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KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT LOCAL ENVIRONMENTAL SANITATION RELATED TO HEALTH ADDIS KETEMA SUB CITY, ADDIS ABABA CITY (HOUSE HOLD SURVEY)

BY

CHERU FRANCIS

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Cheru Francis

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ACRONYMS

AAU	Addis Ababa University
AIDS	Acquired Immune Deficiency Virus
HIV	Human Immuno Deficiency virus
GHG	Green House Gases
IER	Institute of Educational Research
MOH	Ministry of Health
FMOH	Federal Ministry of Health
USGS	United States Geological Survey
WHO	World Health Organization
KAP	Knowledge, Attitude, Practice
HSDP	Health Sector Development Program
FDRE	Federal Democratic Republic of Ethiopia
WHO	World Health Organization
MDG	Millennium Development Goal
GA	General Assembly
IYS	International Year of Sanitation
KMWI	Kenyan Ministry of Water Irrigation
GTZ	German Technical Cooperation
MA	Millennium Ecosystem Assessment
SWM	Safe Waste Management

WEEE	Waste from Electrical and Electronic Equipment
BMW	Biodegradable Municipal Waste
EU	Europe
OAU	Organization of African Union
ECA	Economic Commission for Africa
UNDP	United Nations Development Program
UNICEF	United Nations Children and Education Fund
UNHCR	United Nations Human Right
FAO	Food Agricultural Organization
MCDP	Multi Purpose Community Development Project
CCF	Christian Children's Fund
NGOs	Non Governmental Organizations

ABSTRACT

Three billion people in the world are without proper sanitation today, and around 50% of wastes lie uncollected, polluting the environment and endangering health.

The purpose of this thesis was to assess the Knowledge, Attitude and Practice of residents about local environmental sanitation related to health, Addis Ketema Sub-City, Addis Ababa Town

A community wide descriptive cross sectional study was conducted in the selected kebeles of Addis Ketema Sub-City on a sample of 374 residents. Knowledge, Attitude and Practice was assessed by pre-coded, pre tested structured questionnaire. In addition data were collected using open ended questions and observation check list. Data were collected after getting both written and verbal consent from concerned bodies such as officials of the sub-city and the study subjects. Data was analyzed using SPSS version 15.0 statistical software.

The cumulative knowledge, practice and attitude of the respondents towards local sanitation were computed. Those who have good knowledge accounts (16%). On the other hand those respondents who have good practice and good attitude were (7.8%) and (15.8%) respectively. An association was done between cumulative knowledge and practice of respondents using Chi- square test. The test result showed that there is significant association (x^2: $p<0.05$) between the cumulative knowledge and practice which probably be the gap that exists between their knowledge and practice level. The result also shows that the attitude of the respondents is better than their practice.

Even though the awareness and attitude level of residents is relatively better than their practice, the cumulative knowledge, attitude and practice of the community is lower than expectation. Further research using a large sample size is required. In line with improving local environmental sanitation, intensive environmental health education about the risk of improper waste disposal to health should be given to the community. Lack of facilities to dispose and transport solid waste is found to be very low and critical. Therefore, collaboration is required between different stake holders to reduce the problem.

***Key words**: Sanitation, wastes, Knowledge, Attitude and Practice*

CHAPTER ONE

INTRODUCTION

1.1. Background

Historically, environmental health concerns have focused on toxicological or microbiological risks to health from local exposures. However, the scale of environmental health problems is increasing and various larger-scale environmental hazards to human population health have begun to appear (WHO, 2003).

Environmental health is an important component of public health. Many serious environmental health problems arise at the local or community level. The process of solving these problems can benefit from the wisdom of local residents as well as from the knowledge of professionals who are involved with these investigations (WHO, 1995).

Worldwide, billions of people lack access to basic Sanitation facilities and to this day, sub-Saharan Africa remains the main focus of concern. The UN Monitoring System states that only 37% of people living in sub-Saharan Africa had access to basic Sanitation in 2004, compared to a global average of 59%. Somewhere in the world, every fifteen seconds, a child dies of diarrhea, a total of two million children a year. At least 2.6 billion people still have no access to sustainable, basic Sanitation worldwide. Moreover, these problems are likely to increase in sub Saharan Africa as the process of urbanization is moving at a rate that exceeds the ability of most governments to expand infrastructure and social benefits. Even though these facts are well-known amongst experts, sanitation has still not risen to the top of the political agenda. (EARC, 2007).

Three billion people in the world are without proper sanitation today, and around 50% of wastes lie uncollected, polluting the environment and endangering health. The Sanitation situation is particularly critical among the urban poor and the region is likely to miss the MDG target of halving the proportion of people without sustainable access to basic sanitation by 2015 unless awareness can be raised dramatically and investment increased between now and 2015. The urgent need to accelerate access to Sanitation is more than obvious. (EARC, 2007).

Many of the MDGs are not achievable without sustainable Sanitation and hygiene education. Recognizing the impact of Sanitation on public health, poverty reduction, environment and economic and social development, the General Assembly of the United Nations (GA) declared 2008 an International Year of Sanitation (IYS) in order to raise awareness of the importance of Sanitation. The GA expressed its concern at the slow and inadequate progress made in achieving the global Sanitation target, and stated that progress should be made through active commitment and action by all stakeholders. (Ibid).

Cities have historically been associated with the evolution of ideas of public health and practice. The modern public health revolution began in European cities in 19th century where, under the pressure of industrialization, poverty, crowding and the break down of traditional ways of living, the conditions of daily life had deteriorated for most people. There is a contemporary relevance to this historical account: the failure of many large cities in low income countries to implement similar changes has left them with problems of environmental blight, inadequate housing, poverty and disease. (Szreter, 1997).

Addis Ababa is, the capital city of Ethiopia , with a population of about 3 million people is located at the center of the country and is the largest and

as well as the dominant political, economical , commercial, and industrial center of the country. It has an area of 540 Sq km of which 18 Sq km are rural. It lies between 2000 and 2800 meters above sea level. The environmental pollution due to solid waste has continued to plague the city at an increasing speed due to dumping of solid waste from house hold, commercial and industrial sources.

Addis Ketema Sub City is one of ten Sub Cites of Addis Ababa town bordered by Gulele SubCity in North, Lideta Sub City in south, Kolfe Keranio Sub City in west and Arada Sub City in the east. The total population of Addis Ketema Sub City is 348,063. Currently there are nine administrative kebeles in Addis Ketema Sub City.

It is common to observe or see urine, feces, and refuse indiscriminately disposed in the immediate neighborhood, open spaces and recreational areas in Addis Ababa particularly in Addis Ketema Sub City, which may be related with having the biggest market and the biggest bus station in the nation, low level of consciousness, poor attitude and taking no action to bring change in particular local and home environment. This thesis therefore tried to determine the level of knowledge attitude and practice of household heads in Addis Ketema Sub City, Addis Ababa.

1.2. Statement of the Problem

Currently Sanitation is becoming one of Global issues and addressed in the Millennium Development Goals. Many studies have identified that poor sanitation has risk for human health. Public health problems caused by environmental contamination and emerging infectious diseases are a growing concern worldwide. These public health threats are affected by the relationship between people and the physical, chemical, and biological nature of our natural environments. Population growth and the associated pressures of development are increasing the difficulties associated with sustaining

effective public health practices and policies. Vector-borne and zoonotic diseases, water contamination, airborne contaminants, bio accumulative contaminants in the food chain, and environmental threats to public health in the world require scientific knowledge and know-how to develop new solutions. Understanding environmental and ecological health is a prerequisite to protecting public health (USGS, 2006).

Organized data on environmental health conditions in Ethiopia are scanty. However, some studies, reports and experiences indicate that environmental health situation is very poor, thus attributing to the occurrence of 60-80 per cent of the, communicable diseases arising from lack of basic environmental health services. They are the major causes of mortality, morbidity and disability, especially among infants and children. These diseases can easily be prevented or controlled through provision of safe and adequate food and water supplies, safe and adequate human and other waste disposal systems, vector control, promotion of personal, family, neighborhood and community hygiene and sanitation (MOH, 1997)

Communicable diseases attributable to poor sanitation, and which principally affect the underprivileged sections of the population, are still considered as major health problems in Ethiopia. Despite a relatively long history of environmental health activities in the country, their service provisions in the field are so far not up to expectations. (Abera Kumie and Ahmed Ali, 2005).

Communicable diseases are considered as major causes of morbidity and mortality, as well as disability in Ethiopia. The high prevalence of communicable diseases in the country is linked to the poorly developed socio-economic and environmental factors that have been inherent for centuries. Seventy five percent up to eighty percent of the disease burdens in Ethiopia are assumed to be preventable using measures like improving environmental health status and nutritional interventions. Environmental

health activities in Ethiopia are maintained and used as a means to control diseases and promote health during periods of "Basic Health Service Provision during 1950-1960's", and Primary Health Care (PHC) during the 1970-90's, and currently in the Health Sector development Programmes. Nevertheless, significant improvement in sanitation status could not be achieved due to the prevailing and sustained minimal outcomes given available resources. (Abera Kumie and Ahmed Ali, 2005).

Rapid urbanization is expanding the traditional role of cities as gateways for infections. Crowding and unsanitary conditions are important amplifiers of the transmission of infectious diseases: many infectious diseases thrive where there is a lack of water, and inadequate drainage, sanitation and solid waste removal. Population movement from rural areas into cities and greater mobility within cities are bringing new opportunities for otherwise marginal and obscure microbes. (Ibid).

Large Cities in the least developed countries typically combine the traditional environmental health problems of poverty, particularly respiratory and enteric infections, with those of poor quality housing and unregulated industrialization. Residents there fore are often at risk from diseases and injuries associated with poor sanitation, unsafe drinking water, dangerous roads, polluted air, indoor air pollution and toxic wastes. The United Nations centers for Human settlements, 1996 has written that "the deterioration in the built environment is sharply in evidence through out most of Urban Africa countries. (UNCHS, 1996) Statistically it has been indicated that 30% of the nation's(Ethiopians) urban population, an average of 58% of the establishments, 62% of the employment, 61% of the output and 79% of the fixed assets of the country are located in Addis Ababa (WEDC, 1999).

On the other hand, lack of proper, adequate and organized infrastructures, as well as poorly organized administrative systems have fueled and worsen the delivery of an efficient, equity, accessible and affordable, social services

for the city of Addis Ababa. For example the sewerage system of the city is not adequate to cover the whole Addis Ababa. Moreover, most of the available sanitation facilities did not serve the intended purpose, and are rather seen acting as source of health risk, as a result of poor design and maintenance (ECSA, 1991).

Unlike developed countries where industry waste is a headache, in Ethiopia, particularly in Addis Ababa, households (76%) contribute the lions share of solid waste, followed by commercial establishments and industries. They jointly contribute 14 % of the total solid waste. Four percent of solid waste in the city comes from streets. Thus solid waste is the major obstacle for Addis in particular and other towns and cities in general (Alebel and Dawit, 2006)

Solid waste is an element of environmental pollution, which, in turn, is the contamination of air, water and soil by materials that interfere with human health, the quality of life and nature. From this perspective the enormous solid waste littering Addis Ababa is one of the major areas of apprehension. Indeed it is one of the major public nuisances and the causes of morbidity in the city. For instance the report of Region 14 Health Bureau, compiled from the data obtained from 15 health centers for 1991, indicated that two of the leading top-ten causes of morbidity in the city were acute upper respiratory diseases and infections of skin and subcutaneous tissues. These accounting for one-third of the total out patients. This demonstrates the effect of environmental sanitation on the health of residents. Although this is appreciated by Region 14 Administration, practical solution seem still wanting for progress in this area is rather sluggish. There is an enormous task both for researchers and practitioners to tackle the problem.(Beyene Geleta, 1999).

Like any other cities of developing countries, Addis Ababa exhibited high rate of population growth, low income status, low level of education, and poor personal hygiene, and improper waste disposal practice, lack of the supply of

safe adequate water as well as inaccessibility of efficient health care delivery systems. Studies have shown that most of the health care organizations in Addis Ababa are not adequately staffed and equipped with the necessary medical supply and sanitary facilities in response to the health problems of the population (Beyene Geleta, 1999).

