

IMPACT OF HIV AND AIDS ON AGRICULTURAL PRODUCTION IN SWAZILAND: STRATEGIES FOR MITIGATION

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Abstract

The purpose of this paper was to review the impact of HIV and AIDS on agricultural production and highlight possible mitigation options. United Nations reports and other studies have condemned the high HIV prevalence rate partly as a cause for low subsistence agricultural productivity, food insecurity, malnutrition and poor health, loss of jobs and high rates of job absenteeism in the agricultural sector. This has contributed to tremendous decline of the economy. Results suggested that increased expenditure on financing funerals, healthcare and other medical bills with decreased investment in agricultural inputs and agricultural related activities has led to declining farm productivity and increased food insecurity. These have been a result of increase in deaths. The mitigation option for the impact of HIV and AIDs include; income diversification, early testing for HIV and early taking of ARVs; growing of less labour intensive crops, and access to livelihoods assets. Grounded on the available literature, this review recommends the promotion of production of nutritious food crops that are less labour intensive, supporting vulnerable households in terms of easy access to farm inputs at affordable prices, and promotion of therapeutic feeding and home based care for the chronically ill HIV and AIDS patients, encourage farmers to invest more in agriculture than expenditure on funerals.

Keywords: HIV-AIDS, health management, agricultural production, food insecurity, mitigation options

INTRODUCTION

The largest population of Swaziland live in rural areas and about 70% survive on subsistence farming as a major source of food and market surplus (Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) , 2006; Masuku and Sithole, 2009; Government of Swaziland and World Food Program, 2013). A substantial percentage of the rural population in Swaziland is reported to experience high HIV and AIDS prevalence. In 2006, at least 77% of Swazi households indicated to have lost a family member as a result of HIV and AIDS related illnesses (FANRPAN, 2006; and Masuku and Sithole, 2009). In their study, Masuku and Sithole (2009) indicated the complexity of ascertaining the impact of HIV and AIDS on agriculture and food security and other socio-economic indicators.

Several studies have been carried out to ascertain the socioeconomic impact of HIV and AIDS on the livelihoods of the poor households in Swaziland (FANRPAN, 2006: Central Statistical Office (CSO), 2008; Masuku and Sithole, 2009: Bicego *et al.*, 2013; GoSz and WFP, 2013; Centres for Disease Control and Prevention (CDC), 2013). A few studies related to the impact of HIV and AIDS on agriculture and food security have presented scary results of declining agricultural productivity, declining households incomes, increasing risks of food insecurity, malnutrition, poor health and wide spread poverty. Studies have shown that Swaziland's HIV and AIDS prevalence rate dropped from 42.2% recorded in 2004 to 32% in 2009 (Masuku and Sithole, 2009). This could be mainly attributed to the standard pack of intervention implemented since the late 1990s. The standard pack of interventions included mandatory screening of all donated blood; information, education and communication (IEC) programmes; distribution and promotion of condom use; and the establishment of AIDS Information and Support Centres (Masuku and Sithole, 2009). Recent studies indicate a further decline of HIV and AIDS prevalence rate from 32% to 26.5%, although Swaziland is still regarded to have the highest rate globally (Central Intelligence Agency (CIA), 2012).

Globally, the impact of HIV and AIDS on agriculture and food security especially in developing countries is a course for concern (Economic Commission for Africa) (Economic Commission for Africa-Southern Africa Office (ECA), 2006). For example, Masuku and Sithole (2009) reported that the high HIV prevalence rate in Swaziland has led to increasing risks of food insecurity as manifested in the declining subsistence agricultural production, reduced investment in farming, and less time dedicated to farming (Masuku and Sithole, 2009). Thus, households especially affected by HIV and AIDS become net-buyers of food, and many have resorted to surviving on food-hand-outs from NGOs (Masuku and Sithole, 2009; Smith, 2012). The situation has been worsened by the recent global food crisis related to high food prices that can hardly be met by the rural-poor, especially the HIV-affected households in developing and

low middle income countries including Swaziland (Bruinsma, 2010; Bureau for Food and Agricultural Policy (BFAP), 2011; Vanhove and Van Damme, 2011; United Nations-Swaziland, 2012; Kibirige, 2013).

