of projects which profoundly affect their lives, implying that they ought to, be involved in planning and decision-making as well as implementation and management of projects that relate to their lives.
- ii. Women's participation as a means to improving project results – taking cognizance of the fact that they have particular responsibility for the welfare of households, are more aware than men of the needs for infrastructure and services and are also more committed to the success of projects that improve living conditions.
- iii. Participation of women viewed as an important mechanism for overcoming apathy and lack of confidence since it can make them visible in the community and show them the potential of self-help solutions (United Nations Centre for Human Settlements, 1986; Aureli and Brelet, 2004).

According to Dankelman and Davidson (1988), the influence of women in various societies in water development projects has been restricted by cultural traditions, which ensure that women are not permitted to intervene in decision-making, especially at higher levels, thus leaving male heads of households, for whom water collection is not a concern, to decide on where to build the family home without necessarily considering distance to water source. Other factors include: preclusive ownership of the water system, which may have implications on access of some members of society to the water source; inaccessibility of women to financial and credit support, which automatically disempowers them; preclusive technological requirements associated with some projects, which restrict the participation of women by excluding them from training opportunities to apply technology; and illiteracy, which has severely disadvantaged women,



rendering them much less able to express themselves, hence restricting their visibility to development planners.

Rural women constitute the majority of farmers in Swaziland and are responsible for the production of a significant proportion of the household economic resources. However, they have been traditionally marginalized with respect to social and economic benefits and lack the necessary technical training in the operation and maintenance of facilities in irrigation systems. While women dominate in agricultural activities, their influence in the development of the sector is severely limited, in part, because their effective contribution toward agriculture is obfuscated by their heavy involvement in a miscellany of domestic chores that are traditionally considered female business (Keregero, *et al.*, 2000). Indeed, as noted by De Vletter (1983), Russell (1983), Dutting (1986), Dlamini and Akinnusi (1992) and Women and Law in Southern Africa (1992), women in Swaziland have a heavier workload than men because of additional domestic tasks, especially the chores of supplying water, firewood, cleaning the house and yard, and washing clothes.

About 53% of the population of Swaziland constitutes women and that these are the most disadvantaged socially, economically and politically due, largely, to patriarchy which accords women low status and excludes them from all significant areas of life (WLSA and SARDC, 1998). According to Armstrong and Russell (1986), Swazi law and custom commits a woman always under the authority of a man, particularly with regard to major decisions, implying that a married woman must prove that she has her husband's permission to engage in certain activities.



METHODOLOGY

The target population constituted women and men in all households in the KDDP area. The study covered 12 purposively selected farmers' associations, involving a population of 1015, of whom 707 were male and 308 female. A stratified random sample of 339 (227 men and 112 women) was obtained for interview using the Krejcie and Morgan (1970) formula for determining sample size. The study design was cross-sectional and utilized a combination of qualitative and quantitative methods for data collection. Qualitative data were collected using unstructured individual interviews with KDDP staff, focus group discussions with KDDP staff, and an assortment of participatory rural appraisal (PRA) techniques involving members of three farmers' associations, along with focus group discussions with key informants selected from among knowledgeable and experienced members of associations. The PRA involved members of Buhle Besive Multipurpose Cooperative Society, Intamakuphila Farmers' Association and Vuka Sidvashini Multipurpose Cooperative Society. The PRA techniques used were: focus group discussions, brainstorming, Venn diagramming, pairwise ranking and observation.

Quantitative data were collected through face-to-face interview involving the study sample. The interview schedule was developed specifically for the purpose and utilized input from PRA findings. Since the items in the interview schedule were derived from PRA findings, they were deemed to be content-valid. The interview schedule was checked for reliability and found to be suitable. The survey data were analyzed using the Statistical Package for Social Sciences PC+ v10 2000. Frequencies, percentages, means and standard deviations were used to interpret the data.



FINDINGS

Extent of involvement of women in group activities

The involvement of women in group activities covered participation in formation of groups, as well as conceptualization, planning, implementation, monitoring and evaluation of project activities. The findings on the extent of involvement of women in the formation of their associations are summarized in Table 1. For purposes of interpretation of the findings, means ranging from 3.50 and above were taken to imply involvement, while those below 3.50 were taken to imply non-involvement; and standard deviations of 1.00 or below were interpreted to imply close similarity of opinion among respondents, and those above 1.00 to imply variation in opinion.

Table 1. Extent of involvement of women in formation of associations

Nature of Involvement	Domain Mean	Domain SD
1. Formation of groups.	5.04	1.13
2. Conceptualization of project activities.	4.98	1.23
3. Planning project activities.	4.67	1.14
4. Implementation of project activities.	2.68	1.68
5. Monitoring and evaluation of project activities.	4.74	1.19

The findings reveal that women were generally involved, to a great extent, in: formation of groups, and in conceptualization, monitoring and evaluation and planning project activities (domain mean range of 4.67 – 5.04 for these operations). The domain standard deviation range of 1.13 – 1.23 for these particular



operations implies that respondents varied in their opinions on women's involvement in these aspects. It is also evident that women were active participants, rather than mere spectators or passive participants, in the formation of farmers' associations which are considered as catalysts for change. They were also active in the conceptualization of project activities for their own development, as well as in their planning, monitoring and evaluation. Officials off SWADE attributed this to the awareness training that community members had received prior to formation of associations and, thereafter, to business awareness training that was offered to members of associations. It would appear that the training enabled both male and female community members to overcome cultural traditions that have often constrained the influence of women in community development affairs (Dankelman and Davidson, 1988). The participation of women in these activities can be seen as an important mechanism for overcoming apathy and lack of confidence (United Nations Centre for Human settlements, 1986).

With regard to monitoring, evaluating and planning project activities, the findings reveal that women were active participants in the process of making judgments and enlightened decisions on the welfare and accomplishments of their associations based on well-sourced information. This reflects their ability to engage in making observations, collecting information, applying some standards or criteria to their observations, forming some judgments, drawing conclusions and making decisions, thanks to the training they had received from SWADE. The training had enabled them to get around preclusive and restrictive technological requirements that have traditionally constrained their participation and had enabled them to express their concerns and put their knowledge into action (Dankelman and Davidson, 1988). These findings show that the visibility of women in planning in their own associations had been enhanced.

The findings conform to the description of participation by Bamberger and Shams (1989) as the conscious involvement of rank and file members in identification of community interest, articulation of objectives,



formulation of plans for further action, group action for implementation, generation of local and external sources, selection of leadership, collective evaluation and self-criticism and sustained development effort. The participation of women can be attributed to SWADE's high degree of mobilization of women to participate in activities leading to the formation of associations. This has taken the form of numerous community meetings and training sessions prior to, and immediately after, the inception of associations, coupled with close supervision of activities of associations. As a matter of principle, SWADE continues to provide "guardianship" throughout the budding stages of the associations, with the expectation that the high level of participation can be sustained after the associations are "weaned off" by SWADE and left to stand on their own.

According to the findings, however, women were, generally, not involved in the implementation of project activities. This is, largely, because most of the tasks to be implemented were manual or technical and usually left to be carried out by men with experience and or technical know-how. These include: soil sampling, constructing canals, roads, contours and drains; scouting regularly for sugarcane pests and diseases, and controlling them; harvesting sugarcane; irrigation scheduling, and operating and maintaining irrigation system.

Social and economic benefits derived by women

The social benefits derived by women from participating in their associations are summarized in Table 2. Those that were derived to a moderate-to-great extent are: enhanced recognition of women's contribution to the association, opportunity to learn new things, enhanced spirit of unity among members, enhanced women's participation in project activities, empowerment to undertake different activities together as a



team, increased understanding of the objectives of the association, enhanced feeling of ownership of business venture, and knowledge of how to manage groups.

Table 2. Social benefits derived by project members.

Selected Social Benefits Attributed to Membership in Associations	N	Mean	SD
1. Knowledge of how to manage groups.	337	4.75	1.23
2. Enhanced spirit of unity among members.	337	4.94	0.86
3. Empowerment to undertake different activities together as a team	337	4.86	1.01
4. Increased understanding of the objectives of the association .	337	4.84	1.02
5. Enhanced feeling of ownership of business venture.	337	4.83	1.14
6. Access to water in the vicinity of home.	336	2.74	1.16
7. Ability to practice home gardening using available irrigation water	336	2.76	1.95
8. Ease of communication.	336	3.63	1.58
9. Improved infrastructure (toilets, roads, office, farmers' shed)	338	3.73	1.59
10. Availability of electricity.	336	2.67	1.71
11. Enhanced ability to conserve water.	336	2.93	1.44
12. Improved family diet due to food supplies obtained from the association.	336	2.75	1.65
13. Improved sanitation.	336	3.22	1.42
14. Opportunity to share ideas.	333	4.64	1.13
15. Increased publicity of the community on a nationwide scale	335	4.70	1.01
16. Reduced rate of crime.	334	4.12	1.61
17. Opportunity to learn new things.	333	4.94	0.97
18. Opportunity to spend time productively.	330	4.59	1.06
19. Improved health through physical exercise while doing farm work.	334	4.38	1.16
20. Improved family relations due to wife's ability to contribute some financial support.	335	4.49	1.24
21. Opportunity to learn about nature conservation.	336	4.42	1.48
22. Enhanced recognition of women's contribution to the association.	336	4.94	0.93
23. Enhanced women's participation in project activities.	336	4.89	1.08
Overall (Domain)	336	4.12	1.28



Others were: increased publicity of the community on a nationwide scale, opportunity to share ideas, opportunity to spend time productively, improved family relations due to wife's ability to contribute some financial support, opportunity to learn about nature conservation, improved health through physical exercise while doing farm work, reduced rate of crime, improved infrastructure (toilets, roads, office, farmers' shed) and ease of communication. It is noteworthy that the majority of these benefits focused on learning opportunities, unity and networking, access to facilities and recognition of women.

The social benefits that were only derived by women to a slight extent were: improved sanitation, enhanced ability to conserve water; ability to practice home gardening using available irrigation water, improved family diet due to food supplies from the association, availability of electricity and access to water in the vicinity of home. It can be inferred that these were perceived to be slight because most of the associations were still new and some of the anticipated benefits were yet to accrue fully. For example, at the time of the study, there was inadequate rain that limited the expansion of sugarcane farms and thwarted efforts to conserve water, use water for home gardening and provide water in home vicinities. In other associations, plans to provide water and electricity in home vicinities were still on the drawing board.

The findings reflecting the economic benefits derived by female members of associations are presented in Table 3. The means ranged from 3.51 to 5.02 with an overall mean of 4.08, implying that members were perceived to have derived all these benefits to a moderate-to-great extent. The variation in their opinions was evident in the standard deviation range of 0.99 to 1.78 and the overall standard deviation of 1.45.



Table 3. Economic benefits derived by project members.

Selected Economic Benefits Attributed to Membership in Associations	N	Mean	SD
1. Improved employment opportunities.	337	5.02	1.04
2. Enhanced purchasing power.	337	4.08	1.44
3. Increased capacity to generate income.	337	3.95	1.62
4. Improved standard of living.	337	3.80	1.78
5. Ability to lower running costs of the association through self-help	337	3.97	1.44
6. Acquisition of business skills.	337	4.26	1.47
7. Ability to solicit funding (e.g. loans).	332	3.52	1.75
8. Strong business relationship with commercial farmers and companies	336	5.01	0.99
9. Ability to fulfill social obligations requiring money.	337	3.98	1.16
10. Improved business operations.	333	4.01	1.30
11. Ability to establish small private business enterprises.	336	3.68	1.70
12. Access to a tractor hire pool.	337	3.47	1.85
13. Improved value of arable land.	337	4.67	1.22
14. Improved farm productivity.	336	4.04	1.59
15. Reduced poverty.	336	3.51	1.50
16. Enhanced women's economic independence.	333	4.30	1.11
Overall (Domain)	336	4.08	1.45

The findings indicate that involvement of women in farmers' associations enabled them to derive the following benefits to a moderate-to-great extent: improved employment opportunities, strong business relationship with commercial farmers and companies, improved value of arable land, enhanced economic



independence, acquisition of business skills, enhanced purchasing power, improved farm productivity and improved business operations. They also derived: the ability to fulfill social obligations requiring money, ability to lower running costs of the association through self-help, increased capacity to generate income, improved standard of living, ability to establish small private business enterprises, ability to solicit funding (e.g. loans), reduced poverty and access to a tractor hire pool. These findings are in line with the primary intentions of the KDDP of reducing poverty and unemployment through commercial agricultural development (The Komati Basin Development Project, Swaziland, 2003). In the long run, such benefits contribute to the empowerment of women and to their increased involvement in development activities. The findings also bear testimony to the ability of farmers' associations to stimulate micro-level development action aimed at the greater welfare of members through enhancement of their socio-economic power (Bamberger and Shams, 1989). This is, particularly evident in women's access to land whose value they considered to be high, access to financial and credit support, and to their subsequent empowerment (Dankelman and Davidson, 1988).

