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LinkS project case study
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The impact of HIV/AIDS on farmers' knowledge of seed: a case study from Chókwè District, Gaza Province, Mozambique

Background

CHÓKWÈ DISTRICT, GAZA PROVINCE, MOZAMBIQUE

War, famine, disease and labor migration have featured prominently in the history of southern Mozambique's Gaza Province. In the mid 19th Century a seven year civil war sparked by the death of the monarch who controlled the Gaza kingdom was accompanied by famine and a virulent epidemic of smallpox which ravaged the population of the south (Newitt, 1995). The chaos of that civil war led to the first large-scale movements of migrant labor to South Africa which undermined the social and economic structure of the kingdom that was eventually defeated by the Portuguese and became part of Mozambique. History tends to repeat itself and over a century later another civil war which only ended in 1992 again severely disrupted the life of the predominantly rural population forcing people to flee to the relative safety of towns and to neighboring countries as refugees.

Chókwè District like the rest of Gaza Province has not been spared from these catastrophes. Agriculture in this semi-arid environment is problematic except in the Limpopo River valley where fertile alluvial soils and the availability of perennial water reduce the likelihood of crop failure because of drought, but in 2000 the risks associated with crop production in these low-lying areas were once again highlighted when massive flooding of the Limpopo valley killed both people and livestock, and caused widespread destruction of crops. The unpredictability of agriculture and

the lack of alternative employment opportunities have continued to make labor migration to South Africa an attractive livelihood strategy for many rural households, but just as smallpox decimated the local population in the last century HIV/AIDS is having a similar impact on people today. Labor migration is thought to contribute to the particularly high HIV prevalence rates in the district.

HIV/AIDS

Mozambique is ranked among the 10 most HIV/AIDS affected countries in the world with an average HIV prevalence of 15%, but is yet to feel the full impact of the epidemic as rates are still increasing. The Food and Agricultural Organization of the United Nations predicted that between 1985 and 2020 Mozambique will lose over 20% of its agricultural labor force to HIV/AIDS and that the demographic profile will alter radically as the 15-49 year old age group is worst affected and average life expectancy declines. Nearly 57% of Mozambican adults between the ages of 15-49 who are living with HIV/AIDS are women. The gender disparity is most striking in the 20-24 year age group, where women with HIV outnumber men by four to one (UNFPA 2002).

Post war resettlement and continued labor migration between Mozambique and the Southern Africa region - which has among the highest HIV prevalence rates in the world - has fuelled the epidemic. As migrant workers move back and forth to neighboring countries, families are



separated and sexual networking tends to be extensive, increasing the risk of HIV transmission. As a result HIV prevalence is higher in the central and southern regions of the country where labor migration has for long been an important livelihood strategy. According to the Ministry of Health HIV prevalence in Chókwè have risen from an estimated 15.1% in 2000 to 22% by 2002, and this is felt to be an underestimate as few people go for testing as there is a strong cultural taboo surrounding the disease.

AGRICULTURE

Food security for the vast majority of the mainly rural population in Mozambique is underpinned by farmers' local knowledge around seed and seed management. Over 90% of these farmers are small-scale producers reliant mainly on family labor. Women perform the bulk of agricultural tasks producing food primarily for family consumption as well as for sale. Most small-scale farmers depend on local seed systems that include the use of own-saved seed or seed sourced through informal channels including relatives, neighbors, friends and local markets. The maintenance of these systems depends on acquiring and transmitting knowledge on seeds and seed management from one generation to the next.

Women play the key role in seed selection and conservation and are the ones responsible for handing down seed and associated knowledge including the adaptability of local varieties to the prevailing agro-ecological conditions. Local seed systems have generally been considered as resilient but the rapidly changing socio-economic environment and natural disasters are putting these systems under strain. A new threat in the form of HIV/AIDS now also needs to be considered.

The study

Despite the importance of agriculture in Mozambique and the impact of HIV/AIDS on the population, there is very limited research into the impact of HIV/AIDS on agricultural practices in the country. This study was undertaken to investigate the likely impact of HIV/AIDS on farmers' knowledge of seed, seed management, and the flow of seed-related information from one generation to the next. In recognition of the fact that women are the key retainers of local agricultural knowledge and are worst affected by HIV/AIDS, the study also aimed to identify the gender and poverty dimensions of these processes.

