



**Establishing the Link between HIV/AIDS and the
Environment
Review done in Ethiopia**

Final Report

Feven Tassew (MD, MPH)

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Acronyms and Abbreviations

ABCG	African Biodiversity Collaborative Group
AIDS	Acquired Immunodeficiency syndrome
ART	Anti Retroviral Therapy
BCC	Behavioural Change Communication
CBO	Community Based organizations
CRDA	Christian Rehabilitation and development Association
EDHS	Ethiopian Demographic Health Survey
ERA	Ethiopian Road Authority
ENDA	Environmental and Development Action
FBO	Faith Based Organizations
FGAE	Family Guidance Association Ethiopia
HAPCO	HIV/AIDS Prevention and Control Office
HBC	Home Based Care
HCBC	Home and Community Based Care
HIV	Human Immunodeficiency virus
IDRC	International Development Research Centre
IPPF	International Planned Parenthood Federation
IUCN	International Union for Conservation of Nature
NGO	Non Governmental Organization
PICDO	Progress Integrated Community Development Organization
PLWHA/PLHIV/PLHA	People living with HIV/AIDS
PMTCT	Prevention of Mother to Child Transmission of HIV
SIDA	Swedish International Development Cooperation Agency
VCT	Voluntary Counselling and Testing

Acknowledgements

This study was part of a larger project, *Making the Linkages – Conservation as a Core Asset for Livelihood Security in Eastern Africa*, funded by the International Development Research Centre (IDRC). The project aims to improve the understanding of the importance of sustainable natural resource management for livelihood security and economic growth in Eastern Africa. The project focuses on the following poverty-environment linkages: HIV/AIDS and the environment, drylands and marine natural resources and livelihoods.

The major activities of the project are: 1) conducting community workshops and producing community lessons learned brochures to improve the understanding and awareness of the linkages at the community level; 2) carrying out more in-depth studies on the linkages; 3) initiating community-policy dialogues and interactions to improve understanding at the policy level and 4) influencing policy at the IGAD level through studies and conferences of directors of conservation and health and economic planners to facilitate the dialogue between the different sectoral senior decision-makers.

Executive Summary

The rural communities in Ethiopia, representing about 85% of the country, are utterly dependent on agriculture as a source of livelihood using meagre land based resources while most rural areas are overpopulated, often with a very high population density. Most of the youth do not have access to land and they have to share the land resources owned by their parents.

Ethiopia has just entered its third decade of living with the HIV/AIDS epidemic. With an already vulnerable economy, the epidemic, which is spreading in rural areas, is having a profound effect both socially and economically. Although the overall HIV prevalence in Ethiopia is low (2.1%), because of the large population, the absolute number of persons infected with HIV (and affected by HIV) is significant. The cumulative number of AIDS deaths in Ethiopia was 1,267,000 by 2005 and this is projected to reach 1.9 million by 2010 if present trends continue.

Information regarding the link between HIV/AIDS and the environment is not well established or documented and this creates a gap in designing appropriate programmes addressing the issues. This knowledge gap in understanding the link between HIV/AIDS and the environment has led to a joint effort between the International Union for the Conservation of Nature (IUCN EARO) and the International Planned Parenthood Federation, Africa Region (IPPFAR) to establish the link between HIV/AIDS and the environment and thus create a better understanding for its effective management.

Accordingly, this study was done through a literature review, consultative meetings with relevant stakeholders, interviews with key informants, focus group discussions and visits to project sites.

In this study it was indicated that environmental degradation in rural areas has aggravated the impoverishment of the population which has in turn brought about vulnerabilities and lack of resilience to the HIV/AIDS epidemic. The impact of poverty can be expressed in terms of decreased level of nutrition and food security as well as lack of basic resources like water and required resources for medication, which have far reaching negative consequences, especially for those infected with the HIV virus. Scarcity of resources like water and fire wood, requiring long distance travel to fetch water and wood, have also been identified as a main cause of abuse to women and girls, especially in rural areas, exposing them to HIV infection.

HIV/AIDS in turn exacerbates the poverty situation through loss of the productive forces of the country, loss of knowledge and labour, increasing dependence on natural resources for livelihood as a result of increased morbidity and mortality and changes in land use and access to resources.

A vicious cycle of poverty, aggravating individual and community vulnerability to HIV infection and also resulting in further degradation of the environment, is created in the process. The poverty has also resulted in rural-urban migration in search of jobs and alternative livelihood mechanisms, which has been identified as one of the factors fuelling the HIV epidemic.

The study, on the other hand, has also shown some promising practices of alleviating the combined negative effects of HIV/AIDS and environmental degradation, including urban agriculture, seedling growing and tree planting as a source of income through the engagement of those infected and affected by HIV/AIDS; and these activities at

the same time are replenishing the degraded resources. There is actually the understanding and the commitment of different actors to work on environmental protection along with HIV prevention, by promoting the transfer and implementation of indigenous knowledge to the young generation and meaningfully involving people living with or affected by HIV/AIDS. HIV prevention efforts should also be integrated into such activities with focus on interrupting urban-to-rural transmission and containing the rural epidemic at its current low levels through social mobilization.

Generally, there is a preliminary understanding of the association between HIV/AIDS and the environment among different development actors and community groups, and also a perception that the major strategy to tackle the link should be based on promoting protection and sustainable use of the environment.

Yet there is a lack of clear understanding and little attention given to research on this link by concerned bodies and there was no concrete evidence or practice noticed that addresses the linkage between HIV/AIDS and the environment in a deliberate or proactive manner. Some of the initiatives still require strengthening and scaling up to achieve tangible results.

1. Background

Ethiopia has a projected population of 77 million for 2007 with about 84% living in rural areas (see Ref. no. 1). Economically, Ethiopia is a low-income country with a per capita gross national income of \$110 in 2005 (World Development Report 2006).

Its economy is largely dependent on the agricultural sector, which also provides about 85% of employment. Recurrent famines and civil wars, as well as high population growth have contributed to this low socio-economic status. The population growth is putting pressure on cultivable lands and contributing to environmental degradation, which is worsening the level of poverty (see Ref. no. 2).

