



Africa Rice Center (WARDA)



Systemwide Initiative on HIV/AIDS
and Agriculture (SWIHA)

**HIV/AIDS & Agriculture:
Implications for Food Security in West and Central Africa**



Editors:

A Kormawa, B Beks and AR Agboh-Noameshie



About Africa Rice Center (WARDA)

Africa Rice Center (WARDA) is an autonomous intergovernmental research association of African member states. WARDA is also one of the 15 international agricultural research Centers supported by the Consultative Group on International Agricultural Research (CGIAR).

WARDA's mission is to contribute to poverty alleviation and food security in Africa through research, development and partnership activities aimed at increasing the productivity and profitability of the rice sector in ways that ensure the sustainability of the farming environment.

The *modus operandi* of WARDA is partnership at all levels. WARDA's research and development activities are conducted in collaboration with various stakeholders— primarily the national agricultural research systems (NARS), academic institutions, advanced research institutions, farmers' organizations, nongovernmental organizations and donors—for the benefit of African farmers, mostly small-scale producers, as well as the millions of African families for whom rice means food.

The *New Rice for Africa* (NERICA), which is bringing hope to millions of poor people in Africa, was developed by WARDA and its partners. The success of the NERICAs has helped shape the Center's future direction, extending its horizon beyond West Africa into Eastern, Central and Southern Africa.

WARDA hosts the African Rice Initiative (ARI), the West and Central Africa Rice Research and Development Network (ROCARIZ) and the Inland Valley Consortium (IVC). It also supports the Coordination Unit of the Eastern and Central African Rice Research Network (ECARRN) based in Tanzania.

Since January 2005, WARDA has been working out of the International Institute of Tropical Agriculture (IITA) Benin station in Cotonou, having relocated from its headquarters in Bouaké, Côte d'Ivoire, because of the Ivorian crisis. WARDA has regional research stations near St Louis, Senegal and at IITA in Ibadan, Nigeria.

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**Proceedings of the
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A Kormawa, B Beks and AR Agboh-Noameshie

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For the contributions and contacts provided during the preparation of the workshop, we sincerely thank the following: Mrs Dora Katuli; Mr Clay Trant; WARDA scientists and various committee members involved in organizing and reviewing. WARDA logistics, administration and travel units are commended for a wonderful job done.

It has not been possible to include reviewed versions of all the submissions made to the workshop, although shortened versions of some presentations are included. A special thank you for the completion of this report goes to Dr Richard Konteh.

Finally, we are grateful to the Canada Fund for Africa (CFA) for funding the workshop.

A Kormawa,
B Beks and
AR Agboh-Noameshie

Foreword

Rural Africa feels the greatest impact of HIV/AIDS. Not only in the rural workforce – be that in agriculture, forestry or fisheries – but at all levels of professional life in the scientific, agricultural and rural support sectors. Very often ‘urban’ victims of this devastating syndrome are in reality migrants from rural areas. They often return home to the countryside for nursing care in their families.

Whatever the background to the cases being reported daily, food and nutrition has an important role in mitigating the onset and progress of AIDS so that sufferers remain economically productive for longer. The outputs of agricultural science research can ease the burden that HIV and AIDS place on poor farming families with limited financial and labor resources for nursing and for crop production. Many of those lost to HIV/AIDS are the most experienced and knowledgeable of the agricultural workforce. Their loss creates an inter-generational gap in knowledge

That is why the Systemwide Initiative on HIV/AIDS and Agriculture (SWIHA) was formed to harness the expertise of CGIAR scientists both for directing their technological products towards applications in areas affected by HIV/AIDS and to provide a research base for exploring impact of the syndrome in non-urban areas. Africa may have the highest infection rates and mortality worldwide but the experience of Uganda has demonstrated that improvement is possible. West and Central Africa have lower infection rates than Eastern and Southern Africa and science can elucidate why this should be.

The Africa Rice Center (WARDA) was delighted to host SWIHA and to have helped organize its first international workshop bringing together mainly African scientists from a wide range of disciplines with expertise to offer in the fight against HIV/AIDS.

A major workshop output was the formation of the Africa Network on HIV/AIDS and Agriculture (ANEHA). It is already bringing together agricultural science researchers with an interest in overcoming the effects of the affliction and reversing the destruction to rural economies at both the family and regional levels. The Africa Rice Center (WARDA) remains steadfast in its willingness to use the nutritional benefits of rice in fighting HIV/AIDS, together with the new technologies such as higher-yielding NERICA varieties and new agronomic and post-harvest techniques for growing this rice easily and with added value without further straining scarce resources.

Dr Papa Abdoulaye Seck
Director General, Africa Rice Center (WARDA)

Workshop Objectives and Programme Structures

Introduction:

The HIV/AIDS pandemic is a global crisis with impacts that will be felt for decades to come. The pandemic is no longer just a health problem for the world but has become a major threat to all economic, social and political development. Sub-Saharan Africa is the region worst hit by the HIV/AIDS pandemic, which is depleting the continent of its food producers, cutting food production and generating a spiral of acute poverty. In 2003, UNAIDS estimated that HIV/AIDS had killed 2.9 million people while 4.8 million became infected, bringing to 38 million the number of people living with the virus worldwide. Nearly 25 million of these people live in sub-Saharan Africa, where over 12 million children have lost one or both parents to AIDS.

This workshop provided an opportunity to all stakeholders to share in the rapidly expanding body of research and operational experience in this area, which can serve as a platform for strengthened future collaborations. It also deepened understanding of the interactions between health, HIV/AIDS, agriculture and food security.

Objectives of the workshop:

- Assess interactions between HIV/AIDS, agriculture, nutrition and food security;
- Bring together professionals from all sectors to share research on past experience, on what works and what does not work in HIV/AIDS management;
- Develop mechanisms and processes for addressing policy and programs
- Compare lessons learned from East and Southern Africa and their transferability to West and Central Africa (WCA);
- Forge partnerships with national and international agencies that are involved in HIV/AIDS, agriculture, food security and nutrition;
- Develop proposals for fund raising.

Director General's opening remarks

Kanayo F. Nwanze

Director General, Africa Rice Center (WARDA)

Mr Chairperson, UNAIDS Country Coordinator for Benin and Togo and representatives of UN agencies (UNDP, WFP); representatives from HIV/AIDS Country Programs (NISER-Nigeria, Uganda, Zimbabwe, Malawi); donor representatives (CIDA, USAID/WARP, GTZ, WB, EU); representatives of regional economic commissions (ECOWAS Secretariat); Representatives from sub-regional research organizations (CORAF/WECARD) and NARS partners (IER); NGOs (CARE International, Plan International, CSRS, BNLS); African Universities (Zimbabwe, Malawi, Benin); Sister CG Centers (CIAT, ICRISAT, IWMI, IPGRI, IITA); CGIAR G&D Program; Africa Rice Center Scientists; Invited Guests; Ladies and Gentlemen.

On behalf of the Africa Rice Center (WARDA), and in my personal capacity, I welcome you all to our new location in Cotonou, Benin, and to the SWIHA-organized Regional HIV/AIDS workshop under the theme 'HIV/AIDS and Agriculture: Implications for Food Security in West and Central Africa'.

This workshop was to have taken place in October last year at our Headquarters in M'bé, Côte d'Ivoire. You are all familiar with the Ivorian crisis which resulted in our temporary relocation from that country, and why this workshop is only being held now. It is therefore with immense pleasure that I speak the following words of welcome.

This workshop is a first in so many ways: it is the first of its kind under the umbrella of the Systemwide Initiative on HIV/AIDS and Agriculture (SWIHA), which was officially launched in 2001. And it is also the first for Africa Rice Center as the convening Center of SWIHA.

Between 2001 and 2003, SWIHA-WCA undertook household and farm surveys in Côte d'Ivoire and Nigeria; highlighted HIV/AIDS in the workplace; hosted interns; collaborated with COL, Canada; UNAIDS, ECODEV-CI and was supported by the Government of Norway. The CI crisis impacted severely on its continuity. With support from Canada (CFA grant) in 2004, Annmarie Kormawa was recruited as SWIHA-WCA Coordinator. This workshop attests to her energy, dynamism and commitment.

We are pleased that you have responded massively to our call. The workshop has attracted over 60 participants from Africa and Europe, and over 25 organizations are represented. The 33 abstracts and 25 full papers received three weeks before this workshop is a further testament to your interest in this important subject.

As an agricultural R&D institution, we are concerned that HIV/AIDS threatens the very foundation of agriculture, striking down its workforce with major consequences on family livelihood and sustenance. Over the next three days, we have set ourselves the daunting task of accomplishing the following set of challenging objectives:

- Assess the interactions between HIV/AIDS, agriculture, nutrition and food security;
- Bring together professionals from all sectors to share their past research experience on what works and what does not work in HIV/AIDS management;
- Develop mechanisms and processes for addressing policy and programs
- Compare lessons learned from East and Southern Africa and their transferability to West and Central Africa;
- Forge partnerships with national and international agencies that are involved in HIV/AIDS, agriculture, food security and nutrition;
- And of course, developing bankable proposals to raise funds for future collaborative efforts.

Skeptics ask why agricultural research organizations such as ours are involved in the HIV/AIDS-related fight; that HIV/AIDS is a health and social issue. The answer is simple. The linkages between HIV/AIDS and agriculture are too obvious. Let me cite an example: when people in urban areas contract HIV/AIDS and become too sick to work, they usually return to the rural areas where family members provide care and social security. During this period, investments are shifted from agriculture into funding family care. The end result is that of malnourishment of the remaining household members and, in most cases, food insecurity.

Given the above scenario, agricultural research has the following to offer:

- Explaining the linkages between HIV/AIDS and agriculture and food security;
- Developing agricultural technologies to suit the needs of those living with HIV/AIDS;
- Providing information for advocacy to integrate HIV/AIDS prevention and care into agricultural programs in rural areas.

Our goal here is to engage in useful discourse so as to reach consensus on the most practical and most effective strategies for mitigating the impact of combating HIV/AIDS.

We must agree on the answers to some of these questions:

- What do we need to do to improve the situation in Africa?
- How can agricultural research be used to mitigate the impacts of HIV/AIDS?
- How might agricultural research help families to maintain their livelihoods?
- What impact can agricultural researches have on food production in the face of HIV/AIDS?
- What concrete evidence from Africa exists regarding the interaction between HIV/AIDS, agriculture, food security and nutrition?
- What pressures does HIV/AIDS place on our clients, researchers etc?
- Who should we work with, and how?

These are some of the questions we are asking you to help us to answer and find solutions to.

In the agricultural development domain, we have a challenge to address the dilemma of farming households faced with declining production. We need policies and institutional frameworks that are beneficial in breaking the vicious cycle of property and despair between HIV/AIDS infection and inadequate agricultural production, food security and nutrition. The technologies that will be appropriate for households affected by this deadly disease are not readily available.

HIV/AIDS intervention gives an opportunity to look more carefully at poverty and how it affects farming systems, not forgetting gender issues, marginal and poor groups, and at linking nutritional and health needs to agricultural technology development.

We hope that many of you will find the above reasoning convincing enough to want to join hands in a new partnership in the fight against HIV/AIDS in agriculture. Finding research solutions to HIV/AIDS requires a combined effort from health, agriculture, education, rural development, the social sector and many others. One sector cannot do it alone.

We look forward to your active participation in this important workshop and hope that by the time Wednesday comes around, you will have come out with propositions with bold coverage and dimensions, clear perspective and robust strategies for implementation that will contribute to alleviating the impact of this pandemic – HIV/AIDS – on agricultural productivity.

Once again, welcome to the Africa Rice Center and please enjoy your stay in Cotonou. I keenly look forward to seeing the outcomes of your deliberations.

SECTION ONE:

**Interaction between HIV/AIDS,
agriculture and food security in WCA**

Agricultural approaches to mitigate the effects of HIV/AIDS: lessons from Uganda

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Abstract

This paper summarizes the evidence of AIDS impact from past studies conducted in Uganda with affected and non-affected households, and gives an overview of institutional responses to the epidemic and the shifts in intervention in the fight against AIDS. New opportunities with different agricultural approaches that could play a part in mitigating the impact of AIDS in households and communities affected by AIDS are discussed, together with the opportunities for improving food security through organic agriculture in Uganda. Development and research professionals, in an attempt to offer a solution to food insecurity, poverty and declining rural livelihood as a result of HIV/AIDS, view the expansion of organic agriculture and its market opportunities for small-scale farmers in developing countries as an opportunity to alleviate poverty by increasing their income and domestic food security. While organic agriculture is perceived to alleviate poverty, nevertheless, poverty remains one of the biggest barriers to organic agriculture.

Key words: *organic agriculture, rural livelihoods, mitigation of AIDS impact, affected households and communities*

Introduction

Uganda's success in reducing high HIV infection rates is the result of high-level political commitment and visionary leadership enabling the mobilization of a society-wide movement that empowers people to protect themselves against infection and to fight the stigma and discrimination faced by those who live with HIV/AIDS. The government's first response to the crisis was to establish the National Committee for the Prevention of AIDS (NCPA) in 1985. This committee was charged with epidemiological surveillance; ensuring a safe blood supply for transfusions; providing HIV/AIDS information, education and communication (IEC); providing patient care and counseling; and preventing and controlling sexually-transmitted infections (STIs). The committee's activities led to the formation of an AIDS Control Programme (ACP) at the Ministry of Health in October 1986.

The National Strategic Framework for HIV/AIDS Activities is the major government initiative (UAC/UNAIDS, 2000) for the control of HIV/AIDS in Uganda today. The objectives of the National Strategic Framework, which has a wide cross-section of stakeholders, are to:

- Provide a brief review of trends in HIV sero-prevalence;
- Describe the efforts taken to mitigate the adverse health and socio-economic effects of the epidemic in Uganda;
- Provide overall guidance for activities that are geared towards preventing the spread of HIV/AIDS and to mitigating its effects;
- Serve as the basis for the mobilization of resources to implement the national ACP.

Other government policies that aim at intensifying efforts against HIV/AIDS include the Poverty Eradication Action Plan (PEAP), Uganda Vision 2025 and the National Health Policy. Some responsibilities for HIV/AIDS prevention and care have been transferred to the districts under the Local Government Act of 1997.

At the community level, the Ministry of Health emphasizes more on treatment of opportunistic infections and other STIs as part of proper management of HIV/AIDS. Unlike in the past, people living with HIV/AIDS (PLWHA) seek for early treatment of STIs and OIs from health facilities and traditional herbalists. Drugs for treatment of opportunistic infections are found in government and private health facilities. A majority of patients in the country have knowledge of treatment forms available for them.

