Comment on AIDS-related morbidity, mortality and the environment

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This short note reviews some literature and discusses some research issues around households, rural communities and the environment in Sub-Saharan Africa in the context of a *generalized* AIDS epidemic. It is intended to be informative, provocative, and a useful starting point for researchers and students new to the topic (with lots of references and readings listed below). Discussion spans concerns with methodologies around household level studies, the livelihoods approach, the conservation sector , and specific sectoral concerns (kitchen gardens, indigenous plants, water, fisheries, pastoralists).

At the start, it is important to differentiate HIV and AIDS: HIV refers to infection with the virus (which is itself evolving in a natural process, and is not just one virus, and individuals can be re-infected). Infected individuals often do not know they are infected. Often it takes up to 7-10 yrs, before conversion to AIDS (full-blown Acquired Immune Deficiency Syndrome, manifested through various clinical symptoms, opportunistic infections such as TB, as well as visible in lab tests, such as t-cell counts.). In the absence of adequate care and treatment, AIDS has been a death sentence. Anti-retroviral therapy (ART, i.e. treatment) has become increasingly available in Africa since 2002/3 but is still out of reach for many, especially in rural areas.

With about 26 million person affected in Sub-Saharan Africa alone (www.UNAIDS.org), the projected burden of the disease will be large for years to come, and the burden and phenomena of mortality and morbidity and their impacts merit much more attention.

It is also important to appreciate that AIDS is not simply another shock to rural livelihoods, and that AIDS morbidity and mortality differ from illness and death due to, for example, malaria. Barnett & Whiteside (2001) and many others point out that HIV and AIDS differ because (among other reasons)

- The **long incubation** period means the disease remains invisible while it spreads and the burden cumulates
- **Stigma:** which manifests itself in a range of forms of denial (silence, unwillingness to speak, from village to national levels), discrimination (land-grabbing, loss of work, loss of income as vendors are shunned) and psychosocial stress (depression).
- The **lack of treatment** or even adequate care for the ill, aggravating the burdens on others and speeding up the progression to late-stage AIDS.
- Since infection was equated with death, before rapid tests, good care, and treatment, people greet the disease with **fatalism**
- **Concentration** in a household: because of sexual transmission as the primary mode of transmission in Africa, it enters through the male or female head, and spreads. The “ABC” approach (abstinence, be faithful, or use a condom) approach to prevention was incompatible with aims of fertility and inacceptabilty of condom use within marriage, thus the disease has spread rapidly.
- The disease affects the **community**, through burdens of care, funerals, orphans, and elderly and breakdown of networ and work groups; as well as stigma

- Since it affects adults, we see a growing number of **orphans (**and other "vulnerable children") which poses a challenge to long-term viability of rural livelihoods, as children are pulled out of schools, lose land and inheritance, move to other relatives, and face pychosocial burdens.

The Livelihoods Approach that Alex deSherbinin lays out in the background document is extremely relevant to appreciating how AIDS can and does intersect with rural resource use and management through the five forms of capital (human, natural, physical, financial, social), and how many agencies and researchers are interpreting what is happening in rural areas. A useful document tracing out the links and evidence around this HIV/AIDS-rural livelihoods in some detail is Loewinsohn and Gillespie (2001). This was prepared for the IFPRI research program on AIDS, food security and nutrition (RENEWAL), which is ongoing: www.IFPRI.org

This livelihoods approach links the specific phenomenon of HIV/AIDS with the situation of rural households highly dependent on natural resources (as well as non-farm income, important throughout rural Africa in period of deagrarianization and social change: Bryceson 2000). The Livelihoods approach highlights the multiple points of intersection, potential increased vulnerability to infection, and plausible ways that AIDS can deplete assets and aggravate the vulnerability context (i.e. drought, SAPS, insecurity). Evidence that supports this model arises from dozens of localized, small-scale studies of international agencies, and usually intended to guide specific field interventions (see FAO 1995, FASAZ 2003 and many more from Lesotho to Ethiopia. Unfortunately, these smaller studies lack scientific rigor to allow us to generalize findings from populations/study areas chosen for agency reasons, or seeking the "hard-hit" areas; and to attribute findings to AIDS. More attention is needed to the concept of the "household", but to families and kin networks (extending across space), such as the "cluster approach" tries to do (Donnolly et al 2005). (See Murphy et al 2005 "How do we know what we know…" for some discussion of the methodological issues and current evidence, and please ask for the full table listing studies reviewed)

