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ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
COLLEGE OF DEVELOPMENT STUDIES

ASSESSING THE LIVELIHOOD CONTRIBUTION OF URBAN  
AGRICULTURE FOR PEOPLE LIVING WITH HIV/AIDS  
(PLWHA): THE CASE OF ADDIS ABABA

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF  
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RURAL LIVELIHOOD AND DEVELOPMENT

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**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**  
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*Title*  
*Assessing the Livelihood Contribution of Urban*  
*Agriculture for People Living with HIV/AIDS*  
*(PLWHA). The case of Addis Ababa*

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DEVELOPMENT STUDIES

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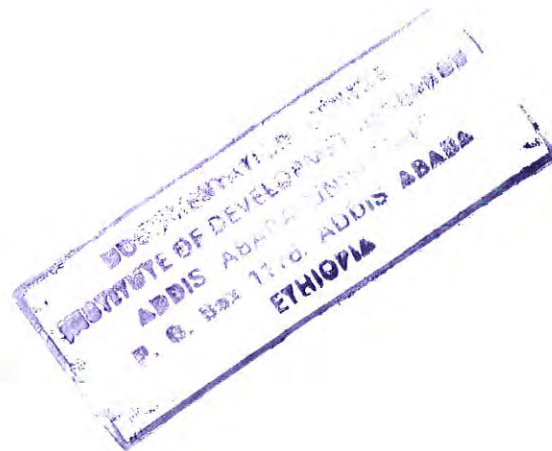
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DEDICATED TO  
PEOPLE LIVING WITH HIV/AIDS



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## ACRONYMS

- AIDS- Acquired Immune Deficiency Syndrome
- CBO-Community Based Organization
- CSA- Central statistics Authority
- DFID- Development for International Development
- FAO- Food and Agriculture Organization
- FGD- Focus Group Discussion
- GMP- Global Mountain Program
- HAPCO- HIV/AIDS Prevention and Control Office
- HIV- Human Immune Virus
- IDRC- International development Research Center
- IFPRI- International Food Policy Research Institute
- ILRI- International Livestock Research Institute
- IMF- International- International Monetary Fund
- KARI- Kenya Agriculture Research Institute
- MOH- Ministry of Health
- NGO- None Governmental Organization
- OSSREA- Organization for Social Science Research in Eastern and Southern  
Africa
- OVC- Orphan and Vulnerable Children
- PLWHA- People Living With HIV/AIDS
- RENEWA-Regional Network on HIV/AIDS, Livelihoods and Food Security
- SAMP- Southern Africa Migration Project
- SSA-Sub-Saharan Africa

UA- Urban Agriculture

UN- United Nation

UNAIDS- Joint United Nations Programme on HIV/AIDS

UNDP-United Nation Development Program

UNECA- United Nations Economic Commission for Africa

UPA- Urban and Peri-urban Agriculture

WHO- World Health Organization

## **GLOSSARY OF LOCAL TERMS**

|        |                                                                                                                                  |
|--------|----------------------------------------------------------------------------------------------------------------------------------|
| ATO    | A title used before the first name or full name of a man who has no other title (equivalent to Mr. in English)                   |
| Eqube  | Traditional institution organized by group of people which used to save Money on certain time schedule                           |
| Kebele | The lowest administration unit in Ethiopia                                                                                       |
| Medeb  | Traditional measurement system used to measure different items, especially vegetables by grouping together certain numbers items |

## ABSTRACT

HIV/AIDS posed heavy burden on the socio-economic development of the country, community, family and households; households and families bear most of the burden of HIV and AIDS, since they are the primary units for coping with the diseases and its consequences. Households affected and/or infected by HIV/AIDS lose their assets and resources that ultimately results in food insecurity, more poverty, livelihood disruption and destitution.

Studies conducted outside Ethiopia revealed that urban agriculture has significant contribution and taken as one option to support the livelihood of affected and/or infected households through rising food availability and generating income. Own production could enable the affected and/or infected households to consume fresh-picked variety foods which in turn contributes to enhance food and nutritional security of households.

Cognizant of this, some organizations currently operating in Addis Ababa have been engaging HIV/AIDS affected and/or infected people in urban agriculture activities especially in vegetable production. In Ethiopia, despite urban agriculture is taken as a means to support the livelihoods of households affected and/or infected by the pandemic, no study has been done to show its contribution in improving the livelihoods of these households. Thus, the purpose of the study is to examine the livelihood contribution of urban agriculture for HIV/AIDS affected and/or infected households particularly focusing on income and social contribution for those who engaged in the sector.

For this study, three sub cities and 63 People Living With HIV/AIDS (PLWHA) who have been doing urban farming activities were selected using purposive sampling techniques. Data were collected from primary sources through interview, focus group discussion, logbook and Key informant interviews, and secondary sources from published and unpublished documents.

To analyze the data, the study employed both qualitative and quantitative methods and statistical tools like SPSS. The result of the study was displayed using percentages, tables, narrative texts etc.

Based on the result observed from this research, PLWHA urban farmers benefited from the sector through increasing food availability, generating income from the sale of part of the produce and get access to diversified and nutritious foods which was difficult to afford for them to buy before their engagement in the sector. Apart from this, it has been observed that PLWHA vegetable farmers contact and relationship with neighborhoods, relatives etc. increased through exchanging and sharing of goods, materials and ideas. Hence, the current research concluded that urban agriculture has livelihood contribution for PLWHA who involve in the sector.

# CHAPTER ONE

## INTRODUCTION

### *1.1 Background*

As studies indicate, HIV/AIDS with out doubt one of the most tragic and challenging health, economic, social and political problem of our days. The problem is worse in sub-Saharan Africa and Africa certainly carries the heaviest burden.

HIV and AIDS brings burdens in the economy of the country, community, family and households, but households and families bear most of the burden of HIV and AIDS, since they are the primary units for coping with the diseases and its consequences (UNAIDS, 2005).It brings catastrophic impact on the affected and /or infected households; it exacerbates poverty, lose of income, lose of asset, and aggravates food shortage and food insecurity. HIV/AIDS have eroded the income-earning capacity and assets of millions of urban households. In the poor households of Ethiopia whose standard of living was deteriorating and vulnerable before the AIDS epidemic, the epidemic drives these households to destitution, since poor households have limited abilities to overcome new adversities.

Studies conducted by Save the Children, 2004, and Drimie et al., 2006, revealed that food and nutrition insecurity are increasingly intertwined with HIV/AIDS. The linkages between malnutrition, on one hand, HIV infection and AIDS impact, on the other, drives people and their households in downwards spiral. Within HIV affected and /or infected households, income and food reserves are severely reduced, saving and assets depleted; to meet health care, living and funeral costs and all dimensions of food security are affected.

According to UNAIDS, 2004, food insecurity is specially damaging for people living with HIV/ADIS, because they need more calories and protein than unaffected individuals. The report

further indicted that PLWHA in one hand needs extra food than the general population to live long and healthy life. On the other hand, they have limited income and cash reserves to purchase adequate amount of food. This is evident particularly for poor PLWHA living in urban areas, because food access hinges primarily on the household's ability to purchase food.

With this in view, HIV/AIDS affected and/or infected households respond to this problem by involving themselves in urban farming activities. Studies conducted outside Ethiopia indicated that urban agriculture has significant contribution to mitigate the impact of HIV/AIDS through increasing food availability, stability and accessibility on affected and/or infected households, notably on poor household's and has been taking as a remedy to assist the livelihoods of poor urban community.

Urban agriculture is also source of employment for poor urban dwellers and urban youth. It also has environmental contribution by absorbing organic wastes, create healthier environment and increase green space.

Urban agriculture provides food, improves livelihoods and procure income to HIV/ AIDS affected and/or infected households who have been doing urban farming. Urban farming enabling affected and/or infected households to raise income and ensure access to nutritious food, close to home (Munn et al., 2003, and Masoka, 2005). This becomes particularly important in the context of urban malnutrition and in support of ART for PLWHA, since home gardening mostly focus on a range of vegetables which have important potential for enhanced household nutrition, notably significant for HIV-positive household members with special nutritional needs.

Despite evidences are lacking, urban agriculture in Ethiopia has been practiced by different social groups of the society including HIV/AIDS affected and/or infected households to support their livelihoods. However, livelihood contribution of urban agriculture, particularly for people living with HIV/AIDS is little researched. This situation initiated the researcher to study the livelihood

contributions of urban agriculture for PLWHA. Thus, this study is designed to assess livelihood contribution of urban agriculture for PLWHA in three sub cities of Addis Ababa (Lidetha, Yeka and Akaki Kality).

## ***1.2 Problem statement***

Households affected and/or infected by HIV/AIDS lose their assets and resources that ultimately results in food insecurity, more poverty, livelihood disruption and destitution. This is basically because of the increase in medical expenses to treat AIDS related sickness, transport costs to health centers, and funeral and memorial costs. It also reduces household productivity through illness and drawing of family members who are economically active to care for the sick, and lose of employment through AIDS related sickness. On top of this, these families face social capital disruption because of the prevailing stigma and discrimination.

Food insecurity is notably damaging people living with HIV/AIDS, because they need more calories and protein than unaffected individuals since they have limited income and cash reserves to purchase adequate amount of food, particularly poor PLWHA. For persons living in urban areas food access hinges primarily on the household's ability to purchase food.

Like other sub-Saharan Africa cities, Addis Ababa hosts huge numbers of people infected by HIV/AIDS, whose livelihoods are chronically disrupted by the pandemic

To lessen the livelihood disruption that those households face, urban agriculture is known to be an option through increasing household income, food security, employment opportunity, and household nutrition. Different organizations currently working in Addis Ababa have been engaging an estimated 2,545 HIV /AIDS affected and /or infected households (1,491 PLWHA and 1054 orphan and vulnerable children) in urban farming activities particularly in vegetable production. But the efforts of different actors in the sector, notably on the livelihood contribution

of urban agriculture for HIV/AIDS affected and/or infected households is not supported by specific scientific set up. This motivated the researcher to look into the livelihood contribution of urban agriculture for people living with HIV/AIDS.

Studies that assess livelihood contribution of urban agriculture for HIV /AIDS affected and/or infected households are outstanding.

### **1.3 Objective of the study**

The study has the following general and specific objectives

#### **1.3.1 General objective**

- ❖ To assess the livelihood contribution of urban agriculture for people living with HIV/AIDS

#### **1.3.2 Specific objectives**

- To investigate whether urban agriculture enhances and improves household income of people living with HIV/AIDS.
- To see whether stigma and discrimination of PLWHA have been increased or decreased as a result of their engagement in urban Agriculture.

### **1.4 Research question**

- What is the income contribution of urban agriculture for people living with HIV/AIDS?
- What is the contribution of urban agriculture on stigma and discrimination for people living with HIV/AIDS who have been practicing urban farming?

### ***1.5 Significance of the study***

Urban agriculture is proven to be a means of livelihoods and source of food for many urban dwellers, particularly low-income households in developing countries. In Ethiopia, even though urban agriculture did not get the attention it deserves, it is apparent that the sector has been contributing food, livelihood, and nutrition security, employment opportunity, environmental benefits. Urban agriculture can be practiced by every group of the society (rich, poor, HIV infected etc.), but the sector has predominantly significant importance for poor HIV/AIDS affected and/or infected community groups because this group of community do not have cash to buy adequate amount food. Urban poor, who are most likely denied of access to food, respond to this by involving themselves in urban food production. Hence this study might give insights about livelihood contribution of urban agriculture in connection with HIV/AIDS and provide some empirical information and evidences for different actors to intervene in the sector. It also gives insights for NGOs, associations, community based organizations to involve the community in urban agriculture activities.

The output of the study can also be used as an input for policy makers and urban planners to consider urban agriculture as an option for livelihood as well as employment opportunities, confronting the urban dwellers. This research will also contribute a lot for further researches.

### ***1.6 Scope and limitation of the study***

The study attempted to assess the livelihood contribution of urban agriculture for people living with HIV AIDS (PLWHA) in Addis Ababa, specifically in three sub-cities (Lidetha, Yeka and Akaki Kaliti). Livelihood contribution of urban agriculture is a wide concept. However, this study addressed the income and social contribution urban farming for people living with HIV/AIDS.

Primarily PLWHA urban farmers have been found in ten sub-cities Addis Ababa. However, due to limit resources (Budget, time and other facilities) the study restricted to only three sub-cities. Hence, the study was limited to number of PLWHA who were selected from the three sub-cities.

Secondly, the study also confronted with lack of sampling frame which forced to selection procedures that limited the ability to generalize the result from the sample to the population. Third, lack of sufficient information about geographical distribution of PLWHA urban farmers. Fourth, lack of similar studies done in Ethiopian context. Fifth, shortage of published documents concerning urban agriculture situation in Ethiopia particularly in Addis Ababa. Sixth, the study was based on a one time survey and could not capture the variability of urban agriculture production due to seasonal variation and other factors.

### **1.7 Definition of terms**

- ❖ **Food security:** A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
- ❖ **Malnutrition:** An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy, protein and/or other nutrients. Malnutrition refers to lack of food energy (under nutrition), and lack of nutrients
- ❖ **People living with HIV/AIDS (PLWHA):** A general term for all people infected with HIV. Whether or not they are showing any symptoms of infection.
- ❖ **Poverty:** Lack of economic resources. High employment, high prostitution, lack of medical care, etc. Poverty creates disruption in families, youth migration to urban areas, forces young girls to exchange sex for money, and creates hopelessness among the youth.
- ❖ **Self-esteem:** the self-evaluation made by each individual; one's attitude toward oneself along a positive – negative dimension. A feeling of confidence and self satisfaction.
- ❖ **Discrimination:** a negative action toward members of a specific social group.

- ❖ **Stigma:** to be associated or labeled with something that is disliked, disapproved of, - shunned or frowned upon. It is the attributed that serves to discredit a person in the eyes of others.
- ❖ **Livelihood:** comprises the assets (natural, physical, human, financial and social capital) the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household.
- ❖ **Family size:** The total numbers of members of a household
- ❖ **Household:** A person or group of persons living together in the same housing unit sharing common meals arrangement regardless of kin relation
- ❖ **Contact gardener:** PLWHA conducting urban farming as the same time they are providing technical assistance on urban agriculture, and care for fellow PLWHAS.
- ❖ **Recycle water:** household waste water used for irrigation after removing soap foam and other residual manually
- ❖ **Social capital:** the social resources upon which people draw in pursuit of their livelihood objectives, including networks, membership of formal and informal groups, and relationships of trust and reciprocity
- ❖ **Isolation-** the habitual avoidance of social contact ; separateness or feeling of Psychological estrangement from others

### ***1.8 Organization of the thesis***

The work in this research is organized and presented in five chapters. Chapter one is the introduction that gives an overview of the study, the problem statement, the objective etc. Chapter

two contains literature review which summaries a review of the theoretical debates on issues related with livelihood impacts of HIV/AIDS, HIV/AIDS and food security, HIV/AIDS and urban agriculture the nexus, urban agriculture and food security, urban agriculture in the Ethiopian context particularly in Addis Ababa etc. The third chapter presents the research methodology which consists of description of the study area, research design, and method of data collection, data sources, sampling method and method of data analysis. Chapter four presents result and discussion which describes demographic and socio-economic characteristics of households, production techniques of urban agriculture, income and social contribution of urban agriculture, challenges facing PLWHA urban agriculture producers and the like. Finally, chapter five presents concluding remarks and recommendations based on the result of the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Global Overview of HIV / AIDS

Since its onset in the early 1980s, HIV/AIDS epidemic has affected every sector of society and, in countries with high HIV/AIDS prevalence, erased decades of progress in combating mortality (UNAIDS, 2004). The disease strikes young adults in their most productive years, it has a particular destructive effect on families and households and the long-term economic development of a country (UNAIDS, 2005).

Every day, over 6,800 persons become infected with HIV and over 5,700 persons die from AIDS worldwide mostly because of inadequate access to HIV prevention and treatment services (UNAIDS / WHO, 2007). The estimated number of persons living with HIV worldwide in 2007 was 33.2 million persons, infection is concentrated in the socially and economically productive groups aged 15-45, with slightly more women infected than men, the estimated number of death due to AIDS in 2007 was 2.1 million worldwide, of which 76% occurred in sub-Saharan Africa (UNAIDS/WHO, 2007). The same report confirmed that decline in the past two years attribute to the scaling up of antiretroviral treatment services.

Global HIV incidence likely peaked in the late 1990s at over 3 million new infections per year, but in 2007 it was estimated to be 2.5 million of new infections of which over two thirds (68%) occurred in Sub-Saharan Africa (UNAIDS/WHO, 2007). The same study point out that this reduction in HIV incidence likely reflects natural trends in the pandemic as well as the result of prevention program resulting in behavioral change in different context. The report further indicated that around 15.4 million women & 2.5million children living with HIV in 2007.

## **2.2 Sub-Saharan Africa**

In the context of the global epidemic, Sub-Saharan Africa remains the most affected region (UNAIDS/WHO, 2007). The same study underlined that more than two third (68%) of all people HIV-positive live in this region, where more than there quarter (76%) of all AIDS death in 2007occured.It is estimated that 1.7 million people were newly infected with HIV in 2007, bringing to 22.5 million the total number of people living with the virus. Unlike other regions, the majority of people living with HIV in Sub-Saharan Africa (61%) are women (UNAIDS/WHO, 2007).

In Sub-Saharan Africa, adult (15-19 Years) HIV prevalence declined from 5.8% in to 2001 to 5.0% in to 2007(UNAIDS/WHO, 2007). AIDS continues to be the single largest cause of mortality in Sub-Saharan Africa (WHO, 2003. cited by UNAIDS / WHO, 2007); of the global a total of 2.1 million adult and child deaths due to AIDS in 2007, 1.6 million occurred in Sub-Saharan Africa. There are an estimated 11.4 million orphans due to AIDS in this region.

## **2.3 Overview of HIV and AIDS in Ethiopia**

Studies conducted by, MOH, 2004, Pankhurst et al, 2002, Demeke et al, 2004, and HAPCO, 2004. as cited by Drimie et al., 2006), revealed that Although HIV prevalence is still relatively low when compared to countries in southern and east Africa, Ethiopia is one of the most seriously affected countries in the world. As a consequence, the pandemic is recognized as one of the major causes of vulnerability in both urban and rural areas. The same studies confirmed that AIDS is the leading cause of death for those aged 15 to 49, and the number of AIDS orphans is apparently growing by the day. The studies further underlined death due to AIDS has brought down life expectancy gains and on average was expected to reduce it by 4.6 years in 2003. HIV/AIDS has become the most

important health problem in Ethiopia and serious threat to social and economic well-being exacerbating poverty (Drimie et al., 2006).

The epidemic started from a low base in the 1980s which spread rapidly in the 1990s and reached the current level, it is now more than two decades since the first evidence of HIV infection in Ethiopia was found in 1984 and the first AIDS case reported in 1986 (Drimie et al., 2006).

According to single point HIV prevalence estimate, the projected national HIV- population (0-49 ages) for 2009 for Ethiopia is 1.02 million (0.4 million male & 0.6 million female) with adult prevalence 2.3 percent, of which 7.7 urban and 0.9 rural (MOH/ HAPCO, 2007). The urban HIV prevalence far exceeds national HIV prevalence and the urban rate is above eight times the rural. According to the same report the projected HIV-population (0-49 ages) for Addis Ababa for 2009 is 197,103 (80,933 male and 116,170 female) with adult prevalence 8.5 percent of which 6.8 percent male and 10.1 percent female.

## **2.4. Livelihood and HIV/AIDS**

### **2.4.1. Household impact of HIV/AIDS**

HIV / AIDS brings burdens in the economy of the country, community, family and households, but households and families bear most of the burden of HIV / AIDS, since they are the primary units for coping with the diseases and its consequences (UNAIDS, 2004 and 2005).

At household level, the impact of the disease diverts attention and resources from productive activities to caring for the sick and surviving the aftermath of the death of key household members (Bishop-Sam brook et al, 2005. as cited by Drimie et al., 2006). If the infected person is the breadwinner, the family suffers financially, from both loss of earnings and increased expenditure for medical care (United Nations, 2004a. as cited by United Nation, 2005). The report adds during

the long period of illness and after the death of the victim, lack of income and the cost of care can force households to spend their saving, sell their productive assets and borrow money.

Studies conducted by (United Nation, 2005, & Menon and others, 1998. as cited by united nation, 2005) confirmed that AIDS affected households often make a rapid transition into poverty, in Rakai, Uganda, AIDS affected households were much less likely to own durable goods than non-affected households, especially if the victim was male. Death of adults, particularly parents, often cause households to break up, with children being sent to live with relatives or even becoming homeless. "Skipped generation" households-comprising grandparents and grandchildren without the middle generation –are becoming more common in countries heavily impacted by AIDS (United Nation, 2004a. as cited by United Nation, 2005).

As studies conducted by United Nation, 2004a, & Ainsworth, 1993. as cited by United Nation, (2005), confirmed that there are lower school enrollment among AIDS-affected households and children often dropped out of school because their families had no money for school fees or needed the children's labor at home. In the united Republic of Tanzania, this was found to be particularly true when the AIDS victim was the mother. Children tended to assume the domestic roles of the mother and left school to do so. In the most immediate and obvious sense, HIV/AIDS reduces available household labor and undermines the balance between the production and consumption units within a household. In Tanzania households lose around two years of labor by the time of death while households with chronically ill member have average reductions in annual income of 30-35%. HIV/AIDS increases the expenditure requirements of already poor households. The study further revealed that when health and/or funeral costs rise; households are forced, typically, to divert cash expenditure from other areas such as school fees and agricultural inputs, which decreases the household's future viability. This increased expenditure requirement often leads to the sale of household assets which begins a cycle of impoverishment with clear repercussions for current and future livelihood and food security.

Study conducted by Bechu, 1998, & UNAIDS-UNECA, 2000.cited by Kelly, 2001, as the most immediate effects of HIV/AIDS are experienced at the individual and household levels, the effects have many facets: illness, physical and psychological pain and suffering, health care and cost, income loss, reduced household productivity, death, funeral cost, mourning and grief, increase poverty, increased vulnerability of women, growth in the number of orphans, the social dislocation of those who survive, and the ultimate disappearance of households. According the same study following an AIDS death, average household consumption in Cote d'Ivoire fell 44 percent on the previous year and households with an AIDS patient spent twice as much on medical expenses as those without such a patient. In Ethiopia, AIDS-affected households were found to spend between 11.6 and 16.4 hours per week in agriculture, compared with a mean of 33.6 hours for non-AIDS-affected household).In Tanzania, a case study survey found that in households where one person was sick because of AID, 29 percent of labor was spent on AIDS-related matter; if two household members were devoted to nursing duties, the average household loss from agriculture activities was 43 percent. In Zimbabwe, a bed-ridden AIDS patient was estimated to cost the affected household an additional US \$ 23-34 per month.