Fieldwork was carried out between September and November 2003 and took place in three phases. In the first phase government officials and representatives of locally based Non-Governmental Organizations (NGOs) involved either in agriculture or in HIV/AIDS prevention and mitigation were interviewed in Chókwè town. In the second

phase Participatory Rural Appraisal (PRA) techniques were used at community level (including semi-structured interviews with focus groups, time lines, community mapping, wealth ranking, and prioritization exercises) to design semi-structured interviews to gather detailed information from individuals on their own personal experiences related to traditional seed knowledge and knowledge transfer. In the third phase 30 households were interviewed in each of three villages chosen to represent the major agro-ecologies within Chókwè District (see Table 1). The lack of medical and statistical information, as well as the strong socio-cultural taboos surrounding discussion of HIV/AIDS made it difficult to select households directly affected/not affected by the disease. For the purposes of the study two groups of household were considered:

1. Those caring for the terminally ill, caring for orphans, or headed by widows or widowers classified as affected households (AHH).
2. Other households that do not have these features classified as non-affected households (NAHH).

In each village 20 interviewees were selected by the 'snowball sampling' technique and 10 interviews were specifically directed to AHHs. The research team

TABLE 1 DETAILS OF THE VILLAGES AND NUMBER OF HOUSEHOLDS INTERVIEWED IN EACH VILLAGE

Village name	Total number of households in each village	Agro-ecology	Number of households interviewed
Thlawene	200	Rainfed cultivation on upland areas	30
Maxinhe	500	Rainfed cultivation on upland areas and in the floodplain of the Limpopo river basin	31
Massavasse	1175	Cultivation within the Limpopo irrigation scheme	29

opted to interview 64 women and 26 men given the greater participation of women in agriculture in these communities.

Individual interviews provided both qualitative information on personal experiences and quantitative information regarding the number of crops and farmer

varieties used by different categories of household, as well as variations in access to different sources of information on seed. Results from the fieldwork were cross-checked and discussed with local informants - including community representatives - at a workshop in Chókwe town. A further workshop was held to present the research findings to policy makers in the capital Maputo in February 2004.

Characteristics of surveyed households

The PRAs conducted in phase two of the study were used to identify wealth indicators so that households could be classified into one of three wealth groups; rich, middle and poor. To control for different indicators between villages, a set of six indicators were selected for each wealth group with a household having to satisfy a minimum of four indicators to be classified within the respective wealth group. These indicators are presented in Table 2.

Rich	Middle	Poor
>25 cattle	Up to 25 cattle	No cattle
Plough	Plough	No plough
Brick house	Wooden hut/zinc roof	Hut with straw roof
Hire labor, paid in cash	Hire labor, paid in kind	Do not hire labor
Motorized transport	Non-motorized transport	No means of transport
Cultivate > 16 ha	Cultivate 1-16 ha	Cultivate 1 ha or less

Of the 90 households interviewed, 64 were female headed and 26 male headed. These were classified into wealth categories and the results are presented in Table 3.

The most obvious finding from the classification of male and female respondents into wealth categories is the higher percentage of poor female respondents when compared to their male counterparts. There were very few rich respondents, either female or male which is perhaps somewhat surprising given the supposed importance of migrant labor in southern Mozambique. However there has been a long-term reduction in formal sector employment opportunities, especially in the South African mines, and

Social class	Women		Men	
	No	%	No	%
Rich	2	3	2	8
Middle	16	25	14	54
Poor	46	72	10	38
Total	64	100	26	100

an increasing number of migrants cross the border illegally in search of unregulated job opportunities that are less remunerative. There is evidence to suggest that this has a negative impact on remittances.

Information was collected on selected household characteristics for both female- and male-headed households and statistical comparisons made to determine if there were any significant differences using analysis of variance techniques. The results are presented in Table 4.

Female-headed households were significantly smaller and had nearly half as many agriculturally active members when compared with their male-headed counterparts. They also had significantly less irrigated land and had lost more crops in the recent past. Access to irrigated land reduces the likelihood of crop failure in this semi-arid environment and allows farmers to grow a much broader range of crops including vegetables that are easily marketed. These data reinforce the gender dimensions of poverty.