Impact of HIV/AIDS on agriculture in Uganda

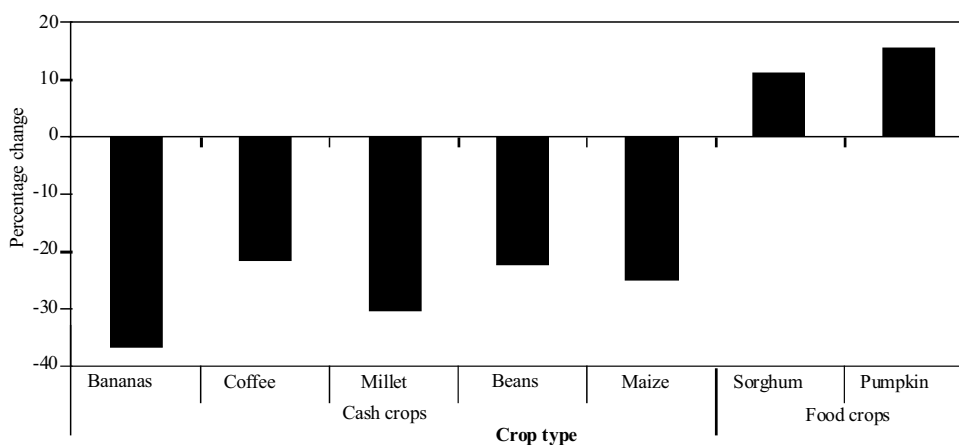
HIV/AIDS has had significant effects on agricultural production (mixed agriculture, fisheries and livestock) sub sectors in Uganda and the livelihood based on it. The impact is felt more in terms of food security, nutrition and livelihoods security (Tumwine, 2003).

Crop production

Evidence from a baseline survey report in Uganda (NAADS, 2003) shows that HIV/AIDS has led to a number of changes at the household and community levels. The effects in crop farming communities include: changes of the area of land cropped, type of crops grown and farming practices used. Affected households reduced the overall area of cropland that they cultivated, while for non-affected households the area under cultivation increased. Noticeable differences between affected and non-affected households are also evident. Affected households have decreased the production of cash crops and increased that of food crops, while non-affected households did exactly the opposite. This may have a lot to do with the fact that farmers do not involve their spouses fully in the daily management of the farm or in other serious issues that have a large bearing on production from the farm. Some crops previously grown are disappearing

due to changes in the household labor allocation, headship and gender roles by which some crops are seen as for women and others for men. AIDS affects the demands of such crops from a gender perspective. Coffee and bananas have decreased in affected households/communities because they are labor intensive crops, besides being perceived as men's crops. The findings of this national survey are in agreement with previous studies (Tumwine, 2003; Barnet and Blaikie, 1992). This is illustrated in Figure 1 below.

Figure 1. Changes in food and cash crops grown in affected households

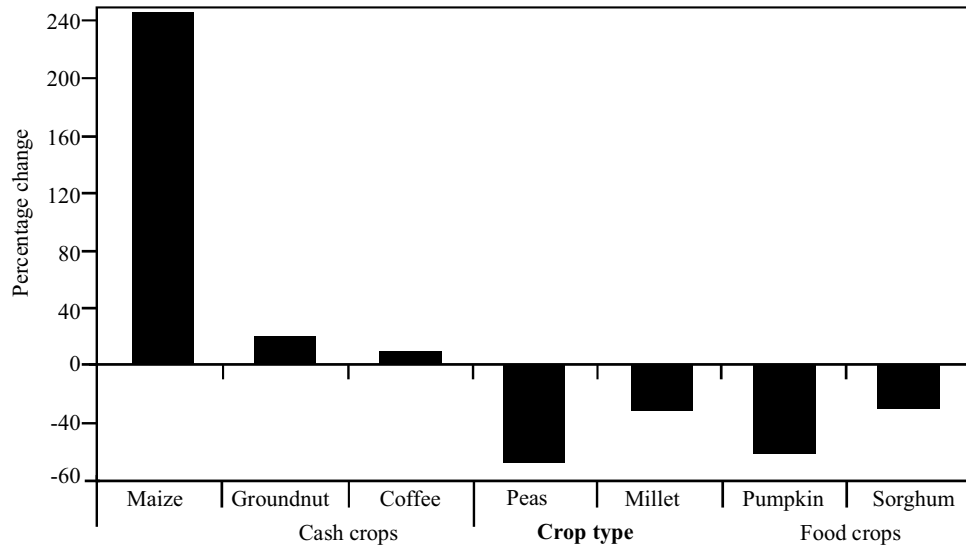


Source: Baseline report (NAADS, 2003)

Non-affected families decreased the cultivation of such food crops as peas by 76 percent, millet by 30 percent, pumpkins by 58 percent and sorghum by 26 percent, while increasing the cultivation of cash crops such as maize (by a massive 247 percent), groundnuts (16 percent) and coffee (4 percent), see Figure 2.

Interventions should therefore focus on ensuring food security and production of more staple foodstuffs that is sufficient to allow all households (especially affected ones) to be food secure. However, this may require the introduction of new production systems. For example, crops such as soybean have been adopted in affected communities as a strategy to improve nutrition through soymilk and income through the sale of soybeans. A focus on management skill and less labor-demanding crops in affected communities could be more meaningful. Evidence from previous studies in Uganda have shown that, in affected households, there is a decrease in crop yields, which can be attributed to poor management practices (Tumwine, 2003a). There is lack of knowledge and skills, and poor quality of planting materials used in the studied districts.

Figure 2. Changes in food and cash crops grown in non-affected households



Source: Baseline report (NAADS, 2003)

This lowered production and resulted in less food being available for household consumption. Also the gender-specific nature of many agricultural activities increases the impact of HIV/AIDS-related illness and disease. For example, weeding and pruning for coffee crops, and mulching for bananas, are all considered male activities, and women do not have the necessary knowledge or skills to carry them out when their husbands fall ill or die (NAADS, 2003).

Besides lack of skills and knowledge, there is a problem of having less equipment and fewer implements, e.g. a hand-hoe is the most common land preparation tool, regardless of status (affected or non-affected) and source of livelihood. There is a general lack of access to and utilization of recommended and appropriate farm implements and tools, owing to lack of money for purchasing them, particularly among affected households. Orphan-headed households have very few implements, and what they have inherited is very poor and worn out. Orphans lack both the skills to make and repair old tools and the money to buy new ones. The weakness caused by ill health has also resulted in shallow tillage and, therefore, inadequate preparation of the land for cropping and poor returns from the fields.

AIDS affects labor allocation and time available to consult extension agents to get modern farming knowledge; farmers are not adopting recommended agronomic practices such

as row and line spacing, appropriate depths, composting and manure (*ibid.*, 2003). In some cases, recommended agronomic practices are too difficult and time-consuming for HIV/AIDS-affected people to manage, as is the case for making composted manure or spacing crops properly. Orphan-fostering households, and those headed by widows, widowers or orphans, have limited ability to add value to farm produce because of their lack of resources and access to farm inputs. In addition, increased expenditure on medication and funeral costs has lowered household investment in livestock, farm inputs and implements, which has lowered the quality of production. The quality of produce is also compromised by the limited extension services that are available to these households. For instance, orphan heads of household are often not included in community-level sensitization sessions because they are regarded as children, although they need information to improve their productivity. Efforts to involve them are of great importance.

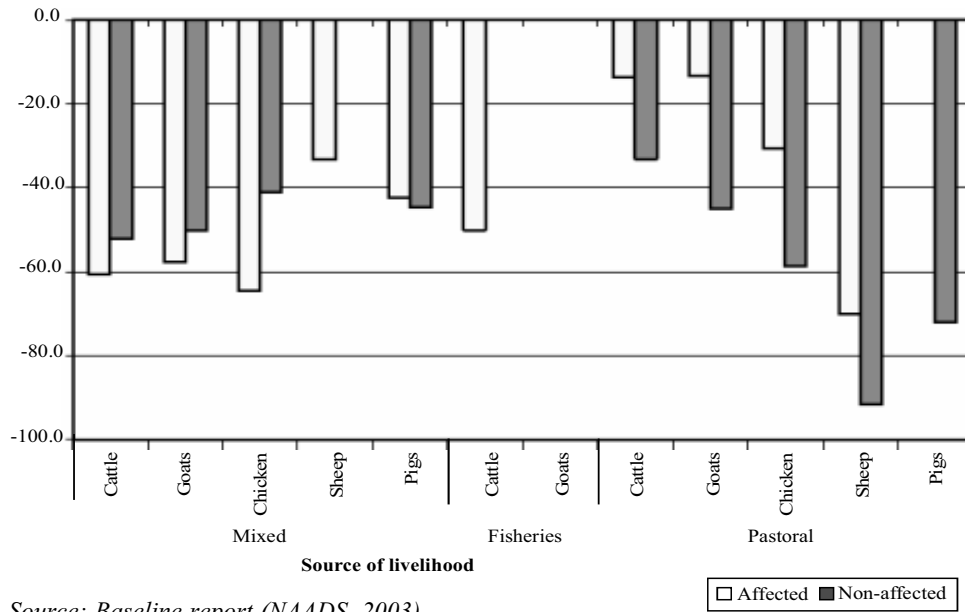
Impact of HIV/AIDS on livestock ownership

In pastoral communities, AIDS has resulted in households decreasing animal numbers because of poor management due to labor constraints, and the lack of financial resources for animal treatment has resulted in increased animal disease, which is exacerbated by grazing in forest areas where disease transmission is high. Increased animal diseases have led to mortalities and a resultant further reduction in the numbers of livestock held by households. Reduced animal numbers have been further compounded by distress sales to fill labor shortages and provide cash. The most important causes of reduced animal numbers are sales, deaths, asset stripping and slaughter for consumption (Tumwine, 2003a).

Findings from a baseline survey (NAADS, 2003) show that for the 1997 to 2002 period, all studied households, irrespective of status and livelihood system, recorded decreased overall numbers of livestock kept. There were, however, significant differences by status in the mean reductions for each livestock species, especially sheep and chickens in the mixed community. In the pastoral community, the reverse was true, with non-affected households having significantly larger reductions in mean livestock numbers. In affected households, men who feel weak spend less time grazing and watering their animals. Cattle rearing is seen as an activity for men. In most cases, the shortfall is made up by hired labor, which is difficult for HIV/AIDS-affected households to supervise and pay for. The outcome of this is poorer livestock care and the grazing of animals closer to the homestead, resulting in lower milk production (especially during the dry season). Women hire labor mainly to dig wells for watering animals, but to do so they have to sell some animals; they also sell cattle to buy grazing and watering rights from their neighbors. Competing needs and reduced incomes have made it impossible to pay grazing fees and

have forced vulnerable households (especially those headed by widows) to resort to forest reserves, where grazing pressure is high. High grazing pressure has aggravated the problem of poor pastures and resulted in lower milk production and a decline in the natural resource base (NAADS, 2003). Figure 3 below shows the percentage changes in the mean household livestock holding, by status and source of livelihood.

Figure 3. Percentage changes in mean household livestock holdings by status and source of livelihood



Source: Baseline report (NAADS, 2003)

Nutrition and food security

Few studies have been conducted to assess nutritional intake by food type, quantities of foods consumed, numbers of meals, etc. This theme presents an overview of food consumption patterns, and explores the reasons for food insufficiency. In Uganda, findings from the baseline surveys show that households have lost self-sufficiency. This is attributed to the reduced availability of produce resulting from less land being cropped and larger household sizes. For example, the fostering of orphans appears to constrain the ability of many households to meet their own food requirements. This is compounded by the loss of traditional food safety nets, which provided vulnerable and needy homes with a means of generating their own food. This loss can be attributed to the rampant poverty prevailing in rural areas and worsened by the impact of AIDS.

The interaction between HIV/AIDS and nutrition can be seen from biological and socio-economic perspectives. Biologically, there are multiple relations between HIV/AIDS and nutritional status: good nutritional status might reduce the chances of infection or extend the lives of patients. Improving nutrition requires an integrated approach to household food security, health and care. In communities affected by HIV/AIDS, nutrition education and the timely transfer of knowledge and skills to prevent their loss to the household and the wider community are required. Participatory techniques are essential to forming an understanding of the specific constraints faced by HIV/AIDS-affected communities and to designing adequate responses. Since HIV/AIDS issues are highly sensitive and require behavioral change, appropriate communication strategies are crucial. The inclusion of HIV/AIDS considerations in agricultural and nutrition strategies is relatively new; cross-sectoral and inter-institutional collaboration is required in order to develop appropriate strategies, through operation research and documentation and evaluation of experiences. Below is the model for visualizing AIDS impact on household food security and nutrition.

Findings from the baseline study in Uganda show that most households (both affected and non-affected) ate two meals a day depending on the season. This is adequate, although the meals were not always nutritionally balanced. In addition, far fewer affected households had at least two meals a day in 2002 than had done in 1997. Orphans lacked a balanced diet and their major food sources are begging, food for work and support from neighbors, so their nutrition status is compromised by uncertain food availability, particularly when they fall ill and cannot work (NAADS, 2003). Table 1 below shows household eating behavior by household status for 2002 and 1997.

Table 1. Households (%) by eating pattern and household status for 2002 and 1997

Household status	Daily eating pattern	2002			1997		
		Mixed	Fisheries	Pastoral	Mixed	Fisheries	Pastoral
Affected	Three meals	22.4 (71)	25.0 (15)	9.4 (3)	38.7 (105)	39.0 (23)	12.5 (4)
	Two meals	65.5 (182)	46.7 (28)	56.3 (18)	56.1 (152)	50.8 (30)	59.4 (19)
	One meal	8.3 (23)	28.3 (17)	13.3 (10)	4.4 (12)	10.2 (6)	25.0 (8)
	Others	0.7 (2)	-	3.1 (1)	0.7 (6)	-	3.1 (1)
	Total	100.0 (278)	100.0 (60)	100.0 (32)	100.0 (271)	100.0 (59)	100.0 (32)
Non-affected	Three meals	30.5 (46)	30.0 (3)	21.1 (8)	37.2 (55)	40.0 (4)	16.2 (6)
	Two meals	61.6 (93)	50.0 (5)	47.4 (18)	59.5 (88)	50.0 (5)	45.9 (17)
	One meals	7.9 (12)	20.0 (2)	31.6 (12)	3.4 (5)	10.0 (1)	37.8 (14)
	Others	-	-	-	-	-	-
	Total	100.0 (151)	100.0 (10)	100.0 (38)	100.0 (148)	100.0 (10)	100.0 (37)

* *Figures in brackets are numbers of households*

Source: Baseline report (NAADS, 2003)

Shifts in intervention in the fight against HIV/AIDS

Since the early 1990s, there has been a growing shift in interventions and in focus from the infected to the affected. The aim was to move from looking at AIDS as a disease of the sick, and blaming and stigmatizing victims, to an understanding that AIDS affects each and every member of society. Program measures increased people's HIV/AIDS awareness and created societal responsibility to fight the disease. The overriding importance of this shift was to give people a fallback position and encourage more people to go for HIV testing.

Organic agriculture: an alternative for HIV/AIDS-affected communities?

Organic agriculture (OA) is one of the fastest growing segments of the food sector worldwide. Sales have been estimated at US\$ 24-30 billion in the years 2003-2005 (ITC, 2002). Australia has the highest land area (10.1 million ha) under organic production in the world (IFOAM, 2004). More than 320,000 hectares (ha) in Africa are under organic management, of which 38% are in Uganda where it constitutes 1.39% of the total agricultural area.