IMPACT OF HIV AND AIDS IN AGRICULTURAL PRODUCTION

The impact of HIV and AIDS has been manifested through the decline in agricultural food production in Swaziland resulting into high risks of food insecurity especially among helpless orphaned children whose parents died of AIDS chronic illness (GoSz and WFP, 2013). Affected crops include maize, which is the staple food in the country and also livestock, especially cattle. In 2009, Swaziland lost over E783 million (US\$ 92 million) due to child malnutrition (GoSz and WFP, 2013). Additionally, in the same period of time the country experienced failure to produce agricultural output worth SZL126 million (US\$ 14.8 million) due to low physical capacity of approximately 270, 000 working age people (GoSz and WFP, 2013). As a result the country had to import maize to cover the deficit. This was mainly attributed to under-nutrition especially during early childhood age. Furthermore, the report revealed that as a result of nutritional-related mortalities, there was an increase in absenteeism at work leading to loss of approximately 37 million working hours in 2009 in Swaziland, equivalent to SZL340 million (US\$ 40 million) in monetary terms.

A study intended to examine the type of impacts that HIV and AIDS may have on households' and communities' food and nutrition security in the context of their livelihoods, particularly with regard to rural populations' dependent on agriculture was carried out (Gillespie, Haddad and Jackson, 2001). The findings indicated that HIV and AIDS significantly contribute to inadequate dietary intake and diseases, deteriorating capacity to produce and avail essential food, compromised good health and malnutrition. A mix of HIV and AIDS epidemic and malnutrition is condemned for the low performance of the labour force, hence affecting the social and economic growth of the country (CSO, 2008; Masuku and Sithole, 2009; GoSz and WFP, 2013; Smith, 2012; United Nations-Swaziland, 2012). This partly explains the current downward trend of Swaziland's economic growth rate experienced since 2000 from about 6% enjoyed by the country between the period of 1985 and 1999 to less than 2% in 2014 (Whiteside and Henry, 2011).

In addition to the low performance and job absenteeism caused by poor nutrition, the Integrated Regional Information Network (IRIN) (2009) survey reported that HIV and AIDS epidemic was blamed for 25% of job absenteeism in Swaziland. This job absenteeism was mainly attributed to HIV and AIDS patients and those who stay at home taking care of the patients. Among the most affected sectors in this regard include subsistence farming (Masuku

and Sithole, 2009). Job absenteeism and the high unemployment rate among HIV and AIDS patients have been linked to lack of access to food, lack of money for treatment, poor health care and nutrition (IRIN, 2009). Deteriorating nutrition status of HIV and AIDS-infected households members lead to poor performance of human resource in all sectors of the economy (Masuku and Sithole, 2009). Moreover, families have lost their members due to poor nutrition and HIV and AIDs illnesses. Therefore, it can be argued that increasing HIV and AIDS related premature death and poor nutrition especially among HIV-patients has led to low labour productivity, and hence a negative impact on the agricultural sector (Masuku and Sithole, 2009; United Nations-Swaziland, 2012; Whiteside and Henry, 2011).

Based on the literature displayed by Masuku and Sithole (2009), the presence of HIV and AIDS has a high impact on all dimensions of food security including the availability, stability, access and use of food. The researchers further indicate that there is no doubt that high prevalence rates of HIV and AIDS pandemic gradually increases food insecurity by affecting the families' ability to produce food due to illness or death of productive adult and skilled household members. The unproductiveness of family members due to illness and loss of family labour due to deaths makes households unable to cultivate land, and gradually become net food buyers and lose income earnings which in turn could be used to further fund agricultural activities like purchase of agricultural inputs (Masuku and Sithole, 2009).

According to Masuku and Sithole (2009), Baiyegunhi and Makwangudze (2013), and Dorward (2013), 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 form the three distinct variables of food security (Masuku and Sithole, 2009; (Baiyegunhi and Makwangudze, 2013; Dorward, 2013). Bonnard (2003) reported that 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 are said to be food secure. The study under review considered a household to be food secure when it had access to food either because it produced enough food for its consumption or when it had sufficient income to purchase it. A shift in spending on agricultural production and food items to spending on non-food items such as funerals and hospital bills may be a threat to food security. Similarly, a reduction in household income may threaten the household's purchasing power and thus its food security.

REVIEW METHODOLOGY

The review was based on a desk study of literature from internet and survey reports conducted by the main author, which was funded by FANARPAN. Journal articles were also consulted during the review.