As HIV/AIDS develops people become weak and emaciated and require care. To try and assess the extent of HIV/AIDS in the study area, households were asked whether they were taking care of the sickly and of orphans. At the same time they were also asked about selected seed management practices. These data are presented in Table 5.

When households were asked if they were taking care of the sickly this question only referred to those that are presently sick and not to others who might have already died. During the five days that the research team worked in Maxinhe (where residents openly admitted that HIV/AIDS is taking a heavy toll) three deaths were reported suggesting that asking households about those who are currently sick tends to underestimate the scale of the epidemic. The most striking difference between female- and male-headed households was in the percentage taking care of orphans with nearly half of all female-headed households doing this compared to just over a quarter of their male-headed counterparts. According to local government officials in the area, most orphans under five are living with their grandparents while older children set up their own households. In a joint study by the District Directorate for Women and Co-ordination of Social Action (DDWSA) and the NGO Terre des Hommes, 55 child-headed households were identified in just six villages.

The difficulties of associating cause and effect in the case of HIV/AIDS on farmers' knowledge of seed, seed management, and the flow of seed-related information from one generation to the next cannot be underestimated. The use of female-headed households as a proxy to HIV/AIDS affected households does not differentiate between those households that are headed by divorcees/single parents where the partner may still be alive and unaffected by HIV/AIDS, and those headed by a widower where the death of a spouse is AIDS related. In the latter case it is not inconceivable that the spouse might have died from other

TABLE 4 SELECTED QUANTITATIVE CHARACTERISTICS OF SURVEYED HOUSEHOLDS

Household characteristic	Mean (n = 90)		Significance
	Female-headed	Male-headed	
Household size	6.3	8.1	Significant (p = 0.05)
Agriculturally active members	2.6	4.0	Significant (p < 0.01)
Dependents	3.8	4.1	Not significant
Area of cultivated lowlands	1.1	1.5	Not significant
Area of cultivated rainfed areas	1.2	1.2	Not significant
Area of cultivated irrigated land	0.7	2.3	Significant (p = 0.03)
Number of crops lost in recent past (number of crops now – number in the past)	-0.1	1.8	Significant (p = 0.01)

TABLE 5 SELECTED QUALITATIVE CHARACTERISTICS OF SURVEYED HOUSEHOLDS

Household characteristic	Percent reporting	
	Female-headed	Male-headed
Take care of the sickly	16	17
Take care of orphans	47	27
Use recommended time of seed selection	63	65
Have access to modern methods of information dissemination	63	65
Use purchased chemicals to preserve seed	13	15

causes. The use of two other proxies to try and identify AIDS affected households - households caring for the sickly and households caring for orphans – also have problems. For example households caring for the sickly might exclude households that have already lost somebody to AIDS as already mentioned, and households caring for orphans whose parent(s) died of AIDS related illnesses might only be indirectly affected as the orphans or other members of the household might not have HIV/AIDS themselves. A breakdown of the households interviewed based on the three proxies described above is presented in Table 6.

The most striking feature is the high number of households caring for orphans. This suggests that there are a large number of households that have ceased to exist and where care of the surviving members has been assumed by other relatives/friends. To what extent was seed-related information passed on before these children became

orphaned, and will their adoptive parents fulfill the same role as the biological parents? Until medical and statistical information on HIV/AIDS is improved, something that will only occur once the strong socio-cultural taboos surrounding discussion of the disease are broken down, it is difficult to draw more definitive conclusions than have been presented in this case study. However the high number of households caring for orphans and the existence of child headed households as reported by the DDWSA suggests that there is significant loss of seed-related information taking place and that there are a number of conclusions and recommendations that can be made with the potential to mitigate the impact of HIV/AIDS.