The overall health status of the Ethiopian people is poor. Life expectancy at birth stands at 54 years (53 years for men and 55 years for women). The infant mortality rate is estimated to be about 77 per 1,000 births, and under-five mortality is about 123 per 1,000. Poor nutritional status, infectious diseases and a high fertility rate, together with low levels of access to reproductive health and emergency obstetric services, contribute to one of the highest maternal mortality rates in the world. Maternal mortality is estimated to be 673 per 1,000 births (see Ref. no. 3).

The major health problems of the country are communicable diseases resulting from poor personal hygiene, improper garbage and waste disposal practices, and lack of an adequate and safe water supply. Significant proportions of other health problems are due to inappropriate nutritional practices, lack of health awareness, and improper cultural taboos. Most of these communicable diseases are vaccine preventable and affect mothers and children under five years of age (see Ref. no. 4)

HIV/AIDS in Ethiopia

HIV was first detected in Ethiopia in stored sera collected in 1984 and the first two AIDS cases were reported in 1986. The national HIV prevalence in 2005 was reported to be 3.5%: 3% among males and 4% among females (AIDS in Ethiopia 6th report).

According to the AIDS in Ethiopia 6th report, the estimated prevalence in urban areas was 10.5% and 1.9% in rural areas. In 2005, it was estimated that a total of 1,320,000 people were living with HIV/AIDS. Of this total, 634,000 were living in rural

areas and 686,000 in urban areas. Prevalence appears to have levelled off in urban areas but continues to rise in rural areas, where 85% of the population lives.

The urban epidemic is at an unacceptably high prevalence level of 10.5%; prevalence of behavioural indicators such as condom use are not at optimal levels; counselling and testing coverage is still low with only 5% of the general population 15-49 years of age ever being tested; ART has been accessed by only 13% of those who need it; and only 0.8% of HIV infections among births to HIV positive mothers was averted in 2005/6 through PMTCT programmes.

There are many factors that promote the spread of the disease including the presence of sexually transmitted infections, gender inequality, multiple sexual partners, prostitution, men with disposable income, alcohol, unsafe blood transfusion, and transmission from infected mothers to the foetus or child during pregnancy or breast-feeding.

The HIV/AIDS epidemic in Ethiopia presents an obstacle to development across nearly all sectors of society. It is documented that HIV poses a threat to all types of assets including human, financial, physical, social, natural and capital. The pandemic is incapacitating the most economically productive age group (20-49), severely limiting gains from agricultural programmes and jeopardizing food security (see Ref. no. 5). By the year 2014, over 280,000 Ethiopians between the ages of 15 and 49 will die every year due to HIV/AIDS (USAID 2002). Similarly, the number of persons living with HIV/AIDS (PLWHAs) in this age group is predicted to increase dramatically while illnesses afflicting these PLWHAs will reduce economic productivity and compromise efficiency. HIV/AIDS is clearly more than a health issue as the socio-economic consequences of the epidemic can seriously undermine the development achievements of existing policies and programmes (see Ref. no. 6).

Given the size of the Ethiopian population and the magnitude of damage already inflicted by HIV/AIDS, it will take a number of years to see a noticeable decline in the socio-economic impact of the disease. Likewise, despite the advances in managing the epidemic and the increasing resource availability, the conditions faced are still far from ideal, and this is unlikely to change in the near future. HIV/AIDS is a growing threat to efforts made for economic growth and poverty reduction (see Ref. no. 7).

Natural resources

Natural resources are the foundation of the Ethiopian economy. Rural livelihood is to a large extent dependent on smallholder peasant agriculture that heavily relies upon the natural resource base. Renewable natural resources including water, forests and forms of biodiversity are a means to meet the daily needs of the rural population. These resources have now deteriorated to a low level of productivity as a result of many and often compounding factors. In many areas of highland Ethiopia, the present consumption of wood is in excess of unaided natural sustainable production with a deforestation rate estimated to vary from 80,000 to 200,000 hectares per annum (see Ref. no. 28).

The genetic diversity of Ethiopia's flora and fauna is increasingly eroded as a result of a long history of disruptive interventions by the state and lack of wise local management in the face of expanding population coupled with the increasing need for agricultural land. Energy usage for household purposes is dependant on biomass. Burning dung as fuel instead of using it as a soil conditioner is considered to cause a reduction in grain production estimated at 550,000 tones annually. Soil erosion is another cause of soil fertility loss and is projected to cause a loss of about 170,000 tones by 2010 (see Ref. no. 28).

The poor national economy of the country is a result, among other things, of failure to fully use the resources of the country. Despite its vast water resources, the country is able to harness only 1% of its potential for irrigated agriculture and hydropower generation (see Ref. no. 28). The energy sector has also failed to develop and to relieve the population from absolute dependence on biomass fuels (including wood, charcoal and animal dung).

Since the link between HIV/AIDS and the environment has not yet been well established, there are no programmatic approaches designed so far but an appreciation of the link between the two exists, according to an official from CRDA, an umbrella organization of over 320 registered NGOs and FBOs. There is also a progressive understanding of the need for integrating HIV/AIDS into developmental programmes by donors; it is becoming common for donor organizations to request for HIV/AIDS activities to be integrated into other projects, as is the case with the World Bank projects with the Ethiopian Road Authority.

HIV/AIDS and environmental development issues are deep and pervasive requiring long-term support and commitment (see Ref. no. 8).

2. Objectives

The general objective of the study is to establish existing information and knowledge about the link between environment and HIV/AIDS.

Specific objectives:

- To generate information and assess the existing information on the influence and the linkage between HIV/AIDS and the environment;
- To assess existing policy and legislative instruments on the linkages or any references in the country and what has been the progress to date of the government;
- To assess what knowledge of environmental and natural resources assets communities have and use in the management of HIV/AIDS.

