A workshop on `The longitudinal impact of HIV/AIDS on agriculture and rural livelihoods in Uganda’ 13\textsuperscript{th}/14\textsuperscript{th} April 2011, Mukono, Uganda

Framing Paper

Introduction

In the mid-1980s, south west Uganda and adjacent areas were often referred to as “the epicentre of the African AIDS epidemic”. There were very real concerns at that time about the effects of HIV on agricultural systems and, specifically, on food production and food security. Much of the commentary on the impacts of HIV/AIDS on reducing household food security has assumed a direct linear connection between AIDS-related illnesses leading to a loss of household labour, resulting in reduced area of land cropped and causing a fall in crop production resulting in food insecurity (Seeley et al. 2010a). It has also assumed that HIV/AIDS is the primary causal factor leading to this food insecurity. Recent research in southern Uganda, supported by the Food and Agriculture Organisation of the United Nations, suggests that not only are there household specific circumstances that need to be considered but there are wider circumstances and other drivers of change in the rural economy that need to be factored into building an understanding of household specific cause-effect relations in relation to HIV impact. This understanding is essential for the formulation of policies to mitigate the impact of HIV on agriculture as well as the implementation of projects aimed at supporting sustainable livelihoods.

The purpose of this workshop is to bring together researchers engaged in work on the longitudinal impact of HIV, and related areas, to present findings from recent research and discuss policy implications, in order to guide the support of international organisations, as well as national Governments, for affected communities. The workshop participants will also develop pointers for future research and the development of future research collaborations.

In this paper we provide an overview of agriculture in southern Uganda, a summary of the research findings from the FAO/ESRC/MRC-supported study which looked at the impact of the HIV epidemic on agriculture in southern Uganda, and an overview of research on the impact of food storage on human health, looking specifically at aflatoxin and HIV. We outline some of the policy issues we may consider and key areas for research that might be developed through collaborations in the future. We conclude with an outline of the sessions planned at the workshop.
Background to agriculture in Southern Uganda.¹

Agriculture in the area bordering Lake Victoria is rain-fed and based on small-holder family farms. The main crops grown are bananas, coffee, beans and a variety of vegetables and root crops. However, over the last 20 years the area under production of different crops has altered significantly.²

Various types of banana form the main component of agricultural production in these regions although production has been declining since 1990 (Bekunda 1999; Ebregt et al., 2004; Talwana et al., 2000). There has been an increase in the proportion of the exotic Pisang Awak (Kayinja) grown relative to the most widely grown local variety, Nabuse (Matooke) (Bariyo, 2009). Pisang Awak is used for brewing beer and appears to be more resilient to pests than Nabuse (Talwana et al., 2000, Edmeades et al., 2008) and the East African Highland banana (Mbidde) traditionally used for making juice and beer (Gensi et al. 1994).

The production of maize, beans, and cassava has increased in the area in the last 20 years (Gibson et al., 2005, Adipala et al., 1993). These crops were not traditionally a significant component of diets in the region however as banana production has declined these crops have become more common as staples. There has been a trend towards the use of improved maize varieties which increase yields significantly but deplete the soil quality over time (Sserunkuuma, 2005, Gibson et al., 2005), soil that has already been depleted, according to Bekunda (1999), because of poor soil management where these crops have been grown on former banana plantations.

Beans are a popular and key protein source because they mature quickly (David et al., 2000). Cassava is an annual crop with a relatively high tolerance of adverse growing conditions such as drought and poor soil fertility. Labour requirements for cassava are high at planting, when tackling disease and at harvest time but lower during its growth cycle which takes around one year (Fermont et al., 2010). The labour requirements have decreased to some extent by the increased use of disease resistant varieties (Kizito et al., 2005, Kizito et al., 2007). However, despite the increase in improved varieties, yields have decreased since the early 1990s (Ebregt et al., 2004).

Groundnuts and sweet potatoes are the other two major food crops grown in the region and remain a significant component of the agricultural mix. Like cassava, these crops are more resilient and less labour intensive than some other crops, such as beans (Aritua et al., 1998, Gibson et al., 2008, Ebregt et al., 2005).