IMPERICAL EVIDENCE OF THE IMPACT OF HIV AND AIDS ON AGRICULTURE

Effects of HIV and AIDS on Crop Production

Households with adults suffering from or had died of HIV and AIDS related diseases generally experience a reduction in food and crop production. Yield on crop production decline because of a decrease in land allocated to crop production, decrease in application of agricultural inputs, less time allocated to agricultural activities and lack of knowledge on how to manage crops. In analysing the impact of HIV and AIDS on crop production the studies also examine how land allocated to the production of different crops changes in households living on farm with sick adults who had died of HIV and AIDS related illnesses. As a result of households having a member suffering from or died of the epidemic is there any change in expenditure on agricultural inputs. A direct negative impact on crop production is anticipated given that a majority of the country's population relies on crop production. This impact was determined by the change in crop harvested before and after an adult of the households fell sick or died of HIV and AIDS related sicknesses.

When a household becomes unable to supply agricultural labour because much time is spent attending to the sick or unable to purchase agricultural inputs because income is diverted to pay for medical treatment and eventually to meet funeral costs, crop production falls and the composition of crops is gradually altered. The results presented in Table 1 indicate that there was a general decrease in maize production after the death of a family member, who was the main source of income. About 424 bags (70kg) are reduced from normal production as a result of loss of labour and money for inputs due to HIV and AIDS. The most affected region with respect to maize production was the Lubombo region followed by the Manzini region. It is worth noting that the Lubombo region is also the most hit by drought, and hence the decrease in maize production could be a combined effect of HIV and AIDS and drought.

A study by Masuku and Sithole (2009) revealed a 21% decline in maize production from the household sample, 4% decline in groundnuts production, 3% decline in sweet potato, 0.8% decline in irish potato, 0.5% decline in cotton and 3% increase in beans (Table 1). The impact within the regions indicated a 44% decline in maize production in the Lubombo region and 22% in the Shiselweni region. In addition to the persistent droughts experienced in these regions, HIV and AIDS is partly to blame for the decline in production. Given the dualistic agricultural practices in the rural areas subsistence farming is stronger than the commercial farming, once households are affected they tend to switch from commercial to subsistence farming. This results in fewer crops sold to generate income for the households, hence less food security. The effect of HIV and AIDS on commercial farming would be a reduction in cash crop as they switch from more demanding commercial farming to less demanding subsistence farming. Dispite the

observed decline in other crops (Table 1), the results showed that there was an increase in the production of beans, especially in the Lubombo and Manzini regions. This could be attributed to the intervention programmes, which encourage the use of legumes because of their nutritional value as coping strategies for HIV and AIDS affected households.

Table 1. Percentage change in crop production for Households with sick adults or adults who died of HIV and AIDS related sicknesses

Region	Maize	Groundnuts	Sweet potatoes	Potatoes	Cotton	Beans
Lubombo	-44	-5	-7	-	-2	+7
Manzini	-9	-2	-2	-3	-	+4
Hhohho	-8	-3	-	-	-	-1
Shiselweni	-22	-4	-2	-	-	-
Overall	-21	-4	-3	-0.8	-0.5	+3

- No Statistically Valid Cases

Source: Masuku (2006)

Effects of HIV and AIDS on Livestock

Livestock in Swaziland account for a considerable percentage of agriculture and also contributes tremendously to agricultural development in the rural areas. Farming in the rural areas is done through drought animal power. Besides being used in farming, livestock also serve as food security by providing milk and meat products for the households. Livestock also produce dung, which serves as manure and is used as fertiliser in farming. This section intends to examine if there is any change in the number of livestock amongst households with infected and/or dead members, before and after illness/death. The study further captures the change in marketing of agricultural products, including livestock that brings cash income to households during and after illness.

The effects of HIV and AIDS on livestock is indirect in the sense that households with infected or death members normally find themselves with inadequate income to pay for hospital or funeral bills, which might force them to sell their livestock and their by-products to meet such costs. The results of the study however, did not find any relationship between HIV and AIDS and the agricultural assets. The observation was that in some affected households some have not experienced any change in agricultural assets, whilst others have increased their agricultural assets, which is contrary to expectation of a negative relationship between HIV and AIDS and agricultural assets. With regard to livestock, some of the affected households indicated a change in livestock numbers due to illness or death of members.

Masuku (2006) found that there was reduction in the number of livestock in all the four regions of the country (Table 2) (Masuku, 2006). The table shows that there was generally a reduction in the numbers of livestock in all the regions and the decline was substantial with cows/heifers (24%) and poultry (24%) in the Lubombo region, cows/heifers (52%), poultry (67%) and oxen (30%) in the Manzini region, bulls (48%), cows/heifers (37%), oxen (26%) and goats (28%) in the Hhohho region, and all the livestock that were available in the Shiselweni region, except pigs. Overall, the most affected type of livestock were the cows (40%), bulls (34%), oxen and poultry.