While the livelihoods model suggests a clear trajectory of decline, and many studies of hard-hit areas find that indeed, households are doing badly, the lack of data—this huge gap in field and survey research-- is remarkable. For a disease that is considered a global pandemic, and a continental emergency--suprisingly modest evidence exists about its nature and impacts in rural Africa. This gap is slowly being filled, but measurement and sampling issues abound.

Some studies capture **AIDS mortality, "**prime-age" (15-45 yrs old) death, sometimes using "verbal autopsy"; as well as some measures of household **morbidity** ("chronic-illness" of some household member, lasting 3 or more months). More problematically, many agency and rapid studies capture impacts through proxies, easier to measure but less directly attributable to AIDS: such as female headship, elderly heads, and the presence of orphans (much of the agency field research). Some observors might imagine it is necessary to clinically verify HIV infection through a blood or saliva test (biomarkers) to gain scientific rigor in attributing impacts to HIV/AIDS. (Some DHS and smaller surveys do include such measures.) These tests however capture only the presence of the virus, and the individual may or not have AIDS, may be affected in other ways (death of spouse) and more importantly data are not linked (for ethical reasons, confidentiality concerns) to other variables that we want to examine, precluding deeper analysis. Biomarker data are thus useful, but not essential, to appreciating the relationship between AIDS, households, and the local environment. They have however been used well to examine negative impacts of HIV/AIDS on school enrollments (Mishra et al 2005). Such tests would help capture the impact of HIV/AIDS on livelihoods, environment, etc. but are insufficient alone and the cost and ethical concerns might preclude their use. (Too much emphasis on the test itself, vs well-crafted survey design, questions, and verbal autopsy, would thus be somewhat misplaced.) (This sidesteps the issue of testing for professionals, such as civil servants in environments and agricultural ministries and to help get counseling and treatment: that is another issue)

The state of the art in survey research is probably the work at MSU's Agricultural Economics research program on Prime-Age Mortality (see Donovan et al, Mather et al 2005, Yamano & Jayne, 2004; and others below, with links to the website). They have conducted surveys in several countries (Kenya, Mozambique, Rwanda), analyzed the data, reflected on methods, and summarized methodological concerns around the use of survey techniques to capture (AIDS-related) adult, prime-age, mortality on rural households (and land use, crops, livelihoods, natural resource use, and other topics of concern to this seminar).

These studies do identify many negative impacts of AIDS (loss of labor, shifts in cropping, asset-stripping), but provide more nuance to the often stereotypical model of household decline. [These build on earlier empirical studies using rigorous sample surveys, careful proxies, and multivariate research techniques to try to isolate the specific effects of AIDS-related illness on households, such as the World Bank studies in Kagera TZ (work by M. Ainsworth, K. Beegle, M. Over). Other reseachers document AIDS related illness and its impacts on productivity through careful tea estate records: Fox et al 2004; commercial plantations by Gabriel Rugalema, or models of workplace productivity, projections of demographic change and labor force size, etc. but are not so pertinent to this discussion on the micro-level.]

Pastoral livelihoods have only recently gotten some attention in relation to HIV & AIDS. At first considered to be at low – risk. Prevalence may be higher, because of circumcision practises, yet little is known of morbidity and mortality due to AIDS and how these might affect their livelihood decisions and resource management (ITDG-EA 2004; Morton 2004).

Given the semi-aridity of much of Eastern and Southern Africa, and the extended droughts, aggravated food crises, the hypothesis of New Variant Famine (de Waal and Whiteside 2004) was put forth to raise concern that AIDS is aggravating food insecurity. Meanwhile, the intersection of AIDS and the water sector is much ignored (exception: Kamminga 2002).