Impact of HIV/AIDS on seed security

The types of crops grown, and how they are cultivated are influenced both by the natural environment and other factors. Interviewed farmers mentioned that male migration, loss of assets during the civil war, the 2000 floods, and recurring droughts have all resulted in loss of traditional crops and varieties. For example in Maxinhe local farmers said that since the floods of 2000 they have lost access to sesame, certain varieties of pumpkin, and pigeonpea seeds. Importantly interviewees argued that the loss of a traditional variety itself leads to gradual erosion of knowledge around that seed. Knowledge of seeds is generally acquired through learning by doing – as children accompany their parents to the fields, as girls assist their mothers in seed selection – and the absence

TABLE 6 PROFILE OF AIDS AFFECTED HOUSEHOLDS ACCORDING TO LOCATION (AHH)

Village	AIDS affected households					
	Male interviewees	Female interviewees	Female-headed households	Households headed by widows	Households caring for the sickly	Households caring for orphans
Thlawene	5	26	17	3	5	15
Maxinhe	10	20	11	11	4	10
Massavasse	11	18	10	5	5	7
Total	26	64	38	19	14	32

of a certain variety means that knowledge around it can no longer be transmitted. Farmers in each of the three villages were asked about the number of crops previously grown, and those that are currently grown to try and assess if there has been a reduction in the range of crops grown over time and this information is presented in Table 7.

The data show that the range of crops grown has declined over time which can potentially have a negative impact on food security especially given the difficulty of the growing environment outside of the irrigated areas. Young (1977) has described how sorghum and millet were gradually replaced

TABLE 7 PERCENTAGE OF INTERVIEWEES GROWING A DIVERSE RANGE OF CROPS OVER TIME ACCORDING TO LOCATION

Location	No. of crops previously grown			No. of crops currently grown		
	< 5	6 – 10	> 10	< 5	6 – 10	>10
Maxinhe	13	60	27	23	43	33
Thlawene	6	65	35	35	26	39
Massavasse	10	52	38	21	43	31
% of total	10	59	31	27	39	34

by maize as women tried to compensate for male labor loss, a fact confirmed by interviewees in Chókwè who said they stopped growing these crops due to the labor demands involved in protecting the crop from birds. Although HIV/AIDS was not mentioned as a factor in the loss of traditional crops and varieties, clearly the fewer agriculturally active household members in female-headed households (see Table 4) will affect what crops are grown. The loss of local knowledge is hard to predict as orphans who are cared for by grandparents will hopefully have learning opportunities from their adoptive parents who tend to be older and hence more knowledgeable about seed management, but child-headed households without ready access to parents or grandparents will not be so fortunate.

Interviewees were asked about where they obtained information on seed-related issues and the results are presented in Table 8.

The vast majority of all farmers, irrespective of gender, age or social class, obtain information on seed management from parents, relatives and neighbors. Interestingly travel or migration also ranks very highly probably because of the long history of labor migration from this area to neighboring countries that have well developed commercial farming sectors where improved seeds are readily available. On-farm experimenting, NGOs/rural extension and media all feature significantly except that poorer households make less use of these channels than their richer counterparts. As AHHs are poorer and are less able to rely on parents and relatives to access information, their assumed inability to access information from alternative sources is worrying.

Conclusions

This study has shown that HIV/AIDS is just one of several factors that can result in the loss of traditional crops and varieties and erosion of knowledge around seed. Because of the continuing socio-cultural taboos surrounding discussion of the disease, it is hard to separate the effect of HIV/AIDS from other factors, but it is safe to assume that the loss of agriculturally active adults and the increased number of orphans will deprive children of learning opportunities from other family members. What the study was not able to discover was whether child-headed households are able to acquire seeds of traditional crops and varieties and the associated knowledge to cultivate these crops and then to save seed for future plantings. Interviewed farmers stressed the importance of learning by doing and the loss of those with the knowledge to do will result in reduced learning opportunities for younger generations. Where orphans are cared for by grandparents the transfer of seeds and knowledge between generations is probably less of a problem than for child-headed households, but as the prevalence of HIV/AIDS increases the number of child-headed households will surely increase.