Accessibility of women to information on project implementation

Table 4 provides a summary of findings on the extent to which women as members of farmers' associations had access to information and services pertaining to the implementation of the farming business of the association. Women had access, to a moderate-to great extent, to information pertaining to: job opportunities, developments taking place in the farm, markets for agricultural produce, performance data of the farm business, business opportunities, sources of farm inputs and supplies, how to plant sugarcane, how to apply fertilizer, finances of the association, how to control weeds in sugarcane fields, available contracting agencies, how to assess soil fertility and sugarcane yields, how to control sugarcane pests and diseases and how to select suitable cane varieties.



Table 4. Accessibility of women to information on project implementation

Type and nature of information	N	Mean	SD
1. Finances of the association	335	4.46	1.50
2. Developments taking place in the farm	336	4.87	1.00
3. Performance data of the farm business	334	4.78	1.08
4. Business opportunities available to members	334	4.61	1.24
5. Job opportunities available to members	337	4.90	1.29
6. Available contracting agencies	337	4.37	1.41
7. How to select suitable cane varieties	337	3.78	1.68
8. How to plant sugarcane	337	4.53	1.40
9. How to assess soil fertility	336	4.20	1.55
10. How to control weeds in sugarcane fields	337	4.40	1.47
11. How to control sugarcane pests	336	4.00	1.72
12. How to control sugarcane diseases	337	3.99	1.70
13. How to apply fertilizer	337	4.50	1.53
14. How to apply manure	337	2.06	1.78
15. Irrigation scheduling	336	2.77	1.74
16. Sugarcane yields	336	4.17	1.57
17. Sources of farm inputs and supplies	336	4.55	1.15
18. Markets for agricultural produce	336	4.83	1.08
Overall (Domain)	336	4.21	1.44



The findings indicate that, as members of associations, women had access to information pertaining to extension support, markets, business development, operations of the associations and related opportunities. Given that information is power, the perceived level of access to information reflects enhanced empowerment of women in this regard.

Information is considered as a prerequisite for development if it is available, accessible in the appropriate form and language, relevant, reliable, timely and delivered via an appropriate medium (Wesseler and Brinkman, 2002). These findings, therefore, reflect a satisfactory level of information delivery and dissemination. This is, largely, a result of commendable efforts being made by SWADE to provide extension and agri-support information services to farmers' associations. The sustainability of these efforts will, in the long run, depend on the extent of networking and bridge-building that SWADE will have to undertake prior to "weaning off" these associations.

The findings revealed that women had access to information pertaining to irrigation scheduling and how to apply manure only to a very slight-to-slight extent. This is because information on irrigation scheduling was exclusively provided to artisans who were specifically employed to carry out this particular task. The lack of access to information on how to apply manure is, largely, a result of a persistent failure and reluctance of agricultural extension workers to advocate the application of manure, which is perceived as rather backward and drudgery.

Overall, it can be inferred that women in KDDP had satisfactory access to information on project implementation. However, the same could not be said for the rest of the populace in other communities. As observed by Jiggins *et al.* (1996), in terms of relevant, timely, well-adapted and adequately delivered information for agricultural and rural development, there is a big gap in most developing countries. This is,



particularly the case with women farmers, to whom considerable effort has been directed in the last few decades, and it is only now that positive effects are beginning to show in agricultural production statistics and in indices of family welfare.

Ways of enhancing women's participation in projects involving use of water in agriculture

As shown in Table 5, the study found that women's participation in projects involving the use of water for agriculture could be enhanced to a very great extent (means of 5.45 – 5.48) in the following ways: encouraging them to be assertive, training them in business and entrepreneurship, encouraging them to form women's project groups and making them aware of benefits of engaging in projects involving the use of water for agricultural development. The importance attached to the encouragement of women to be assertive is a reflection of the need to enable them to act on their prevailing socio-cultural circumstances. This is necessary in order to enable women to overcome apathy and lack of confidence (United Nations Centre for Human Settlements, 1986). As noted by the Swaziland Committee on Gender and Women's Affairs (SCOGWA) and Gender Sector Committee (GSC), women, by virtue of their gender, experience discrimination in terms of denial of equal access to the power structures that control and determine development issues. Their low status mostly derives from some traditional values that recognize them as minors (SCOGWA and GSC, 1996).

The importance attached to the encouragement of women to get trained in entrepreneurship underlines the need to empower them through improvement in their productive, marketing and business skills. The lack of deliberate efforts to train women to apply technology, and the high levels of illiteracy among some of them



have been cited as contributors to their poor participation in projects and to their inability to express their concerns and utilize their considerable knowledge (Dankelman and Davidson, 1988).

Table 5. Ways of enhancing women's participation in projects

Ways of Enhancing Participation of Women	N	Mean	SD
1. Encouraging them to take up leadership positions in the association.	335	5.33	0.77
2. Encouraging them to engage in project activities.	333	5.35	0.63
3. Training them in leadership skills.	334	5.40	0.76
4. Training them in business and entrepreneurship.	335	5.47	0.71
5. Making them aware of benefits of engaging in projects involving the use of water for agricultural development .	334	5.45	0.69
6. Relieving them of drudgery associated with their involvement in such projects.	335	5.37	0.77
7. Relieving them of drudgery associated with their domestic chores	335	5.32	0.79
8. Providing project incentives that accrue directly to them.	328	5.44	0.85
9. Allowing them freedom to work outside the homestead	334	5.38	0.83
10. Allowing them to buy shares in their own right.	334	5.19	1.19
11. Providing them access to loans.	334	5.43	0.83
12. Encouraging them to form women's project groups	335	5.45	0.76
13. Encouraging them to be assertive.	334	5.48	0.71
14. Enhancing their access to resources.	335	5.43	0.76
15. Enhancing their control over resources.	335	5.44	0.75
16. Enhancing their control over benefits.	335	5.42	0.82
Overall (Domain)	334	5.40	0.79



The findings also revealed that women's participation could be enhanced to a great extent (means of 5.19 – 5.44) in the following ways: providing project incentives that accrue directly to them, enhancing their control over resources, enhancing their access to resources, providing them access to loans, enhancing their control over benefits, training them in leadership skills, allowing them freedom to work outside the homestead, relieving them of drudgery associated with their involvement in such projects, encouraging them to engage in project activities, encouraging them to take up leadership positions in the association and allowing them to buy shares in their own right. These strategies mostly underscore the need to empower women by providing them with access to resources and enhancing their control over these, and preparing them for leadership. The strategies seek to provide more integration of women in planning and decision-making, as well as implementation and management of water projects of importance to development; and to provide women with visibility in their communities (United Nations Centre for Human Settlements, 1986; Dankelman and Davidson, 1988).

CONCLUSIONS

The study found that women were generally involved in group activities, including, formation of groups, and conceptualization, monitoring and evaluation and planning of group activities. Women derived social benefits from involvement in farmers' associations, the majority of which focused on learning opportunities, unity and networking, access to facilities and their own recognition. The economic benefits derived by women are in line with the primary intentions of the KDDP of reducing poverty and unemployment through commercial agricultural development and contribute to the empowerment of women and to their increased involvement in development activities. Women had access to information pertaining to extension support, markets, business development, operations of the associations and related opportunities. This reflects



enhanced empowerment of female members of associations and a satisfactory level of information delivery and dissemination arising from commendable efforts being made by SWADE to provide extension and agricultural support information services to farmers' associations. The participation of women in development projects involving the use of water for agriculture can be enhanced, among others, by: encouraging them to be assertive, training them in business and entrepreneurship, encouraging them to form women's project groups, and making them aware of benefits of engaging in projects involving the use of water for agricultural development.

Based on these findings, it can be concluded that women in KDDP have generally been active, rather than mere spectators or passive participants in group development projects. To this effect, the farmers' associations have served as enabling structures that have provided opportunities for women to engage in development activities by fully exploiting their potential and reaping social and economic benefits in return.

APPLICATION FOR DEVELOPMENT

The findings of this study revealed that, even in a society considered by many to be strongly committed to traditions, it is possible for women to engage in development-oriented group activities. This can, largely, be attributed to the sensitization programmes conducted by SWADE that have created awareness regarding the importance and benefits of participation of women in farmers' associations. The fact that women have been able to reap social and economic benefits that would, ordinarily, not be accessible to women in Swaziland has had a major demonstration effect, thus attracting greater involvement. By far, the most important benefit of women's involvement in farmers' associations has been the empowerment that has opened up a whole range of opportunities for them to contribute to their own development and that of their families and communities. This has put women in their communities in a front-line position when it comes to



engaging in activities that are intended to meet the needs of present and future generations, which is the essence of sustainable development.

IMPLICATIONS FOR POLICY AND PRACTICE

Based on these findings, it can be concluded that women in KDDP have generally been active, rather than mere spectators or passive participants in group development projects in their communities. To this end, farmers' associations have served as enabling structures that have provided opportunities for women to engage in development activities by fully exploiting their potential and reaping social and economic benefits in return. In this way, group strength has enabled them to overcome status restrictions and stereotypes that are often associated with women as individuals in Swazi society. It can be inferred from these findings that policies that encourage group participation by women in development activities have a better chance of enabling them to contribute effectively to their own development and that of their families and communities. This is the essence of women's empowerment for development.

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Opinions of rural community dwellers regarding gender-based violence in Swaziland

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ABSTRACT

The study sought to describe gender-based violence (GBV) in Swaziland, describe perceptions of Swazi adults regarding GBV and identify factors influencing its occurrence. Data were collected from selected staff and local traditional leaders and health motivators through a survey and focus group discussions. The findings revealed that the majority of respondents were aware of GBV and had experienced it one way or the other and that its most frequently mentioned forms were: sexual abuse, physical abuse and emotional abuse. Respondents tended to report GBV matters to structures other than the police, partly due to dissatisfaction with the manner in which these matters were handled, fear of reprisal and embarrassment and deliberate protection of family secrets. This made it difficult for the law to take its course and did not help in building badly needed confidence between the people and protective structures. The most frequently mentioned factors influencing the occurrence of GBV were: lack of respect for others, alcohol and drug abuse, unemployment, extra-marital affairs, and other socio-cultural considerations. Provision of more educational programmes on GBV in order to facilitate increase in reporting of cases and introduction of harsh sentences and heavy penalties for offenders were suggested as ways of reducing or eradicating GBV.

Key words: Abuse, discrimination, gender, opinions, Swaziland, violence



INTRODUCTION

According to UNIFEM (2006), GBV is violence involving men and women, which arises from unequal power relationships between men and women. It has been observed that GBV is, perhaps, one of the most widespread and socially tolerated human rights violations that come in the form of domestic violence and sexual and psychological abuse of women and girls both outside and within the home (Abdur-Rahman, 2006). However, even though GBV affects all societies, cultures and social groups, most people are unaware of its magnitude, causes and consequences [United Nations Development Programme (UNDP), 2006; United Nations Fund for Women, (UNIFEM), 2006]. When the General Assembly adopted the Declaration on the Elimination of Violence against Women in 1993, the United Nations defined GBV as: “violence that results in or is likely to result in physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life” (UNDP, 2006:1).

Women from all cultural backgrounds, educational levels, income levels and personalities, are subjected to GBV by their husbands, lovers, boyfriends or male relatives. This kind of violence evolves, in part, from women’s subordinate status in society. Most cultures, traditional beliefs, norms and social institutions legitimize and, therefore, perpetuate violence against women (UNDP, 2006).

Women and girls are victims of numerous forms of violence, which include domestic violence, female genital mutilation, rape and forced prostitution, with domestic violence being the most pervasive of them all. Domestic violence occurs in a home setting and is usually perpetrated by relatives and/or family members who are supposed to provide protection. Domestic violence can come in the form of forced marital sex, incest and child beating, among others (Beelen and Osakue, 2006).



Sexual violence is the most common form of GBV worldwide and includes sexual intercourse without consent, rape, child defilement, insertion of objects into genital openings and forced prostitution. Rape is the most prevalent form of sexual violence among these and, more often than not, the perpetrators are familiar people rather than total strangers ((Beelen and Osakue, 2006). The major sources of violence, according to UNIFEM (2006), are the uneven distribution of power between males and females and the dominance of masculine culture. Different kinds of violence are linked with power inequalities between women and men, or between children and their caregivers, as well as with growing economic inequalities within and between countries. However, inequality between women and men is the primary cause of gender-based violence (UNIFEM, 2006).