Other study conducted by IMF, 2004, & UNAIDS, 2000.as cited by Muelder, 2004, on the household impact of HIV/AIDS indicates that, the pandemic brings labor shortages and subsequent output reductions result in reduced lifetime family income as well as household debt increase due to reduced income and increased expenditure, asset reduction and heightened vulnerability push the affected into chronic poverty, from which recovery is increasingly difficult. AIDS infected households have to reallocate a grater share of their declining incomes to health care, including not only drugs and doctors fees but also supplies for home care.

According to studies conducted by (FAO, 2000, Pitayanon et al., 1997., UN population Division, 2003, & Steinberg et al, 2002. as cited by UNAIDS, 2004), revealed that AIDS brings income loss among AIDS affected households in Burundi, Coted'Ivoire and Haiti found a steady decline in the

number of economically active member per household. This was usually followed by a drop in per capita household consumption which exposed to food insecurity. The same studies indicated that in South Africa and Zambia, studies of AIDS –affected household most of them already poor found monthly income fell by 66%-80% due to coping with AIDS-related illness. The studies further confirmed In Thailand a person with steady employment died of AIDS, the household's lifetime income loss was more than 20 % grater than a household with non-AIDS-related death. AIDS is intensifying chronic food shortages, causes labor losses due to both the direct cost of treatment and services and the indirect cost of losing work days because of sickness or caring for the sick and depletes family income that would normally purchase food. In high-prevalence countries, a vicious cycle exists between food shortage, malnutrition and AIDS (FAO, 2000, Pitayanon et al., 1997., UN population Division, 2003, & Steinberg et al, 2002. as cited by UNAIDS, 2004).

A study conducted by Panos, 2007, in Ethiopia widespread malnutrition problems, coupled with very low access to basic services such as safe water, sanitation and health care, means that HIV and AIDS are having devastating social and economical impact. The study adds not only is the epidemics the leading cause of adult morbidity and mortality, it is also major contributor to recent food crises and livelihood disruption and the country's food security and HIV/AIDS status in desperate situation. The same report indicate the pandemic contribute to food insecurity and compromise the goal of poverty reduction in the country, breaking down family and community structures and leading to socio-economic crisis by raising medical expenditure, HIV and AIDS also increase the financial burden on households at a time when their food purchasing power is decreasing. The pandemic also erodes assets and resources for food production and ultimately results in food insecurity.

According to the same report in the country, poor households whose standard of living is deteriorating and vulnerable before the AIDS epidemic, the epidemic drives these households to

destitution, since poor household has limited abilities to overcome new adversities. Poor families have a reduced capacity to deal with the effects of morbidity and mortality than do richer ones because they have no savings and other assets which can cushion the impact of illness and death and the poor are already on the margins of survival and thus are also unable to deal with the consequent health and other costs. The study further confirmed the pandemic has enormous strain on the capacity of families to cope with psycho-social and economic consequences of illness, such that many families experience great distress and often disintegrate as social and economic units.

A study conducted by Aster, 2005, in Addis Ababa revealed that HIV/AIDS infected households' monthly income highly dropped and expenditure for treatment, funeral increased. As a result sales of assets and withdrawal of financial savings as coping mechanism were practiced and females are more vulnerable for income deterioration.

#### **2.4.2 HIV/AIDS and food security**

Studies conducted by Save the Children, 2004, and Drimie et al., 2006, revealed that food and nutrition insecurity are increasingly intertwined with HIV/AIDS. The linkages between malnutrition, on one hand, and HIV infection and AIDS impact, on the other, drives people and their households in downwards spiral. According to the same studies the links between food security and HIV/ AIDS are bio-directional; HIV/AIDS increase the vulnerability of households and communities to food insecurity exposed to poor nutrition, which hinders immunity, and can worsen the effects of opportunistic infections and in turn speed up the progression from HIV to AIDS.

Drimie et al., (2006), argues that at household level, there is a two-way relationship between livelihoods and HIV/AIDS. Insecure livelihoods exacerbate the risk and vulnerability environment for HIV/AIDS, at the same time; illness and death associated with AIDS undermine livelihoods options. Insecure livelihoods exacerbate the risks and vulnerabilities of HIVAIDS and Lack of

options can push some people into activities or situations that put them and others at high risk of HIV, such as sex work. Lack of food, money and health care are key factors in rapid progression from HIV infection to onset of AIDS and those with weak livelihoods are more vulnerable to social and economic impacts of illness and death in their families and communities.

Drimic et al., (2006), depicted the intertwined relationship between food insecurity and HIV/AIDS as follows:

In one hand insecure livelihoods exacerbate the risk and vulnerability environment for HIV/AIDS, through:

- ❖ Faster progression from HIV infection to onset of AIDS;
- ❖ Difficult environments for proper treatments of HIV; and
- ❖ Increased socio-economic impacts of AIDS. On the other hand illness and death associated with AIDS in turn undermine livelihoods options by:
  - Weakening or destroying human capacity (human skills, knowledge, experience, and labor)
  - Depleting control and access to other key assets: financial, social, natural and physical; and
  - Constraining options for productive activities, reducing participation in community activities, and increasing time needed for reproductive and caring activities

According to UNAIDS, 2004, food insecurity is predominantly damaging for peoples living with HIV/AIDS, because they need more calories and protein than unaffected individuals. The report further indicted PLWHA in one hand needs extra food than the general population to live long and healthy life, on the other hand they have limited income and cash reserves to purchase adequate amount of food, particularly poor PLWHA, because for persons living in urban areas food access hinges primarily on the household's ability to purchase food.

According to studies conducted by Topouzis, 1999, Castleman et al. 2003, Munn, 2003, & Crush et al. 2006, as cited by Bukusuba et al., 2007, with in HIV/AIDS-affected households, income and food reserves are severely reduced, as well as saving and assets depleted, to meet health care, living and funeral costs and all dimensions of food security – availability, stability, access and utilization of food, are affected. These effects further exacerbated by the ongoing food crises, which has led not only to further increases food insecurity and vulnerability of households, but also to an increase in poverty.

The study further revealed with in households affected by HIV, there is an increased risk of food insecurity as sick members are unable to work, income declines, expenditure on health care increases and care-giving burdens increase. The same studies further revealed that it has been noted that HIV-affected households in urban areas struggle to meet urban expenses, the type, quantity and quality of food consumption tends to be an area of cut-back since it is not viewed as fixed and absolute expenses. Food consumption has been found to drop by 40% in households affected by HIV/AIDS. In developing countries people living with HIV/AIDS in resource-limited settings are often unable to follow optimal food and nutrition recommendations for antiretroviral therapy owing to lack of access to the foods required. Therefore, access to food becomes more difficult among HIV-affected households, especially when one or more of the productive members can no longer bring in income.

Study conducted by UNAIDS, 2003, Gillespie et al. 2004 as cited by Bukusuba et al., 2007, & Panos, 2007, indicated that in HIV/AIDS-affected households, prolonged illness of the productive adults in the family has been shown to compromise the household's access to adequate food as a result of diminished income and savings. The study confirmed when one or both heads of the household are living with HIV/AIDS; the result is a drop in household production and income due to the reduction in the household labor force and shift in spending from food to medicine, which affects availability and access. Moreover, families often purchase poorer quality, less nutritious

food as income shrink, affecting utilization of nutrients. The study further confirmed that poor households affected by HIV/AIDS lost their income & expenditure on health increases, they can not longer afford to meet basic needs and they are vulnerable to high food price and their food purchasing power decrease notably when coupled with food price increase due to limited income and cash reserves because of this the households forced to reduce the quality and quantity of food they ate and the frequency of eating, (UNAIDS, 2003, Gillespie et al. 2004 as cited by Bukusuba et al., 2007, & Panos, 2007).

A study conducted (Palamuleni et al. 2003. as cited by Bukusuba et al., 2007), in three main urban areas of Malawi to analyze the linkages between HIV/AIDS and food security among urban households showed that HIV/AIDS affects food security through its negative effects on human capital, financial capital and social capital. In the same study, HIV/AIDS-related illness among the working cohort resulted in a direct income loss through withdrawing from work (100%) or reducing the amount of time and input. This study in Malawi estimates an income loss of approximately 60 %.

HIV infections translate into a direct shock on household livelihood and food insecurity. In the short term the most immediate impact is likely to be increased impoverishment due to the loss of productive and financial assets, i.e. loss of income-earning labor, loss of household assets and increased health care and funeral expenses (<http://V4.fews.net/docs/publications/1000087>.accessed on, December 11, 2008).

In Ethiopia, although evidences are lacking, it is presumed that PLWHA suffer from the consequence of household food insecurity and malnutrition (ENDA-Ethiopia dietary assessment unpublished report, 2006). This is further compounded by the fact that most PLWHA in the country represent the poorest section of the population. Therefore poor PLWHA who have the

fewest resources to buffer themselves and their dependents become sick and die faster than the better off, since they are food insecure and malnourished (Drimie et al., 2006).

Despite the role of food and good nutrition in slowing the progression of the disease and delaying death, is well recognized; accesses to enough food and nutrition has been one of the formidable challenges to HIV/AIDS affected and/or infected households (ENDA-Ethiopia dietary assessment unpublished report, 2006).

### ***2.5. Social impact of HIV/AIDS***

From the moment scientists identified HIV and AIDS, social responses of fear, denial, stigma and discrimination have accompanied the epidemic (Habtamu, 2007). The report adds discrimination has spread rapidly, fueling anxiety and prejudice against the groups most affected, as well as those living with HIV/AIDS. It goes without saying that HIV and AIDS are as much about social phenomena as they are about biological and medical concerns. The same study revealed that HIV/AIDS associated with stigma, repression and discrimination, as individuals affected (or believed to be affected) by HIV have been rejected by their families, their loved ones and their communities. Stigma is a powerful tool of social control and can be used to marginalize, exclude and exercise power over individuals who show certain characteristics (Habtamu, 2007).

While HIV is not transmitted in the majority of workplace settings, the supposed risk of transmission has been used by numerous employers to terminate or refuse employment (Habtamu, 2007). The study also indicates if people living with HIV/AIDS are open about their infection status at work, they may well experience stigmatizations and discrimination by others. The study further confirmed that, infected members of the family can find themselves stigmatized and discriminated against within the home.

HIV/AIDS negatively affects people's psychosocial well-beings, and it makes them more vulnerable to the impact of other shocks and stresses (<http://www.ifpri.org/renewal> accessed on,

January, 13, 2009). The same report revealed that AIDS related stigma is widespread and is enacted through gossip and social exclusion.

In Ethiopia HIV/AIDS related stigma may adversely affect the ability of individuals or households to respond and major development challenge (Drimie et al., 2006). The report adds depending on the social environment, disclosure of HIV status may lead to stigma. The report further confirmed the societal rejection of certain social groups such as sex workers may predate HIV/AIDS, the disease has, in many cases, reinforced this stigma. By blaming certain individuals or groups, society can excuse itself from the responsibility of caring for and looking after such populations. This is seen in how such groups are denied access to the services and treatment they need. Stigma may not be primarily associated with promiscuity and reckless behavior, but may be increasingly linked to the sense of being overwhelmed by the work, expense and emotional strain of having to care for sick people, in the context of declining household resources (Bond, 2005 as cited by Drimie et al., 2006). The report further indicated in Addis Ababa stigma has destructive force and the infected individuals face discrimination and neglect.

AIDS-related stigma remains one of the greatest obstacles to people living with HIV being able to fulfill their human rights (UNAIDS, 2004). The report adds stigma is also a major barrier to creating and implementing HIV programming. As the same study indicated stigma is a multi-layered process of devaluation that tends to reinforce negative connotations by associating HIV and AIDS with already-marginalized groups. This study further adds stigma lies at the root of discriminatory actions that exclude people who need AIDS-related services.

Discrimination is an infringement of human rights that often leads to people being subjected to various forms of abuse, a research carried out in India, Indonesia, the Philippines and Thailand indicated that a wide and persistent range of discrimination against people living with or perceived to be living with HIV. This included discrimination by friends and employees in workplace and

health-care settings, as well as exclusion from social functions and being denied benefits, privileges or services (UNAIDS, 2004).

Study conducted by UNDP, 2007, underlined that HIV/ AIDS related stigma and discrimination affects the livelihoods of PLWHA directly and/or indirectly. Directly when PLWHA stigmatized and discriminated at work place they lost jobs, thereby reducing household earnings. The other direct effect of stigma and discrimination is that it undermines personal connections, presents barriers to participation in community life, and reduces the safety-levels of the social network in which people are embedded, thus severely compromising their social capital. This situation restricts PLWHA to participate in various socio-economic activities; thus adversely affects their livelihoods. Stigma also affects the livelihoods of PLWHA indirectly PLWHA suffering from stigma and discrimination are more likely to experience depression and emotional burden; depression in turn hastens disease progression and exposed PLWHA to frequent illness which ends up loss of income and livelihoods of PLWHA household UNDP, 2007.

## ***2.6 Global Overview of Urban Agriculture***

According to (Hovorka et al., 2009), urban agriculture also defined as the production of food (for example, vegetables, fruits, meat, eggs milk, fish) and non-food items (for examples, fuel, herbs, ornamental plants, tree seedlings, flowers) within the urban area and its periphery, for home consumption and/or for the urban market, and related small-scale processing and marketing activities (including street vending of fresh or prepared food and other products. The same study point out urban agriculture takes place on private, leased, or rented land in peri-urban areas, in backyard, on roof tops, on vacant public lands (such as vacant industrial or residential lots, roadsides), or on semi-public land such as school grounds, in prisons and other institutes, as well as in ponds, lakes, and rivers.

Studies conducted by Rabinovitch and Seametzer, 1997. Cited by IDRC, 1999, and UNDP, 1996, cited by Hovorka et al., 2009 revealed that about eight hundred million people were practicing

urban agriculture, 200 million of them market producers employing 150 million people full time. As much as one-seventh of the world's food supply comes from cities, in the United States, for instance, 70% of fruit, vegetable and ornamental plants are grown on urban land without urban agriculture and Peri-urban agriculture, the challenge to feed the Mega cities would be enormous.

The same study confirmed that for long time the importance of urban agriculture was overlooked or dismissed as merely the result of traditional habits brought by rural migrants to the city, expected to fade away over time when these people integrated into the city economy. There was opposition to urban agriculture from public health and urban planning circles, which perceived urban agriculture either as a threat to public health that should be abandoned or as low-rent land use that would not be able to compete with other urban land uses (Hovorka et al., 2009). But during the past 15 years, studies have shown that urban agriculture should be recognized as an integral and permanent element of the urban socio-economic and ecological system (Van Veenhuizen and Danso, 2007; Mougeot, 2006 cited by Hovorka et al., 2009). The same report indicated that it forms an important part of the livelihoods strategies of large numbers of urban poor.

## ***2. 7 Why urban agriculture***

The world population is increasing by around 85 million every year. According to the United Nation's projections, the world's population will grow from roughly six billion today to more than nine billion by 2050 (IDRC, 1999). The same report indicates that, these figures are closely related to the rapid growth of the world's cities. The United Nation (UN) expects that between 1995 and 2025 the number of people living in urban areas will nearly double from 2.8 to 5.3 billion, and that 90% of that growth will be in developing countries (IDRC, 1999). The study adds African's 1985 urban population will have doubled by the year 2000. This implies that more people will live in

towns and cities than in rural areas. The study further confirmed this trend is alarming in a region with limited resources for providing the necessary urban services.

According to the study conducted by the world Resources institute, (2000), as cited by IDRC, (2004), the combination of rural to urban migration and lack of employment is increasing the concentration of poor in urban areas. It was estimated that in 2000, 56% of the world's poor lived in cities and when this condition coupled with the impact HIV/AIDS the problem become worsen. Since developing countries urban centers are at the core of the HIV/AIDS epidemic (Caceres, 2004).

Population pressure not only directly increases the demand for food, but also indirectly reduces its supply through building, environmental degradation and marginalization of food production (IDRC, 1999). The same report confirmed Africa can not able to produce enough food for the mega cities of tomorrow.

The rapid increase in the population of many developing countries implies that food production has to increase correspondingly to meet the increasing demand (Gyiele et. al. cited by Gete et al., 2007). The study further stated that although rural agriculture has a major role to play, urban agriculture (UA) has become recognizable partner in meeting this demand (Karanja et al., 2007). In apparent reaction to the increasing urban population, peri-urban and urban farming systems have emerged and are expected to assume greater importance and intensification in the year ahead (IDRC, 1999).

Urban agriculture contributes for food security, employment opportunity, income-generation, source of food, and means of livelihood etc. for urban dwellers in general and low-income HIV/AIDS affected households in particularly, world wide and notably in developing countries, [http://www.fao.org/unfao/bodies/coag/coag\\_15/x0076e.htm](http://www.fao.org/unfao/bodies/coag/coag_15/x0076e.htm), accessed on December 21, 2008. Other

study conducted by Ayaga et al., 2004), confirmed that urban agriculture can play pivotal role towards alleviating malnutrition, hunger, and urban unemployment.

Urban agriculture appears to reduce food insecurity by providing direct access to home produced food to households and the surplus sold into local market to generate income and successful strategy for the immediate relief on hunger and malnutrition. UA increase availability of fresh products which improve the quality of urban diets through diversification, by adding horticultural and animal products to the basis of staple food. This allows urban poor households consume more balanced diets that is not only sufficient in energy, but also in protein and micronutrients required for body growth and maintenance [http://www.fao.org/unfao/bodies/coag/coag\\_15/x0076e.htm](http://www.fao.org/unfao/bodies/coag/coag_15/x0076e.htm), accessed on, December 21, 2008.

UA can contribute to food security through increase the amount of food available and enhances the freshness of perishable foods reaching urban consumers and reduced post-harvest loss significantly, since the production is located close to consumers (FAO, 1999). It also offers opportunities for productive employment in a sector with low barriers to entry. The same report pointed out that, broad diversity of horticultural crop species allows year-round production, employment and income. Other study conducted by IDRC, (1999), revealed that traditional leafy vegetables which grow fast and absorb few inputs are one of their most important products, because they contribute to the inexpensive vegetable supply of the urban lower classes.

Studies conducted by Egal et al., 2003, and Lee-Smith et al., 2006, indicated that urban farmers consume more vegetables than urban non-farmers and production of food in urban and peri-urban areas brings nutrition and health benefits to poor producer households.

Urban agriculture plays an important role in providing emergency supply of food when households suffer with crises i.e. illness, health, sudden unemployment and enhances the freshness of perishable foods reaching urban consumers, increase overall variety and the nutritional value of

food available, because food produced by consumers or in close proximity to them is often fresher than food that travel long distance to markets (<http://www.fao.org/unfao/bodies/coag/coag15/x0076e.htm>, accessed on, December 21, 2008). A survey conducted by covering cities in a number of countries including Ethiopia, Kenya, Senegal, the United Republic of Tanzania and Uganda (IDRC, 1993. cited by FAO, 1997), showed that urban agriculture makes a significant contribution to the food supply of many major cities and improves household food securities.

Urban and per-urban agriculture contributes to urban food security through increased food availability, stability and, to some extent, accessibility (Egal et al., 2003). The same report indicates urban and peri-urban agriculture (inasmuch as it produces food), increases food availability and contributes to the overall urban food supply.

The same study also argue although UPA production is, of course, influenced by seasons, it has also developed as a means of reducing seasonal gaps in fresh foods due to climatic differences with the main production zones, as well as more reliable access to water, access to non-flooded areas, and availability of labor (Egal et al., 2003). It therefore contributes to the stability of urban food supply and improves physical accessibility (Egal et al., 2003). The study adds urban poor spend 60-80 percent of their income on food, to this end UPA contributes to poverty alleviation both through a reduction of expenditures and through an increase of income.

A study conducted in Kenya, Nairobi, indicates that urban farming can play a crucial role towards improved livelihoods of the urban poor, since urban farmers cultivate a wide range of crops and rear a large number of livestock with substantial yields (Ayaga et al., 2006). The same report confirmed that urban agriculture provides better nutrition, save money that are going to allocate to buy food, generate income, create jobs and create green environment.

Urban agriculture is significant economic activity, central to the lives of hundreds of millions of people throughout the world (CFSC, 2003). The study further indicates the potential urban agriculture for food security is real and 15 percent of food worldwide is grown in cities, the opportunity exists to significantly increase this percentage. According to the same report one-half of the vegetable consumed in Havana, Cuba are grown in city's farmers and gardens, in Singapore 10,000 urban farmers produce 80 percent of the poultry and 25 percent of the vegetables consumed. The same report adds currently, 14 percent of London's and 44 percent Vancouver's residents already grown food in the gardens. Case studies from Bangladesh and Central America that examined the socio-economic aspects of home gardening and its contribution to family consumption and income provide strong evidence that home gardening has significant economic benefits and that it can be a viable strategy for increasing food supplies for family consumption (Marsh, 1994. as cited by FAO, 1997).

A study conducted in Kampala, Uganda revealed that urban farming is a useful instrument to alleviate urban poverty and improve household food security and nutrition, as well as offer employment to the redundant youths (Azuba et al., 2005). The report further pointed out that urban farming is cost effective activity whose benefits can be realized after a short time.

## ***2.8 Environmental benefit of UA***

UA contributes to healthier living environment by reusing organic waste and urban- waste water (Egal et al., 2003). The same report indicates UA contributes the "greening "of open land spaces through horticulture and urban forestry may also improve the quality of life as well as providing easier access to fuel wood. Other report also confirmed urban agriculture absorbs urban organic waste through composting, increases urban bio-diversity, increase urban green space and improves urban physical environment and enhance urban ecology. It also beautifies and makes productive abandoned lots and trash dumps (Bellows et al., 2003).

A study conducted by IDRC, (1999), urban agriculture use bio-degradable waste as input after composted. The report adds composting can turn this waste into a resource, reducing the public cost of waste management, soil and water pollution, and thus providing a better living environment. The report further pointed out that, in china and other East Asian societies have recycled urban waste –both refuse and night soil –to intensify agriculture production systems on top of this a lot of sold waste is currently being recycled into fresh food through urban cultivation, without long distance transportation of such wastes, thus avoiding pollution and contributing to some environmental sanitation.

Most of the urban populations have no access to adequate sanitation and very few are connected to sewerage system. However, urban farming that uses some of the wastes can improve both the productivity of the urban areas and the health of the people (IDRC, 1993). The report adds urban agriculture may reduce the problems of waste disposal; waste can be used as manure and consequently increase agricultural productivity. Urban agriculture can also improve the health of the people through the reduction of wastes and an increase in the nutritional status (IDRC, 1993).The report further confirmed, if wastes are left unused; they become a health hazard especially in the slums.

Other study conducted by Harris et al. (2001) as cited by Gete et al., (2007), there is high potential for waste recycling into urban agriculture through composting, as 60-80 percent municipal solid waste in developing countries is organic. Waste recycling leads to the possibility of income generation which will also reduce the quantities of material that have to be transported for disposal (UN-Habitat, 1989 as cited by Gete et al., 2007).

However, urban agriculture activities can create problems. They may contaminate local water sources if high inputs of fertilizers and pesticides are used (Hovorka, 2009). The same study revealed urban farmers may use high-cost treated drinking water for irrigation purposes. As the

same study further revealed problems can be caused by poorly managed farm wastes clogging storm drains and piling up in the streets, while farming on steep slopes or along sensitive parts of river banks may lead to erosion and siltation.