The background paper by DeSherbinin mentions the intersection of poverty with AIDS in rural Africa: Yes, rural and urban poverty are closely aligned with the burdens of AIDS, and each aggravate the other. When considering policy implications of morbidity and mortality, it is important to address chronic poverty: through micro-credit, non-farm employment options, food production, nutrition, rural infrastructure, social services, health care, etc. Unfortunately, this is not an easy task—decades of development assistance have not eradicated poverty (and may in fact have helped to perpetuate it: Crewe & Harrison, 1998; Escobar, 1995). Some of the statements about mitigating the impacts of AIDS have drawn from limited evidence, such as worst-case stories of land-grabbing and evictions, lack of inheritance rights, insecure land tenure. It is possible that some of the concern for AIDS is overstated (i.e. Aliber et al 2004) when many other local cultural and gender factors aggravate insecurities.

Meanwhile, AIDS clearly costs governments (in loss of human resources and $$) that had already suffered cutbacks due to structural adjustment, debt, and "the lost decade of the 1980s" (and ongoing corruption, rent-seeking, etc. as well). These macro-level factors affect environmental change, conservation policy, and resource degradation interact which in turn exacerbate the burden of the AIDS epidemic in rural communities. These interactions confound simple policy formulations and undermine the prospects of small rural poverty alleviation schemes.

The Case of Lambwe Valley, Kenya.

In western Kenya, among Luo communities around Lake Victoria AIDS is a substantial burden (some records indicated extremely high HIV prevalence of over 30% among mothers visiting ante-natal clinics in the late 1990s, although the population prevalence is perhaps 7-15% in this region, and 7% nationally: DHS 2004). Here, the Ruma National Park located in Lambwe Valley, Suba District, harbors **tsetse fly** in

the brush and thicket --but relatively few wildlife and fewer tourists bringing in $ to see the endangered Roan Antelope. Meanwhile, decadeas of confusing policies and changing institutions for the control of tsetse fly populations lead to regular outbreaks of trypanosomiasis that kill off local livestock, especially when water and grazing lands are scarce. The most recent outbreak was 2002/3. With the loss of labor and income to AIDS, more risky behaviors and asset-stripping can result; along with trypanosomiasis, the loss of cows, oxen (for ploughing) and donkeys (for transport, ploughing) further undermine food production and remove any safety net. Severe poverty was a prior condition, further exacerbated by these national level policies and cutbacks in the livestock and conservation sectors which undermined livestock and human health. (Murphy et al 2006 "No Plough, No Bull, No Donkey…").

Nearby (4 km away), the ecosystem of Lake Victoria has been of concern for decades (the introduction of Nile Perch in the 1950s, municipal pollution, and affects the livelihoods of fisherpeople in Uganda, Tanzania and Kenya. The level of poverty due to declines in fish stocks and restrictions on fishing, and expansion of commercial fishing; lead to local scarcity, risky behaviors, and trading "sex for fish" which exacerbates HIV infection. National and regional policies for managing Lake Victoria need to be improved to help fisherpeople dependent on tilapia, omena (for domestic consumption) and nile perch (for export). (Bishop-Sambrook 2004; ELCI 2003; Gori 2005)

Furthermore, the poverty angle –however important -- is not enough to appreciate the larger consequences of AIDS for "**environment"** sector broadly. HIV has entered through the more affluent and mobile educated professionals: teachers, park-guards, civil servants, tourist sector employees, and others involved in environmental education, resource management, bio-diversity conservation. The Africa Biodiversity Conservation Group (ABCG, the Dwasi 2002 study mentioned in the background report and other resources) have begun to document the many real and potential links between AIDS and the concerns for conservation of bio-diversity, categorized broadly as:

- loss of capacity for conservation (of human resources, trained staff, community champions, social structures for NRM, time for CBNRM, diversion of funding: ABCG 2004: see www.abcg.org for the community of practise on this topic)
- increased demand of rural people on forest products, bushmeat, land, etc. within and around protected areas