Eliminating all kinds of violence against women was one of the key objectives of the Platform for Action adopted by the United Nations Fourth World Conference on Women held in Beijing in 1995 (UNIFEM, 2006). About three of the 12 strategic objectives of the Beijing Platform for Action directly focused on eliminating open, physical violence against women and girls (UNIFEM, 2006). According to UNIFEM (2006), GBV accounts for more deaths and disabilities among women than the combined effects of cancer, malaria, traffic injuries and war. In conflict situations, women and children are often raped by members of armed forces as a form of intimidation to the enemy (Anonymous, 2006).

Gender discrimination

According to Shisana (2004), some legal systems encourage gender discrimination, thereby serving as fertile grounds for GBV. This is, particularly, the case with societies and parliaments, which are usually male-dominated, enacting gender-insensitive and gender-biased laws. The South African AIDS Law Project, in its study on human rights and gender issues in the legislations of Botswana, Lesotho,



Mozambique, South Africa, Swaziland and Zimbabwe, found several laws that discriminate against women. For example, in Botswana tribal courts, adultery is treated as a female crime only, thus allowing men to get away with crimes of forced sex (Shisana, 2004).

In Lesotho and Swaziland, women who are married in community of property are considered as legal minors and, hence, perceived to need constant male protection, and cannot sign any legal contracts without the husband's permission (Shisana, 2004; Armstrong and Ncube, 1987). Women in Swaziland are denied access and rights to own assets such as land and cattle and are, hence, tied to a dependent relationship with men as fathers, husbands, uncles and even sons (Armstrong and Ncube, 1987). The subordinate role accorded women in the family and in public contributes to women's vulnerability to GBV and coerced sex (Shisana, 2004). Only recently in 2010, through a landmark court case of Doo Aphané versus the State, were women married in community of property made free to register title land in their own name. However, there has been not much progress with rights of access on Swazi Nation Land under the control of chiefs, even with the Constitution of 2005 guaranteeing women this right.

Studies have shown that, even though gender violence is a disgraceful thing that ought to be eradicated, some women in Swaziland view spousal battery as a positive sign (Gama, 2000). They view men as their moral and intellectual superiors, hence perceive physical violence as a sign of love. Culturally, Swazi women are supposed to be under the supervision and guardianship of men, who may be husband, father, uncle or male relative. This practice has led to the misguided belief that physical violence against women is, in some circumstances, justifiable (Armstrong and Nhlapho, 1985).



Factors contributing to gender-based violence

In its nature, GBV is rooted in gender inequality, discrimination against women, violation of human rights and is determined by gender perceptions rooted in established societal norms. The reality of GBV is that it is inextricably linked to other social and economic strains driven by poverty and inequality. Along with femicide (the hate murder of women or extreme forms of violence that lead to death), GBV destabilizes development initiatives as it impedes the capacity of women, their families and communities to participate in the social, cultural, economic and political life of their country (Lorna Hayes, 2007). Even though GBV occurs across all socio-economic classes, women living in poverty are more likely to experience it and are likely to have little or no resources to escape violence in the home. Also, men in difficult economic circumstances, that is, those unemployed, or with low socio-economic status and low educational level may resort to violence out of frustration and a sense of hopelessness (Lorna Hayes, 2007).

Gender discrimination and the perceived low status of women in society have a direct link to GBV. Some of the traditional and cultural practices within traditional marriage rites in Swaziland worsen the subordination of women (Aphane *et al.*, 2001). Such practices include *kuteka* (the customary Swazi marriage) a custom that has tended to be abused by performing it without the consent of the bride or her parents, *kwendziswa* (an arranged marriage, usually without prior consent of the bride), *emalobolo* (bride price) which has been equated to rights over women by husbands and in-laws, *inhlanti* (a substitute wife usually a sister to the bride if the wife is barren) and *kungenwa* (wife inheritance) among others. *Kuteka*, for example, encourages violence against women because, in most cases, it involves forcing a girl to marry her lover without her consent (Aphane *et al.*, 2001).



In addition, socialization and upbringing contributes to domestic violence in that socially learned behaviours, as instructed by society, tend to mould individual attitudes and roles in society. The family is supposed to act as the chief agent for socialization and plays a central role in preserving and transmitting cultural values from one generation to the next [Women and the Law in Southern Africa (WLSA), 1998]. In a patriarchal society like Swaziland, men and women are socialized to believe that men are superior to women.

Patrilocality – the relocation of a newly wedded couple to the man’s parental home – is a very common practice in Swaziland. In most cases, this leads to the husband’s family playing a significant role in influencing the couple’s life and this is hardly favourable to the wife. More often than not, interference by in-laws, relatives and friends in the couple’s relationship and personal affairs leads to misunderstandings and conflicts that often lead to domestic violence (Aphane *et al.*, 2001).

Statement of the problem

While GBV has existed in Swaziland for a long time, the extent to which it is recognized as such and addressed by society is unclear. This is, partly, due to the manner in which it is perceived by society and to the factors that contribute to its occurrence. A study was, therefore, undertaken to gain insight into the occurrence of GBV in Swaziland as a way of generating knowledge regarding this problem. The specific objectives of the study were to: describe gender-based violence in Swaziland, describe the perceptions of Swazi adults regarding gender-based violence, and identify factors influencing gender-based violence in the country.



METHODOLOGY

The study utilized a survey and focus group discussions. The survey examined qualitative and quantitative aspects of GBV while focus group discussions examined respondents' understanding of GBV, the circumstances leading to it and the handling of GBV cases by the police, society leaders and the general public. The target population included selected staff from organizations dealing with issues associated with prevention of GBV in Swaziland, traditionalists (*bucopho* and *bandlanane*), health motivators (*bagcugcuteli*), members of *lihlombe lekukhalela* (child protection volunteers) and the general public. A purposively selected sample of 11 staff was drawn from Women and the Law in Southern Africa (WLSA), Swaziland Action Group Against Abuse (SWAGAA), Lutheran Development Services (LDS), Council of Swaziland Churches, Conference of Swaziland Churches, UNICEF, Umtapo Wabomake, Family Life Association of Swaziland (FLAS), Welfare Officers and Gender Officers of the Ministry of Home Affairs and the Child Protection and Domestic Violence Unit of the Royal Swaziland Police. For these, a semi-structured interview guide was used for data collection.

A total of 100 local traditional leaders and health motivators were involved in focus group discussions and were drawn from the following *tinkhundla* in the four administrative regions of Swaziland: Hhohho Region (Lobamba, Mbabane West and Tiphisini); Manzini Region (Manzini North, Ngwempisi and Ntondozi); Lubombo Region (Siphofaneni, Lomahasha and Tikhuba) and Shiselweni Region (Gege, Shiselweni II and Sigwe). Based on input from focus group discussions, a structured interview schedule was developed and face-to-face interviews were conducted on a sample of 480 respondents drawn from each of 12 selected *tinkhundla* stratified by age (adults, youth) and sex (male, female).



The semi-structured interviews were conducted by the researchers, while focus group discussions were conducted by researchers with the help of research assistants. Face-to-face interviews were conducted by research assistants who were trained on how to interview and record data. Data from focus group discussions and semi-structured interviews were recorded and analyzed through inductive categorization of emerging ideas thematically. Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS) (version 12 for Windows) computer programme. Frequencies, standard deviations and means were used to describe the data.

FINDINGS AND DISCUSSION

Gender-based violence in Swaziland

The distribution of respondents according to whether they had ever been involved in or had witnessed GBV is summarized in Table 1. The majority (78.6%) of them indicated that they were aware of GBV by reason of having been involved in it or having witnessed it, while only 21.4% had not. These findings reveal that the majority of respondents were aware of the existence of GBV in the country and had experienced it one way or the other.

When asked to describe their understanding of GBV, three basic forms of GBV emerged: sexual abuse, physical abuse and emotional abuse. Sexual abuse included rape, forced sex and incest. Forced sex involved women and girls being coerced by their male partners to have sexual intercourse. Women indicated that they were sometimes forced to have dry sex, which is painful to them, and that they were forced to do so even when they were sick. This could be attributed to the fact that Swazi men perceive women as their possession, either through marriage or merely having a romantic relationship.



Table 1. Distribution of respondents by awareness of GBV

Response	Respondents		Total
	Male	Female	
Yes	147 (30.9%)	227 (47.7%)	374 (78.6%)
No	43 (9.0%)	59 (12.4%)	102 (21.4%)
Total	190 (39.9%)	286 (60.1%)	476 (100.0%)

Physical abuse mostly involved assaulting a partner (woman or girl) and was most frequently mentioned in focus group discussions in Shiselweni Region. Interestingly, it is only men and youth, rather than women participants who mentioned wife beating as a form of GBV. Emotional abuse involved verbal abuse in the form of shouting, snapping and insulting; disrespect and ill-treatment; desertion of lovers with babies; denial of conjugal rights; and infidelity between spouses. They indicated that men were the ones most frequently subjected to verbal abuse, particularly through emotional outbursts from women even in public places.

Other forms of abuse that were less frequently mentioned included violation of civil and human rights (for example: some men being in the habit of coming home late at night and disturbing women, some women being forced by culture to marry partners desired by their families rather than themselves, and women being denied the right to exercise their sexuality and reproductive rights). Economic violence was also reported, mostly arising from inheritance disputes between widows and their in-laws over late husbands' property and women and children not being adequately supported by men in situations of women's severe economic dependence on their spouses, and economic abuse (women and children not being supported adequately by males). Since many Swazi women, especially in rural areas, do not have enough education and skills training, they have severe economic dependency on husbands and are, hence, less likely to



escape violent relationships. Males also reported feelings of economic abuse, especially when unemployed and dependent on the wife or partner for income. They argued that women were driven by their financial status to disrespect them.

It can, thus, be inferred that physical abuse by spouses, rape and child abuse were reported as the most prevalent or common forms of GBV. Some of the causes of physical violence include misunderstandings between partners, which is often a result of men's drunkenness. This violence is sometimes extended to children who end up being beaten when fights ensue between their parents. While the findings reveal an understanding of GBV, at times, respondents portrayed lack of clarity regarding GBV. This is because some focused on issues of general violation of human rights and freedoms, as well as lack of respect and dignity for male heads of families.

Of all the forms of GBV, rape has long been declared a criminal offence. In fact, in the late 1990s, rape was declared as a non-bailable offence, while rape leading to death became a capital offence (CRIN, 2007). The Swaziland Police Force has been hailed by SWAGAA for the change in attitude when receiving abuse cases. They no longer dismiss complaints from battered wives as 'domestic matters' and view abuse survivors (including those from incidents of incest and child abuse) as victims of crimes and perpetrators as criminals. This is despite the fact that, traditionally, GBV has been covered up by families in fear of exposing house garbage (*tibi tendlu*) to the world (CRIN, 2007). These days, GBV cases are increasingly being reported, partly due to increased awareness by the public that abuse is wrong. This has led to more people going to the police and support organizations to report abuse and violence cases rather than suffering from abuse in silence. This gradual change in Swazi attitudes is a far cry from the situation when SWAGAA was established in 1994 when there was a lot of resistance among Swazi men to the idea of curbing violence against women and children. By then, a significant number viewed "moderate wife



beating” as some form of spousal discipline meant to put the woman in her place. Some men misunderstood the concept of gender equality to female superiority, arguing that it would lead to Swazi women being undisciplined, unfaithful and disloyal. This misguided notion is, often, the source of violence against women (CRIN, 2007).

Reporting of GBV

Respondents were asked to indicate whether they had ever reported matters of GBV to the police. The findings, as revealed in Table 2, show that only a minority (11.9%) ever reported such matters to the police, while the majority (88.1%) did not. Thus, even though awareness of GBV has increased over the years and support organizations, including the police, encourage that GBV cases be reported, actual reporting has remained minimal and problematic. It was difficult for third parties to report GBV cases in situations where the victims did not initiate it (*kulukhuni kukhutsalela indzaba yebantfu nangabe bona bathulile*). This is, particularly, the case in sensitive matters, such as sexual abuse and incest, which are often concealed by the victims and families, due to fear of stigma and embarrassment.

Some cases were not reported because of fear of repercussions. In one case, for example, a child was sexually violated by her father, but the matter was never reported by the mother who argued that the husband was the bread winner. In another case, a paedophile first abused a neighbour’s child and impregnated her and later sexually abused his own child who was forced to run away from home, but the matter was not reported in fear of jeopardising family income as the paedophile was the breadwinner. At the same time, males shun reporting GBV caused by wives because of the fear of stigma and embarrassment of being viewed as weaklings. Closely associated with this is the failure to report such cases due to a culture of silence that seeks not to hang dirty linen in public (*tibi tendlu*).



Table 2. Distribution of respondents by reporting GBV to police

Response	Frequency	Percentage
Yes	51	11.9
No	378	88.1
Total	429	100.0

Some respondents indicated that some cases were not reported because they were simply not viewed as abuse by victims. Reasons for this ranged from having no idea about GBV to vitually being blinded through witchcraft as is the case when a husband is said to be under the wife's spell (*indvodza ifakwe lijazi*). Table 3 shows the various structures to which respondents had reported matters of GBV. It is evident that a slight majority (59.6%) of the respondents reported GBV matters to structures other than the police, while 40.4% reported to the police.