Investment in Uganda's formal organic production is increasing, as are production levels. Organic produce attracts a 15-30% price-premium at the retail end. EPOPA, a Swedish-funded agency, has promoted smallholder-oriented certified OA in Uganda. A section of smallholder farmland is devoted to OA for export. Organic products from Uganda include fresh vegetables, tropical and dried fruits, tea, coffee, spices, sesame seed and agro-forestry products, according to a 2004 report from the International Federation of Organic Agriculture Movements (IFOAM). Although the export market share for traditional Ugandan crops (coffee, tea) is declining (71.3% to 39.1% in the years 1999 to 2002), the non-traditional exports (NTE's) have been on the rise, with 61.7% of the export market share in 2001. The European Union (EU) countries accepted the largest share (33 percent) of the Ugandan exports in 2002, followed by the COMESA (23%) countries (MFPED, 2003). According to the International Trade Center (ITC), the export of Ugandan organic produce is envisaged to grow by US\$ 6 million in 2003-2005. Smallholder farmers, who form about 95% of the farming sector, will supply some of these increased exports.

OA has the potential to improve the productivity of traditional systems of agriculture by optimizing the use of local resources. Ugandan farming methods fit the description of 'traditional agriculture', 'passively organic agriculture' or 'organic agriculture by default',

primarily because of the low external input use including inorganic fertilizers and pesticides. The Ministry of Agriculture, Animal Industries and Fisheries reports inorganic fertilizer use at 1 kilogram (kg) of plant nutrients ha⁻¹, about 11% of the average sub-Saharan Africa (SSA) utilization for 1999. At the international level, the Federation of Organic Agriculture Movements (IFOAM) and the Codex Alimentarius define the guidelines and principles for OA as a holistic production and management approach that protects the ecosystem, promotes welfare, food safety and is economically feasible. The primary goal of OA is to optimize the health and productivity of interdependent communities of soil life, plants, animals and people. The departure from the purely organic approach in Uganda is attributed to unsuitable climatic and soil conditions, high illiteracy rates, ineffective extension approaches, inputs of uncertain quality, inefficient distribution systems high cost of inorganic inputs and the dependency on rainfed agriculture.

Organic agriculture and HIV/AIDS in Uganda

Over the years, extensive research has been undertaken by many research and development organizations on mitigation of the impact of HIV/AIDS on rural livelihoods through low-labor input agriculture and related activities such as (labor-saving crops and agricultural techniques). The great majority of research was not done in the context of AIDS but in a more general attempt at reducing demands on labor, especially in agriculture-based economies.

Development and research professionals, in an attempt to offer a solution to declining rural livelihoods as a result of HIV/AIDS and poverty, view the expansion of organic agriculture and its market opportunities for small-scale farmers in developing countries as an opportunity to alleviate poverty, by increasing their income and domestic food security. It needs to be noted, however, that the transition to organic agriculture is not only complex but also constrained by a range of biophysical, economic and social factors.

While organic agriculture is perceived as alleviating poverty, poverty also remains one of the biggest barriers to organic agriculture. Little or no research has ever addressed the changes in livelihood strategies and outcomes as a result of the introduction of agricultural approaches such as organic agriculture and their market opportunities compared to other agricultural approaches. There are few empirical studies on the effects of HIV/AIDS on organic agriculture, and the opportunities that organic agriculture and other approaches may offer to communities and households affected by HIV/AIDS in Uganda. Similarly, no study has ever addressed whether organic agriculture is more suitable for people living with HIV/AIDS (PLWHAs) than other agricultural approaches.

The key question to be pursued in this now ongoing study is whether organic agriculture offers good opportunities to improve the livelihoods of households affected by HIV/AIDS, compared to other agricultural approaches. Or whether it provides better incentives to people with HIV/AIDS compared to other agricultural approaches.

Objectives of the study, research questions and hypotheses

The overall objective of the ongoing study is to investigate and determine the dynamic bi-directional effects of HIV/AIDS on OA and opportunities that organic agriculture could offer to households and communities affected by HIV/AIDS compared to other agricultural approaches. The study's working hypothesis is that successful agricultural approaches will improve rural livelihoods and mitigate the effects of HIV/AIDS. The specific objectives of the study are:

- to analyze and describe the livelihoods of the households and communities affected by HIV/AIDS in Uganda;
- to investigate the extent to which organic agriculture could offer good opportunities to improve the livelihoods of households and communities affected by HIV/AIDS;
- to analyze changes in people's livelihoods and livelihood strategies as a result of practicing organic agriculture;
- to analyze organic agriculture's market opportunities compared to other agricultural approaches in households and communities affected by HIV/AIDS;
- to identify opportunities and develop strategies for empowering HIV/AIDS-affected communities to participate in successful agriculture approaches.

The major questions that will be answered in this study are:

1. to what extent is HIV/AIDS affecting the assets and livelihoods of the affected households and communities in Uganda;
2. to what extent can organic agriculture and its market linkages offer good opportunities to improve the livelihoods and reduce vulnerabilities of the people affected by HIV/AIDS?
3. to what extents are the changes in the livelihoods a result of participation in the selected agricultural approaches by the household?
4. how can poor smallholder farmers, especially women and other disadvantaged people, especially those affected by HIV/AIDS benefit from successful agricultural approaches.

Conclusion

The consequences of the HIV/AIDS epidemic are closely linked to wider challenges to development such as food and livelihood insecurity, poverty and gender inequality. In fact, HIV/AIDS tends to either exacerbate already existing development problems or create new challenges (orphan-headed households, breakdown of social safety nets). Not only does the HIV/AIDS epidemic pose a serious threat to health but also to development as a whole by erasing the gains acquired with utmost difficulty over the past decade (Topouzis, 1998). Today, it is widely acknowledged that, the spread of HIV/AIDS has a significant impact on rural people's livelihoods in several ways: loss of labor, capital, food insecurity, loss of opportunities where children are withdrawn from schools due to lack of resources; and at the national level, the combination of a decline in food production, the sale of food reserves and diminished sources of income cause food shortages and long-term nutritional deficiencies. Moreover, AIDS is an expensive disease and taking care of AIDS patients is a 24-hour job. This does not leave much time to invest in other activities, hence the reliance of affected families on community support groups, as well as the extended family, for food, support, labor and money augmentation. AIDS causes a range of problems which, given its systemic impact, are capable of attacking all levels of society.

Action to improve household and community resilience to AIDS is urgently needed.

Over 80% of the population in Uganda derive livelihoods from agriculture which contributes 44% of GDP. There is a need to try out different agricultural approaches, such as organic agriculture and its market opportunities, that may mitigate the effects of AIDS and increase people's resilience to AIDS.

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Impact du VIH/SIDA sur l'agriculture dans le Couffo – stratégies de lutte développées et acquises : expériences de IFAD-ONG

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Résumé

Les ravages du SIDA constituent une catastrophe mondiale d'une ampleur sans précédent touchant plus de 40 millions de personnes dans le monde dont 2/3 en Afrique subsaharienne. Le Bénin, bien que faisant partie des Etats les moins touchés, enregistre des taux de prévalence inquiétants au niveau de certains départements dont le Couffo avec une prévalence de 13,8 % touchant essentiellement les bras valides que constituent les jeunes, forces productives des communautés. Ceci a une répercussion directe sur l'activité principale des populations qu'est l'agriculture surtout avec la génération des orphelins du SIDA. Face à cette situation qui compromet l'activité agricole voire la vie des populations, IFAD-ONG développe une stratégie intégrée de lutte contre la maladie et ses impacts socio-économiques se résumant à :

Prévention

- *Conscientisation des communautés sur l'existence du SIDA : campagnes de dépistage, témoignages de PVVIH, sensibilisation par les groupes culturels d'enfants et clubs anti-SIDA dans les établissements scolaires*
- *Appui à la Gestion intégrée de la fertilité des fols afin de maintenir les jeunes au village*
- *Renforcement capacités des groupements féminins (GF) sur les activités génératrices de revenu (AGR) en vue de les rendre moins dépendantes des hommes*

Prise en charge des victimes SIDA

- *Prise en charge des malades et orphelins SIDA*
- *Création d'association PVVIH*
- *Installation/équipement en machines agricoles aux comités locaux de soutien aux orphelins SIDA et PVVIH*
- *Renforcement des capacités des associations PVVIH en AGR notamment élevage lapins, aulacodes et volailles*
- *Appui financier et technique aux veuves et familles d'accueil pour les AGR*

Mots-cles : *VIH/SIDA, stratégie intégrée, orphelins, agriculture.*

Introduction

Le département du Couffo se trouve au sud-ouest de la République du Bénin (Afrique de l'Ouest). Ce département compte six (6) communes (Aplahoué, Dogbo, Klouékanmè, Lalo, Toviklin et Djakotomè) et s'étend sur une superficie de 2404 km²

avec une population totale de 524 586 habitants dont 53,4 % de femmes et 46,6 % d'hommes.

La principale source de revenu des populations de ce département reste l'agriculture qui jadis faisait de ce dernier un véritable grenier du pays en matières de vivriers. Cette agriculture connaît aujourd'hui une crise profonde qui compromet la vie au niveau de ce département. Le problème majeur est celui de l'appauvrissement continu des sols ajouté au ravage des bras valides causé par le VIH/SIDA. En effet, dans le département du Couffo, le taux de prévalence du VIH/SIDA est le plus élevé de notre pays oscillant entre 5,1 % et 14,1 % en 1999 selon le Programme national de lutte contre le SIDA (PNLS). Le diagnostic participatif effectué par notre ONG en 2002 a révélé que ceux qui meurent du SIDA sont le plus souvent des jeunes adultes (entre 15 et 40 ans), souvent eux-mêmes parents et un effet moins bien cerné mais dévastateur du SIDA est le nombre très élevé d'enfants qu'il a rendu orphelins dans notre pays et particulièrement dans le département du Couffo, sans toutefois ignorer la panoplie de problèmes auxquels sont confrontés les veuves/veufs ainsi que les autres membres des familles affectées. Le recensement des orphelins du Couffo organisé en juillet 2004 nous a permis de déceler 37 372 enfants dont 17 179 filles et 20 193 garçons.

Les problèmes auxquels sont confrontés ces personnes affectées, ont pour noms, baisse de la production agricole, la marginalisation par la société, difficultés de subvenir aux besoins alimentaires, de se soigner, de se vêtir, de scolariser les orphelins, de mener une activité génératrice de revenu faute de moyens économiques, etc.

Ainsi, ni les statistiques, ni les mots ne peuvent traduire la tragédie humaine des enfants qui pleurent des parents morts ou mourants et qui sont plongés dans la crise économique et l'insécurité alimentaire et sociale se débattent sans services ni soins. La meilleure partie qu'ils puissent tirer de ce système est de se retrouver à la charge de leurs grands-parents ou tantes déjà appauvris et souvent âgés, sans efforts physiques pour des activités agricoles et qui, pour la plupart, étaient financièrement dépendants de leur fils ou fille qu'ils viennent de perdre. Face à ce constat amer et pitoyable qui compromet l'agriculture voire la vie des populations au niveau du département du Couffo, IFAD-ONG a développé des stratégies participatives de lutte intégrée basée sur la prévention et la prise en charge des personnes infectées et affectées.

Conséquences du VIH/SIDA sur l'agriculture dans le Couffo

Dans le département du Couffo, l'activité principale des populations reste l'agriculture. Les statistiques de la Mairie de Klouékanmè nous montrent que ceux qui vivent de l'agriculture en 2005 sont évalués à 95 % de la population du département. Cette activité de type pluvial déjà perturbée par les aléas climatiques, connaît de nos jours une crise

profonde qui compromet dangereusement la vie au niveau de ce département. Le problème majeur est celui de la propagation du VIH/SIDA dans le département.

Les statistiques en 1999 nous donne une prévalence du VIH/SIDA oscillant entre 5,1 % et 14,1 % dans le département. Une étude réalisée par IFAD-ONG au cours de l'année 2002 révèle que la propagation du VIH trouve ses causes dans la rareté des terres cultivables entraînant une diminution des jachères et par ricocher un appauvrissement des sols. Ceci pousse les jeunes à migrer vers les pays limitrophes et les villes du pays laissant enfants et conjointes sans moyens, obligés de se livrer à la prostitution clandestine. Les jeunes, arrivés sur la terre d'accueil, adoptent des comportements à risque les exposant au SIDA. Victimes de leurs comportements, ils reviennent malades ou porteurs sains propager le virus dans leurs villages où le lévirat est encore de mise. En effet, 90 % des PVVIH déclarées dans le département sont des jeunes qui sont revenus soit de Kraké, soit de la Côte d'Ivoire, du Togo ou des villes du Bénin.

L'une des caractéristiques de la maladie du SIDA est qu'elle prive l'agriculture du capital le plus indispensable qui est la force de travail. En attaquant une personne productive, la maladie du SIDA amène les autres membres de la famille à délaisser leur travail pour s'occuper des soins au malade puis après à pleurer sa mort et à observer les rites d'enterrement et de veuvage qui durent plusieurs mois voire des années dans ce département privant l'agriculture d'une partie de la main-d'œuvre.

Ainsi, les services de vulgarisation déjà accablés de travail et en sous effectifs sont pénalisés par un fort taux d'absentéisme, pour cause de maladie, de multiples cérémonies d'enterrement ou de décès. Au Bénin il a été démontré que 85% des PVVIH sont âgés de 15 à 49 ans. La conséquence évidente est que ce sont les bras valides, constituant la force productive du département, qui disparaissent entraînant ainsi une baisse de la productivité déjà insuffisante pour nourrir une population sans cesse croissante.

Par ailleurs, la maladie tout en détruisant lentement le système immunitaire de son hôte l'amène à vendre progressivement tous ses champs et à brader toute son économie pour faire face aux frais médicaux. Dans ces conditions l'individu atteint du SIDA avant sa mort se débarrasse de tous ses biens, laissant des orphelins dans une situation très vulnérable dans la mesure où les capitaux qui devraient être investis dans l'agriculture pour produire le revenu, étaient orientés vers les soins et les funérailles.

Perte des bras valides, baisse croissante de la production, bradage des capitaux, taux de prévalence du VIH/SIDA élevé, nombre élevé d'orphelins en situation difficile : voilà le cercle vicieux que tente de briser IFAD-ONG dans le département du Couffo à travers des stratégies communautaires de lutte contre le VIH/SIDA.

Stratégies de lutte développées par IFAD-ONG

Les stratégies de lutte développées par IFAD-ONG prennent en compte à la fois les personnes saines, les personnes infectées et celles affectées. Cette stratégie comporte deux composantes :

- la prévention
- la prise en charge des personnes infectées et affectées

Stratégie préventive

Les efforts sont déployés pour susciter au niveau des populations une prise de conscience individuelle et collective et les organiser autour des grands défis en matière de prévention du VIH/SIDA. Pour la prévention, IFAD-ONG utilise une approche communautaire de conscientisation des populations et de démythification de la maladie. Du point de vue opérationnelle, cette approche est basée sur trois grandes activités :

- La sensibilisation
- les témoignages à visage découvert
- les renforcements de capacité

Sensibilisation

Elle est constituée par l'organisation des séances de sensibilisation de masse pour expliquer aux communautés les causes et les moyens de prévention de la maladie. Les techniques d'information et de communication utilisées sont des sketches, des chants, des danses et des projections de films. Pour une meilleure sensibilisation à l'endroit des élèves qui constituent une couche à risque, des clubs anti-SIDA sont installés au niveau de certains établissements scolaires pour des séances de communication pour un changement de comportement. Par ailleurs pendant les vacances il est organisé une émission dénommée 'Vacances sans SIDA' avec de multiples rubriques à savoir théâtre, poésies, interprétation de chansons et la chorégraphie, le tout centré sur le SIDA.

