



Effects of Agricultural Input Assistance on Households Affected by HIV/AIDS: A Case of Chirumanzu Communal Area

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Abstract

This study was designed to ascertain the effect of humanitarian and developmental aid programmes on vulnerable households affected by HIV/AIDS. The study looked at the effect of NGOs-donated maize seed and fertilizer packs to the HIV/AIDS affected households using wards in Chirumanzu district of Midlands province in Zimbabwe as a case study. This was done by comparing the land-use and output of maize, household income, farming assets and number of the main livestock types for the affected households before and after they received agricultural input assistance. The results from this study showed that agricultural inputs were a limiting factor to the households that are affected by HIV/AIDS. Provision of input packs enabled the households to increase cropping land by incorporating land that was not longer being utilize. In the process they managed to increase their agricultural maize production which resulted in increase in their welfare. Following the findings of this study, it is recommended that government and donors should support the vulnerable households through the provision of agricultural inputs which is a better way of achieving poverty alleviation in the medium to long term for the vulnerable households. However, for this to be achieved effectively, the support to the households affected by HIV/AIDS should be holistic including other forms of support like medical, palliative and other socio-economic support.

Keywords: Development aid, HIV/AIDS, Agricultural inputs, NGO, Welfare, Zimbabwe

Introduction

Zimbabwe is one of the countries among other sub-Saharan countries that have been seriously affected by the HIV/AIDS pandemic with the prevalence rate estimated at 26.5% in 1997 but dropped to 14% in 2010 (UNGASS, 2010). About 60,000 people are estimated to be dying from HIV/AIDS related illnesses every year (UNGASS, 2010). Zimbabwe is experiencing a terrible loss of labour and skills through this pandemic (FAO, 2006). Zimbabwe has a high number of orphans in proportion to its

population with one in every four children (24%) mainly due to AIDS (ZIMSTAT, 2009). HIV/AIDS creates a poverty vicious cycle where both the consequences and root causes of the epidemic are one and the same, that is, poverty, food insecurity and malnutrition. HIV/AIDS has caused a reversal of these trends in the most severely affected countries, particularly in sub-Saharan Africa.

FAO studies done in Southern Africa indicate evidence that poor households goes even to the extent of incurring debt in order to meet additional health costs, funeral expenses, amid other immediate expenses (FAO, 2006). More than 60 percent of people in Zimbabwe reside in rural areas and depend on rain fed smallholder

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agriculture as the main source of livelihood (Muir, 2004). The welfare of the households affected by HIV/AIDS is compromised. The welfare here is measured in terms of income farm assets which include livestock and farm implements (Mishra *et al.* 2002). HIV/AIDS affects more of these households through its impact on the availability of the assets that are required to undertake agricultural production because affected households have to dispose some of these assets to get money to look after the sick relative's medical and nutrition requirements and at the same time to meet the household's needs. As a result, HIV/AIDS affected household are left without any meaningful productive asset, the household might not be able to revert back and restore their former productivity and food security status without any external assistance (ZIMVAC, 2010). In addition, since members of the affected households have to spend more time looking after their sick household member suffering from the prolonged illness, HIV/AIDS affect the household's ability to generate income from agriculture. In this case productive labour is diverted to care for the sick. Affected households, and in particular female-headed households, reduces the total area under cultivation due to labour shortages (Kwaramba, 1997). Furthermore, stigmatization due to infection can limit the household's social linkages and networks, thus limiting access to resources (Van Lierre, 2002).

The widespread loss of active adults disrupts mechanisms for transferring indigenous farming methods, knowledge, values and beliefs from one generation to the next. This has serious implications on agricultural and livestock production. In addition, the pandemic erodes gendered-local knowledge. Death of the man usually means the disappearance of knowledge and skills related to maize and cotton production, whereas the death of the woman affects the household's knowledge on legume production (Drimmie, 2002). The burden of the care of sick adults might cause productive duties to be neglected or children to be taken out of school (Kajawu and Mwakiwa, 2006). In most cases many orphans are not taken in by extended families and thus burdened with adult responsibilities, such as putting food on the

table, long before they are mature enough (Barks-Ruggles, 2001).