Unfortunately, little hard data exist. the forestry /NRM sector, the FAO has a series of informational pamphlets and has commissioned research into HIV/AIDS and Malawi's forestry sector (Barany, pers comm); various NGOs and UN agencies are trying pilot projects to integrate HIV/AIDS awareness into conservation projects. The ABCG study report (Dwasi, 2002) is helpful but draws (like so much of the AIDS impacts reseach) from research on three protected areas in Caprivi, Namibia; KwaZulu Natal, SA, and Kabale, Uganda, plus interviews in Kenya with conservation professionals. The COMPASS project documents local-level impacts of AIDS on NRM in Malawi, and community responses (Page, 2002). More work could be done in this area to appreciate the presence of HIV and the impacts of AIDS on the environmental sector broadly; and specifically at the intersection of rural livelihoods, such as challenges to community-based natural resource management, conflicts between people and protected areas (i.e. Ruma National Park vs. Lambwe Valley farmers), or ways in which AIDS unravels leadership of local co-management schemes.

Is there any positive news around AIDS in Africa? It is easy to be dismayed, especially with the stock portraits of elderly widows caring for several orphaned grandchildren (in listserves, news and agency appeals). While true, we find that individuals and communities are responding to the death and burden of care, and increasingly want to "live positively" with HIV: this might be good for local environments and resource management. Some qualitative, in-depth research in western Kenya suggests that HIV/AIDS brings advantages and resources that can help sustain resources for livelihoods and nutrition. HIV/AIDS now receives a great deal of attention through NGOs, UN agencies, and ministries. They bring messages about and assistance in food security, nutrition, techniques of "conservation agriculture" (minimum

tillage), and the value of indigenous crops which have been neglected in recent decades, displaced by exotic kale and other imported varieties (see Africanharvest.org).

Specifically, (organic) kitchen gardens are making a comeback in villages in Bungoma District, Kenya (see Gari 2004; Murphy, Kassam & Kesekwa 2006), as well as in Malawi (documented in the work of Stacia Nordin), and elsewhere in SSA. The long-standing neglect of this bio-diversity, specifically native greens such as spiderplant, amaranth, cowpeas, and grains such as millet and sorghum, means that seeds are hard to find, while irrigation water is a concern. Other obstacles and barriers to local food security and nutrition may undermine these innovative efforts at cultivating a productive, diverse landscape with fewer adults. Lack of knowledge as adults are infected and afflicted with AIDS may undermine seed banking and germplasm conservation and other natural resource management systems, but in fact, little empirical evidence exists so far (Gari 2004; Waterhouse 2004). Community groups seem to be able to fill in the gaps left by deceased or ill adults.

By way of a conclusion, here are some of possible research directions on AIDS morbidity, mortality, and rural livelihoods & environment (with a clear emphasis on rural Africa) that arise from this brief review:

- Go **beyond the household**: looking at extended families across space, and at the village level, use of clusters of households (not to be confused with cluster sampling), to get at inter-household associations, social networks, and community-level impacts (see Drinkwater et al 2005)
- Conduct **longitudinal large-scale population** based surveys of "prime-age" mortality (using verbal autopsy) and chronic illness among adults to ascertain impacts within the larger population (more along the lines of the MSU studies),
- Examining through **long-term detailed case studies** the impacts of AIDS mortality (adult deaths) and morbidity (decreases in productivity) in intensive farming systems dependent on labor/knowledge (ie. revisiting areas described in Conelly and Chaiken 2000)
- further exploratory survey and qualitative research within **pastoralist** communities in low-density, semi-arid zones

And in the applied research domain, some important areas are:

- on **conservation agriculture** as AIDS-mitigation technology: better understanding the diffusion, diversity, and prospects for these approaches to enhance human health and natural resource management in light of asset constraints;
- on **rural water supply** (quality and quantity). Given the importance of water for hygiene (care for AIDS affected) and irrigation (kitchen gardens and livestock); and of water quality for immuno-compromized (HIV+, AIDS, including those on ART), much more research is needed to capture how household/populations affected by AIDS are changing water management and storage systems; and to test and diffuse ways to improve household and community water supply and quality.
- in-depth and rigorous research into the interactions of HIV infection, AIDS mortality and morbidity and **community-based NRM**, co-management and other schemes to balance rural livelihoods and bio-diversity conservation.

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