Table 2. Percentage change in Livestock numbers for Households experiencing HIV and AIDS related illnesses or deaths of adult members

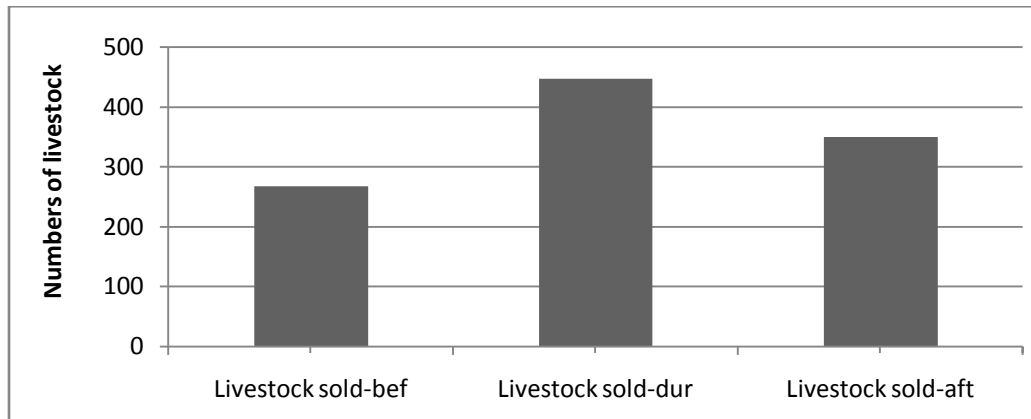
Region	Bulls	Cows/ heifers	Donkeys	Sheep	Poultry	Oxen	Calves	Goat	Pigs
Lubombo	-14	-24	-1	-	-24	-10	-2	-5	-2
Manzini	-14	-52	-3	-3	-67	-30	-13	-17	-4
Hhohho	-48	-37	-	-	-17	-26	-16	-28	-10
Shiselweni	-56	-40	-	-	-43	-21	-32	-32	-4
Overall	-34	-40	-1	-0.8	-40	-23	-17	-22	-5

- No Statistically Valid Cases

Whilst the results seemed to confirm the decline in livestock in the affected households, this may not be sufficient to conclude that the reduction in livestock was related to selling of livestock to cater for the sick or funeral costs. Some households might have sold their livestock to pay school fees and other needs. Therefore further analysis is necessary to look at how many livestock were sold during and after sickness to establish the expected negative effects of the epidemic on the number of livestock.

Figure 2 presents the number of livestock sold during and after illness among the affected households. The results suggest that more livestock were sold during illness than those sold before illness and after death of a household member. However, the number of livestock sold after death were higher than before illness, suggesting that money was still needed after death to cover post-death expenses, such as costs for funerals and cleansing. This trend was observed with all the regions except Hhohho where the numbers remained constant before and during illness, and dropped slightly after death.

Figure 1. Livestock sold before, during illness and after death in households experiencing HIV and AIDS related illnesses and deaths



Source: Masuku (2006)

It could be ascertained from the above figure that cattle were the mostly affected livestock, as it constitutes a large number of livestock in Swaziland. Poultry were also the most affected livestock, possibly because of its less complication to sell. These results were in line with the observations that a majority of the affected household members had distinct contribution in the upkeep of livestock either financially, knowledge, and experience or through work. When the male died, the remaining household members may lack skills, physical strength and financial backing to maintain livestock management and production. It has also been observed that decision making with respect to the type, variety, number and selling of livestock shift from the head (husband or father) to wife or mother and then son or sometime brother to husband. The decline in livestock is therefore expected in women or child-headed households because of lack knowledge on decision-making as in most households they are sidelined in decision-making whilst the male household head is still alive.

Effects of HIV and AIDS on land allocation for crop production

Households with infected members particularly male infected members tend to land utilisation from high labour intensive crops to less labour intensive crops. Table 3, presents the percentage change in land allocation to different crops in HIV and AIDS affected households. The results show that land allocated to maize production and to other crops declined except for beans in households with members affected by HIV and AIDS related diseases. The results therefore explain why the decline in the production of crops such as maize, groundnuts and an increase in soybean production as previously. The most affected crop was maize (-9.5%), followed by sweet potatoes (-3%).