Témoignages à visage découvert

Cette forme de sensibilisation, la première dans le département a pour but de démythifier la conception désastreuse de la maladie de SIDA. Ces témoignages à visage découvert, guidés par le principe « *il vaut mieux voir une fois que d'entendre mille fois* », permettent de convaincre les 'saints Thomas' et de donner espoir aux personnes infectées. Au cours de ces témoignages à visage découvert, des campagnes de dépistage sont organisées de concert avec le PNLS et AGEFIB afin de permettre aux personnes désireuses de connaître leur état sérologique de le faire pour une prise en charge précoce des séropositifs.

Renforcement des capacités

Ce renforcement des capacités est centré sur l'amélioration des revenus. Des producteurs sont formés sur les techniques de gestion intégrée de la fertilité des sols. Cette activité tire sa raison du fait qu'elle permet de maintenir dans l'agriculture les jeunes non scolarisés et déscolarisés afin d'éviter l'exode rural et la misère qui sont les principales causes de la propagation rapide de la maladie dans le département. Les efforts sont déployés pour vulgariser dans les villages des options concluantes de gestion intégrée de la fertilité des sols pour d'une part une amélioration des rendements des cultures et d'autre part une compensation de la production déficitaire des personnes malades au niveau du Département.

Par ailleurs les actions de promotion des activités génératrices de revenus sont menées à l'endroit des groupements de femmes (GF) à travers des formations et des appuis en équipements appropriés pour la réduction de la pénibilité du travail. Précisons que ces GF encadrés constituent des relais importants de sensibilisation de proximité pour la prévention du VIH/SIDA et l'orientation des PVVIH/SIDA vers les structures appropriées que sont les associations de PVVIH, les centres de santé de prise en charge et IFAD-ONG.

Pour une durabilité des activités de prévention, des dispositifs communautaires tels que les relais communautaires, les organisations paysannes de promotion de la gestion intégrée de la fertilité des sols (OPP-GIFS), les clubs anti-SIDA, les comités locaux de soutien aux orphelins du SIDA et des PVVIH sont formés et dotés par IFAD-ONG, des outils appropriés de sensibilisation.

Stratégie de prise en charge

Tout comme la prévention, la prise en charge est basée sur une approche intégrée avec une grande responsabilisation des communautés. Les activités de sensibilisation menées dans les villages accompagnées des campagnes de dépistage ont permis d'identifier dans le Couffo des personnes infectées et des orphelins du SIDA. La prise en charge des personnes infectées et affectées est nécessaire pour donner espoir aux PVVIH et aux orphelins du SIDA sans oublier les veuves et pour soulager les familles des personnes infectées, quand on sait que là où apparaît le SIDA l'économie disparaît. En effet, une caractéristique de la maladie du SIDA est qu'elle tue lentement mais sûrement son hôte en épuisant tout le stock économique de ce dernier. Toute personne atteinte par la maladie se trouve dans une situation où elle est contrainte de brader son économie pour lutter contre la maladie qui finit toujours par l'emporter laissant ainsi des orphelins dans une situation sans soutien. La prise en charge des PVVIH et orphelins du SIDA permet

d'éviter la fuite des capitaux destinés à la production agricole et la survie du ménage vers la maladie.

Cette prise en charge est pluridimensionnelle et prend en compte :

- le psychologique, l'alimentaire, le médical, le scolaire, le matériel
- le renforcement des capacités en AGR des associations de personnes vivant avec le VIH/SIDA et associations des orphelins du SIDA
- la promotion et l'appui en équipement des comités locaux de soutien des orphelins du SIDA et PVVIH
- l'appui financier aux veuves pour l'exécution d'activités génératrices de revenus

Prise en charge proprement dite des orphelins du SIDA et PVVIH

Assistance psychologique

Cette activité concerne aussi bien les PVVIH que les orphelins du SIDA. Avant toute autre action à l'endroit d'un orphelin ou d'une PVVIH, il faut un appui psychologique pour donner une lueur d'espoir à ces personnes afin qu'elles soient confiantes et se disent qu'elles ont les mêmes chances que toutes les autres personnes. L'homme étant à l'image de sa pensée, la prise en charge psychologique permet aux PVVIH d'être positifs et de vivre leur situation de malade tout en continuant les travaux agricoles.

Cette activité qui se résume essentiellement aux visites à domicile et aux conseils, aux séances d'écoute et d'échange et aux entretiens individualisés de l'équipe technique de IFAD-ONG afin de réduire l'émotion, le stress et la stigmatisation.

Assistance médicale

L'un des nombreux problèmes auxquels sont confrontés les PVVIH et les orphelins et autres enfants vulnérables est les soins médicaux fréquents liés au traitement des maladies opportunistes pour les premiers et des affections courantes pour les seconds. Afin de réduire la fuite des capitaux destinés à la production agricole vers les frais médicaux, il s'avère indispensable d'apporter aux orphelins et aux PVVIH une aide médicale pour le traitement des maladies opportunistes. L'assistance médicale varie, que l'on soit orphelin ou PVVIH. Pour ce faire, IFAD est en partenariat avec des formations sanitaires qui dispensent les soins qui sont remboursés par IFAD.

Cas des orphelins du SIDA

Pour favoriser une prise en charge médicale correcte des orphelins nous avons mis en place le système ci-après. Au niveau des trois communes du Couffo dans lesquelles nous intervenons, le tableau synoptique des orphelins du SIDA recensés fait dégager des zones

de concentration au niveau de certains arrondissements. Pour ce faire, IFAD a signé des accords avec quatre (04) Centres de Santé d' Arrondissement (CSA) où vont se traiter les orphelins du SIDA se trouvant dans leurs rayons d' intervention. Au terme d' un ou de deux mois, ces formations sanitaires adressent à IFAD les factures de soins, d' analyses bio-médicales et d' achats de médicaments qui sont remboursées aux centres. Le suivi et la supervision de cette activité par IFAD sont faits sur la base des visites à domicile aux orphelins, le contrôle des carnets de santé et registres spécifiques de soins conçus par IFAD pour ce faire.

Cas des PVVIH/SIDA

Les personnes infectées sont prises en charge à travers un partenariat avec une formation sanitaire de la place qui traitent les PVVIH aux ARV et contre les affections opportunistes. Les factures des soins sont payées dans les mêmes conditions que celles décrites précédemment.

Assistance alimentaire

L' assistance alimentaire prend en compte les personnes infectées et celles affectées. L' alimentation est de loin le premier problème quotidien auquel sont confrontés les PVVIH et orphelins car la maladie du SIDA, compte tenu de sa durée et sa complexité, ' emporte ' avec elle beaucoup de ressources financières et matérielles des personnes infectées et affectées. Les familles ont souvent le temps de dépenser tous leurs revenus et il faut plusieurs années pour les reconstituer. Tout ceci crée énormément de problèmes d' alimentation aux familles et orphelins du SIDA qu' il s' avère nécessaire d' appuyer.

Cette assistance se fait à travers des dons de vivres locaux à savoir le maïs, le haricot, l' huile, le gari, les fretins, le riz, etc... L' achat des vivres est fait par une équipe composée, à chaque occasion, des représentants des comités locaux de soutien aux orphelins du SIDA et PVVIH, des associations de PVVIH, des orphelins, des veuves sous la supervision de IFAD-ONG. Après l' achat, la distribution se fait par ces mêmes personnes aux sièges des associations de PVVIH.

Assistance scolaire

Cette assistance se fait exclusivement à l' endroit des orphelins du SIDA écoliers ou élèves. Elle consiste à donner des fournitures scolaires et uniformes kakis aux orphelins du SIDA. Le suivi de ces écoliers se fait à travers des visites dans les établissements scolaires.

Assistance matérielle

Cette activité se fait à l' endroit de tous les orphelins. Les éléments donnés sont constitués de savon, de tissus imprimés, de serviettes, de friperies, de draps, de moustiquaires imprégnées etc...

Appui financier aux activités génératrices de revenu des veuves

L'assistance financière est accordée aux veuves du VIH/SIDA pour la mise en œuvre des activités génératrices de revenus sous forme de crédit remboursable avec un intérêt de 2 %. Les crédits sont parfois individuels, parfois à caution solidaire.

Appui à la formation professionnelle des orphelins déscolarisés ou non scolarisés

Il s'agit, pour cette activité, d'assister les orphelins déscolarisés ou non scolarisés et qui ont l'âge d'apprendre un métier de le faire. Le choix du métier est laissé à l'enfant avec l'appui des parents proches ou à défaut de nous même. Les frais de formation sont payés par IFAD et un contrat tripartite IFAD-Patron d'atelier-Parents est signé et désengage l'enfant et IFAD de tout autre paiement de dot de libération qui pourrait poser problème plus tard. Les métiers choisis par ces enfants sont la coiffure, la couture, le tissage, la soudure, la conduite auto, etc...

Le souhait de IFAD est de se baser sur les premiers enfants installés pour assurer la formation des autres générations afin de faciliter la pérennisation de l'activité et aussi réduire le coût des formations. Les intéressés seront fortement sensibilisés à ce sujet à leur installation.

Appui en AGR aux associations de PVVIH

Les campagnes de sensibilisation et de dépistage ont permis d'identifier des personnes vivant avec le VIH/SIDA. Pour un meilleur encadrement de ces derniers, IFAD-ONG a facilité dans ces zones d'intervention la mise en place de trois associations de PVVIH/SIDA. Pour une durabilité des activités d'appui envers les PVVIH, des renforcements de capacité en AGR leur ont été apportés. De façon spécifique les membres des associations ont été formés sur les techniques d'élevage des lapins et des aulacodes. Des projets d'élevage ont été financés aux associations. Par ailleurs plusieurs membres des associations développent à domicile à leurs propres comptes ces mêmes activités. Les recettes générées par la vente de ces produits d'élevage consistent à prendre en charge les membres des associations dans divers domaines.

Appui aux comités locaux de soutien

Les comités locaux de soutien sont des structures locales composées des leaders d'opinion, d'orphelins, de PVVIH, d'élus locaux, de représentants des églises, des jeunes, etc... volontaires pour la lutte contre le VIH/SIDA. Ces comités sont formés et dotés des équipements dont les bénéfices sont utilisés pour appuyer les orphelins du SIDA et PVVIH. L'appui à la création de ces comités de soutien est guidé par le principe de la durabilité dans le soutien communautaire aux orphelins du SIDA et aux PVVIH.

Quelques acquis

Après trois années d'activités intenses, beaucoup d'acquis ont été capitalisés. IFAD de par ses actions envers les personnes vivant avec le VIH/SIDA a pu démystifier la conception honteuse de cette maladie et faciliter l'intégration dans la communauté de cette couche vulnérable qui dans le passé était marginalisée. Des résultats palpables ont été obtenus et ont permis à IFAD-ONG d'être une structure de référence en matière de prise en charge des PVVIH et orphelins du SIDA dans le Couffo voire dans le pays. Au nombre de ces résultats nous pouvons mentionner :

- Facilitation de la mise en place de trois associations de PVVIH bien structurées et déterminées à lutter contre la maladie dans le département

Il s'agit de l'Association 'Alôlé-Alômè' d'Aplahoué (150 personnes), l'Association 'Nonvignon' de Dogbo (156 personnes) et l'Association 'Solidarité et Vie' de Klouékanmè (115 personnes). Ces associations sont aujourd'hui des structures qui servent d'appui aux institutions internationales de lutte contre le VIH/SIDA et qui sont reconnues et appréciées par les autorités locales et nationales. A ce titre plusieurs partenaires comme Plan Bénin, PPLS, PNLS, ADF et la Banque mondiale ont appuyé directement certains projets de ces associations.

- Installation de 17 comités locaux de lutte contre le SIDA qui sont des dispositifs communautaires de sensibilisation et de lutte contre le VIH/SIDA composés des élus locaux, des représentants d'ONG, des jeunes et des femmes.
- Appui à l'installation et au fonctionnement de neuf (9) comités locaux de soutien aux orphelins du SIDA et PVVIH
- Appui financier et technique aux activités génératrices de revenus de 76 veuves par le SIDA
- Renforcement des capacités de 100 relais communautaires qui ont été suivis dans la réalisation de 3832 séances de sensibilisation de proximité
- 10 Clubs de promotion de la santé de reproduction ont été créés et fonctionnels
- Prise en charge médicale, alimentaire, scolaire, professionnelle (formation), matérielle et psychologique des orphelins du SIDA

La prise en charge des enfants orphelins de SIDA dans ces différents domaines s'avère indispensable quand on sait que là où passe le SIDA, trépasse l'économie de la famille où les enfants sont confrontés à d'énormes problèmes de subsistance. Ces problèmes ont pour noms, difficultés de se nourrir, de s'instruire, de se loger, de se soigner et se vêtir qui sont les besoins vitaux de tout être humain.

Après trois années d'activités des résultats tangibles ont été obtenus en matière de prise en charge des enfants orphelins de SIDA et se résumant à :

Prise en charge de 540 orphelins et enfants vulnérables dans le domaine alimentaire

- Prise en charge médicale de 220 enfants orphelins et enfants vulnérables. La prise en charge médicale des orphelins du SIDA a été faite à travers des soins médicaux donnés aux enfants malades. A cela se sont ajoutés les achats de médicaments entrant dans le traitement des maladies. Ces soins ont été donnés dans les formations sanitaires en partenariat avec IFAD-ONG à savoir les Centres de Santé des arrondissements de Tchikpé et de Djotto (à Klouékanmè), de Dékpo et de Tannou (à Aplahoué) et le Centre de Santé de la Commune de Dogbo.
- Assistance scolaire à 290 enfants orphelins de SIDA à travers des dons de fournitures scolaires et de tenues kaki.
- Assistance matérielle à 540 enfants orphelins de SIDA à travers des dons de pagne, de savons, de moustiquaires, serviettes, bref des produits de premières nécessités.
- Assistance psychologique à 540 enfants orphelins de SIDA. L'assistance psychologique a consisté essentiellement aux visites à domicile aux OEV et aux séances d'écoute des OEV pour des problèmes spécifiques et individuels.
- Mise en apprentissage de 34 orphelins du SIDA pour une formation professionnelle.
- L'amélioration des rendements de la culture du maïs de 800 kg à 3000 kg. Cette amélioration du rendement de la principale culture a un impact de maintenir les jeunes dans l'agriculture et de combler le vide de la production agricole des personnes malades.
- La mise en place de 6 OPP-GIFS dans 6 villages. Ces organisations paysannes permettent de continuer les activités de sensibilisation et de promotion des options concluantes de gestion intégrée de la fertilité des sols.
- Appui de 21 GF en divers équipements (râpeuses, pousse-pousse et presses) nécessaires à la rentabilisation des activités.

Conclusion

De tout ce qui précède nous constatons que dans le département du Couffo, le VIH/SIDA prive les communautés d'une partie de la main-d'œuvre agricole ce qui entraîne une baisse de la production et par surcroît une insécurité alimentaire au niveau de ce département.

IFAD-ONG grâce à une approche intégrée de lutte, basée sur la prévention et la prise en charge, a su démystifier la conception désastreuse liée à cette maladie et donner un espoir à cette couche sociale. Ainsi de par leur organisation et la promotion des dispositifs communautaires de soutien, les PVVIH participent activement au développement de la communauté.