Table 3. Distribution of respondents by structures to which they reported GBV matters

Structure	Frequency	Percentage
Royal Swaziland Police	115	40.4
Family members/relatives	45	15.8
<i>Umphakatsi</i> (chief's kraal)	43	15.1
Offender's family	34	11.9
Swaziland Action Group Against Abuse (SWAGAA)	17	5.9
Community police	15	5.3
Others	16	5.6
Total	285	100.0



Handling of GBV cases

Respondents were, generally, not happy with the manner in which GBV cases were being handled both by traditional authorities and the police. Examples of cases of sexual abuse reported to the police included father impregnating daughter, brother and sister relationship ending in pregnancy, priest impregnating an orphan, and step-father sexually abusing step-daughter after the death of her mother. According to respondents, either the police took no action on the perpetrators or the victims dropped the charges in fear of threats from perpetrators. For example, in the case of a child who was abused by her stepfather and reported to the police, the aunt was advised by the police not to pursue the matter in order to avoid endangering herself and the child from the stepfather's reprisals. Besides, when perpetrators of rape and other sexual assault offences were released, they more often than not came back and continued with the same violations. For example, in a case of an uncle who was alleged to have raped his niece, the matter was reported to the police, but within no time the uncle was released and returned home to intimidate the victim even further. Thus, reporting was no longer viewed as a viable option by respondents who were dissatisfied with the justice system.

At community level, the traditional structures were viewed as subjective since they often took sides in favour of wealthy and popular persons to the detriment of others. While some men viewed them as condoning women's actions, some women saw them as siding with males who dominated traditional decision making structures. Reporting was also often inhibited by lack of confidentiality since reported cases easily became common knowledge. In some situations, community structures often referred abuse cases back to family councils which were either nonexistent or unhelpful.



The findings also reveal that families were, at times, handling very serious GBV cases, such as rape, without reporting them to the police in violation of legal procedures. Wives also violated the law by concealing rape of children and incest in fear of losing breadwinner's support. In one incident, a boy raped a step sister several times, but the matter was handled quietly by the family and the boy eventually committed suicide. Focus group discussion respondents indicated that very few GBV cases have usually been handled to the satisfaction of all parties concerned. This may explain why respondents were not convinced that reporting was a viable option.

Factors influencing GBV

The findings on opinions regarding factors influencing gender-based violence within families and communities are summarized from focus group discussions, unstructured interviews and face-to-face interviews. Focus group discussions revealed that, within families, GBV was influenced by lack of: respect for others, self-respect, love, communication, proper parental guidance and trust. It was also influenced by lust, alcohol abuse, drug abuse, involvement in extra-marital affairs, misunderstandings and differences in opinions, poverty and financial problems, unemployment and idleness, ungodliness and immorality, broken family structures, polygamy, minority status of women, vulnerability of orphaned children, Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) and socialization. The opinions of community-members and key informants were generally in line with those of focus group members and revealed the multi-dimensional nature of GBV. While some factors touched on power relations, others focused on economic, social and cultural aspects of society.

Table 4 presents findings on the distribution of survey respondents according to their opinions on factors influencing GBV within families. The most frequently mentioned factors were: lack of respect for others,



alcohol abuse, extra-marital affairs, lack of love and patience, misunderstandings and/or differences of opinion, financial problems, unemployment, poverty, lack of self-respect, lack of trust, broken family structures and polygamy.

According to focus group discussion members, the factors that influenced GBV within communities were: alcohol abuse, unemployment and/or idleness, drug abuse, lack of respect for one another, unfaithfulness, poverty, land disputes, women's dress code and misunderstandings. The findings of the opinion survey on these aspects are summarized in Table 5.

Table 4. Distribution of respondents by opinions on factors influencing GBV within families

Opinions on Factors influencing GBV within families	Frequency	Percentage
Lack of respect for others	126	26.3
Alcohol abuse	101	21.0
Extra-marital affairs	69	14.4
Lack of love and patience	42	8.8
Misunderstandings and/or differences of opinion	40	8.3
Financial problems	29	6.0
Unemployment	24	5.0
Poverty	20	4.2
Lack of self-respect	17	3.5
Lack of trust	15	3.1
Broken family structures	14	2.9
Polygamy	12	2.5



The most frequently identified factor was alcohol abuse, and was followed by unemployment, drug abuse and lack of respect for others. Those that were less frequently mentioned are: unfaithfulness, poverty, lust, land disputes, women's dress code, misunderstandings between neighbours, polygamy, lack of education on GBV, food aid, patriarchal power relations, broken family structures and witchcraft.

Table 5. Distribution of respondents by opinions on factors influencing GBV within communities

Opinions on Factors influencing GBV within communities	Frequency	Percentage
Alcohol abuse	186	38.8
Unemployment	85	17.7
Drug abuse	82	17.1
Lack of respect for others	72	15.0
Unfaithfulness	25	5.2
Poverty	20	4.2
Lust/immorality/ungodliness	17	3.5
Land disputes	11	2.3
Women's dress code	11	2.3
Misunderstandings between neighbours	10	2.1
Polygamy	8	1.7
Lack of education on GBV	8	1.7
Food aid	8	1.7
Power relations (patriarchal society)	7	1.5
Broken family structures	6	1.3



Witchcraft	5	1.0
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It is noteworthy that the factors considered to influence GBV within communities were more or less similar to those mentioned in relation to families. About 57% of respondents indicated that some elements of Swazi culture had an influence on GBV, while 34% disagreed and 9% indicated that they did not know or were not sure. Those that agreed indicated that some of these practices were outdated and, therefore, out of tune with current reality, while others were considered to be outright abusive and oppressive to women. Culture was viewed negatively by most members of focus group discussions in terms of its ability to deal with GBV. It was noted that culture was not responsive to calls of gender equality, as a result of which gender inequality has led to various forms of GBV being directed mostly at women and girls. Respondents mentioned *kwendziswa* and *kungenwa* as typical examples of cultural practices that compel women to enter into marriage without their will, thus violating them emotionally. They also pointed to the cultural practice of *kuzila* (wearing of mourning gowns after husband's death), which is normally enforced even where the husband died after separation.

Women were also very vocal about the polygamy custom, which they associated with enhancement of hatred among co-wives, and considered to be unworkable in contemporary society where the residences of wives are far apart. They argued that this resulted in the husband abandoning other wives in the process. In addition, women were denied the freedom to exercise their rights in as far as sexuality and reproductive health issues were concerned. An instance was related of a woman that was forbidden to use the pill for family planning purposes.



Those who disagreed argued that there was nothing wrong with culture *per se* and that the problem lay in its interpretation and subsequent abuse. Others simply held that Swazi culture was fine and instilled discipline, but that modernization and civilization were the problem. They viewed the advent of human rights as the cause of problems and were of the opinion that Western values were an assault on Swazi culture.

Suggestions for eradicating GBV

The findings reflecting suggestions on ways in which GBV could be reduced or eradicated are presented in Table 6. The need for more educational programmes on GBV to increase reporting of cases was the most frequently mentioned, followed by suggestions for meting harsh sentences/heavy penalties and jailing offenders.

Table 6. Suggestions on how GBV can be reduce and/or eradicated in Swaziland

Suggestions for reduction or eradication of GBV	Number	Percent
1. More educational programmes on GBV to increase reporting of cases	98	20.4
2. Harsh sentences/heavy penalties for offenders	71	14.8
3. Jail offenders	51	10.6
4. More educational programmes on human rights	40	8.3
5. Increase job opportunities to improve people's welfare	34	7.1
6. Encourage individuals to respect human rights	20	4.2
7. Abolish cultural practices that condone GBV	18	3.8
8. More educational programmes on Swazi culture	9	1.9



9. Family counseling	9	1.9
10. More education on dangers of alcohol and drug abuse	5	1.0

Other less frequently mentioned suggestions were: more educational programmes on human rights, increased job opportunities to improve people's welfare, encouragement of people to respect human rights, abolition of cultural practices that condone GBV, more educational programmes on Swazi culture, family counselling and more education on dangers of alcohol and drug abuse.

Other suggestions relate to the minority status accorded to women in Swaziland. Until very recently, women were not allowed to acquire land in their own names but had to have a male relative, father, husband or even a son to register on their behalf. This practice has led to the misguided belief that physical violence committed by such males against women "over whom they preside" could be justifiable (Armstrong and Nhlapho, 1985).

CONCLUSIONS

Based on the findings of the study, it can be concluded that the majority of respondents were aware of the existence of GBV in the country and had experienced it one way or the other. The most frequently mentioned forms of GBV were: sexual abuse, physical abuse and emotional abuse. Only a minority of respondents ever reported GBV matters to the police, while the majority preferred to report such matters to other structures, thus making it difficult for the law to take its course. Reasons for not reporting to police include dissatisfaction with police action, fear of reprisal, fear of embarrassment and protection of family secrets.



Respondents were, generally, not happy with the manner in which GBV cases were being handled in the country, both by traditional authorities and the police. The police were viewed to be taking no action on perpetrators and to be dropping charges in fear of threats from the perpetrators. On the other hand, traditional structures were viewed as subjective since they often took sides in favour of wealthy and popular persons to the detriment of others. The most frequently mentioned factors influencing GBV within families were: lack of respect for others, alcohol abuse and extra-marital affairs; while those within communities were: alcohol abuse, unemployment, drug abuse and lack of respect for others. The rest of the factors touched on power relations, as well as economic, social and cultural aspects of Swazi society. The most frequently mentioned suggestion for reducing or eradicating GBV was provision of more educational programmes on GBV in order to increase reporting of cases. Other suggestions included meting harsh sentences/heavy penalties for offenders and jailing them.

APPLICATION FOR DEVELOPMENT

While scanty concrete data are available on the impact of GBV on the economy, development and democracy, recent studies point to possible knock-on effects at national level (Lorna Hayes, 2007). At individual level, GBV has serious mental and behavioural implications. It may cause post-traumatic stress, depression, anxiety and low self-esteem which can lead to substance abuse, risky behavioural changes and victimization. At family level, children growing up in a violent environment are most likely to emulate violent patterns and have behavioural problems. As a result, GBV compromises livelihood and economic strategies, thus impoverishing the family. At community level, GBV also takes its toll on the state in terms of costs incurred in the health and justice system; as well as lost investment, material and potential production which represents significant economic costs. In terms of sexual reproductive health, GBV has a direct link



to increased vulnerability to sexually transmitted infections (STIs) including HIV. In a country that has one of the highest HIV prevalence rates, GBV, as a key driver of the epidemic, ought to be acknowledged.

Thus, the effects of GBV are felt in all sectors. Firstly, it has adverse effects on the health and security systems whereby funds that would otherwise be allocated to primary health and education are diverted to cater for it. Secondly, GBV erodes human capital and productivity in cases whereby it results in death. Thirdly, GBV undermines efforts directed at establishing good governance, democracy and the promotion and defence of human rights. Essentially, GBV makes it very difficult for government to build a legitimate and democratic state, one that will protect the lives and development of its citizens. Fundamentally, GBV is a public health, security and human rights problem that hinders long-term development effort. Lastly, when GBV is coupled with discriminatory legislation, women are often obstructed from exercising and enjoying their human rights and from contributing in development initiatives.

The results of the study call for government's zero tolerance to GBV through the implementation of international mechanisms calling for the reform and strengthening of the judiciary, police as well as other security forces to deal with GBV, and reform discriminatory laws. They also call for the implementation of awareness-raising and prevention campaigns with the general population on GBV in order to stimulate the national social and political conscience; increased coordination between state institutions and civil society to increase efficiency of response; and the need for the government to explicitly denounce GBV.



IMPLICATION FOR POLICY AND PRACTICE

The findings of this study point to the urgent need to expedite the passing of the Sexual Offences and Domestic Violence Bill by Parliament. One of the objectives of this Bill, which was gazetted in July 2009, is to strengthen and consolidate certain common law and statutory provisions. The intention is to adequately provide for the successful dealing, in a non-discriminatory manner, with sexual offences and domestic violence and provide adequate protection to complainants. This legislation will not only prevent people from committing these crimes but also ensure that perpetrators are punished accordingly. It also takes into account the constitutional provisions in the sense that it deals with inequality. The Bill also seeks to address gaps in previous legislations dealing with sexual offences and domestic violence. For instance, it has broadened the definition of rape to cover not only unlawful sexual intercourse with another but also unlawful sexual acts committed under certain circumstances (such as in any coercive manner, under false pretence or by fraudulent means, and under duress, fear of violence or psychological oppression) and indecent treatment of children, including rape of a male child. All these have far-reaching implications on GBV. An important component of the Bill is its provision enabling the court to make protection orders, the absence of which previously made it difficult to report cases of emotional abuse, for example. In this sense, the Bill seeks to punish perpetrators and restore peace in family settings.