The overall effects of HIV/ AIDs on agriculture is reduced production and productivity as labour and other basic resources for farming such as purchased inputs are compromised. In Indonesia, Waridin, 2013 noted that elasticity coefficients for farm inputs were positive (i.e. land 0.739, labour 0.497, and seed 0.163) implying that as larger the land size, the production will increase and fertilizer was also positively influencing food-crop production (coefficient 0,084). Farmers who utilized K fertilizers were able to have larger productions as compared to others. It was indicated that input availability is the most important aspect for developing strategy of farming, performance of food crop farming was closely related to inputs availability and its distribution. Mahadeb and Shwu-En (2012) observed in South Asian Countries, the decline in wheat production was due to decline in both yields and area under cultivation, as such they recommended an urgent need to develop a program that can help to revive the yield growth of wheat such as provision of high yielding variety seeds along with subsidized inputs as a policy option to improve the competitiveness of wheat production in the country thereby attracting farmers to allocate more land to wheat production. These outcomes implied that any reduction in key resources to farming is likely going to induce a decrease in production and affect household welfare.

The impact of HIV and AIDs on agricultural dependent households has attracted the attention of various governmental, non government developmental and humanitarian organizations playing different roles in trying to assist the affected households. Various programmes and projects have been implemented ranging from agricultural, medical to socio-economic programmes on a humanitarian basis. The agricultural programmes come in mainly two forms: food aid and agricultural input programmes. Food aid, a form of humanitarian aid, is just giving households a pack of food such as grain and pulses and it is mainly to cover the households short term food requirements, thus pronouncing setback to such type of assistance. On the other hand agricultural input

programme programmes are a form of development aid, is advantageous because it is aimed at medium to long term food security of the benefitting households. Under developmental programmes, the HIV/AIDS affected households are usually provided with input aid in the form of mainly seed and fertilizer. In most cases the seed is for hybrid maize and in cases where the households are in an irrigation scheme they are provided with vegetable seeds (Rohr *et al.*, 2004). In Zimbabwe, the Non-governmental organizations which include Care International, World Vision Catholic Relief Services, Plan International, Citizens Network for Foreign Affairs and other international and local NGOs have contributed to improved fertilizer use by training and establishing agro-dealers in smallholder areas in addition to agricultural inputs provision (Rusike *et al.*, 1997).

There are success stories noted elsewhere in capacity building interventions for farming households such as those affected with HIV/AIDS. In a similar study by Ayanwale and Adisa, 2012, non-beneficiaries of Farmer Empowerment Programme (FEP) in Osun State, Nigeria had lower incomes when compared with their beneficiaries' counterparts. It was further observed that poverty incidence, depth and severity as well as the poverty gap index were lower among beneficiaries of FEP than non beneficiaries. The higher income and lower poverty indicators of the beneficiaries compared to non beneficiaries was indicative of the potential of the FEP to improve the livelihood of the respondents and lift them out of the poverty trap.

Despite the frequency of intervention programmes through input subsidies and grants in Zimbabwe, little is known about their efficacy. The agricultural input distribution is assumed to contribute to an expansion of the cropped area but the HIV/AIDS affected households, but unfortunately there has been no independent data to ascertain such gains. This is because the inputs that are distributed could be misused by the households beneficiaries. In addition, the households might not the requisite capital to put the inputs distributed to good use. Some cases of improper inputs that were distributed to vulnerable households have been

reported, although there is no data to dispute such claims. Despite no confirmation of gains and problems associated with agricultural inputs programmes, each year as the crop season approaches, these programmes are simple started afresh, so that the NGOs can be seen to spend the funds allocated by their donors. This research intend to address the issue on the effectiveness of agricultural input aid and look at the household level of impact of fertilizer and seed donations on maize productivity and general livelihoods. The study used Chirumanzu communal area, Chiranzu District of Midlands Province in Zimbabwe as a case study to show the effects of donor funded agricultural input programme on the livelihoods of HIV/AIDS affected households. Masvingo province has a population of over 1.6 million (Zimstat, 2012).

Materials and Methods

The Study Area

This research was carried out in Tatonga Wards 1 and 2 in Chirumanzu District, Midlands Province which lies in Natural Farming Region 3 of Zimbabwe. It is located to the central east of the province. Chirumanzu district has a population of 81,000 whilst Ward 1 and Ward 2 have populations of 4,030 and 3,825 respectively (Zimstat, 2012). Ward 1 has 1,042 households whilst Ward 2 has 903 households (Zimstat, 2012). The main activity of the district is agriculture. Inhabitants of this district survive mainly through the cultivation of crops such as maize, groundnuts and rapoko. Chirumanzu is characterized mainly by sand and clay soils with some very few portions covered with loam soils and this requires large amounts of fertilizers to boost production. Due to high costs of inputs such as seed and fertilizers and unavailability of labour, some HIV and AIDS affected households among other vulnerable households have not been able to meet costs thereby leaving the fields uncultivated. This has attracted the attention of various organizations such as Care International, CADEC and Oxfam now embarking on input donations in the area in the form of chemical fertilizers, maize and groundnut seeds.