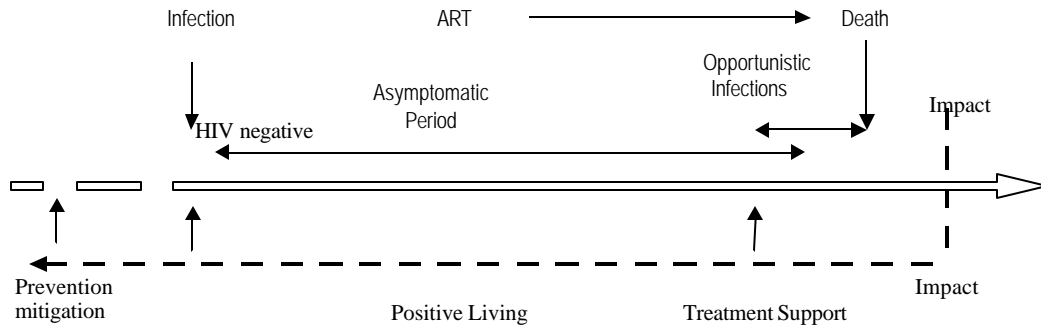
3. Methodology

The methods used include a literature review; assessment of existing policies; focus group discussions with grassroots implementers; key informant interviews and field visits to project sites and discussion with beneficiary groups. In addition, analysis of research documents and consultative meetings with relevant stakeholders engaged in related work on environment and HIV/AIDS were carried out. Different projects were consulted noting their strategy, best practices or lessons learnt in relation to the link between HIV/AIDS and environment.

Operational definitions:

The term ‘**Environment**’ is defined under the Environmental Organs Establishment Proclamation No. 295/2002 as “the totality of all materials whether in their natural state or modified or changed by humans, their external spaces and the interactions which affect their quality or quantity and the welfare of human or other living beings, including but not restricted to, land, atmosphere, weather and climate, water, living things, sound, odour, taste, social factors, and aesthetics”.

To better understand issues of **HIV/AIDS**, it usually helps to consider the HIV/AIDS time line which illustrates the different stages of the disease in a continuum; and therefore the different needs of those affected and infected as well as the different interventions required at the different stages of the disease progression.



What is meant by impact on HIV/AIDS in this document can refer to any of the different stages in the time line including the spread of HIV infection, disease progression, treatment tolerance, and impact on those affected after the death of the adult who is usually the bread winner. Organizations, communities and institutions can respond and provide assistance at any point of the continuum, although in practice most interventions are clustered at the beginning and the end, as was also noticed during this study.

HIV refers to the virus causing AIDS; and **AIDS** is a syndrome of diseases resulting from reduced immunity inflicted by the HIV virus. People living with HIV/AIDS (**PLWHAs**) are also referred as **infected**, while those referred to as **affected** are the people impacted by HIV/AIDS or whose livelihoods have been negatively affected.

4. Findings of the Review

The findings are presented in three major sections: review of relevant policies; Environment and HIV/AIDS and the impact of HIV/AIDS on the Environment. Under each section are sub-sections based on the outcomes of the brief assessment done on the linkages.

4.1. Review of relevant policies

Policy on HIV/AIDS (see Ref. no. 13)

Recognizing the catastrophic impact of the HIV/AIDS epidemic across generations unless it is checked in time, the Government of Ethiopia demonstrated its commitment to the prevention and control of HIV/AIDS by issuing the National Policy on HIV/AIDS in 1998. This policy was formulated by the Ministry of Health and adopted by the Council of Ministers in 1998. It mainly focuses on prevention to stop the transmission of HIV and control of HIV/AIDS to mitigate the impact of the disease through monitoring of HIV/AIDS. The overall objective of the policy is to provide an enabling environment for the prevention and control of HIV/AIDS in the country.

Also in the policy document are the following points:

- The fact that HIV/AIDS is not only a health problem but also a development problem is recognized.
- The need for a concerted multi-sectoral effort in controlling the HIV/AIDS epidemic is noted, given the magnitude of the problem as well as the considerable resources needed in combating the HIV/AIDS epidemic.
- It is also mentioned that the policy is cognizant of the human rights of people living with HIV/AIDS.

In general the policy creates a favourable environment for collaborative efforts from different developmental actors and recognizes the need for concerted multi-sectoral efforts in the fight against the pandemic. Yet, the policy does not specifically put issues of environment in relation to HIV/AIDS in the document.

The Health Policy of Ethiopia states relevant objectives, including intensifying family planning for the optimal health of mother, child and families; accelerating the provision of safe and adequate water for urban and rural populations; and developing safe disposal of human, household, agricultural and industrial wastes and encouraging recycling; all of which have either a direct or indirect association with HIV/AIDS and the environment.

Environment Policies of Ethiopia

The Environment Policy of Ethiopia was adopted by the Council of Ministers in 1997. The Constitution of Ethiopia has granted the right to a clean and healthy environment to all citizens. It has furthermore made it a condition that plans or programmes affecting the lives of communities shall not be implemented without prior consultation being made to solicit their opinions.

The overall objective of this policy is “to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.”

The policy sets out sectoral and cross-sectoral objectives in order to achieve this goal. The cross-sectoral policies include population growth and distribution and its impact on natural resources, community participation in environmental management, rural land and natural resource tenure and access, land use planning, social, cultural and gender issues, environmental economics, environmental information system, environmental research, environmental impact assessment and environmental education and awareness.

The environmental policy of Ethiopia acknowledges the right to a healthy environment, community empowerment, creation of an enabling atmosphere, security of land tenure, increased environmental awareness and interdependence of environmental issues at all levels.

The Environment and HIV/AIDS

As noted by Alex de Sherbinin in the cyberseminar’s background paper, two important trends in population and the environment are presently colliding to shape the sustainability of rural livelihoods in many of the “lesser developed” regions of the world. The first such trend is an alarming rise in adult mortality largely attributed to the HIV/AIDS pandemic, especially in rural sub-Saharan Africa. The second trend is

a similarly troubling perpetuation of environmental degradation. Taken together, the trends of rising adult mortality and continuing environmental degradation pose severe threats to rural sub-Saharan African livelihoods, yet despite increasing HIV/AIDS prevalence and the fact that natural resources represent a central component of rural African livelihoods; the environmental dimensions of the African HIV/AIDS pandemic have received little scholarly attention (see Ref. no. 9).

Natural resources are the foundation of the Ethiopian economy. As a result of rapid population growth, climate change and other factors, the quality of renewable natural resources such as land, water and forests has deteriorated. This in turn has affected agricultural productivity (see Ref, no 10). There are very close linkages between HIV/AIDS, rural livelihoods, human capacity and the environment (see Ref, no. 11).