Another implication is the need to formulate a family policy in Swaziland that would facilitate the developmental role the family performs for society, that of bearing and rearing the next generation, economically supporting family members, and caring for the elderly, sick and disabled in ways that no other institution can do or do as well. A family policy will direct and coordinate all efforts of efficiently performing



the various important functions for family members and society. This cannot be achieved in an environment plagued with GBV.

Finally, there is need to domesticate international conventions that Swaziland has ratified, such as The Convention on the Elimination of all forms of Discrimination against Women (CEDAW) and the Southern African Development Community (SADC) Protocols on Gender. This should include a review of laws to be in line with the dictates of the Constitution.



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Public awareness and involvement in the environmental impact assessment process in Swaziland

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ABSTRACT

The purpose of the study was to determine the level of public awareness and involvement in the environmental impact assessment (EIA) process. The study was exploratory and descriptive and was conducted in the four administrative regions of Swaziland. Three major development projects were purposively sampled per region and a total sample population of 293 respondents was conveniently selected. Interview schedules and physical observations were used during EIA scoping meetings and secondary data were obtained from EIA reports. Quantitative data were coded and analyzed using Microsoft Excel (2003) and the qualitative data were content analyzed according to emerging thematic areas. The findings indicated respondents were generally aware of the development projects being carried out, with those in Hhohho Region taking the lead in awareness. Information provided to the public was considered adequate only by respondents from Shiselweni and Hhohho Regions, while awareness regarding public involvement in the EIA process was largely confined to respondents in Hhohho and



Lubombo Regions. Except for Hhohho Region, the public was not adequately provided with information on the EIA process. The public was not mobilized to get involved in the EIA process and actual involvement was mostly reported in Hhohho and Lubombo Regions only. Generally, the extent of public involvement in the EIA process on a countrywide scale was poor.

Key words: Environmental impact assessment, public involvement, public awareness.

INTRODUCTION

One of the objectives of the environmental impact assessment (EIA) process is to give information about the likely environmental impacts of a proposal to the developer, public and decision makers in order to make a better decision. Public Involvement is a process that leads to a joint effort by stakeholders, technical specialists, authorities and project proponent who work together to produce better decisions than would be the case if they acted independently by addressing the process objectives of a project.

Over the past few years, there has been remarkable and refreshing interest in environmental issues. A major impetus was provided by the Report of the World Commission on the Environment and Development in 1987 and this was accelerated by the Rio Summit of 1992. Increasing interest in environmental issues and in sustainable development has focused on better management of activities in harmony with the environment. Consequently, development planners have proposed rapid and participatory appraisals to enable them to quickly understand the local perspectives of a particular location.

Since its establishment in the USA in 1969, EIA has spread worldwide in various forms and has become an approach in good currency (Glasson *et al.*, 1994). The process of EIA has been defined differently by different people. Wood (1995) defined it as the evaluation of the effects likely to arise from a major project



or other actions significantly affecting the natural and man-made environment. Glasson *et al.* (1994) defined EIA as a systematic process that examines the environmental consequences of development actions in advance, the emphasis being on prevention. In this context, EIA is different from many other mechanisms for environmental protection. Fuggle and Rabie (2000) defined it as an activity designed to identify and predict the impact on mankind's health and well-being of legislative proposals, programmes, projects and operational procedures, and to interpret and communicate information about the impacts.

Process and objectives of EIA

According to Glasson *et al.* (2001), one of the objectives of the EIA process is to provide information about the likely environmental impacts of a proposal to the developer, public and decision makers in order to make a better decision. Thus, as pointed out by Fuggle and Rabie (2000), EIA should be understood as the administrative or regulatory process by which the environmental impact of a project is determined.

In accordance with international environmental norms and practices and, as a result of the United Nations Conference on Environment and Development held in Rio De Janeiro in June 1992, the Government of Swaziland passed, in December 1992, an Act of Parliament that provided for the setting up of the Swaziland Environment Authority (SEA). The main function of SEA is to safeguard the environment from adverse impacts resulting from developmental projects.



In Swaziland, EIA entails the process of predicting and evaluating the likely environmental impacts of a proposed project where the scale, extent and significance of such impacts cannot be easily determined (Swaziland Government 2000). There has been progress in the implementation of the Rio Convention in Swaziland in that, after the establishment of the SEA, in April 1996, the Minister of Natural Resources and Energy, in consultation with SEA, gazetted environmental regulations, popularly called the Environmental Audit, Assessment and Review Regulations. These regulations established guidelines and requirements for environmental impact assessments and environmental audit reports. In addition, in 2003, the 2002 Draft Environmental Management Act became law.

Glasson *et al.* (1994; 2001; 2005), Fuggle and Rabie (2000), and Kemm (2004) outlined some of the important purposes of the EIA process. The steps taken when undertaking the EIA process were also outlined by Glasson *et al.* (1994; 2001; 2005), and by Fuggle and Rabie (2000). Participation is one of the most crucial steps in the EIA process. Effective public participation can strengthen the ability of impact assessment mechanism for ensuring the conservation, sustainable use and equitable sharing of biological and environmental resources. Public participation is supposed to be an integral part of all the steps of the EIA process.

Public involvement in the environmental decision-making process has two aspects – public participation and public consultation. Kuntala (2004) noted that community participation is an ambiguous term with vague but positive overtones. It implies an interactive process between members of the public, individually or in groups, and representatives of a government agency, with the aim of giving citizens a direct voice in decisions that affect them. The term, however, does not specify the nature of the interaction. According to



Soneryd and Weldon (2003), public consultation, as opposed to public participation, includes education, information-sharing and negotiations with the concerned public – interested and/or affected parties.

On the other hand, public participation is defined as a process that leads to a joint effort by stakeholders, technical specialists, authorities and project proponents who work together to produce better decisions. That is, public participation distills and adds to the content of the EIA process. The classic definition of participation is given by Stiefel and Wolfe (1984) as the organized efforts to increase control over resources and movements of those hitherto excluded from the control.

Public participation is useful in determining the scope of the EIA; providing specialist knowledge about the site; evaluating the significance of likely impacts; proposing mitigation measures; ensuring that the environmental impact report is objective, truthful and complete; and monitoring any conditions of development agreement (Glasson *et al.*, 2001). According to Kuntala (2004), the role of citizen participation in decision-making and governance is to remedy social injustice through some redistribution of political power. Mathews (1979) noted that participation is about power, as it involves sharing in actual decision-making. Ideally, the process should provide appropriate opportunities to inform and involve the interested and affected publics so that their inputs and concerns can be addressed explicitly in the documentation and in decision-making.



Importance of participation

Kuntala (2004) noted that the term “participation” has an omnibus character and potential deceptiveness. Pateman (1970) distinguished between pseudo, partial and full participation. Arnstein (1969), on the other hand, defined a “ladder” of public participation procedures ranging from “true” participation, involving a real transfer of some power, to various forms of manipulation.

Public involvement helps in modifying development plans before they reach an advanced stage. Project modifications made earlier in the planning process, before plans have been fully developed, are more easily and cheaply accommodated than those made in later stages. It is cheaper, for example, to have projects that do not have to go through legal inquiry. According to *Glasson et al.* (2001), early participation of the public also prevents a build-up of frustration and anger, therefore avoiding the possibility of more forceful “participation”. The implementation of a project goes smoothly and cheaply if local residents agree with the proposal, with fewer complaints about impacts such as erosion, pollution and noise. The total benefits of transparency exceed its costs, despite the expenditure and delays that might be associated with full-scale public participation in the project planning process.

Del Furia and Wallace-Jones (2000) noted that, in addition to the benefits gained specifically by the public through participation, many are reaped by the developer and contribute to the strengthening of the EIA procedure as a whole. This is by way of increasing the quality of the decision, rendering planning more efficient, attaining transparent decisions and a higher level of commitment to the decision, and avoiding public controversy and creating trust in the applicant and his/her planning.



According to Soneryd and Weldon (2003), public involvement is a matter of urgency not only in the interests of promoting participatory democracy or the idea that consultation gives better knowledge about environmental impact, but also because the conflicts arising from projects against new developments are practical problems that ought to be solved. Although some proponents view public participation as an unnecessary increase in cost, the World Bank (1993) noted that it is labour intensive rather than capital intensive. According to Kuntala (2004), citizen participation is a lot more than just consulting people for the successful resolution of social and economic issues related to environmental conflicts. Its primary goal is to give proper responsibility to people for, and control over, their lives.

Citizen participation in many developed countries is ensured by legal requirements from the very beginning of a project. A study of public participation in the EIA process in North Atlantic Treaty Organization (NATO) member states revealed that most legal provisions for public participation are deficient in regard to their effectiveness (NATO/CCMs, 1995). Oakley (1989) described community involvement as a process of establishing participation and cooperation between government and the community itself. In this way, communities participate in planning, implementation, use and evaluation of projects intended for community benefits.

Much as community participation leads to the redistribution of power among people in a society, many experts (Schuurman, 1993; Slater, 1993; Booth, 1994; Peet and Watts, 1996) have noted the continued existence of a gap between academic inquiry and development practice. This gap highlights the weakness in community participation in the real world.



Del Furia and Wallace-Jones (2000) noted that the importance of public involvement lies in: understanding the perception of proposed activity, resolving conflict and reaching consensus, identifying interested parties and their concerns and values surrounding the proposed development, and collecting information about the local environment and the local community. It also lies in defining problems and issues that should be addressed in EIA (scoping); identifying alternatives, validating the quality of the environmental impact statement (EIS) and obtaining feedback about the quality of the proposal; and informing and educating on the project, the consequences and the decisions.

It is often very difficult and tedious to engage the public in EIA. Some of the factors negatively influencing public participation are: lack of knowledge pertaining to community, traditional structures and ethos in organization; local political dynamics; dominance of professional culture; and lack of skills in organization. Del Furia and Wallace-Jones (2000) cited four factors that contribute to effective public participation as: nature of public involved; amount of power attributed to the public in EIA and related decision-making process by the inherent nature of techniques and methods used; when the public is involved in the procedure; and the ability to manage conflict. Kuntala (2004) emphasized lack of education as a major factor in the non-participation of relatively powerless groups. This is clearly an area that has much broader implications than just effective community participation. The implication of lack of education, according to Kuntala, is the fact that expert “scientific” knowledge is usually given precedence over local, lay knowledge during the decision-making process.



Problem statement

While the importance of EIA has been well articulated at a professional level, the involvement of the public in the process remains a challenge that has not been adequately ascertained in Swaziland. Therefore, a study was conducted to determine the level of public awareness and involvement in the EIA process. The specific objectives were to: describe the awareness of members of the public regarding development projects undertaken in their areas; assess the adequacy of information provided to the public regarding development projects in the area; describe the awareness of members of the public regarding public involvement in the EIA process; ascertain whether the public was provided with information on the EIA process in their areas; ascertain whether the public has been involved in the EIA process; and assess the extent of public involvement in the EIA process.

METHODOLOGY

The study was exploratory and descriptive and utilized both quantitative and qualitative data collection techniques. Both primary and secondary data were collected. The target population consisted of experts in EIA (Swaziland Environmental Authority, University of Swaziland, Yonge Nawe and government ministries) and community leaders and members in areas where development projects had been initiated or proposed.

The instruments used consisted of a focus group discussion checklist and a structured personal interview schedule developed from findings of focus group discussions, secondary data checklist, observation checklist and a diary. The thirty five participants for the focus group discussions were experts drawn from



the SEA, the University of Swaziland, key government ministries responsible for the environment and Yonge Nawe. The study targeted the 953524 people living in Swaziland (Swaziland Government, 2007) and drew up a sample size of 293 participants using Raosoft sample size calculator (Raosoft, 2004). This sample size gives an error margin of 5%, a level of 95% confidence, and a response distribution of 25.6%.

The interview schedule consisted of items intended to measure the extent of awareness of the public regarding the EIA process. A panel of experts was used to review it and attest to its content validity. It was pre-tested on a conveniently drawn-up sample of 10 stakeholders at Mbabane from SEA, Government Ministries, and affected parties along the Mbabane – Ngwenya new highway. The observation checklist and diary were used to record anecdotes during visits to scoping meetings that were held during the study period to ascertain public attendance and awareness of the EIA process. The secondary data checklist was used to record data from reports and other documents on public participation in the environmental decision-making process in Swaziland.

Research assistants were used to collect data using interview schedules. The research assistants were drawn from Bachelor of Science students in the Environmental Health Programme in the Faculty of Health Sciences, University of Swaziland. The quality of the data was ensured by training the research assistants and checking all information collected for completeness on a daily basis.