There have also been significant changes in the production areas and varieties of cash crops and livestock holdings in the Districts over the past 20 years. There have been declines in the production areas per household of previously significant components of agriculture: cattle, bees, and English/Irish potatoes (Vega-Sanchez et al., 2000, Hunter et al., 1993,

¹ This review is drawn from Taylor et al. (2011).
² Such changes are not new to the area. Thirty years ago cotton was an important crop, but is now no longer grown.
Haslwimmer, 1994, Ocaido et al., 2009, Mugisha et al., 2008, Ogaba and Akongo, 2002). Meanwhile there have been increases in the contributions of vanilla, forestry and pig keeping to the region’s agricultural economy (Buyinza and Mukasa, 2007).

Coffee remains the most important cash crop in the area. However, production has declined significantly since the mid-1990s (Baffes, 2006) when coffee hit record low prices on the world market. Farm sizes in the area have declined (Bekunda 1999; Fermont et al. 2008; Seeley et al. 2010b).

This rich agricultural mix, coupled with a growing off-farm sector, seems to have played a major role in the resilience exhibited by the sector through conflict, drought and disease (both human and crop/animal) in recent years, the investigation of which was the focus of the FAO-supported research project.

**Background to the FAO/ESRC/MRC-supported study**

The overall purpose of the FAO/ESRC/MRC-supported study was to analyse the trajectories of households and communities affected by HIV and AIDS and the impact of HIV and AIDS in Uganda on agriculture and rural livelihoods over the past 20 years, in order to understand the long-term impact of the epidemic and to contribute to the design of policies and programmes for impact mitigation.

We analysed data from the General Population Cohort (GPC) of the MRC/UVRI Uganda Research Unit on AIDS (in Masaka District) and the Rakai Community Cohort Study (RCCS) of the Rakai Health Sciences Programme (in Rakai District), both of which have been in existence for over 15 years, and in which demographic data have been collected on an annual basis. The GPC covers 25 contiguous villages (20,000 people of all ages) and the RCCS covers 50 villages (12,000 and 16,000 people aged 15-49) scattered throughout Rakai District. We also draw on new data collection from 300 households, undertaken for this study on the farming systems in the GPC and RCCS study areas.

Our findings suggest that there are drivers of change in the rural economy, beyond the agricultural system, that are important in understanding the impact of HIV. Time, for example, is important: when the AIDS-related illnesses or death occurred and to whom, and how long the illnesses continued, can all affect the short and long term impact on household members. If prolonged illness followed by the death of a male or female household head coincided with a crop pest outbreak then there may be very negative outcomes with respect to household food security, at least in the short and medium term. In addition household members may respond to each specific effect of HIV, or other short or long term crisis, through adaptive practices (such as diversifying livelihood options or changing household membership composition), thus weakening the strength of the implied cause-effect relation between one effect and another. These potentially may set the household onto a different trajectory whereby the effects of an AIDS-related illness are progressively moderated and thus lead to household recovery from the immediate effects. Household members are also likely to draw on social resources from outside their immediate household to assist, blurring the lines between one household and another. This last point is important and raises the
issue of the utility of the household as the unit of analysis, because the links to other family members and social networks are not taken into account when the individual household is the sole focus.

Not only have political, social and economic changes occurred in the two Districts, following the establishment of the present government in 1986, but the study area has also experienced long term and dynamic trends in agriculture, both crops and livestock, driven by price and disease as summarised above. In addition, there has been a long term trend of the increasing importance of non-farm income, thus reducing the significance of on-farm production for food security. The HIV-epidemic needs to be seen within this broader context of change, and not viewed in isolation.

The conclusions drawn from the data to be presented at the workshop are specific to the location of study and should not be generalised beyond this context without careful consideration. With those caveats in mind we suggest that the evidence does not show a direct linear connection between HIV and outcomes across all the factors we explored. Accordingly HIV impacts have not been as direct, or as catastrophic, at the community level as had been anticipated. What this indicates is that the wider context is important, with HIV being one factor among many that has shaped household livelihood trajectories. Households, and more particularly the wider social networks which link different households, may be much more resilient on the whole than had been expected.

There may not be a clear causal link between HIV and change in agricultural systems and practices but that does not mean that there are not important questions that remain about the interface between agriculture and HIV or human health more broadly. Emerging research, for example, suggests another important area of investigation related to HIV and agriculture. The HIV epidemic may be exacerbated by the uncontrolled exposure of people in developing countries to food-borne aflatoxin (Williams et al. 2005). This is an area which will be explored during the workshop because if this is so decreasing exposure to aflatoxin could be an important intervention in reducing the severity of the epidemic. This is explained briefly in the next section.