Malgré ces résultats obtenus des défis sont encore énormes à relever. Au nombre de ces défis nous pouvons citer :

- Finances insuffisantes pour satisfaire les besoins des PVVIH et orphelins du SIDA pour une prise en charge correcte
- La couverture complète de tout le département
- L'identification des PVVIH
- La mise sous antirétroviraux d'un nombre élevé de PVVIH

Fortification of foods for HIV/AIDS-affected people

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Abstract

High-protein, legume-fortified gari and complementary bio-foods were produced from different agricultural food products using fermentation technology. The crops and products were cassava, maize and grain legumes (soybean, cowpea, groundbean, bambara groundnuts, groundnuts, velvet bean or mucuna), coconut milk, coconut press cake, oil seed (melon seed) and palm oil. They were evaluated for their nutrient density and sensory properties. A cost-benefit analysis was carried out for the legume-fortified gari. The fortified foods had improved nutrient density with protein and energy levels of 6.9-7.72% and 15.55-19.03% (dwb) and 17,571.05-18,563.4 kJ/kg, respectively, for fortified gari and fortified complementary foods compared to 1.86-11.72% (dwb) and 16,734-17,505.0 kJ/kg for the unfortified foods (gari and ogui) used as controls. The palm oil-fortified gari had vitamin A (β -carotene) levels of 263.63 $\mu\text{g/g}$ or 43.94 $\mu\text{g retinol/g}$. All the fortified gari received higher scores than the controls, and no significant difference ($P>0.05$) was found among the quality attributes. A cost-benefit analysis for the fortified gari production indicated that the profit increased by two to five times over the absolute profit of the unfortified gari (control). The gari fortification technology is being transferred between Beninese gari-processing women groups and scaling-up of the process is underway through the Garisecure Project, an International Scientific Cooperation Project. The production technology – the co-fermentation or simultaneous fermentation – when applied at household level is an endogenous strategy to increase women's income at the village level as well as to alleviate protein-energy malnutrition, micronutrient deficiencies in all strata of populations, including HIV/AIDS-affected persons, and to ensure food security at the household level

Key words: *gari, fortified foods, HIV/AIDS, fermentation, processing*

Introduction

Good nutrition or feeding practices do not cure AIDS nor prevent the infection, but they can help maintain and improve the food status of HIV/AIDS-infected persons and delay the progression of HIV and opportunistic diseases. Eating well keeps a person healthy and productive as well as improving the immunological system and the body's protection against infection. The efficiency of most drugs is also enhanced by better nutrition (UN System Network on Rural Development and Food Security, 2003). The nutrient requirements of HIV-infected persons differ from non-infected individuals. Current evidence suggests that as the infection progresses, the nutrient requirements change.

The requirements are different for the two distinct phases of HIV infection. The phases of infection are characterized by the absence or presence of illness symptoms: asymptomatic and symptomatic.

During the asymptomatic phase, the energy requirement for HIV-infected persons increases by 10 percent, the protein and micronutrient requirements for HIV-infected persons remain the same (compared to the level recommended for healthy non-HIV-infected persons for the same age, sex and physical activity).

During the symptomatic phase, the energy requirement for HIV-infected persons increases by 20-30 percent; protein and micronutrient requirements for HIV-infected persons remain the same (compared to the level recommended for healthy non-HIV-infected persons for the same age, sex and physical activity). These recommendations are for all HIV-infected persons, regardless of whether they are taking anti-retroviral drugs or not (UN, 2003). The situation is worse for infected children whose energy requirements may rise to 50% or even 100% of that of uninfected children (WHO, 2003).

Africa is blessed by a variety of food sources, the processing of which leads to high protein-energy foods beneficial to all people and patients, including HIV/AIDS-affected people. Feeding HIV/AIDS-affected persons with such foods may improve their nutritional status as well as reinforce their medical treatment.

Gari and *ogui* are two fermented foods widely consumed in West Africa. *Gari* is a cassava-based fermented, dried, sour food with color varying from white, yellow, yellowish to creamy (Babadankpodji, 1998). It is a staple food in the Guinea Gulf (Nigeria, Benin, Togo and Ghana), considered a security food in Benin in particular, and consumed by more than 80 million people in West Africa (Cook, 1985). Its low moisture content (Table 5) and its very long shelf life (over one year in air-tight containers) make *gari* a food of choice for institutions, schools, prisons, hospitals, army and police barracks, sailors and families. *Gari* is such a versatile food product that it can be used with almost any other food type. On the other hand, *ogui* is a cereal-based fermented, wet, sour food used as breakfast porridge or as a main dish after processing. Unfortunately, the low protein levels of *gari* and *ogui* (1.86% and 11.72%) (Tables 5 and 6) may induce nutritional deficiencies when consumed exclusively, especially by children and patients.

The objective of this work was to provide simple household fortification techniques to add nutritional value to cereals, grain legumes, cassava, melon seeds, palm oil or coconuts.

Materials and Methods

Raw materials

Cassava (*Manihot esculenta* Crantz), variety Ben 86052, was bought from a farmer in Glodjigbé village. The following were bought in Dantokpa International Market, Cotonou, Benin: maize (*Zea mays*); grain legumes, namely soybean (*Glycine max* Merr.) variety Jupiter; cowpea (*Vigna unguiculata* L. Walp); groundbean (*Macrotyloma geocarpa* Harms); bambara groundnuts (*Voandzeia subterranea* Thouars); groundnuts (*Arachis hypogea*); melon seeds (*Citrullus vulgaris* Schrad); palm oil (red flavoured palm oil known as *Zomi*); and coconuts. Velvet bean (*Mucuna pruriens* var. *utilis*) was provided by the International Institute of Tropical Agriculture, Benin Station, Agonkanmey, Benin.

Production of ordinary and fortified gari

Ordinary and fortified *gari* (*soy-gari*, palm oil-fortified *gari*, soy-palm oil-fortified *gari*, soy-coconut milk-flavoured *gari*, coconut milk-flavoured *gari*, bambara groundnut-fortified *gari* and melon seed-fortified *gari*) were produced according to Egounlety (2002a) by the 13 members of the Edjromédé Women Gari Processing Group at Ouèdo in the District of Abomey-Calavi. Fifty kilograms of cassava were peeled, washed and mechanically grated. The legumes or the oilseed (melon seed) were sorted, washed, cooked for various lengths of time according to the type of beans, drained, cooled and wet-milled.

To produce ordinary *gari* (control), the grated cassava (cassava mash) was allowed to ferment for 48 h after which it was pressed/dewatered, defibered, cooked/garified and sieved (2.0 mm mesh size). The fortified *gari* (proteinized, vitaminized, proteinized and vitaminized) were produced by first mixing cassava mash with the appropriate treated legume or palm oil or coconut milk and the mixture was treated in the same way as for ordinary *gari* except that the fermentation time was 18-24 h (Egounlety, 2002a).

Production of high protein-energy complementary foods

Eight (Egounlety, 2002b) high protein-energy complementary foods, namely *soy-ogui*, *cowpea-ogui*, *bambara groundnut-ogui*, *groundbean-ogui*, *groundnut-ogui*, *melon seed-ogui*, *mucuna-ogui* and *coconut press cake-ogui*, with *ogui* as the control were prepared at laboratory level. Table 2 shows the proportions of the raw materials used. Production of *ogui* is a household activity carried out by women.

Table 2. Formulation of high protein-energy complementary foods

Materials	Weaning foods				
	Ogui (control) (%)	Soy-Ogui (%)	Cowpea-Ogui (%)	Bambara-Ogui (%)	Groundbean-Ogui (%)
Maize	100	70	50	50	50
Soybean	-	30	-	10	-
Cowpea	-	-	40	-	-
Bambara groundnuts	-	-	-	40	-
Groundbean	-	-	-	-	40
Melon seed	-	-	10	-	10

Maize was sorted, washed and soaked for 72 h, drained and milled. Legumes or oilseed (melon seed) were treated in a similar way as for fortified *gari*. Alternatively, some legumes may be soaked for 4-6 h, drained and oven-dried and cooked. The milled, soaked maize and the cooked, milled and proteinized material or coconut press cake were mixed, wet-sieved (mesh size: 1.0 mm) and allowed to ferment for 28-30h. The fermented slurry was dried at 60-66°C for 15 h and milled (Egounlety, 2002b and 2003).

Determination of yields and chemical composition of fortified gari

Technical and commercial yields were determined as a ratio of fortified *gari* to the total material input both before and after sieving the cooked (garified) foods through 2.00 mm. For the complementary foods, gross and net yields were determined as the ratio of oven-dried or milled product to the total material input. Proximate composition was also determined by Standard Methods (AOAC, 1984).

Determination of vitamin A of vitaminized foods

Vitamin A (β -carotene) was assayed using the method of Zaman *et al.* (1993). Vitamin A was extracted with cyclohexane, separated and isolated by thin layer chromatography on silica gel support, eluted in cyclohexane-benzene-acetone mixture and dissolved in I propanol-2. The optical density of the extract was determined at a 326 nm wavelength. The level of vitamin A in the sample can be expressed in μg retinol /g of *gari* or in μg β -carotene/g (1 μg retinol = 6 μg β -carotene = 3.3 IU¹). Three extractions were done per sample and the level of vitamin A was determined twice for each extract.

Sensory evaluation of fortified gari

The fortified *gari* were evaluated for color, aroma, taste, particle size and overall acceptability by one hundred (100) panellists composed of cassava producers, *gari* producers and consumers of all the stratum of the population using the multiple comparison difference test. The ordinary *gari* was used as a reference to which the panellists were asked to compare the quality attributes of the fortified *gari* on a 9-point hedonic scale where 1= extremely inferior, 5=equal to the reference and 9 = extremely superior (Larmond, 1977).

Statistical analysis

The statistical significance of the fortified foods was determined by the Student's t-test (Fisher and Yates, 1943). For all analyses, $P < 0.05$ was accepted as a significant probability.

Evaluation of production costs of ordinary and fortified gari

Production costs of ordinary and fortified *gari* were evaluated taking into account the direct production costs (inputs) and the indirect production costs (the amortizing of the workshop and the equipment), the quantity of commercial *gari* (output) and its unit price/kg.

Results

Yields of ordinary and fortified gari

Data on yields of ordinary and fortified *gari* are presented in Table 3. Commercial yields of fortified *gari* were 26.69 ± 0.78 %, 29.10 ± 1.08 % and 31.08 ± 0.88 % respectively for *vitaminized gari*, *proteinized gari* and *proteinized-vitaminized gari* compared to 22.4 ± 0.45 % for ordinary *gari* (control). Previous studies revealed that the loss of dry matter occurred mainly during peeling and pressing, accounting for 15.3% and 4.4%, respectively (Agueh, 1995). The coarse particles obtained after sieving the cooked/garified foods are recycled and re-used in another batch.

Table 3. Yields of ordinary and fortified *gari*

Foods	Technical Yield (%)	Commercial Yield (%)
Ordinary <i>gari</i>	23.99 ± 0.83 ^c	22.42 ± 0.45 ^c
Vitaminized <i>gari</i>	28.71 ± 0.58 ^c	26.54 ± 0.78 ^c
Proteinized <i>gari</i>	33.43 ± 1.65 ^c	29.10 ± 1.08 ^c
Proteinized & vitaminized <i>gari</i>	34.85 ± 1.25 ^c	31.08 ± 1.88 ^c

* Mean value of three (3) replicates

* Means in column followed by the same letter are not significantly different at 5% level

Yields of high protein-energy complementary foods

Results on gross and net yields (in flour) are presented in Table 4. Net yields in weaning flours were 59.72%, 64-76%, 66.15% and 71.47%, respectively, for weaning foods based on cowpea, groundbean, bambara groundnut and soybean, compared with 52.35% for maize-based food used as a control (Table 4). Losses of dry matter accounted for 12-17% due mainly to the milling process. Milling of wet materials or oven-dried foods was carried out in a town mill where losses of material are not controlled (Fig.4) (Egounlety, 2002b).

Table 4. Yields of *ogui* and high-protein-energy complementary foods

	Ogui (control) (%)	Soy-Ogui (%)	Cowpea-Ogui (%)	Bambara-Ogui (%)	Groundbean-Ogui (%)
Gross yield (%)	59.54	78.12	69.10	75.57	74.00
Net Yield (%)	52.35	71.47	59.72	66.15	64.76
Losses (%)	12.08	17.02	13.75	12.47	13.15

Nutritive value of fortified gari

Table 5 presents the chemical composition of ordinary and fortified *gari*. Levels of proteins varied from 1.38-1.86% for the vitaminized (yellow) and ordinary (control) *gari* to 6.96-7.72% for proteinized foods. Fat and ash contents increased from 0.66% to 3.0-4.92%, and from 0.76% to 1.02-1.20% in the fortified foods. Gross energy of fortified *gari* was slightly higher than that of the ordinary *gari* (17,571 kJ/kg against 16,734.21 kJ/kg). Moisture content was lower at 4.4-5.6% than the 6% recommended by the Codex Alimentarius. This is an indication of a long shelf life when packed in moisture-proof materials (Table 5). Regarding the levels of vitamin A (â-carotene), the data indicated residual levels of 263,63 µg or 43.93 µg retinal/g in vitaminized products.

Table 5. Chemical composition of fortified *gari* (on dry weight basis)

Foods	Moisture (%)	Protein (%)	Fat (%)	Total Carbohydrate (%)	Ash (%)	Gross Energy (kJ/kg)	Vitamin A (β-carotene) (μg retinol/g)
Ordinary <i>gari</i>	4.43 ± 0.04 ^a	1.86 ± 0.06 ^b	0.66 ± 0.04 ^d	96.72 ± 0.12 ^a	0.74 ± 0.01 ^b	16,734.21 ± 8.36 ^a	None
Vitaminized <i>gari</i>	5.59 ± 0.01 ^a	1.38 ± 0.02 ^b	2.08 ± 0.03 ^c	95.78 ± 0.07 ^a	0.76 ± 0.01 ^b	17,030.16 ± 9.2 ^a	43.94 ± 1.52
Proteinized <i>gari</i>	5.58 ± 0.01 ^a	7.72 ± 0.02 ^a	3.06 ± 0.04 ^b	88.02 ± 0.15 ^b	1.20 ± 0.01 ^a	17,158.90 ± 11.90 ^a	None
Proteinized & vitaminized <i>gari</i>	4.93 ± 0.32 ^a	6.96 ± 0.05 ^a	4.92 ± 0.08 ^a	87.06 ± 0.10 ^b	1.06 ± 0.04 ^a	17,571.05 ± 6.27	43.94 ± 1.52

* Mean value of three (3) replicates

* Means in column followed by the same letter are not significantly different at 5% level

Nutritive value of high protein-energy complementary foods

Table 6 shows the data on proximate composition of high protein-energy foods. Levels of protein and energy fluctuated between 15.55 and 19.03% and 18.265 and 18.728 kJ/kg against 11.72 % and 17.505 kJ/kg for *ogui* (control). Apart from the *bambara-ogi* that has a protein level of 15.55%, protein and energy contents of all the legume-fortified weaning foods developed were above the recommended levels for weaning foods (Table 6).

