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HIV/AIDS, FOOD SECURITY, AND RURAL LIVELIHOODS: UNDERSTANDING AND RESPONDING

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Abstract

There is hardly need these days to repeat that HIV/AIDS is devastating African societies and economies, threatening the hard-won human development gains of the past several decades. The changes to the development landscape wrought by AIDS demand a review of existing development actions at many levels, from households seeking to secure viable livelihoods, to policymakers attempting to better understand and internalize the implications of AIDS for their own sectoral goals and strategies.

In this paper, we describe processes of understanding and responding that are needed for HIV/AIDS to be effectively addressed. Key concepts of resistance and resilience are illustrated through a discussion of the two-way interactions between food insecurity and HIV/AIDS, and their implications for the ways in which affected households, communities, and sectors may best respond.

One major set of responses is required from the agriculture sector, as the need to secure and provision food for populations affected by HIV/AIDS is rapidly increasing as the impact waves hit. Food is the first priority of many people affected by the pandemic. We are also beginning to learn more about the crucial role of nutritional status—both in terms of susceptibility to HIV infection and transmission and in terms of the quality and quantity of life of HIV-positive individuals.

A sea change is required—in attitudes and consciousness of what HIV/AIDS is doing at different levels and the pathways through which it moves through societies. Such a new awareness may be facilitated by the use of an 'HIV/AIDS lens'—essentially a tool for reviewing situations and development actions from the perspective of our evolving knowledge of AIDS interactions. The lens will facilitate the development of more HIV-relevant policies and programs of more sectors—and ultimately in larger scale, sustained progress in responding to AIDS. While the specifics will become clear through use of the lens, external support will likely be most effective in the long run where it is directed to preserving and developing institutional capacities to strengthen resistance and resilience.

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Acknowledgments

The authors are very grateful for comments received on an earlier draft from Andrew Tomkins, Robin Jackson, Andrew Thorne-Lyman, and Joseph Collins. This paper draws to some extent on experience the authors have gained in co-facilitating the Regional Network on HIV/AIDS, Rural Livelihoods and Food Security (RENEWAL), currently active in Uganda, Malawi, Zambia, and South Africa. See the RENEWAL website for additional relevant papers: www.isnar.org/renewal.

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1. Introduction

There is hardly need these days to repeat that HIV/AIDS is devastating African societies and economies, threatening the hard-won human development gains of the past several decades. Without decisive action, other developing and transitional societies are at equal risk.

That AIDS is a development problem, not just a health issue, has become a mantra in recent times, but what does it mean in practice? The changes to the development landscape wrought by AIDS demand a review of existing development actions at many levels—from households seeking to secure viable livelihoods, to policymakers attempting to better understand the implications of AIDS for their own sectoral goals and strategies. One of the UN Millennium Development Goals is to "combat HIV/AIDS, malaria, and other diseases." However, it is increasingly clear that—unless AIDS is brought under control—most, if not all, of the remaining outcome goals are unlikely to be achieved.[1] A truly multisectoral approach to addressing HIV/AIDS is essential.

In this paper, we describe the kinds of understanding and response needed for agriculture-, food-, and nutrition-relevant organizations to effectively confront HIV/AIDS. First, we outline some underlying principles needed to understand the variable and changing nature of AIDS epidemics. Such concepts include the variance among different epidemics and the notions of susceptibility, vulnerability, resistance, and resilience. We illustrate these concepts by describing the particular interactions between food and nutrition insecurity and HIV/AIDS, and their implications for response strategies.

Second, we examine the implications of this understanding for the ways in which different people—in affected households, communities, and sectors—may best respond.

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[1] Without making significant headway against HIV/AIDS, the goals of halving poverty and hunger, achieving universal primary education, eliminating gender disparity in education, reducing by two-thirds of child mortality, and improving maternal health will not be reached.

We focus on the particular importance of food and nutrition for the four conventional aspects of response—prevention, care, treatment, and mitigation—and why it is a mistake to compartmentalize these approaches. The imperative and different rationales for multisectoral mainstreaming are then discussed.

Third, we describe a flexible and evolving aid, the HIV/AIDS lens, and the processes through which agricultural and other professionals can employ it to respond more effectively. We highlight the fundamental principles that compose the lens and then illustrate how the lens can be used to review agricultural, food, and nutrition policies and programs at different levels. The paper draws on the experience of countries participating in RENEWAL (Regional Network on HIV/AIDS, Rural Livelihoods and Food Security[2]) where the lens and its uses are being refined. As we make clear, the lens is not a static construct. Rather, its distortions are being reduced through the practice of applying it. Action research by sector organizations is key to this learning process. A recent workshop explored methodological challenges and opportunities in research and evaluation (RENEWAL 2003). Two forthcoming RENEWAL publications will synthesize these methodological issues and describe the development of networks to advance practical understanding.

The experience and illustrations we draw on are primarily from Sub-Saharan Africa, where the impacts of HIV/AIDS are most widespread and severe. Our primary focus is on agriculture, rural livelihoods, and food security, because these are the predominant concerns of most people affected by HIV/AIDS. There is also evidence that the agriculture sector is less able than others to absorb the human resource losses associated with the pandemic. The principles and approach we highlight are, however, of wider relevance and interest, especially where HIV/AIDS epidemics are fast developing.

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[2] RENEWAL is a country-driven initiative, co-facilitated by the International Service for National Agricultural Research (ISNAR) and the International Food Policy Research Institute (IFPRI), and described in www.isnar.org/renewal.

2. Understanding HIV/AIDS

Many Different Epidemics

There are common features among HIV/AIDS epidemics, but there are important variations as well. One is that HIV/AIDS epidemics are long-wave phenomena, though the fact that there are several waves—of HIV infection, opportunistic infections, AIDS, and death followed by the impact wave—may be less well understood. A few countries appear to be over the peak of the first wave, including Uganda, Thailand, and Brazil. But no country has yet reached the crest of the AIDS mortality wave and the impact wave is only just beginning for the majority of affected countries. This fourth wave, which may include social and political destabilization, will engulf countries for decades to come. It will demand massive responses at many levels.

Yet, while HIV/AIDS is now global in its spread and devastating where it becomes generalized, it is important not to forget that what we confront is not a single, unicausal epidemic, but many differentiated ones. The determinants of HIV's spread are rooted in poverty and in inequality, and these create local situations of risk (Farmer 1999). Infection rates and trends are sometimes found to vary dramatically, often over quite short distances (Ngwira, Bota, and Loevinsohn 2001). The patterns of population movement and interaction, and the locales where sex is transacted determine risk. Both are diverse in nature and change with time. Access to food and livelihoods are often fundamental to people's choices. Similarly, the consequences of AIDS-linked illness and death, which reverberate through households, extended families, communities, and beyond, are shaped by features of agricultural and livelihood systems—for example, access to labor-saving technologies or the nature of social safety nets—and by preexisting patterns of food insecurity.

AIDS Is Endogenous to Livelihood Systems

Not only is HIV/AIDS variable in time and space, it is also affected by a range of actions and interventions. HIV is endogenous to livelihood and agricultural systems that are shaped by human actions at many levels. "We are all affected" is a common slogan. But it is equally true that we all affect. Policies and programs of many sorts affect—for example, patterns of movement and access to livelihood alternatives—and hence may influence, positively or negatively, susceptibility to HIV or vulnerability to AIDS' consequences. Not all these links are immediately obvious; indeed some may be counterintuitive. For example, stimulating the creation of labor-attracting rural industries and plantations that exploit local comparative advantages and resources has been a pillar of development policy for decades. That the programs that pursue it may inadvertently create conditions that hasten the spread of HIV in rural areas and ultimately do more harm than good may not be an easy idea to accept.

Learning about HIV/AIDS, Food, and Livelihoods

To confront vector-borne diseases like sleeping sickness or river blindness—diseases that added greatly to the burden on rural Africans and obliged them to alter the way they use the land—the knowledge that needs to be fostered is of a specific kind. These diseases are restricted to particular habitats and habitat conditions and affect particular groups disproportionately. But generalized epidemics require generalized understanding. Because the situations of HIV/AIDS risk are widespread, shaped by diverse and locally specific factors and influenced by many persons' actions, a broad range of people acting at different levels needs to become more conscious of how what they do may be enhancing or reducing risks. They will need more than simple messages and guidelines to be effective. They must be able to look at situations—the features of food insecurity in an area, for instance—and their own actions (e.g., marketing policies in the case of a ministry analyst or the management of local grain banks for a community group) and assess how they are relevant to HIV/AIDS risks. The task of nurturing that

broad-based capacity seems daunting, but we are by no means without examples and experience on which to draw.

There is first the growing understanding that many Africans have gained of the causes and consequences of HIV/AIDS. They are recognizing and avoiding situations of HIV risk and reducing AIDS' consequences. There is good evidence of this happening in a few countries, particularly Uganda, where discussion has been comparatively open and widespread, encouraged by the long-standing commitment of national leaders and underpinned by many people's direct experience of AIDS at home and at work (Low-Beer et al. 2000). Several methods have been designed to focus and strengthen this learning. One such is *Stepping Stones* (Welbourn 1998), which enables people to identify the sources of risk they confront and decide what to do to diminish or avoid them. It is a group-based approach that can be adapted to different situations and that draws on people's own experiences.

Second, there is growing experience with the management of change in agriculture. Farmers and other resource users in many developing areas are confronting rapid and unprecedented changes in the systems they manage. The causes are diverse, including the collapse of established markets, extreme weather events, the emergence of new pests or diseases, and the degradation of and sharpening conflict over critical natural resources. In a growing number of such situations, research and development workers have sought to support farmers in rethinking their decisionmaking. Their methods typically comprise two main elements: a learning process and a tool or aid of some sort designed to help farmers grasp something that is deemed to be critical about the systems they manage. Usually, it is an aspect or aspects that are poorly visible or difficult to make out or express. In pest management, for example, it is often the existence and role of the pest's natural enemies and the capacity of crops to compensate for a degree of pest damage if they are otherwise healthy and well nourished. Farmers learn about these principles by discovery, experimentation, and through learning-by-doing in groups where planning, action, and reflection are shared (Loevinsohn, Berdegué, and Guijt 2002; van der Veen 2000). Whether consciously or not, the methods promote constructivist

learning and "problem-solving transfer"—the ability and confidence to devise solutions for new problems that may be encountered (Mayer 1999). The Farmer Field School is perhaps the best-known and most widely employed example of such an approach, but it is by no means unique, and farmers are not the only professional group to benefit from them (Loevinsohn 2002). These methods share several traits in common with HIV/AIDS education approaches like *Stepping Stones*, including group discussion and reflection on immediate experience. In both contexts, the focus is not on messages but on principles and their practical application.

Enabling people to link the personal and professional realms is key to securing a broad-based capacity to confront HIV/AIDS epidemics. Beyond individual choices and behavior, agricultural professionals need to understand the wider determinants related to rural livelihoods and food security that shape the risks people face. At best, this is happening now only very slowly. Even in Uganda's favorable social and policy environment, most farmers, agricultural researchers, development workers, and policymakers do not see how what they do for a living may contribute to HIV/AIDS prevention or mitigation. We need to design efficient learning processes for these professionals.