Sample Size Selection, Data Collection and Analyses

This research focused on vulnerable households affected by HIV/AIDS. The sample was drawn from a list of households with members who had joined Tatonga Home Based Care Program (THBCP) after testing positive for HIV virus and undergone counselling. The households ranged from child-headed to single-headed families and their occupation was mainly through small scale farming in Chirumanzu district.

A list of household heads was collected from THBCP. This program consisted of 365 families. Of the 365 families, 200 families had received input assistance from NGOs. From the list of the households that had received input assistance, 101 households were randomly selected. A structured questionnaire was used to collect data from these selected households. Data that was collected included the demographic and socio-economic characteristics of the households. This data included number of members in the household; sex of the household head; marital status of the household head; number of livestock, farm implements land under maize, output and income obtained in 2004/05 (before donations) and 2009/10 (after donations) seasons; source of inputs for the 2009/10 season.

Data was processed, cleaned and entered into computer for analysis. In turns comparative analysis using independent t-test and paired sample t-test were used to ascertain the implications of input donations on household welfare. In this case a comparison analysis was done to compare number of livestock, number of

key farming implements, maize output and income realized before agricultural inputs donations (2004/05) and after input donations (2009/10). Based on these results, appropriate recommendations were then made accordingly.

Results

General Characteristics of Respondents

Sex and marital status of household heads:

Only 39% (N=101) of the households heads were males while 61% of the households heads were females (Table 1). The majority of household heads were widowed/widower (69%), with more widows (49%) than widowers (20%). This outcome emphasis the dominants of females among vulnerable households. It is even worse when someone is a widow, since woman are usually disadvantaged in accessing resources. According to the UN Secretary General’s Task Force Report on Women, Girls and HIV/AIDS in Zimbabwe (2004), as the death toll from AIDS is mounting many widowed women are experiencing dispossessions of land in rural areas. Women often do not have marriage certificates or other documentation to protect their rights (and wills are rarely drawn up). A study by Brent *et al.* (2003) in Namibia revealed that households where husbands had died of HIV/AIDS-related illnesses are disadvantaged. The traditional practice of taking land away from the widow and children continued and, in extreme cases, their livestock are also taken. From the results, about 13% were unmarried household heads mainly composed of children and 18% were married (Table 1).

Table 1: Sex and Marital Status of Key Household Member

Marital Status	Males		Females		Total
	Frequency	Percent	Frequency	Percent	
Married or living together	12	12%	6	6%	18%
Never married including orphans	7	7%	6	6%	13%
Widowed/widower	20	20%	49	49%	69%
Total	39	39%	61	61%	100%

Source: Survey data, 2011

Education : About 44% of the household heads had secondary education, 38% primary education, 12% tertiary education and the remainder with no education at all (Table 2). This results shows that the majority of the household head were literate.

Table 2: Highest Level of Education Attained by Household Head

Education Level	Frequency	Percent
No education	7	6.9%
Primary level	38	37%
Secondary level	44	44%
Tertiary level	12	12%
Total	101	100%

Source: Survey data, 2011

Farming Practices

Maize cropping area over time: Table 3 shows the size of land under maize in both seasons of 2004/05 and 2009/10. The majority of the households, comprising of 47.5% cultivated a total area of less than one hectare in 2004/2005 season compared to only 32% in 2009/10 season indicating a reduction of households using less

than one hectare in maize production. About 27% cultivated between 2-3 hectares of maize in 2004/05 season while 36% were in the same range in 2009/10 season indicating an increase in area of maize cropped in this range. Maize area of over 3 hectares was attained by only 25% in 2004/05 season compared to 32% in 2009/10 season (Table 3).

Table 3: Total Size of Land Cultivated Under Maize in Both Seasons

Hectares	2004/05 cropping season		2009/10 cropping	
	Frequency	Percent	Frequency	Percent
<1 hectare	48	47.5	32	32
1-2 hectare	27	26.7	36	36
>2 hectare	26	24.7	33	32
Total	101	100	101	100

Source: Survey data, 2011

Procurement of inputs: Table 4 show input sources and usage for the 2009/10 cropping seasons. When a comparison is made on the source of inputs, making a ratio of donated over bought: maize seed has a ratio of 1.31; AN fertilizer has a ratio of 1.38; and Compound D has a ratio of 1.75. This shows the major source of the inputs was made up of donations, with a greater of proportion of donations realized in the

Compound D fertilizer. From the table, the great majority of the donated seed was sown and households would leave an average of 4.4 kg for the next season which is even more than the quantity retained from the last season. Seventy percent of top dressing fertilizer donated was applied whereas basal fertilizers applied were far below the mean quantities donated. This was mainly attributed to the late arrival of this input.