Table 3. Percentage change in land allocation for crop production for Households experiencing HIV and AIDS related illnesses and deaths of adult members

Region	Maize	Groundnuts	Sweet potatoes	Potatoes	Cotton	Beans
Lubombo	-24	-4	-5	-	-2	+8
Manzini	-3	-1	-2	-1	-	-
Hhohho	-4	-	-	-	-	-
Shiselweni	-7	-1	-5	-	-	-
Overall	-9.5	-1.5	-3	-0.3	-0.5	+2

- No Statistically Valid Cases

Effects of HIV and AIDS on Agricultural Inputs Use

Crop production and harvest is directly related to agricultural inputs such as seeds and fertiliser. To buy these agricultural inputs most households in Swaziland depend on income from households' members in gainful employment. However, due to the negative impact of HIV and AIDS on mostly young economically active members' households begin to experience income shortages, which can hardly allow them to buy agricultural inputs, hence the decline in input use shown in Table 4. This ultimately results in poor yields.

Table 4. Percentage change in expenditure on agricultural inputs for households experiencing HIV and AIDS related illnesses and deaths of adult members

Region	Seeds	Fertiliser	Chemicals for crops	Veterinary Medicine	Hired Labour
Lubombo	-4	-3	-2	-5	-
Manzini	-7	-8	-5	-2	-
Hhohho	-3	-3	-1	-	-
Shiselweni	-11	-4	-1	-1	-1
Overall	-6.3	-4.5	-2.3	-2	-0.3

- No Statistically Valid Cases

The results in Table 4 indicate that, affected households experienced a 6.3% decline in the use of hybrid seeds and 4.5% reduction in the use of fertiliser. It is observed that there was a negative impact of HIV and AIDS on the use of inputs. This means that expenditure on agricultural inputs decreased in all the regions. This implies that households were using less agricultural inputs during production. The negative impact of HIV and AIDS on the use of inputs was highly realised in the Shiselweni and Manzini regions.

MITIGATION OPTIONS FOR IMPACT OF HIV AND AIDS ON AGRICULTURE

Due to the negative attributes of HIV and AIDS in respect to illness and deaths, households are thought to switch from labour and agro-input intensive commercial farming to a less labour and agro- input demanding subsistence farming and this may result in less household incomes and food availability. However, some increment in crop production was observed in the Lubombo and Manzini regions. The increment was mainly attributed to the introduction of nutritional related programmes which encouraged growing of legumes for protein deficiency HIV and AIDS patients.

Household coping strategies aimed at raising income

Income diversification

According to Sauerborn *et al.* (1996) and SAfAIDS (2000) in their study in Burkino Faso and Zambia respectively found that rural households that cannot meet their food requirements, or obtain cash, through agricultural production, undertake a range of income-generating activities such as selling of firewood, brewing millet beer, selling livestock, building fences, handicrafts, tailoring, and petty trade to supplement their income (Sauerborn, Adams and Hien, 1996; SafAIDS, 2000). In Malawi it was reported that households cope by doing ganyu (casual labour). In rural Zambia and Swaziland, some members of rural households were reported to have migrated to urban areas in search of employment so that they can remit some income to their rural areas, while some work in neighbours' fields as casual labour so as to earn some income. Households that do not have the ability to diversify the source of income are particularly vulnerable to the epidemic (Masuku, 2006).

Sale of agricultural produce and use of savings

A study by Kwaramba (1997) as cited by Masuku 2006) reported that in Zimbabwe, the sale of agricultural produce was a dominant coping strategy to raise income to meet additional health costs (Kwaramba, 1997). Similarly, Tibaijuka (1997) in Tanzania reported that households sold bananas (their staple food) in desperation to raise money to meet medical costs. The same studies also indicate that households use up savings to raise money to meet health and funeral costs (Tibaijuka, 1997).

Sale of assets

In Tanzania, it had been reported that households that did not have enough income to buy food or to pay for health care, funeral expenses or education costs sold assets in response to the crises (Tibaijuka, 1997; Rugalema, 1998) . The amount and type of assets disposed vary across

households. Evidence showed that a wide variety of assets, except land, were disposed of to generate cash to pay for medical bills. The range of assets most commonly sold included cattle, bicycles, chickens, furniture, carpentry tools, radios and wheelbarrows. Some households reported pledging future crops to meet immediate cash needs.