This is not a sideshow of the struggle with AIDS; indeed it may well prove central. Historically, changes in the wider determinants that shape people's risks of major diseases have often made large contributions to changes in health. For example, in Europe, North America, and among white South Africans, the prevalence of tuberculosis fell precipitously through the final decades of the nineteenth century and the first decades of the twentieth, before effective treatment became available, primarily as a result of improved living conditions and nutrition. The experience of black South Africans, who confronted discriminatory racial policies and whose living conditions deteriorated, was very different (McKeown 1988; Packard 1989). These changes, positive and negative, occurred as unforeseen by-products of broader developments and over a span of decades. In the case of HIV/AIDS, the challenge we face is to bring about an informed and conscious management of those links, with results visible in years.

Susceptibility, Risk, and Resistance to HIV

The HIV/AIDS lens that agricultural, food, and nutrition professionals need builds on the lens that they are learning to use as citizens. Among the common and basic principles that comprise the lens are those pertaining to the biology of HIV. Currently, two routes of infection are dominant in the region: heterosexual contact and mother-to-child transmission (MTCT). Elsewhere and at other times, other routes have been important, such as men having sex with men, contaminated blood transfusions, and the use of contaminated needles in medical injections.

A few concepts can help to understand how food insecurity and rural livelihoods influence these HIV risks.

- *Susceptibility* relates to the chance of an individual becoming infected by HIV. It has two components: (1) the chance of being *exposed* to the virus, which in turn relates to the risk environment and specific situations of risk that the person confronts and the *riskiness* of her/his behaviors (both of which may be related); and (2) the chance of being *infected* with the virus once exposed.
- *Resistance* is the ability of an individual to avoid infection by HIV, either by escaping exposure or, if exposed, by escaping infection.

A number of factors combine to influence behavior and shape risk environments and situations.

- *Asymmetric sexual relations.* The chance of being exposed to HIV is increased where a small number of women have unprotected sex with a larger number of men, or vice versa. Epidemiological models show that such asymmetrical relationships hasten the spread of infection in a population (Garnett and Anderson 1996).
- *Movement.* Where people move into, out of, or between situations of risk, they can contribute to widening the epidemic and raising infection rates in areas or

among groups previously little touched. There would be no generalized HIV/AIDS epidemic if people did not move.

- *Inequalities.* Inequalities of several sorts are central to the risks of exposure that people face (Farmer 1999). Social, economic, and gender inequalities shape the sexual relationships they enter; geographic disparities affect their decisions on movement.

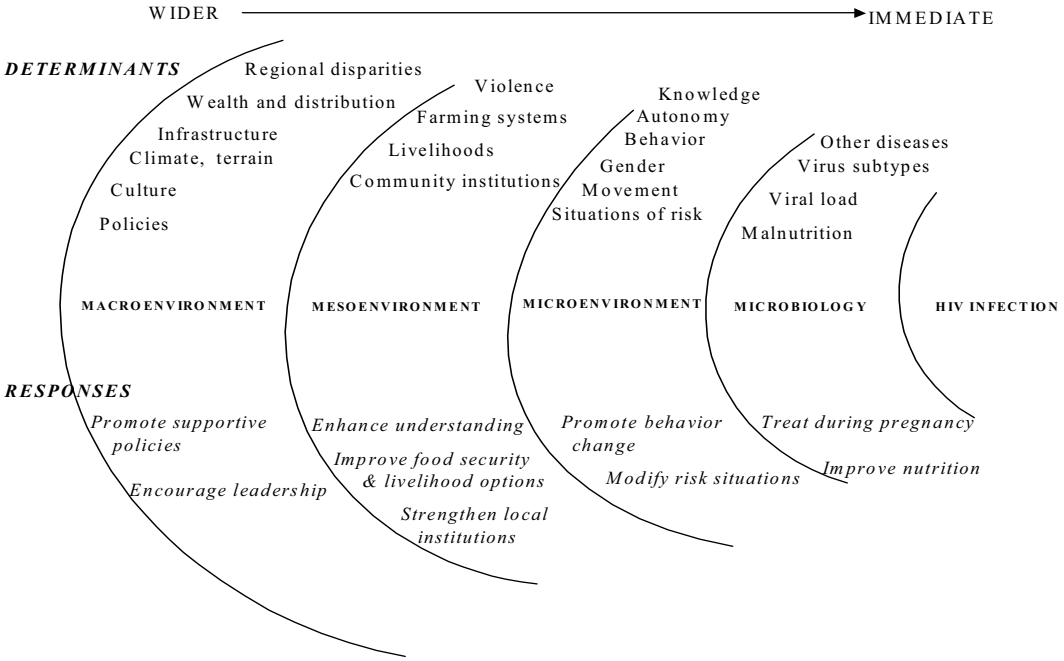
In RENEWAL's early experience working with agricultural professionals to identify the elements of agricultural and livelihood systems that are contributing to susceptibility or resistance in particular contexts, we have found that a generic "map" (Figure 1) is often helpful. The influences that need to be considered are situated on different spatial and social scales. The wider determinants influence the more local ones, leading ultimately to HIV infection. In what follows, we highlight some of what appear on present knowledge to be common determinants and the pathways of their influence in Sub-Saharan Africa. The contributions of livelihoods and food security can be said to end with an individual's exposure to the virus.

Microbiology

At the microbiological and physiological level, the probability that this exposure results in infection is influenced by prior infection, notably by sexually transmitted diseases (STDs) and nutritional status. Micronutrient deficiencies, for example, increase the likelihood of mother-to-child transmission (MTCT) (Piwoz and Preble 2000) and may lower the resistance of the mother's epithelial tissue to penetration by HIV.

It is well-known that malnutrition and infection become intertwined in a vicious cycle (Scrimshaw, Taylor, and Gordon 1968; Tomkins and Watson 1989). When the infection is with HIV, the cycle turns faster, and there are some important HIV-specific interactions (Semba and Tang 1999). Malnutrition, particularly involving vitamin A deficiency, is also associated with an increased risk of genital ulcers and STDs (Semba

Figure 1—HIV/AIDS epidemics: Determinants and generic responses



Source: Adapted from Barnett and Whiteside 2002.

1998), which in turn increases the risk of HIV transmission (World Bank 1993). It has been suggested that HIV may have more opportunities to mutate into more virulent variants in a pool of malnourished hosts (Semba et al. 1994; Domingo 1997). A malnourished person is more susceptible to parasitic infestation (Storey 1993), and chronic parasitosis often leads to chronic immune activation, which in turn may exhaust the immune system and render it less capable of successfully repelling invaders, as well as hastening the transition from HIV to AIDS (Bentwich, Kalinovich, and Weisman 1995).

Mother-to-child transmission of HIV is the second most important route of infection in Sub-Saharan Africa, and the principal risk factor is the health of the mother. Mothers with relatively good immune status are far less likely to transmit the virus to their infants than are mothers with poor immune status (Leroy et al. 2002; Fawzi et al.

2002).[3] This is a major finding with profound implications. Maternal immune status in turn is strongly related to her nutritional status (Tomkins and Watson 1989). We also know that if a pregnant woman is seriously nutritionally depleted—particularly if due to anemia—she is more likely to die in childbirth, with major consequences on the survival of the child (Ross and Thomas 1996). Also, on the child's side, we know that better nutrition before and during pregnancy increases birth weight and improves infant immune status—thus reducing several child-side risk factors too (Allen and Gillespie 2001). This is one fact that has not changed from pre-AIDS times—better maternal nutrition clearly benefits mother and child.

The importance of the environment at all levels in disease transmission was first highlighted by Louis Pasteur, who stated "the microbe is nothing, the terrain everything" (quoted by Stillwaggon 2002). The first level of terrain, as described above and shown in Figure 1, is an individual's nutritional status.

Microenvironment

The microenvironment is that of the individual and the most immediate influences on behavior. In countries where the epidemic is now well advanced, surveys generally find that adults in large proportions know about HIV, how it relates to AIDS, and how infection can be prevented. However, their ability to act on that knowledge—their autonomy—is often constrained (UNAIDS 1999; Malawi 2001a). The subservient status of especially young women appears to be a central feature of the risk environments of southern and eastern Africa. Older men, who are at higher risk of being HIV positive, and who are also more likely to have moved in the past, for shorter or longer periods, are able to dictate the terms under which they have sex with young women. This appears to

[3] Recent data from West Africa and Tanzania illustrate this relationship. In a West African study, investigators reported that postnatal transmission (measured from 6 weeks through 24 months in breastfeeding infants) was 10 to 14 percent in mothers with baseline CD4 counts below 500 (measured in pregnancy), while transmission was less than 3 percent during this same time period among women with baseline CD4 counts ≥ 500 (Leroy et al. 2002). In a Tanzanian study, postnatal transmission risks were 2.13 and 2.99 times greater in women with CD4 counts below 200 and between 200 and 499 cells/μl, respectively, when compared with women who had CD4 counts ≥ 500 in pregnancy (Fawzi et al. 2002).

be behind the widespread observation that HIV infection among 15–19-year-olds is many times higher in women than in men (Malawi 2001b).

Food insecurity further undermines women's autonomy. In many cases, younger and older women feel obliged to find food for their families and will sell sex for cash or kind as a last resort. In northern Tanzania, Gabriel Rugalema (personal communication, 2000) recounts a man telling him: "If my wife goes out in the afternoon and comes back with a bowl of maize flour, I don't ask her where she got it." The authors have heard almost identical words from men in Uganda and Malawi: only the commodity in question and the relationship (wife, sister, or daughter) differed. The mission may be less than voluntary. Near Zomba in South Malawi, a young woman described girls being sent out to find paraffin at 4 p.m. or after dark, during the current food crisis. These links are sensitive, critical, and poorly described.

Besides these diffuse situations of risk, replicated in many places, there are often more focused ones where sex is transacted in hazardous circumstances not far from home. In Malawi and Uganda, these include rural weekly markets and trading centers. In a recent survey in Malawi, informants described these places as important sites of social and sexual contact between rural and urban people, and among people from different rural areas. Market operating times were said in some cases to favor sexual relations more than commercial ones (Bota, Mphepo, and Malindi 2001; Ngwira, Bota, and Loevinsohn 2001). Respondents suggested that if markets opened and closed earlier, some of these risks could be reduced. Marketing and financial arrangements for commodities like tobacco, sugarcane, and fish often draw men and women away from their families for extended periods and were also seen to be situations of risk in rural communities.

Mesoenvironment

More widely, in what can be called the mesoenvironment, are plantations and related agricultural industries. In Malawi and Uganda these typically produce tea, coffee, tobacco, sugarcane, and rice, which are also often associated with situations of significant

risk. Common features that contribute to the risk are high and seasonal demands for labor; workers moving on their own, sometimes from considerable distances and lodged in single sex dormitories; long and often irregular pay intervals; and a dependent population of occasional and/or commercial sex workers from nearby villages or further afield (Ngwira, Bota, and Loevinsohn 2001; Kisamba, Mugerwa, and Nduhura 2003). Ownership structures, the national policy environment, and the economics of the industries are said to be important influences on the persistence of these features.