4.2. The Environment and its impact on HIV/AIDS

i. Environmental degradation/depletion and HIV/AIDS

Local natural resources are an important means of sustenance and income generation in many rural areas of developing countries. The health of the local environment can also shape individual vulnerability to HIV/AIDS in at least two ways. First, resource scarcity often deepens poverty in natural resource-dependent regions, as in much of rural sub-Saharan Africa. Second, natural resource scarcity may lead to food insecurity and inadequate diet, which can further undermine the immune system of HIV-infected people (see Ref. no. 14).

Food insecurity and inadequate food as a result of natural resource scarcity is a big threat especially to the health of PLWHAs. Malnutrition increases the susceptibility of HIV-infected persons to opportunistic infections, while also increasing the risk of HIV transmission from mother to baby (see Ref. no. 16). One researcher in Singapore suggests that malnutrition may also reduce the effectiveness of HIV/AIDS treatment (see Ref. no. 17).

Research has demonstrated that desperate economic circumstances can heighten the risk of HIV infection by leading individuals, particularly women and girls, to engage in "transactional sex" for material goods, sometimes to meet daily sustenance needs (see Ref. no. 15). Although transactional sex has not yet been directly linked to the environment, local resource scarcity and risky sex are both clearly associated with a strong intermediary, i.e. poverty (see Ref. no. 14).

According to the Swedish International Development Cooperation Agency, in parallel with the spread of the AIDS epidemic, there are growing signs of cyclic or long term climate change in sub-Saharan Africa. The change can be characterized by both less rainfall and more irregular rainfall (see Ref. no. 12).

Land degradation and ecological destruction are the most serious environmental problems facing Ethiopia today. Women and girls, as primary producers of food and collectors of water and fuel, are particularly hard hit by environmental deterioration (see Ref. no. 10).

Natural resource degradation leads to reduced crop production, fewer animals, and less biomass, which lowers per capita caloric intake. Resource degradation also compels farmers to adopt more labour-intensive methods of crop cultivation and to travel longer distances to access water, fuel, construction materials, and grazing

sites, which leads to a progressive deterioration of farmers' standard of living (see Ref. no. 18).

Depletion of natural resource leads those dependent on these resources to migrate to other areas looking for other means of livelihoods which usually ends up putting them at a greater risk of HIV infection.

“Environmental degradation is decreasing the biodiversity of the country, and in such instances PLWHAs will have greater difficulty to fulfil the required daily intake of nutritious food; and even those areas which are known to be rich in water resources and now having shortages to fulfil basic needs,” a staff member from an organization working on environmental protection stated.

Rural-urban migration as a result of poor agricultural productivity is a major challenge, especially for young people migrating to cities and towns since they are exposed to prostitution, begging, and many forms of abuse due to their vulnerability in such a situation.

ii. Environmental protection work and HIV/AIDS

The requirement for environmentalists to travel to different sites related to their job, away from their home creates vulnerability to HIV infection; as it is been long understood that spending time away from home is associated with more chances of getting infected with HIV. When people spend long periods of time away from their families, they can be tempted to have temporary sexual contacts with the risk of being infected (see Ref. no. 12).

According to EDHS, the number of times a man slept away from home is more closely associated with HIV prevalence than is the total amount of time that a man spent away. The HIV rate is 3% among men who slept away six or more times in a 12-month period prior to the survey compared with less than 1% among men who never slept away and men who slept away fewer than six times (see Ref. no. 3).

Another study has also shown that fisherman often land fish in markets away from home where cash in the pocket is easily spent on alcohol and transactional sex with women who often have no other means of feeding their families (Gordon 2005, Torell 2007).

The assessment group visited the Ethiopian Road Authority (ERA), Environment Department and HIV/AIDS unit. According to the information from these units ERA had been hard hit by the epidemic and had lost significant manpower to HIV/AIDS.

“Around 400 construction workers died of AIDS in a single road construction project, and we have actually put up a monument for them on that very road where they used to work; similarly in another site we have lost almost all our engineers during road construction” (interview in ERA).

So ERA learned about HIV/AIDS the hard way and started to look for ways of addressing HIV/AIDS along with carrying out its routine mandate. The vulnerability associated with construction work that puts workers at risk of HIV/AIDS could be summarized as: separation of workers from families for a long time; camping at different sites and having contact with the local community at different camping sites (which puts them as well as the local community at risk of HIV infection); lack of HIV awareness and prevention activities within the camp or in the community, which is in contact with the workers usually by establishing hotels, bars, and small shops. Construction workers are classified as a *high risk population* due to the nature of their work and related mobility.

Accordingly, ERA conducted a baseline survey for HIV/AIDS prevention and control intervention in 2004. Based on the findings and its recommendations, it developed a HIV/AIDS policy, allocates a separate budget to address HIV/AIDS issues in all its projects and contracts out the HIV/AIDS related tasks to relevant organizations to work along with construction companies in addressing workers and the surrounding community in the programme. Donors like the World Bank have also stipulated that addressing HIV/AIDS issues be part of the contractual obligations for funding.

Currently, the Authority has established an HIV/AIDS unit which coordinates the HIV/AIDS activities both within the organization and externally in outreach programmes at construction sites addressing construction workers (both full time and daily labourers) and the surrounding community. Currently reminders on HIV/AIDS are posted everywhere and condom promotion and distribution is done wherever workers are, be it at the office or out on a field assignment. The interventions are meeting their objectives with HIV/AIDS issues and challenges being addressed from different angles, according to the officials.

Other activities which require people to move from their home, even for a short time, involve associated risks; as was stated by one participant of a focus group discussion with actors of environmental protection. *“Improved seed and fertilizer disbursement in the rural areas requires farmers to travel for more than six hours to the nearby towns where they spend the night, mostly in local liquor houses usually accompanied by commercial sex workers. And this has been one of the ways the virus gets its way back to the rural areas,”* a staff member from Agri-service Ethiopia stated.

These examples indicate how other development organizations with requirements of mobilizing workers, communities and beneficiaries to areas away from their home, should consider issues of HIV/AIDS along with their routine tasks. As was indicated by the African Biodiversity Collaborative Group, coping strategies for identified HIV/AIDS-environment linkages should include development of institutional HIV/AIDS policies and strategies; adapting conservation training programmes by including a special HIV/AIDS module; working with local communities to find alternatives to unsustainable resource use and to develop natural resource-based micro-enterprises; and promoting HIV prevention and awareness in community partners by mainstreaming HIV/AIDS into environmental awareness programmes.

iii. Urban Agriculture/ Marketable agricultural practices and HIV/AIDS

Urban agriculture mainly focuses on fast growing, marketable vegetables and has multiple objectives including nutrition for the household, income generation by sale of the products and saving (be it for buying other items or participating in saving groups). Urban agriculture is an environment friendly practice, especially when considering how people are making use of different areas for the purpose; some clear waste dumping areas for agriculture, others use previously idle spaces like school compounds, unused privately owned areas or make use of grow bags.