Some of the major causes for the high morbidity and mortality rate is found to be inaccessibility to sanitation facilities, namely safe and adequate water supply, toilet, waste disposal places , clean and adequate housing, etc. This prevailing situation more or less reflects and applies to the existing sanitation condition of Addis Ababa. It is also noted that the population of Addis Ababa keeps growing at alarming rate from time to time due to the increase of fertility and migration. Statistically, the population growth rate per annum was 3.79% of these 2.97% have been due to migration 0.82% due to natural increase (birth rate minus death rate). Where as, the increase and development of health facilities is gradual, leading to a disparity between demand and supplies. (Addis Ababa Health Office, 2000)

It has been noticed also, rapid and massive population growth, and the increase of industrialization, transportation, energy production, commercial, institutions, and domestic activities, are the root causes for over crowding, congestion, traffic accidents, the pollution of air, water and land. As these activities continue to advance and develop, the demand for additional sanitary facilities, (toilet, washing facilities, clean room, and adequate water supply) as well as the demand for efficient, equity, sustainable, and accessible health services increases. (Beyene Geleta, 1999).

Improper dumping practices of any type of waste are the causes for the proliferation of insects, mosquitoes, rodents and vermin. Hence, the proper handling, storage and disposal of these wastes are important for the control of infections, growth of rodents, insect population, odors and unsightly

conditions of environments. The proper management of wastes, the accessibility of the supply of adequate safe water, toilet facilities and other facilities such as personal hygiene are the key issues that should be addressed so as to ensure the maintenance of healthy, sound, and entertaining environment to the community. Based on preliminary observation made by the researcher the sanitation problems mentioned above particularly solid waste which overwhelm the Sub-City's street, rivers , home compounds and other areas seems more prominent in Addis Ketema Sub-City which might probably be having the biggest Market (Merkato) and the Biggest Bus station (Tiliku Menaheria) both in the Nation. This deposition of wastes everywhere could affect health by increasing morbidity and mortality rate of the community which could in turn pose crisis to the economic and environmental welfare of the community. Knowing the sources and the composition or the type of waste will facilitate the proper collection, storage, transport and disposal of each waste without causing any damage to human health and the environment.

According to K Kaliyperumal, 2004 "KAP" study measures the Knowledge, Attitude and Practices of a community. It serves as an educational diagnosis of the community. Before beginning the process of creating awareness in any given community, it is first necessary to assess the environment in which awareness creation will take place. Conducting a "KAP" study can best do this?. "KAP" study tells us what people know about certain things, how they feel and also how they behave. The Knowledge possessed by a community refers to their understanding of any given topic. Attitude refers to their feelings towards this subject, as well as any preconceived ideas that they may have towards it. Practice refers to the ways in which they demonstrate their knowledge and attitude through their actions. Therefore this study tried to assess the level of knowledge, attitude and practice of household heads about local environmental sanitation related to solid waste disposal and its association to health in Addis Ketema Sub City.

1.3. Objective of the Study

1.3.1. General Objective

To assess the Knowledge, Attitude and Practice of residents about local environmental sanitation, particularly related to solid waste and its association to health

1.3.2. Specific Objectives

1. To assess knowledge of residents about solid waste disposal related to health.
2. To assess attitudes of residents about solid waste disposal related to health
3. To identify measures taken by the residents to dispose solid waste and maintain their health
4. To provide appropriate conclusion and recommendation based on the findings/information collected from residents.

1.4. Significance of the Study

To date, in Ethiopia there have been very few studies conducted that have assessed "KAP" of the community related to sanitation problem. The city is suffering from migration to, which could aggravate the problem particularly Addis Ketema Sub-City where the biggest bus station and business area in the nation are located. This study being one of few studies done to assess "KAP" of the community; it will provide information on level of knowledge, attitude and practice of residents about sanitation particularly related with solid waste disposal system and its association with health. It can also be used as information by other bodies who are responsible so that to forward possible solutions to the management of the problem. It can also be used as baseline information for other researchers.

1.5. Delimitation and Limitation of the Study

The study is delimited to selected kebeles of Addis Ketema sub-city. Sanitation includes several aspects such as personal hygiene, liquid and solid waste disposal and others. In addition sanitation problem is also common in other sub-cities of Addis Ababa. It is also a problem both in urban and rural areas of Ethiopia. However, this study focuses on assessing "KAP" of community limited to solid waste disposal system to a single sub-city of Addis Ababa city. There fore the research would have been more comprehensive and conclusive if it had been carried out either at all sub-cities of Addis Ababa city or more preferably at national level. The limitation to a single sub-city at Addis Ababa city is due to many factors such as financial and time constraints.

1.6. Definition of Terms

The environment: is the collective term used to describe all the living and non –living things that make up our surroundings. This includes the biological, physical, cultural and social, economic and political environment. (Wood C. H et al (1981)

Environmental health: according to Corburn, (2006), is the branch of public health that is concerned with all aspects of the natural and built environment that may affect human health. Other terms that refer to the discipline of environmental health include environmental public health and environmental health and protection.

What exactly is sanitation?: One definition of sanitation is the "safe interaction with human excreta". This suggests the use of facilities to safely manage and dispose of human excreta, enabling dangerous pathogens to be kept away from human contact either directly or indirectly through food, water, or the environment (air, animals, etc.).

This then should lead to a healthy environment and higher quality of life. On a wider level, sanitation also involves the issues of management (collection, treatment and disposal) of solid and liquid wastes generated in the village (Kamal K. 2004).

Ecology: is the study of interrelationships between individual organisms, and between organisms and their environment (free Encyclopedia, 2008).

Biodiversity: The word biodiversity is often used to describe all the species living in a particular area. If we consider this area at its largest scale - the entire world - then biodiversity can be summarized as "life on earth." However, scientists use a broader definition of biodiversity, designed to include not only living organisms and their complex interactions, but also interactions with the abiotic (non-living) aspects of their environment. Definitions emphasizing one aspect or another of this biological variation can be found throughout the scientific and lay literature.

Ozone layer: A region of the stratosphere, between 15 and 30 kilometres in altitude, containing a relatively high concentration of ozone.

CHAPTER TWO

REVIEW OF LITERATURE

2.1. Environmental Health and Sanitation

Environmental health problems may be placed into two broad categories: those due to lack of development, and those resulting from the development process itself. The problems are not contained by national frontiers. Some elements in the environment of one country can present a hazard for the health situation in other. For example, diseases and health problems can spread from one country to another simply through transpiration of food; sewage and industrial effluent may pollute the sea, producing health hazards on bathing beaches and adverse effects on fisheries common to neighboring countries; rivers which flow from one country to another or from boundaries between two countries may cause major environmental problems if polluted; and, due to the movement of air over vast areas, air-borne contaminants can be conveyed from country to country . However, environmental heath is generally neglected by both politicians and health professionals and has so far remained a weak component of health care system (MOH, 1997).

In environmental health, the indicators that are most relevant are those that represent the link between environment and health. This link can be looked at in two ways: 'backwards' from health to environment, or 'forwards' as the link from environment to health. The former focuses on the environmental contribution to the health outcome of concern; the latter considers the potential risks to health from exposures to a specific environmental hazard. (Briggs D.2003).

Around the world, concerned community members are demanding a greater role in the scientific research and decision-making processes that impact

their health and well-being. In recent decades there has been a widespread concern about sustainability of the environment and all of its ramifications. The global concern about sustainability arose as a result of increasing environmental degradation. The concern about pollution and deterioration of environmental quality has been building momentum to various environmental movements. (Corburn J., 2007).

Developing countries face increasingly serious environmental problems that threaten efforts to improve the standard of living and worsen health conditions. In cities, increased congestion, industrial expansion, and lack of pollution control result in unhealthy levels of pollutants in air and water. (Rosemary D. Ebong 2002).

Environmental health problems that Ethiopia faces are those emanating from both under development and adverse consequences of developments, it is moving to situations of advanced pollution problems before control over the traditional pollution sources is achieved. Complex problems evolving from modern development schemes such as population growth, urbanization, industrialization, modernization of commerce and trade, mechanization of agriculture, uncontrolled use of agro-chemicals, mining, etc. are emerging. (MOH, 1997).

Environmental hazards are responsible for about a quarter of the total burden of disease worldwide, and nearly 35% in regions such as sub-Saharan Africa. As many as 13 million deaths can be prevented every year by making our environments healthier. In 23 countries worldwide, more than 10% of deaths are due to just two environmental risk factors: unsafe water, including poor sanitation and hygiene; and indoor air pollution due to solid fuel use for cooking. Around the world, children under five are the main victims and make up 74% of deaths due to diarrheal disease and lower respiratory infections (WHO, 2007).

The lack of adequate sanitation has been recognised as an important factor in the poor health and morbidity of people in developing countries. While statistics vary, it is generally agreed that far too many children die in these countries due to poor sanitary conditions and unsafe hygiene practices. The issue of sanitation is an important but often neglected issue in the field of development. The effects of poor sanitary conditions and bad hygiene practices are many. Various estimates suggest that poor sanitation is responsible for approximately 30% of the incidence of diarrhoea. Poor sanitation is also linked to other diseases such as cholera and typhoid. Such diseases results in increased expenditure on medical bills, loss of productivity for the household, etc. and further degradation in terms of the quality of life (Kamal K. 2004).

2.2. Health-Environment Nexus

The world has through its multi-lateral environmental agreements, adaptation activities and sustainable livelihood tried to identify the synergies between health and development. The lack of responses addressing inter linkages of health, environments and development in certain instances has led to conflicting goals between policies at local, national, regional and international levels. However, since health is a catalyst of environmental problems and hence development, it is necessary to consider health and development in the context of their roles in promoting, facilitating and implementing integrated responses to addressing challenges of development, therefore the need for strengthening inter-sector collaboration for health and development. (Lewis J., 2006).

Over the decades, the environments and health nexus has remained much the same. But many man-made factors have risen in prominence and impact, including air, water, and soil pollution; the influence of industrially produced chemicals in consumer items (such as plastics) as well as drugs and

chemical residues in food. Most recently, the Millennium Ecosystem Assessment (MA) has comprehensively studied the consequences of the profound changes that human intervention has brought to the planet's ecosystems and climate. The result has never being better since man's quest for and participation in development has resulted into much health related issues. (Leitner, 2005)

Protecting health is the principal objective of protecting the environment. The vast majority of environmental policies and regulations worldwide are motivated by public-health concerns, and most economic valuation exercises have found that health impacts constitute the largest portion of environmental damages. It has long been recognized that the environment in which people live from the household to the global level significantly affects their health. Until recently, however, it was not possible to quantify the magnitude of health impacts from exposure to various environmental factors. Nor was it possible to compare the cost-effectiveness of preventive measures to reduce such exposure with health-sector activities that cure the resulting illnesses. The opportunity to do so emerged from work on the "global burden of disease," which uses a standardized measure of health outcomes across various causes of illness and death (Lvousky, K. 2000a).

It has long been recognized that the environment in which people live from the household to the community to the global level significantly affects their health. Every year in developing countries an estimated 3 million people die prematurely from water-related diseases and 2 million people die from exposure to stove smoke inside their homes. The largest proportion of these deaths are among infants and young children, followed by women, from poor rural families who lack access to safe water, sanitation and modern household fuels. Over 1 million people die annually from vector-borne malaria, with the vast majority of deaths in poverty-stricken Africa. Another

million people die from air pollution in the urban environment, and there is a reason to believe that here too the poor suffer most. (Lvousky, K. 2000b).

Thus environmental health is yet another dimension of the multi-faceted nature of poverty. The links between poor environmental health and other dimensions of poverty are complex and multiple, reinforcing each other in various ways. Poor people typically face greater environmental health risks in their surroundings because they live in unhealthy locations such as low lying and marginal lands and lack basic infrastructure services, like clean water and sanitation. (Ibid).

They are more vulnerable because they are less able as a result of insufficient education and information, daily drudgery and hardship to adjust their behavior to moderate their exposure. Additionally, they are the most susceptible to the effects of such exposures because of the simultaneous effect of several factors, such as exposure to indoor smoke and water-borne pathogens, exacerbated by malnutrition and inadequate health care. (Ibid).

By the 1980s, 40 per cent of the world's population was living in urban areas. Most of them live in developing countries, and projections for 2025 indicate that four out of every five urban residents in the world will be in developing countries. In theory, living in urban centers offers great potential gains, such as health benefits. However this theory is broken by the reality that the urban poor or poverty and its ramifications in the developing world. An estimated 30 - 70 per cent of the urban population in developing countries live in extreme poverty (Gobar Times 2002).