## ***2.9 Link between urban agriculture and HIV/AIDS***

Urban agriculture Provides food improves livelihoods and procure income to HIV/ AIDS affected people (Munn et al., 2003).An assessment conducted by (Masoka, 2005), on households affected and/or infected by HIV/AIDS practicing urban agriculture revealed that the households obtained economic returns, increased food and nutrition security as well as psychological benefits, such as increased self-esteem, improved group cohesion, decreased stigma, and increased community support. The same study also confirmed that urban gardens are an essential part of urban livelihood systems particularly of the poor and vulnerable.

In Lesotho homestead garden own production enables urban poor HIV/AIDS households to get fresh and enough food without much cost throughout the year and marketing homestead garden produce, enabling this households to raise some cash income (Abbot et al., 2005 as cited by Drimie et al., 2006). The same study confirmed home gardening offers potential for households to raise income and ensure access to nutritious food, close to home. This becomes particularly important in the context of urban malnutrition and in support of ART for PLWHA, since home gardening mostly focus on a range of vegetables which have important potential for enhanced household nutrition, notably significant for HIV-positive household members with special nutritional needs.

Study conducted in Kampala, Uganda revealed that urban agriculture is the source of employment and food supply, to promote food and nutrition security for HIV/AIDS affected and/or infected households and important instrument to mitigate the impact of HIV/AIDS (Azuba et al., 2005). Other study conducted by Bukusuba et al., (2007), also revealed that in the urban settings of

Uganda urban agriculture becomes positive coping strategy in the face of food shortage for PLWHA urban farmers, since it contributes to household food security status and quality of food eaten as well. The same study indicated the practice of agriculture within and around the town makes a significant contribution to food access among the household of PLWHA. The practice of urban agriculture also diversifies their dietary intake to meet wide range of essential nutrients, since PLWH in particular need energy-and nutrients-dense foods (Arimond & Rule, 2004 as cited by Bukusuba et al., and 2007).

A study conducted by (Karhagomba, 2005), in DR Congo people living with HIV/AIDS practicing urban and peri-urban agriculture become economically and socially re-integrated in their community; PLWHA develop permanent linkages among themselves and with healthy community members' i.e. PLWHA become socio-economically active again and continue to maintain their family as in past. The study further confirmed through the gardens PLWHA have access to valuable food and alternative medicines. The combination of food with medicinal plants together helps to enhance the immune systems and PLWHA remain physically unrecognizable as HIV affected. Similar study conducted in Nakuru town, Kenya, indicates that HIV/AIDS affected households involving in urban agriculture activity (Horticulture and livestock production) generates US\$ 15 per month from the sell of the produce and consumes part of the produce worth US\$ 10 (Karanja et al., 2008).

Poor urban households affected and/or infected by HIV/AIDS faces; reduction of food availability in the family and increase malnutrition (Karhagomba, 2005). Urban and peri-urban agriculture have great contribution to food security of those households, through increased food availability, stability and, to some extent, accessibility (Egal et al., 2003).

Urban poor households spend 60-80 % of their income on food (Egal et al., 2003). If these households infected by HIV/AIDS they need extra food and nutrition because HIV-infected

individuals have higher food and nutrition requirements than uninfected individual (FAO, 2005). The same study reported that HIV/AIDS affected and/or infected poor households food may be scarce and lack diversity. To this end urban agriculture contributes to increase food availability, and diversity both through a reduction of expenditures and through an increase of income (Egal et al., 2003).

Urban agriculture can play a pivotal role to alleviate hunger and malnutrition, by generating income, creating job opportunity, and providing food, and better access for nutrition to poor marginalized and HIV/AIDS impacted households (Ayaga et al., 2004). As reported by the same source urban agriculture is a survival strategy for the urban poor, the urban unemployed and those unable to engage in other useful income generating activities and play a crucial role towards improving livelihoods of urban poor. Other study confirmed that PLWHA who have lost their jobs due to their poor health and are not strong enough to engage in labor intensive activities to earn a living, they support their livelihood by conducting urban gardening and poultry production ( Fikansa, 2005). A study conducted by Devereux et al., 2001, indicated urban poor should diversify their source of livelihood by producing part of their own food to cope with food insecurity and livelihood disruption they face.

Other study conducted by WHO / FAO, 2002, Ayaga et al., 2004, and Bukusuba et al., 2007)), Leafy vegetables produced in home gardens play important role for food security and income generation and good sources of nutrients. These foods are especially important for people living with HIV/AIDS to fight infection, since PLWHA needs nutrient-dense foods to meet their dietary needs. The studies further indicated that leafy vegetables ensures the intake of essential micronutrients including minerals and vitamins, and offers opportunity for boosting the nutrition of urban poor families.

According to (Ababa, personal communication) in Addis Ababa, PLWHA who have been practicing urban farming especially vegetable farming has been supporting their livelihood through:

- Providing food for PLWHA household
- Enhance PLWHAs' nutritional standing, since own production create accesses to variety of vegetables and animal protein
- Generate cash income by selling part of the produces

### ***2.10 Overview of urban agriculture in Ethiopia***

According to the study conducted by IDRC, 1993, in Ethiopia, urban agriculture is the final sequence of survival strategies exhibited by household and a contributor to improve nutritional levels among the urban poor, since most of the urban population in Ethiopia consists of the poor who cannot afford to buy high-valued food staffs. The report further stated that, households in the urban areas respond to the extreme threat of poverty and food insecurity by carrying out urban farming on any vacant space available. Urban agriculture is also practiced because of shortage of income and unemployment.

#### **2.10. 1 Urban agriculture situation in Addis Ababa**

Urban agriculture is proven to be a means of livelihoods and source of food for many urban dwellers, particularly low-income households in developing countries (Gete et al., 2007). The case is true in Addis Ababa. However, its contribution towards urban food security or livelihood has never clearly been recognized, simply because urban agricultural practices are largely assumed a replacement for rural agricultural activities therefore not encourage and bound to fizzle out as cities develop. As a result, the sector has never received the support it deserves. But in recent years in Ethiopia urban agriculture is gaining popularity and being promoted as a means of sustaining the livelihood of poor, unemployed urban dwellers.

Based on the unpublished report from Addis Ababa city administration urban agriculture department, (2006), urban agriculture cultivation in the city can be characterized in to three farming system on the basis of location. These are the peri-urban, household or homestead gardening and vacant-space cultivation. The peri-urban cultivation takes place on lands just outside the built area of the city. Vacant-space cultivation is done in open spaces like residential lands, stream banks, road sides, and reservation along drainage channels etc...where as household or home gardening takes place within and around homes. Households from all income levels carry out UA, but for the very poor this activity is very crucial for their food security. As it is evident there is no social security for the unemployed and therefore food insecurity is a difficult problem to solve since every commodity is obtained with cash.

In Addis Ababa, urban agriculture is a traditional practice that is taken as a means of livelihood especially for low income communities and it is practiced in a formal and informal manner with practitioners utilizing their spare land at home, river sides, and idle public lands (Gete et al., 2007). However general observations indicate that informal roadside cultivation is not taking place in contrast with Nairobi, Kenya where it is prevalent (Lee-Smith& Memen, 1994 as cited by Gete et al., 2007). According to the same sources this is true today as most of the land within the city is well controlled by the local authorities either at sub city or kebele level. Therefore, those that are formal are long established agriculture lands e.g. crop in the periphery, and vegetable productions on the river sides occupied by cooperative farmers, and registered dairy farms etc.; and those that may be considered as informal are homestead small scale dairy farms, seasonal vegetable and crop farms in idle public lands and at household level for personal consumption.

According to a study conducted by Gete et al., 2007, in terms of spatial occupation, it covers about 16,000 hectares of the city surface area of which 11,182 hectares are cultivated. The report further stated that, the sector is known to have involved some 50,000 people as a means of their livelihoods.

The main agriculture activities in the city are crop production (field crop and vegetable production), animal raising, bee keeping, etc. This sector provides employment opportunity, food security and enhances nutrition at household level through the production of fresh vegetables, dairy product, etc within the city (Gete et al., 2007). The city has suitable agro ecology for vegetable production thus, urban agriculture activities can be practiced in all the ten sub cities of Addis Ababa, although the potential varies from sub city to sub city. Sub cities like Akaki Kaliti, Bole, Nefase Silk Lafto, Kolfe Keranyo and Yeka have relatively highest potential to practice urban and peri urban agriculture, where as the rest sub cities have somehow low potential due to congested settlement pattern (Ababaw, personal communication).

According urban agriculture department unpublished report, (2006), in Addis Ababa vegetable production has been conducted at association (have legal right and bylaws to conduct urban farming), group and household levels. The report further revealed that in the city there are 53 vegetable producer associations, which comprise 1476 members (859 male & 617 female), there are also 9 vegetable producing groups involving 171 individuals (70 male and 101 female). The report adds beside associations and groups there are 4382 households practicing urban gardening in their backyard, vacant lots, riversides etc. And 60-70% of the city's leafy vegetable demand is covered by the vegetable produce in intra-urban and peri-urban areas of the city. The report further confirmed that in the city there are 350, 000 local and cross-breed poultry, 1,546 beehives, and 31,000 heads of cross-breed cattle which contribute for about 71 percent of the total milk supply.

### **Urban agriculture policy in Ethiopia**

Even though there is no stated policy frame work for urban agriculture the city government of Addis Ababa has positive outlook and recognize its benefit and contribution to the city development effort and recognized as one of the land use component with in the 10 years city structural plan, 2001-2010. and the plan reserved 7,175 hectares of land for urban agriculture representing 13.82% of the total land use with in the city (Gete et al., 2007).

Recently urban agriculture sector get attention as compared to the past. Even though, there is no stated policy for urban agriculture, the then Addis Ababa city council has established Urban Agriculture Department under the Addis Ababa city administration Trade and industry development Bureau to provide agriculture extension services (Abebaw, personal communication). He adds the city council supports the sector by allocating annual budget and other facilities. He further stated that, sub city urban agriculture offices also established in respective sub-cities to assist the community closely.

### **Potentials and opportunities of urban agriculture in Addis Ababa**

According to Addis Ababa City Administration Urban Agriculture Department unpublished report, (2006), the potentials and opportunities of urban agriculture in Addis Ababa stated as follows:

- In recent years the city government's positive out look towards urban agriculture and the recognition of its benefits and contribution to the city's development effort
- The setting up of urban agriculture office in the city
- Including urban agriculture in the ten (10) year master plan of the city (2001-2010)
- The availability of huge amount of degradable organic waste which can be converted to compost and very mach important for plant growth
- Presence of big number of unemployed and poor urban residents who can practice urban agriculture for their livelihoods
- Suitable agro-ecology for urban agriculture
- The relative availability of market for the produce
- The relative availability of production inputs (farm tools, seeds, fertilizers etc.)

## Challenges

According to Addis Ababa City Administration Urban Agriculture Department report, (2006), and Ababaw, & Tefera, personal communication described the challenges of urban agriculture as follows:

- ✚ Land use policy –still contribution of urban agriculture is taken as secondary to other economic activities within the city
- ✚ Lack of technical assistance like improved and appropriate technologies for intensification of production
- ✚ Lack of research support on urban agriculture in order to generate new technologies and methods of work
- ✚ Lack of incentives and/or support to encourage the sector considering its contribution towards the city's need
- ✚ Lack of awareness at different levels i.e. both at community, and decision makers to intensify urban agriculture and to give assistant the sector it deserves
- ✚ The increase in river water pollution due to the discharge from the factories, health centers, garages, industries etc. could possibly increase the contamination of vegetable produces and deteriorate of soil fertility because of the heavy metals deposition in the soil
- ✚ Loose and absence of linkage between the urban agriculture department of the city and non-governmental organizations which are currently operating urban agriculture development
- ✚ Lack of skilled man power in connection with urban agriculture techniques
- ✚ No clear urban agriculture extension approach to meet the demand urban community
- ✚ Due to resettlement and relocation of dairy production decreasing from time to time

## CHAPTER THREE

### METHODOLOGY

#### *3.1 Description of the Study area*

##### **3.1.1 Location and topography**

The study was conducted in Addis Ababa city. Addis Ababa is located at the central part of Ethiopia, between 8° 55' and 9° 05' north latitude and 38° 05' and 39° 05' east longitude and with a surface area of 540.14 Km<sup>2</sup> (Gete et al., 2007). The city composed of 10 sub-cities and 99 Kebeles. According to Addis Ababa city administration urban agriculture department report, the territory of the city is found within an altitude range of about 2100 - 3000 meters above sea level, with rolling hills in the north and flat in the southern part. The city has a bimodal type of rainfall pattern, two rainy seasons: The main rainy season usually starts at mid June and extends up to the end of September, while the small rainy season begins usually in March and stops around the middle of May.

##### **3.1.2 Population**

Based on the population and housing census undertaken by the Central Statistics Authority, carried out in 2007, the current population of Addis Ababa is 2.7 million, and with a growth rate of 2.1 annually. The population in the study sub-cities is depicted as Yeka 345,807 (161,136 male & 184, 671 female), Lidetha 201,613 (96,221 male & 105,392 female) and Akaki Kaliti 183,288 (89,693 male & 93,595). Natural increase and Rural-urban migration contributed to the fast growth of the population of the city Addis Ababa HAPCO, unpublished report, (2008).

### 3.1.3 PLWHA population

According to single point estimate the city has total HIV/AIDS population (0-49) 197, 103(80,933 male & 116,170 female) (MOH/ HAPCO, 2007). Total HIV/AIDS population in the study sub-cities described in the following table.

*Table 1 showing PLWHA population in the study sub cities*

| Sub-city     | Estimated PLWHA |
|--------------|-----------------|
| Yeka         | 24,206          |
| Lidetha      | 14,113          |
| Akaki Kality | 12,830          |

Source: Addis Ababa HAPCO, unpublished report, (2008)

### 3.1.4 Urban agriculture population

Recently different NGOs, CBOs, and government organizations working in the city have started engaging HIV /AIDS affected and /or infected poor households in urban agriculture activities especially in vegetable production to improve their livelihoods, (Ababaw, personal communication). According to the same source HIV /AIDS affected and /or infected households have been producing different vegetables (Swiss chard, Lettuce, Kale, Cabbage, Carrot, Beet root, etc) in their back yard, vacant lots, on the road and river sides, etc at household and group levels. They are also engaged in poultry production activities. In the city an estimated 1491 PLWHA and 1054 OVCS have been doing urban farming activities with in the ten (10) sub-cities to improve their food and nutrition security through own production (Ababa, personal communication). In the study sub cities (Lidetha, Yeka and Akaki kality) estimated to 585 PLWHA have been practicing urban agriculture activities (Abebaw, personal communication).

### ***3.2 Selection of the study area***

Addis Ababa was selected as the current research area. The second step was to select the study sub-cities and plan to discuss with Addis Ababa city administration urban agriculture department relevant experts and discussion was made accordingly and the following information was obtained:

- The department experts have relatively enough information on people living with HIV/IDS practicing urban agriculture residing in these sub-cities and this was convincing reason to select the sub-cities. Based on this three sub-cities (Yeka, Lidetha & Akaki Kality) were selected purposively for the study and PLWHA who have been doing urban agriculture activities within the respective sub-cities were identified together with urban agriculture department relevant expertise and urban agriculture project implementers organizations.

### ***3.3 Study design***

Since the objective of the study is to assess the contribution of urban agriculture for people living with HIV/AIDS (PLWHA), after their engagement in the sector. The study used before-and-after study design and employed both quantitative and qualitative methods for data collection and analysis.

### ***3.4 Study population and sampling method***

Different categories of respondents, which were the units from which information was collected, had participated in this study. The use of these different categories of study population is to triangulate the data and obtain more insight information gathered from the study subjects.

The source population for the study comprised of people living with HIV / AIDS who have been engage in urban agriculture residing in the 3 sub-cities (Yeka, Lidetha and Akaki-Kality) of Addis

Ababa, ADDIS Ababa city administration urban agriculture department experts and sub-city HIV/AIDS desks as well as project officers of organizations, associations etc. working on urban agriculture projects with PLWHA were the study population.

Concerning sample size of the study, it was decided based on the presence of PLWHA conducting urban agriculture activities, based time and resource availability. As a result, this study was conducted on 63 PLWHA conducting urban agriculture (24, 15 and 24 PLWHA were interviewed from Yeka, Lidetha, and Akaki Kality sub-cities respectively).

When we come to sampling method of the study, since it was not possible to get a sampling frame and geographical distribution of PLWHA practicing urban agriculture activities, a purposive non-probability sampling was adapted and implemented. Thus, the study subjects were purposively selected from NGOs and associations working on urban agriculture projects in the selected sites, and key informants were from Addis Ababa city administration urban agriculture department experts, Lidetha and Yeka sub-cities HIV/AIDS desks and relevant project officers' of implementer NGOs and associations working on urban agriculture projects and PLWHA urban farmers.

### ***3.5 Data collection instruments***

The choice of the data collection instrument of a particular study depends on the purpose of the study at hand. In a given research, the choice of data collection instruments influences the way in which the researcher collected data. However there are no strict rules as such for the choice of the data collection method but a researcher needs to strike a balance between the cost and time available for the research and depth and breadth of information needed to be analyzed (Robsen, 1993 and Kumar, 1996).

The study employed observation, structured interview (both close ended & open ended), focus group discussion and key informant interview with (PLWHA, Addis Ababa city Administration urban agriculture department experts, Yeka and Lidetha, sub-cities HIV/AIDS desks and with project officers of NGO working on urban agriculture projects.

### **3.5.1 Direct Observation**

Direct observation involves collecting information by noting down the things one sees happening at the time that they happen (Hovorka, A. et al., 2009). The same author underlined that direct observation is useful for gaining a better understanding for a situation, specifically those things that are difficult to verbalize or often go unnoticed.

Observation is one way to collect primary data. Field observation helps to understand realities in the study community and to observe the situation at field level. Through observation I was able to collect data that did not obtained through interview, focus group discussion and key informant interviews by using observations techniques quantitative data like size of land where vegetables are grown, number of chickens, etc. were gathered.

### **3.5.2 Log book**

The study used log book which was prepared in Amharic and put on each PLWHA house to record quantitative data like amount produced, consumed, sold and income generated from the sale of the produce be it vegetable or animal product. The purpose of the log book was to cross-check the data obtained by interview and eases the difficulty of recalling on questions like monthly income from urban agriculture in birr, amount consumed when estimated in birr per month etc. It was filled by PLWHA themselves or their family every day after they get familiar with how to fill the log book by the researcher. The logbook was put at the selected PLWHA house in the month of January and collected at the end of the month. A Problem of properly filling the logbook was observed, but the mistakes were corrected together with each respondent. Finally the log book was

put at each PLWH house in the month of February and March. Continuous follow up was conducted and gave corrections through the whole processes of data collection until the data collection through logbook was finalized at the end of March.

In the log book local unit of measurement like bunch and 'medeb' to measure vegetables produced, consumed and sold was used. The results were converted to Kilogram after taking sample measurement of each vegetable. The data obtained through logbook very much helpful, in cases the respondents did not remember (to talk during interview) the amount of vegetable, eggs etc sold, consumed and income generated in birr.

### **3.5.3 Interview of households**

Interview is any person-to-person interaction between two or more individuals with a specific purpose in mind. Interview is commonly used method of collecting information from people. To collect the necessary data concerning the livelihood contribution of urban agriculture for PLWHA like income contribution, social contribution, challenges of facing while practicing urban agriculture and other issues were collected through both open and closed-ended questioners with each respondents. The interview was administered by the researcher and conducted by going door-to-door. Through interview both qualitative and quantitative data were collected

### **3.5.4 Focus group discussion**

Focus group can be described as a research approach whereby a group of individuals are selected to discuss together, in a focused and moderated manner, the topic under research (Robert et al., 2003). FGD is conversation mediated by the researcher in an informal setting and approach with the purpose of gathering data on designed topics. Focus group discussion allows group interaction such that participants are able to build on each other in ideas and comments to provide in depth views not attainable from individual settings, unexpected comments and new perspectives could be explored easily while discussing the issue (Robson, 1993).

FGD was conducted by the lead researcher with the help of an assistant who take notes of the discussion. One FGD was conducted with contact gardeners (all of them are HIV infected) who are lead vegetable growers coordinating and providing technical assistance for other PLWHA vegetable growers in their respective sub-cities. They have been working being care givers for HIV patients (they are doing urban agriculture and care giving activities simultaneously). These groups of people have good information in urban agriculture and HIV/AIDS issues that is why the researcher was convinced to conduct the discussion with them. Seven (7) contact gardeners, five (5) of them were females, who were selected purposively from Yeka, Lideta & Akaki kality sub-cities were participated in the discussion. The group consisted different sex & age groups. The study employed semi-structured questioner for group discussion.

This method was employed to obtain opinions, attitudes and views from the group and help to elaborate, clarify and counter check ideas experiences arguments that were obtained through other methods. Issues like income contribution and social contribution and benefits & challenges of urban agriculture were discussed thoroughly.

### **3.5.5 Key informant interview**

According to Hovorka et al., (2009), Key-informant interviews are conducted with specially selected individuals who have long experiences in a certain community or specialized knowledge or skills in a certain topic

Key informant interview was employed particularly using semi-structured interview schedule, for topics prepared to guide the specific questions during the interview. The study employed key – informant interviews to collect necessary data concerning social and economic contribution of urban agriculture, other benefits of urban agriculture, and challenges encountered in conducting agriculture in urban setting etc. Individuals participated in key informant interview were people who have good information on the study area as well as good information on HIV/AIDS and urban

agriculture. These individuals are HIV positive people who also implement urban agriculture activities and they have been acting being contact gardeners providing technical advice for urban agriculture producers and care givers for HIV/AIDS victims. In this case two contact gardener's one female and one male drawn from Lidetha and Akaki Kality sub-cities were interviewed. On top of this three female PLWHA who conduct beekeeping, sheep fattening and dairy production activities were part of the key informants.

Key informant interview was also conducted with Addis Ababa city administration urban agriculture department expert, who have good information on the study area and knowledge on urban agriculture. More over Key informant interviews were held with Lidetha and Yeka sub-city HIV/AIDS desks as well as two project officers from NGOs working on urban agriculture projects with people living with HIV/AIDS.

### **3.5.6 Case anecdote**

Among the respondents who participated in the survey, 5 cases were selected purposively which were believed to be representatives of the other informants. They were selected based on the information they gave in the survey. The cases included five female PLWHA (3 household heads and 2 spouses).

In this case the histories of PLWHA before and after practicing urban agriculture, their economical and social status before and after practicing urban agriculture were discussed.

### **3.6 Data source**

This study makes use of data from primary sources generated through household survey, focus group discussion, interviews with key informants, as well as case story, & secondary sources. The primary sources of data were the selected PLWHA urban agriculture producers, Addis Ababa city administration urban agriculture department experts, sub-cities HIV/AIDS desks & implementer

organization project officers. The secondary data sources comprises; Addis Ababa city administration urban agriculture department unpublished reports, literatures, internet, documents, research findings, census data & other published & unpublished sources.