The inability of local agricultural systems to provide people and especially young adults with adequate livelihood opportunities often motivates their decisions to move, whether to other farming areas, rural industries, towns, or cities on a seasonal or long-term basis. The size of holdings, local practices and customs relating to inheritance, the extent of resource depletion, and the employment possibilities are among the "push" factors in people's decisionmaking. It is important to note that it is not movement per se that puts people at risk of HIV; it is the conditions under which it occurs. Much of the literature in this area emphasizes movement by single adults, "alone and lonely," but little of it addresses the specific rural situations that are of concern here.

Macroenvironment

Finally, in the macroenvironment, a range of factors influence the productivity and sustainability of agricultural and livelihood systems. These include climate, geography, and physical infrastructure such as major road links. Policies of various sorts and the programs that implement them are also situated here and influence risks. Several have been implicated as contributing to the current food crisis in southern Africa, such as the decision in Malawi to reduce the strategic grain reserve (Devereux 2002) and the land distribution program in Zimbabwe (IDC, 2003). Their contribution to susceptibility through the kinds of links described above has yet to be well documented. But the decisions and policy processes at play go beyond the national arena. The market liberalization policies that are reported to have increased food insecurity among small

producers were influenced by decisions in and pressures from northern-based institutions (Ngwira, Bota, and Loevinsohn 2001).

Recognizing Resistance

It is vital that we consider at each of these scales not just the factors that contribute to susceptibility but also those that make people more resistant. In our still limited experience with facilitating reflection among agricultural professionals on the links between agricultural and livelihood systems and HIV/AIDS, we have found that the latter are considerably more difficult to grasp and identify. In one sense, resistance can be seen as merely the contrary of susceptibility: if food insecurity contributes to susceptibility, then food security promotes resistance. If it were that simple, there would be no need for both terms. But where susceptibility emphasizes static and passive characteristics, resistance includes those that are active and draw on strengths. At each level, these involve processes of awareness, recognition, and response.

- At the microbiological level, resistance includes the crucial though imperfect immune responses to HIV and opportunistic infections.
- At the individual level, a person aware of HIV and recognizing the risks s/he faces, does something different. Our particular concern here is with innovations in or around agriculture, but they also occur in other realms. For example, a young rural woman who sees few prospects for inheriting land or otherwise making a living, realizes that it would be possible to grow vegetables out of season by the river using a treadle pump and to sell them at a good profit in town.
- At the household level, her parents, recognizing the risks young people like her face, agree to her using a patch of riverside land they now farm themselves.
- At the community level, the young woman discusses and refines her idea with other members in the anti-AIDS club organized by a local church. Several decide to join her and lobby for funds for the pump and for more land from village leaders.

- Local government and NGOs, realizing that her idea and others like it may be spreading, sponsor a series of specialized "farmer field schools" aimed at young adults in the district that support their learning about life skills, vegetable crop management, and marketing.
- At the national level, a farm radio program picks up the story and airs it. The ministry of agriculture takes note and expands its technical support to field school programs and the development of locally relevant curricula.

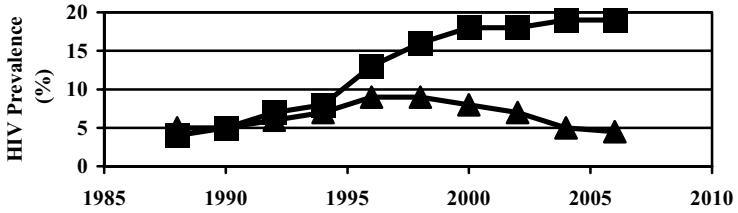
In each case, the response involves some element of innovation and, above the microbiological level, of borrowing, modifying, and combining existing and accessible components—technical and social. There is a dearth of research into the sources of resistance and how resistance can be effectively supported. We will need to bring to bear our understanding of innovation processes. We return to this later.

The responses described above, from the individual to the national level, are illustrative but are not our invention: they are being planned or are already underway in different parts of Malawi and Uganda where RENEWAL partners are working. As we suggest below, the effectiveness of these responses would likely be enhanced were they brought together and linked, the "wider" ones supporting the more "immediate" ones. But how would we recognize such effectiveness? What does resistance to HIV look like in the field?

Resistance can be assessed at each level of decisionmaking. Individuals or households that remain HIV free when others, similarly situated, are infected can be considered resistant. So, too, can communities, districts, or countries that have a lower HIV prevalence than other, similarly situated social units at a particular moment and that, over time, have a trajectory of prevalence that lies below them (Figure 2). By "similarly situated," we mean that people in these units confront similar risk environments and situations. A village distant from roads and towns but with abundant resources and minimal food insecurity may maintain low prevalence relative to other villages largely by

virtue of its inhabitants being minimally exposed. Sampling error could also be responsible for the observed variation. Prevalence below what one would expect combined with evidence of a response to the HIV threat that enables people to escape these risks would constitute the "gold standard" of resistance. Decosas (2001) and Thomas et al. (1999) promote a similar concern with the outliers—in their cases communities with HIV or STD prevalence above or below expectation—and the factors responsible. Action research in Malawi and Uganda supported by RENEWAL will be developing operationally feasible and locally meaningful definitions of resistance.

Figure 2—Illustration of resistance to HIV at the community level (The lower curve represents a relatively resistant community)



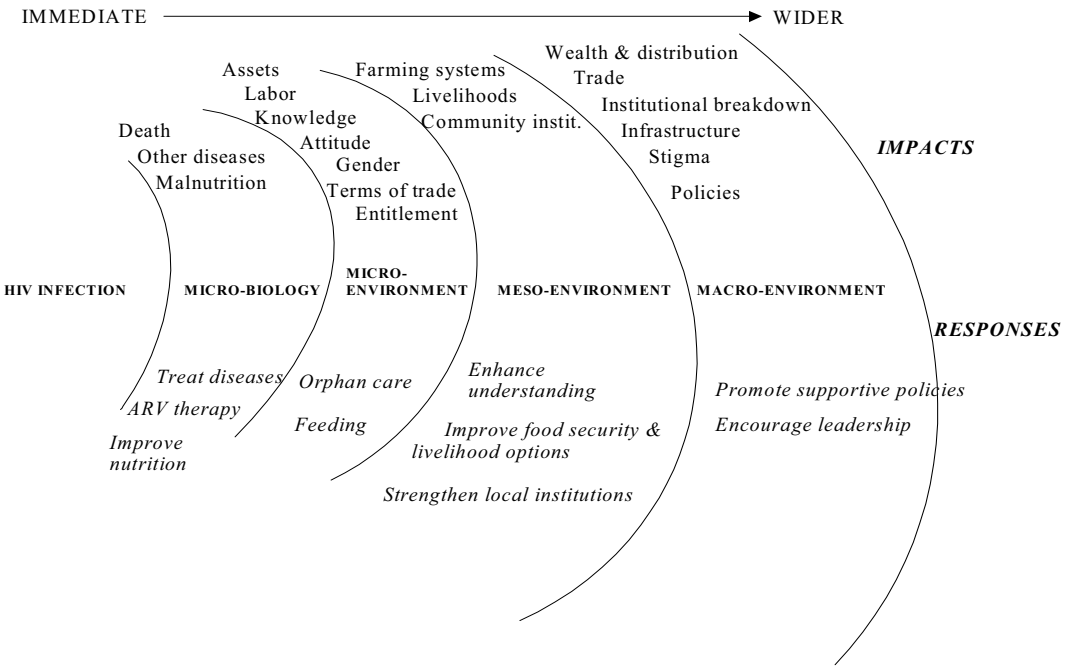
Vulnerability and Resilience to AIDS Impacts

If we have dwelt long on the contributions of food security and livelihoods to risks of and resistance to HIV, it is because, in our experience, this proves harder for agricultural, food, and nutrition professionals to grasp than the impacts of AIDS-linked illness and death on food security and livelihoods. In a sense, AIDS, though widely dispersed, is just one of many disasters with which the rural people of Africa contend. But the diverse ways in which AIDS can affect rural societies and economies are not always obvious, and less so are the sources of strength that confer some resilience to those impacts.

Vulnerability differs from susceptibility; it refers to the likelihood of significant impacts occurring at a certain level (e.g., individual, household, community). These impacts are not one-time events, but rather processes, often hidden, slow-moving, and destructive. These processes are often punctuated by events, such as the sale of assets, some of which are irreversible, leaving the household—if indeed it survives—significantly impoverished.

Resilience is to vulnerability as resistance is to susceptibility. It refers in particular to the active responses that enable people to avoid the worst effects of AIDS at different levels or to recover faster to an acceptably normal level. Again, we have found that a generic map is often helpful to agricultural professionals trying to identify the sources of vulnerability and resilience in particular situations (Figure 3). Note that the arcs representing different levels of organization in this and Figure 1 can be joined to form concentric circles with infection at the middle, and time running from left to right,

Figure 3—HIV/AIDS epidemics: Impacts and generic responses



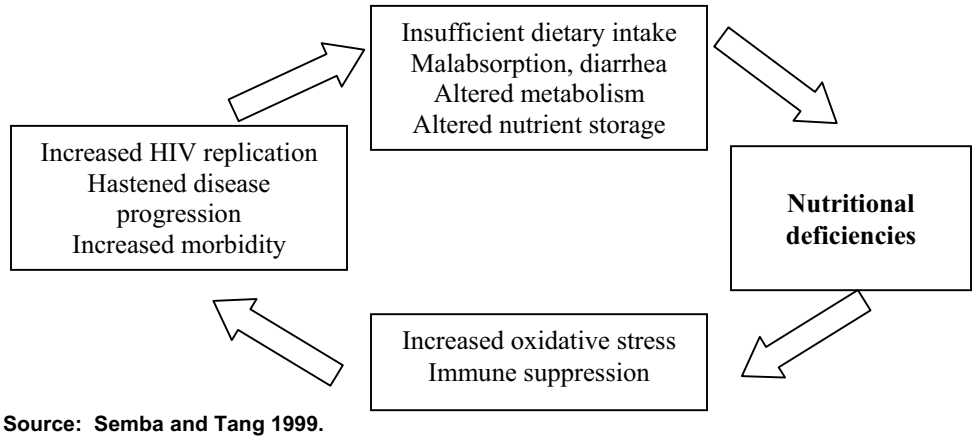
emphasizing the systematic relationship between susceptibility/resistance and vulnerability/resilience, a matter to which we will return later.

We focus here on what appear on present knowledge to be some of the most widespread and common impacts, and some of the major gaps in understanding.

Microbiology: Nutrition and Disease

AIDS' impacts begin at the physiological level. People living with HIV/AIDS have increased nutritional requirements: up to 50 percent greater for protein and 15 percent for energy (Piwoz and Preble 2000).[4] AIDS strains already meager diets and pushes many into a vicious circle: failure to maintain nutritional status weakens immunity and increases susceptibility to opportunistic infections; this, in turn, undermines nutritional status and hastens the onset of full-blown AIDS (Semba and Tang 1999; see Figure 4).

Figure 4—The vicious cycle of malnutrition and HIV



Source: Semba and Tang 1999.

[4] The Food and Nutrition Technical Assistance (FANTA) project in a recent draft statement (24 April 2003) has reaffirmed these figures, and in addition recommended that micronutrient intakes of HIV positive individuals be increased by 100 percent (www.fantaproject.org).

On the other hand, people able to meet these heightened demands can prolong the asymptomatic period of relative health and ultimately their lives, with benefits also accruing to those who depend on their labor and care, particularly young children.