What makes urban agricultural practices relevant for HIV/AIDS is the fact that many participants are either infected or affected by HIV/AIDS; many organizations including FGAE conduct what they call Home and Community Based Care (HCBC) which has evolved from Home Based Care (HBC), a palliative care service for bedridden PLWHAs. This development from HBC to HCBC was due to the fact that after the advent of Anti retroviral Therapy (ART), most PLWHAs started to get better, got out of bed and their homes and started to look for ways to support themselves and their

families. Progressively the need for simple HBC revolved around the question of how to support those in a relatively healthier condition to engage in viable livelihoods.

Urban agriculture is found to be one of the promising practices to help the urban poor residents infected or affected by HIV/AIDS as the practice primarily focuses on availing food to the household, creating opportunities for income generation and organizing beneficiaries into saving and loan groups; all of which are important to support these groups to help themselves.

Other emerging practices identified in urban agriculture include poultry keeping, animal fattening, bee keeping and growing ornamental plants (flowers and shade trees). It was also noticed that innovative approaches have been designed to overcome the problem of space in urban settings. People practice gardening using grow bags and other used items, an example from one local organization, called Progress Integrated Community Development Organization.

The other promising practice noticed was integration of solid waste management with urban agriculture in Environmental Development Action (ENDA) which is working on urban agriculture of bio-intensive gardening and small scale dairy production. Its other main programme area is integrated solid waste management which is urban based. It is trying to link the two programme areas through producing compost out of solid waste that can be used as fertilizer for the agriculture programme. Compost preparation has been made part of urban agriculture training; participants are using compost for their gardens and also sell it to others which supports their income generation as well. Having a clean environment benefits all through disease prevention, and agricultural products improve nutrition; both areas specifically benefiting those infected and affected by the HIV epidemic.

Interviews with beneficiaries involved in urban agriculture indicate that it has changed theirs and their families' lives significantly. It enables them to send children to school, their family eats well and some PLHA participants said their involvement in this activity has been satisfying and helps them as a form of 'psychotherapy'.

'Whenever I am working in my garden, it gives me the feeling of worth and takes my mind away from negative thinking. It means a lot for me to be able to send my daughter to school and pay my house rent; it is a miracle for me to be still alive, own so much and have a job that I enjoy doing,' a PLHA urban agriculture participant stated.

Participants of urban gardening expressed their will, interest and ability to work at a larger scale and be involved in conservational activities like re-forestation; if they can only get enough space and support from concerned units. However, the issue of working far away from where they live is a problem to those households impacted by HIV/AIDS.

'Even if FGAE has found me land to work on and expand my gardening, I cannot work far away from home since I look my children and the orphans of my sister who died of AIDS, so I have to limit my practice to using grow bags and the small space around the house,' a women supporting nine children including her own and those of her late sister stated.

Urban agriculture has been positively impacting the lives of those engaged in it along with all household members benefiting from the products. Yet, the practice is at a very small scale and in many cases the efforts are not consciously aimed at protecting the land or environment but rather at providing a livelihood for those

affected and infected, as an impact mitigation measure. Considering the interest of many organizations and beneficiaries in urban agriculture, this creates an opportunity for concerned stakeholders to scale up the initiative and collaborate to ensure that both sectors benefit out of this linkage.

On the other hand, one concern worth considering in relation to the practice is that it is very important to protect those not yet infected (guardians and OVC) from HIV. The risk here is that these people are exposed to a market situation which increases their interaction with different people and increases their vulnerability to HIV if not equipped with the necessary information and life skills to protect themselves.

“We have formed saving groups and meet weekly for our regular contribution, and during the meeting we discuss about our savings and maybe about the market, but we have had no discussion about HIV/AIDS so far,” one participant in urban agriculture in Adama, Nazareth, stated.

This indicates that, even if the original idea of engaging in urban agriculture was to mitigate the impacts of the epidemic, mainly targeting those affected households, HIV/AIDS prevention seems to be lacking. Despite that, most of the groups have already created favourable conditions for disseminating HIV/AIDS related information, like their saving groups with regular meetings. This is believed to be a missed opportunity for education and sensitizing the groups on the issues of HIV/AIDS.

In addition, people with disposable income are known to have a higher risk of HIV than those without, and in this case participants have direct access to money through the sale of their vegetables and other products. Men with disposable income were identified as one of the groups promoting the spread of HIV according to EDHS 2005. The same survey found out that employment (in the past 12 months) is also related to HIV levels among both women and men, with those who are employed being more likely than the unemployed to be infected.

Therefore, the scheme needs to consider preventing HIV, reducing risks and vulnerabilities while empowering participants economically and socially. It is actually a good entry point to address both HIV/AIDS and environmental protection, utilizing the opportunity created by organized groups, as mentioned earlier.

iv. Water, sanitation and HIV/AIDS

According to EDHS 2005, 61% of households in Ethiopia have access to an improved source of drinking water with access in urban areas much higher than in rural areas (94% and 56%, respectively). The most common source of improved drinking water in urban areas is piped water with 90% of households having access to this source. On the other hand, only 13% of rural households have access to piped water. The major source of improved drinking water in rural areas is a protected spring (39%). Only 8% of households reported having water on their premises and in the majority (74%) of households, an adult female usually collects drinking water. Female children under age 15 are over three times more likely than male children the same age to fetch drinking water. In the same survey, all households were asked whether they treat water prior to drinking and the overwhelming majority of households (92%) did not treat drinking water.