### ***3.7 Data analysis***

Data analysis is the process of liking data that are gathered from the field (Kumar, 1996). Data and information made available through the various instruments concerning livelihood contribution of urban agriculture for people living with HIV/AIDS were analyzed both quantitatively (descriptive statistics) and qualitatively (by describing and narrating). In addition to this, the various responses obtained from interview questionnaires and log book were categorized and coded entered into a computer and analyzed using SPSS (statistical package for social science) software was used to summaries the data. Based on the result, various tables for a simple frequency distribution (means and standard deviation), percentage computations and descriptive statistics were prepared to support the discussion.

## **CHAPTER FOUR**

### **RESULT AND DISCUSSION**

#### ***4.1 Demographic characteristics of respondents***

##### **4.1.1 Sex**

In the study 63 PLWHA were participated. Majority (87.3 %) of the respondents were Female, where as 12.7 percent of the respondents were male. The number of female respondents is higher than males, this is because, as Key informant interview held with Addis Ababa city administration urban agriculture expert and project officers of NGOs and associations working on urban agriculture projects confirmed that organizations implementing urban agriculture activities with HIV/AIDS affected and/or infected people have been given priority to involve more female PLWHA than male PLWHA. When they were asked why females get priority, they put the following reasons:

- ❖ Socio-economically women are more vulnerable than men
- ❖ HIV/AIDS is more prevalent on female than male
- ❖ Most female PLWHA pass most of their time at home doing household chores

##### **4.1.2 Age**

The respondents' age ranges from 20-65 years, and majority (90.5 %) of the respondents are aged from 20-50 years. This implies HIV/AIDS mostly affected the active age group as well as most respondents were in their active age to conduct urban farming activities.

##### **4.1.3 Marital status**

Concerning marital status of the total PLWHA respondents, nearly half (49.2%) of them said that

they are divorced/separated/widowed, 42.9 % currently married and the rest 7.9% are never married.

#### **4.1.4 Household relationship & family size**

As regards to respondents relationship with their household majority of them (60.3 %) are household heads, and 30.2 %, 7.9%, and 1.6% of them claimed that spouse, children and sibling, respectively. Concerning family size of respondents 21 (33.3 %) of respondents reported that they have 1-3 dependents, 55.6 percent of the respondents having 4-6 dependents and 6 (9.5 %) respondents claimed that having 7-9 dependents and 1(1.6%) reported having 10-12 dependents who live under their responsibility and who share all what they have. Most (93.7%) of the respondents confirmed that at minimum one and maximum eleven persons, are living permanently together with them while 4 (6.3%) of them reported living alone. The result obtained from field observation and individual interview indicated that majority of dependents have been currently participating in urban farming activities. This implies majority PLWHA did not face labor shortage to conduct urban farming activities because majority of the respondents have been assisted by their dependents.

*Table 2 Demographic characteristics of respondents*

| Variables                                | Frequency | Percent |
|------------------------------------------|-----------|---------|
| <b>Sex of respondents</b>                |           |         |
| Male                                     | 8         | 12.7    |
| Female                                   | 55        | 87.3    |
| <b>Age</b>                               |           |         |
| 20-30                                    | 23        | 36.5    |
| 31-40                                    | 27        | 42.9    |
| 41-50                                    | 7         | 11.1    |
| 51-60                                    | 5         | 7.9     |
| above 60                                 | 1         | 1.6     |
| <b>Marital status of respondents</b>     |           |         |
| never married                            | 5         | 7.9     |
| currently married                        | 27        | 42.9    |
| Divorced                                 | 10        | 15.9    |
| Separated                                | 1         | 1.6     |
| Widowed                                  | 20        | 31.7    |
| <b>Relationship with their household</b> |           |         |
| Household head                           | 38        | 60.3    |
| Spouse                                   | 19        | 30.2    |
| Child                                    | 5         | 7.9     |
| Sibling                                  | 1         | 1.6     |
| <b>Family size</b>                       |           |         |
| 1-3                                      | 21        | 33.3    |
| 4-6                                      | 35        | 55.6    |
| 7-9                                      | 6         | 9.5     |
| 10-12                                    | 1         | 1.6     |

Source: field survey

## **4.2 Social and economical characteristics of the study subjects**

### **4.2.1 Educational level**

In regard to their educational level of the study subjects, 15.9 percent of PLWHA respondents are illiterate, 84.1 percent are literate of which 32.1 percent reported attaining 1-6 grades, 60.4 percent claimed attaining 7-12 grades, and very few (7.5%) respondents attaining above grade 12. Result obtained from focus group discussion and field observation result revealed that no different observed in conducting urban farming and amount of production in terms of their educational level of the study subjects.

### **4.2.2 Occupation and source of income**

Concerning occupation of study subjects majority (80.9 %) of the respondents are daily laborer and run other business. Where as 17.5 %, 15.9 %, 3.2 % and 1.6 % of them, respectively claimed that civil servant, other occupation, housewife and guard are their occupations.

Concerning sources of income urban agriculture, external aid, petty trading, daily labor, monthly salary, pension, remittance and income from house rent have been main current income sources for the study participants. Urban agriculture (66.7 %), external aid (47.6 %), petty trading (46.0), and daily labor (44.4 %) are the major income sources of respondents. In fact nearly 31.7 %, 19.0 %, 15.9 % of them, respectively, admitted that monthly salary, pension and remittance are their main source of income. This implies urban agriculture is one of their main sources of income for the study subjects and has been assisting their livelihoods.

*Table 3 Social and economical characteristics of the study subjects*

| Variables                                | Frequency | Percent |
|------------------------------------------|-----------|---------|
| <b>Educational levels of respondents</b> |           |         |
| Illiterate                               | 10        | 15.9    |
| Literate                                 | 53        | 84.1    |
| <b>Among read &amp; write</b>            |           |         |
| grade 1-6                                | 17        | 32.1    |
| grade 7-12                               | 32        | 60.4    |
| Above 12 <sup>th</sup> grade             | 4         | 7.5     |
| <b>Occupation</b>                        |           |         |
| Civil servant                            | 11        | 17.5    |
| Daily laborer                            | 22        | 34.9    |
| run other businesses                     | 29        | 46.0    |
| Guard                                    | 1         | 1.6     |
| House wife                               | 2         | 3.2     |
| Other occupation                         | 10        | 15.9    |
| <b>Main source of income</b>             |           |         |
| Monthly salary                           | 20        | 31.7    |
| External aid                             | 30        | 47.6    |
| Urban agriculture                        | 42        | 66.7    |
| Remittance                               | 10        | 15.9    |
| Daily labor                              | 28        | 44.4    |
| Petty trading                            | 29        | 46.0    |

Source: field survey

#### **4.2.3 Income categories**

Monthly income of respondents ranges from 100-1600 birr, but majority, (63.5 %) of the respondents have been obtaining 100-500 birr per month, 22.2 percent getting 501-700 birr per month, 6 percent of the respondents have been obtaining 901-1100 birr per month and 3.2 percent have been getting above 1100 birr per month. This shows when the amount of birr increased number of respondents decreased, which means most PLWHA living at low income level. Therefore, the involvement of this group of community in urban farming predominately important to mitigate the livelihood disruption they have been facing by generating both in-kind and cash income from the sector. Result obtained from individual interview indicated that PLWHA respondents who have been working being civil servant and those PLWHA participating in diverse urban farming activities have been getting better income.

#### **4.2.4 Possession of durable household goods and utensils**

In terms of having durable goods majority ((96.6%) of the respondents having spring bed, 85.7 percent of the respondents have Radio/Tape and those having television are 74.6 percent and very few 4 (6.3%) have refrigerator. As indicated in the table 4 majority of respondents have low cost utensils like spring bed, working radio/tape, tables, chairs, beds and TV but most PLWHA lack expensive utensils, like refrigerator which help them to preserve food items. The current study is supported by a study conducted in Rakai, Uganda, on AIDS-affected households, the study revealed that AIDS-affected households were much less likely to own durable goods than non-affected households, especially if the victim was male (Menon and others, 1998. as cited by United Nations, 2005). As case studies conducted with PLWHA revealed that few PLWHAS started purchasing some durable goods after their engagement in urban agriculture, from the sell of part of

the produces. This shows urban agriculture has been contributed a lot to rebuild the asset of PLWHA households which was depleted before because of HIV/AIDS pandemic.

*Table 4 categories of income and possession of durable goods of respondents*

| Variables                                    | Frequency | Percent |
|----------------------------------------------|-----------|---------|
| <b>Categories of income</b>                  |           |         |
| 100-300                                      | 20        | 31.7    |
| 301-500                                      | 20        | 31.7    |
| 501-700                                      | 14        | 22.2    |
| 701-900                                      | 4         | 6.3     |
| 901-1100                                     | 2         | 3.2     |
| above 1100                                   | 3         | 4.8     |
| <b>possession of durable household goods</b> |           |         |
| Radio/tape                                   | 54        | 85.7    |
| TV (television)                              | 47        | 74.6    |
| Sofa                                         | 23        | 36.5    |
| Table & chair                                | 30        | 47.6    |
| Cup board                                    | 16        | 25.4    |
| bed                                          | 61        | 96.8    |
| Refrigerator                                 | 4         | 6.3     |

Source: field survey

#### **4.2.5 Living condition of respondents**

##### **Status of the house**

Regarding status of the house they currently living, 63.5 percent of the study subjects confirmed

that they live in rented house; (41.3 %) rented from kebele and (22.2 %) rented from individuals while 19 (30.2 %) of them confirmed that they live-in their own private house. Those who reported that they live in rented house claimed that they pay 1.00-225.00 birr with mean of 50.2 per month for house rent. Moreover, 38 (60.3%) informants reported that they live in a single room, 14 (22.2 %) of respondents allege that their house have two rooms and 11 (17.5 %) of respondents reported that their house have 3-6 rooms. As confirmed in the individual interviews PLWHA rented from Kebele pay the lowest amount where as those PLWHA rented from individuals pay the highest amount. Filed observation and individual interview result revealed that those PLWHA who have been living in rented house faces space shortage to conduct urban farming especially to conduct dairy production, sheep fattening and beekeeping activities. This implies living condition of PLWHA is one determining factor to conduct urban farming activities.

*Table 5 Status of respondents' house*

| Variables                             | Frequency   | Percent |
|---------------------------------------|-------------|---------|
| <b>Status of the house they live</b>  |             |         |
| Private                               | 19          | 30.2    |
| rented from individual                | 14          | 22.2    |
| rented from kebele                    | 26          | 41.3    |
| other                                 | 4           | 6.3     |
| Total                                 | 63          | 100.0   |
| <b>Cost of house rent</b>             |             |         |
| Mean                                  | 50.2 birr   |         |
| minimum                               | 1.00 birr   |         |
| maximum                               | 225.00 birr |         |
| <b>Number of rooms of their house</b> |             |         |
| One                                   | 38          | 60.3    |
| Two                                   | 14          | 22.2    |
| Three                                 | 8           | 12.7    |
| Four and above                        | 3           | 4.8     |

Source: field survey

## 4.2.6 Health status of respondents

### ARV treatment

As indicated in the table 6, majority (82.5 %) of the respondents currently take ARV. The study conducted by Abbot et al., 2005 as cited by Drimie et al., (2006), confirmed home gardening ensures access to nutritious food, close to home. This becomes particularly important in the context of urban malnutrition and in support of ART for PLWHA, since home gardening mostly focus on a range of vegetables which have important potential for enhanced household nutrition,

notably significant for HIV-positive household members with special nutritional needs.

### **Health condition of respondents after practicing urban agriculture**

Regarding health condition of PLWHA after engaging in urban agriculture activities, majority (81.0 %) of the respondents claimed that their health condition is improved after practicing urban agriculture. Few (11.1 %) PLWHA respondents claimed that their health condition did not show improvement and very few (7.9 %) of respondents claimed that their health condition deteriorated after they practice urban agriculture. When asked why their health condition of PLWHA improved after practicing urban agriculture, they put the following reasons:

- They frequently eat urban agriculture products from own produces such as vegetables, eggs etc. than before
- They emotionally satisfied because they realize that they can work and live like other citizens
- They buy and eat that they did not produce by their own, because they get income from the sale of vegetables, eggs etc.
- They have access to variety of foods from own produces

*Table 6 Respondents taking ARV & health condition of respondents after practicing urban agriculture*

| Variables                              | Frequency | Percent | Cumulative Percent |
|----------------------------------------|-----------|---------|--------------------|
| <b>PLWHA taking ARV</b>                |           |         |                    |
| yes                                    | 52        | 82.5    | 82.5               |
| no                                     | 11        | 17.5    | 100.0              |
| <b>Health condition of respondents</b> |           |         |                    |
| same                                   | 7         | 11.1    | 11.1               |
| Deteriorating                          | 5         | 7.9     | 19.0               |
| improving                              | 51        | 81.0    | 100.0              |
| same                                   | 7         | 11.1    | 11.1               |

Source: field survey

#### **4.2.7 PLWHA disclosed their HIV status to some one**

Regarding to PLWHA disclosing their HIV positive status to some one, as indicated in table 7 majority of the respondents claimed that they disclose their HIV positive status to neighbors, friends, relatives, work mates, spouse, and almost half (47.6) of the study subjects disclose their HIV positive status for their child. This indicates that majority of the respondents' neighbors, friends, relatives, work mates, friends, spouse etc. knows the HIV status of the study subjects.

Table 7 proportion of respondents who disclose their HIV status to some one

| Person to whom they disclose | Response     |             |
|------------------------------|--------------|-------------|
|                              | Total (N=63) |             |
|                              | Yes          | No          |
| To spouse                    | 55 (87.3 %)  | 8(12.7%)    |
| To children                  | 30 (47.6 %)  | 33 (52.4 %) |
| To neighbors                 | 58 (92.1 %)  | 5 (7.9 %)   |
| To relatives                 | 56 (88.9 %)  | 7(11.1 %)   |
| Work mates                   | 54 (85.7%)   | 9 (14.3 %)  |
| Friends                      | 57 (90.5 %)  | 6 (9.5 %)   |
| Not disclose to any one      | 0            | 63 (100 %)  |

Source: field survey

### 4.3 Urban agriculture

#### 4.3.1 Urban agriculture activities practiced by PLWHA respondents

All 63 (100 %) respondents have been practicing vegetable production, in their backyard, in institute lands, vacant lots close to their home etc, 25.4 percent have been practicing both poultry and vegetable production , where as very few (1.6 %) PLWHA have been engaged in beekeeping, sheep fattening and dairy production.

The field observation result revealed that PLWHA respondents commonly producing leafy vegetables like Swish chard, lettuce, Kale, Spinach etc. and root vegetables like carrot, beet root etc. The result obtained from individual interview, key informant interview as well as focus group discussion confirmed that vegetable production needs less labor and could be done in part time (early in the morning and in the evening) and uses local available materials as an input like

household waste for compost preparation, household waste water for irrigation, used or damaged household utensils to grow vegetables on it, waste and vacant lots which otherwise would be dumping site of wastes etc.

As shown in the table 8, 16 (25.4 %) of PLWHA respondents who have been participating in poultry production, rearing 1-8 heads of poultry per household, both local and exotic breeds. Key informant interview conducted with urban agriculture department expert, led vegetable growers and focus group discussion confirmed that poultry rearing needs more labor and follow up than vegetable production where as shoat fattening, dairy farm and beekeeping needs more labor and sizeable or spacious land than vegetable and poultry production.

Result obtained through household survey confirmed that unlike vegetable and poultry production PLWHA participation in dairy cow production, sheep fattening and beekeeping activities are very low. The reason why the involvement of PLWHA are low in sheep fattening, dairy farm and beekeeping, as confirmed by key informant interview held with implementer organization project officers and contact gardeners are set as below:

- These activities need more labor and spacious space
- NGOs, associations working in this area gave priority for vegetable gardening
- It needs relatively high start-up capital than vegetable and poultry production

This implies those PLWHA who have no private house and cash reserves have been facing challenges to involve in urban agriculture activities especially in dairy production, sheep fattening, beekeeping etc.

Result obtained from FGD indicated that vegetable production is complementary with other urban agriculture activities notably with poultry production and sheep fattening in a sense that the leftover of vegetables could be feed for chickens and sheep as well as the manure obtained from chicken and sheep could converted to compost and used for vegetable production.

## **Urban agriculture training**

Concerning training situation of the study subjects almost all 62 (98.4 %) respondents took vegetable production training, 92.1 percent took nutrition training, and the remaining 54 percent had attended marketing training. This indicates that PLWHA have got basic knowledge on production, marketing and nutrition, which in turn helps them to pursue the activity independently. As confirmed through individual interview and focus group discussion almost all started vegetable production after taking the training from different organization operating urban agriculture projects with PLWHA. But the field observation result revealed that majority PLWHA were reluctant to down-to-earth the knowledge and the skill they got from the training, that is way majority of the respondents did not conduct urban farming properly. On top of this as field observation and focus group discussion result confirmed majority of dependents who live under the responsibility of PLWHA have been participating in urban agriculture activities, even when the PLWHA got sick they are fully responsible to run the activity, but they did not took the training concerning urban agriculture.

*Table 8 urban agriculture activities practiced by study subjects and training situation*

| Variables                                       | Response     |             |
|-------------------------------------------------|--------------|-------------|
|                                                 | Total (N=63) |             |
| Urban agriculture activities practiced by PLWHA | Yes          | No          |
| Vegetable production                            | 63 (100%)    | 0           |
| Poultry production                              | 16 (25.4 %)  | 47 (74.6 %) |
| Beekeeping                                      | 1(1.6 %)     | 62 (98.4 %) |
| sheep fattening                                 | 1(1.6 %)     | 62 (98.4 %) |
| Dairy production                                | 1(1.6 %)     | 62 (98.4 %) |
| Training situation of respondents               |              |             |
| Training on vegetable production                | 62 (98.4 %)  | 1 (1.6 %)   |
| Training on nutrition                           | 58 (92.1 %)  | 5 (7.9 %)   |
| Training on marketing                           | 34 (54 %)    | 29 (46.0 %) |

Source: field survey

#### **4.3. 2 Vegetable production technique**

In regard to the PLWHA vegetable production techniques good number of PLWHA claimed that they have been producing vegetable on spare plots find in their backyard, vacant lots close to their home, etc. Filed observation result revealed that majority of PLWHA gardeners have been producing vegetables on plots, and very few 5 (7.9 %) respondents who have no spacious space to produce vegetable on plots have been producing vegetables using different techniques (barrel gardening, pot gardening, sack gardening, tyre gardening and other containers).About 23 (36.5 %) PLWHA have been producing vegetables both on plot and using different used containers.

*Table 9 vegetable production techniques of respondents*

| Variables       | Frequency | Percent | Cumulative Percent |
|-----------------|-----------|---------|--------------------|
| on plot         | 35        | 55.6    | 55.6               |
| used containers | 5         | 7.9     | 63.5               |
| both            | 23        | 36.5    | 100.0              |
| Total           | 63        | 100.0   |                    |

Source: field survey

### **Plot gardening**

Plot size of respondents ranges from 1.5-104.8 square meters with mean of 17.7 square meters. As shown in the table 10, majority 43 (75.4 %) of the respondents holds small plot of land that ranges 1.5-21.51 square meters. The field observation result confirmed that those PLWHA who have been living in rented house; either rented from individual or rented from Kebele hold small plot of land, where as few PLWHA respondents who have been living in private house, PLWHAs' who have been practicing vegetable production in vacant lots out side their compound and those PLWHA who practice urban gardening in institute lands have relatively spacious land.

The field observation result indicated that majority of PLWHA did not utilize effectively the limited space they have. The plots are prepared traditionally and vegetables are not planted and managed properly which means vegetables are not planted in line with the recommended spacing (spacing between plants and between rows), poor cultivation practices as well as seed beds are not prepared in a way suitable for vegetable production. This implies PLWHA urban gardeners on one hand they face shortage of space, on the other hand they did not properly and effectively utilize the limited space they have

*Table 10 plot size of the study subjects*

| Plot size in m <sup>2</sup> | Frequency     | Percent | <i>Cumulative Percent</i> |
|-----------------------------|---------------|---------|---------------------------|
| 1.50-11.5                   | 24            | 42.1    | <i>42.1</i>               |
| 11.51-21.51                 | 19            | 33.3    | <i>75.4</i>               |
| 21.56-31.56                 | 8             | 14      | <i>89.4</i>               |
| 31.57-41.57                 | 3             | 5.3     | <i>94.7</i>               |
| Above 41.57                 | 3             | 5.3     | <i>100</i>                |
| total                       | 57            |         |                           |
| Mean                        | 17.7          |         |                           |
| Minimum                     | 1.50          |         |                           |
| <i>Maximum</i>              | <i>104.80</i> |         |                           |

Source: field survey



Figure 1 Female PLWHA at plot gardening in Akaki Kality sub-city

Source: Author

### **Types of container gardening practiced by PLWHA respondents**

#### **Barrel gardening**

Field observation result indicated that PLWHA respondents have been producing vegetables using barrel gardening. The result obtained from individual interview, focus group discussion and key informant interviews indicated that PLWHA vegetable growers have been using barrel and other containers to utilize the vertical space so as to mitigate the problem of space limitation.

During key informant interview, Addis Ababa city administration urban agriculture department horticulture expert confirmed that if they plant vegetables at the piece of land where the barrel is put they could plant 3-4 vegetables, but even if it varies according to the type of vegetable they plant, if they put barrel with similar size piece of land, they can plant up to 40 individual vegetables. Field observation result also revealed that PLWHA respondents made up to 20-30 holes by using sharp objects on a single barrel and filled with soil, and they water it to moisten the soil and planted up to 20-30 seedlings on each hole on each side of the barrel as well as at the top.

### **Sack gardening**

Field observation result indicated that this technique is widely used by PLWHA respondents as compared to barrel, pot and tyre gardening. The purpose of using sack gardening is similar to the above mentioned techniques. The result obtained from field observation points out that PLWHA respondents use damaged and wasted sacks and they fill with soil and make holes on both sides of the sack. After they fill with soil, they water until the soil in the sack becomes moist and ready for planting, then they plant seedlings on each hole and at the top.



*Figure 2 Partial view of sack & barrel gardening conducted by two female PLWHA at Bella and Kebena*

Source: field survey

### **Pot gardening**

Similar to barrel and sack gardening PLWHA respondents, who have been conducting vegetable farming in the study areas, grow vegetables using old, damaged and wasted pots. Data obtained from field observation and individual interview confirmed that despite container gardening is not well developed and widely used, PLWHA have been conducting pot gardening to lessen the

problem of space shortage and to use the vertical space effectively. Field observation result confirmed that the preparation of pot gardening is similar with other container gardening mentioned earlier. First they put old and damaged pot on certain place then filled with soil, and make holes on each sides of the pot and they water it and finally seedlings are planted on each holes and at the top of the pot.