Environmental health basically refers to those aspects of human health, including quality of life, that are determined by physical, biological, social, and psychosocial factors in the environment Most causes of disease, injury, and death in developing countries lie outside the purview of the health sector. They cover a broad spectrum, ranging from physical factors such as

inadequate sanitation, water, drainage, waste removal, housing, and household energy to behavioral factors such as personal hygiene, sexual behavior, driving habits, alcoholism, and tobacco smoking. (Lvovsky, K. 2000c)

2.3. Health Environments Interface

Environmental hazards/ecosystem degradation is a root cause of a significant health burden. It is the major cause of 25% of the burden of disease globally and out of 35% of disease burden in very poor regions such as sub-Saharan Africa. (WHO, 1995).

In many developing countries unsafe water kills 1.7 million, the result of mostly diarrhoeal diseases. Emissions from indoor smoke from solid fuels kills 1.6 million people in sub-Saharan Africa. This definitely is a deforestation related issue. (Twisuk Punpeng 2004).

Population pressures related to growth and migration to urban areas has resulted in high dependency ratio and its attending pressures on natural resource use. Social amenities and infrastructural facilities have become inadequate as a result of such explosion in population. Grassroots awareness illness may be seen fatalistically. Basic livelihood needs are a first priority, and links between health, environment and economic wellbeing are not well perceived. It is also justifiable since the physiological need should be perceived prior to environmental security hence the loose end becoming the health of the people (Twisuk Punpeng 2004)

Environmental health risks, therefore, can be grouped into two broad categories. Traditional environmental hazards affect developing countries and the poor most. Their impact exceeds that of modern health hazards by a ratio of 10 for Africa, 5 for Asian countries, and 2.5 for the Middle East. Water-borne diseases, caused by inadequate water supply and sanitation, impose

an especially large health burden in the African, Asian and Pacific regions. In India alone, more than 700,000 children under five years old die annually from diarrhoea. More than half of the world's households use unprocessed solid fuels, particularly biomass (crop residues, wood and dung) for cooking and heating in inefficient stoves without proper ventilation, exposing people mainly poor women and children to high levels of indoor air. (Twisuk Punpeng, 2004).

In Africa alone, malaria is responsible for about 800,000 deaths annually. A study of environmental health in the Indian state of Andhra Pradesh found that the burden of disease from traditional risks falls disproportionately on the poorest 40 per cent of all households. At the same time, environmental health outcomes show significant variations that cannot be simply explained by a household's economic status, and hence reflect indicators of human development other than income measure alone (Lvovsky, K. 2000c)

Aside the negative implications of poor environmental management, it is important not to confuse environmental hazards and environmental degradation. Most of the urban poor face very serious environmental hazards in their homes and their surrounds and in their workplaces. Such hazards cause ill health, injury, and premature death, contributing significantly to urban poverty. However, most environmental hazards do not cause environmental degradation. For instance, the inadequacies in provision for piped water, sanitation and drainage often means serious problems with insect borne diseases such as malaria and dengue fever but these do not degrade any environmental resource. The small makeshift homes in which so many urban poor live make accidents a common cause of serious injury or premature death, and present serious environmental hazards but do not cause environmental degradation (Gobar Times, 2002).

The environment -health nexus emphasizes that improvements in people's health require a holistic, multi-sectoral approach to mitigating major risks by

integrating cost-effective efforts in infrastructure and human development areas, and by building effective institutions at all levels of governance, including in the communities themselves. A holistic approach is particularly important for improving the health of the poor, who are most vulnerable both to the main environmental hazards and to deficiencies in health service delivery. The World Bank environment Strategy developed in extensive consultation with various stakeholders in client countries, other donors and international non-governmental organizations considers environmental health a top priority and calls for a greater focus on this principal development outcome in Bank operations across all relevant sectors (Lvovsky, K. 2000c).

2.4. The Environment-Poverty Nexus

Since environmental sustainability is a key dimension of sustainable development and poverty reduction is the core of the Millennium Development Goals (MDGs), in order to properly understand the sustainable development-MDG linkage, it is essential to grasp the environment-poverty nexus (Brockles by et al, 2001).

2.5. Relationships between Environment and Poverty

The environment-poverty nexus is a two-way relationship. Environment affects poverty situations in three distinct dimensions: by providing sources of *livelihoods* to poor people, by affecting their health and by influencing their vulnerability. On the other hand, poverty also affects environment in various ways: by forcing poor people to degrade environment by encouraging countries to promote economic growth at the expense of environment, and by inducing societies to downgrade environmental concerns, including failing to channel resources to address such concerns. Environment matters a lot to poor people. Their well-being is strongly related to the environment in terms of, among other things, health, earning capacity, security, physical

surroundings, energy services and decent housing. In rural areas, poor people may be particularly concerned with their access to and control over natural resources, especially in relation to food security. For poor people in urban areas, access to a clean environment may be a priority. Prioritization of environmental issues may vary across different social groups. For example, poor women, reflecting their primary role in managing the household, may regard safe water, sanitation facilities, and abundant energy services as crucial aspects of well-being for poor people. Some of the environmental degradation reflects truly global concerns, such as global warming and the depletion of the ozone layer. Some is international, like acid rain, the state of the oceans, or the condition of rivers that run through several countries. Some is more localized, though it may often occur worldwide, like urban air pollution, water pollution, or soil degradation. Even though poor people also feel the impact of global environmental degradation, it is local environmental damage that affects the lives of poor people more. (Banuri, Tariq. 1998 and Brocklesby et.al.2001).

The impact of environmental degradation is unequal between the poor and the rich. Environmental damage almost always hits poor people the hardest. The overwhelming majority of those who die each year from air and water pollution are poor people. So are those most affected by desertification and by the floods, storms and harvest failures brought about by global warming. All over the world, it is poor people who generally live nearest to dirty factories, busy roads and dangerous waste dumps. The loss of biodiversity is most severe for poor rural communities. Environmental degradation, by depleting the health and natural support systems of poor people, may make them even more vulnerable. (Brocklesby et al 2001).

Box 1 below provides some quantitative estimates of the human impact of environmental degradation in the developing world. Because of the nature of the degradation, it is poor people in general who bear the brunt of this

impact and with the poorest bearing the hardest burden. Impoverishment pushes them to the most ecologically fragile lands; they are at the bottom of the energy ladder and they are nearest to toxic dumps. Women also bear a disproportionate burden. Since mostly women and girls in developing countries stay indoors for cooking and other household work, they constitute 80% of the 1.8 million deaths from indoor pollution. The effect of biodiversity loss is the most severe for indigenous people, as they depend more on biodiversity for their livelihoods, energy, and medicine. (Jahan, Selim, 1998 and 2002).

BOX 1:

IMPACTS OF ENVIRONMENTAL DEGRADATION IN THE DEVELOPING WORLD

- Water-related diseases, such as diarrhea and cholera, kill an estimated 3 million people in developing countries, the majority of whom are children under the age of five.
- Vector-borne diseases such as malaria account for 2.5 million deaths a year, and are linked to a wide range of environmental conditions or factors related to water contamination and inadequate sanitation.
- One billion people are adversely affected by indoor pollution.
- Nearly 3 million people die every year from air pollution, more than 2 million of them from indoor pollution. More than 80% of these deaths are those of women and girls.
- Nearly 15 million children in Latin America are affected by lead poisoning.
- As many as 25 million agricultural workers – 11 million of them in Africa – may be poisoned each year from fertilizers
- More than one billion people are affected by soil erosion and land degradation. Some 250 million people are at risk from slash crop yields.
- Desertification already costs the world $42 billion a year in lost income.
- Over the last decade, 154 million hectares of tropical forests, covering almost three times the land area of France, have been lost.
- About 650 million poor people in the developing world live on marginal and ecologically fragile lands.

Source: UNDP (2000)

2.6. Human and his Environment

The relationship of humans to the environment is reciprocal in that the environment has profound influence on humans and, at the same time, humans extensively alter the environment to suit their needs and desires. Some of these changes have proved beneficial, but some aspects of these changes have created new hazards. The humans' attitudes toward the environment are still negative and are often contrary to the concept of sustainable development, which recognizes that economic growth and environmental protection are inextricably linked and that the quality of present and future life rests on meeting basic human needs without destroying the environment on which all life depends (Peters SW. (1993)). Despite various programs by different tiers of government to address the issue of environmental sanitation, many Nigerians still have negative attitudes toward environmental sanitation and do not value personal or environmental sanitation (Milas S, 1987).

It is very important to realize that people can change their environment. This is partly what development is all about. The environment can be made healthier. However, sometimes man's environmental changes introduce new disease into the area of make existing ones worse, thus making it less healthy (Wood C.H. et al, 1981).

The study of diseases is really the study of man and his environment. The interplay and integration of two ecological universes- the internal environment of man himself and the external environment- determine the health status of an individual, a community or a nation, which surround him. World Health Organization (WHO) defines health as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity. It is evident from the definition that there is rather an extension of elements of health as social well being than limited general concepts of

health as against sickness. In the modern concept, disease is due to a disturbance in the delicate balance between man and his environment. Three ecological factors (agent, host and environment) are responsible for disease. The disease agent of disease is usually identified with the help of laboratory. The host is available for study; but the environment from which the patient comes is largely unknown. Yet frequently, the key to the nature, occurrence. prevention and control of diseases lies in the environment. Without such knowledge, this key may not be available to the physician who desires to cure disease, prevent or control it. Hence, the study of diseases is really the study of man and his environment (Park, K. 1994).

Proper environmental management is the key to avoiding the quarter of all preventable illnesses which are directly caused by environmental factors. The environment influences our health in many ways through exposures to physical, chemical and biological risk factors, and through related changes in our behavior in response to those factors.

Ukpong 2002, emphasized the importance of education in achieving the goals in environmental sanitation. He stressed strategies such as analysis, sensitization, information, education, and motivation, and indicated that these strategies would provide knowledge and would change the people's attitudes toward environmental sanitation.

2.7. Environment and Urbanization

Environmental conditions in many areas threaten to reverse the gains made in public health over the last several decades. Every human should have a healthy and productive life in harmony with nature. In a tragically degraded environment, human health is threatened. Most cities of the world are faced with problems of growth. In Nigeria, environmental pollution is an important challenge to public health as a result of urbanization. (Ukpong SJ. 1991).

Urban living is the keystone of modern human ecology. Cities have multiplied and expanded rapidly world wide over the past two centuries. Cities are sources of creativity and technology, and they are the engines for economic growth. However, they are also sources of poverty, inequality, and health hazards from the environment. Urban populations have long been incubators and gateways for infectious diseases. The early industrializing period of unplanned growth and laisez-faire economic activities in cities in industrialized has been superseded by the rise of collective management of the urban environment. This occurred in response to environmental blight, increasing literacy, the development of democratic government, and the collective accrual of wealth. In many low income countries, this process is being slowed by the pressure and priorities of economic globalization. Beyond the traditional risks of diarrhoeal diseases and respiratory infections in the urban poor and the adaptation of various vector-borne infections to urbanization, the urban environment poses various physicochemical hazards (Anthony J., 2000).

2.8. Community Knowledge, Attitude and Practice towards Local Environment

2.8.1. Environmental Knowledge

Environmental literacy can be defined as the ability to demonstrate observably what has learned, i.e. knowledge of key concepts, acquired skills and disposition towards issues. It builds on an ecological paradigm and "…. Is the capacity to perceive and interpret the relative health of environmental systems and to take appropriate action to maintain, restore or improve the health of those systems" (Roth, 1992 in Bartosh O., 2003)

In essence, knowledge in general is dynamic formed through social interactions, personal experience and observation. It is also context embedded which depends on specific time and space. Aonaka, Toyama and Nikonao, 2001). Entailing the above general features, environmental

knowledge refers to the acquisition of wider experiences and internalization of basic understanding regarding the environment and its related problems (Roa and Reddy, 2003)

In the last decade many researchers have focused on measuring environmental knowledge of various populations. According to the articles surveyed, most of these studies show predominantly low levels of knowledge among populations studied (Gigliotti 1990; Hausebeck et al. 1992; Kuhlemeier et al. 1999; Lawrenz 1983; Wright and Floyd 1992, in Bortosh (2003).

Knowledge produced by health research, if disseminated widely, is a global public good. Knowledge contributes to the policies, activities, and performance of health systems and to the improvement of individuals and population health. (Pardes, 1999).

Using the existing knowledge adapted to local condition is particularly crucial in achieving the Millennium Development Goals. To achieve these and other health related goals, a well functioning health system must be able to access and utilize research based knowledge and the products of research. It should also be part of the Global effort to generate new knowledge to address the problem of tomorrow (WHO, 2003).