Water and sanitation have gained ground in recent years in becoming accepted as both a basic need and a human right. According to one study conducted, people living with HIV/AIDS, including the families and caregivers of those infected, have

special needs over and above those of unaffected consumers of water, sanitation and hygiene (WSH) services. Improved WSH services can and do have a crucial role to play in slowing the progression of HIV and in reducing the number of AIDS-related deaths. AIDS kills by drastically reducing the sufferer's immunity to common diseases. Death comes when the patient succumbs to one or other of these "opportunistic" diseases. Among the most common opportunistic diseases are diarrhea and skin diseases. Safe water supplies and good hygiene practices are the main weapons in preventing infections and reducing the spread of diarrhea and skin diseases. They thereby enable HIV-infected people to stay healthy longer and help those with AIDS to be protected against infection (see Ref. no. 19).

People on antiretroviral treatment (ART) require greater amounts of water for drinking. A great irony exists in giving advanced, costly life-saving ART to patients with a glass of water that could infect them with a life-threatening illness. It is important to maximize the effectiveness of these medicines by using safe water for ingesting them, since a side effect of many ARV drugs is diarrhoea (See Ref. no. 20). Clean water is also needed for formula feeds as an alternative to breast-feeding for babies and infants born to HIV positive mothers and not having clean water will put the babies at greater risk of dying from diarrhoeal diseases. A study showed that in the first two months, a child who receives replacement feeding is six times more likely to die than a breastfed child (UNICEF 2002). Thus safe drinking water becomes that much more necessary as ART becomes more pervasive in the developing world (See Ref. no. 20).

"Though there are some parts of the country known for having plenty of water, in general, sanitation problems make it extremely difficult to get potable water for the community and therefore, women have to travel far to fetch clean water for everyday consumption," a staff member from Ethio-wetlands and Natural Resources Association stated.

In a HIV/AIDS context, it is especially important that water supply points and latrines are easily accessible and close to where they are needed. This not only reduces the burden of long-distance water collection for care-givers or those who are weak but also cuts the risk of girls and women being raped while fetching water or relieving themselves in remote places, and thus reduces vulnerability to infection by HIV (see Ref. no. 19). Studies have shown that those traveling great distances to collect water will reduce intake of water and use less safe water sources and those without easy access to latrines will often resort to open defecation methods (WSP 2007).

Increased access to water also assists PLWHAs and their families to maintain kitchen gardens or engage in income generating activities that will help ensure food security, improved nutrition, and provide additional income for the household (see Ref. no. 20); as was discussed in urban agriculture.

v. Herbal medication and HIV/AIDS

To the majority of rural populations in developing countries, medicinal plants are a precious resource. This is especially true in Africa where more than 80% of the population depends upon medicinal plants for health care. Because of meagre revenue, lack of modern health infrastructures and traditional customs, medicinal plants are a major asset (see Ref. no. 23).

Traditional medicine is an important health care system in Ethiopia. According to the WHO report, 90% of the Ethiopian population use traditional medicine for their primary health care needs. Such a wide use of traditional medicine shows that the

contribution of this indigenous knowledge and resource to the enhancement of the health care needs of the Ethiopian population cannot be underestimated (see Ref. no. 21). Traditional health practitioners in Ethiopia command great respect in the community. They are most often the first line of care, and are more widely distributed than modern health workers (see Ref. no. 21).

The prevalence of the use of herbal drugs in Addis Ababa, the capital city of Ethiopia, was found to be 37%. The main reasons given for choosing herbal medicine as the first option of medication were: dissatisfaction with the services of modern health institutions due to their time consuming nature, cost considerations and perceived efficacy (see Ref. no. 22). Many local and traditional communities in Ethiopia conserve rare medicinal plants in home gardens.

“The stock of medicinal plants continues to decrease at an alarming rate due to environmental degradation and human activity. And the knowledge passed down from one generation to the next is disappearing as fast as the precious plant varieties,” points out Dr. Davy, a biologist. Deforestation to meet agricultural and domestic energy needs, the increased use of these plants in traditional medicine, inappropriate harvesting methods, commercialization and a growing demand on the market are all factors that threaten the sustainability of this biodiversity. *“And we know to what extent Africa needs these resources to meet its numerous health care challenges – malaria and AIDS to name only two,”* he pointed out (see Ref. no. 23).

Cultural preference and the high cost and unavailability of anti-HIV drugs for PLWHAs in the developing world lead many to turn to traditional medicine to manage HIV-related illnesses. Traditional health practitioners can play an important role in delivering an AIDS prevention message and some may be able to offer treatment for opportunistic infections (see Ref. no. 24).

In addition to patient safety issues, there is the risk that a growing herbal market and its great commercial benefit might pose a threat to biodiversity through the over harvesting of the raw material for herbal medicines and other natural health care products. These practices, if not controlled, may lead to the extinction of endangered species and the destruction of natural habitats and resources (see Ref. no. 25).

4.3 Impacts of the HIV/AIDS epidemic on the Environment

HIV/AIDS is a growing threat to efforts made for economic growth and poverty reduction (see Ref. no. 7). HIV/AIDS is only one of a complex web of factors that impact on rural people's livelihoods and it is often difficult to disentangle the effects of AIDS from other environmental, political and economic events and trends (see Ref. no. 6).

Although clearly an important association, only limited empirical research has been published in academic outlets demonstrating the impacts of HIV/AIDS on household resource and livelihood strategies. Additionally, important questions remain as to the unique impacts resulting from AIDS morbidity and mortality, as opposed to the loss of an adult household member from other causes of mortality. With regard to HIV/AIDS, it is logical to consider that household experience with protracted adult illness may exacerbate the impacts of eventual mortality, while the stigma associated with AIDS might also lessen assistance in times of household crisis (see Ref. no. 9).

The HIV/AIDS pandemic is having unprecedented and tragic impacts on all sectors of society in sub-Saharan Africa, causing untold human suffering, serious economic

effects, and social disruption. It is also affecting the environment: there are very close linkages between HIV/AIDS, rural livelihoods, human capacity and conservation (see Ref. no. 11).

i. Loss of crucial human capital - knowledge and labour are lost due to AIDS

The commercial and subsistence agricultural sectors in Ethiopia are non-mechanized and intensive labour requirements demand a strong, healthy labour force (see Ref. no. 5). However, given that the epidemic affects the most economically productive segment of the population, it impacts negatively on productivity. Work time is lost through frequent absenteeism and decreased capacity to do normal work as the disease advances (see Ref. no. 6).