Microenvironment

The impacts of AIDS at the microenvironmental level are broken down here into those relating to household labor supply, household resources, and attitude and knowledge.

Household Labor Supply. The quantity of labor is further affected as members of afflicted households spend time looking after the sick and burying the dead and less time in agricultural pursuits. Other members of society are also affected, for the "time spent at funerals, visiting the sick…is in a way a subscription to society and thus enables the family to claim benefits in time of hardship…it is checked in the society's register" (Bota, Mphepo, and Malindi 2001, 7). imilar trends have been observed in Uganda, Tanzania, and Zambia (Topouzis 1998). Traditionally, funerals ceremonies lasted 4–7 days, with more "celebrations" after one month or 40 days or a year. However, the customs are changing to shorter and less expensive ceremonies.

A recent study in three districts in Central Malawi (Shah et al. 2001) found impacts of chronic illness (mostly AIDS-linked in the current context) that are similar to those described elsewhere in eastern and southern Africa. The loss of adult labor leads to a suite of changes in affected households' use of land and other resources (reviewed in Haddad and Gillespie 2001; De Waal and Tumushabe 2003). Agricultural activities are often delayed, with negative effects on production, and land is often left fallow. There are now several rigorous studies detailing the drops in net household production associated with AIDS-related adult mortality. In Kenya, Yamano and Jayne (2002) found a 68-percent decline in net household production; in Zimbabwe, Kwaramba (1997) found output declines of 37–61 percent for different crops; and in Swaziland, Muwanga (2002)

found a reduction of 54 percent in maize production following the death of the household head.

Surviving household members may be under increased pressure to seek agricultural wage labor or may pursue nonagricultural income-generating activities that yield a quick return. In either case, labor available for on-farm work is further reduced, and less available at critical moments in the season. Affected households are also frequently forced to reduce their reliance on labor- or input-intensive crop or livestock enterprises, and to focus on activities that are of reduced scale and with fewer risks, but that also have lower output or provide less income.

Household Resources. Loss of labor is not the only immediate effect of chronic illness and death. A host of expenses are incurred during the illness, at a time when income is also reduced. Then various customs surrounding funerals create further demands on household savings and assets. Less of these resources can then be devoted to agriculture. Declining public health-care systems often lead people to seek health services in parallel systems and especially from traditional healers, whose fees can be exorbitant. At the time of death, there are expectations to spend lavishly to appease the spirits so that death is cleansed from the village. In some parts of Malawi, a cow is slaughtered (Bota, Mphepo, and Malindi 2001). Disposable assets may be sold, often with a meager return. Increased indebtedness is also common (Shah et al. 2001, 51–52).

The sequence of responses to illness and death—reduced production, shift to less demanding and remunerative enterprises, sale of assets, indebtedness—results for many afflicted households in deepening impoverishment. This has misleadingly been referred to as "coping" (see Box 1). Wealthy households and larger ones may escape some of the effects (Shah et al. 2001); however, the protection is likely partial and possibly only temporary. As already mentioned, important assets like land or livestock or household effects may be lost by the surviving spouse due to inheritance customs. In patrilocal systems of marriage, women cannot continue to use their spouse's property if they want to remarry or move away from the marital home. Property grabbing is also rampant

(Ngwira 2001). Critical agricultural resources may thus be lost by the affected household, further deepening impoverishment.

Reduced production, consumption, and income as a result of prolonged illness put household members other than the person living with HIV/AIDS, particularly children, at risk of malnutrition. Women may be left with few means to secure their own and their family's living other than to sell sex. This is one of the ways in which vulnerability to AIDS' effects are linked to susceptibility to HIV infection.

Box 1: The Illusion of Coping

"Coping is a way of escaping from the challenge of confronting how people's capabilities are stunted, how their entitlements are blocked, and how their abilities to function as full human beings with choices and self-definitions are frustrated" (Barnett and Whiteside 2002).

Impacts of HIV/AIDS are often revealed through the responses made by households and communities, often referred to as "coping" or "coping strategies." But has the dominant focus on coping become something of a copout? Coping may be a dangerous misnomer, an illusion, for the following reasons.

- Many responses are those of distressed households that are simply not coping (see Rugalema 2000). There may be little in the way of conscious strategy in some responses.
- It implies a reversible management strategy, though many changes (e.g., sale of major assets, pulling children out of school to work) may not be reversible.
- It suggests that the adoption of such strategies is not too costly, though the reality is that many households are forced to make distress sales and they may become permanently impoverished or destitute. Some break up altogether.
- It implies homogeneity on the part of households or communities, when the reality is often that some individuals (e.g., women) from some households (e.g., the poorest) are hit much harder by HIV/AIDS. Focusing on the mean, and not on the variance and different types of response, may obscure innovative responses, as discussed above. It is usually the positive or negative outliers that provide the most instructive lessons.
- The notion of coping usually fails to take account of time—the long-term effects. For example, what is the long-term effect of a child's foregone education, as s/he is pulled out of school to make up for lost adult labor? Recent studies (e.g., Yamano and Jayne 2002) have shown that economic recovery of the household following the death of an adult household head may not happen for years, if at all.
- It implies a degree of self-sufficiency, which may be a fallacy. It deflects from central authorities' responsibility to mobilize extra resources to fill local capacity gaps, and is thus diametrically opposed to a human rights approach, wherein duty bearers, including governments, are held accountable for the respect, protection, and facilitation of people's rights to such essentials as food and health care.

For these reasons, we prefer the value-neutral term "responding" to that of "coping."

Through these various effects on household labor and resources, AIDS may increase vulnerability to episodes of acute food insecurity as well as to chronic food insecurity. Shocks that used to be weathered may become more significant in the context of AIDS. Southern Africa in 2002/03 is a case in point (Devereux 2002; IDC 2003), though it is hard to disentangle AIDS-related impacts from those of other shocks, as they have become so intertwined and embedded.

The coincidence of generalized HIV epidemics with episodes of acute food insecurity has been hypothesized as triggering a "new variant famine" (De Waal and Whiteside 2003) in which conventional famine-management capacities and strategies are being selectively nullified by AIDS. AIDS may both constrain options for responding to acute food insecurity as well as increase the prevalence and depth of chronic food insecurity. During 2003–2005, RENEWAL aims to foster a better understanding of the dynamic interactions between HIV/AIDS and other factors in food crises, thus highlighting options for more effective responses.

Attitudes and Knowledge. AIDS also affects the productive sectors by altering values. Many people who have been affected by HIV/AIDS develop a short-term outlook. In terms of economic activities, they often prefer to invest in petty trading, rather than agricultural enterprises whose returns take longer to accrue. From the perspective of a poor householder, even growing annual crops can be risky.

The children left behind when their parents die may not have acquired enough skills to perform some key agriculture and economic activities. This increases livelihood insecurity. Concurrently, children are drawn increasingly into adult responsibilities by parents or guardians and may be taken out of school (e.g., Arndt and Wobst 2002), with long-term negative impact on their ability to acquire literacy-based skills. Girls are particularly vulnerable.

Whole communities are affected when teachers, too, drop out of school due to HIV/AIDS. Teachers are frequently absent and their morale is reduced due to the time they must spend nursing their sick relatives and burying the dead (Kadzamira et al. 2001,

69). Absenteeism was reported to be higher among female than male teachers, since they are the customary duty bearers in times of illness. This leads to poor education quality and also low enrollment rates as the families themselves fail to send children to school, especially girls.

Mesoenvironment: Social Networks

HIV/AIDS further threatens food security by eroding social security networks, an important social capital. The burdens of caring for the sick and for orphans are customarily spread within communities (Shah et al. 2001). As prevalence rises, these burdens may overwhelm the ability or willingness of other households to take in further dependents, further dividing their economic entitlements (Mtika 2001). This is leading to an increase in the incidence of child-headed households. Girls become increasingly vulnerable to abuse, since some caretakers see them as a source of labor or as chattel to be exchanged in marriage (Ngwira, Kayambazinthu, and Kamchedzera. 2000).

Very little is known about how AIDS affects access to and management of common property resources, such as forests, aquatic resources, and grazing land. Concern has also been raised in Uganda (Kisamba, Mugerwa, and Nduhura 2003) and other countries over the potential spread of pests and diseases from the fields and banana groves that affected households are no longer able to adequately manage.

Insecurity in rural areas, particularly as a result of theft of crops and livestock, is another major problem resulting in reduced production and unwillingness to invest further in vulnerable agricultural enterprises (Malawi 2001b). The AIDS epidemic contributes to this problem, because adults who are absent from home for long periods to nurse sick relatives in hospitals cannot properly care for and guard their own fields and animals (Ngwira 2001, 7).

Macroenvironment: Institutional Resources

AIDS affects the ability of agricultural and allied institutions to provide services by depleting their human resources. First, there is attrition of staff in agricultural

administration, extension, and research, due to death. Second, the quality of human resources declines due to morbidity and disorientation of those left behind. It is reported that in 1998, nearly 66 percent of staff that died in the Ministry of Agriculture in Malawi died from AIDS-related illness (based on UNAIDS estimates of AIDS-related mortality in urban areas, Bota, Malindi, and Nyekanyeka [1999, 9]).

A second area where institutions are affected is the use of resources to take care of the sick, pay life insurance claims, death gratuities, and the cost of burying the dead. The problem is compounded by cultural practices that require that the dead be buried in their grandparents' village. The expectation that employers will transport the dead is very high, to the extent that those who have failed to do so have had dead bodies dumped in their offices or homes.

Recognizing Resilience

Resilience can be defined as the ability to recover relatively quickly from the effects of a major shock—here, the AIDS-linked illness and death of an adult household member—or to avoid its worst consequences. It can be considered in relation to different aspects of well-being, such as food security, nutrition, health, education, or income. Resilience to AIDS impacts shares several features with resistance to HIV:

- As with resistance, resilience can best be assessed relative to other similarly situated social units, in this case those that have suffered a similar shock—the loss of an adult member following a long illness, or similar amounts of such loss. A relative definition makes sense: perfect stability can hardly be expected in the face of a shock of such magnitude.
- As with resistance, resilience assumes an active response. The household directly affected can innovate, using the resources available to it in different ways. Their response can also be supported by actions at other levels—the community, district, national, or international. It can be appropriate therefore to assess resilience at these different levels.

While the concept of resilience has a slightly wider currency than that of resistance among researchers and development workers concerned with HIV/AIDS (e.g., du Guerney 2002), it has yet to be treated rigorously. A major constraint is that the evidence of resilience is still seriously underreported. AIDS has affected rural households and communities across a wide swath of Africa, yet we have little more than isolated accounts of innovations that go beyond the typical responses described above, which often entail a mining of remaining assets and resources. These typical responses are also the average ones that emerge from survey-based studies of how people are "coping" with the impacts of AIDS (Box 1). The methods used are ill-adapted to bring out the exceptional and more hopeful responses that can inspire others similarly affected and provide leads to further research and development.