Table 6. Nutritive value of high-protein-energy legume-fortified weaning flours

Weaning flours	Moisture (%)	Protein (%)	Fat (%)	Ash (%)	Total carbohydrates (%)	Energy (kJ/kg)
Ogui (control)	8.80	11.72	4.22	0.70	83.39	17.505.0
Soy-Ogui	7.93	19.03	10.47	0.93	69.57	18.752.7
Cowpea-Ogui	5.61	18.57	08.35	1.20	71.87	18.265.4
Bambara-Ogui	6.56	15.55	08.26	0.80	75.38	18.312.6
Groundbean-Ogui	9.20	17.83	09.81	1.24	71.11	18.563.4
Recommended levels	<10.00	>16.70	6<	X	<10	15.675.0

Sensory properties of fortified gari

The results of multiple comparison difference tests are shown in Table 7. The incorporation of soybean palm oil or both into cassava mash improved the sensory properties of the fortified foods. These foods received high scores and no significant difference ($P>0.05$) was found among the quality attributes except for the taste and particle size of proteinized-vitaminized *gari*. The latter recorded the lowest scores for all quality attributes especially

for taste (5.93) while the vitaminized *gari* had the highest scores in aroma (7.77), particle size (7.71) and overall acceptability (7.32). In general, large variations (standard deviations) were found in the sensory scores of the proteinized foods indicating the reserve of some stratum of the population (30% of the panellists) towards the innovations.

Table 7. Sensory properties of fortified *gari*

Foods	Colour	Aroma	Taste	Particle size	Overall acceptability
Ordinary <i>gari</i>	5.00 ± 0.00 ^a	5.00 ± 0.00 ^a	5.00 ± 0.00 ^a	5.00 ± 0.00 ^a	5.00 ± 0.00 ^a
Vitaminized <i>gari</i>	6.83 ± 1.55 ^b	7.77 ± 1.04 ^b	7.68 ± 1.06 ^b	7.71 ± 1.22 ^b	7.32 ± 1.49 ^b
Proteinized <i>gari</i>	6.84 ± 2.42 ^b	7.25 ± 2.25 ^b	7.87 ± 3.85 ^b	7.16 ± 2.21 ^{bc}	7.16 ± 2.24 ^{bc}
Proteinized & vitaminized <i>gari</i>	6.00 ± 2.71 ^b	6.09 ± 2.80 ^b	5.93 ± 2.96 ^c	6.74 ± 2.05 ^c	6.29 ± 2.37 ^{bc}

* Mean value of 100 scores. Means for each attribute followed by the same letter are not significantly different at 5% level. Higher values indicate greater preference.

Production costs of ordinary and fortified gari

Data on the production costs of ordinary and fortified *gari* are shown in Table 8. Production of ordinary *gari* is a non-profit activity (-690.4 FCFA²) while that of fortified *gari* generated more revenue for women varying from 1601.17 to 3476.18 FCFA, two to five times the absolute profit of the ordinary *gari*.

Table 8. Production cost of ordinary and fortified *gari* (in francs CFA)

Inputs	Ordinary <i>gari</i>	Vitaminized <i>gari</i>	Proteinized <i>gari</i>	Proteinized & Vitaminized <i>gari</i>	Coconut-flavoured Proteinized <i>gari</i>
DIRECT COSTS					
1. Cassava (50 kg)	1,000	1,000	1,000	1,000	1,000
2. Soybean (3.2 kg)	-	-	800	800	800
3. Palm oil (0.5 litre)	-	500	-	500	-
4. Coconut	-	-	-	-	500
5. Baker's yeast	-	50	50	50	50
6. Water	-	-	-	-	-
7. Grating	150	150	150	150	150
8. Milling	-	-	-	-	-
9. Labor (peeling, washing, pressing ... Etc.)	750	850	850	850	850
10. Wood	350	350	500	500	500
INDIRECT COSTS					
11. Amortizing					
Processing materials	200	200	200	200	200
Workshop	150	150	150	150	150
TOTAL INPUTS	2600	3250	300	4200	4200
1. Marketable <i>gari</i>	11.2	13.26	15.82	16.43	16.12
2. Unit cost (FCFA)	170.5	365.85	406.98	465.12	476.19
EQUIVALENT COST	1909.6	4851.17	6438.42	7641.92	7676.18
PROFIT	-690.4	1601.17	2738.42	3441.92	3476.18

Table 9 Contribution of high protein-energy foods to daily requirements of HIV/AIDS-infected adults

Nutrients	Daily recommended allowance	Complementary foods (1)	Fortified <i>gari</i> (2)	(1) + (2)
Protein, g/day	53.8	11.89	17.42	29.31 (54.48%) ¹
Energy, kJ/day ²	10,990.06	1,172	4,392.75	5,564.78 (50.63%)
Vitamin A, μg retinol/day	450	-	10,985	(2441%)

¹Values in parentheses indicate the percentage contribution of the two foods to daily nutritional requirements

²Energy was increased to 20% of the daily allowance of a non-infected adult. We assume that the adult is eating 62.5 g of complementary food at breakfast and 250 g of fortified *gari* at lunch and dinner in the form of 'eba', a stiff recipe.

Contribution of high protein-energy foods to daily requirements of HIV/AIDS-infected people

Table 9 shows the contribution of a complementary food and a fortified *gari* to daily requirements of HIV/AIDS-infected people. We assume that the adult is eating 62.5 g of complementary food at breakfast and 250 g of fortified *gari* at lunch and dinner in the form of 'eba', a thick recipe. On this basis, the high protein-energy foods will contribute 54.48, 50.63 and 2441% of the daily allowance for protein, energy and vitamin A, respectively, for HIV/AIDS-affected adults taking into account the nutritional requirements as reported by the United Nations (UN, 2003), i.e. a 20% increase in energy requirements and the same level in protein needs as a non-affected person.

Discussion

Simple fortification techniques with legumes or oilseeds have been developed to improve the nutritive value of *gari* and *ogui* (Egounlety, 2002 and 2003; Agueh, 1995; Fakambi and Egounlety, 1994, Egounlety *et al.*, 2000). The incorporation of these proteinized materials into cassava mash or the milled soaked cereals not only reduced the fermentation time from 36-48 h to 18-24 h and 48 h to 30 h, respectively) (Egounlety *et al.*, 2000) but also improved the nutrient density of the resultant fortified products. Protein levels in fortified *gari* and *ogui* were 6.96-7.72% and 15.55-19.03%, respectively, compared to 1.86% and 11.72% for the controls (Tables 5 and 6). The vitamin A level of the vitaminized foods was 263.63 µg/g b-carotene or 43.94 µg retinal/g against none for the traditional (yellow) *gari* (Table 5).

By using fermentation technology, a variety of high protein-energy foods were produced from locally-available food resources (Tables 5 and 6). Fermentation is a widely practised, traditional and a very economical method of food and beverage production in developing countries (Cooke *et al.*, 1987, Sasson, 1988). Fermentation brings about numerous biochemical, nutritional and organoleptic changes in the raw materials, including the breakdown of certain constituents, the reduction of anti-nutritional factors in grain legumes, the reduction/elimination of toxic substances in cereals and the synthesis of B-vitamins. In other words, the technology led to safe, bio-available nutrient-dense and acceptable foods (Mensah *et al.*, 1990; Egounlety, 1998). People infected by HIV/AIDS generally suffer from loss of appetite and mouth infections that make their food intake problematic. The acidity of these fermented products would be expected to exacerbate this but the fermentation times (18-24 h and 30 h) were carefully selected not only to induce the above optimal nutritional changes but also to maintain the acidity of these foods at an acceptable level for all.

Similarly, the processing technology is easily applied at household levels and generates more revenue for women processing *gari* (Table 9). In this regard, the *gari* fortification technology is being disseminated among Beninese *gari*-processing women's groups (Egounlety 1998b, 2001, 2004; Egounlety and Nago, 1999). Alternatively, a scaling-up of the process is underway through the Garisecure Project, an International Scientific Cooperation Project aimed at improving the quality and nutritional status of *gari* through the use of starter cultures and fortification with soybean, palm oil and coconut milk (Egounlety, 2002c).

The above nutritional changes occurring during the preparation of high protein-energy foods are beneficial to all strata of populations including vulnerable groups, especially HIV/AIDS-infected people. As people get malnourished, they are at high risk of catching opportunistic diseases (UN, 2003). In addition, a healthy diet is the foundation of long-term health maintenance and a strong immune system. It helps with medication tolerance, maintenance of body weight and muscle mass, and overall energy and quality of life. An optimal diet will reduce the risk of disease and strengthen the body's defences and natural healing power. It will help to reduce the other daily stresses to the system, and even positively affect mood and sense of well-being. In particular, generous amounts of high quality protein are important for maintaining rapid production of cells to support the immune system, preventing loss of lean muscle mass and boosting energy (Rosard, 2002).

The high protein-energy will contribute 54.48%, 50.63% and 2441% of daily allowance for protein, energy and vitamin A, respectively, of HIV/AIDS-affected adults taking into account nutritional requirements as reported by United Nations (UN, 2003).

Conclusion

The production technology – co-fermentation or simultaneous fermentation – applied at household levels provides an endogenous strategy to increase women's income at village levels as well as alleviating protein-energy malnutrition and micronutrient deficiencies in all strata of populations including HIV/AIDS-affected persons and ensuring food security at household levels.

Consumption of high protein-energy foods by HIV/AIDS infected persons will improve their nutritional status and therefore prolong their lives.

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Elements of a framework for analyzing, combating HIV/AIDS and protecting for food security

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Workshop presentation

Increasingly, the HIV/AIDS epidemic is having a major impact on nutrition, food security, agricultural production and rural societies in many countries, including Nigeria. All dimensions of food security – availability, stability, access and use of food are affected where the prevalence of HIV/AIDS is high. An urgent need has therefore arisen to comprehensively develop a framework for analyzing, combating HIV/AIDS and protecting food security. In analyzing the impact of HIV/AIDS on food security at the community and household levels, five areas provide points of analysis. They are: direct and indirect impact on households; nutrition impact; breakdown in informal institutions and culture; and poverty and disease. The specific impact of HIV/AIDS is a matter of empirical research often dictated by the livelihood systems of affected households and will vary according to their productive activities (agricultural and non-agricultural) and the economic and socio-cultural context in which they live.

While the response to HIV/AIDS will vary depending on location, general potential principles that can underline successful initiatives to combat the epidemic, especially as it affects agriculture and food security, are discussed. These include dynamic and political will to curtail HIV/AIDS effects, mounting effective check on the spread of the infection, evolution of immediate assistance and development initiatives for households and communities already affected.

Also, a people-centered, multisectoral, community-based approach to development is fundamental for creating and sustaining the condition in which HIV/AIDS can be prevented and its impact addressed most effectively. Finally, linking HIV/AIDS and food security initiatives can most effectively be accomplished by the reciprocal incorporation of HIV/AIDS considerations into food security initiatives and the incorporation of food security objectives into HIV/AIDS programs.

Constraints to effective action on HIV/AIDS highlighted in the paper include that HIV/AIDS as well as sexual behavior are not openly discussed in most cultures; it is difficult but necessary to address topics such as women's vulnerability to high-risk sexual practices, multiple sexual partners outside of marriage, spread of the disease by those who travel

widely, the exploitation and sale of children and women into prostitution and virtual slavery etc. Against the backdrop of these constraints, elements of a framework for combating HIV/AIDS and protecting for food security are articulated. These are development of strong advocacy strategies to raise awareness of governments, policymakers and other stakeholders in development about the impact of HIV/AIDS; recognition that combating HIV/AIDS is not solely the responsibility of the HIV/AIDS-affected households and the health sector but rather a broad coalition of actors from affected communities, all tiers of government, religious and social institutions, UN agencies, NGOs, the private sector and concerned individuals.

In addition, coping with the widespread HIV/AIDS epidemic must become a priority in the policies and programs of government, agencies and local institutions. Elements of national approaches to combat the epidemic should take into account high political commitment, concerted multisectoral action and the effective involvement of all stakeholders. The extent and severity of HIV infection needs to be assessed and the likely consequences for food security recognized. The effect of the disease on rural social security systems, assets and other resources needed to sustain rural livelihoods, on gender dynamics and on other social and economic processes need to be analyzed. Participatory household food security and community nutrition programs are identified that present a neutral and acceptable way to initiate discussion about HIV/AIDS where the disease generates stigmatization.

All field staff, in particular agricultural extension workers, need to be informed about the importance of good nutritional status while popular messages to prevent the marginalization of affected households and to help communities deal with the epidemic must be disseminated.

Finally, donor countries must assist in preventing the spread of this disease and mitigating its negative impact on food security by providing advice and resources to countries heavily affected by the HIV/AIDS epidemic. Such assistance might include food aid to provide supplementary feeding to households and orphanages.

HIV/AIDS and the deterioration of families and rural communities

HIV/AIDS can have devastating effects on household food security and nutrition. The specific impact is related to the livelihood systems of affected households and will vary according to their productive activities (agricultural and non-agricultural) and the economic and socio-cultural context in which they live.

Direct impact on households: Classically, a downward spiral of the family/household's welfare begins when the first adult in a household fall ill. There is increased spending for health care, decreased productivity and higher demands for care. Food production and income drop dramatically as more adults are affected. Once savings are gone, the family seeks support from relatives, borrows money or sells its productive assets. When the AIDS patient dies, expenditures are incurred for the funeral and the productive capacity of the household is further reduced.

Gender issues: Women are especially vulnerable in HIV/AIDS-affected households. Usually, they care for the sick and dying in addition to maintaining heavy workloads related to provisioning and feeding the household. Women are more likely to be illiterate, of lower socio-economic status and have fewer legal rights, which combine to limit their access to resources and social services. In some societies, socio-cultural practices mean a widow may not be able to maintain access to or benefit equitably from the property of her deceased husband. Poverty, tradition and social pressure tend to limit women's ability to express their wishes regarding choice of sexual partners and 'safer-sex' practices. Low-income, income inequality, and low status of women are associated with high levels of HIV infections.

Nutritional impact: In households coping with HIV/AIDS, food consumption generally decreases. The family may lack food and the time or the means to prepare some meals, especially when the mother dies. Patients can be locked in a vicious cycle whereby under-nutrition increases susceptibility to infections and consequently worsens the severity of the HIV/AIDS disease, which in turn results in a further deterioration of nutritional status. Good nutrition is important for disease-resistance and may improve the quality of life of AIDS patients. The onset of the AIDS itself, along with secondary diseases and death, might be delayed in individuals with good nutritional status.

Breakdown in informal institutions and culture: Informal institutions, customary practices and tradition are affected by HIV/AIDS. When a high proportion of households are affected, the traditional safety mechanisms to care for orphans, the elderly, the infirm and the destitute are overwhelmed.

Loss of knowledge and skills: Mechanisms for transferring knowledge, values and beliefs from one generation to the next are disrupted, and social organization is undermined. Within rural households, there are marked differences in impact depending on whether a man or woman is affected first by the HIV virus.

Poverty and the disease: Affected rural families commonly shift to off-farm income earning activities such as small-scale trading, processing and servicing, which requires access to urban or peri-urban communities. People may migrate in search of employment, or may look for rapid income, which can lead to high-risk behaviors such as drug abuse or involvement in prostitution.