2.8.2. What is Community Knowledge?

Community knowledge in environmental health science often includes information gained through the experience of coping with toxic pollution and related illness. Community knowledge links these understandings with how local geography, social networks, economic conditions, and cultural norms can influence how and why populations are exposed. Much like the physician-patient relationship where, depending on the question asked, the patient may be as or more knowledgeable about an illness or part of their

body than the clinician community members often have an intimate knowledge of environmental hazards, how people are exposed, and the social, economic, political and technical barriers they face for reducing exposures. Yet, community knowledge is not just data or information, but is also a process of information gathering, public testing, and building trust and relationships through learning. Thus, community knowledge, like professional science, should never be considered as separated from the processes that generated it. (Corburn J. 2007).

2.8.3. How community Knowledge Contributes to Environmental Health?

2.8.3.1. Helping Professionals

Community knowledge contributes to environmental health by identifying hazards and revealing some problems that professionals may have missed and raises new questions about hazards that matter to those most impacted by hazard exposures; it also provide good data by giving some information which are inaccessible to outsiders. In addition to these contribution it also contributes by improving access to difficult to reach informants/clients i.e. local knowledge can make reluctant community members, such as immigrants & non-English speakers, participate and can overcome disincentives to participation, such as poverty; expand scope of implementation alternatives by identifying new options for reducing and eliminating environmental hazards and improving implementation success. Besides these it recognizes various actors, perspectives, practices and traditions that influence the effectiveness of local policy and greater understanding of community claims in order to work well with communities, professionals and helps to understand what residents think, what they do, and what they want, and community knowledge is one way to organize this information. Community knowledge also increase trust and credibility with skeptical publics and recognize the fallibility of all knowledge by

incorporating community knowledge into public debate and opens it up to scrutiny, criticism and testing. (Corburn J. 2007).

2.8.3.2. Helping Communities

Community knowledge contributes to environmental health by Organizing and builds community coalitions through production and sharing of information, practices, and images. It also empowers by educating, raising awareness and developing self-help strategies through mobilization of knowledge and action strategies. In addition to these it also recognizes whether community members have important information, can be trusted, are not ignorant and are not dependent on professionals for problem solving. Besides all these contribution it also Improves intra-community decision-making by helping community by providing the community new information for local groups to help themselves, define priority issues and learn , define priority issues and learn what is important to their constituents (Corburn J. 2007).

2.8.4. What are the Value Characteristics of Knowledge?

Knowledge is information whose certainty is context-dependent and that gives individuals and organizations the capacity to act. Knowledge is the series of three successive transformations.

1. **From reality to data:** This transformation allows individuals and organizations to develop instruments to represent, collect, record, and store discrete about reality.
2. **From data to information (also "know what"):** This transformation allows individuals and organizations to process and organize data in order to create a message, such as by producing reports.
3. **From information to knowledge (also called "Know how"):** This transformation allows individuals and organizations to interpret information in order to derive an action.

Knowledge normally leads to one or more of three possible outcomes: better understanding of the world around us, useful products or technologies or a guide to making decisions, such as a policy, professional practice or information (Rejean Landry et al, 2006).

2.9. Environmental Attitude

Environmental attitude is defined as a learned belief which develops from an individual's knowledge and values about the environment and governs action to support or sustain the environment. (Uitto et al, 2005).

Environmental attitude according to Pelstring (1997) is "a learned predisposition to respond consistently in a favorable or unfavorable manner with respect to the environment". In fact, environmental problems are linked to environmental attitude. Environmental attitudes refer to perceptions or values regarding environmental issues. Thus, positive responses promote the well being of environment while negative reactions facilitate the deterioration of nature. (Tuna, 2004; Dunlap and Van Liere, 1978: in Atlabachew, 2007).

In the real world, according to Downs (1970), actions emanates from cognitive and affective components. The pieces of information received by the senses enable to form some sort of value and images which, in turn, serve to pass practical decision in certain way.

Environmental attitude, thus, emanates from environmental knowledge. Knowledge is the pre condition for attitude. And attitude expresses ones concern towards environment (Kaiser et al, 1999; Vining and Ebero, 1992).

2.9.1. Influential Concerns on Attitude

Zeiss (1991) proposed consecutive linkage starting from physical impacts to beliefs, and finally to attitudes. He classified impacts into two categories: physical and non-physical. Physical impacts include health risks, nuisances, and environmental change, and these in turn generate non-physical impacts, which are categorized into economic (e.g. property value decrease), social (community image loss), and political (e.g. lack of fairness) impacts. Fears about physical impacts are usually exaggerated by residents and do not correspond to actual damage, and non-physical impacts affect attitudes as strongly as physical ones. Therefore, a minor physical impact may trigger a very strong negative attitude to an SWM facility. In terms of physical impacts, pollution causes psychological stress and fear of health risks (Petts and Eduljee, 1994; Becker, 2001). As Lima (1996) mentioned in a study related to an incinerator, perception of risk is a factor in changing attitudes, and a risk is considered greater when the hazard is involuntary and uncontrollable, not natural, and cannot be compensated for by any benefits (Petts,1994).

Petts (1994) suggested that citizens' attitudes are influenced not only by impacts, but also by a lack of credibility in waste managers, decision makers, decision processes, and control mechanisms for waste facility siting and operation. Without a clear or open decision making process, siting of undesirable facilities becomes an extremely difficult task (Opaluch, 1993). Besides negative impacts, there are positive aspects of an SWM facility. The benefit a facility may bring to local residents can influence attitudes (Lima, 1996). For example, residents who have an incinerator in their community think it is a better disposal facility than a landfill due to the heat supply service it provides to its surrounding area. Citizens' attitudes depend on knowledge about a facility. Zeiss (1991) mentioned that residents tend to show more negative attitudes to unfamiliar facilities of which they have no experience, compared with similar facilities that already exist. As a factor of personal background, educational level is also influential.

2.10. Environmental Practice/Behaviour

Action, according to Cullen (1976), "is a response to the physical or social environment". Responses arise from reasoning. As Brookfield explains, "Decision makers operating in an environment as they perceive it, not as it is. The action resulting from their decision, on the other hand, is played out in a real environment." Environmental attitudes are pre-conditions for ecological behaviour. Perception, in turn, grounds on knowledge. Behaviour is influenced by intention, attitude, norms, values and factual knowledge.

The rational behind investigating the cognitive aspects is "if we can understand how human minds process information from external environments and if we can determine what they process and use, then we can investigate how and why choices concerning those environments are made (Atlbachew, 2007).

2.11. Definition and How Wastes are Produced

Waste includes all items that people no longer have any use for, which they either intend to get rid of or have already discarded. Additionally, wastes are such items which people are require to discard, for example by lay because of their hazardous properties. Many items can be considered as waste e.g., household rubbish, sewage sludge, wastes from manufacturing activities, packaging items, discarded cars, old televisions, garden waste, old paint containers etc. Thus all our daily activities can give rise to a large variety of different wastes arising from different sources (Purdom P. W., 2003).

As people engage in the activities associated with living, wastes are produced. These are products which have no apparent useful purpose, or they are of such marginal utility that recovery is uneconomical. Such products include human, residential, agricultural, commercial, and industrial wastes of all kinds. The continuous removal and safe disposal of these wastes is essential

to the continued existence of any community; otherwise, the community may be overwhelmed and its citizens endangered. These wastes may be solid, liquid, or gaseous (Ibid).

2.11.1. Types of Waste

Waste can be divided into many different types. The most common methods of classification is by their physical, chemical and biological characteristics. One important classification is by their consistency. Solid wastes are waste materials that contain less than 70% water. This class includes such materials as household garbage, some industrial wastes, some mining wastes, and oilfield wastes such as drill cuttings. Liquid wastes are usually wastewater's that contain less than 1% solids. Such wastes may contain high concentrations of dissolved salts and metals. Sludge is a class of waste between liquid and solid. They usually contain between 3% and 25% solids, while the rest of the material is water dissolved materials. Wastes may also be classified as municipal waste(including household and commercial), industrial waste(including manufacturing), hazardous waste Construction and demolition Waste, Mining Waste ,Waste from electrical and electronic equipment (WEEE), biodegradable municipal waste and packaging Waste (Posh E., 2005).

2.11.2. Waste Disposal

Unsanitary disposal of wastes is a major environmental concern in the world. The current legislation system and waste management practices require numerous improvements and modification.

It is contended that such changes need to be accompanied by a community environmental education program designed to improve citizens' knowledge, attitudes and behavior (Posh E., 2005, McGartity et al., 2000).

The World Health Organization (1974) has stressed that the unhygienic disposal of waste is one of the most serious environmental problems in many regions of Africa. The negative attitudes of the people toward involvement in environmental sanitation programs in many developing countries is detrimental. Instead of emphasizing laws, environmental education should be intensified by adopting a community environmental education approach that uses inter group relationships, value patterns, and communication resources in the specific social system.

Unhealthy disposal of solid waste is considered as one of the most important problems in many societies. The problem of waste management has arisen recently in developing countries where there is little history of the implementation of formal and informal community environmental education awareness program. The instigation of such program is essential to rapidly educate the public and facilitate the development of environmentally friendly community waste behavior. To be successful, useful programs should be designed to engage their target audiences in not only increasing their environ mental knowledge but their environmental skills, attitudes and behavior as well. Accordingly, a first step in the program design process is to establish the prior knowledge of specific age groups, covering such categories as the level of knowledge, its sources and everyday application (Palmer, 1995; Caneer, 1997; Tucker et al., 1998).

2.11.3. Waste Management

Waste management is the collection, transport, processing, recycling or disposal of waste materials. The term usually relates to materials produced by human activity, and is generally undertaken to reduce their effect on health, aesthetics or amenity. Waste management is also carried out to reduce the materials' effect on the environment and to recover resources from them. Waste management can involve solid, liquid or gaseous substances,

with different methods and fields of expertise for each (Wikipedia Encyclopedia, 2008).

Waste management practices differ for developed and developing nations, for urban and rural areas, and for residential and industrial, producers. Management for non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management for non-hazardous commercial and industrial waste is usually the responsibility of the generator (Tucker et al., 1988).

Thirteen million deaths annually are due to preventable environmental causes. Preventing environmental risk could save as many as four million lives a year, in children alone, mostly in developing countries (WHO, 2008).

In Ethiopia, environmental problems are increasing at an alarming rate. This is because the degree of land degradation, deforestation, over cultivation and overgrazing are extremely intensified due to intensive agriculture and early settlement. (Ermias, 2003; Desalegn, 2003; Aklilu, 2001; Gebeyehu, Yosef and Gronrall, 1992; Beletu and Yosef, 1990 in Atlabachew, 2007). Equally important, urban environmental problems such as solid waste, liquid effluents and air pollutions turn to be series hurdles to environmental well being (Alebel and Dawit 2006). Goods and services are returned after use into the environment as waste and emissions which instigate various forms of environmental problems: quality noises, etc (Ibid).Besides, environmental problems have their own effect on the socio economic progress. They also dispose peoples quality of life, and dwellers experience health problems (Huizen and Nijkamp, 1995 in Atlabachew, 2007).

The three main pathways through which the urban environment impinges on human health are through the social changes that accompany urbanism and the way in which these changes alter behavior based risks to health; the way that physical urban environment poses various microbiological risks and

risk toxicity; and the way that the larger-scale environmental impacts of modern urban populations creates wider-spread and longer-term risks to health through their disruption of the life-support systems of the biosphere. (Anthony J., 2000)

In large cities every where, poor people are the main victims of property crime, assault, and murder. The vulnerability of poor people then increases further because the adaptive behavior and violence are inevitable with high levels of unemployment and poverty. Poverty is more than income deprivation. Urban poverty is the most important predictor of environmental health risks when its definition includes other forms of deprivation such as physical assets, political influences, access to basic services and access to social capital (WHO, 1995).

Urbanism potentiates many changes in human behavior that affect disease risks. For example, the urban facilitation of microbial traffic, via the increased intensity and diversity of human mobility, contact and sexual behaviors, may have been critical in launching the otherwise poorly transmissible human immunodeficiency virus (HIV). (WHO, 2007).