“We used to bury up to four people every day when we start working as HBC volunteers before the advent of the drugs for HIV/AIDS,” a Home Based Care (HBC) volunteer coordinator in Adama, Nazareth, working with FGAE stated.

When agricultural labour is lost and household incomes decline, households often farm more extensively with fewer inputs. This can result in more environmentally damaging techniques including the increased use of fire (see Ref. no. 26).

As labour supply decreases due to AIDS illness and deaths, commercial farmers commonly shift from labour intensive cash crops to subsistence farming. On a national level, this adaptation reduces national agricultural production (and consequently GDP) and depletes Ethiopia's ability to trade commodities internationally. Less labour-intensive crops also tend to have lower nutritional value, contributing to malnutrition (see Ref. no. 5).

There is also the issue of loss of traditional knowledge related to conservation as well as the loss of productive forces due to AIDS, which creates a knowledge gap for the surviving generation who will be challenged to sustain biodiversity. Analyzing the extent of this gap and associated problems, two national NGOs have started to address the concern by designing programmes. One of the NGOs, Melca Mahber, has a program called ‘*Segni*’ (“seed” in one of the local languages) which attempts to create responsible and purpose-oriented youth who can live a balanced life without irreversibly damaging the surrounding ecosystem. This is done by organizing retreats with participation of elders, HIV/AIDS club leaders and students identified to have bad behaviour and irresponsible attitudes, in isolated parks. There information is provided about biodiversity in the park and also traditional knowledge related to conservation and herbal medicines. Melca Mahber strongly believes in reviving culture to combat both HIV/AIDS and environmental degradation.

Likewise, another local NGO, the Institute of Sustainable Development which has branches all over the country is working with schools and colleges and has launched a cultural biodiversity programme. The organization is working on co-curricular activities on environment; their focus is to address the root causes of environmental degradation by introducing activities which include education on culture and indigenous knowledge, practical teaching like composting, tree planting, and researching organic gardening in school compounds. It also has a national programme of experience sharing among different regions through organizing exhibitions on a rotational basis. Young people passing through this process are followed up and most are engaged in environment friendly activities forming activist groups and making a living from the environment as well.

ii. Overuse of natural resources – increased dependence on natural resources for livelihood

It is believed that households under stress from hunger, poverty or disease will adopt a range of strategies to mitigate their impact through complex multiple livelihood strategies. These entail choices that are essentially 'erosive' (unsustainable, undermining resilience) and 'non-erosive', easily reversible (see Ref. no. 6).

As related to mortality, the Africa Biodiversity Collaborative Group reports that throughout sub-Saharan Africa changes in the natural resource collection strategies frequently involve unsustainable collection practices and the de-emphasizing of stewardship in general (Dwasi 2002). Unfortunately, the death of a prime-aged adult also often represents the loss of a skilled and knowledgeable natural resource collector. In contrast, children and inexperienced natural resource collectors are more likely to employ unsustainable collection practices due to a lack of traditional knowledge (Dwasi 2002) (see Ref. no. 9).

Lack of transfer of indigenous knowledge, as a result of high morbidity and mortality brought about by AIDS, is also another aggravating factor in unsustainable use of resources. In the World Bank Bulletin, 1998, indigenous knowledge is defined as the local knowledge that is unique to a given culture or society. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities (Warren 1991).

When the local population is subjected to limitation in its traditional use of land, or when people are forced to move from national parks, nature reserves or forest reserves, it is most often difficult to create understanding among the people concerned of the importance of measures of this type. Conflicts can be expected to increase when the effects of the AIDS epidemic increases people's needs for access to easily exploited natural resources (see Ref. no. 12).

iii. Environmental sanitation - Disposal of contaminated materials related to HIV/AIDS care

HIV/AIDS prevention and care services produce different contaminated materials including condoms, syringes, gloves, razor blades etc. Appropriate waste disposal methods are not yet well established in Ethiopia. Inappropriate disposal can expose others, primarily family members and children, to the body fluids of HIV infected people.

"It is common to see children playing with used condoms as balloons and used syringes as toys to splash water with," a CBO leader stated.

Improper disposal of these materials creates an unhealthy environment which can expose people, especially PLWHAs, to different diseases. Since these materials do not decompose, they remain in the soil making it unsuitable for planting anything by preventing roots of plants from properly developing.

iv. Change in land use and access to resources

HIV/AIDS primarily attacks adults in their most economically productive age (20-49) and the loss of young adults in their productive years of life will affect the country's overall economic output. As it was also estimated by USAID, by the year 2014, over

280,000 Ethiopians between the ages of 15 and 49 will die every year due to HIV/AIDS; this indicates that the impact is still to continue.

When the middle aged adults die leaving the young, usually without properly transferring their knowledge of living harmoniously with nature, a big knowledge and value gap is created among the young generation. The situation leads to failure to adopt sustainable farming practices and disruption of the culture of maintaining healthy and diverse environmental assets which have been kept intact for a long time.

It was also reported during the interviews that when the adult of the household dies, extended family members or guardians claim the land and usually divide the plot among themselves. These plots usually end up being too small an area for proper cultivation, resulting in further deterioration of the land and lack of proper use.

The survivors of the household (elders and children) have to make ends meet to feed themselves and therefore engage in different activities to meet their immediate needs for food; primarily collecting fire wood for sale without understanding its implication.

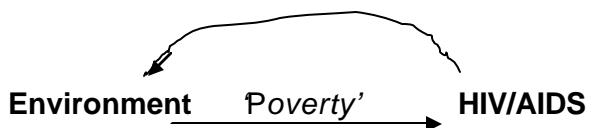
v. Diversion of conservation funds

Those working on environmental protection are equally vulnerable, if not more vulnerable, as other people and if a deliberate effort to integrate and address issues of HIV/AIDS, protect staff from infection, promote safe practices and positive living is not made, this could lead to grave consequences for both the organizations and the workers.

Fulfilling different needs is required in the event of HIV/AIDS, including medical expenses of staff, sick leave, terminal benefits and funeral costs and training of replacement staff. These expenses reduce the budget available for conservation work, and often have to be covered by scarce core funds (see Ref. no 26). A proactive effort, whenever possible, to integrate issues of HIV/AIDS into environment sector programmes would be more effective and less costly than managing its devastating impacts (see Ref. no. 27).