In light of the above conclusions, some preliminary recommendations are made towards ensuring that seed system interventions contribute to strengthening community resilience in the face of HIV/AIDS and avoid undermining local seed systems:

TABLE 8 ACCESS TO SEED-RELATED INFORMATION ACCORDING TO GENDER, AGE AND WEALTH GROUP

Sources of information	Social Difference						
	Gender		Age Group		Social Class		
	% of Women	% of Men	% of Adults (<45 years)	% of Elders (>45 years)	% of Rich	% of Middle	% of Poor
Parents, relatives & neighbors	92.2	96.2	100.0	85.7	100.0	96.7	93.3
Travel or migration	90.6	96.2	91.7	92.9	100.0	90.0	92.9
Employment on commercial farms	17.2	11.5	16.7	14.3	0	13.3	17.9
On farm experimenting	48.4	42.3	41.7	52.4	75	50.0	42.9
NGOs and rural extension	59.4	65.4	56.3	66.7	100	70.0	53.6
Media	14.1	38.5	12.5	31.0	75	33.3	10.7
School	4.7	3.8	4.2	4.8	25	3.3	3.6

- Information on local seed characteristics and management practices should be systematically recorded, stored in a form that is easily accessible to rural producers and disseminated. For example this could involve the network of primary schools, making use of the new primary school curriculum which opens a space for integration of local teaching materials (e.g., through the use of school gardens; inviting elderly people to talk about seeds and seed management at the school)
- Seed System Profiles being developed for disaster-affected districts make an important step towards recording information around local seed systems. These should be further developed to include more information on the social factors involved in seed management
- Measures should be taken to increase the availability and accessibility of local varieties, or seed from other sources but well adapted to local agro-ecological conditions. Seed Fairs sponsored by the Mozambique Government with support from FAO are a useful contribution, but should not just be run following natural disasters as chronic food and seed insecurity is likely to increase with increased HIV/AIDS prevalence rates. Information exchange between farmers and extension workers and visits to other areas with similar agro-ecological conditions could facilitate this process
- Research and extension should give greater focus to the improvement, in situ, of local varieties that even though less productive than improved varieties in ideal conditions present less risk and require less labor. The specific time and labor constraints faced by women should be taken into account
- Government and NGO rural extension programs should further facilitate the development of seed multiplication fields within local communities using traditional seed varieties
- Government institutions and NGOs should further develop practical training programs based on local agricultural knowledge that are easily accessible to

out of school youth, girls and boys, including orphans. Revision of the adult literacy curriculum presents another opportunity for integrating useful and accessible agricultural information

- Improved varieties developed outside the community could be pre-tested in the community together with local farmers – both women and men - allowing them to select the preferred qualities
- The new varieties should be developed taking into account the resource and time constraints faced especially by women farmers and should be introduced using in situ physical demonstrations. The example of SARRNET, a program for multiplication and dissemination of cassava and sweet potato cuttings - should be examined to see how this could be replicated to include a broader range of crops and varieties

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<p>About ICRISAT</p> <p>The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political, international organization for science-based agricultural development. ICRISAT conducts research on sorghum, pearl millet, chickpea, pigeonpea and groundnut – crops that support the livelihoods of the poorest of the poor in the semi-arid tropics encompassing 48 countries. ICRISAT also shares information and knowledge through capacity building, publications and information and communication technologies (ICTs). Established in 1972, it is one of 15 Centers supported by the Consultative Group on International Agricultural Research (CGIAR).</p>	<p>Contact</p> <p>ICRISAT-Patancheru (Headquarters) Patancheru 502 324 Andhra Pradesh, India Tel +91 40 30713071 Fax +91 40 30713074 icrisat@cgiar.org</p> <p>ICRISAT-Nairobi (Regional hub ESA) PO Box 39063, Nairobi, Kenya Tel +254 20 7224550 Fax +254 20 7224001 icrisat-nairobi@cgiar.org</p>	<p>LinkS Project Gender, biodiversity and local knowledge systems for food security</p> <p>The LinkS project works to improve rural people's food security and promote the sustainable management of agrobiodiversity by strengthening the capacity of institutions to use participatory approaches that recognise men and women farmer's knowledge in their programme and policies. The LinkS project has three main activity areas, which are capacity building and training, research and communication and advocacy. The project is funded by the Government of Norway.</p>	<p>Contact</p> <p>Gender and Development Service (SDWW) Sustainable Development Department Food and Agriculture Organisation of the United Nations Viale delle Terme di Caracalla 00100 Rome, Italy Fax: (+39) 06 570 52004 Email: links-project@fao.org Website: www.fao.org/sd/links/gebio</p>
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