Addis Ababa is the capital city of Ethiopia, diplomatic capital for Africa (OAU, ECA), regional head quarters like UNDP, UNICEF, UNICEF, UNHCR, and FAO. However its development is too slow to meet the demands of the increasing population due to both natural growth and rural urban migration. In particular, the complete inadequacy of the dry waste management is major environmental problem in Addis Ababa. As effort to improve dry waste management, the city administration has transferred the service provision of dry waste management to the newly established Addis Ababa City Sanitation, Beatification and Park Development Agency (since January 2003), with objective to make the city naturally balanced, green and favorable environment through integrated management and urban recreational area

development. The city council recognizes six major sources of solid waste: households, street, commercial institutes, industries, hotels and hospitals. Available data for 1993 shows that households take the lion share of solid waste generated in the city. From total generated households 71%, street 10%, commercial institutions 9%, industries 6%, hotels 3% and hospitals 1% (Addis Ababa Health Office, 2000).

A human excreta is the major area of concern even from the household wastes. In 1984 about 30% of the population of the city has no access to latrines. This proportion estimated to have only slightly fallen to 29.2 per cent in 1997 in relative terms. This means almost one-third of the population of the city has no latrines and experiences open defecation. Hence human excreta take proportionate share of the solid waste in the city. Moreover the available septic tanks used in the latrines usually overflows and pollute most of the older and overcrowded inner city with no short term solutions. Therefore this study tried to determine the level of knowledge, attitude and practice of household heads about local environmental sanitation related with solid waste disposal and its association with health in Addis Ketema Sub City.

CHAPTER THREE

METHOD OF STUDY

3.1. Study Area and Period

The study was conducted in Addis Ketema Sub City, Addis Ababa the Capital City of Ethiopia from September 21, 2007 to June 3, 2008. Addis Ketema Sub City is one of the nine Sub Cities of Addis Ababa city bordered by Gulele Sub City in North, Lideta Sub City south, Kolfe Keranio Sub City west and Arada Sub City in the east. The total population of Addis Ketema Sub City is 348,063. Currently there are nine administrative kebeles in Addis Ketema Sub City. The name of these kebeles in the Sub-City are 01/02/03, 04/05, 06/07, 08/09/18, 13/15, 16/17, 14/21, 19/20, 10/11/12.

3.2. Reason for Selecting the Study Area

The biggest market in the nation /Merkato/ and bus station are located in this sub City.

In association with these and other expectations peoples traveling/migrating to from different areas of the country in general to Addis Ababa and particularly the study area makes to be over populated, and cause to produce attest-catching piles of garbage's, flying festal, rubbish, construction demolition and moved-earth from new constructions sites littering the sub City indefinitely. Obnoxious odors emanating from decomposing solid wastes, semi-liquid and liquid waste is sickening all citizens in the sub City. There fore Addis Ketema Sub City is purposely selected from others because of the above mentioned reasons.

3.3. Study Design

A cross-sectional study is the simplest variety of descriptive or observational epidemiology that can be conducted on representative samples of a population. It is a study design that aims to describe the relationship between diseases (or other health-related states) and other factors of interest as they exist in a specified population at a particular time, without regard for what may have preceded or precipitated the health status found at the time of the study. Cross-sectional studies, also known as surveys, are a useful way to gather information on important health-related aspects of people's knowledge, attitudes, and practices. There fore Cross sectional study design is an appropriate and was implemented for this particular study.

3.4. Population

3.4.1. Source/ Study Population

A population is the entire aggregation of cases that meets a designed set of criteria. The *source population* is the collective of *study units* for which the values of the vitiates of interest could possibly be determined. Based on this definition all households of Addis Ketema Sub City in Addis Ababa town were the source population for this particular study. According to health delegates of selected kebeles, the rough estimate of total population of 01/02/03 is 54,000; kebele 13/15 50,000 and kebele 14/21 is 55,000.

3.4.2. Study Unit and Study Subjects

The study units were purposely selected kebeles from the Sub City. The kebeles were selected after making thorough discussion with the sub city officials particularly with head of health office for each kebele organized by the head of health office of the sub city. Based on this discussion from the nine kebeles, three of them i.e. kebele 01/02/02, kebele13/15 and kebele 14/21 were selected purposely since they are assumed to be more affected by

solid wastes than others. According to the heads of health office from each of these selected kebeles, 13/15 is more affected in association with the big bus station in the Nation. Kebele 01/02/03 was recommended to be considered in the study since populations around the biggest Anwar Mesgid particularly areas around American Gibi and populations around Tekle Haimanot Church particularly Berbere Tera up to Tasa Tera is over crowded and they usually practice throwing solid wastes to the rivers and open field. Finally Kebele 14/21 which is located at the back of St. Michael church is also highly affected in solid wastes and the community practices throwing waste usually to the near by rivers. In addition to this discussion the researcher had also made preliminary observation to select the kebeles.

3.4.3. Inclusion Criteria

For the study subjects to participate in the study, he/she should be age greater than twelve, who can communicate (no health problem such as mental illness or any other health problems that could make difficult to give response), speak either Amharic or English language, who live at least one year in the kebele, available at the time of data collection and willing to give information. Visitors are considered only if they know the area well because of their frequent visit. Houses were selected systematically i.e. houses for data collection were selected at equal intervals.

3.5. Sample Size Determination

Sample size (n) was determined based on the assumption of 50% proportion of environmental health problems with 5% margin error and 95% confidence level of certainty. The assumption is made since the knowledge, attitude and practice of environmental health condition of the community was unknown. The actual sample size was calculated using single population proportion formula. (Cochran, G. 2003).

$N= (z.\alpha /2). (z.\alpha /2).p(1-p)/d^2$

N= (1.96). (1.96). (0.5). (0.5)/ (.05). (.05)=384

Where: P=the prevalence of health problem related with improper solid waste disposal

d=the margin error between the sample and the population

$Z\alpha /2$=Critical value at 95% confidence level of certainty (1.96)

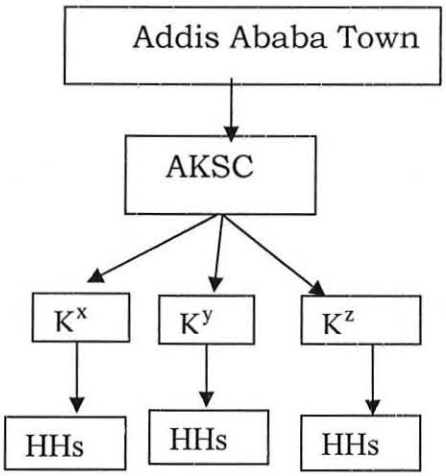
The calculated sample size=384

There fore the total sample size considered in this study were 384. But ten (10) respondents refused to give response and a total of 374 study subjects were interviewed.

3.6. Sampling Procedures and Techniques

1) Thorough discussion was made with all health office heads of each kebeles which were conducted in the head of health office of the Sub-City. The aim of the discussion was to explain the over all aim of the study, to identify focal persons in each kebele and how to select more affected kebeles related with solid waste disposal hazardous to health.
2) Three Kebeles were selected purposely as the procedure is well described under study unit and study subject
3) The total sample size was distributed to the selected Kebeles equally
4) After purposeful selection of kebeles, households were selected in systematic random technique i.e. at equal intervals to minimize bias.

3.6.1. Schematic Presentations of Sampling Procedure



Key: AKCS: Addis Ketema Sub-City
Kx,y,z: Selected kebeles
HHs: Selected house holds

3.7. Data Collection

3.7.1. Data Collection Method and Instrument

Quantitative data was obtained using a pre-tested structured interviewer administered questionnaire prepared in English and then translated to Amharic. The questionnaire has addressed the selected Variables. The selection of the variables was limited only to those which are highly related to human health in the local environments of the households. Respondents who fulfill the inclusion criteria's were interviewed. The condition of their homes and surrounding local environment was observed during the interview. Observation check list was prepared and employed in order to collect data on environmental health conditions related with waste disposal in the home and outside home compound. The principal investigator has done the observation. Qualitative data was obtained using open ended questions with three heads of health office in the selected kebeles and the other 7 from residents and sanitation, beatification and parking office. The technique used to collect qualitative data's were in-depth interview.

3.8. Procedures to Determine Overall Level of Knowledge, Attitude and Practice of Respondents

The cumulative knowledge level of respondents was determined by categorizing the response of the study subjects as "Good knowledge", "Moderate knowledge" and "Poor knowledge" for selected questions from knowledge related questions. The questions selected from questionnaire part to determine cumulative level of knowledge were items /204, 205, 206, 601, 603, 404 and 407/. After selecting the questions, items were assigned (1-7) points. Those who answered six (6) and seven (7) of them correctly are labeled as having "Good knowledge". Those who answered four(4) and five (5) of the seven items correctly are labeled as having "moderate knowledge", and those who answered less than four(4) of those selected questions are labeled as having "poor knowledge".

The same procedure was employed to determine the cumulative practice level of respondents but the number of selected items for practice were eight (8).Those who answered seven(7) and eight (8) of the selected items correctly were labeled as having "Good practice". Those who answered four(4),five(5) and six(6) of the selected items were labeled as having "Moderate practice" and those who answered less than four (4) of the selected items were labeled as having "Poor practice". The same procedure was employed to determine the cumulative attitude level of respondents. The number of items selected for attitude were eight (8).Those who answered seven (7) and eight (8) of the selected items correctly were labeled as having "Good attitude". Those who answered four(4),five(5) and six(6) of the selected items were labeled as having "Moderate attitude" and those who answered less than four (4) of the selected items were labeled as having "Poor attitude". The selected items used to measure attitude from the questionnaire were (801 through 808).

To determine the attitude of the respondent's, response items were categorized to five categories as strongly agree, agree, undecided, disagree and strongly disagree. Since the strongly agree and agree have the same or favorable view they were summed up as one and labeled as favorable. The strongly disagree and disagree were also done in the same way since both show unfavorable tendency and labeled as unfavorable. Those who have neither favorable nor unfavorable tendency are labeled as undecided.

3.9. Pilot Study

Pilot study was done to identify potential problems and to revise the method and questionnaire before actual data collection. The pilot study has helped the researcher a lot in redesigning the questionnaire and identifies the possible reactions and expectations of the study subjects. For example "Do you know that refuse and garbage is a health hazard" was one of the item to measure knowledge but almost all respondents says "yes" there fore the item was redesigned as "Do you think that refuse and garbage is a health hazard, if yes why"?. On top of this it has helped me how to approach and clear confusions and fear of the study subject since the data collection time almost coincides with the time of National election as most peoples were very sensitive to give data. During pilot study most of the respondents were assuming that the data collection was made for the purpose of election and most of them reacted and were not willing to give data. There fore data collectors were told to consider this issue and clarifying the purpose of this study and explaining that there is no relation between the current study and the election. The pilot study was conducted in the non selected kebele of the study area to minimize bias.

3.10. Data Collectors and Supervisors

Following extensive training on the data collection instrument for three days, twenty college students from St. Lideta health Science College who can speak both English and Amharic has collected data using the structured interviewer administered questionnaire for five days under close supervision of the principal investigator.

3.11. Variables

3.11.1. Dependent and Independent Variables

Dependent variables are:

1. Knowledge of respondents about environmental sanitation
2. Attitudes of respondents about environmental sanitation
3. Practice of respondents about environmental sanitation

Independent variables:

1. Educational status/level of respondents
2. Average monthly income of the family
3. Marital status of respondents
4. Availability of environmental health education in the respondents kebele
5. Access of facilities to dispose solid waste in the respondents kebele

3.11.2. Socio Demographic Variables

Sex, Age, Average monthly income, occupation, marital status, Educational status and Religion were the socio demographic variables considered in the study.

3.12. Data Processing and Analysis

The data collected through different instruments were analyzed both quantitatively and qualitatively. Quantitative data were processed and analyzed using SPSS 15.0 versions. Data was checked for completeness and consistency. Coded data was entered in to the programs after cleaning is done. Frequency distribution, percentage and two ways table Chi-square test to ascertain association between dependent and independent variables was done. For each of attitude measuring variables Chi-square goodness of fit test was done. For the statistical tests, the decision is significant if the p-value is < 0.05. To cross check the data that were obtained from the quantitative part of the questionnaire and to observe the actual sanitary conditions of each kebele check list was prepared. Using this checklist the researcher observed the actual sanitation condition of each kebele. In depth interview was made with three kebele health office delegates and other three delegates from beautification and parking office and from selected residents in order to triangulate data one another and with the quantitative data. Finally, the data collected from open-ended questions, interview and observation were briefly described.