5. Conclusion

This brief review of the linkages between the environment and HIV/AIDS has tried to look at the association between the two from different angles. The association can easily be detected by taking into consideration the issue of *poverty* which is a strong intermediary between the two.



As depicted in the diagram above, the association or impact of environmental mismanagement on HIV/AIDS is relatively straight forward, since environmental depletion deepens the poverty leading to many factors strongly associated with HIV transmission, disease progression and early death of PLWHAs. The impact of HIV/AIDS on the environment, on the other hand, is more indirect and not so easily noticed. Environmental development to reduce poverty can therefore contribute a lot

in alleviating the pressure on people to adopt behaviour putting them at risk of HIV to overcome their destitution, even with adequate awareness about the pandemic.

Achieving environmentally sustainable development requires, among other things, cross sector-linked approaches that mirror the livelihood strategies of poor households and communities (see Ref. no. 27). In sub-Saharan Africa, household coping strategies following HIV/AIDS are mainly aimed at improving food security; raising, supplementing and diversifying income in order to maintain household expenditure and to alleviate loss of labour (White and Robinson 2000).

The role of public and poverty reduction policies and interventions should also include consideration of the importance of protecting environmental resources and making sustainable use of the resources to fight against poverty. As such, environmental conservation and bolstered efforts at sustainable resource management should be central components of policy measures designed to mitigate the impacts of AIDS (see Ref. no. 9).

Mobilizing existing resources, including natural resources, culture and indigenous knowledge, to overcome poverty could actually be the way forward towards a promising future for the country in general and the poor and marginalized groups in particular, as they represent the majority in the country. As indicated in this review, there are also emerging practices piloted by some organizations which are showing promising results and which are worth replicating and or scaling-up by concerned stakeholders in order to get tangible outcomes at a national level.

Recognizing the association between HIV/AIDS and the natural environment can contribute to the well-being of both human populations and the local environment, particularly in regions characterized by high prevalence of HIV/AIDS and natural resource dependence and scarcity. Although research on HIV/AIDS and environment intersection is in its infancy, the early evidence suggests that the public health, HIV/AIDS, and environmental policy and advocacy communities would gain strength by recognizing the overlaps in their agendas (see Ref. no. 14).

6. Recommendations

The following actions are recommended:

1. Bringing relevant stakeholders together to plan for designing well integrated strategies and approaches to address the link between the environment and HIV/AIDS.
2. Considering incorporating the linkage into the strategic plan and designing appropriate approaches that fit the specific context of the target group and area one works in.
3. Reviewing current practices to identify approaches that have the potential to aggravate the pandemic; and adopting healthy practices to avert these risks.
4. Designing appropriate alternative livelihood strategies for those affected by the pandemic to prevent further exploitation of the environment and to reduce their vulnerability of being exposed to HIV infection.
5. Designing a training module on how to address the integration based on current and indigenous knowledge and cascading capacity building of potential partners.
6. Targeting the youth: working with schools to raise an environmentally conscious generation, scaling up existing practices like environmental clubs.

7. Promoting intergenerational transfer of indigenous knowledge and culture to prevent HIV and protecting the environment through designing programmes involving the young and the elderly.
8. Promoting Environmental Impact Assessment (EIA) in different developmental endeavours and promoting the implementation of assessment recommendations to protect the environment.
9. Closely working with communities, addressing their felt needs using the rights based approach, promoting ownership of natural resources and the environment in general.
10. Designing separate strategies for urban and rural interventions, with focus on marginalized groups who are more dependent on natural resources.
11. Allocating sufficient resources for addressing issues identified in the link between HIV/AIDS and the environment.
12. Working towards having a National strategy on the integration of HIV/AIDS and the Environment.

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Annex 2: Interview Guides

I. Guiding questions for organization visited

1. What are the major program areas in your organizations?

2. Which geographical areas do you work at?

3. Has HIV/AIDS affected your work, performance in any way? How? Please elaborate.

4. Do your staff members travel frequently for work related tasks away from their home and families?

5. Can you tell us the relationship between your mandate and HIV/AIDS?

6. How do you involve PLHAs and those affected by the epidemic in your area of work?

7. What is your opinion on the linkages of HIV/AIDS and the environment?

8. Any recommendation you have towards an integrated approach to address issues of HIV/AIDS and the Environment?

II. Interview guides for project beneficiaries

1. Name: _____
2. Residence:
 - 2.1 Region: _____
 - 2.2 Zone: _____
 - 2.3 Woreda (district): _____
3. What activities are you engaged in currently?

4. What were you doing (your occupation) before starting your current job?

5. Have you ever tested for HIV?

6. (IF PLWHA) How do you cope to survive after you were told you are HIV positive?

7. (If non PLWHA) how are you managing to protect yourself from HIV virus?

8. Are you engaged in any HIV/AIDS related work? If so what?

9. How did you become part of this program?

10. What is your participation/ role on the following issues?
 - 10.1 Land use _____
 - 10.2 Forestry resource _____
 - 10.3 Soil Conservation _____
 - 10.4 Area protection _____
11. What do you think of your participation in natural resources conservation?
 - a) Nursery establishment _____
 - b) Seedling raising _____
 - c) Hillside terraces. _____

III. Interview guide questioners for CBOs

1. Name: _____
2. Location
 - 2.1 Region _____
 - 2.2 Zone _____
 - 2.3 Woreda (district) _____
3. Year of establishment (organized) _____
4. Number of excusive committee members _____
5. Are HIV positive members represented in the leadership?
If Yes, how? _____
If No, why not? _____
6. What are your duties and responsibilities in the CBO? Particularly in association with HIV/AIDS related work?

7. Do you have any working relationship with NGOs Can you describe it?

8. Any working relationship with governmental organizations? _____
9. What are the strategies/ activities you have on HIV/AIDS?
 - 9.1 Existing strategy _____
 - 9.2 Future strategy _____
10. Your observation on ART use? _____
11. Do you participate in natural resource conservation and development?
If Yes, how? _____
If No, why not? _____
12. Your observation on natural resources:
 - 12.1 Natural resources a few decades ago

 - 12.2 Natural resources currently

13. What do you recommend should be done to protect environment?

14. Do you think HIV/AIDS has an impact /any relation with the environment?
If Yes, how? _____
15. Your general comment