Qualitative data were content-analyzed and classified according to emerging thematic areas. Quantitative data were analyzed by use of a computer package (Microsoft Excel). Frequencies, means and standard deviations were used to describe the data.



FINDINGS AND DISCUSSION

Awareness regarding development projects undertaken

The findings reflecting awareness of respondents regarding development projects undertaken in their area are summarized in Figure 1. They indicate that all (100%) of the respondents drawn from Hhohho Region were aware of the development projects undertaken in their areas, as compared to 89.2% in Shiselweni Region, 73.1% in Lubombo Region, and 72.5% in Manzini Region. These findings generally reveal that development projects were being carried out throughout the country and that respondents were generally aware of these projects, with those in Hhohho Region taking the lead over their counterparts in other regions.

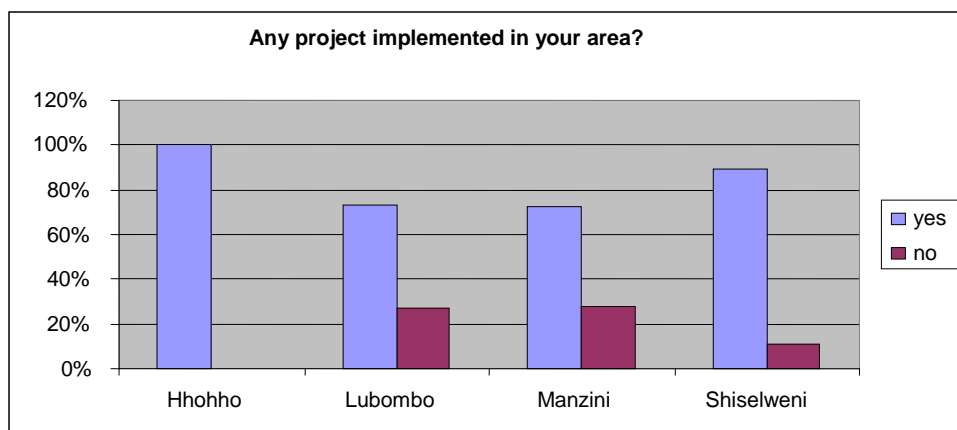


Figure 1. Distribution of respondents by awareness of development projects by region

Adequacy of information provided to the public

Figure 2 shows the findings pertaining to respondents' assessment of the adequacy of information provided to the public regarding development projects in the area. While 63.5% of the respondents in the Shiselweni



Region indicated that adequate information was provided, 56% shared similar sentiments in Hhohho Region, and only 48.7% and 14.5% did so in Lubombo and Manzini Regions, respectively. Conversely, 75.4% of respondents in Manzini Region considered the information provided to have been inadequate, a view shared by 40.4% from Hhohho Region, 38.5% from Lubombo Region and 28.4% from Shiselweni Region. Thus, the findings generally reveal that, while the information provided to the public was considered adequate by respondents from Shiselweni and Hhohho Regions, it was considered to be inadequate by respondents from Lubombo and Manzini Regions. In fact, respondents from Manzini Region overwhelmingly subscribed to the view that information from developers was inadequate.

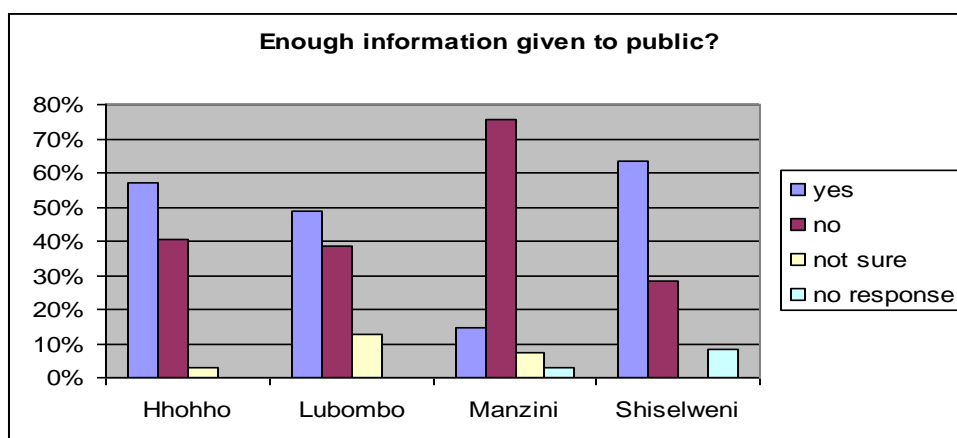


Figure 2. Distribution of respondents by adequacy of information provided to the public.

Awareness regarding public involvement in the EIA process

A summary of the respondents' opinions on awareness of members of the public regarding public involvement in the EIA process is provided in Figure 3. The majority (72.2%) of the respondents in Hhohho Region were of the opinion that members of the public were aware of public involvement in the EIA process, compared to 56.4% in Lubombo Region. However, only 47.8% of respondents in Manzini Region and 21.6% in Shiselweni Region shared this view. That is, 78.4% and 52.2% of respondents from



Shiselweni and Manzini Regions, respectively, disagreed with this view, compared to only 43.6% and 27.8% from Lubombo and Hhohho Regions, respectively. It can, thus, be inferred from the findings that awareness of members of the public regarding public involvement in the EIA process tended to vary from region to region, with more of those in Hhohho and Lubombo Regions being perceived to be aware than those in Manzini and Shiselweni Regions. The awareness situation in Shiselweni Region appears to be particularly worse.

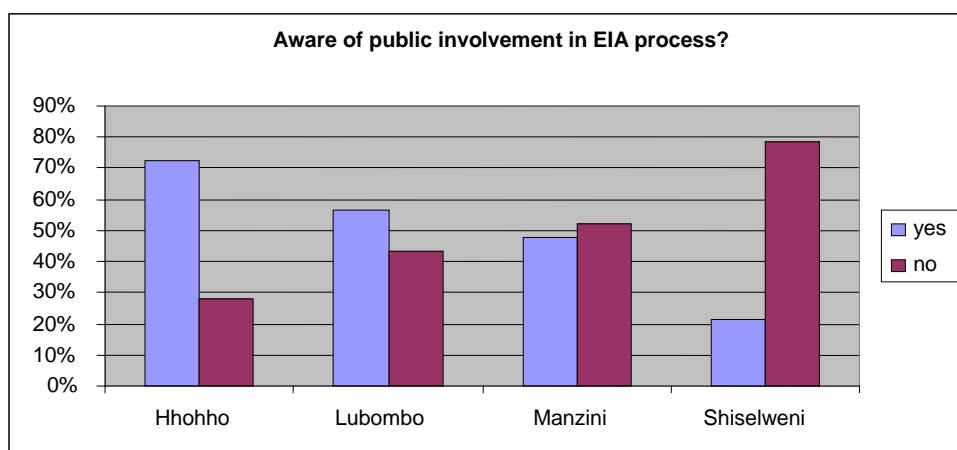


Figure 3. Distribution of respondents by public awareness of involvement in EIA process

Awareness of whether public was provided with information on the EIA process

Respondents were asked to indicate whether the public was provided with information on the EIA process in their areas. According to the findings presented in Table 1, the majority (76.4%) of the respondents in Hhohho Region indicated that the public was provided with information on the EIA process, compared to only 41.0% in Lubombo Region, 15.9% in Manzini Region and 13.9% in Shiselweni Region. Conversely, 78.3% in Manzini Region, 74.3% in Shiselweni Region, 46.2% in Lubombo Region and 12.5% in Hhohho Region disagreed. About 11.1% in Hhohho Region, 12.8% in Lubombo Region, 1.5% in Manzini Region and 1.4% in Shiselweni Region indicated that they were not sure.



Thus, except for Hhohho Region, it would appear that the public was not adequately provided with information on the EIA process. This state of affairs has implications on the degree and quality of participation and involvement of the public in this process. The difference in the trend as portrayed by respondents Hhohho Region could be attributed to the provision of information on the EIA process in Northern Hhohho during the much-publicized initiation of the Maguga Dam.

Table 1. Distribution of respondents by opinion on whether public was given information about EIA

Regions	Whether Public Given Information about EIA Process				Total
	Yes	No	Not Sure	No Response	
Hhohho	55 (76.4%)	9 (12.5%)	8 (11.1%)	0 (0.0%)	72 (100.0%)
Lubombo	32 (41.0%)	36 (46.2%)	10 (12.8%)	0 (0.0%)	78 (100.0%)
Manzini	11 (15.9%)	54 (78.3%)	1 (1.5%)	3 (4.3%)	69 (100.0%)
Shiselweni	10 (13.5%)	55 (74.3%)	1 (1.4%)	8 (10.8%)	74 (100.0%)
Total	108 (36.9%)	154 (52.6%)	20 (6.8%)	11 (3.8%)	293 (100.0%)

Awareness of whether the public has been involved in the EIA process

In order to assess whether the public was actually involved in the EIA process, respondents were requested to indicate whether they were always mobilized to get involved in the EIA process, whether the public was actually involved and whether they (respondents) were actually involved. The findings are presented in Figures 4 – 7.



According to the findings summarized in Figure 4, some 41.7% of the respondents in Hhohho Region, 35.9% in Lubombo Region, 12.2% in Shiselweni Region and 4.3% in Manzini Region indicated that they were always mobilized to get involved in the EIA process. Conversely, 43.5% of the respondents in Manzini Region, 40.3% in Hhohho Region, 37.8% in Shiselweni Region and 28.2% in Lubombo Region indicated that they did not. Interestingly, a sizeable proportion did not respond: Hhohho Region (18.0%), Lubombo Region (35.9%), Manzini Region (52.2%) and Shiselweni Region (50.0%). These were, actually, mostly those that had not been availed information pertaining to the EIA process. In general, the findings indicate that the public was not always mobilized to get involved in the process.

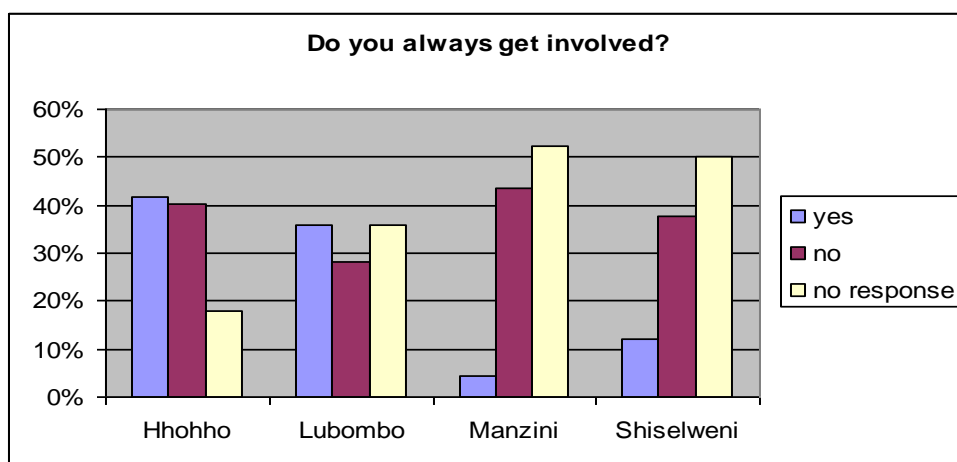


Figure 4. Distribution of respondents by whether they were always involved

The findings in Figure 5 reflecting opinions on actual involvement of the public reveal that 68.1% of the respondents in Hhohho Region indicated that the public had actually been involved in the EIA process, compared to 59.0% in Lubombo Region. However, only 17.4% in Manzini Region and 23.0% in Shiselweni Region shared this view. On the other hand, 75.4% in Manzini Region, 62.2% in Shiselweni Region, 25.0% in Hhohho Region and 37.2% in Lubombo Region disagreed with this view. Therefore, it would appear from these findings that the public had been actually involved in the EIA process mostly in Hhohho and Lubombo Regions and not in Manzini and Shiselweni Regions. It would seem that the companies that have proposed



projects in Manzini and Shiselweni Regions have not done enough to engage the public like their counterparts in the other regions.