3.13. Data Quality Assurance

Data quality will be assured by the following measures:

1. ***Translation and back translation of the questionnaire:*** The questionnaire is first prepared in English and was translated to Amharic language by the researcher. In order to ascertain its accuracy environmental health experts and graduate from English department were consulted. For example how to name ozone layer, ecology, biodiversity and others

2. ***Pilot study:*** pretest was carried out on 5% of sample size of the populations, in non selected kebeles and were not included in the main study.
3. ***During data collection:***
    - Training was given to data collectors which covers areas like overview of the research and its objectives, of the methods to be used, practice in coding, health education on topics of importance of environmental protection
    - Supervisors were monitoring the data collection process. Every day at the field, data was checked for completeness and consistency by supervisors. Questionnaires were sent back to the household and refilled in the presence of supervisor to correct any incomplete and inconsistent responses.
4. ***Data management, storage and analysis:*** Training was given to data entry personnel. Data was entered to the programs after cleaning and edition. Data exploration was undertaken to see if there are odd codes or items & outliers that are not logical and then subsequent editing was made.

3.14. Ethical Considerations

Approval was secured first from The Ethical Clearance Committee of Institute of Educational research, Addis Ababa University. A written letter from the Graduate Program Coordinating Office of the Institute was obtained and submitted to Addis Ketema Sub City head office. Similar letters were also given to health Office of the Sub City and there by to each kebele health office. Informed verbal consent was obtained from each respondent and they were also told to have the right to give-up the interview any time s/he wishes. Health education was given for each respondent about the importance of environmental protection to maintain health.

CHAPTER FOUR

RESULTS

The sample size included in this study was 384. From the total 384, ten respondents were refused to give information in the actual data collection time. There fore total respondents successfully surveyed were 374.

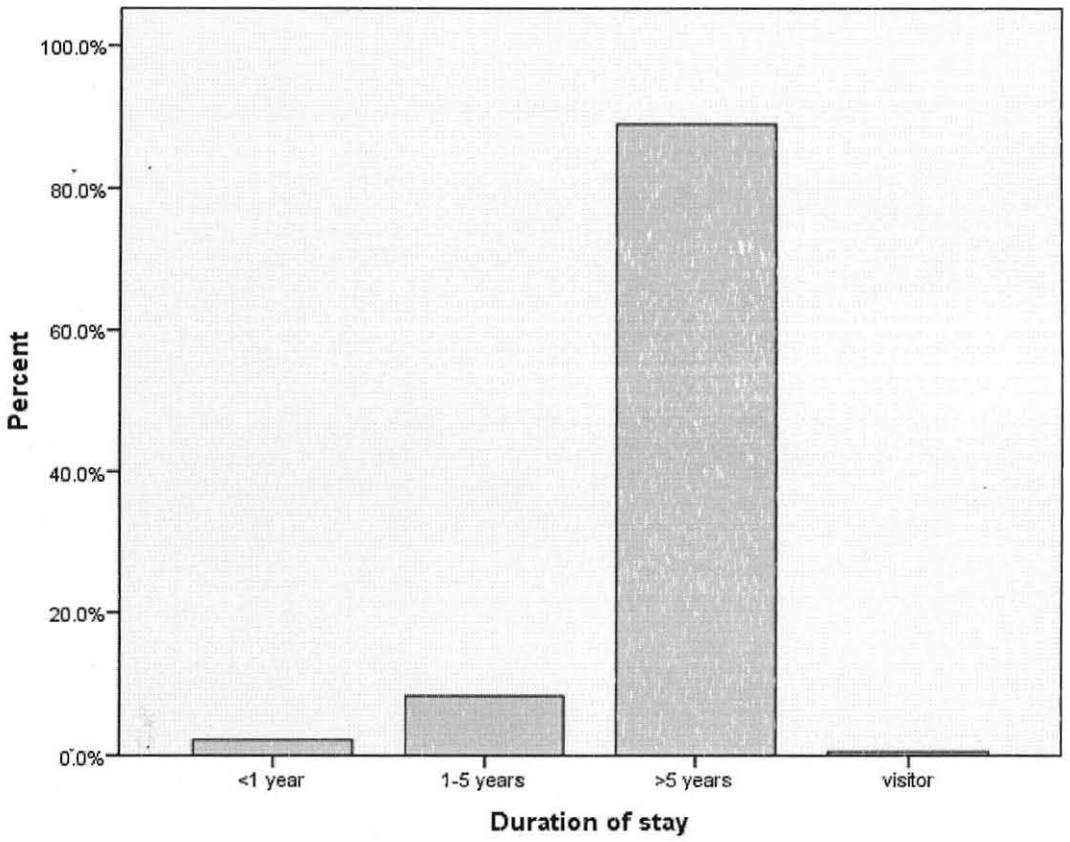
4.1. Socio-Demographic Characteristics of the Respondents

The mean age of the respondents was 36.74 with a minimum of 17 and maximum of 83 years old. About 39% of them were age greater than 40 years. Female respondents account the majority around 68.2% of the houses holds. The male to female ratio of respondents in the sub city for this particular study was almost 1:2 respectively. The majority of respondents were married (57.8%) and Christian (57.0%) followed by Muslim (42.8%). Around (42.2%) of the respondents were Amhara followed by Gurage (27.5%) and about (31.3%) of the respondents had secondary education followed by primary education and illiterates accounting (24.9%) and (19.8%) respectively. Most (48.9%) of respondents do have occupations other than occupations mentioned 1-3 of /Table-1/. According to the respondents other occupations include bar ladies, commercial sex workers, house wives, and those who refuse to tell their occupation followed by merchants (23.5%). Based on the responses provided by those interviewed, the mean average family monthly income was 293 Ethiopian Birr. Most (29.7%) of the families earn between 251 and 500 Ethiopian Birr and the least were respondents with no income (8.8%). The average duration of stay for majority of the respondents was greater than five (5) years (*Figure-1).*

Table 1: Socio-demographic characteristics of respondents, Addis Ketema Sub City Addis Ababa, May 2008

Variables		No.	%
Age	15-29	123	32.9
	30-39	105	28.1
	40+	146	39.0
	Total	374	100.0
Sex	Male	119	31.8
	Female	255	68.2
	Total	374	100.0
marital status	Single	113	30.2
	Currently married	216	57.8
	Separated	16	4.3
	Widowed	29	7.8
	Total	374	100.0
Religion	Christian	213	57.0
	Muslim	160	42.8
	Others	1	0.3
	Total	374	100.0
Ethnicity	Amhara	158	42.2
	Oromo	61	16.3
	Tigre	30	8.0
	Gurage	103	27.5
	Others	22	5.9
	Total	374	100.0
Educational status	illiterate	74	19.8
	can read and write	50	13.4
	primary	93	24.9
	secondary	117	31.3
	above secondary	40	10.7
	Total	374	100.0
Occupation	merchant	88	23.5
	wage employed	40	10.7
	daily laborer	63	16.8
	other	183	48.9
	Total	374	100.0
Family Income	No income	33	8.8
	1-150	87	23.3
	151-250	75	20.1
	251-500	111	29.7
	501+	68	18.2
	Total	374	100.0
Average duration of stay	<1 year	8	2.1
	1-5 year	31	8.3
	>5 year	333	89
	Visitor	2	0.5
	Total	374	100

Figure 1: Average duration of respondents in years, Addis Ketema Sub City, Addis Ababa, May 2008.



Around Seventy-Seven percent of the respondents were generally well aware about environmental health. Among the study subject, asked about the importance of safe environment, majority of them (61.0%) responded that safe environment is important to prevent disease. Those interviewed also expressed the importance of having beautiful local environment (31.3%). Nearly half (46.3%) of the respondents said that diarrhea is the possible disease to be transmitted if local environment is disrupted and the least was Malaria (7.0%). More than half of the respondents did not experienced diarrhea, eye disease, skin disease, Intestinal parasites, malaria or other diseases in near past. According to the response of the subjects improper waste disposal accounts 60.2% as major source for local environmental contamination followed by 19.0% who said overcrowding to be the source of local environmental contamination (Table 2). Regarding the source of

information about environmental health, nearly equal percentage of the respondents' reported Radio, 28.1% and Television, 25.7% as source of information. Only 0.3% get information from private readings (Fig-2). Knowledge about environmental terms in general shows that there is a big knowledge gap. Among the respondents only 28.1% are aware of the term Ozone layer and only 0.3% are aware of the term ecology (Fig-3). The respondents were also asked whether the above mentioned environmental terms including biodiversity and green house effect do affect their health. Almost three fourth of those interviewed were unaware about (70.9%) respondents do not ozone layer, ecology, green house effect and biodiversity affect their health or not. About quarter of the respondents replied that environmental terms mentioned above may affect their health. Only (3.5%) which accounts the least percentage said that Ozone layer, ecology, green house effect and biodiversity do not affect their health (Fig-4).

Table 2: General assessment of knowledge of respondents Addis Ketema Sub City, Addis Ababa, May 2008

Variables		No.	%
Have you heard about environmental health?	Yes	289	77.3
	No	85	22.7
	Total	374	100.0
Importance of safe environment	To prevent serious environmental degradation	25	6.7
	To prevent diseases	228	61.0
	To have beautiful local environment	117	31.3
	Other	4	1.1
	Total	374	100.0
Disease Transmitted if local environment is disrupted	Eye disease	77	20.6
	Skin disease	41	11.0
	Diarrhea	173	46.3
	Intestinal parasites	46	12.3
	Malaria	26	7.0
	Others	11	2.9
	Total	374	100.0
Any experience of diseases stated above among family members in near past	yes	113	30.2
	No	261	69.8
	Total	374	100.0
Source of local environmental contamination	Unclean container	37	9.9
	Improper waste disposal	225	60.2
	Stagnant water	38	10.2
	Overcrowding	71	19.0
	Others	3	0.8
	Total	374	100.0

Figure 2: Source information about environmental health, Addis Ketema Sub City, Addis Ababa, May 2008.

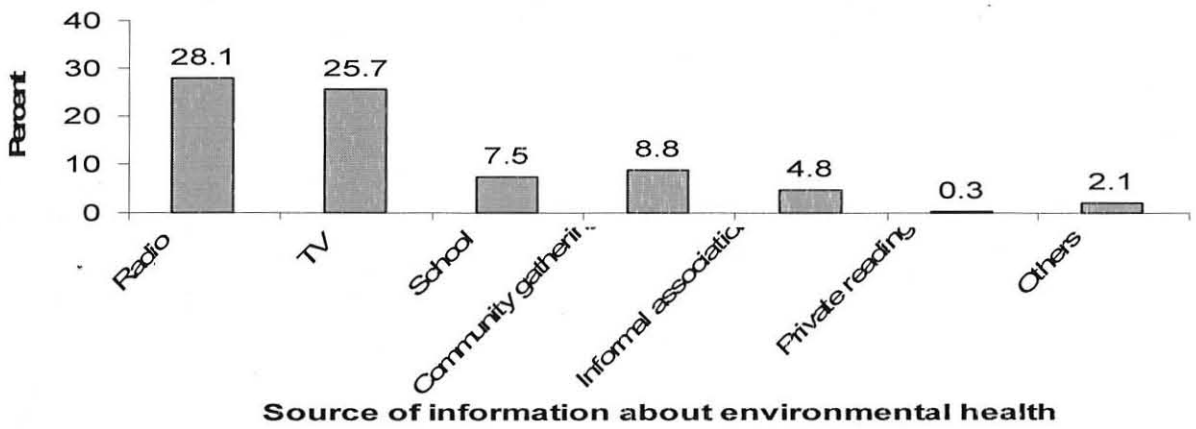


Figure 3: Awareness level to general environmental terms, Addis Ketema Sub City, Addis Ababa, May 2008.