### **Tyre gardening**

Key informant interview held with Addis Ababa city administration urban agriculture department confirmed that like barrel, sack and pot gardening, tyer gardening is another techniques which helps to use the vertical space. But the individual interviews and field observation result revealed that very few PLWHA have been using this technique.

The result obtained from field observation indicated that very few PLWHA produce vegetable using tyer gardening and it is poorly prepared. As it is indicated in the picture and data obtained from field observation shows that to prepare tyre gardening first they stood wooden post on the ground then they put the tyer at certain intervals and filled by top soil or composted soil and plant the seedling on the upper side of the tyer.



*Figure 3 Partial views of pot & tyre gardening conducted by a female and a male PLWHA at Yeka (Bella) & Lidetha around (Amstegna) respectively*

Source: field survey

### Plastic bottle and other container gardening

The field observation result indicated that in addition to the above mentioned techniques PLWHA respondents have been producing different vegetables using various old and damaged household utensils like plastic bottle, sieve and other damaged household utensils as indicated in the following picture.



*Figure 4 partial views of 2 female PLWHA growing vegetables using plastic bottle and other household utensil at Yeka subcity around Adewa Dilidy and Bella*

Source: field survey

In general the result obtained from field observation, key informant interview and focus group discussion point out that container gardening has the following advantageous:

- ❖ It can be practice in every corner of the city including congested urban areas, even on buildings, since it needs small space only to put the container where vegetables grow
- ❖ It enables vegetable growers to use the vertical space above the ground
- ❖ Relatively better to retain moisture by decreasing both evaporation and infiltration
- ❖ It conserves both soil and water as containers prevent run of and excess water
- ❖ It is inexpensive, since they can use old, waste and damaged household utensils that otherwise would be thrown in to any where. But field observation result revealed that despite its advantages, container gardening were poorly developed in terms of quality and quantity ; those PLWHA respondents who are currently using the techniques did not exploit to the capacity it expected and majority (55.6 %) of PLWHA respondents did not currently use the techniques.

#### **4.3.3 Water sources for vegetable production**

As indicated in table 11, 32 (50.8 %) of PLWHA respondents use from own tap, 16 (25.4 %) of respondents buy from public tap, 13 (20.6 %) of respondents buy from private tap, 7 (11.1%) of respondents use river water, 24 (38.1 %) of PLWHA respondents use recycled water and very few 3 (4.8 %) use from other water sources like spring and borehole, to conduct urban gardening. Field observation and individual interviews result confirmed that majority (96.8 %) of respondents use tap water; either own tap, public tap or buy from private tap, to irrigate their vegetables. This scenario exposed majority PLWHA vegetable growers to monthly water charge increase. Data obtained from field observation and individual interviews indicated that despite some PLWHA vegetable growers started using recycled household waste water for vegetable production; majority of them did not use currently. Key informant interviews held with contact gardeners indicated that using recycled water for vegetable production decreases water charge that confront PLWHA vegetable growers.

#### **4.3.4 Production months of vegetable farming**

Concerning number of months that PLWHA practice vegetable production activities per year, majority 54 (85.7 %) of PLWHA respondents claimed that they produce vegetables through out the year, but few 9 (14.3 %) of PLWHA respondents produce vegetable that ranges 6-10 months per year. As individual interview and field observation result confirmed that, 14.3 percent of PLWHA urban gardeners forced to produce vegetables in rainy season by using rain water and immediately after the rainy season by using residual moisture with supplementary irrigation. This is because they face intermittent water shortage during the dry seasons. Result obtained from field observation indicated that majority of PLWHA vegetable growers did not use water conservation techniques, but very few have been using drip irrigation to conserve water but it is not properly using the drip kits, because the drip kits are large in size and designed to fit for regular shape plots which is not fit for small size and irregular shape urban plots.

*Table 11 Respondents' source of water for vegetable production and numbers of months doing urban agriculture activities / year*

| Variables                      | Frequency | Percent |
|--------------------------------|-----------|---------|
| <b>Source of water</b>         |           |         |
| Own tap                        | 32        | 50.8    |
| Buy from Public tap            | 16        | 25.4    |
| Buy from Private tap           | 13        | 20.6    |
| River water                    | 7         | 11.1    |
| Recycled household waste water | 24        | 38.1    |
| Other water sources            | 3         | 4.8     |
| <b>Production months</b>       |           |         |
| 6 months                       | 2         | 3.2     |
| 7 months                       | 2         | 3.2     |
| 8 months                       | 2         | 3.2     |
| 9 months                       | 1         | 1.6     |
| 10 months                      | 2         | 3.2     |
| 12 months                      | 54        | 85.7    |

Source: field survey

#### **4.3.5 Respondents selling site of urban agriculture produces**

Concerning selling site of produces, all PLWHA respondents agreed that they sale their surplus produces at neighborhoods and the local market close to their vicinity. The result obtained from individual interviews, focus group discussion and key informant interviews indicated that PLWHA who conduct neighborhood selling; their contact and relationship with their neighborhoods increased, as well as it decreases transport and labor cost of both producers and buyers that otherwise would be spent for transportation while they went to the public market either to buy or sell the produces.

*Table 12 Study subjects selling site of produces*

| Selling site of produces      | Frequency | Percent |
|-------------------------------|-----------|---------|
| Neighborhood                  | 22        | 52.4    |
| Neighborhood and local market | 20        | 47.6    |
| Total                         | 42        | 100.0   |

Source: field survey

#### **4.3.6 Benefits of urban agriculture**

All (100%) PLWHA respondents agreed that urban agriculture is source of fresh, healthier and safer food, save money that could be allocated for food purchase and generate income. The result obtained from individual interviews and focus group discussion indicated that own production supplies fresh, healthier safer produces, since it produces in their backyard and vacant lots close to home which did not travel long distance to reach to the consumers. The key informant interviews result also confirmed that vegetables produced in PLWHA backyard are fresh and reached the consumers with out losing its nutrient contents, this is very important for PLWHA because this group of community needs extra nutrients than the general population. On top of this result obtained through logbook and individual interviews revealed that urban agriculture saves money that could be allocated for food purchase as well as generate income from the sale of the surplus produces, since PLWHA vegetable farmers use the produces to household consumption.

#### **Beautifies the compound**

As shown in table 13, 46.0 percent of PLWHA respondents also agreed that practicing urban agriculture beautify their compounds. The focus group discussion, individual interviews and field observation result confirmed that urban agriculture especially vegetable production beautifies the compounds because:

- ✚ Vegetables by itself are green and it beautifies the compound
- ✚ Vegetable production uses household wastes both solid and liquid wastes as inputs for vegetable production i.e. solid household waste converted to compost and liquid waste have been used for irrigation water for vegetables after they recycled it manually.

### **Physical exercise**

The filed survey also showed that good number (61.9 %) of PLWHA respondents reported that practicing urban agriculture helps a lot for physical exercise. Results obtained from individual interviews and field observation points out that PLWHA have exposure for physical exercise while doing routine activities like watering, cultivating, weeding, seed bed preparation etc. for vegetable production as well as, while managing, feeding, and watering chickens and others etc. This implies PLWHA who have been doing urban farming notably vegetable gardening have exposure to outdoor exercise which counteract their physical passivity.

### **Psychological benefit of urban agriculture**

Majority (84.1 %) of the respondents agreed that practicing urban agriculture has psychological satisfaction. During individual interview, focus group discussion indicated that urban agriculture notably vegetable production has psychological benefits because of the following reasons:

- ✓ They feel emotional satisfaction when they see green vegetables in their backyard
- ✓ Helped them to gain feeling of importance, develop confidence and feel enriched by the possibility of working constructively, since they worked and lead themselves and their households independently
- ✓ They have something to do, they are not idle and they are not thinking about their illness
- ✓ Their neighborhood and the local organization operating in their localities have been giving due consideration and encourage them, since they are doing exemplary works

The current study result supported by an assessment conducted by (Masoka, 2005), in Zimbabwe, on

households affected and/or infected by HIV/AIDS practicing urban agriculture brought psychological benefits, such as increased self-esteem. And other study conducted in Kenya, Nakuru, by Hovorka et al., (2009), indicated that PLWHA participating in urban farming increased self-esteem and hope.

### **Increase contact and relationships with neighborhoods**

As shown in table 13, majority (88.9 %) of PLWHA respondents claimed that urban agriculture increase contact and relationships with neighborhoods. Results obtained from individual interviews, focus group discussion and key informant interviews revealed that urban agriculture increased contact and relationships with neighborhoods through neighborhood sales, farm tools and seedling exchange, exchanging technical advice, providing gifts etc.

### **Other use of urban agriculture**

34 (54 %) of PLWHA claimed that urban agriculture creates employment opportunity and less expensive to practice especially vegetable production. Result obtained from key informant interview held with urban agriculture department experts and sub-city HIV/AIDS Desks as well as focus group discussion held with contact gardeners, confirmed that urban agriculture provides employment for persons with limited skills and formal education and less expensive to establish and maintain, easy to practice and provide creative ways to reuse household wastes as well as old and damaged materials as inputs notably urban gardening.

*Table 13 benefits of urban agriculture*

| Benefits of urban agriculture                          | Frequency | Percent |
|--------------------------------------------------------|-----------|---------|
| Provide Fresh, healthier and safer own food            | 63        | 100.0   |
| Save money that could be allocated for purchasing food | 63        | 100.0   |
| Generate income                                        | 63        | 100.0   |
| Physical exercise                                      | 39        | 61.9    |
| Increase contact & relationship with neighborhoods     | 56        | 88.9    |
| Psychological satisfaction                             | 53        | 84.1    |
| Beautifies the compound                                | 29        | 46.0    |
| Other uses                                             | 34        | 54.0    |

Source: field survey

#### **4.4 Cost and benefit of urban agriculture activities**

##### **4.4.1 Vegetable**

Cost and benefit of urban gardening was estimated for 57 respondents who produce vegetable only on plots among the 63 PLWHA vegetable gardeners, but cost and benefit was not done for vegetables produced on containers; because of the problem to measure the size the containers. It was estimated for one production season (a span of 4 months), daily labor requirement needed for one growing season for seed bed preparation, planting, cultivating, watering, harvesting, etc were gathered through individual interviews and capital inputs were calculated for one growing season and include cost of seed, cost of water, cost of garden tools, cost of botanical pesticides and cost of fencing materials, etc. Cost of garden tools distributed for 6 production seasons. This is because as individual interview held with vegetable growers and key informant interview held with Addis Ababa city administration urban agriculture department horticulture expert revealed that garden tools can serve for six consecutive production seasons (for two years) on average. Plot sizes of

respondents were obtained through field measurement. Costs of production of vegetable produced on containers were not included in this analysis because it is difficult to measure the size of the containers.

To compare cost of production with benefits obtained by the study subjects from urban gardening data like amount produced, amount consumed, amount sold and income generated from the sale of vegetables were collected through logbook.

Concerning the benefit of vegetable farming, as data obtained through individual interviews and logbook confirmed that the 57 study subjects have been generating income (both cash and in-kind income) that ranges from 10.5-675.00 birr with mean of 87.2 birr per one production season (a span of 4 months) when labor cost included as cost. But when labor cost is excluded the amount of income gain by each PLWHA urban gardener increased. Among the total respondents 47.3 percent generate income that ranges from 10.5 to 50.00 birr, 22.8 percent of the study subjects generate 51-100 birr, where as 19.3 percent gain income 101-150 birr, and the rest 11 percent of the study subjects obtained above 150 birr per one production season. Data obtained through logbook indicted that most of the food produced by PLWHA urban farmers eaten by the households, and the left over sold to generate cash income.

As shown in table 14, there is big income gab among the respondents. This is because as field observation and focus group discussion held with contact gardeners revealed that there is variation in plot sizes as well as majority of PLWHA did not mange their plot properly (did not keep the recommended spacing between rows and plants, seed beds are not prepared in a way suitable for vegetable production, PLWHA did not cultivate their plot properly etc).

*Table 14 cost and benefit of vegetable production per square meter for one season*

| variables                             | Cost (in birr) | Benefit (in birr) | Profit in birr |
|---------------------------------------|----------------|-------------------|----------------|
| Vegetable farming with labor cost     | 4.3            | 9.2               | 4.9            |
| Vegetable farming with out labor cost | 2.2            | 9.2               | 7.00           |

Source: refer annex 1 and 2

Based on the cost benefit analysis, total benefit obtained by the study subjects from vegetable production in one production season depicted as follows:

*Table 15 total benefit obtained from vegetable production in one production season*

| Income from vegetable | Frequency   | Percent | Cumulative Percent |
|-----------------------|-------------|---------|--------------------|
| 10.5-50               | 27          | 47.3    | 47.3               |
| 51-100                | 13          | 22.8    | 70.1               |
| 101-150               | 11          | 19.3    | 89.4               |
| 151-200               | 1           | 1.8     | 91.2               |
| 201-250               | 2           | 3.5     | 94.7               |
| 251-300               | 1           | 1.8     | 96.5               |
| >300                  | 2           | 3.5     | 100                |
| Mean                  | 87.2 birr   |         |                    |
| Minimum               | 10.5 birr   |         |                    |
| Maximum               | 675.00 birr |         |                    |

Source: filed survey

#### **4.4.2 Dairy cow and Beekeeping production**

Cost of production of dairy cow were collected through individual interview and includes feed cost, labor cost, veterinary services cost, initial cost (money spent to buy dairy cow, cost of housing, cost of utilities) etc. But full purchasing cost of dairy cow did not counted as cost,

because when the dairy cow cease giving milk (culled cows) resale again a little bit by lower price from the purchasing price for slaughter. Thus the balance (buying price-selling price) was calculated as cost. Cost of cow and cost of housing were distributed for 7 years, since as individual interview held with PLWHA who rear dairy cow and key informant interview held with urban agriculture animal husbandry expert confirmed that a cross-breed cow could provide milk for seven years on average.

Income obtained from dairy cow were gathered through logbook and individual interview which includes income from milk, and income from cow dung, but income from the sell of calf was not included in the analysis because it is difficult to know whether the future new born calf is male or female, since the market price of both calves are different. Secondly it is difficult to know the number of calves a dairy cow born through out her life time. Estimation of economic benefit of dairy cow included both cash and in-kind income obtained from the dairy cow per year, in-kind income estimated from milk and other milk products consumed by PLWHA households as well as cow dung used for household fuel, and cash income is calculated from money generated from the sale of milk and milk products.

Concerning beekeeping production, individual interview held with PLWHA beekeeper revealed that honey harvesting have been done twice in year (in October and May) and obtained 16 Kilograms per year per hive on average. The cost that the respondent spent on beekeeping activity and the benefit obtained from the sector was estimated on yearly basis. Costs of production includes labor requirement, which comprise labor requirement for cleaning, managing the beehive, harvesting honey, where as capital cost includes cost of beehive, cost of bee colony, cost of beekeeping utensils, cost of protective materials etc. Cost of beehive, cost of bee colony and cost of materials distributed for ten years. This is because as Addis Ababa city administration urban agriculture department animal husbandry expert and PLWHA beekeeper confirmed that one modern hive, bee colony and utensils could serve for ten years on average and cost of protective

materials distributed for five years, since they can serve for five years. Benefits also estimated from income obtained (both cash & in-kind income) from the sell of honey. As shown in table 16, cost of production for dairy production and beekeeping activities were estimated with labor cost and without labor.

When we come to total benefit of dairy production and beekeeping activities, results obtained through logbook, individual interview and key informant interview revealed that PLWHA who involve in beekeeping production activity has been obtaining both cash and in-kind income estimated 512.5 birr per year while labor cost is included as cost. Where as PLWHA who involve in dairy cow production obtain 3,759.5 birr per year while labor cost is included as cost. The amount of income increased for both sectors when labor cost is not counted as cost.

This shows that PLWHA urban farmers benefited from beekeeping and dairy production activities by consuming the produced and selling the left over to create cash income. Result obtained from individual interview confirmed that PLWHA who have been conducting dairy cow production can save money that is going to spent for purchasing fuel wood by using cow dung for household fuel consumption.

*Table 16 costs and benefit of dairy and beekeeping activities per year*

| variables                                        | Cost (in birr) | Benefit (in birr) | Profit in birr |
|--------------------------------------------------|----------------|-------------------|----------------|
| Dairy production per cow with labor cost         | 14,016.00      | 17,775.5          | 3,759.5        |
| Dairy production per cow with out labor cost     | 10,986.5       | 17,775.5          | 6,789.0        |
| Beekeeping per year per hive with labor cost     | 447.5          | 960               | 512.5          |
| Beekeeping per year per hive with out labor cost | 282.5          | 960               | 677.5          |

Source: field survey

#### 4.4.3 Sheep fattening

Cost and benefit analysis for sheep fattening was estimated for one fattening cycle (a span of 3.3 months). Cost of production includes feed cost, labor cost, initial capital to purchase sheep, housing cost, veterinary services cost and other costs. Where as, benefit obtained from sheep fattening estimated from income gain from the sell of sheep after 3.3 months and sheep manure used for household fuel. Cost spent to construct sheep house was distributed to two years. This is because key informant interview held with Addis Ababa city administration urban agriculture department animal husbandry expert and individual interview held with sheep fattener revealed that sheep house can serve up to two years.

As shown in the table 17, PLWHA who involve in sheep fattening activities did not make profit when labor cost included as cost. As result obtained from interview held with sheep fattener revealed that PLWHA believed that they make profit as they do not consider their labor spent as cost. This is because they use family labor to conduct sheep fattening.

In regard to the benefit obtained from sheep fattening, results obtained through logbook and individual interview indicated that PLWHA who have been involving in sheep fattening activity generate 204.9 birr per one fattening cycle (a span of 3.3 months), when labor cost is not counted as cost. But when labor cost is counted as cost PLWHA who conduct sheep fattening activities did not obtain profit.

*Table 17 cost and benefit of sheep fattening per sheep per fattening cycle*

| Descriptions                        | Cost (in birr) | Benefit (in birr) | Profit in birr(income-cost) |
|-------------------------------------|----------------|-------------------|-----------------------------|
| Sheep fattening with labor cost     | 869.6          | 774.5             | (-95.1)                     |
| Sheep fattening with out labor cost | 569.6          | 774.5             | 204.9                       |

Source: field survey

#### 4.4.4 Poultry production

Cost and benefits for poultry production were estimated for both exotic and local breeds. Cost of production includes cost of chicken, cost of feed, cost of labor, cost of veterinary services, cost of poultry house etc and income obtained estimated from income gain from the sell of eggs and sell of chicken as well as eggs and chickens used for household consumption.

Like dairy cow chickens can resell after they cease in giving egg (culled chicken) for slaughter. Cognizant of this the balance (buying price-selling price) included as cost or benefit, if the balance is positive it included as cost and if the balance is negative it calculated as benefit. Data obtained from poultry producers confirmed that buying price of exotic breed chicken higher than selling price; in this case the balance calculated as cost. But for local breed chicken the reverse is happen, the buying price is lower than selling price; in this case the balance is calculated as benefit. Individual interview held with PLWHA poultry producers and urban agriculture department animal husbandry expert confirmed that chicken can give egg for 12 months. Data obtained through logbook and individual interview point out that exotic breed chicken lay 25 eggs per month on average where as local breed chicken gives 16 eggs per month on average.

According to the cost and benefit analysis like sheep fattening PLWHA who rear 1-5 heads of poultry did not get profit when labor cost is considered as cost. But PLWHA who rear more than 5 heads of poultry obtain income. This is because as the individual interview held with poultry producers revealed that there is no significant labor cost difference in managing 1-5 heads of poultry and more than 5 heads of chickens, because time allocated to mange 1-5 heads of chickens are almost similar with time allocated to manage above 5 heads of chickens. There fore, due to labor cost advantage PLWHA who rear more than 5 heads of chickens can make profits.

In regard to the benefit obtained from the sector, data obtained through individual interviews and logbook confirmed that PLWHA who have been involving in poultry production generate cash

income from the sell of eggs and chickens as well as in-kind income by using eggs and chickens for household consumption when labor cost is not counted as cost. As indicated in table 19, about 3 (18.8 %) of the study subjects obtained income that ranges from 100-500 birr, where as 5 (31.3 %) have been gaining 501-900 birr, about 5 (31.3 %) of the respondents get 901-1300 birr, and the rest 3 (18.8 %) have been obtaining above1300 birr per year. This implies PLWHA who conduct poultry production have access to protein foods, since they consume from own produces like eggs and chicken meat and also create income from the sell of the surplus

*Table 18 cost and benefit of poultry production per chicken per year*

| Descriptions                              | Cost (in birr) | Benefit (in birr) | Profit in birr(income-cost) |
|-------------------------------------------|----------------|-------------------|-----------------------------|
| Exotic-breed chicken including labor cost | 436.2          | 352.1             | (- 69.9)                    |
| Exotic-breed chicken excluding labor cost | 160.8          | 352.1             | 191.3                       |
| Local breed chicken including labor cost  | 474.5          | 229.0             | (-191.6)                    |
| Local breed chicken excluding labor cost  | 136.9          | 229.00            | 92.1                        |

Source: Refer Annex 3 & 4

Inline with the cost benefit analysis, the total benefit obtained by the respondents from poultry production described as follows:

*Table 19 total benefit obtained from poultry production by PLWHA without labor cost*

| Income per year | Frequency | Percent | Cumulative Percent |
|-----------------|-----------|---------|--------------------|
| 100-500         | 3         | 18.8    | 18.8               |
| 501-900         | 5         | 31.3    | 50.1               |
| 901-1300        | 5         | 31.3    | 81.4               |
| above 1300      | 3         | 18.8    | 100.               |
| total           | 16        | 100     |                    |

Source: field survey

As indicated in the above tables urban farming has income contribution (both in-kind and cash income) for PLWHA who involve in the sector. This implies PLWHA who conduct urban farming diversify their income sources and could secure their daily household needs by turning the surplus in to cash and by reducing household food expenditures and redirect such finances to other purposes. Urban farming enables PLWHA to generate additional income that helps to assist their livelihoods.

The current study confirmed that PLWHA households which have limited access for vegetables and animal protein before their involvement in urban agriculture activities, get access to fresh vegetables as well as animal protein like egg, milk etc due to their engaging in urban farming activities, which are not affordable to buy by this group community, before their engagement in the sector. As the current study indicated that own production increase food availability which helps in improving their nutritional standing of PLWHA households and provide better balanced food which in turn helps in improving their nutrition security.

The study reveals PLWHA can diversify their food sources and saves money that are going to spend on food by involving in urban agriculture activities and also increases the frequency of

eating fresh-picked vegetables, eggs, milk etc. This shows that PLWHA urban farmers have relatively more access to variety of foods than before. This implies if PLWHA consumes variety of foods from own produces, their health conditions improved, and if their health condition improves treatment and other related expenses also decreased as well as PLWHA also regain energy that in turn help them to participate in other productive activities.