Table 4: Input Sources and Usage (mean quantities in kgs)

Input (kgs)	Source			Use	
	Bought (own)	Retained from last season	Donated	Planted/Applied	Remaining
Maize seed	9.8	1.1	12.9	22.4	4.4
AN	55	5	76	59.3	14.5
Compound D	20.1	-	35.2	24.9	36.6

Source: Survey data, 2011

Input donations: Farmers received input donations packs from various organizations such as OXFAM, CARE, and MASSO and each

organization was offering a standard package of inputs as indicated in Table 6.

Table 5: Input Donations (mean quantities per household in kgs) for 2009/10 season

Donor	Received (kgs)	Planted/applied (kgs)	Remaining (kgs)
OXFAM seed	10	8	2
AN	100	89.2	10
D	25	10	15
CARE seed	15	10	5
AN	70	65.3	5.9
D	20	20	-
MASSO seed	12	11.2	0.8
AN	50	50	-
D	50	-	50

Source: Survey data, 2011

Impact of Input Donations on Maize Production

Comparison of Maize Output for 2004/2005 and 2009/2010

Table 6 below presents results that compare mean output of maize per household in tonnes

obtained in 2004/05 season and that of 2009/10 season. In order to see if this contribution made by the donated inputs was significant, an independent t-test was then conducted and results are presented below.

Table 6: Paired Sample Tests: Mean Comparison of Maize Output for the Seasons 2004/05 and 2009/10

	Before donations 2004/05	After donations 2009/10	t-value	Significance
Maize output (Tonnes)	1.589	2.144	-3.569	0.001

Source: Survey data

The result shows that there was a very significant increase in maize output realized in 2009/10 season when the donations of maize seed were made to the vulnerable households as compared to the 2004/09 season ($t=-3.569$, $p<0.01$; Table 6). This shows that the agricultural input donations were effective in increasing agricultural output of the vulnerable households in Ward 1 and Ward 2 of Chirumhanzu district of Midlands province in Zimbabwe.

Welfare Impacts of Input Donations

To evaluate the welfare impacts of the agricultural input donations, livelihoods of the vulnerable households were evaluated by looking at the average incomes obtained, total number of assets and livestock acquired by

beneficiary households before and after donations. Here we are assuming that the income, farm implements and livestock are indicators of being better off in terms of welfare in the rural areas (Mishra *et al.*, 2002). The following assets have significantly increased in 2009/10, after the donations as compared to the 2004/05 season before the agricultural inputs donation: hoes, chickens and goats. All these are significant at 5% except for chickens which are significant at 1% level. The vulnerable households were also able to have more income realized mostly from their agricultural production ($t=0.321$; $p<0.05$) according to Table 7. However, ploughs and number of cattle are not significant. This is a reasonable result given that these are major and expensive assets which would require significant investment and can

only be acquired in the medium to long term. Nonetheless, besides these two assets (cattle and ploughs) the result indicates that the agricultural

input donations significantly contributed to the increased welfare of the vulnerable households.

Table 7: Paired Sample t-test of Mean Income, Assets and Livestock

Variable	Mean before donations	Mean after donations	t-value	Significance
Level of income (USD)	4.35	7.18	0.321	0.049**
Number of hoes	1.23	3.02	0.302	0.041**
Number of ploughs	0.33	0.33	-0.012	0.423
Number of cattle	0.33	0.33	-0.012	0.423
Number of goats	1.67	2.14	-0.428	0.03**
Number of chicken	1.73	4.23	-0.497	0.000***

Source: Survey data, 2011

** significant at 5% level, *** significant at 1% level

Discussions

The Impact of Input Donations on Productivity of Smallholder Farmers

The results have shown that the donations of agricultural inputs by the NGOs in Ward 1 and Ward 2 of Chirumhanzu district were actually required by the vulnerable households as shown by that the source of majority of inputs in the 2009/10 were made up mainly donations. In addition, the vulnerable households actually used the inputs in their fields. This is evidenced by increased area used when a comparison was made before the agricultural donations were made and after the donations were made. Since the households did actually use the inputs and not abuse the inputs by selling them somewhere else to cover for looking after sick relatives, shows these inputs were a necessity to the households. It also shows agricultural inputs were a limiting factor to agricultural production by the vulnerable households. In addition this might also show the increase in life saving anti-retroviral therapy success story in Zimbabwe which enabled the households to shift their requirements and necessities from palliative care to agricultural production. This is because the respondents in this study were chosen from a home based care programme who actually receive antiretroviral therapy amongst other interventions. When an individual is under ARV therapy, her or his productivity can be restored. UNGASS (2010) indicates an improvement of individuals receiving antiretroviral therapy in