We can discern several patterns among the innovations at the household level that have thus far come to light:

1. Making efficient use of remaining labor and other resources. Ncube (1999) describes the development of a light cotton planter by Zimbabwean farmers that can be drawn by a donkey. Oxen had previously been used but are difficult to handle by women or youths and many have been sold.
2. Focusing effort on parts of landholdings. Gabriel Rugalema (personal communication) recounts the efforts of a group of orphans in northern Tanzania to grow vegetables for an urban market on a well-watered and fertile plot that one of them had access to.
3. Adapting introduced technologies. Josef Decosas (personal communication) describes the case of a group of Mozambican widows whose husbands had previously collected honey from the forest—a pursuit the women felt unable to continue. Instead they sought out support to develop apiculture using locally constructed hives.
4. Reforming gender roles. The previous examples and evidence provided by Mutangadura, Mukurazita, and Jackson (1999) describe how surviving household

members in several areas are cultivating crops or raising livestock in which they previously had little part.

5. Collective action. Neema (1999) cites testimony from a Ugandan widow of the importance of labor exchange, especially in land preparation.

There is still limited evidence of how such actions are being supported by communities. In southern Malawi, we have met with community groups that are building on traditions of orphan support by donating labor to crop production and providing food or cash to orphans and those caring for them. We take up below opportunities for support to such responses by formal institutions.

Another poorly understood area is the contribution that local agricultural and livelihood systems can make to resilience. Differing levels of productivity among farming systems may affect households' capacity to withstand and recover from the shock associated with the death of an adult through AIDS. The range of agricultural technologies and enterprises—long existing or recently introduced—available to households in a system may also make it easier or harder for them to alter the nature and permutation of their livelihoods in response to the effects of HIV/AIDS and thus to find new ways to meet their requirements. For example, energy availability may be increased through switching from the cultivation of beer bananas to sweet bananas or plantains (Gillespie 1989); accessible and adapted low labor-demanding crops like cassava and sweet potato may facilitate people's response to AIDS (Barnett and Blaikie 1992), though as discussed later, such changes may have long-term nutritional costs given the low protein concentration of such crops. Proximity to markets and nonfarm employment opportunities may provide additional possibilities for innovation. These ideas need to be tested.

As with resistance, it is important to consider how one would recognize resilience in the field. In Figure 5, the experience of different households or classes of households is compared in terms of a food security indicator. As suggested above, other aspects of well-being could be considered; the choice can probably best be made in consultation

with people in the community. The top curve shows the two facets of resilience: lesser depth of drop-off and shorter time to return to a level accepted as normal.[5]

Figure 5—Illustration of resilience to AIDS at the household level

(Time is measured from the death of a male household head.)

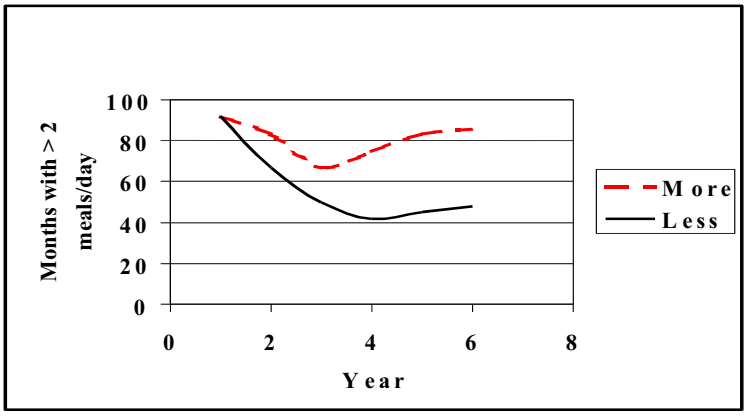


Figure 6 illustrates how one might identify resilience at the level of communities, with adult mortality here being a proxy for AIDS prevalence, and resilience being assessed in relation to child malnutrition. Again, the mere fact of being an outlier is not sufficient evidence of resilience. One would want to identify the specific responses, the innovations that enable some households or communities to fare better than others. These approaches are currently being refined in work in southern Malawi.

In trying to identify sources of resistance and resilience in a particular context, the Sustainable Livelihoods framework (see Figure 7) may also prove a helpful guide, complementing the generic system maps in Figures 1 and 3. The six capital classes—human, social, economic, physical, natural, and political—that the framework highlights and on which resilience can draw may be situated at more than one spatial or social scale.

[5] It is quite possible that some households not directly affected by AIDS may actually be benefiting from the effects on others. This could happen, for instance, if in-laws take over land or other assets from widows and orphans. If widespread, this could translate at the community and wider levels into a minimal impact of AIDS in aggregate economic terms (production or income), coincident with substantial impact in terms of health, nutrition, or education.

Figure 6—Illustration of resilience to AIDS at the community level

(The black symbol represents a relatively resilient community.)

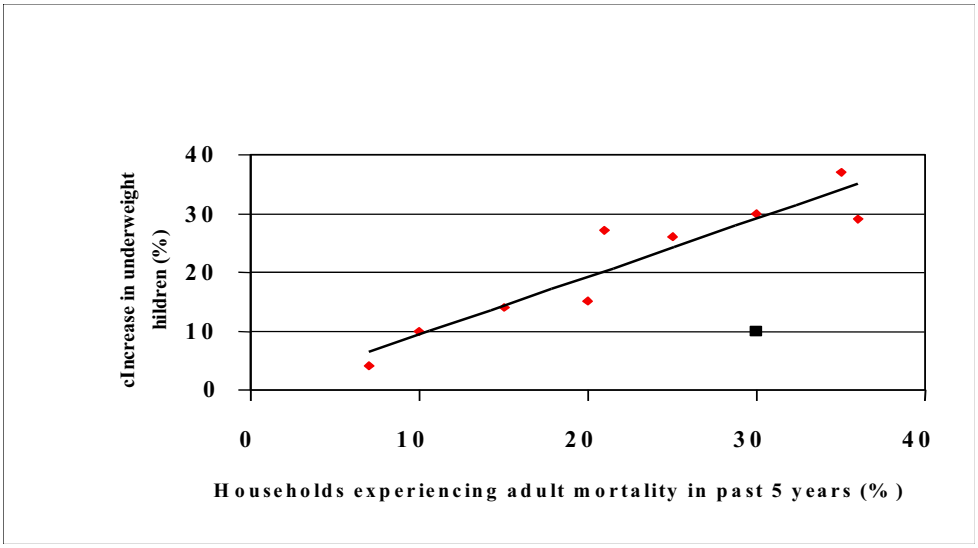
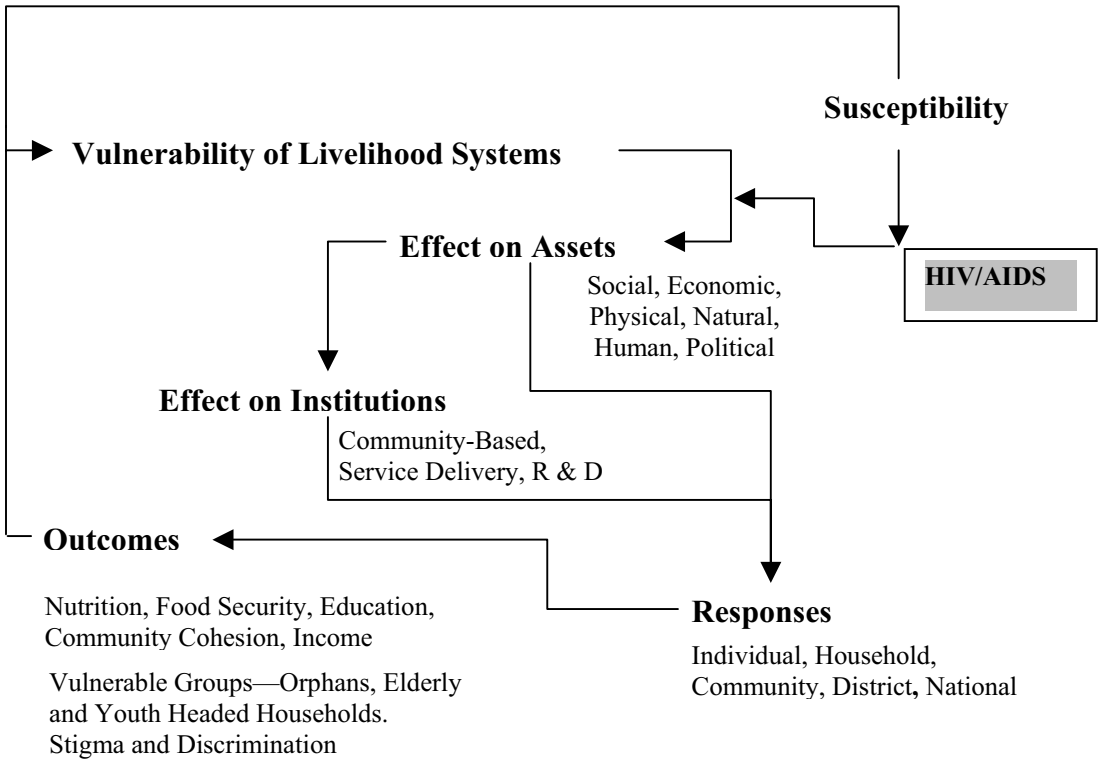


Figure 7—Understanding HIV/AIDS in the context of people's livelihoods



3. Responding to HIV/AIDS: Opportunities for Institutions

In this section, we examine institutional opportunities for responding effectively to HIV/AIDS. First, we address each of the four elements of conventional response—prevention, care, treatment, and mitigation—from the perspectives suggested by the foregoing approaches to understanding HIV/AIDS. Second, we illustrate the interconnectedness of these four elements. Finally, we address the rationales for multisectoral mainstreaming.

Preventing HIV Infection

HIV prevention has generally been focused on behavior change (abstinence, faithfulness) and the promotion of condom use. Enhancing life skills, particularly among young adults, has also been a facet of some programs. Unfortunately, we appear to be years away from an effective and affordable vaccine and from having the means to deliver it widely.[6] It should be pointed out that if and when those advances are achieved, we will still have to deal with the wave of HIV/AIDS impacts resulting from individuals who are seropositive today and those who become so in coming years.

The preceding section suggests broader opportunities for prevention in the area of food security and rural livelihoods. First, those designing and implementing policies and programs in the sector should ensure that these "do no harm." Several ways in which they may inadvertently increase susceptibility or undermine resistance have been pointed out above. Second, and more actively, policies and programs can aim to reduce susceptibility and/or to support resistance to HIV. Among the former would be initiatives to alter situations of HIV risk by, for example:

[6] The International AIDS Vaccine Initiative (IAVI) hopes to advance the most promising of its vaccines to final-stage studies by 2007 (www.iavi.org).

- Changing the opening and closing times of rural markets to make the trade in sex more difficult, as has been attempted by local governments in northern Tanzania (D. Kasongi, ACORD, personal communication);
- Providing family accommodation rather than single-sex dormitories for workers on plantations and other rural industries;
- Implementing effective sanctions against those distributing food in famine relief or in camps for the internally displaced who abuse their positions to extort sex (Kisamba Mugerwa and Nduhura 2003).

Support for resistance to HIV can buttress local efforts, making it possible for people to act on what they know concerning infection and its consequences. This may involve expanding livelihood opportunities in and around agriculture, in production, or value addition. An illustration of such support by institutions acting at different levels was provided in the last section.