**Food storage, aflatoxin exposure and HIV**

In 1988 Hendrickse and Maxwell suggested that the interaction between HIV infection and aflatoxin exposure demanded urgent attention, based on their research with intravenous heroin users in Britain who were injecting with drugs contaminated with aflatoxin B. They did not follow-up on their research suggestion and it was not until over a decade later that Tim Williams and colleagues (2005) suggested that aflatoxin could promote HIV transmission and progression because of the effects of aflatoxin on immunity and nutrition. Other research on aflatoxin and human health provides a background for this work: the work of Chris Wild, Andy Hall and colleagues on the impact of aflatoxin on child health and development in West Africa in the 1980s and 1990s, being one example. In 2008 Williams and colleagues found that high aflatoxin `appeared to accentuate some HIV associated changes in T-cell phenotypes and in B-cells in HIV-positive participants’ (2008: 1).

In Uganda, Archileo Kaaya has developed a body of work on aflatoxin in different crops (maize, ground nuts and cassava) and the impact on human health, building on research
undertaken in the 1960s and 1970s which showed a link between liver cancer and aflatoxin. While much research has been undertaken on the ‘malnutrition-infection complex’ (Chevalier et al. 1996, Scrimshaw and SanGiovanni 1997 among many others) and there is an increasing body of work on HIV and nutrition (Drain et al. 2007, Pribram 2011, for example) there have been fewer studies of the adverse effects of toxins in food stuffs and HIV susceptibility and progression. Detailed work on the potential links between HIV progression and aflatoxin has not been undertaken in Uganda (or East Africa) nor has any research been done on the possible impact of aflatoxin on the health of people living with HIV and taking Anti-Retroviral Therapy (ART). This area appears to be of particular importance as the numbers of people infected with HIV in Africa continues to grow while increasing numbers of people need access to ART to sustain their lives, lives that may be affected by comorbidities related to their HIV infection and ART (see Palella et al.2006 and Lewden et al. 2004, for example). We know little about the role food quality may play in co-morbidity and disease progression.

Workshop sessions

As noted above, agricultural systems are dynamic and the systems in southern Uganda as in many other places have undergone many changes over the last 50 years. We will begin the workshop by providing this historical context as well as describing the current makeup of agriculture and broader rural livelihoods in the area. The next session will be made up of presentations from the FAO-supported study, briefly described above. We will describe our findings and offer possible explanations for the results, for further discussion by workshop participants. The next session will focus on food storage, taking the case study of aflatoxin to look at the interaction between HIV and contaminated food stuffs. While this session will serve to highlight the research agenda related to aflatoxin, it will also provide the opportunity to explore whether other food pathogens/HIV interactions require further exploration. These three evidence sessions will set the scene for discussions on the policy implications of the research and recommendations for a future research agenda.

Policy and research issues to be considered

While we expect workshop discussions to stimulate innovative thinking around the policy and research agendas, some topics are listed below to provide a starting point for discussions. We are interested, in particular, to explore some of the questions raised by the findings of the FAO/ESRC/MRC-funded study described above so that we can build on that body of knowledge.

Policy

- What are the implications of national and regional agricultural development policies for rural communities affected by the HIV epidemic and other crises?
- Are agricultural policies and policy makers sensitive to the social inequalities resulting from HIV and other crises (including access to resources, dependency ratios)?
• Which non-agricultural policies affect agricultural production (education and health, for example) and how might synergies be enhanced and detrimental effects reduced?

• What roles can decision-makers in central and local government, civil society and academia, as well as development workers play in putting policy in to practice that supports agriculture-based livelihoods?

Research

• What role has livelihood diversification played in mitigating the impact of HIV in affected families and communities and how might benefits of diversification be supported?

• Many households have dissolved, or reformed, as a result of HIV-related morbidity and mortality, what has been the effect on the well-being of surviving household members (including educational outcomes)?

• How has nutrition and food quality affected the health and well-being of people living with HIV, those taking ART and household members where someone is infected with HIV or has died as a result of infection.

• Are food storage practices in Uganda having a detrimental effect on the health of people living with HIV? Might aflatoxin be playing a role in susceptibility to infection and disease progression?

Participants are invited to add to this list before the workshop, as well as during the two days of deliberation.

References


Chevalier P, Delpeuch F & Maire B. (1996) Le complexe "malnutrition-infection" premier problème de santé publique chez les populations défavorisées (The "malnutrition-
infection" complex, the most widespread public health problem in underprivileged populations. *Médecine et Maladies Infectieuses* 26(3): 366-370.