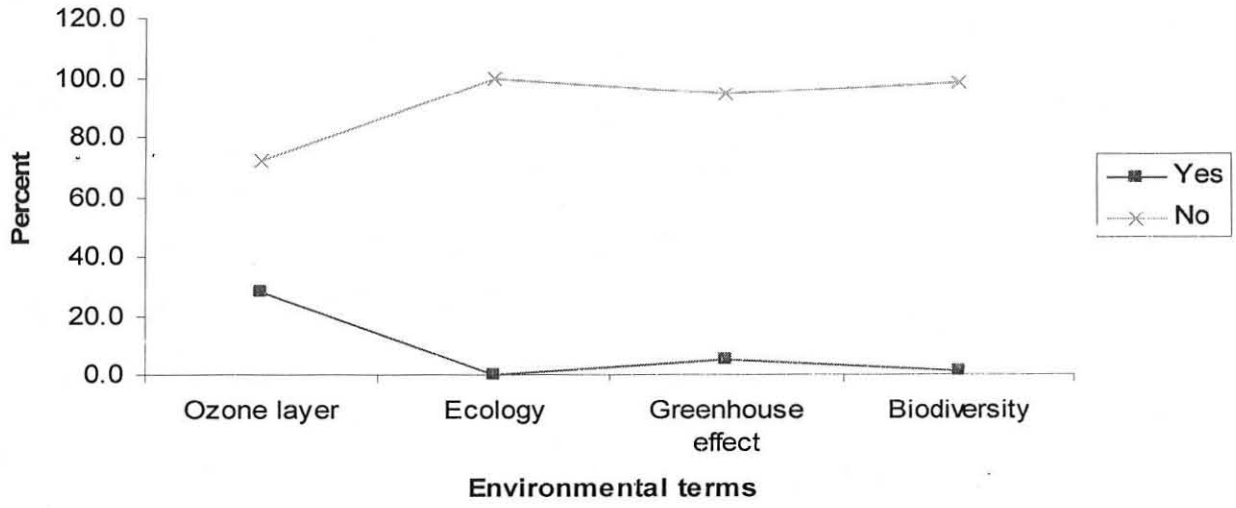
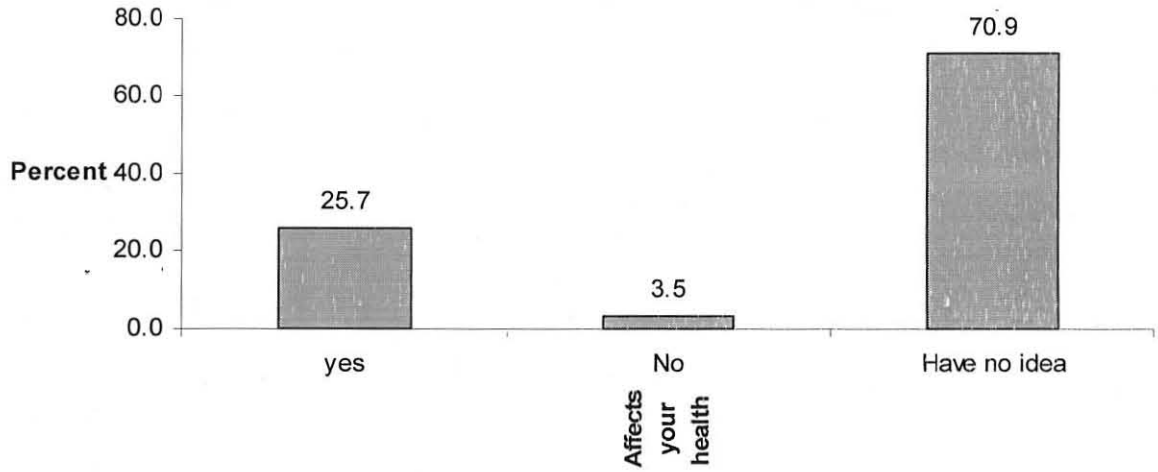


Fig 4: Awareness level of respondents about general environmental terms in fig (3) related to health, Addis Ketema Sub City, Addis Ababa, May 2008.



Three hundreds respondents (80.2%) said that every citizen is responsible to protect local the environment. Fourty respondents (10.7%) felt that the government is responsible to protect the environment. Half of those respondents replied environmental experts should play role for educating the community about environment. Almost a quarter of the respondents (23.8%) which takes the second place replied parents should play role for environmental education. Individual measures taken by the respondents were asked and the result showed that majority of the respondents (57.5%) at least clean their home. Almost half of the study subjects (54.0%) responded that they use waste storage container where as the rest (46%) reported not using waste storage container. The majority of the respondents which accounts 37.2% do not use waste storage container rather throw their waste in to the near by rivers. Almost equal number of respondents replied that they dump their waste in to other villages (20.9%) and dispose in other means (22.7%) such as giving their solid waste to door to door collectors who are self help working group and dump solid waste into collecting cars (Table-3).

Table 3: Practice of respondents towards Local Sanitation Addis Ketema Sub City, Addis Ababa, May 2008.

Variable		No	%
Who is responsible to protect your local environment?	Government	40	10.7
	Every citizen	300	80.2
	Community leaders	31	8.3
	Religious leaders	2	0.5
	Others	1	0.3
	Total	374	100.0
Whose role (environmental education)?	Environmental experts	187	50.0
	Government officials	65	17.4
	Parents	89	23.8
	Teachers from school	23	6.1
	Others	10	2.7
	Total	374	100.0
Individual measures taken	Participate in hygiene campaign	137	36.6
	Clean home environment	215	57.5
	Not my role	22	5.9
	Total	374	100.0
Waste storage container use	Yes	202	54.0
	No	172	46.0
	Total	374	100.0
If not using waste storage container where do you dispose?	Open space	19	11.0
	Throw to the river	64	37.2
	Burn	14	8.1
	Take to other village	36	20.9
	Other	39	22.7
	Total	172	100.0

Regarding availability of latrine (87.2%) of the respondents have latrine either in their home or public latrine for defined house holds. Though there is no significant percentage gap between the source of information about the importance of latrine, greater number of respondents (28.1%) reported that they get information from school and almost equal number of respondents indicated mass media as a source. Nearly all respondents (94.9%) know that refuse and garbage are health hazards. According to the respondents the major share of solid waste is domestic waste (42.5%) followed by commercial establishments (26.2%). The study subjects were asked about the types of diseases related to improper solid waste disposal and almost half of them (50.5%) responded that diarrhea is more likely related with improper solid

waste disposal (Table4). Respondents were asked about the importance of latrine and almost equal percentage of respondents replied that it is important to prevent diseases transmission (41.4%) and to keep our environment clean (39.3%) respectively (Fig 5). The reason for not having latrine was also asked and the major reason found was lack of space to construct latrine, followed by lack of money for construction (Fig 6). Of those who do not have latrine almost half of the respondents defecate near the river or defecate and throw to the river (Fig 7).

Table 4: Knowledge of respondents towards Local Sanitation Addis Ketema Sub City, Addis Ababa, May 2008.

Variables		No.	%
Do you have latrine?	yes	326	87.2
	no	48	12.8
	Total	374	100.0
Source of information of about importance of latrine?	Mass media	79	21.1
	Health personnel	74	19.8
	School	105	28.1
	Imitation from others	56	15.0
	Others	60	16.0
	Total	374	100.0
Refuse and garbage are health hazards	Yes	355	94.9
	No	13	3.5
	Do not know	6	1.6
	Total	374	100.0
Major share of solid waste in your locality	Domestic waste	159	42.5
	Commercial establishment	98	26.2
	Industries	6	1.6
	Street sweeping	55	14.7
	Hotels	56	15.0
	Total	374	100.0
What types of diseases are related to improper solid waste disposal?	Diarrhea	189	50.5
	Eye Disease	85	22.7
	Asthma	80	21.4
	Do not know	13	3.5
	Others	7	1.9
	Total	374	100.0

Figure 5: Pie chart about importance of latrine

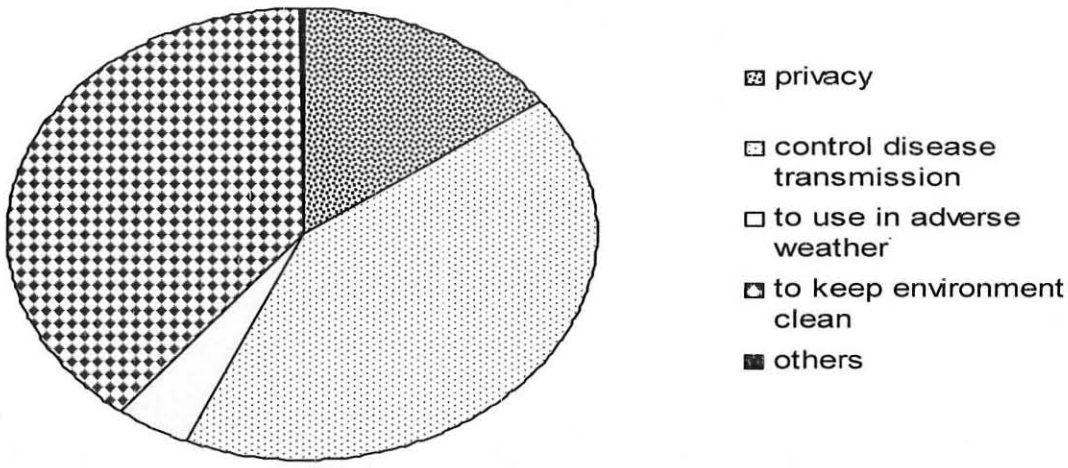


Fig 6: Respondents reason for not having latrine

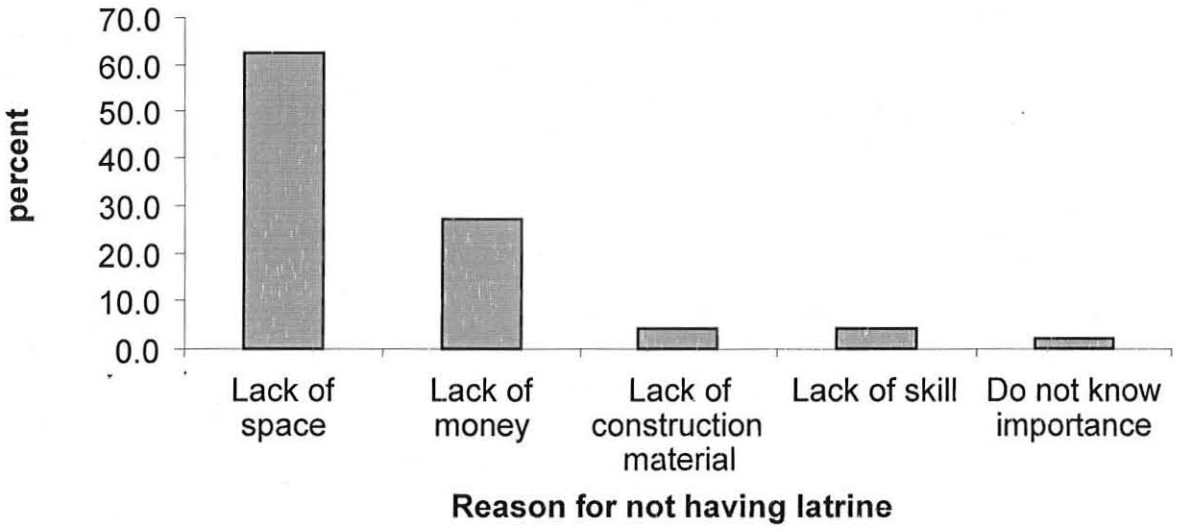
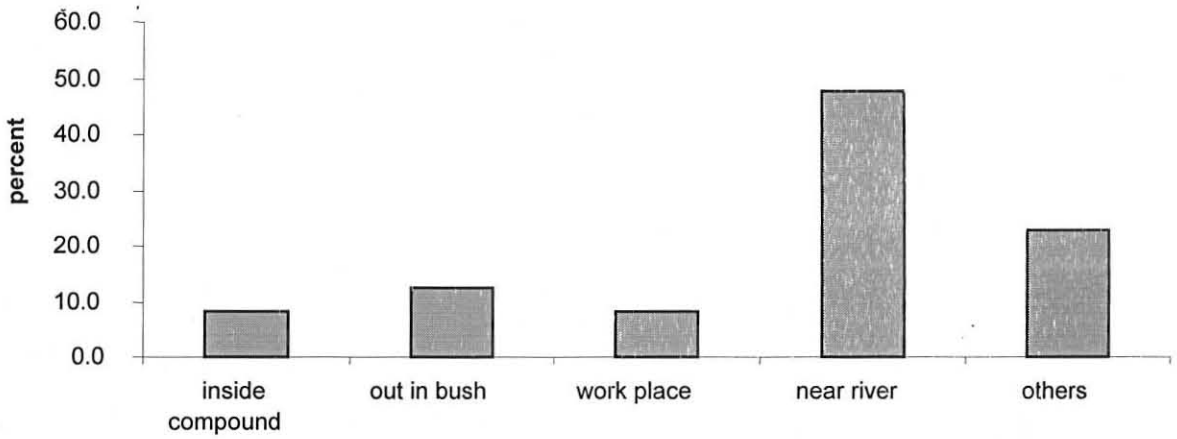


Fig 7: If no latrine (fig 6) where do you defecate



Where do vou defecate?