These actions by themselves are hardly novel: treadle pump irrigation, out-of-season vegetable production, and farmer field schools are now practiced in many areas. What would distinguish support to HIV resistance, then, from any other adaptive research or advisory program that employed these elements? We suggest that three aspects are important:

1. It would reach out to those most at risk and ensure that the support provided was relevant and made sense to them, while not excluding others. Often the most susceptible to HIV are young adults—young women in particular—groups that are often left out of conventional extension or even farmer field school programs (Loevinsohn, Meijerink, and Salasya 2000). However, local assessment, drawing on local understanding, is essential to identify other particularly susceptible groups.
2. It would build on or integrate efforts to enhance the life skills and knowledge of HIV risks of these same people. The links between the food security or livelihood

action and risk reduction should be clear and ideally the action would be one that they have prioritized.

3. It would be monitored and evaluated to ensure that the livelihood or food security action was viable and sustainable and that it permitted those susceptible to escape the HIV risks. This information should be available to those involved in the initiative to enable them to make corrections. The reality is that these two legs—agricultural sustainability and risk reduction—on which such actions will have to stand have been the concerns of different institutions and sectors. RENEWAL is seeking to enhance the capacity to deal with both sides through the action research it is supporting.

Finally, there are issues that require research a step or two removed from pilot implementation. A number of gaps in understanding have been identified in the previous section that, were they clarified, would permit more effective actions to be mounted. These include clear evidence of the links, positive or negative, between specific agricultural-sector policies and HIV risks, and clarification of the contribution to susceptibility and resistance of different agricultural and livelihood systems (see below).

Treating and Caring for People Living with HIV/AIDS

For persons living with HIV/AIDS (PLWHA), nutritional care and support is critically important in preventing or forestalling nutritional depletion. Relevant specific objectives might include improving quantity and quality of diet, building or replenishing body stores of micronutrients, preventing or stabilizing weight loss, preserving muscle mass, preventing diarrhea and other digestive discomforts associated with fat malabsorption, speeding recuperation from HIV-related infections, and preparing for and managing AIDS-related symptoms that affect food consumption and dietary intake. Nutritional support has the potential to significantly prolong the life of individuals for their own benefit and those who are dependent on them for care, e.g., young children (Page 2000). Such interventions are likely to have the greatest overall impact early in the

course of disease by prolonging the period of relative health with asymptomatic infection (Piwoz and Preble 2000). Unfortunately, relatively few people know they are infected at this time.

As argued in Box 2, nutritional support needs to go beyond micronutrient supplementation, and even beyond food provision. Nutritional adequacy requires adequate food, health, and care (UNICEF 1990). For PLWHA, this means that appropriate treatment of opportunistic infections, stress management, physical exercise, and emotional, psychological, and spiritual counseling and support are all relevant (Abdale and Kraak 1995), along with conventional approaches such as home-delivered, ready-to-eat foods for homebound AIDS patients who are unable to prepare their own meals. One excellent example comes from the AIDS Support Organization (TASO) of Uganda. In its 17 years of supporting PLWHA, TASO has learned of the need to catalyze and support holistic approaches toward "living positively" that revolve around food, health, and care provision in the context of increasingly mobilized communities. PLWHA are not patients, they are partners who often become engaged in community awareness-raising on HIV/AIDS (Mukasa Monico 2001).

In addition to care, food and nutrition are relevant to treatment. We do not know enough about whether, how, and to what degree treatment efficacy may be compromised by poor nutritional status. The fact that some medicines need to be taken "on a full stomach" may be a problem for many people. Anti-retroviral (ARV) drugs are toxic, and they may be particularly toxic to someone who is not well-nourished. There are particular effects on bone metabolism (Tebas et al. 2000) that may be serious among populations where calcium deficiency is widespread, and there are serious concerns about the development of metabolic disorders in patients on long-term ARV therapy (McDermott et al. 2001). Moreover, we still do not know enough about the impact of ARVs on milk composition in malnourished lactating women, and about how ARVs interact with specific micronutrient deficiencies. Not only do these questions remain unanswered, many are not even being asked in the debates on ARV access.

Box 2: Responding to HIV/AIDS: Lessons from Another History

HIV/AIDS epidemics and chronic malnutrition are similar in that they are both multicausal as well as multi-impact. Coincidentally, the strong linkages between malnutrition and infection were earlier referred to as Nutritionally Acquired Immunodeficiency Syndrome (Scrimshaw, Taylor, and Gordon 1968). AIDS itself during the 1980s was called "Slim," reflecting the wasting syndrome characteristic of the disease.

Lessons may be learned from examining the historical evolution of approaches taken to combat malnutrition. In the 1970s around the time that "integrated rural development programs" were in the ascendant, the multisectoral nutrition-planning paradigm was dominant. Though advances were made in recognizing the multiple causality of malnutrition, the prescription—of a single nutrition planning unit with a mandate to somehow orchestrate the sectors in top-down, highly planned, multisectoral action plans that required complex coordination—basically failed (Field 1985). There may be some similarities and lessons here with the response to AIDS being grounded in National AIDS Commissions (NACS) that have been established to spearhead the multisectoral response to AIDS in affected countries.

After the failure of multisectoral nutrition planning, the pendulum swung back in the 1980s to direct nutrition-specific interventions that, though they may have been community-based, were not community-driven and often not sustainable. After this next disillusionment, the era of micronutrients unfolded during the 1990s: vitamin A capsules, iodized salt, and, to a lesser extent, iron supplements represented the essential nutritional arsenal, easily delivered with short-term measurable impacts. The broader and deeper problem of basic energy malnutrition—manifested in underweight, stunting, and wasting in children—was largely ignored as too complex.

When it comes to the role of nutrition in responding to HIV/AIDS, the prevalent view has been overly reductionist—emphasizing the roles of micronutrients, particularly vitamin A, while underplaying the importance of the macronutrients (energy and protein) and the ultimate importance of a diverse diet. While micronutrient supplementation may have an important role within the overall nutritional response to HIV/AIDS, *food* is a crucial requirement—not least because the disease significantly raises energy and protein requirements that cannot be met by pills alone.

Other lessons may be relevant. It often makes sense to seize multiple opportunities for combating complex problems to more effectively put the brakes on vicious cycles and accelerate virtuous ones. Malnutrition is an outcome of two immediate causes that interact in a vicious cycle—inadequate dietary intake and ill health. These immediate causes are themselves underpinned by inadequacies relating to food security, health care, and environment conditions. In terms both of cost and effectiveness, it is often better, if feasible, to initiate a multipronged attack on these causes. Some of the most effective nutrition advocates have been individuals who have challenged the bureaucratic inertia that derives from compartmentalized organizational structures and processes that offer few incentives for integration. Sustained success in nutrition requires the forging of partnerships at different levels and the intersectoral convergence of relevant programs that address the multiple causes and consequences of malnutrition (Gillespie, McLachlan, and Shrimpton 2003).

Mitigating AIDS

In rural areas, mitigation has often built on community initiatives to support orphans and others affected by AIDS. Food has been at the heart of these efforts. Rarely, however, have agricultural organizations been involved to help make them more effective and sustainable.

The opportunities for agricultural-sector organizations to contribute to mitigation include, but go well beyond, such direct support and are broadly symmetrical to those for prevention. Again, the first concern should be to do no harm through policies or programs that unwittingly increase vulnerability or undermine resilience. For example, inheritance laws or local customs that fail to protect widows' continued access to land may leave them more insecure. Policies aimed at settling nomadic pastoralists may inadvertently erode the extensive stock loans and labor exchange characteristic of several East African groups that likely support resilience to AIDS and to other shocks like drought (Sperling 1987). How policies and programs can be improved, taking into account the multiple concerns that often underlie them, is taken up in the following section.

More actively, policies and programs can aim to reduce vulnerability and to enhance resilience. Among the opportunities:

1. Food-for-work programs that reach the most vulnerable can draw on people's understanding and energy to remove long-standing sources of vulnerability (Kadiyala and Gillespie 2003), for example, by building structures to capture rainfall.
2. Extension and advisory programs can ensure that the most vulnerable have access to potentially helpful technologies, such as mosaic-tolerant cassava varieties. There is reason to be concerned that widow-headed households may not be well served by conventional extension (Gilbert, Sakala, and Benson 2002) and even by more recent group-based approaches (see below).

3. Savings and credit programs that are within reach of widows and others affected by AIDS in terms of collateral requirements and repayment schedules may be of real help to them in reconstituting their livelihoods (Parker, Singh, and Hattel 2000).
4. Initiatives can also serve to bring to light and diffuse "hopeful" innovations by AIDS-affected and at-risk households and communities, which, it was suggested, are likely severely underreported. RENEWAL is in the early stages of support to such an effort that draws on rural radio.

These and similar initiatives that RENEWAL partners and other groups are planning or implementing draw on existing programs meant to serve a wide range of rural clients, including households whose poverty is traceable to forces other than HIV/AIDS. As with prevention-oriented initiatives, a program that seeks to add mitigation of AIDS impacts to its objectives will need to do the following:

1. *Draw on local understanding* to identify and reach out to those who are most vulnerable. What it offers should be relevant and helpful to them.
2. *Build on existing local efforts,* individual and collective, to mitigate AIDS impacts (this is one way in which the risks of inadvertently exposing those affected or living with HIV/AIDS to stigma and discrimination can be reduced).
3. *Monitor and evaluate progress.* The food security or livelihood action should be economically viable and sustainable and contribute to resilience, enabling people to recover quickly in terms of the aspects of well-being they most value.

Again, as with prevention, care, and treatment, there are critical gaps in our understanding that constrain more effective action. These are opportunities for research upstream from the operational. Several were suggested in the preceding section. Stakeholders in Malawi and Uganda prioritized a number of these research themes; the action plans they developed can be found at www.isnar.org/renewal.

The above suggests that there are strong similarities between how prevention, care, treatment, and mitigation can be supported by agricultural-sector organizations. These similarities derive from the systematic links between the causes and consequences of HIV/AIDS that we pointed to in the preceding section and that are exemplified by the way in which Figures 1 and 3 can be joined. The differences are equally important, however. Crucially, the people most concerned are often not the same. In many cases, poor, young women, and slightly older young men are among the most susceptible to HIV. Orphans and widows are often among the most vulnerable to AIDS. They may well be endowed very differently: for example, young underemployed adults with little access to land; widows with land they cannot till (and often at risk of losing) but with very little time to spare. Those in need of care and treatment are in a particular and precarious situation, but one not without hope as many who are "living positively" are showing.

Synergies Among Prevention, Care, Treatment, and Mitigation

The different aspects of the response to HIV/AIDS—prevention, care, treatment, and mitigation—should not be compartmentalized into hermetically sealed programs. Together they represent a continuum or an interlinked web of mutually reinforcing responses. Each one is necessary, but insufficient in itself, in the struggle with HIV/AIDS. Through internalizing the implications of the two generic maps—of determinants (Figure 1) and impacts (Figure 3)—it will become easier, at each decision point, to identify the most appropriate set of responses. We illustrate the interconnectedness of responses below:

- *Treatment can be preventive*. If the viral load of individuals living with HIV/AIDS can be reduced through treatment, then they will be less likely to transmit the virus in an unprotected sexual encounter, even without any change in their behavior. (Conversely, and ironically, the life-prolonging effect of ARVs

increases the time through which an HIV-positive person may expose others to the virus.)