Impact at national level

The negative impact of HIV/AIDS on nutrition and food security expands from the household to the wider community. Ensuing socio-economic deterioration will eventually have a significant impact at the national level. The decrease in the labor force, worker productivity, total outputs, and overall economic growth could lead to a decline in national food supplies and a rise in food prices, including those in urban areas. The breakdown of commercial enterprises may undermine capacity to export and generate foreign exchange.

The epidemic has a major impact on development because it undermines three of the main determinants of economic growth: physical, human and social capital. For instance, UNDP estimates for South Africa suggest that the Human Development Index could be 15 percent lower in 2010 due to the HIV/AIDS epidemic. Notwithstanding the methodological difficulties involved, the World Bank has estimated that HIV/AIDS has reduced the annual rate of Africa's per capita GDP growth by 0.7 percent.

The social cost of the epidemic is staggering. The cost of treatment of AIDS and related infections is expected to require 30 percent of the Ministry of Health budget in Ethiopia by 2014, and 50 percent and 60 percent in Kenya and Zimbabwe, respectively, in 2005. To this must be added the cost of assisting orphans and destitute households.

The capabilities of the future labor force are jeopardized by reductions in education. In the first 10 months of 1998, Zambia lost 1300 teachers due to AIDS. Training of primary school teachers had to be reduced from two years to one year to be able to cope with the loss of teachers. Many agricultural and rural development institutions can no longer achieve their planned program outputs because of loss of labor.

Guiding principles for responding to the HIV/AIDS crisis

While actions to respond to HIV/AIDS will vary, experience indicates that several principles underlie successful initiatives to combat the epidemic.

- Dynamic leadership and political commitment at all levels are imperative for effective action.
- Preventing the spread of the infection is of paramount importance.
- Prevention of HIV/AIDS in poor communities can only be accomplished if immediate assistance and development initiatives are also carried out.
- A people-centered, multi-sectoral, community-based approach to development is fundamental for creating and sustaining the conditions in which HIV/AIDS can be prevented and its impact addressed most effectively.
- Linking HIV/AIDS and food security initiatives can most effectively be accomplished by the reciprocal incorporation of HIV/AIDS considerations into food security initiatives and the incorporation of food security objectives into HIV/AIDS programs.

What can research and development institutions do? Policy and program implications

The 1998 Harare Conference Responding to HIV/AIDS: Technology Development Needs of African Smallholder Agriculture offered practical suggestions for technological interventions, including:

- Agencies responsible for rural development need to integrate HIV/AIDS into their core rural development policies and programs.
- Existing labor and capital saving technologies need to be promoted amongst smallholder farmers to maintain and improve production with low-input cropping, using technologies such as inter-cropping and animal weeding to reduce weeding time, zero or minimum tillage to minimize labor requirements, and natural pest management to reduce the need for expensive chemical inputs.
- Affected households require agricultural inputs that take into account their needs. These include high-value, drought-resistant food crops and lighter ploughs for use by women and young people.
- Existing agricultural extension programs and conventional technologies need to be reviewed to adapt them to emerging needs and ‘the emerging clientele’.
- Appropriate technologies need to be developed to reduce the time spent on water and fuel collection, thereby reducing women and children’s workload.
- Income-generation activities need to be developed based on micro-credit, micro-enterprises, and rural employment creation and poverty alleviation programs.
- Existing community-based initiatives aimed at alleviating labor and capital constraints need to be strengthened, e.g. traditional savings and mutual assistance associations, customary way of labor sharing etc.

Nutritional interventions

A study by FAO proposes that nutritional intervention to mitigate the impacts of HIV/AIDS should focus on agrobiodiversity and preserving traditional knowledge. The report recommends that agrobiodiversity interventions should:

- Optimize use of local and foreign resources
- Diversify diets
- Improved micro-nutrient intake
- Support roles of rural women in household nutrition

Efforts to preserve traditional knowledge should focus on promoting:

- Traditional diversification
- Agricultural diversification
- Home gardens
- Wild food plants
- Medicinal plants
- Community seed systems
- Livestock and agropastoral system

Educational interventions

A number of studies and reports suggest that the agricultural sector is in a strong position to initiate HIV/AIDS education interventions, including an HIV/AIDS education component and the establishment of farmers' panels by agricultural institutions so that those who have coped or are coping with the disease can talk with people from hitherto lightly-affected communities.

Policy options for combating the HIV/AIDS food insecurity nexus

What options exist for responding to the HIV/AIDS-food-insecurity nexus? The rationale here is twofold—firstly, to raise the chances that food and nutrition security policies and programs can achieve their original objectives despite AIDS, and secondly, to contribute to the multisectoral response to HIV/AIDS.

Several important stocktaking and visioning exercises have been conducted, including the Millennium Project Hunger Task Force's recommendations, a UK Department for International Development policy paper in 2003 and subsequent electronic consultation on 'New Directions for Agriculture in Reducing Poverty', and IFPRI's 2004 publication 'Assuring Food and Nutrition Security in Africa by 2020'. These recommendations are indicative of certain action priorities:

Rural livelihoods – Increase agricultural productivity of food-insecure farmers, particularly smallholders; increase income for the food-insecure through both farm and non-farm livelihoods; make markets work for the poor; improve access and infrastructure, such as roads.

Social protection – Reduce risk and vulnerability through appropriate safety nets and, where required, food aid, nutrition and human capital; improve the nutritional status of vulnerable groups; ensure public health and education policies that support the poor, especially girls and women.

Governance and capacity – Foster good governance and public accountability; develop capacity.

There is no magic bullet. Antiretroviral drugs, for example, are certainly not a universal panacea. So there are real dangers in generalization. In agriculture, for example, such factors as ratios of land, capital, and labor and the relative degree of substitutability among household resources will determine the nature and scope of possible responses to HIV/AIDS. This cautions against any form of blueprint response to interactions between HIV/AIDS and food security. One size absolutely does not fit all; nor should everything necessarily have to change.

Below are the outlines of some examples of the policy options that may emerge from a policy review.

Women's Nutrition and Prevention of Mother-to-Child Transmission (MTCT) of HIV

Global estimates among breastfeeding populations show that: on average, 63 percent of children of HIV-positive mothers will not be infected by HIV; 7 percent will be infected during pregnancy; 15 percent during delivery; and 15 percent during the first two years of breastfeeding. Interventions that enhance immune function may significantly reduce transmission risks. Micronutrients may improve epithelial integrity and thus reduce risk.

Nutritional Counseling, Care and Support of the Individual Living with HIV/AIDS
For individuals living with HIV/AIDS, nutritional counseling, care and support are necessary to put the brakes on the vicious cycle.

Protecting Orphans and Vulnerable Children (OVCs)

It is cost effective and more sustainable to focus on building on existing structures within communities, such as self-help groups, women's groups and church groups. Sectoral

policy needs to be much more proactively geared to assisting households in managing this increased burden and providing other options when capacity is exceeded.

Ensuring safety nets

To maximize food and nutrition security in the context of HIV/AIDS, the overriding priorities should be to augment community and household resistance and resilience as far as possible, and ensure there are safety nets in place for those who are otherwise unable to cope. Efforts should move from an ‘individual-infected’ capacity for response. The emphasis in mitigation strategy needs to be on strengthening *resilience*, the ability of households and communities to adapt livelihood strategies that allow them to recover from the shock of HIV/AIDS.

Nutritionally balanced food aid may also be important as a safety net for those acutely food-insecure, or at risk of becoming so. Food aid has significant potential not only for mitigating AIDS impacts on food security but also for reducing the susceptibility of people to the HIV virus by preventing the adoption of risky livelihood strategies. The competitiveness and productivity of smallholder agriculture can be supported through increased public investment in transport and communications infrastructure and the development of markets for secure land rental and for local sale of products.

Agriculture policy should consider generating new incentives for collective action and the formation and preservation of social capital so as to enable the protection of common property resources, such as rangelands, river basins and forests. Tree planting and preservation, for example, may be considered to preserve the soil quality of fallow land.

HIV/AIDS prevention is conventionally equated with sex education, condom distribution, and behavioral change. But opening up opportunities for less risky, less susceptible livelihoods also constitutes prevention: for example, diversifying livelihoods to ensure food and nutrition security may preclude the need for an adult to migrate for work and help keep families together. Within commercial agriculture, encouraging “safe migration” by providing incentives for families to move together to places where work is available will be important.

Microfinance

In the context of HIV/AIDS, microfinance – the tailoring of financial services to the needs of low-income households – may have limitations: (1) it is usually small-scale, currently serving only about two million clients across Africa; (2) there is an inherent

tension between scale (the number of clients served) and the extent of services provided to the clients; and (3) it often cannot serve the neediest, who are most likely to default on loans. Microfinance does have potential for helping the socioeconomic impacts of AIDS. Innovations include mandatory loan-default insurance, mandatory death-benefit insurance, legal services and the provision of education trusts for children.

Etude de l'impact socio-économique du VIH/SIDA en zones CMDT et Office du Niger, Mali

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Présentation lors de l'atelier

Le SIDA est l'ensemble des manifestations pathologiques, anormales ou de maladie. Il s'agit d'un stade qui suit celui de l'infection asymptomatique. Ces éléments anormaux sont liés pour la plupart à une baisse de l'immunité. Ce sont des maladies « opportunistes ». L'immunodépression est « acquise » parce que consécutive à la contamination par le VIH. La maladie ne peut pas être guérie, mais le traitement avec les médicaments anti rétroviraux (ARV) aide à la contrôler.

La maladie a des répercussions démographiques, sociales et économiques parce qu'elle affecte le tissu social et économique des individus, des ménages, des entreprises et de la communauté.

L'objectif de notre étude est de déterminer l'impact socio-économique du VIH/SIDA en milieu rural dans le but de faire des résultats un instrument de référence et de décision pour la formulation et la mise en oeuvre des politiques et stratégies de lutte contre la pauvreté.

Le choix raisonné sur la base du zonage n'est pas applicable dans la mesure où l'existence des PVVIH est distribuée au hasard dans chaque zone (Office du Niger et Compagnie malienne de développement des textiles, CMDT). Les outils de collecte sont en adéquation avec l'approche méthodologique utilisée qui a été largement tributaire des réalités extrêmement complexes de terrain.

Les résultats obtenus sont les suivants :

- Le ratio femmes/hommes des personnes dépistées séropositives dans les centres de Niono, Koutiala et Zégoua (Cercle de Kadiolo) est de 1,50 (60% de femmes contre 40% d'hommes) ;
- Les ménagères, à forte prédominance rurale, constituent 41% des personnes dépistées séropositives ;
- Les tranches d'âge les plus touchées sont entre 25 et 39 ans, avec un pic chez les 30-34 ans (70% des personnes dépistées séropositives) ;

- Les cultivateurs représentent 16 % des personnes dépistées séropositives ;
- Une des conséquences directes de l'infection au VIH est le manque de temps consacré à la surveillance, à l'entretien et à l'éducation des enfants ;
- Les travaux champêtres et les activités génératrices de revenus sont réduits ;
- Le VIH/SIDA perturbe le fonctionnement socio-économique normal des ménages que ceux-ci soient agricoles ou d'un autre type parce que la maladie cause une baisse des revenus ;
- Il existe des indices de potentialisation de la propagation du VIH dans les années à venir ;
- Il existe des indices de résistance aux médicaments dans les années à venir ;
- La prise de conscience de l'infection au VIH commence à perturber le fonctionnement des us et coutumes des communautés rurales.

Les résultats obtenus permettent de conclure que le VIH/SIDA perturbe le fonctionnement socio-économique et culturel normal des ménages par suite de la baisse des revenus. Les conséquences directes du fléau sont parmi tant d'autres : i) le manque de temps consacré à la surveillance, à l'entretien et à la scolarisation des enfants, ii) la réduction du temps consacré aux travaux champêtres, iii) la réduction, voire l'abandon des activités génératrices de revenus.

D'autres types de zones socio-économiques et culturelles au Mali peuvent être abordés avec la même méthodologie ; toutefois les réalités socioculturelles, économiques et sanitaires de chaque milieu s'imposent dans la conduite des études.

The role of improved access to markets in reducing the HIV/AIDS epidemic among the youth: the case of Domasi youth in southern Malawi

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Workshop presentation

Malawi is a small land-locked country in southeastern Africa. With a population of 12 million and about 85 percent living in rural areas where agriculture is the main activity, Malawi is one of the poorest countries in the world. The 1997/98 Integrated Household Survey reported that 65 percent of Malawians live in poverty, of which 75% are women, and that 40 percent survive on an income of less than US\$ 0.30 per day (Malawi Government, 2000). The HIV/AIDS pandemic is affecting the welfare and livelihood of millions of Malawians resulting in the life expectancy at birth falling from 52 years in the 1990s to 43 years old in the 2002. The prevalence of HIV/AIDS among the adult population is estimated at 16 percent. Given that a majority of Malawians derive their livelihood from the agricultural sector, the impact of HIV/AIDS on agriculture has been phenomenal since it affected both rural livelihoods as well as food security. This study sought to increase our understanding of the impacts of coping strategies for HIV/AIDS on livelihoods and on the predisposition of households to HIV/AIDS contraction. The study also examined how other livelihood activities in rural areas are affected by HIV/AIDS or how they affect HIV/AIDS. Specifically, the study focused on a community-based organization, which is aimed at reducing the spread of HIV/AIDS among the youth, Anxious Youth Organization (AYO). A two-pronged approach was used: a study of cultural factors that might affect the spread of HIV/AIDS, and interviews with the youth on how they earn their livelihoods. This study was carried out in Domasi, a rural area in Zomba district in southern Malawi.

Cultural factors predisposing young people to HIV/AIDS contraction

The youth – both males and females – in Bimbi village have to undergo an initiation ceremony at eight years old and at 11-12 years as part of their culture. Males are circumcised but not females. During the second initiation ceremony of the boys, the circumcision is traditionally conducted using one razor blade or one knife. If one of the

first initiates is HIV-positive the chances are high that the subsequent initiates will be infected. During the second initiation ceremonies of both boys and girls, the initiates are taught how to have sex and are encouraged to have sex once they graduate from the camp. This tradition is called *kuchotsa fumbi*, literally meaning removing dust. It is believed that once they go out, the initiates should have sexual intercourse as soon as possible to remove dust, failing which their skin will look dusty, a process said to be irreversible. Traditionally, it is believed that going through this process is part of re-integrating the initiates into the society since they were in a 'cold place'. Having sexual intercourse will make their bodies as strong as those of their parents, who are also encouraged to have sexual intercourse as part of removing dust and welcoming their children back into society. In cases where one parent is absent, tradition requires that the single parent should get a sexual partner to fulfil this requirement.

On the night of the coming out, the society observes a festival called *mwanambera*, which is accompanied by a traditional dance called *manganje*. It was observed during the study that people take advantage of that festival to engage in risky behaviour. They will meet old acquaintances and make new ones with the objective of having casual sex for the night. While some people engage in such risky behaviour to celebrate the graduation of their relatives, others do so to follow custom.

Livelihoods of the rural youth

The rural youth group that we have been working with basically comprises farmers. A majority of them are primary school drop-outs (Standard 8) and are participating essentially in food crop growing of maize (the main staple food), cassava, vegetables and rice. While maize is grown mostly as a food crop, the other crops are grown for food as well as for cash. Rice is the crop with potential to be the major cash crop in the area. Our analysis of access to markets in the area focused on this crop. With no other major attractive income-generating activity around, the research examined how the farmers in the area access the markets, and what dangers are involved, especially as regards the household predisposing itself to HIV/AIDS contraction. Furthermore, extrapolations were made as to the difference increased access to markets would have in making people less vulnerable to the risks involved.