Focus group discussion held with contact gardeners and key informant interview held with sub-city HIV/ AIDS desks and urban agriculture department staffs revealed that urban gardening enables PLWHA vegetable producers to consume fresh picked vegetables without losing their nutritional continents, stables family income and help to counteract the food insecurity being imposed upon them, and the current study also revealed few PLWHA started to rebuild their assets which were depleted before from the sale of urban agriculture produces.

With this in view, the current research revealed that urban farming (own production) improves the livelihoods of PLWHA through, diversify their food, create access to nutritious food like vegetable, eggs, milk etc which did not affordable to buy before their engagement in the sector. Frequency of eating vegetables, eggs etc increased than before which in turn PLWHA have better access to balance diet, reducing household food expenditures, generate some cash from the sell of their surplus produces etc.

The current research result supported by various studies, a study conducted by FAO, (2005), indicated that PLWHA need extra food and nutrition because HIV-infected individuals have higher food and nutrition requirements than uninfected individual, but for this group of community food may be scarce and lack diversity. To this end urban agriculture contributes to increase food availability, and diversity both through a reduction of expenditures and through an increase of income (Egal et al., 2003).An assessment conducted (Masoka, 2005), in Zimbabwe on households affected ad/or infected by HIV/AIDS practicing urban agriculture indicated that the households

obtained economic returns, increased food and nutrition security. The current study also supported by a study conducted by Fikansa, (2005), in Ndola, Zambia, which confirmed that PLWHA who lost their jobs due to their poor health and are not strong enough to engage in labor intensive activities earn a living and generate income by involving in urban gardening and poultry production. The following case studies consolidate the aforementioned result.

#### **Case one**

*A woman, 32, residing in Yeka sub-city, kebele 09/10 a house wife and a mother of three, and tested HIV positive in 2005. Due to this she was constantly getting sick and disturbed so that she became unable to even manage her household chores. Then she states, 'In 2006 I took urban agriculture training particularly on vegetable production. After the training, I began to cultivate my small portion of land (not more than 4m<sup>2</sup>) in my backyard and soon realized the produce is satisfactory. After a couple of months I was able to not only supplement my diet but also generate income out of sale of the vegetable. Thus I decided to approach the Kebele Administration office for a spare land in my area. They helped in providing me a piece of land (30m<sup>2</sup>) close to my home. The land provided was hard, stony, difficult to cultivate, However, I worked hard and made it suitable for vegetable production. On top of this I have been producing vegetable using growing bag, pot and other used and old containers.*

*In doing so, water was a major problem. Therefore I had to transport it 50 meters away from my vegetable garden. Hence, I decided to purchase a water hose to convey water without carrying it. I bought a 50 meter water hose for 250 birr out of my vegetable sale. with this, started generating the income with less labor then I bought Refrigerator for 3,500 birr, oven for 975 birr, and juice squeezer for 300 from the sale of vegetable. On top of these I saved 800 birr at Addis Saving enterprises, I have been generating 300 birr/ month from the sale of vegetable and consumed vegetables that worth 64 birr/month.*

*Beside the economic benefit I gained social benefits from practicing urban agriculture. At the beginning when I knew my HIV status I became stigmatized, isolated and my social contact with my neighbors became very much decreased. But after my engagement in vegetable production, the neighborhood and the surrounding community accepted and considered me as exemplary. Local institutes like Kebele, Women's Affairs, 'Idir' etc invited me in various events to tell my success story for the surrounding community. I am now not hopeless, worthless and rejected but energetic. I am now able to effectively participate in various issues within the community, and feel good like any other human being. I also regained energy, and now I am engaged in many more activities in my vicinity. I can say through urban agriculture I survived.'*

#### **Case two**

*A female, 38, residing in Lidetha sub-city Keble 04/06, tested HIV positive in 2006. Before she took training on urban agriculture she did not have knowledge on the sector. 'The area am using for vegetable production used to be a weed area and I avoided the weed by paying for daily laborer so now the land is paying me. After I took training on urban agriculture I started producing vegetable in 7.6 m<sup>2</sup> land very close to my house and I begun producing vegetables and generate income out of it. From the sale of vegetables I have been generating 50 birr/month and consumed vegetable that worth 40 birr per month. Before practicing urban agriculture I used to consume vegetable 2-3 days per month, but currently I consume while I want to eat. I also have cash in my hand every day obtained from the sale of vegetables which helps me to buy other vegetables which are not found in my backyard.*

*Urban agriculture not only provides income but also has social benefit for me. Unlike today, before practicing urban agriculture my contact and relationship with the neighborhood and the surrounding community was not interesting since they used to consider me as unproductive citizen, and very much isolated me. But when I started producing vegetables and sale for them, gradually they started to approach and encourage me. Through urban agriculture I knew various*

*individuals because they came to my house to buy vegetables. In addition to their encouragement, they have been assisting me in bringing water from public tap to water the vegetable. Urban agriculture is also a bridge in connecting me with different institutes found in my kebele. Kebele Ademonstrators, kebele small and micro-enterprises workers visited my backyard repeatedly and encouraged me. While organizing trainings and other events for communities' at kebele level practical visits were organized at my backyard. These organizations promised to me to participate in other income generation activities. I now have something to do, I am not idle as before, this has also given me an opportunity to meet and chat with my fellow vegetable producers. All the above mentioned points empower and help me to build self-esteem.'*

#### **4.5 Social contribution of urban agriculture**

##### **4. 5.1 Contact and relationship of PLWHA before practicing UA**

Above two-third (71.4 %) sampled PLWHA confirmed that they were discriminated or stigmatized or did not have good contact and relationship with their neighbors, relatives, friends, work mates, community before their engagement in urban agriculture. Out of the respondents very few 3 (4.8 %) had experienced good contact and relationship with their neighbors, relatives, friends, work mates, community before their engagement in urban agriculture. The remain 18 (28.6 %) of the respondents indicated that they don't know whether stigmatized or having good contact and relationship with their neighbors, relatives, friends, work mates, community before their engagement in urban agriculture. This scenario makes PLWHA to refrain from different productive activities and push them to socio-economic disruption.

Data obtained through individual interviews focus group discussion and key informant interviews confirmed that despite stigma and discrimination decrease from time-to-time, still PLWHA have been experiencing stigma and discrimination.

*Table 20 social contact and relationship of PLWHA before practicing UA*

|                   | Frequency | Percent | Cumulative Percent |
|-------------------|-----------|---------|--------------------|
| have good contact | 3         | 4.8     | 4.8                |
| Isolated          | 42        | 66.7    | 71.4               |
| don't know        | 18        | 28.6    | 100.0              |
| Total             | 63        | 100.0   |                    |

Source: Field survey

#### **4.5.2 Contact & relationship of PLWHA after their engagement in UA**

The survey result shows that majority 51 (81 %) of the respondents reported that their social contact and relationship with their neighbors, relatives, community etc. were improved after their involvement in urban agriculture. Few 9 (14.3%) respondents reported that there are no improvements from the preceding scenario. And the rest 3 (4.7 %) claimed that their contact and relationships deteriorate after engaging in urban agriculture activities, this is because they face conflict with their individual house renters due to lack of awareness and conflict of interest on the side of renters. Data obtained through individual interview, focus group discussion and key informant interviews indicates that after involving in urban agriculture their social contact and relationships of PLWHA with their neighbors, relatives, community, etc, have been improving. This implies that urban agriculture notably vegetable gardening is a good tool in reducing stigma and discrimination among PLWHA. This implies when stigma and discrimination decrease PLWHA can participate in various socio-economic networks and get relief from depression and emotional burden which in turn helps them to involve in various productive activities; thereby their livelihood improved than before.

*Table 21 social contact and relationship of PLWHA after their involvement in UA*

| variables    | Frequency | Percent | Cumulative Percent |
|--------------|-----------|---------|--------------------|
| improved     | 51        | 81      | 81                 |
| Same         | 9         | 14.3    | 95.3               |
| Deteriorated | 3         | 4.7     | 100                |
| Total        | 63        | 100.0   |                    |

Source: field survey

As individual interview & focus group discussion revealed that PLWHA contact and relationship with neighborhoods, relatives etc. increased because of the following reasons:

#### **Conducting neighborhoods sale**

During individual interviews all (100 %) of the respondents claimed that they sale their produces at the farm get (at home) and local market close to their home for neighborhoods and community residing in their vicinity. Because of this their neighborhoods and the surrounding community came and buy fresh vegetables, eggs etc frequently. Based on this, as confirmed by the study result PLWHA make contact and relationship continuously with the community residing in their vicinity which has contribution in decreasing HIV/AIDS related stigma & discrimination. Beside to this as individual interview and focus group discussion indicated that a neighborhood sale benefits both PLWHA and the consumers as follows:

- They decrease transport cost and labor to go to the market whether to buy or sell the produces.
- The consumers get fresh-picked and safe produces close to their home
- The consumers buy the vegetables and eggs a little bit lower than the retail price

- They buy vegetable and eggs through credit sales. All these strengthened and encourage PLWHA relationship and contact with the surrounding community, which in turn contribute to decrease HIV/ AIDS related stigma & discrimination.

#### **PLWHA providing technical advice for neighborhoods, relatives etc**

As indicated by individual interview and focus group discussion majority 62 (98.4 %) of the respondents start urban agriculture after taking urban agriculture training. In line with this PLWHA offer technical advice for neighborhoods, relatives, and for the community residing in their vicinity up on their request and by their on initiation. This witnessed that during field observation good number of PLWHA neighbors have been producing urban agriculture especially vegetable production by getting the technical advice from PLWHA vegetable growers. This has contribution to increase contact and relationship to their neighborhoods and to intensify urban agriculture activities to the general population. Individual interviews held with PLWHA respondents, focus group discussion and key informant interview confirmed that, PLWHA urban gardeners and other community members who have been conducting urban agriculture especially vegetable production living in close vicinity conducted discussions on vegetable production matters; this situation creates social forum and increase group cohesion. This helps a lot to facilitate contact and relationship of PLWHA among their neighborhoods, community etc. This situation in turn has good contribution to reduce HIV/AIDS related stigma and discrimination which in turn helps to improve their livelihoods.

#### **Through exchanging garden tools, seeds and seedlings with neighborhoods**

Respondents participated in individual interview as well as in focus group discussion indicated that there has been exchanging of garden tools , seed and seeding among PLWHA and their neighborhoods and among community residing in close vicinity. This allowed them to communicate and discuss different matters, which has good contribution to facilitate their contact and relationship among each other which end up in decreasing HIV/AIDS related stigma & discrimination.

### **Exchanging gifts**

Result obtained from individual interviews confirmed majority of the respondents reported that they provide vegetables as gifts to their neighborhoods, relatives etc. On the other hand data obtained from individual interview and field observation revealed that neighborhoods, relatives, etc in turn give labor assistance, and provide household waste water for PLWHA to irrigate the vegetables. This shows PLWHA and their neighborhoods, relatives assist each other, this scenario enhance and strengths contact and relationship of PLWHA with their neighborhoods, relatives etc. which in turn lessened HIV/AIDS related stigma and discrimination at local or micro level. In addition to this data obtained from focus group discussion and key informant interview revealed that neighborhoods and relative etc approached PLWHA while they see involving in productive activities. The current study revealed that urban farming particularly urban gardening build social capital by exchanging and sharing of goods, information, materials etc and bringing people together and improving neighborhoods.

Therefore, based on the aforementioned research results, the current study confirmed that urban agriculture notably vegetable production has good contribution to increase social relationships and contact with neighborhoods which in turn helps to decreases stigma and discrimination. This implies urban farming particularly vegetable production helped PLWHA a lot in boosting their contact and relationships among neighborhoods, relatives etc. This is helpful in improving the social ties of PLWHAS' as well as helped a lot to regain their social capital. When PLWHA regain their social capital, they could participate in various socio-economic networks with out fear, this in turn helps them to involve in different productive activities and generates income, hence their livelihoods improved. On the other hand when PLWHA social interaction improved, depression and emotional burden decreased, thereby their health condition improved and if their health condition improved they can involve in productive activities to assist their livelihoods. The next case studies highlighted

this fact.

### **Case three**

*A woman, 38, lives in Yeka sub-city kebele 03/04 and identified her HIV status in 2005. 'Before practicing urban agriculture I am very poor and chased by house renter due to the prevailing stigma and discrimination and I used to live in the street. In the meantime the kebele administrator provided shade to me. In 2007 I took urban agriculture training through the local NGO operating in my Kebele.*

*Following the training I started producing vegetables in 15 m<sup>2</sup> plot of land very near to my shade. I also produce vegetables using growing bag and other used containers. After realizing the benefit of vegetable I planned to diversify my production. Cognizant of this I bought 6 chickens from the sale of vegetables. Currently I conducted vegetable and poultry production simultaneously and generated 220 birr per month from the sale of vegetable and egg. Me and my family also consumed vegetable and egg that worth 100 birr per month.'*

### **Case four**

*She, 32, has been living in Yeka sub-city kebele 13/14 and tested positive in 2004. She selected and took urban agriculture training by local NGO which implement urban agriculture project in her kebele. 'While I have been attending the training I was very much worried about the practicality of vegetable production in urban setting and how this activity was implemented by a person living with HIV like me. Finally the training eases my concern and I became convinced to produce vegetables. In my preparation to start the activity, I planned to sell the produce at local market if I produce more than the household consumption, because I convinced myself that the neighbors would not buy my produces due to the existing stigma & discrimination. But the neighbors were very much amused when they see me doing urban farming, since the community did not have the confidence that PLWHAS' involvement in productive activities. But after they saw me doing urban farming they began to encouraged me, assist me and also buy my produces without any problem.*

*Unlike before now I have a good communication with different individuals that even I did not know before they came to purchase my produces. Based on this, I can say, urban agriculture especially vegetable production has good contribution to increasing contact and relationships with the neighbors by decreasing stigma and discrimination and I currently considered myself I can do every thing.*

*I bought 4 chickens from the sale of vegetable and I am conducting vegetable (on 7m2 plot of land) and poultry productions. I obtain 110 birr/month from the sale of both vegetable and eggs, and consumed vegetables and eggs that worth 95 birr/month.'*

#### **Case five**

*A woman, 41, lives in Yeka sub-city Kebele 06/07 & a mother of 2 (a son and a daughter). 'Initially I used to pass most of my time at home and did not have good contact with neighbors. In 2007 I took urban agriculture training focusing on vegetable production. After the training I started producing different vegetables on 21.7m2 piece of land and using barrel gardening, growing bags and other used container. From the sale of vegetables I bought a cupboard for 1800 birr and electric stove for 800 birr and I have been saving 16 birr per month on local institution known as 'Equb' organized in my vicinity by me and my friends.*

*Before my engagement in urban agriculture, my contact and relationship with the community in my residential area was not good. But after my involvement in the sector, from the first production I gave vegetable for the neighbors freely as gift, but after that my neighbors came and bought my produces. Not only my neighbors but also the surrounding community I did not know before came and bought the vegetable. Due to these my contact and relationship improved with the neighbors and the surrounding community improved. Urban agriculture also helped me to have good contact with the institutes operating in my kebele.*

*I have been invited by various institutes operating in my kebele whenever events are organized. In general I have a good contact and relationship within my community as well as with various*

*institutes operating in my kebele. Before practicing urban agriculture I used to take orange, banana and other fruits if available to visit sick persons, mothers who gave birth etc., but after I started producing vegetables I have been giving vegetables as gift.* ‘

The current research result supported by an assessment conducted (Masoka, 2005), in Zimbabwe on households affected ad/or infected by HIV/AIDS practicing urban agriculture indicated that that the households improved group cohesion, decreased stigma, and increased community support.

To sum up, PLWHA who practice urban farming mitigates the impact of the pandemic on their livelihoods through increasing food availability, generating income from sale of the surplus, reducing food expenditures and redirect such finances to other purposes, increasing contact and relationships by decreasing stigma and isolation etc.

#### ***4. 6 Challenges facing PLWHA urban agriculture producers***

Majority 59 (93.7 %) of PLWHA respondents claimed that they face periodic water shortage, where as good number 49 (77.8 %) of PLWHA allege that they were exposed to water charge increase, 28 (44.4 %) of PLWHA respondents face space shortage, 17 (27 %) of PLWHA claimed that they have labor shortage and the remain 33 (52.4 %) of respondents faces other problems like pest and disease infestation on vegetables, soil problem to grow vegetables, etc.

##### **4. 6.1 Water shortage**

The result obtained from individual interview and field observation indicated that majority of PLWHA respondents practicing vegetable gardening have exposed to periodic water shortage. This scenario brings seasonal limit, and forced PLWHA respondents to wait rain to produce vegetables.

#### **4.6.2 Water charge increase**

Majority 49 (77.8 %) of the respondents claimed that the water charge increase after practicing urban agriculture notably vegetable production. The result obtained from individual interviews revealed that water charge increase ranges from 2.50-20.00 birr per month with mean of 6.9 birr. The result obtained from individual interviews held with PLWHA and key informant interview held with contact gardeners indicated that PLWHA who rely on recycled water to irrigate their vegetable, water charge increase is not the major challenge.

#### **4.6.3 Space shortage**

About 28 (44.4 %) PLWHA respondents have constraint of space to implement urban agriculture. As field observation and individual interview result confirmed PLWHA living in rented house (rented from individual and Kebele) suffer with space problem.

#### **4.6.4. Labor shortage**

Concerning labor shortage 17 (27 %) of PLWHA confirmed that they face labor shortage to conduct urban agriculture activities. Individual interview held with PLWHA, focus group discussion and field observation result confirmed that PLWHA respondents that face labor shortage are; PLWHA urban farmers who have no dependents, PLWHA who manage relatively spacious land and PLWHA who frequently getting sick. In contrast, as the individual interview held with PLWHA, focus group discussion and field observation result confirmed that majority of PLWHA did not have labor constraint, since most PLWHA households have dependants who have been participating in urban agriculture activities, majority of PLWHA manage small plots of lands that did not want much labor, and good number of PLWHA did not frequently sick because their health condition improved than before.

#### 4. 6.5. Other problems

The result obtained from individual interview, field observation and focus group discussion confirmed that problems such as pest and disease prevalence on vegetables have been reducing their yield. PLWHA who have been practicing urban gardening in Akaki Kality sub city reported that they have face problem of soil which means the soil were clay soil which needs frequent watering and cracked with a couple of days after irrigated thus not suitable for vegetable production . On top of these the result obtained from individual interviews, key informant interviews and focus group discussion indicated that PLWHA have been facing shortage of start-up capital and other inputs to start urban agriculture activities especially poultry production, shoat fattening etc.

As the field observation, individual interview and focus group discussion as wells key informant interview result confirmed that despite majority of the study subjects took urban agriculture trainings, they have been facing knowledge and skill gap on production techniques, particularly on planting, on keeping the recommended spacing between vegetables and rows, on seed bed preparation and feeding and managing poultry and others animals are the major ones. On top of this as key informant discussion held with Addis Ababa city administration urban agriculture department experts and individual interviews revealed that lack of proper and consecutive extension service is another impediment that faces PLWHA who practice urban agriculture.

Individual and key informant interviews confirmed that very few PLWHA who have been living in rented house (rented from individuals) face conflicts from their renters particularly at the initial stage of production, the conflict were born because of individual renters did not have awareness on urban agriculture as wells as there is conflict of interest. As the individual interview held with PLWHA indicated that the conflicts decreased through time when renters get awareness on urban gardening and when PLWHA provides gifts like seeds, seedlings, and other produces. And finally individual interviews held with PLWHA respondents confirmed that despite majority of the study

subjects have been conducting vegetable production in their backyard, very few PLWHA have been practicing urban gardening in vacant lots and institute lands found around their home. This vegetable growers face land tenure insecurity problem, thus the PLWHA do not own the land they use to grow vegetables and with out title.

As field observation and focus group discussion result indicated PLWHA are reluctant to get involved in urban farming activities, because of the dependency syndrome created by the handouts that many HIV/AIDS projects give to PLWHA. As key informant discussion held with sub-city HIV/AIDS desks and Addis Ababa city administration urban agriculture department expert reveled that most organizations involved in HIV/AIDS programs such as NGOs, Associations, etc focus on advocacy and care giving, but pay little attention to enhancing access to food and nutrition by involving PLWHA in own production. As the key informant interview held with Addis Ababa city administration urban agriculture horticulture expert confirmed that lack of awareness on urban agriculture both the community and decision makers and river water population are also big problems that hinder the sector.

Table 22 major problems facing respondents while practicing urban agriculture

| Variables                                                       | Frequency | Percent |
|-----------------------------------------------------------------|-----------|---------|
| <b>Problems facing respondents practicing urban agriculture</b> |           |         |
| Shortage of water                                               | 59        | 93.7    |
| Monthly water charge/bill Increase                              | 49        | 77.8    |
| Space shortage                                                  | 28        | 44.4    |
| Labor shortage                                                  | 17        | 27.0    |
| Other problems                                                  | 33        | 52.4    |
| <b>Water charge increase in birr</b>                            |           |         |
| 2.50-5.50                                                       | 23        | 47.0    |
| 5.51-8.51                                                       | 11        | 22.4    |
| 8.52-11.52                                                      | 11        | 22.4    |
| 11.53-14.53                                                     | 1         | 2.0     |
| 14.54-17.54                                                     | 1         | 2.0     |
| 17.55-20                                                        | 2         | 4.1     |
| <b>Amount of water charge</b>                                   |           |         |
| Mean                                                            | 6.9480    |         |
| Median                                                          | 6.0000    |         |
| Minimum                                                         | 2.50      |         |
| Maximum                                                         | 20.00     |         |

Source: field survey

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### ***5.1 Summary***

The study of livelihood contribution of urban agriculture for people living with HIV/AIDS conducted on 63 PLWHA who have been practicing urban farming activities. Of the total informants, 87.3 percent were females while the rest 12.7 percent were males. This is because the organizations operating urban agriculture projects with PLWHA gave priority for female PLWHA, and almost all respondents were in the working age group. Among the surveyed samples majority (63.5 %) of them are living by earning low income. Concerning the status of the house informants lives almost two-third (63.5 %) of the study subjects live in rented house, either rented from individual or Kebele possessing low cost household utensils whereas they lack relatively expensive utensils.

The study indicated that majority (82.5 %) of the respondents currently taking ARV. Results from the served sample of PLWHA urban farmers suggested that majority of PLWHA urban farmers obtained range of benefits from urban farming among them urban agriculture provides safe and fresh produces, generates cash from the sell of the surplus, provide food and diversify their dietary intake, create opportunity for out-door physical exercise which help them to counteract physical passivity, provide psychological satisfaction, enhance contact and relationship among neighbors, relatives etc

The study found out that all the study subjects have been conducting vegetable farming. The result obtained from PLWHA urban farmers revealed that involvement of PLWHA in sheep fattening, dairy production and beekeeping activities were very low. The also indicted that majority of the

respondents have been conducting vegetable farming in small plots found in their backyards. About three-fourth of the respondents cultivate less than 22 square meters plots. But few respondents who have been producing vegetables in vacant lots, riversides institute lands hold relatively spacious space. According to the current study majority of the respondents use tap water to irrigate their vegetables, due to this PLWHA vegetable producers have been facing water charge increase.