- *Care is also preventive*. Programs aimed at improving the physical, economic, social, and spiritual well-being of people infected or affected by HIV may reduce transmission risk. For example, STD treatment will reduce risk of HIV transmission. Orphans who are cared for by the extended family or community are less likely to engage in risky sexual practices than if they were abandoned to fend for themselves.
- *Care mitigates impacts, while mitigation increases caring capacity.* Care and support clearly mitigate individual-level impacts, while other forms of mitigation may improve the capacity to care within households and communities, e.g., by freeing time through laborsaving technologies or practices.
- *Mitigation is preventive for those not yet infected* in AIDS-afflicted households and for future generations. To the extent that food insecurity or malnutrition increases HIV susceptibility, mitigating efforts that succeed in combating food insecurity or malnutrition (whether AIDS-induced or not) may reduce HIV exposure. "HIV-sensitive" food and nutrition-relevant programs (that derive from use of an HIV/AIDS lens, described below) may do so even more effectively. If the surviving household members are able to do better than merely survive, they can avoid the most extreme poverty and the necessity to sell sex. If mitigation efforts can help the survivors avoid this downward spiral, then the community as a whole gains a preventive advantage, since prevalence is contained, and so the wider risks of exposure.
- *At the community level, there may be "positive sum" solutions linking mitigation and prevention*. For example, AIDS widows may be left with landholdings that they can no longer cultivate and possibly livestock and other resources that they can no longer manage. They are often at risk of losing them to the husband's family where the widow's inheritance rights are insecure or, if they sell in

distress, the price they obtain will be minimal. At the same time, there may be young adults in the community who have no land or livestock of their own; with poor livelihood prospects they may be at heightened risk of HIV-infection. Social innovations that secure the widows' entitlements, allowing them to exchange a fair share of the production for the young adults' labor would benefit both.

These opportunities can be grasped when they are recognized. This requires understanding of the underlying links between HIV/AIDS on one side and food security, nutrition, and livelihoods on the other. It also requires a space or a forum where the different interests can be represented and possibilities discussed. Decosas (2001) and others refer to the capacity to recognize and act on the links among prevention and mitigation as "community HIV/AIDS competence." Individuals and communities, however, can only do so much on their own. They need the support of HIV/AIDS competent institutions, subnational, national, and international.

Why Mainstream?

This internalization, subsequently reflected in AIDS-aware decisionmaking, is the essence of mainstreaming—essentially a process of harnessing and developing the capacity of an organization or sector to respond at the broadest level.

Mainstreaming is different from integration, which may just involve adding or linking an AIDS-specific component or intervention to another development program—or adding an "AIDS chapter" to a development plan. Unlike integration, mainstreaming influences an institution's "core business." It may change both *what* is done and *how* it is done. It is an iterative process, with HIV/AIDS considerations being fully factored into programming cycles of problem assessment, causal and resource analysis, followed by action.

Mainstreaming is required for several reasons. We have already spoken of the threat AIDS poses to the achievement of several Millennium Development Goals beyond the HIV-specific goal. Mainstreaming is also necessary to better align the breadth and

depth of the response with the breadth and depth of the epidemics' impacts. Scaling up is not just a matter of increasing coverage of HIV programs; it can be functional, organizational, and political as well as quantitative (Gillespie 2002). Mainstreaming HIV considerations into developmental policy is one means of increasing the scale of the response. Ultimately, the reason HIV/AIDS should be mainstreamed across and within sectors is that HIV epidemics themselves are multisectoral—both in terms of etiology and impact.

Five simple principles have been put forward for mainstreaming: identify an entry point; mainstream within existing institutional structures; ensure adequate advocacy, sensitization, and capacity development; differentiate internal and external domains; and develop strategic partnerships based on comparative advantage, cost-effectiveness, and collaboration (UNAIDS/GTZ 2002). To this should be added extra resources and secure financing—to counteract the perception that "mainstreaming" is a way of avoiding expenditure while maintaining an appearance of combating AIDS (Egero 2003).[7]

4. Developing an HIV/AIDS Lens

To facilitate mainstreaming, we need appropriate, adaptable methods and tools to help understand the dynamic interactions of HIV infection and AIDS impacts on different sectoral concerns (e.g., food insecurity), and to identify appropriate policy and program modifications in the face of HIV/AIDS realities. This is where the "HIV/AIDS lens" is useful.

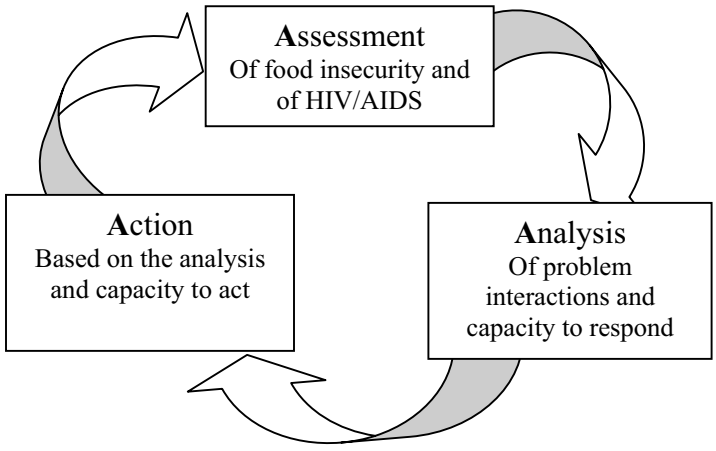
The HIV/AIDS lens is a conceptual tool intended to help decisionmakers in agriculture and allied fields—from farmers to policymakers—to review situations (e.g., heightened food insecurity) and actions (e.g., an extension policy or a village grain bank

[7] "HIV/AIDS has no budget line; no specific funds are allocated to it; and the sector's activities will not be restructured to accommodate HIV/AIDS but, rather, HIV/AIDS programmes will be adjusted to fit into the strait-jacket of existing sector functions" (quote from UNFPA mission report on realities of "mainstreaming" [UNFPA 2001]).

program) in the light of HIV/AIDS. The lens is designed to support reflection on how the situation may be increasing or reducing the risks, either of contracting HIV or of suffering severe consequences flowing from AIDS-linked illness and death, and how the action, actual or planned, might contribute to these effects.

Using a lens essentially precludes the common reflex of "new problem, new program." Such compartmentalization constrains the development of effective solutions to problems precipitated or exacerbated by HIV/AIDS. So while not everything need change, a hard look is needed to effectively respond to new threats and seize new opportunities. Aided by the generic maps in Figures 1 and 3, and the concepts described earlier, and over time (i.e., through several iterations of the cycle in Figure 8 below), use of the lens becomes second nature. A process for using the lens is described below. But first, we need to look more closely at the characteristics of the lens and its potential applications.

Figure 8—The Triple A Cycle applied to HIV/AIDS and food insecurity



Source: Adapted from UNICEF (1990).

Characteristics of the Lens

- *Bifocal*. The lens is bifocal in that it may be applied to look at HIV-related susceptibility and/or AIDS-related vulnerability. It may reveal the way in which a particular program affects the *interaction* between HIV/AIDS and the initial

problem being targeted. For example, if the program aims to reduce malnutrition, the lens will shed light first on whether and how the program is still likely to effectively reduce malnutrition in the context of expected HIV/AIDS interactions; and second, how it might increase or decrease HIV/AIDS-related susceptibility and vulnerability.

- *For internal and external use*. The lens may be applied internally (within institutions) and externally (within policy and programming). Internally, the lens aims at preserving and augmenting capacity, focusing on workplace policies and responses to HIV/AIDS. This includes issues of insurance, benefits, access to information, and treatment. Externally, it will clarify the interactions between HIV/AIDS and sectoral policies and programs, as described above.
- *For analyzing problems as well as generating solutions***.** The lens should not only relate to action; it should also crucially be applied to initial problem assessments by all stakeholders. The UNICEF-pioneered Triple A cycle (see Figure 8) is a useful construct for highlighting the *process* aspect of lens use. It emphasizes that situations need to be *reassessed* once actions have been implemented. To permit this, HIV/AIDS considerations need to be built into all relevant monitoring and evaluations systems.
- *Gender-sensitive***.** It reflects the different HIV susceptibility of men, women, and other groups. Women are biologically, socioeconomically, and culturally more at risk of HIV infection than men, and they are more vulnerable to AIDS impacts (Rao Gupta 2000). The lens must take into consideration how a particular action will affect people vulnerable to threats other than AIDS.
- *Context-specific*. There are many different types of lens users at different social and spatial locales. The lens can be applied to grassroots situations (e.g., by farmers and community workers), to programs (e.g., agricultural extension workers), and it can be applied at the level of policy planning (see Figures 1 and 3). The lens will look different for different users in different situations. The

type of lens a policymaker will use to review agricultural policy will be different from the implicit lens a family member will use to decide how to respond to reduced family labor power. But it will be important that the policy lens will have factored in the possible livelihood effects, choices, and decision options of an AIDS-affected, agriculture-dependent household. The policymaker will need to see what AIDS is doing to agriculture in order to better understand what policy levers are best engaged to strengthen resistance and resilience.

- *Evolving over time*. The lens should not be conceived as a prescription or a product—or at least not a static one. It is dynamic, evolving, and will be refined as knowledge of what is happening is updated. Using and refining the lens is an iterative learning and doing process (see Figure 8).
- *Revealing "positive-sum" solutions and opportunities*. The use of the lens, particularly in a social context, can help to identify new possibilities that may not otherwise have been obvious (see the earlier example of village youth being put to work on the land of AIDS widows to their mutual advantage).
- *Revealing trade-offs and dilemmas*. The lens may reveal new or hidden costs and benefits, and thus some new trade-offs, which need to be resolved. For example:

    1. Applied to infant feeding, it will show that while exclusive breastfeeding for the first six months may bring certain benefits to the child, it may also increase the risk of HIV transmission from an HIV-positive mother. Yet, while switching to formula feeding will cut the HIV risk, it significantly increases the risk of other health hazards, e.g., contaminated feeds. We are still learning how to help mothers make the best choice in such

situations. Conditions and, hence, risk profiles differ significantly within and between countries.[8]

2. Poverty may force families to split up temporarily or permanently as an adult goes in search of work. The benefits may include increased household income but—if we apply the lens—we may highlight some major costs if this dislocation leads to more frequent sexual interactions. There may be a significantly greater risk of the migrating individual (as well as his/her partner who remains) being infected with HIV.
3. Applied to agriculture, in the short term, cassava may be a good choice to grow as it does not require a lot of labor, but in the long term, unless there is scope for diversifying the diet elsewhere, it may increase the chances of long-term nutritional problems, given its low protein concentration (at a time when HIV/AIDS is raising protein requirements).
4. A diversified diet (e.g., achieved through developing kitchen gardens to grow micronutrient-rich fruits and vegetables) requires more time, which may also be used in wage earning or caring for the sick.
5. Liberalization of food markets may increase income, but it may also increase risk if there is more travel and more time spent in overnight stays at spatially scattered markets.
6. Better transport infrastructure facilitates the marketing of food surpluses, but it may also increase travel-related HIV susceptibility.