Zimbabwe for example there was a 50% increase between 2009 and 2010 (UNAIDS, 2011).

The results showed that the vulnerable households managed to increase the area they were cultivating as a result of the agricultural input donations. In addition, the mean output of the two seasons revealed before and after the donations, has shown that an increase in the output was realized after the donations. This shows that the seed donations increased the maize output for the vulnerable households in Ward 1 and Ward 2 of Chirumhanzu district. Seed distribution contributed to an expansion of cropped area whilst fertilizer presumably increased the production levels and productivity. If households did not receive these inputs, they would have simply planted less land and their output would not have been increased. The increase in production was achieved through opening up of farming on abandoned plots and increasing in hectrage. Scarcity of seed and fertilizers before the program led to less land under cultivation and subsequently lower output, since the households did not have inputs given the devastating effects of HIV/AIDS on them (Kwaramba, 1997). This outcome concur with Maramanyika in 2008 who noted that provision of crop input packs enabled more farmers to increase their land under cultivation and yields. ICRISAT (2004) further noted that fertilizers offer an average of 60% yield gain in maize. Similar observations were also noted by

Waridin, 2013 who emphasized the importance of improved inputs in boosting production and productivity of farmers. The outcomes from literature and the current study proves the potential for production and productivity increases through use agricultural inputs.

Comparative Evaluation of Livelihood Status of Supported Households

Three indicators of livelihoods or welfare analyzed were changes in the levels of asset and livestock ownership and changes in incomes. Our results show that the vulnerable households managed to significantly their incomes, assets (in form of small livestock and farming implements) after they got agricultural inputs aid. It can be explained that increased income was realized from increased agricultural production which was made possible from increased access to inputs by the vulnerable households which were availed through the agricultural development aid. This means that households benefited from donated inputs and have therefore managed to improve their farming incomes which they would now use to acquire more assets, paying school fees and supplementing household food requirements. The above results show that the number of mechanical assets such as the average number of hoes acquired after the 2009/10 season had significantly increased from those acquired after the 2004/05 season. This same applied for chicken and goats. These have significantly increased since they are quite affordable and can easily be bought by these households. However, for bigger assets like cattle and ploughs, it would require more time and significant amounts of money to be acquired. Ayanwale and Adisa, 2012, has similar outcomes from Osun State in Nigeria. The study proved that non-beneficiaries of Farmer Empowerment Programme (FEP) in Osun State, Nigeria had lower incomes when compared with their beneficiaries' counterparts. It was further observed that poverty incidence, depth and severity as well as the poverty gap index were lower among beneficiaries of FEP than non beneficiaries. . The higher income and lower poverty indicators of the beneficiaries compared to non beneficiaries was indicative of the potential of the FEP to improve the livelihood of the respondents and lift them out of the poverty trap. Thus intervention programmes though

input support is a key strategy to improve livelihoods and welfare of vulnerable farming households.

Conclusion and Recommendations

This study has shown that agricultural inputs are a limiting factor to the households that are affected by HIV/AIDS. When these vulnerable households have this limiting factor removed, they can manage to increase land that was not longer being utilize and put under productive use. In the process they can manage to increase their agricultural production. This will result in increase in their welfare. However, this will only be achieved in conjunction with other programmes like antiretroviral therapy, palliative care, etc. Otherwise, even if the households are given agricultural inputs in the absence of antiretroviral therapy and other supporting programmes (although this should be further ascertained), they might sell the inputs to meet the medical and other households needs. Following the findings of this study, we therefore recommend that government and donors should support the vulnerable households through the provision of agricultural inputs, a form of development aid. The assistance through provision agricultural inputs provides a better way of achieving poverty alleviation in the medium to long term for the vulnerable households. However, for this to be achieved, the support to the households affected by HIV/AIDS should be holistic including medical support. This would enable the households to shift their requirements from medical to developmental needs. Only in such cases will these vulnerable households use development assistance effectively to improve their welfare.

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