According to the outcome of the current study PLWHA who have been doing urban farming activities generate cash income from the sell of the produces and consume fresh produces from own production which was not affordable to buy by limited income households. As the current study revealed PLWHA who engage in own production diversify their income and food sources because they have access for fresh picked vegetables, animal protein which in turn helps to diversify their dietary intake. As different studies revealed on one hand PLWHA need extra food more than the general population and on the other hand they did not have enough income and cash reserves to buy adequate food. To this end own production contribute a lot in increasing food availability and stability because majority of the sampled PLWHA produce urban agriculture through out the year as well as create money by turning the surplus into cash which helps them to buy foods which are not found in their backyard.

The study found out that PLWHA urban farmers could enhance food and nutrition security through own production, since most of the food produced by PLWHA households is eaten by the family and the left over sold to create cash income. Moreover PLWHA engage in dairy production use the cow dung for household fuel which help to save money that would be spent for buying fuel wood. As the study found out PLWHA who have been involving in urban farming activities could mitigate the volatile and soaring food price that confronts them and help to lessen PLWHA reliance on food aid.

The current study revealed that HIV/AIDS related stigma and discrimination has been decreasing after PLWHAS' engagement in urban agriculture activities particularly after engaging in urban gardening. This is because PLWHA contact and relationship with neighborhoods increased through neighborhood sales of the surplus produces, through exchanging garden tools, seed and seedlings, providing technical advice for their neighborhoods, providing gifts, exchanging and sharing of goods and materials. As PLWHA frequently and repeatedly communicate with their neighborhoods, relatives etc their contact and relationship have been improving among neighbors, relatives etc, thus help in decreasing HIV/AIDS related stigma and discrimination. This implies PLWHA who have been conducting urban agriculture particularly urban gardening (vegetable production) have been boosting their contact and relationships among neighbors, relatives etc which in turn decreased stigma and discrimination that helps them in improving their social ties and regain their social capital. In line with the improvement of their social capital PLWHAS' involvement in various socio-economic networks improved as well as emotional burden and depression decreased. All these enable PLWHA to involve in different productive activities, and thereby improved their livelihoods.

As the study found out PLWHA faces different constraint while doing urban farming activities. Among them are water shortage, monthly water charge increase, Labor shortage, space shortage, Knowledge and skill gap on urban farming were identified by the study. There are also problems that confronts PLWHA urban agriculture producers these are disease and pest prevalence on vegetables, soil problem particularly in Akaki Kaliti sub-city which hinders vegetable production, create conflict; even though urban farming notably vegetable production increase contact and relationship with neighborhoods, very few PLWHA living in rented house (rented from individuals) face conflict with renters due to lack of awareness and conflict of interest on the side of the renters, lack of proper and successive extension services, shortage of inputs and start-up capital and tenure insecurity for those PLWHA conducting urban agriculture in vacant lots and

institute lands outside their compound, river pollution, lack of awareness on urban farming both on the side of the community and decision makers, unwillingness of PLWHA to involve in urban farming, organizations working on HIV/ AIDS programs in the city more focus on advocacy and care giving activities rather than involving PLWHA on urban farming etc, were identified by the current research.

## ***5.2 Conclusion***

The study of the livelihood contribution of urban agriculture for PLWHA conducted on 63 people living with HIV/AIDS is believed to provide an important contribution to the limited literature it had on the livelihood contribution of urban agriculture for PLWHA. The study found out that the study subjects make living by involving themselves in a range of occupations like daily labor, urban agriculture, petty trading and the like. Whereas good numbers of the informants have been getting external aid. Majority of the respondents are living by earning low income. To this end urban agriculture plays crucial role to decrease PLWHAS' reliance on external aid. Concerning the status of the house informants live, about two-third of the study subjects live in rented house, either rented from individual or Kebele and possessing low cost household utensils and lack relatively expensive utensils.

Concerning healthy status of respondents majority of them currently taking ARV and about three-fourth of the respondents, health condition improved after engaging in urban agriculture activities. Moreover majority of the study subjects disclose their HIV status to spouse, neighborhoods, relatives etc. This implies PLWHA neighborhoods, relatives etc know the status of PLWHA.

The study showed that all (100 %) of the study subjects has been doing vegetable farming and 25.4 percent of the study subjects have running poultry production, but participation in sheep fattening, dairy production, and beekeeping are very low. As study found out the reason for low

engagement of PLWHA in dairy production, sheep fattening and beekeeping are: These activities need more labor and spacious land, organizations working in urban farming gave priority to participate PLWHA in vegetable production, it needs relatively high start-up capital, etc. The current study indicated that majority of PLWHA urban farmers conducted urban farming activities throughout the year. Concerning selling site of urban farming produces almost all PLWHA urban farmers conduct neighborhood sells. This helps PLWHA and their neighborhood to get fresh produces, save transport cost, labor and enhance contact and relationship with the surrounding community.

In regard to production techniques, the study indicated that majority of the study subjects conducted vegetable production on small plots found in their backyard and few PLWHA have been producing vegetables using different old and used containers (sack gardening, barrel gardening, pot gardening etc). The study point out that majority of the study subjects did not properly and effectively use the limited space they have as well as despite there is some initiation in using container gardening among PLWHA it is still not developed in terms quality and quantity.

In regard to water source of PLWHA urban agriculture producers, majority of the respondents have been using tap water either from own tap or buy from private tap or public tap to practice urban gardening. But very few informants have been using recycled water, river, spring water etc as supplementary water source to irrigate the vegetables. This scenario exposed majority respondents for monthly water charge increase as well as restricts PLWHA not to produce vegetables in drier months.

The study highlighted urban agriculture has a range of benefits for PLWHA, All (100 %) of the respondents admitted that urban agriculture provides fresh, healthier and safer produces, it also generate income from the sale of the surplus and saves money that otherwise would be allocated for food purchase. The study also showed urban agriculture has undeniable contribution for

psychological satisfaction, physical exercise and social benefit; in improving contact and relationship with their neighborhoods and the surrounding community. The current study revealed that urban farming create employment for persons with limited skills and formal education and it is less expensive to establish maintain and uses local available materials as inputs.

The out put of the study revealed that PLWHA who have been practicing urban farming activities generate income (both in-kind and cash income). This implies PLWHA who involve in own production get access to vegetables and animal protein which did not affordable to buy before their engagement in the sector, due to their limited income and cash reserves. The study also confirmed PLWHA who have been doing urban farming activities diversify their income sources and could secure their daily household needs by turning the surplus in to cash and by reducing household food expenditures and redirect such finances to other purposes. As the current study revealed urban farming enables PLWHA vegetable producers to consume fresh picked vegetables without losing their nutritional continents, stables family income and helps to counteract the food insecurity being imposed upon them. The study also confirmed few PLWHA started to rebuild their assets which were depleted before from the sell of urban agriculture produces. To this end, urban farming enables PLWHA to generate additional income that helps to improve their livelihoods.

As the study confirmed PLWHA urban farmers have relatively more access to variety of foods than before. If PLWHA consumes variety of foods from own produces their health conditions improved, if their health condition improved treatment and other related expenses also decreased as well as PLWHA also regain energy that in turn help them to participate in other productive activities.

The study found out that even though stigma and discrimination have been decreasing from-time-to-time from the general population most PLWHA were victims of HIV/AIDS related stigma and

discrimination from their neighborhoods, relatives etc. But in contrast stigma and discrimination decreased after their engagement in urban agriculture activities particularly after engaging in urban gardening. This is because of PLWHA contact and relationship with neighborhoods increased through neighborhood sales of the surplus produces, through exchanging garden tools, seed and seedlings, providing technical advice for their neighborhoods, providing gifts, exchanging and sharing of goods and materials. In doing so PLWHA frequently and repeatedly communicate with their neighborhoods, relatives etc which in turn contribute in enhancing their contact and relationship among neighborhoods, the surrounding community as well as with relatives. Thus helps in decreasing HIV/AIDS related stigma and discrimination. This implies PLWHA who have been conducting urban agriculture particularly urban gardening (vegetable production) have been boosting their contact and relationships among neighbors, relatives etc which in turn decreased stigma and discrimination that helps them in improving their social ties and regain their social capital.

To sum up the current study confirmed that urban farming has livelihood contribution for PLWHA through:

- Generating income through neighborhood sell of surplus produces
- providing fresh, healthier and safer vegetables, as well as animal protein not available otherwise, thus improving nutritional standing and changing consumption habit
- increase food availability
- Save money that is going to spent on food purchase
- Increase contact and relationship with neighborhoods and the community living in their vicinity.
- Contribute for out door exercise that helps PLWHA to counteract their physical passivity etc.

With this in view, PLWHA who practice urban farming activities mitigates the impact of the pandemic on their livelihoods through increasing food availability, generating income from sell of part of the produces , reducing food expenditures and redirect such finances to other purposes, increasing contact and relationships by decreasing stigma and isolation etc. Thus urban agriculture has significant contribution in improving the livelihoods of PLWHA who engage in the sector.

The study indicated that PLWHA faces various impediments and challenges while they are doing urban agriculture activities. Water shortage, Monthly water charge increase, Labor shortage, space shortage, Knowledge and skill gap on urban farming are the major challenges that confronts PLWHA urban agriculture producers. The study also found out problems like disease and pest prevalence on vegetables, soil problem particularly in Akaki Kality sub –city which hinders vegetable production, create conflict; despite urban farming notably vegetable production increase contact and relationship with neighborhoods, very few PLWHA living in rented house ( rented from individuals) face conflict with renters due to lack of awareness and conflict of interest on the side of the renters, lack of proper and successive extension services, shortage of inputs and start-up capital and tenure insecurity for those PLWHA conducting urban agriculture in vacant lots and institute lands out side their compound, river pollution, lack of awareness on urban farming both on the side of the community and decision makers, unwillingness of PLWHA to involve in urban farming, NGOs, association etc working on HIV/ AIDS programs in the city more focus on advocacy and care giving activities rather than involving PLWHA on urban farming etc were the challenges identified by the current research.

In general, despite there are many challenges that confronts urban agriculture, the sector can play a crucial role in improving the livelihoods of PLWHA households by providing both economic and social benefits.

### ***5.3 Recommendation***

Based on the study findings the following recommendations are suggested that can be adopted by the concerned bodies to strengthen the ongoing activities and to scale up the intervention.

1. Considering the livelihood contribution of urban agriculture for PLWHA and their households, the sector has to be scale up to involve more PLWHA as wells as other vulnerable group of the community
2. To improve the livelihood of PLWHA urban farmers in sustainable way they should participate in integrated activities which supplement each other in addition to vegetable farming, like poultry production, sheep fattening etc.
3. Most female PLWHA pass most of their time at home doing household chores, to this end combining urban farming with household chores should be strengthen
4. PLWHA urban gardeners should get additional training on how to produce vegetables using limited space and container gardening so as to mitigate the problem of space shortage
5. PLWHA vegetable farmers should be encouraged and advised to use recycled water and various water conservation techniques so as to lessen the problem of water
6. Continuous awareness raising activity concerning urban agriculture should be done for the general population
7. Urban agriculture training should also given to dependants rather than PLWHA only
8. Organizations working on HIV/AIDS programs should integrate urban farming activities with advocacy and care giving activities
9. Further research need to be carried out to identify whether PLWHAs' health improvement is due to practicing of urban agriculture or other factors.
10. In addition, future research need to conduct further investigate whether PLWHAS' psychological satisfaction is because of their involvement in urban farming or other factors

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## Annex 1

*Cost and benefit of vegetable production with labor cost*

| S.No             | Plot size in m <sup>2</sup> | Cost         | Benefit       | Profit in Birr |
|------------------|-----------------------------|--------------|---------------|----------------|
| 1                | 1.5                         | 22.85        | 40            | 17.15          |
| 2                | 2                           | 28.7         | 90            | 61.3           |
| 3                | 2.3                         | 32.9         | 98            | 65.1           |
| 4                | 2.5                         | 34.4         | 99.5          | 65.1           |
| 5                | 2.5                         | 35           | 107.6         | 72.6           |
| 6                | 2.5                         | 35.15        | 101.9         | 66.75          |
| 7                | 3.4                         | 38.3         | 113.3         | 75             |
| 8                | 3.6                         | 41.6         | 130.00        | 88.4           |
| 9                | 3.6                         | 39.75        | 75.00         | 35.25          |
| 10               | 3.6                         | 40.5         | 90.00         | 49.5           |
| 11               | 5.2                         | 45.5         | 160.00        | 114.5          |
| 12               | 5.7                         | 48.5         | 140.00        | 91.5           |
| 13               | 6                           | 46.9         | 231.00        | 184.1          |
| 14               | 6.4                         | 47.7         | 90.00         | 42.3           |
| 15               | 6.7                         | 48.9         | 96.00         | 47.1           |
| 16               | 6.9                         | 46.00        | 65.00         | 19.00          |
| 17               | 7.00                        | 50.5         | 190.00        | 139.5          |
| 18               | 7.00                        | 49.5         | 105           | 55.5           |
| 19               | 7.55                        | 53.56        | 180           | 126.44         |
| 20               | 8.14                        | 54.72        | 129           | 74.28          |
| 21               | 9.5                         | 58.00        | 76.00         | 18             |
| 22               | 10.4                        | 56.62        | 150           | 93.38          |
| <b>Sub-total</b> | <b>114.0</b>                | <b>955.6</b> | <b>2557.3</b> | <b>1601.8</b>  |

...continued

| <i>S.No</i>      | <i>Plot size in m<sup>2</sup></i> | <i>Cost</i>   | <i>Benefit</i> | <i>Profit in Birr</i> |
|------------------|-----------------------------------|---------------|----------------|-----------------------|
| 23               | 11                                | 60            | 200.00         | 140.00                |
| 24               | 12                                | 62.1          | 170.00         | 107.9                 |
| 25               | 12.5                              | 64            | 195.00         | 131.00                |
| 26               | 12.75                             | 65            | 95.00          | 30                    |
| 27               | 13                                | 66.75         | 100.00         | 33.25                 |
| 28               | 13.89                             | 67.00         | 190.00         | 123.00                |
| 29               | 13.9                              | 64.5          | 75.00          | 10.5                  |
| 30               | 15.00                             | 74.5          | 205.00         | 130.00                |
| 31               | 15.2                              | 74.00         | 150.00         | 76.00                 |
| 32               | 16.7                              | 75.4          | 100.00         | 24.6                  |
| 33               | 16.83                             | 76.00         | 90.00          | 14.00                 |
| 34               | 18.64                             | 78.00         | 92.00          | 12.00                 |
| 35               | 18.7                              | 77.5          | 90.00          | 12.5                  |
| 36               | 18.8                              | 76.00         | 89.00          | 13.00                 |
| 37               | 19.8                              | 80.00         | 105.00         | 25.00                 |
| <b>Sub-total</b> | <b>228.7</b>                      | <b>1060.8</b> | <b>1946.0</b>  | <b>882.8</b>          |

...continued

|    | <i>Plot size in m<sup>2</sup></i> | <i>Cost</i> | <i>Benefit</i> | <i>Profit in Birr</i> |
|----|-----------------------------------|-------------|----------------|-----------------------|
| 38 | 20.5                              | 79.5        | 110            | 30.5                  |
| 39 | 21.2                              | 82.00       | 106.00         | 24.00                 |
| 40 | 21.29                             | 83.00       | 108.00         | 25.00                 |
| 41 | 21.3                              | 76.5        | 93.00          | 16.5                  |
| 42 | 21.3                              | 84.6        | 150.00         | 65.4                  |

|                  |              |               |               |               |
|------------------|--------------|---------------|---------------|---------------|
| 43               | 21.56        | 86.00         | 225.00        | 139.00        |
| 44               | 23.00        | 86.00         | 180.00        | 94.00         |
| 45               | 24.00        | 91.21         | 310.00        | 218.80        |
| 46               | 24.6         | 89.00         | 220.00        | 131           |
| 47               | 25.00        | 80.00         | 95.00         | 15.00         |
| 48               | 25.23        | 90.4          | 540.00        | 449.6         |
| 49               | 27.2         | 97.5          | 132.00        | 34.5          |
| 50               | 28           | 117           | 150.00        | 42.4          |
| 51               | 33.9         | 116.9         | 792.00        | 675.00        |
| 52               | 39.10        | 137.00        | 154.00        | 17            |
| 53               | 40.4         | 142.5         | 180.00        | 37.5          |
| 54               | 41.2         | 146.00        | 159.00        | 13.00         |
| 55               | 42.9         | 153.00        | 210.00        | 57.00         |
| 56               | 59.2         | 190.00        | 330.00        | 140.00        |
| 57               | 104.8        | 258           | 520.00        | 262.00        |
| <b>Sub-total</b> | <b>665.7</b> | <b>2285.3</b> | <b>4770.2</b> | <b>2487.2</b> |
| Grand-total      | 1008.4       | 4,301.7       | 9,273.5       | 4,971.8       |

Source: field survey

## Annex 2

*Cost and benefit of vegetable production with out labor cost*

| S.No | Plot size in m <sup>2</sup> | Cost  | Benefit | Profit in Birr |
|------|-----------------------------|-------|---------|----------------|
| 1    | 1.5                         | 19.1  | 40      | 20.9           |
| 2    | 2                           | 24.4  | 90      | 65.6           |
| 3    | 2.3                         | 28.1  | 98      | 69.9           |
| 4    | 2.5                         | 29.1  | 99.5    | 70.4           |
| 5    | 2.5                         | 29.3  | 107.6   | 78.3           |
| 6    | 2.5                         | 29.7  | 101.9   | 72.2           |
| 7    | 3.4                         | 31.00 | 113.3   | 82.3           |

|                  |              |               |               |               |
|------------------|--------------|---------------|---------------|---------------|
| 8                | 3.6          | 33.9          | 130.00        | 96.1          |
| 9                | 3.6          | 32.1          | 75.00         | 42.9          |
| 10               | 3.6          | 32.7          | 90.00         | 57.3          |
| 11               | 5.2          | 34.4          | 160.00        | 125.6         |
| 12               | 5.7          | 36.3          | 140.00        | 103.7         |
| 13               | 6            | 34.1          | 231.00        | 196.9         |
| 14               | 6.4          | 34.00         | 90.00         | 56.00         |
| 15               | 6.7          | 34.6          | 96.00         | 61.4          |
| 16               | 6.9          | 31.3          | 65.00         | 33.7          |
| 17               | 7.00         | 35.5          | 190.00        | 154.5         |
| 18               | 7.00         | 34.5          | 105.00        | 70.5          |
| 19               | 7.55         | 37.9          | 180.00        | 142.1         |
| 20               | 8.14         | 37.3          | 129.00        | 91.7          |
| 21               | 9.5          | 37.3          | 76.00         | 38.7          |
| 22               | 10.4         | 34.4          | 150           | 115.6         |
| <b>Sub-total</b> | <b>114.0</b> | <b>711.00</b> | <b>2557.3</b> | <b>1758.8</b> |

...continued

| <i>S.No</i> | <i>Plot size in m<sup>2</sup></i> | <i>Cost</i> | <i>Benefit</i> | <i>Profit in Birr</i> |
|-------------|-----------------------------------|-------------|----------------|-----------------------|
| 23          | 11                                | 36.5        | 200.00         | 163.5                 |
| 24          | 12                                | 36.4        | 170.00         | 133.6                 |
| 25          | 12.5                              | 37.3        | 195.00         | 157.7                 |
| 26          | 12.75                             | 37.8        | 95.00          | 57.2                  |
| 27          | 13                                | 39.00       | 100.00         | 61.00                 |
| 28          | 13.89                             | 36.8        | 190.00         | 153.2                 |

|                  |              |              |               |               |
|------------------|--------------|--------------|---------------|---------------|
| 29               | 13.9         | 34.8         | 75.00         | 40.2          |
| 30               | 15.00        | 42.4         | 205.00        | 162.6         |
| 31               | 15.2         | 41.5         | 150.00        | 108.5         |
| 32               | 16.7         | 39.7         | 100.00        | 60.3          |
| 33               | 16.83        | 40.00        | 90.00         | 50.00         |
| 34               | 18.64        | 38.2         | 92.00         | 53.8          |
| 35               | 18.7         | 37.5         | 90.00         | 52.5          |
| 36               | 18.8         | 35.8         | 89.00         | 53.2          |
| 37               | 19.8         | 37.7         | 105.00        | 67.3          |
| <b>Sub-total</b> | <b>228.7</b> | <b>571.4</b> | <b>1946.0</b> | <b>1374.9</b> |

...continued

|    | <i>Plot size in m<sup>2</sup></i> | <i>Cost</i> | <i>Benefit</i> | <i>Profit in Birr</i> |
|----|-----------------------------------|-------------|----------------|-----------------------|
| 38 | 20.5                              | 35.7        | 110            | 74.3                  |
| 39 | 21.2                              | 36.7        | 106.00         | 69.3                  |
| 40 | 21.29                             | 37.5        | 108.00         | 70.5                  |
| 41 | 21.3                              | 30.9        | 93.00          | 62.1                  |
| 42 | 21.3                              | 37.6        | 150.00         | 112.4                 |
| 43 | 21.56                             | 39.9        | 225.00         | 185.1                 |
| 44 | 23.00                             | 36.8        | 180.00         | 143.2                 |
| 45 | 24.00                             | 40.9        | 310.00         | 269.1                 |
| 46 | 24.6                              | 35.6        | 220.00         | 184.4                 |
| 47 | 25.00                             | 26.6        | 95.00          | 68.4                  |
| 48 | 25.23                             | 35.4        | 540.00         | 504.6                 |
| 49 | 27.2                              | 39.4        | 132.00         | 92.6                  |

|                    |               |                |                |               |
|--------------------|---------------|----------------|----------------|---------------|
| 50                 | 28            | 57.1           | 150.00         | 92.9          |
| 51                 | 33.9          | 50.9           | 792.00         | 741.1         |
| 52                 | 39.10         | 53.4           | 154.00         | 100.6         |
| 53                 | 40.4          | 56.1           | 180.00         | 123.9         |
| 54                 | 41.2          | 57.9           | 159.00         | 101.1         |
| 55                 | 42.9          | 61.3           | 210.00         | 148.7         |
| 56                 | 59.2          | 63.4           | 330.00         | 266.6         |
| 57                 | 104.8         | 67.00          | 520.00         | 453.00        |
| <b>Sub-total</b>   | <b>665.7</b>  | <b>899.1</b>   | <b>4770.2</b>  | <b>3952.2</b> |
| <b>Grand-total</b> | <b>1008.4</b> | <b>2,181.4</b> | <b>9,267.3</b> | <b>7085.9</b> |