Coping strategies aimed at alleviating the loss of labour

Sauerborn *et al.* (1996) as cited by Masuku and Sithole (2009) reported that in Burkina Faso reallocation of tasks among household members was the most frequently used strategy to cope with expected production losses resulting from adult morbidity and mortality (Sauerborn, Adams and Hien, 1996). Children were taken out of school to fill labour and income gaps created when productive adults become ill or were caring for terminally ill patients or were deceased. Rugalema (1998) in a study conducted in Tanzania found that intensive use of child labour was a major strategy typically used by the afflicted household during care provision (Rugalema, 1998). Although children are not directly involved in care provision they are involved indirectly, by fulfilling mothers' and fathers' roles in some domestic and agricultural activities (such as collecting water and firewood and harvesting crops). They also prepare food for the rest of the household, gather food, attend to livestock and run errands.

Studies conducted in Zambia, Burkina Faso, Tanzania, Malawi and Zimbabwe indicated that affected households reported hiring labour and draught power to meet their production requirements (Masuku, 2006). Labour was hired to meet the needs of the most labour-constraining activities, namely land preparation, weeding and harvesting. However, hiring labour depends on the availability of income to pay the workers. Only households with a stable income or source of remittance were able to hire labour and draught power. Some households had to pay the labour in kind, e.g. using maize or other commodities. Poor households relied on free labour from relatives and supportive and sympathetic community members.

POLICY IMPLICATIONS

A combined effort of government, non-government organisation, and public-private partnerships is needed to design and implement policies geared towards addressing the immediate health needs of already infected and affected households, and preventive methods to reduce the transmission of the HIV virus. Alongside health related policies, support related to promoting increased agricultural production of nutritious food crops that are less labour intensive among the affected households is needed. Such policies may include agro-inputs grants and subsidies, and encouraging effective agro-input markets especially in the rural areas. Other policies thought to be relevant to the current situation in this review include government and NGOs

focus on therapeutic feeding and home based care for the chronically ill in vulnerable; increased accessibility and use of ARVs, and promotion of health and nutritional education related to HIV and AIDS from extension workers to rural households.

CONCLUSIONS

The findings suggested some positive relationship between HIV and AIDS, and farm production and food security. The findings indicated that HIV and AIDS had a substantial negative impact on agriculture and food security. The pandemic is blamed for reduced investment and re-investment in agricultural production as most farm incomes were spent on paying medical bills and financing funerals. Moreover, livestock was being sold for incomes with less if any replacement, and thus making households more vulnerable to high risks of food insecurity and poverty. Loss of important farming skills was observed as a result of chronic illness and deaths related to HIV and AIDS. All these negative effects caused by HIV and AIDS are thought to be partly responsible for the declining agricultural production in Swaziland. The HIV and AIDS pandemic was also blamed for exposing households to acute livelihood vulnerability levels with a direct affects food security.

Development policies related to improved nutrition among HIV and AIDS suggest increased agricultural production as one cheaper means of achieving more health HIV and AIDS patients with a positive living, reduced HIV and AIDS mortality, reduced absenteeism and loss of labour, sustainable productivity, improved household incomes, and achieving rural economic growth in the positive direction.

This review suggests that the methodology, the results and policy implications recorded thereof in this study are still relevant to the current situation when compared with the recent published reports including Whiteside and Henry (2011), CIA-Swaziland (2012), United Nations-Swaziland (2012), Baiyegunhi and Makwangudze (2013), Bicego *et al.* (2013), Dorwad (2013), GoSz and WFP (2013), and CDC-Swaziland (2013), among others (Bicego *et al.*, 2013; GoSz and WFP, 2013; CDC, 2013; CIA, 2012; United Nations-Swaziland, 2012; Whiteside and Henry, 2011; Baiyegunhi and Makwangudze, 2013).

WAY FORWARD

To achieve the stated recommendations and policies, more information should be generated regarding the impact of HIV-AIDS on agricultural productivity through research. Based on the present research and review findings, further work should be carried out to determine the actual pressure and contribution of HIV- AIDS on agricultural manpower, agricultural family labour, ability to replicate and transfer traditional and sustainable agricultural technologies to the next

generations. More research that is detailed should be carried out to estimate the impact of HIV-AIDS on different agricultural enterprise productivity, food security, and the general national development. A combination of research findings and dissemination of results is thought to contribute towards the development and implementation of appropriate policies related to improved health and food management as well as community-based development programme, among rural small-scale farmers households.

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