One recurrent issue will be how to weigh up the costs and benefits of short- versus long-term responses. How feasible are sustainable responses? Where capacities of households and communities are being eroded, often irreversibly, in

[8] The latest guidelines (WHO 2001) state: "When replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV-infected mothers is recommended. Otherwise exclusive breastfeeding is recommended during the first months of life. To minimize HIV transmission risk, breastfeeding should be discontinued as soon as feasible, taking into account local circumstances, the individual women's situation and the risks of replacement feeding (including infections other than HIV and malnutrition)."

ways that will reverberate across generations, how realistic is it to expect responses undertaken now to not undermine capacity to respond in the future (see Box 1 on coping)? Sustainability in this context may be something to strive for, but not to be straitjacketed by.

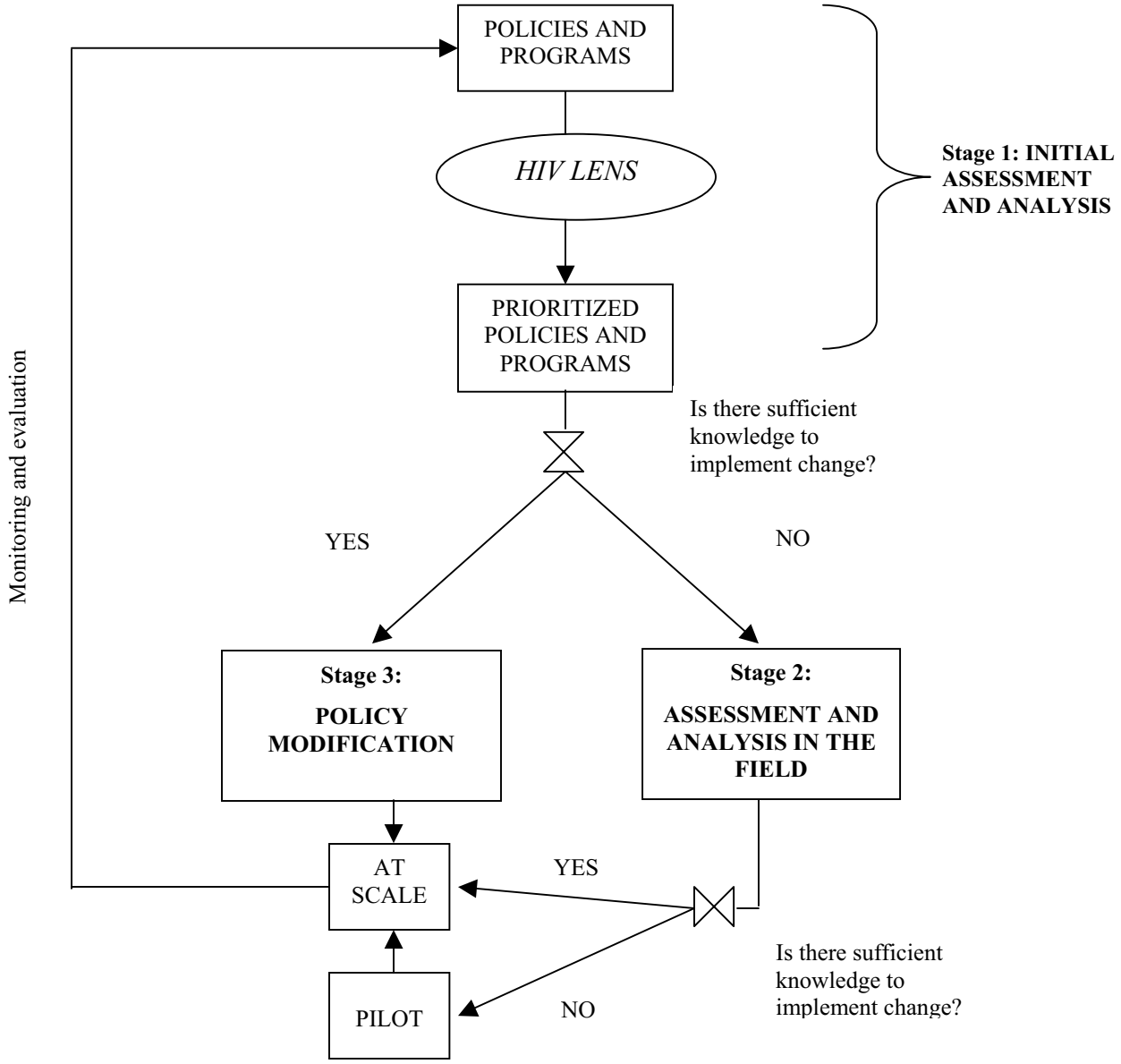
- *For reviewing HIV-specific programming*. Finally, in addition to applying an HIV lens to development policy, there is a need to promote the use of a developmental lens to the design of specific HIV policy and programs, whether these are related to prevention, care, or treatment. Any new program aimed at risk-reducing behavioral change, for example, needs to fully take account of what, in addition to information, influences or constrains choices and behaviors (see Figure 1). Better communications between sectors will permit the findings of such basic analyses to be channeled to those who can act on them.

Using the Lens: An Illustration at the Level of Policy

RENEWAL is developing processes through which decisionmakers at different levels and in different contexts can learn to use the lens. These processes are linked and currently include (1) the formation of sector-wide national networks that advance practical understanding through action research and forums for exchange and policy dialogue; (2) the review of national agricultural policies and programs; and (3) the development of community-led action on food security and livelihoods to advance prevention, mitigation, care, and/or treatment. Experiences with the first and last will be described in forthcoming publications. Here we outline a three-stage process of applying the lens to national agricultural policies and programs (Figure 9).

Stage 1 involves a review of agricultural policies and programs in terms of their potential contribution—positive or negative—to HIV/AIDS prevention and mitigation. This may be carried out in workshops, primarily by the researchers, program managers, or policymakers responsible for them, with outside facilitation and the involvement of

Figure 9—Illustration of the process of using an HIV/AIDS Lens to improve policy



key stakeholders. The lens is first introduced (the concepts of susceptibility, resistance, vulnerability, and resilience), followed by the generic maps and other aids to understanding, and, finally, the current state of knowledge on the links between

agriculture and HIV/AIDS and how interventions can modify them. Attention is then directed to particular policies and programs in turn. Those responsible introduce them, explain their purpose, how they are operated, and the extent to which HIV/AIDS has already been taken into account in design or implementation. Looking through the lens, participants then assess potentially negative and positive effects, asking the following type of questions:

- How might this policy or program be increasing people's susceptibility to HIV?
- How might this policy or program be increasing people's vulnerability to the consequences of AIDS?
- How likely, serious, and widespread are these effects expected to be?
- How might this policy or program be enhancing people's resistance to HIV?
- How might this policy or program be enhancing people's resilience to the consequences of AIDS?
- How likely, beneficial, and widespread are these effects expected to be?

The facilitator ensures that issues are adequately discussed and that crosscutting issues receive due attention, asking, for example, "How are women in particular affected?" and "How would this affect people who are vulnerable to other threats?"

The output of this review will be a list of policies and programs prioritized in terms of their potential positive or negative contribution to HIV/AIDS prevention and mitigation. In some cases, those responsible may feel compelled to alter the policy or program on the basis of the review alone, particularly where serious harm is thought likely and a remedy is obvious. However, given the imperfect nature of the lens currently, they are more likely to conclude that evidence from the field is essential before taking action.

Stage 2 will seek that evidence for those policies and programs thought to be having the greatest positive or negative effects, the number depending on the resources available. The methods used will be determined by the nature of the threat or

opportunity, but in all cases will include seeking the views of the social groups concerned. Researchers, in collaboration with those responsible for the program or policy, will gather quantitative and qualitative evidence on whether it is helping or hindering affected households in their struggles to overcome the consequences of AIDS or avoid falling into situations of high HIV risk. For example, with respect to mosaic-tolerant cassava varieties, research would assess whether current diffusion mechanisms are succeeding in putting them into the hands of AIDS-affected household heads, whether the households are able to put them to use, whether they in fact gain the expected production advantage, and whether the benefits reach the most vulnerable.

Stage 3 will involve the modification of programs and policies, drawing on the results of Stage 2. There is a spectrum of possible modification—ranging from changing nothing to changing everything (by stopping the existing program or initiating a new one). Different aspects—the what, how, who, and where—may need to change.

In some cases, the changes needed may be clear and uncontroversial and can confidently be implemented at full scale. Here, the research required would be limited to monitoring and evaluating the revised program or policy. In other cases, however, the way forward may be less certain, with no evaluated experience to draw on. Policies causing concern will often have been designed to balance different stakeholders' interests; how a new balance is to be achieved with HIV/AIDS factored in may not be obvious. In these situations, trials at pilot scale may help provide guidance to policy or program reform.

Take again the example of mosaic-tolerant cassava. The Stage 2 analysis may have shown that affected households are having trouble accessing the improved varieties through group-based extension approaches, possibly because the widows, orphans, and grandmothers simply do not have time to attend the meetings where they are distributed, or because they find themselves excluded. Other approaches would then have to be tested to reach them and other households similarly situated, but whose poverty is not due to AIDS. That may entail developing partnerships with community-based organizations that are already working with these groups.

Such trials would use the results from Stage 2 as a baseline against which to evaluate the modified policy or program. If they are to be an effective guide to policy and program reform, it is important that key stakeholders, including local government and civil society actors, be familiar with the trials and have a chance to influence their design. They must also have access to their results in a timely and usable form.

The action research of Stages 2 and 3 need not await the conclusion of the Stage 1 review. Where there is good reason to believe that particular policies or programs may be having beneficial or detrimental effects, delaying trials to clarify these and to seek ways to reduce the negative and enhance the positive effects is difficult to justify.

5. Conclusions

In a situation where HIV/AIDS is seriously eroding, and often tearing apart, the social and economic fabric of countries, a patchwork approach is insufficient: the entire fabric needs strengthening. This will require responses that are not only multisectoral but multilevel—from the rural farmer adopting and adapting livelihoods to reduce risk, to national policymakers embarking on a comprehensive review of the AIDS-relevance of existing development policy.

The linked concepts of resistance and resilience need to become grounded in processes of understanding and responding at all levels. Resistance here refers to the ability to avoid HIV infection, while resilience refers to the ability to withstand the different impacts of AIDS. Both imply active responses. Ultimately, a better understanding of what determines resistance and resilience at different levels and for different people will point to clear options for effectively responding. An actor-oriented, innovation perspective is needed to counteract the widespread hopelessness deriving from "doom and gloom," broad-brush prophecies of livelihood collapse. Much positive experience does exist, and this needs to be documented, disseminated, and learnt from.

One major set of responses is required from the agriculture sector, as the need to secure and provision food for populations affected by HIV/AIDS is rapidly increasing as

the impact waves hit. Food is often the first priority of people affected by the pandemic. We are also beginning to learn more about the crucial role of nutritional status—both in terms of susceptibility to HIV infection and transmission and in terms of the quality and quantity of life of HIV-positive individuals.

A sea change is required—in attitudes and consciousness of what HIV/AIDS is doing at different levels and the pathways through which it moves through societies. Such a new awareness may be facilitated by the use of an HIV/AIDS lens—essentially a tool for reviewing situations and development actions from the perspective of our evolving knowledge of AIDS interactions. The lens will facilitate the development of more HIV-relevant policies and programs in more sectors—and ultimately in larger scale, sustained progress in responding to AIDS. While the specifics will become clear through use of the lens, external support will likely be most effective in the long run where it is directed to preserving and developing institutional capacities to strengthen resistance and resilience.

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