Source: field survey

### Annex 3

*Cost and benefit of poultry production including labor cost*

|                                                      | <i>Cost per year<br/>(in Birr)</i> | <i>Benefit per<br/>year (in Birr)</i> | <i>Profit per year (in Birr)</i> |
|------------------------------------------------------|------------------------------------|---------------------------------------|----------------------------------|
| <i>Respondent 1 (keeps 1 exotic-breed chicken )</i>  | 1370.0                             | 354.00                                | (-1016.00)                       |
| <i>Respondent 2 ( keeps 2 exotic breed chickens)</i> | 1606.0                             | 730.00                                | (-876.00)                        |
| <i>Respondent 3 (keeps 3 exotic chickens)</i>        | 1788.5                             | 1131.5                                | (-657.00)                        |
| <i>Respondents 4 (keeps 3 exotic breed chickens)</i> | 1715.5                             | 1134.5                                | (-581.00)                        |
| <i>Respondent 5 (keeps 4 exotic</i>                  | 1971.00                            | 1460.00                               | (-511.00)                        |

|                                               |                 |                  |                   |
|-----------------------------------------------|-----------------|------------------|-------------------|
| <i>breed chickens)</i>                        |                 |                  |                   |
| Respondent 7 ( keeps 4 exotic chickens)       | 1934.5          | 1428.5           | (-506.00)         |
| Respondent 8 ( keeps 4 exotic chickens)       | 1975.00         | 1450.00          | (-525.00)         |
| Respondent 9 ( keeps 5 exotic chickens)       | 2080.5          | 1741.5           | (-219.00)         |
| Respondent 10( keeps 5 exotic chickens)       | 2044.00         | 1 723.00         | (-221.00)         |
| Respondent 11 ( keeps 5 exotic chickens)      | 2098.8          | 1801.8           | (-219.1)          |
| Respondent 12 ( keeps 6 exotic chickens)      | 2135.3          | 2090.00          | 54.7              |
| Respondent 13 ( keeps 6 exotic chickens)      | 2153.5          | 2112.00          | 43.8              |
| Respondent 14 (keeps 7 exotic chickens)       | 2445.5          | 2395.00          | 109.5             |
| Respondent 15 (keeps 7 exotic chickens)       | 2482.00         | 2405.00          | 80.3              |
| Respondent 16 ( keeps 8 exotic chickens)      | 2,734.00        | 2,689.2          | 149.5             |
| <b>Total 70 chickens</b>                      | <b>30,534.1</b> | <b>24,646.00</b> | <b>(-4,893.3)</b> |
| Respondents 6 ( keeps 4 local breed chickens) | 1898.00         | 916.00           | (-766.5)          |

Source: field survey

## Annex 4

Cost and benefit of poultry production excluding labor cost

|                                                          | <i>Cost per year<br/>(in Birr)</i> | <i>Benefit per year<br/>(in Birr)</i> | <i>Profit per day (in<br/>Birr)</i> |
|----------------------------------------------------------|------------------------------------|---------------------------------------|-------------------------------------|
| <i>Respondent 1 (keeps 1 exotic-<br/>breed chicken )</i> | 237.3                              | 354.00                                | 116.8                               |
| <i>Respondent 2 ( keeps 2 exotic<br/>breed chickens)</i> | 381.00                             | 730.00                                | 349.00                              |
| <i>Respondent 3 (keeps 3 exotic<br/>chickens)</i>        | 520.00                             | 1131.5                                | 611.5                               |
| <i>Respondents 4 (keeps 3 exotic<br/>breed chickens)</i> | 536.00                             | 1134.5                                | 598.5                               |
| <i>Respondent 5 (keeps 4 exotic<br/>breed chickens)</i>  | 657.00                             | 1460.00                               | 803.00                              |
| <i>Respondent 7 ( keeps 4 exotic<br/>chickens)</i>       | 653.4                              | 1428.5                                | 775.2                               |
| <i>Respondent 8 ( keeps 4 exotic<br/>chickens)</i>       | 693.5                              | 1450.00                               | 756.5                               |
| <i>Respondent 9 ( keeps 5 exotic<br/>chickens)</i>       | 793.00                             | 1741.5                                | 948.5                               |
| <i>Respondent 10 ( keeps 5 exotic<br/>chickens)</i>      | 786.5                              | 1 723.00                              | 936.5                               |
| <i>Respondent 11 ( keeps 5 exotic<br/>chickens)</i>      | 803.00                             | 1801.8                                | 998.8                               |
| <i>Respondent 12 ( keeps 6 exotic<br/>chickens)</i>      | 908.9                              | 2090.00                               | 1,181.1                             |

|                                                      |                 |                  |                |
|------------------------------------------------------|-----------------|------------------|----------------|
| <i>chickens)</i>                                     |                 |                  |                |
| <i>Respondent 13 ( keeps 6 exotic chickens)</i>      | <i>912.5</i>    | <i>2112.00</i>   | <i>1199.5</i>  |
| <i>Respondent 14 (keeps 7 exotic chickens)</i>       | <i>1058.5</i>   | <i>2395.00</i>   | <i>1,336.5</i> |
| <i>Respondent 15 (keeps 7 exotic chickens)</i>       | <i>1076.8</i>   | <i>2405.00</i>   | <i>1,328.2</i> |
| <i>Respondent 16 ( keeps 8 exotic chickens)</i>      | <i>1,241.00</i> | <i>2,689.2</i>   | <i>1,448.2</i> |
| <b>Total 70 chickens</b>                             | <b>11258.4</b>  | <b>24,646.00</b> | <b>13387.8</b> |
| <b>Respondents 6 ( keeps 4 local breed chickens)</b> | <b>547.5</b>    | <b>916.00</b>    | <b>368.5</b>   |

Source: field survey

## Annex 5

List of NGOs and association implementing urban agriculture project with HIV/AIDS affected and/or infected households in Addis Ababa

1. Environmental Development Action (ENDA) - International NGO
2. Progress Integrated Community Development Organization (PICDO) - Local NGO
3. Welfare for the Street Mothers and Children Organization (WeSMCO)-Local NGO
4. Integrated Service for AIDS Prevention and Support Organization (ISAPSO) - Local NGO
5. Social Welfare Development Action (SWDA) – Local NGO
6. Community Based Development association (CBDA) - Association
7. Community Vision for development Association (CVDA) - Association
8. Emmanuel Development Association (EDA) – Association
9. Birhan Integrated Community Development association (BICDO) - Association
10. Plan Ethiopia Addis Ababa branch –Local NGO
11. Bio-economy Association- Local NGO
12. Miraf Hulegeb Yeketema Limat Mahiber (MHYLM)-Association
13. Hiwot HIV- Local NGO
14. Hiwot Ethiopia- Local NGO
15. L'esperance Children's Aid organization- Local NGO
16. New Life Community-Association
17. Bodi Food Association - Association
18. Marefia Children's Center- Association

## Annex 6

### QUESTIONNAIRE

Study on livelihood contribution of urban agriculture for HIV/AIDS affected and/or infected people

Survey Questionnaire

Confidentiality and consent

[Interviewer: Please read the following paragraph to the respondent and continue the interview only if the person consented to participate in this study]

Hello! My name is ----- I came from-----

----. I am a member of the data collector team undertaking data collection on the livelihood contribution of urban agriculture for HIV/AIDS affected and/or infected poor households. The purpose of the study is to critically examine the livelihood contribution of urban agriculture for HIV/AIDS affected and/or infected poor households in three sub-cities, namely; Yeka, Ledeta and Akaki.

Information for the study will be collected through individual interview, FGD and log book. I am asking you for a little of your time, not more than forty minutes, to help in this study. In the end it is hoped that the information you give us could help to know the real livelihood contribution of urban agriculture for you and your family and the study may provide information for other HIV/AIDS affected and/or infected households who do not involve in urban agriculture so far to engage in this activities and may convince other actors to participate in this program. I would greatly appreciate your help in responding to the interview. Your name will not be written on this form, and will never be used in connection with any of the information you tell me. Would you be willing to participate?

Agree \_\_\_\_\_ Disagree \_\_\_\_\_

Questionnaire Code Number \_\_\_\_\_

Region \_\_\_\_\_ Sub-City \_\_\_\_\_ Kebele \_\_\_\_\_ House No \_\_\_\_\_

Date of interview \_\_\_\_\_ Starting time \_\_\_\_\_ completing time \_\_\_\_\_

Name of data collector \_\_\_\_\_ Signature \_\_\_\_\_

Comments of supervisor:

1. Questionnaire completed \_\_\_\_\_ 2. Questionnaire incomplete \_\_\_\_\_

Name of supervisor \_\_\_\_\_ Signature \_\_\_\_\_

[Introduction for Interviewer: In almost all the questions just forward the questions as they are and circle or underline the option only when the respondent mentions it. Do not read the options or do not give hints. For some questions more than one answer are possible, probe and circle or underline all that mentioned].

#### I. BACKGROUND INFORMATION OF THE RESPONDENT

101. Sex 1. Male 2. Female

102. Age \_\_\_\_\_

103. Marital Status 1.Never married 2.Currently Married 3.Divorced 4.Separated 5.Widowed 6.

Other/ specify \_\_\_\_\_

104. What is your relationship with the head of the household 1.Householdhead 2.Spouse

3.Child 4.Sibling 5. Grand parent 6.Other relative 7.Non-relative 8.Other,

specify \_\_\_\_\_

105.Religion 1.Orthodox 2.Muslim 3.protestant 4.Catholic 5.Other/specify \_\_\_\_\_

106. Ethnicity 1.Oromo 2.Amhara 3.Tigrie 4. Gurage 5. Other/specify \_\_\_\_\_

107. Can you read or write? 1. Yes 2. No

108. If yes to question 107; what was the highest grade attained \_\_\_\_\_

109. How many persons including you permanently live in this house? \_\_\_\_\_

## II. ECONOMIC STATUS AND SOCIAL ISSUES

201. Current occupation 1. House wife (for female) 2. Daily laborer 4. Civil servant  
5. uniformed worker (Police/military) 6. Maid servant 7. Guard 8. Not working 9. Self  
employed (private business) 10. Other, specify \_\_\_\_\_
202. What are you're/ family's current main sources of income (circle all that apply: probe, more  
than one answer is possible)? 1. Monthly salary 2. income from petty-trading 3. income from urban  
agriculture 4. external aid 5. remittance 6. income from daily labor 7. incom from pension  
8. other/specify \_\_\_\_\_
203. How much is your household's monthly income, currently (in Birr) ----
204. Have ever been involved in urban agriculture activity? 1. Yes 2. No
205. If yes to question 204 since when-----
206. What was your income source before we practice urban agriculture? 1. Monthly salary  
2. income from petty-trading 3. income from urban agriculture 4. external aid 5. remittance 6. income  
from daily labor 7. incom from pension 8. other/specify \_\_\_\_\_
207. How much was your household's monthly income before you start urban agriculture activities  
(in Birr) -----
208. Your income from urban agriculture (in birr) -----
209. Do your income increased because of your involvement in urban agriculture activities? 1. Yes  
2. No
210. If yes to question 109; how much is the increase (in birr) -----
211. Approximately, how much money you save monthly due to your engagement in own  
production that could be allocated for purchasing food -----
212. Is there any able bodied working and income generating adult other than you in the family? 1.  
Yes 2. No

213. Is the house you live in your personal assets / or rented from individual or kebele? 1. Private house 2. rented from an individual 3. Rented from kebele 4. Others/ specify \_\_\_\_\_

214. If it is a rented house, how much do you pay per month (in birr) \_\_\_\_\_

215. How many rooms are there in your house? \_\_\_\_\_

216. Are floor of the rooms cemented or covered by plastic? 1. Yes, cemented 2. no, covered by plastic 3. Others/ specify \_\_\_\_\_

217. Do you have private kitchen/ not shared with others / which you can use to store, prepare, serve and eat food? 1. Yes, have private kitchen 2. No, I shared with others 3. Others/ specify- \_\_\_\_\_

218. Do you have durable goods like?

- |                         |              |
|-------------------------|--------------|
| 1. Bed                  | 1. Yes 2. No |
| 2. Working Radio/Tape   | 1. Yes 2. No |
| 3. Working TV           | 1. Yes 2. No |
| 4. Sofa                 | 1. Yes 2. No |
| 5. Tables, chairs, beds | 1. Yes 2. No |
| 6. Refrigerator         | 1. Yes 2.    |
| 7. Others/specify _____ | 1. Yes 2. No |

### III. HEALTH AND HIV/AIDS COMPONENTS

301. When did you identified your HIV status \_\_\_\_\_

302. How do you assess your health condition in the past few years, especially after you engage in urban agriculture activities? 1. Same 2. Deteriorating 3. Improving 4. Do not know

303. Have you ever disclosed your HIV status to any of the following? ((More than one answer is possible, probe for more answer and circle all that mentioned)

1. Spouse 2.Children 3.Relatives 4.Neighbors 5.Work mates 6. Friends 7. Not disclosed to any one 8.Others, specify\_\_\_\_\_

304. Is there any one who knows your HIV status from your neighbors or community members?

1. Yes, there are 2. No one

305. Have you ever take ARV? 1. Yes 2. No

306. Are you currently taking ARV? 1. Yes 2. No

307. If yes to question 304, when did you start to take ARV for the first time? Month \_\_\_\_\_  
Year\_\_\_\_\_

308. If yes to question 304 and question 305, can you describe your health condition after you initiated ARV?

1. Improved very well 2. Improved some how 3. No improvement 4. Don't know, because I didn't make Checkup 5. Others/specify \_\_\_\_\_

309. How do you describe your current health condition? 1. Good 2. Ok 3. Poor

310. Can you perform your day-to-day activity without any problem? 1. Yes 2. No

#### IV. URBAN AGRICULTURAL COMPONENT

401. When did you start urban agriculture activities? -----

402. for how long you practice urban agriculture activities -----

403. What makes you to start urban agriculture activities? -----

404. What do you think are benefits of practicing urban agriculture activities? (More than one answer is possible, probe for more answer and circle all that mentioned)

1. Help to obtain fresh; healthier and safer own food 2. Help to save money that could be allocated for purchasing food 3. Help to generate income from sale of the surplus products 4. Physical exercise 5.Others/specify\_\_\_\_\_

405. Have you ever been involved in urban agriculture training? 1. Yes 2. No

406. If yes, area of involvement 1.Production 2.Nutrition 3.Marketing 4.other specify-----

407. What type of urban agriculture activities you have been implementing? 1. Vegetable production 2. Fruit production 3. Poultry production 4. Shoat fattening 5. Beekeeping 6. Other specify----
408. Do you have space to practice vegetables and fruits cultivation? 1. Yes 2. NO
409. If yes area of land (in m2) -----
410. Do you have other alternative to practice vegetable production? -----
411. Where do you get water to practice urban agriculture? 1. From public tap 2. Own/privet tap 3. Buy from private tap 4. River water 5. Recycle household waste water 6. Other specify -----
412. Do your monthly water charge increase due to your involvement in urban agriculture activity?  
1. Yes 2. No
413. If yes, how much the increase (in birr) -----
414. Do conducting urban agriculture activities divert you from other income generating activities?  
1. Yes 2. No
415. If yes why?
416. If no why?
417. Where do get inputs to conduct urban agriculture? Like vegetable seeds, farm tools, poultry, shoat etc- -----
418. Labor requirement for horticulture crops for one production season (in hours)  
1. for seed bed preparation-----, 2. For planting -----, 3. Watering -----  
4. Weeding and cultivation -----, 5. harvesting -----, 6. for selling----- 7. For fencing -----  
-----, 8. other specify -----
419. Cost of inputs for one growing season (in birr) 1. Cost of fertilizers -----, 2. Cost of pesticides -----, 3. cost of seed -----, 4. Cost of fencing materials -----, 5. cost of water -----, 5. cost of farm tools, 6. Other specify -----

420. Daily labor requirements for dairy production (in hours)

1. for constructing house and fencing -----, 2. For feeding and watering -----, 3. For selling animals and animal products ----- 4. Milking ----- 5. for cleaning the barn ----- other costs -----

421. Daily labor requirement for bee keeping (in hours)

1. for cleaning and managing the hive ----- 2. For harvesting honey ----- 3. for selling honey ----- 4. for fencing 5. Other costs -----

422. Daily labor requirement for poultry production (in hours)

1. For constructing house and fencing -----, 2. For feeding and watering ----- 3. For selling chickens ----- 4. For cleaning the poultry house ----- 5. Other costs -----

423. Cost of inputs per day (in birr) 1. Cost of feed and water for sheep/ dairy cow/ poultry ----, 2. Cost of veterinary services for sheep/poultry/dairy cow -----, 3. Cost of poultry/sheep/ dairy cow/bee colony -----, 4. Cost of different utensils sheep/poultry/dairy cow -----, 5. Price of housing materials sheep/poultry/dairy cow -----, 6. Cost of bee hive ----- 7. Cost of beekeeping materials 8. Cost of protective materials for beekeeping ----- 9. Cost of utensils for beekeeping ---- 10. Other costs -----

424. Daily Labor requirement for sheep fattening (in hours)

1. For constructing house and fencing -----, 2. For feeding and watering ----- 3. For selling fattened sheep ----- 4. For cleaning the barn ----- 5. Other costs -----

425. For how many months or seasons you practice vegetable production per year

426. Where you sell your produce? -----

427. Do you think that vegetables, fruits. and animal consumption are important for PLWHA?

1. Yes 2. No 3. Don't know

428. Do you think that participation of PLWHA in urban vegetables and fruits production has good potential to enhance micronutrients of HIV infected persons and their families? 1. Yes 2. No 3. Don't know

429. Do you think that it is possible for PLWHA to cultivate and produce vegetables and fruits at their residential compound? 1. Yes, it is possible 2. No, it is not 3. Don't know

430. If 'no', why? (More than one answer is possible, probe for more answer and circle all that mentioned)

1. Lack of interest 2. Limitation of gardening space and water 3. Lack of knowledge 4. Lack of labor for cultivation 5. Lack of finance 6. Lack of seeds 7. Others/specify \_\_\_\_\_

431. Have you ever practiced some vegetables and fruits productions in your compound? 1. Yes 2. No

432. Do you currently produce any of vegetables and fruits at your residence? 1. Yes 2. No

433. What are the challenges you face while practicing urban agriculture activities?

#### V. SOCIAL COMPONENT

501. How is your social interaction and contact with your neighbors, relatives, friends, work mates, community etc., before your engagement in UA activities? 1. Have a good contact 2. Isolated or discriminated 3. Don't know

502. How is your social interaction and contact with your neighbors, relatives, friends, work mates, community etc., after your engagement in UA activities? 1. improved 2. Deteriorating 3. Same 4. Don't know

503. If the answer for question 502 is improved, why?

504. If the answer for question 502 is deteriorating, why?

505. How do understand your relationship and contact with your neighborhoods, family, relatives, work mates, friends, community etc., before you engage in urban agriculture activity? 1. Good 2. Ok 3. Bad 4. Do not know

506. How do understand your relationship and contact of with your neighborhoods, family, relatives, work mates, friends, community etc., after you engage in urban agriculture activity? 1. Improved 2. Deteriorating 3. Same 4. Do not know
507. If the answer for question 506 is improving why?
508. If the answer for question 506 is deteriorating why?
509. Have you experience stigma, isolation and discrimination? 1. Yes 2. No
510. How do assess stigma, isolation and discrimination after you engage in UA? 1. Improved 2. Deteriorating 3. Same 4. Do not know
511. If the answer for question 510, is improving why?
512. If the answer for question 510, deteriorating why?

### **Checklist for lead vegetable growers/contact gardeners**

- How do you assess your health condition after your engagement in urban agriculture activities?
- What do you think are benefits of urban agriculture?
- Do PLWHA households participate in urban agriculture activities?
- Do practicing urban agriculture activities create conflicts with neighborhoods, house renters, etc?
- Do practicing urban agriculture activities possible to PLWHA?
- What are the major challenges facing PLWHA urban farmers?
- Do practicing urban agriculture activities have negative impact on the health of PLWHA?
- Does urban gardening contribute in enhancing social contact and relationship with neighbors, relatives etc
- Do the neighborhoods refused to buy the produces of PLWHA urban farmers
- What are the social benefits of urban gardening?
- What is the trend of PLWHA urban gardeners in using recycled waste water to irrigate their vegetables?
- Is it possible to conduct urban agriculture activities while residing in rented house?

What is the trend of PLWHA urban gardeners in using container gardening?

**Checklists for organizations implementing urban agriculture projects with HIV/AIDS affected and infected households**

Why you involve more female PLWHA than male PLWHA?

Trend of PLWHA urban gardeners in using recycled water to irrigate their vegetables

Why PLWHA urban farmers' involvement in dairy production, sheep fattening and beekeeping is low?

What do you think are benefits of urban agriculture?

Social benefits of urban agriculture

Do practicing urban agriculture activities possible to PLWHA?

Does a vegetable production alone bring change of the livelihood PLWHA?

**Chick lists for Addis Ababa city administration urban agriculture department staffs and PLWHA sheep fattener, dairy cow owner, beekeeper and poultry producers**

Do practicing urban agriculture activities possible to PLWHA?

What do you think are benefits of urban agriculture?

Why PLWHA urban farmers' involvement in dairy production, sheep fattening and beekeeping is low?

Why the involvement of male PLWHA in urban agriculture is low?

Does urban gardening contribute in enhancing social contact and relationship with neighbors, relatives etc?

For how many years a sheep and cow barn give service

For how many season or year agricultural tools give service

For how many years a bee colony, beehive and beekeeping equipments and utensils provide service

For how many years a cross-breed cow gives milk

For how many years exotic breed chicken gives egg

For how many years local breed chicken gives egg

Number of years poultry house give service

Benefits of container gardening

Challenges of urban agriculture

### **Checklists for HIV/AIDS desks**

Benefits of urban agriculture for PLWHA

Does urban gardening contribute in enhancing social contact and relationship of PLWHA with neighborhoods?

Do practicing urban agriculture activities have negative impact on the health of PLWHA?

How do you see urban agriculture in connection with HIV/AIDS?

## Annex 7

Daily Register format , mounth \_\_\_\_\_, year\_\_\_\_\_this form filled by beneficiary(Log book/sheet)

[illegible]

Name and signature of respondents\_\_\_\_\_

Supervisor name and signature\_\_\_\_\_

# Annex 8

Daily Register format , month \_\_\_\_\_, year \_\_\_\_\_ this form filled by beneficiary(Log book/sheet)

|                                          |                          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|------------------------------------------|--------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| amount produced per day                  | Milk (liters)            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | beef (KG)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | shoat meat (KG)          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | eggs (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | poultry meat (KG)        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | honey (kg)               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | others                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| animal products consumed per day         | beef (KG)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | shoat meat (KG)          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | poultry meat (KG)        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | eggs (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | milk (liters)            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | honey (kg)               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Others                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Animals and animal products sold per day | beef (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Beef meat (KG)           |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Fattened shoat(kG)       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Fattened Shoat Meat (KG) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | eggs (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Poultry (No)             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | honey (kg)               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | milk (liters)            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | others                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Income gained in birr                    | beef (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Fattened shoat(kG)       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Fattened Shoat Meat (KG) |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | eggs (No)                |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | Poultry (No)             |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | honey (kg)               |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | milk (liters)            |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          | others                   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                          |                          |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

Name and signature of respondents\_\_\_\_\_

Supervisor name and signature\_\_\_\_\_

## Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Declared by:

  
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Candidate

Confirmed by:

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