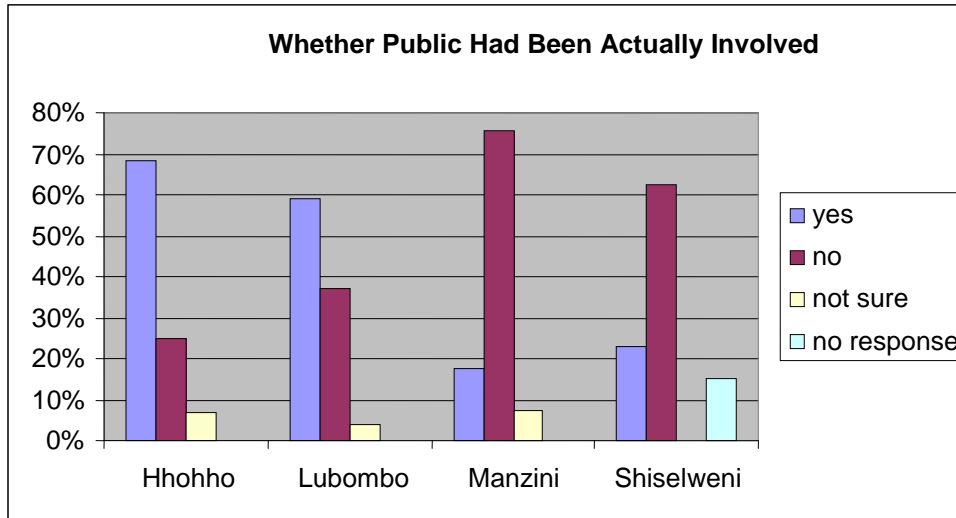


Figure 5. Distribution of respondents by opinions on public involvement in EIA process

The findings presented in Figure 6 reflect the opinions of respondents on whether they had actually involved themselves in the EIA process. While 66.7% and 55.1% of those in in Hhohho Region and Lubombo Region, respectively, indicated that they were actually involved, only 17.4% of those in Manzini Region and 10.8% of those in Shiselweni Region concurred with this view. On the other hand, 33.3% of the respondents in Manzini Region disagreed with this view while 49.3% did not respond; and 12.2% in Shiselweni Region disagreed with the view while an overwhelming 77.0% did not respond. These findings generally indicate that respondents in Hhohho and Lubombo Regions had actually engaged in the EIA process, but a greater proportion of their counterparts in Manzini and Shiselweni Regions had not. The majority of respondents in Manzini and Shiselweni Regions were either unaware or unconvinced of the need to get involved in the EIA process.



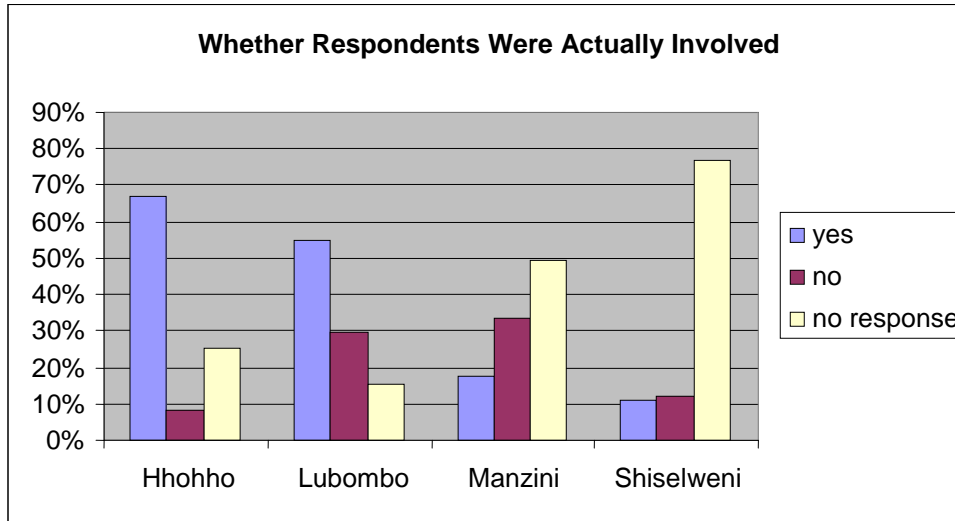


Figure 6. Distribution of respondents by actual involvement in EIA process

Figure 7 shows the distribution of respondents according to their opinions on the extent of public involvement in the EIA process. The findings reveal that 52.8% of the respondents in Hhohho Region indicated that the public was involved in the EIA process to a moderate-to-great extent, with 43.1% indicating moderate public involvement and 9.7% indicating full public involvement. However, they also show that only 48.8% of those in Lubombo Region indicated that the public was involved to a moderate-to-great extent, with 32.1% indicating full public involvement and 16.7% indicating moderate public involvement. Only 13.5% and 13.0% of the respondents in Manzini and Shiselweni Regions, respectively, acknowledged that the public was involved to a moderate-to-great extent. These findings, generally, show that the extent of public involvement in the EIA process was perceived to be poor countrywide as only Hhohho Region seems to have demonstrated some appreciable level of public involvement in the EIA process.



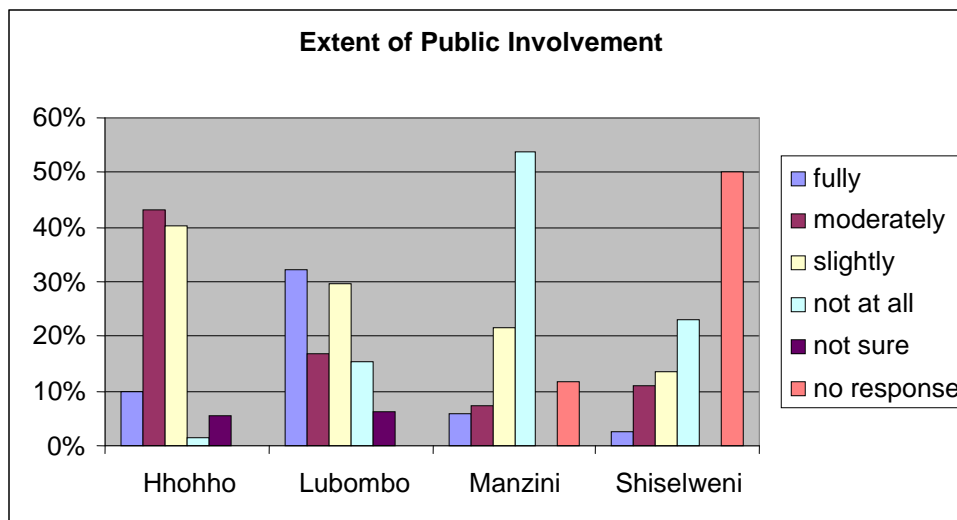


Figure 7. Distribution of respondents by opinions on extent of public involvement.

CONCLUDING REMARKS

Based on the findings of the study, it can be concluded that development projects were being carried out throughout the country and respondents were generally aware of them, with those in Hhohho Region taking the lead over their counterparts in other regions. The information provided to the public was considered adequate only by respondents from Shiselweni and Hhohho Regions, while awareness regarding public involvement in the EIA process was largely confined to respondents in Hhohho and Lubombo Regions. With the exception of Hhohho Region, the public was not adequately provided with information on the EIA process. In fact, the public has not always been mobilized to get involved in the EIA process, with actual involvement being mostly reported only in Hhohho and Lubombo Regions. Generally, the extent of public involvement in the EIA process on a countrywide scale was poor.



APPLICATION FOR DEVELOPMENT

It is evident from the conclusions of this study that the extent of public involvement in the EIA process on a countrywide scale was poor. This implies that the good intentions of the EIA process are not being adequately achieved due to lack of adequate citizen participation. It has been noted that citizen participation is a lot more than just consulting people for the successful resolution of social and economic issues related to environmental conflicts. With the primary goal of citizen participation being to give proper responsibility to people for, and control over, their lives, the shortcomings highlighted by this study imply that citizen empowerment is still a pipe dream.

IMPLICATION FOR POLICY AND PRACTICE

The study revealed a clear need for the promotion of public awareness and involvement in the EIA process. It underscores the need to reorient policy and practice in order to achieve positive results. In this context, there is need for a paradigm shift from the treatment of the EIA process as a mere policy and legal requirement to embracement of this process as a vital aspect of community life. As such, the Swaziland Environment Authority ought to work closely with the Community Development Department of the Ministry of Tinkhundla Administration and Development to identify more participatory approaches that would enhance public involvement in the EIA process. It is also necessary for the Swaziland Environment Authority to mount nationwide awareness raising campaigns regarding the EIA process. This could be achieved through the use of both print and electronic media, as well as traditional, community and civic structures to get the message across. Special attention ought to be focused on Manzini, Lubombo and the Shiselweni Regions, which seem to be lagging behind. Proponents of



development projects ought to be required to be transparent and supply enough information regarding their proposed development projects.

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Sustainability of rural agricultural development projects undertaken by non-governmental organizations in Swaziland

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ABSTRACT

Non-governmental organizations (NGOs) strive to establish sustainable agricultural projects in rural communities to combat food insecurity and poverty. However, in Swaziland, factors contributing to the sustainability of these projects have not been investigated. The study used a descriptive-survey method for collecting data. A purposive sample of already sustainable projects was drawn. Five out of seven NGO projects were included in the study. A questionnaire containing both opinion and factual items was developed, validated and pretested. The analysis used percentages, means and standard deviations. Findings on sustainability of projects revealed that: Savings and Credit Cooperatives by World Vision and Africa Cooperative Action Trust were the most sustainable projects; the highest beneficiaries were from Kaphunga community; sustainability was highest in institutional and social aspects; and the level of participation by community members was very high. They also showed that the involvement of agricultural extension officers was moderate; level of ownership of projects by members was high; resources were often available; a lot of training was received by members; and level of leadership skills in the projects was high. Conclusions are that, while NGOs indeed facilitate project sustainability, the level of involvement of agricultural extension officers ought to be promoted and the level of availability of resources ought to be increased. The level of ownership by members was commendable and the levels of training of members



and leadership skills in the projects were adequate. A key lesson for application for development is that NGOs facilitate sustainability through the promotion of project ownership by members, provision of material and human resources and training, and development of leadership in the projects. The policy and practice implication is that NGOs are in a good position to facilitate project sustainability of rural agricultural development projects. They ought to be given support and space to innovate in ways that can empower the beneficiaries to take control of their own projects and destiny.

Key words: Sustainable development, rural agricultural projects, non-governmental organizations.

INTRODUCTION

In Swaziland, about 70% of the population lives in rural areas and derives livelihood mainly from agricultural activities (Ministry of Economic Planning and Development, 2006). The American Society of Agronomy (1989) stated that sustainable agriculture is that which, over the long term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fibre needs; is economically viable; and enhances the quality of life for farmers and society as a whole.

Participation of members in a community project is critical for a team's ability to turn new ideas and individually-held knowledge into innovative procedures, services and products (Somech, 2005), and for self-reliance and sustainability (Duvell, 1996). Tembo (2003) argued that participation processes ought to begin at the design stage in order for the community to take ownership of the intervention, as well as ownership of both problems and the solutions (Pretty, 1995).

Agricultural extension agents support sustainable agriculture by providing the network of information on sustainable agricultural education (Tones, 2001), though their role is also changing from transferring



knowledge and technology to consultants, advisors and facilitators of the farmer learning processes (Karbasioun, 2007). A growing realization is evident that traditional extension methods have not been sufficiently effective in promoting adoption of sustainable agricultural practices (Vanclay and Lawrence, 1995), though, a well-organized extension service assists to close the disparity between potential and current productivity of an organization (Davidson and Ahmad, 2000). However, for people to develop, they must also be aware of resources within their reach and must utilize them in such a way that they have increased control over their productivity (Mavuso, 1992).

Farmers must receive adequate training in different disciplines in order to develop new skills and acquire new knowledge and familiarize themselves with modern agricultural technology (Beretetaib, 1999; Coombs, 1974). Empowering and enhancing the productive capacities of women, not just on their domestic and reproductive roles, is also important (Fisher, 1993; Mehra, 1997; Crowder *et al.*, 1999). Mathews (2003) stated that the concept of sustainability has many dimensions: economic, social, institutional as well as environmental. In this study, the concept of sustainability was operationalized using these dimensions.

Over the years, non-governmental organizations (NGOs) have taken keen interest in rural development projects in Swaziland, just as in other countries. A non-governmental organization (NGO) is an association with a legal status, which is non-profit, financially independent of government and is actively engaged in the political, social and economic transformation of society. Mattocks and Steele (1994) defined NGOs as legally-constituted organizations created by natural or legal persons that operate independently from any government. The label is usually used by governments to refer to entities that have no government status. Usually, NGOs mobilize people for self and national development beyond mere basic needs (Akinyele, 1994). They work with communities and empower them for sustainable development through the identification of the needs of the rural poor in sustainable agricultural development.



Tembo (2003) found out that capacity building for the leadership of community-based organizations (CBOs) during the life-time of a project is essential for sustainable development, and should be part of the project design rather than an after-thought. This can also be said to be true for NGOs operating in rural communities in Swaziland whose major role is to work alongside the poor and disadvantaged in pursuit of improved livelihoods. Projects introduced by NGOs require knowledgeable and skilled individuals in the communities, who will manage them properly so that they become eventually adopted. Project sustainability depends on the maintenance of a good environment, economic benefits rendered to beneficiaries, and social contributions for community improvement. In light of the proliferation of NGOs and their involvement in rural development projects on a wide scale, a need arose to critically examine the sustainability practices of these entities and members in such projects, so as to determine whether projects yield the desired impact and, if so, to shed some light on how they can be duplicated in other areas.