It was seen from the outset that the participants did not seem to have confidence in the marketing of crops in general, and the marketing of cash crops in particular. There was a general feeling that when there is food scarcity, the market does not function efficiently, i.e. the price of maize tends to be too high. Therefore households would rather play it safe.

Rice cultivation and marketing

Rice is regarded as a luxury in Malawi where maize is the staple food crop. Although most of the rice cultivation schemes set up with Chinese assistance in the 1960s have run down, rice cultivation within the wetland is still a major agricultural activity along the shore of Lake Chilwa. The people in Bimbi village have to travel to the wetland area, a distance approximately 4 to 5 kilometres to cultivate rice.

The rice in this area can be sold either at Govala market (6 kilometres), at Songani market (10 kilometres) or at their homes. At both markets, the structure of the rice marketing was said to be similar. There is an association of market participants with a committee. Before anybody can participate as a buyer, they need to register with the committee. There are several players involved in the overall process of marketing. These include people who do the actual buying from farmers, other people who own weighing scales (who are essentially different from the buyers, i.e. owners of the commodity), and people who do the bagging. After buying from farmers, the rice is milled by private millers before it can be sold. Selling is both at retail and at wholesale.

This structure has implications for how farmers access the market. Farmers must decide whether they want to sell their produce right in the village at the lowest prices or shoulder the cost of taking it to the market. At the market, they can sell milled rice or unmilled rice. Milled rice sells for more money but entails paying the millers immediately after milling and also loaders. If traders from the cities are not present then the farmers may have to fend for themselves until they arrive. It is during these days of fending for themselves that our focus group participants say that farmers, especially women can engage in casual sex as a survival strategy to penetrate the market.

HIV/AIDS risk and the implications of high transactions costs in market access

The study revealed that because the youth have less access to marketing opportunities for a potentially lucrative crop such as rice, they face risks with regard to the contraction of HIV/AIDS. This happens through involvement in cultural practices and also, for females, trading sex as a survival or coping strategy in the villages. High transaction costs of accessing markets suggest also that the rural youth are likely to continue being subsistence farmers rather than active participants in cash crop production to improve their livelihoods. Attempts to absorb some of these transaction costs can result in the youth putting themselves in risky situations.

Reducing these transaction costs would result in making the growing of a cash crop more profitable. Improving organization among farmers can reduce these costs through collective marketing and bargaining. At global level, increased access to international

markets for developing countries would have the potential of increasing access to markets by the youth who would be relieved of their current plight. Opening up world markets may be a way of reducing the spread of the HIV/AIDS pandemic by reducing the necessity for young people to engage in selling sex because of problems of accessing the markets for a better livelihood.

Nutrition et VIH/SIDA : importance de la recherche scientifique

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Présentation lors de l'atelier

La 'triple menace' que constituent le VIH/SIDA, la crise alimentaire et l'affaiblissement des Etats, pourrait aggraver l'instabilité sur le continent africain. La progression, l'ampleur et l'impact de l'épidémie du VIH/SIDA en Afrique suscitent une réponse urgente et efficace autant pour les personnes atteintes que pour celles qui ne le sont pas. Le VIH/SIDA a diminué les capacités des communautés à produire suffisamment de nourriture et dans de nombreux villages la terre est laissée en jachère, faute de main-d'oeuvre pour la cultiver. Cette situation a pour effet d'accélérer l'exode rural vers les centres urbains où la hausse du chômage nourrit l'instabilité. En décembre 2003, l'OMS a annoncé le lancement d'une campagne sans précédent visant à administrer un traitement antirétroviral avant la fin de 2005 à trois millions de personnes vivant avec le VIH/SIDA dans les pays en développement : la campagne '3X5'. Deux mois plus tard, le gouvernement américain lançait le 'plan d'aide d'urgence à antirétroviraux' à deux millions de personnes et à prévenir sept millions de nouveaux cas d'infection d'ici à 2008 dans 15 pays dont 12 en Afrique. Cependant, malgré cet engagement au niveau international, l'aide alimentaire aux personnes affectées/infectées par le VIH/SIDA est nécessaire afin de répondre aux carences préexistantes ou induites par la maladie, de tenir compte de l'altération des ressources des familles induite par la maladie, de favoriser une amélioration de l'état de santé en vue d'un retour du patient à une vie active. Par ailleurs, l'OMS a été à l'origine d'un effort concerté visant à mettre au point des approches fondées sur les données scientifiques les plus récentes en ce qui concerne les macronutriments et micronutriments nécessaires aux personnes infectées par le VIH, les besoins nutritionnels spécifiques des femmes enceintes et allaitantes infectées par le VIH et leurs enfants, et les besoins nutritionnels des adultes et des enfants infectés par le VIH et bénéficiant d'un traitement antirétroviral. Les données pertinentes ont été recueillies avec l'aide du groupe consultatif technique de l'OMS sur la nutrition et le VIH/SIDA et les premières constatations ont été présentées et examinées lors d'une consultation technique sur les besoins en nutriments des personnes vivant avec le VIH/SIDA. Les principales conclusions tirées d'un examen détaillé de ces données ont été présentées lors d'une consultation technique sur la nutrition et le VIH/SIDA qui s'est tenue en Afrique (Durban, Afrique du Sud, 10-13 avril 2005)¹.

Elle avait pour but de procéder à la synthèse des récentes investigations sur les relations entre l'infection au VIH et la nutrition et leurs conséquences ; l'objectif étant d'apprendre de la communauté africaine si les efforts accomplis pour apporter une alimentation suffisante, des soins nutritionnels avec des traitements antirétroviraux avaient ou non été couronnés de succès. La rencontre visait aussi à donner des indications pratiques sur les meilleurs moyens d'incorporer la nutrition dans les programmes nationaux de prévention, de prise en charge et de soins dans le domaine de la lutte contre le VIH/SIDA.

A l'issue de cette réunion, les participants ont abouti à la conclusion que l'évaluation alimentaire et nutritionnelle est une donnée très importante pour garantir l'efficacité d'un traitement antirétroviral. D'où la nécessité de mettre en œuvre des recherches opérationnelles pour mieux appréhender l'interaction entre nutrition et traitements antirétroviraux.

Avant d'aborder des thèmes de recherche opérationnelle pertinents, les axes prioritaires sur lesquels doivent se focaliser les interventions nutritionnelles associées aux projets/programmes de riposte au VIH/SIDA vont être présentés et enfin, seront discutés les déterminants de la recherche scientifique dans ce domaine.

Axes prioritaires des interventions nutritionnelles

Peu de crises ont autant touché la santé humaine et menacé les progrès sociaux, économiques et nationaux que le VIH et le SIDA. La pandémie a une incidence dévastatrice sur la sécurité alimentaire et la nutrition des ménages car elle se répercute sur les disponibilités alimentaires et la stabilité des approvisionnements ainsi que sur l'accès à la nourriture et son utilisation pour une bonne nutrition. Elle a aussi de sérieuses répercussions sur la production agricole et l'emploi, et exerce une forte pression sur les services sanitaires et sociaux. Les familles perdent leur capacité de travail et de production. Plus les ménages s'appauvrissent, plus il leur est difficile de se procurer de la nourriture et de couvrir leurs besoins les plus élémentaires.

Il n'est plus à démontrer qu'une bonne nutrition est indispensable pour tout individu qui veut être en bonne santé. Cela devient un impératif lorsqu'il s'agit d'un cas de pathologie aussi lourde que l'infection au VIH/SIDA. La nutrition doit être intégrée aux services essentiels de soins, de traitement et d'appui aux personnes vivant avec le VIH/SIDA, et aux efforts effectués pour prévenir l'infection. Une nutrition adéquate ne peut guérir l'infection à VIH, mais elle est indispensable pour préserver le système immunitaire, maintenir un niveau d'activité physique favorable à la santé et permettre une qualité de la vie optimale. Elle est capable de prolonger la vie des personnes infectées par le VIH et de prévenir la transmission du VIH de la mère à l'enfant.

La malnutrition est une grave menace pour les personnes atteintes du VIH/SIDA. Au cours des premiers stades de la maladie lorsqu'il n'y a encore aucun signe apparent, le VIH modifie l'état nutritionnel du corps. Le risque de malnutrition augmente considérablement au fur et à mesure que progresse l'infection. Il est essentiel de satisfaire les besoins alimentaires, nutritionnels et d'autre nature des ménages touchés par le VIH et le SIDA pour qu'ils puissent vivre dans la dignité et la sécurité. Le soutien et les soins nutritionnels sont des éléments importants de l'accompagnement des personnes aux divers stades de la maladie.

Les PVVIH doivent suivre un régime alimentaire équilibré en calories et en protéines. Ce régime varie suivant que le patient est adulte ou enfant. Un adulte actif non infecté par le VIH a besoin d'environ 2070 kcal/ jour. Par contre un adulte infecté par le VIH a besoin de 10 à 15 % d'énergie en plus par jour (soit environ 400 kcal supplémentaires pour les hommes et 300 kcal pour les femmes). Il a besoin également de 85 g de protéines par jour pour les hommes et 72 g de protéines par jour pour les femmes. Un régime sain et équilibré aidera le corps à se maintenir en bon état et à ne pas maigrir. Se nourrir correctement permet de se protéger et de renforcer le système immunitaire.

Le traitement de la PVVIH repose d'abord sur la prévention de la dénutrition par la prise en charge rapide des facteurs étiologiques.

Macronutriments

Les compléments nutritionnels stabilisent ou augmentent le poids et les apports en énergie¹. En particulier les protéines (1 à 1,5 g/kg/j) peuvent être apportées à travers la viande, les poissons, les œufs et les produits laitiers. Les compléments nutritionnels peuvent être également ingérés sous forme de : liquides et crèmes sucrés, potages et mixés hyperprotéinés, protéines en poudre, boissons aux fruits hyperprotéinés, biscuits et barres de céréales.

Tout état catabolique s'accompagne de besoins accrus en oligo-éléments et en vitamines. La supplémentation systématique en vitamines et oligo-éléments est inutile, sauf en cas de carence documentée. Les dépenses d'énergie sont fortement augmentées chez la PVVIH (augmentation du métabolisme, stress des infections répétitives) qui diminue ses activités en compensation.

Micronutriments

Certains micronutriments aident l'organisme à résister en stimulant l'immunité. Pour l'aider à mieux résister aux infections, les vitamines A, C, E et les éléments minéraux tels que le

zinc peuvent lui être apportés. Ils participent à lutter contre les radicaux toxiques libres. Le zinc lutte contre les infections en intervenant dans la plupart des actions mises en œuvre par les globules blancs contre les agents. Certains auteurs ont insisté sur des carences en zinc et en sélénium en cas de diarrhées importantes ; une supplémentation en ces oligo-éléments peut donc être envisagée. De même, les apports en vitamines B sont nécessaires. D'autres éléments tels que le fer et la vitamine D ont également un rôle important lors de l'infection au VIH.

Plusieurs études ont montré que des suppléments en antioxydants peuvent améliorer la santé des PVVIH. L'utilisation de suppléments en vitamine E restaure les niveaux de cellules immunitaires et de globules rouges.

Un grand nombre des pathologies associées au VIH/SIDA affectent l'ingestion, la digestion et l'absorption des aliments tandis que d'autres altèrent les fonctions du corps. Une bonne nutrition peut agir sur les symptômes de ces pathologies (diarrhée, perte de poids, nécrobacillose, mal de gorge, nausée et vomissements). Une supplémentation en vitamines Q, B-complex, C, E, en sélénium et en zinc est nécessaire au système immunitaire pour combattre les infections. Car, l'effet de diverses carences nutritionnelles sur la susceptibilité au virus a été très étudié, essentiellement pour tenter d'identifier des stratégies augmentant la résistance à l'infection. Les assertions qui suivent en découlent : une masse cellulaire réduite et un taux d'albumine sérique inférieur à la normale sont associés à une survie plus courte, indépendamment du taux de CD4 ; des déficits en vitamines Q, B-complex, C et E, en sélénium et en zinc, nécessaires au système immunitaire pour combattre l'infection, sont observés fréquemment chez les personnes infectées, indépendamment de leur contexte socio-économique ; des déficits en vitamines antioxydantes et en minéraux augmentent le stress oxydatif, ce qui peut accroître la réplication virale.

Une supplémentation en matières grasses pour corriger une masse cellulaire réduite et un taux d'albumine sérique inférieur à la normale s'avère indispensable.

Une nutrition correcte ne peut guérir du SIDA ou prévenir l'infection du VIH, mais elle peut améliorer l'état nutritionnel des malades et retarder la progression des maladies liées au VIH/SIDA. Elle peut donc améliorer la qualité de vie de ceux qui en sont victimes. Il est important d'offrir un soutien et des soins nutritionnels dès les premiers stades de l'infection afin de prévenir le développement de carences nutritionnelles. Un régime sain et équilibré aidera le corps à se maintenir en forme et à ne pas maigrir. Se nourrir correctement permet de protéger et de renforcer le système immunitaire (protection du corps contre la maladie) et de se maintenir en bonne santé le plus longtemps possible. Une bonne nutrition complétera et renforcera l'effet des médicaments prescrits.

Un régime équilibré est essentiel pour combler la perte d'énergie et de nutriments qu'entraînent les infections. Une nutrition correcte aide également à communiquer un sens de bien-être et à renforcer la détermination des malades à guérir. Pour procurer aux PVVIH un bien-être adéquat grâce à l'alimentation, la recherche occupe une place prépondérante.

Conclusion

Un régime équilibré est essentiel pour combler la perte d'énergie et de nutriments qu'entraînent les infections dans le cas du VIH. Le poids est la résultante entre les apports (aliments, boissons) et les dépenses d'énergie. Quand un patient perd du poids, il faut qu'il arrête de boire de l'eau et ne boive que des boissons sucrées, ce qui permet d'aider à le stabiliser. Un défaut d'apport en micronutriments peut aussi être source de dysimmunité. L'approche nutritionnelle lors de l'infection par le VIH vise à :

- combler les besoins en énergie (calories), protéines, vitamines et minéraux de la personne infectée afin d'optimiser les réserves nutritionnelles ;
- favoriser le fonctionnement optimal du système immunitaire. Plus de 16 éléments nutritifs agissent sur les composantes du système immunitaire ;
- prévenir et corriger la perte de poids et de masse musculaire qui accompagne généralement l'infection par le VIH ;
- diminuer l'intensité ou la fréquence de certains symptômes et réduire au minimum les effets secondaires des traitements ;
- faire adopter des habitudes alimentaires qui réduisent les risques d'infection d'origine alimentaire.

Les progrès déployés pour promouvoir et mettre en œuvre des stratégies basées sur l'alimentation en vue d'accroître l'apport en micronutriments de manière durable ont été en général lents. Des initiatives de recherche opérationnelle à propos de l'impact du soutien nutritionnel sur la récupération nutritionnelle et la stabilisation de l'état nutritionnel des PVVIH ont été prises et méritent d'être renforcées. L'appui des décideurs politiques autant que celui des firmes pharmaceutiques est prépondérant et dans un strict respect des normes éthiques et techniques.