OBJECTIVES

The purpose of the study was to describe factors for sustainability of rural agricultural development projects implemented by NGOs in Swaziland. The objectives of the study were to: (i) describe level of sustainability of rural agricultural development projects implemented by NGOs in Swaziland; and (ii) ascertain the factors of sustainability in terms of: (a) level of participation by the community members, (b) level of involvement of agricultural extension officers, (c) level of ownership by members, (d) level of availability of resources, (e) level of training received by members and (f) level of leadership skills.



METHODOLOGY

The study design was descriptive and used a survey method. The target population was all community members (N = 6183) who benefited from the rural agricultural projects implemented by NGOs under the Food Security and Development Consortium (FSDC). An up-to-date list of NGOs was obtained from Coordinating Assembly of Non- Governmental Organisations (CANGO), which is the hub for all NGOs, thus, controlling frame error. Seven NGOs were found to be members of the FSDC.

The study sample (total n = 361) used was, however, purposive. Project members of only five of the seven NGOs were used, and were selected based on the rationale that they had an existing sustainable project that could be included in the study as attested to by NGOs project officers, and that members could be traced. Sustainable projects were identified by project officers for inclusion in the sample if they had continued as they had been introduced by the NGO or in a modified form with benefits continuing to accrue to members even after the NGOs had wound up involvement in the projects. Thus, the sample distribution drawn from the five NGOs selected was: (i) Africa Cooperative Action Trust (n = 148), (ii) Baphalali Swaziland Red Cross Society (n = 73), (iii) Caritas Swaziland (n = 15), (iv) Lutheran Development Services (n = 15), and (v) World Vision Swaziland (n = 110). The NGO officers were also included (total n = 43) according to the following distribution for the respective NGOs above: (i) 20, (ii) 3, (iii) 1, (iv) 7, and (v) 12.

Data were collected using a validated and pilot-tested questionnaire. A panel of experts were used to validate the instrument: three teaching staff at the University of Swaziland, a senior official at Microprojects Unit, and a programme coordinator at the World University Services Swaziland. They attested to the content and face validity of the instrument. The pilot test was conducted to establish reliability of the instrument and, was administered to 60 respondents comprising: 15 World University Services Swaziland



(7 officers and 8 beneficiaries), 28 Swaziland Farmers Development Foundation (22 beneficiaries and 6 officers), and 17 Africa Cooperative Action Trust officers. These individuals were not part of the study sample. Cronbach alpha calculation was used to determine reliability coefficients of the relevant sections of the instrument. The reliability coefficients ranged from .55 to .94, and the total instrument reliability was .79.

The questionnaire was hand-delivered to each respondent at the project site and the researcher explained and assisted the respondents in completing it. Those absent at the material day were followed up at home. A 100% response rate was obtained and all 404 questionnaires were usable, and formed the data source for the study. The findings of the study can, thus, be generalized to the five projects. The control of errors in a survey research was in accordance with suggestions by Miller and Smith (1983).

FINDINGS

Level of sustainability of rural agricultural development projects

The study revealed the following project enterprises as the most sustainable along with corresponding percentages of their sample beneficiaries: Savings and Credit Cooperatives (71%) offered by World Vision and Africa Cooperative Action Trust; communal gardens (20%) offered by Baphalali Swaziland Red Cross; backyard gardens (5%) offered by Caritas Swaziland and indigenous chickens (4%) offered by Lutheran Development Services. The percentage distribution of beneficiaries was: Africa Cooperative Action Trust (41 %), World Vision Swaziland (31%), Baphalali Swaziland Red Cross Society (20%), Caritas Swaziland (4%) and Lutheran Development Swaziland (4%).



The study revealed that the communities studied and the number and percentage of beneficiaries reached were: Kaphunga (133; 37%), Bhekinkhosi (15; 4%), Sinceni (38; 11%) and Dladlameni (23; 6%). Others were: Gundvwini (28; 8%), Bulunga (25; 7%), Ngculwini (21; 6%), Ndzevane (15; 3%), KaLanga (31; 9%), St. Phillips (18; 5%) and Sithobela (14; 4%).

The level of sustainability of rural agricultural development projects was measured by respondents indicating their extent of agreement with opinions on the economic, environmental, social and institutional sustainability dimensions of their projects. The findings showed that sustainability of the projects was highest in the institutional aspect (M =5.61 = strongly agree, SD = .40), followed by the social aspect (M = 5.52 = strongly agree, SD = 1.03), then economic aspect (M = 5.37, = Agree SD = .60), and lastly, in the environmental aspect (M = 4.81 = Agree, SD = .55). Overall, the sustainability of the projects was found to be moderately high (M = 5.25 = Agree; SD = .43).

Factors of sustainability

The factors of sustainability considered were: level of participation by community members, level of involvement of agricultural extension officers, level of ownership by members, level of availability of resources, level of training received by members and level of leadership skills.

Level of participation by community members

The level of participation by community members in the projects was measured by respondents indicating how frequently they had participated in the projects' processes. The findings, as presented in Table 1.



Table 1. Level of participation by project members

Variables rated	N	M	SD
Defining the problem/s being addressed in our project	404	5.77	.57
Identifying possible solutions to our problem/s	404	5.88	.33
Project planning to address our real needs	404	5.19	1.49
Project implementation to answer our real needs	404	5.68	.47
Giving support to the programme	404	5.54	.50
Attending demonstration sessions for the project	404	6.00	5.00
Advancing new ideas	404	5.89	.311
Ensuring a fair distribution of resources among women and men members	404	5.83	.41
Domain	404	5.72	.30

Rating Scale: 1 = never, 2 = very seldom, 3 = seldom, 4 = often, 5 = very often, 6 = always.

Level of involvement of agricultural extension officers

The findings show overall mean and standard deviation of 5.72 and .30, respectively, which imply that community members were judged to be participating very often. The item that received the highest mean rating was, "Attending demonstration sessions for the project" (M = 6.00), which implies that community members always participated in these sessions.

Respondents were requested to rate the level of involvement of agricultural extension officers in project activities. As shown in Table 2, the overall mean and standard deviation of 4.19 and 1.89, respectively, imply that agricultural extension officers were considered to be involved often.



Table 2. Level of involvement of agricultural extension officers

Variables rated	N	M	SD
Promoted adoption of innovative agricultural practices	404	4.07	2.07
Facilitated the availability of agricultural information	404	4.20	1.97
Trained members at the project location	404	4.17	1.98
Provided some of the materials needed for demonstration	404	4.24	1.92
Demonstrated procedures which enhanced community understanding of information	404	4.19	1.94
Taught members recommended agricultural practices	404	4.20	1.97
Advised us on how to overcome production constraints	404	4.26	2.04
Total	404	4.19	1.89

Rating Scale: 1 = never, 2 = very seldom, 3 = seldom, 4 = often, 5 = very often 6 = always.

Level of ownership by members

The findings on the level of ownership of the projects are summarized in Table 3. The overall mean of 5.70 implies that respondents generally agreed strongly with all-but-one variables reflecting ownership of rural agricultural projects. Even on the exceptional variable, the respondents had agreement (M = 5.33, SD = .79).



Table 3. Level of ownership of rural agricultural development projects by members

Variables rated	N	M	SD
Built the membership strengths	404	5.94	.37
Promoted community participation	404	5.93	.25
Promoted community ownership of issues surrounding the projects	404	5.88	.33
Identified their needs	404	5.89	.31
Designed support measures to benefit members	404	5.33	.79
Were involved in the project planning	404	5.51	.68
Were involved in the project implementation	404	5.61	.51
Were involved in the project management	404	5.59	.49
Were involved in the project evaluation	404	5.64	.53
Total	404	5.70	.30

Rating Scale: 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree.

Level of availability of resources

Table 4 presents findings on the level of availability of selected resources for the implementation of rural agricultural development projects. The overall ratings ($M = 4.17$, $SD = .75$) imply that respondents considered the selected resources to be often available for project implementation. The only exception was the availability of transport facilities to take produce to markets ($M = 2.73$, $SD = 2.00$) which was rated as rare. This is, largely, due to poor roads and lack of vehicles to take produce to markets.



Table 4. Level of availability of resources

Variables rated	N	M	SD
Good leaders	404	4.41	1.10
Available semi skilled labour	404	5.29	1.18
Available unskilled labour	404	5.37	.92
Funds for the sustainability of our project	404	3.59	1.45
Good roads for all weather conditions	404	3.89	1.36
Transport facilities to take produce to the markets	404	2.73	2.00
Enough water for irrigation	404	3.88	2.03
Total	404	4.17	.75

Rating Scale: 1 = never available, 2 = very rarely, 3 = rarely, 4 = often, 5 = very often, 6 = always available.

Level of training received by members

The findings reflecting respondents' level of agreement regarding level of training received in relation to their projects are presented in Table 5. The overall mean and standard deviation ratings (M = 5.30, SD = .38) indicate that respondents generally received enough training. Specifically, respondents indicated that they received very much training on 10 items, a lot of training on three (3) items, just enough training on one (1) item and some training on two (2) items.

The 10 items on which very much training was received are: savings and credit cooperatives, how to plant vegetables in backyard gardens, crop production, vegetable production, planting methods for the purpose of improving food security, conservation agriculture, how to manage business, how to start their own business, proper use of farming inputs to ensure sustainability and broiler production.



Table 5. Level of training received by members

Variables rated	N	M	SD
How to start their own business	404	5.61	.80
How to manage business	404	5.68	.59
Crop production	404	5.81	.39
Vegetable production	404	5.75	.40
Planting methods for the purpose of improving food security	404	5.74	.43
Conservation agriculture	404	5.69	.44
Record keeping to measure performance of our project	404	3.07	.46
Indigenous poultry production	404	4.88	1.88
Broiler poultry production	404	5.48	1.26
Dairy production	404	3.85	2.07
Savings and credit cooperatives	404	5.91	.29
Handicrafts	404	4.83	1.20
How to make water safe for drinking	404	4.89	1.85
How to plant vegetables in backyard gardens	404	5.87	.34
Proper use of farming inputs to ensure sustainability	404	5.61	.53
Irrigation schemes	404	3.07	1.43
Total	404	5.30	.38

Rating Scale; 1 = very little, 2 = little, 3 = some, 4 = just enough, 5 = a lot, 6 = very much.

The three (3) items on which a lot of training was offered are: how to make water safe for drinking, indigenous poultry production and handicrafts. The only item on which just enough training was provided is



airy production. The two (2) items on which only some training was offered are: record keeping to measure project performance and irrigation schemes.

Level of leadership skills in projects

Table 6 presents the findings on respondents' opinions regarding the level of leadership skills available for project implementation. The overall mean and standard deviation (M = 5.43, SD = .49.) imply that respondents agreed that the level of leadership skills rendered with respect to the various variables was high enough for sustainability of rural agricultural development projects.

Table 6. Level of leadership skills in projects

Variables rated	N	M	SD
Ensured success of the project	404	5.65	.57
Ensured proper coordination of the project	404	5.59	.66
Gave clear guidelines to the members	404	5.57	.70
Checked progress of members	404	5.57	.69
Was willing to teach basic agricultural skills	404	5.59	.66
Volunteered to oversee the projects' progress	404	4.43	1.37
Ensured that the project's initial inputs were made available	404	5.58	.59
Total	404	5.43	.49

Rating Scale: 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree.



CONCLUSIONS

The findings revealed that rural agricultural development projects being implemented by NGOs are indeed sustainable. Institutional sustainability appears to be highest, followed by social sustainability, economic and environmental sustainability. The level of ownership of projects is considered to be very high, with community members very often participating in project activities, while agricultural extension officers do so only often. The resources for project implementation are available often, except for transport facilities to take produce to markets, which are rarely available. Project members received a lot of training on various technical aspects. The level of leadership skills rendered is high for sustainability of rural agricultural development projects.

APPLICATION FOR DEVELOPMENT

The five out of seven NGO projects that were initially identified as sustainable were indeed found to be sustainable. The NGOs that assisted in the projects – specifically Africa Cooperative Action Trust, World Vision Swaziland, Baphalali Swaziland Red Cross Society, Caritas Swaziland and Lutheran Development Services – were validated as institutions that facilitated sustainability of projects. Sustainability was facilitated through the enhancement of project ownership among members, the provision of material and human resources and training, and the development of leadership in the projects.

APPLICATION FOR POLICY AND PRACTICE

The study highlighted the weak areas of support by NGOs where potential assistance has a better chance of leading to project sustainability. These are: environmental sustainability support, extension services



linkage, transport facility, record keeping, measurement of project performance and formation of irrigation schemes.

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