The study subjects were asked questions related with their practice of solid and liquid waste disposal. The result showed that (39.6%) of the respondents dispose their refuse to other places such as to the river, dumping in to other kebeles or other areas far from their home, and giving to door to door waste/refuse collectors and dumping in to waste collecting cars. The area where the respondents dispose their refuse next to above mentioned areas is throwing to open field (27.0%). The least percentage for this question was burning which accounts (14.2%).Majority of the respondents (42.0%) dispose their liquid waste in to pit. Questions to determine the practice of respondent's interms of frequency was asked and about (69.0%) said they don't throw rubbish when no body watches them followed by (12.6%) who throw rubbish sometimes when no body watches them. About (41.7%) of the respondents have never seen while their neighbors throw rubbish followed by (28.6%) who said they saw sometimes when their neighbors throw rubbish. To determine the measures taken by the respondents when they see while their neighbors throw rubbish were asked and majority of them (43.6%) responded that they give advice to protect environment but almost equal percentages (39.9%) of the respondents see and ignore when they see their neighbors throw rubbish .About (57%) of the study subjects never discuss

about their local environment related to health with any concerned person /body. Questions to determine/ label the status of their local environment was asked and almost half of the respondents replied that their local environment is partially managed and almost equal number of them (43.9%) responded that their local environment is not properly managed. From those who said their local environment is not properly managed (45.7%) of them said the reason is because of the community followed by Negligence of Government which accounts (34.8%) (Table-5).

Table 5: Practice of respondents towards local sanitation Addis Ketema Sub City, Addis Ababa, May 2008

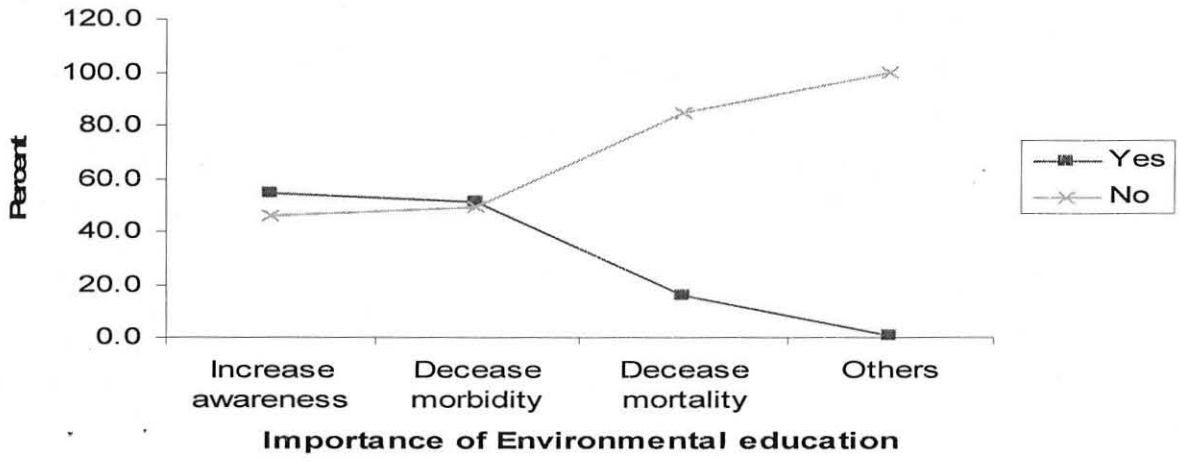
Variables		*No*	*%*
Where do you dispose refuse?	Open field	101	27.0
	Pit	72	19.3
	Burn	53	14.2
	Others	148	39.6
	Total	**374**	**100.0**
Where do you dispose liquid waste?	Open field	37	9.9
	Pit	157	42.0
	Septic tank	136	36.4
	Latrine	34	9.1
	Others	10	2.7
	Total	**374**	**100.0**
How often do you throw rubbish when nobody watches you?	Always	32	8.6
	Sometimes	47	12.6
	Seldom	37	9.9
	Never	258	69.0
	Total	**374**	**100.0**
How often do you see when your neighbors throw rubbish?	Always	58	15.5
	Sometimes	107	28.6
	Seldom	53	14.2
	Never	156	41.7
	Total	**374**	**100.0**
What do you do when you see your neighbor throw waste?	Advice	95	43.6
	See and ignore	87	39.9
	Report to concerned body	25	11.5
	Other	11	5.0
	Total	**218**	**100.0**
How often do you discuss about your local environment related to health?	Always	28	7.5
	Sometimes	79	21.1
	Seldom	53	14.2
	Never	214	57.2
	Total	**374**	**100.0**
How do you label your local environmental condition?	Properly managed	32	8.6
	Partially managed	168	44.9
	Not properly managed	164	43.9
	Do not know	10	2.7
	Total	**374**	**100.0**
If you answer 'Not properly managed', why do you think it is?	Lack of awareness	28	17.1
	Negligence of community	75	45.7
	Negligence of government officials	57	37.2
	Total	**164**	**100.0**

In order to determine the level of awareness/knowledge of respondents regarding the association between local environment and health was asked and (68.4%) of them are aware of about how local environment may affect health while the rest of them (31.6%) are not aware of it. From those who said that there is association between local environment and health (55.1%) replied that environmental education improves health. Almost all respondents (94.1%) are aware of that environmental education prevents illness. One hundred seventy nine (47.9%) of the respondents replied that community environment is most hazardous to health followed by one hundred four (27.8%) of them replied home environment is most hazardous to health if disrupted. Regarding the source of environmental education, respondents were asked and majority (40.6%) of them responded that environmental knowledge can be gained from formal education followed by who said it can be gained in an informal way which accounts (36.6%)(Table-6). Respondents were asked about the importance of environmental education and majority of the respondents replied that it is important to increase awareness about its impact related to health followed by decrease morbidity and decrease mortality respectively (Fig 8)

Table 6: Knowledge of respondents about environmental health education, Addis Ketema Sub City, Addis Ababa, May 2008

Variables		No.	%
Association between local environment and health?	Yes	256	68.4
	No	118	31.6
	Total	**374**	**100.0**
If 'Yes', what association?	Environmental education improves health	141	55.1
	Environmental education has little contribution	50	19.5
	Could have association if only given by health professional	59	23.0
	Others	6	2.3
	Total	**256**	**100.0**
Environmental education prevent illness	Yes	352	94.1
	No	22	5.9
	Total	**374**	**100.0**
Which local environment is most hazardous to your health if disrupted?	Home	104	27.8
	Industries around home	59	15.8
	Community environment	179	47.9
	Do not know	32	8.6
	Total	**374**	**100.0**
Where do you think environmental knowledge be gained?	Non-formal education	66	17.6
	Informal way	137	36.6
	Formal education	152	40.6
	Others	19	5.1
	Total	**374**	**100.0**

Fig 8: Importance of environmental health education (knowledge)



More than three-fourth of the respondents (78.0%) replied that there is no regular environmental health education program in their kebele. From those who said there is environmental health education in their kebele, those who

attended the environmental health education account (19.8%). From the same respondents on average (55.4%) of them attended environmental health education once per month. Exactly half of the respondents replied that they get the education some where in their kebele. Again from those who attended the education, majority of them (54.1%) said that health personnel from health organizations deliver the education. Almost equal number of respondents said that they are ready to participate in local environmental hygiene campaign program and educate family members and others (Table-7).

Table 7: Practice of respondents about environmental health education, Addis Ketema Sub City, Addis Ababa, May 2008

Variables		**No.**	**%**
Environmental health education is available	Yes	84	22.0
	No	290	78.0
	Total	**374**	**100.0**
Ever attended if available	Yes	74	19.8
	No	300	80.2
	Total	**374**	**100.0**
If attended, how often?	Once per week	9	12.2
	Once per two week	15	20.3
	Once per three week	3	4.1
	Once per month	41	55.4
	Others	6	8.1
	Total	**74**	**100.0**
If attended, where?	Health institution regularly	18	24.3
	Health institution only when family members are sick and there	14	18.9
	Somewhere in the kebele	37	50.0
	Community gathering	5	6.8
	Total	**74**	**100.0**
If attended, who gives you?	Personnel from NGO	18	24.3
	Personnel from hygiene and beautification office	15	20.3
	Personnel from health organization	40	54.1
	Others	1	1.4
	Total	**74**	**100.0**
If attended, what measure did you take?	Participate in local environmental hygiene campaign	36	48.6
	Educate family members and others	38	51.4
	Total	74	100.0

In order to see whether there is an association or not, dependent and independent variables were cross tabulated and tested using Chi-square test and the following results were identified.

In order to determine whether there is an association between the general knowledge (dependent variable) of the respondents and their marital status, the link between environment and health, availability of environmental education in the kebele (Independent variables) were cross tabulated. The test result showed that there is significant association (x2: $P<0.05$) between in those who heard about environmental health and those who replied that there is a link between local environment and health. In the same way there is significant association between those who are aware of environmental health and availability of environmental education in the kebele (Table-8).

In order to see whether an awareness about environmental education related to health(dependent variable) is associated with educational status, availability of solid waste container/dustbin , availability of environmental education in the respondents kebele (Indcpendent variables).The result shows that there is a significant association (x2:$P<0.05$) between awareness about environmental education, availability of solid waste container/dustbin and availability of environmental education in respondents kebele (Table-8).

Table 8: An association table between General Knowledge of respondents and marital status and availability of environment education, Addis ketema Sub City, Addis Ababa, May 2008

			Heard about environmental health		*Total*	x^2
			yes	*no*		
Marital status	***Single***	**No.**	92	21	113	
		%	81.4%	18.6%	100.0%	
	Married	**No.**	161	55	216	
		%	74.5%	25.5%	100.0%	
	Separated	**No.**	12	4	16	
		%	75.0%	25.0%	100.0%	2.57
	Widowed	**No.**	24	5	29	
		%	82.8%	17.2%	100.0%	
Total		**No.**	289	85	374	
		%	77.3%	22.7%	100.0%	
		%	77.3%	22.7%	100.0%	
Availability of environmental education in your kebele	***yes***	**No.**	77	7	84	
		%	91.7%	8.3%	100.0%	
	no	**No.**	212	78	290	12.78*
		%	73.1%	26.9%	100.0%	
Total		**No.**	289	85	374	
		%	77.3%	22.7%	100.0%	

P<0.05

There was a strong association (x2: P<0.05) between in those who said environmental education prevent illness versus availability of solid waste container/dustbin. In the same way and availability of environmental education. The possible reason for not having significant association between those who replied environmental education prevents illness versus educational status may be due to almost similar distribution of respondents for each educational level (Table-9).

Table 9: An association table between general knowledge of respondents and respective Independent and other determinant variables, Addis Ketema Sub City, Addis Ababa, May 2008.

			Environmental education prevents illness			
			yes	*no*	*Total*	x^2
Educational status	***illiterate***	**No.**	70	4	74	1.49
		%	94.6%	5.4%	100.0%	
	can read and write	**No.**	46	4	50	
		%	92.0%	8.0%	100.0%	
	primary	**No.**	86	7	93	
		%	92.5%	7.5%	100.0%	
	secondary	**No.**	112	5	117	
		%	95.7%	4.3%	100.0%	
	above secondary	**No.**	38	2	40	
		%	95.0%	5.0%	100.0%	
Total		**No.**	352	22	374	
		%	94.1%	5.9%	100.0%	
availability of solid waste container/dustbin	***yes***	**No.**	86	13	99	12.78*
		%	86.9%	13.1%	100.0%	
	no	**No.**	266	9	275	
		%	96.7%	3.3%	100.0%	
Total		**No.**	352	22	374	
		%	94.1%	5.9%	100.0%	
Availability of environmental education in your kebele	***yes***	**No.**	74	10	84	7.10*
		%	88.1%	11.9%	100.0%	
	no	**No.**	278	12	290	
		%	95.9%	4.1%	100.0%	
Total		**No.**	352	22	374	
		%	94.1%	5.9%	100.0%	

P<0.05

To identify whether there is an association between the practice of the respondents and its respective independent variables, Chi-square test was made and the following association was found. There is a significant association (x2:P<0.05) between area selection to dispose refuse and availability of discussion in the kebele about local environment related to health , availability of solid waste container/dust bin and availability of environmental education in the respondents kebele(Table-10)

The trend of waste container use was cross tabulated with house hold income, *marital status, Educational status*, availability of solid waste container/dust bin, availability of environmental education in the respondent's kebele. The test result shows that there is significant association (x2:P<0.05) between waste container use, marital status and availability of solid waste container/dust bin (Table-10).

Table 10: An association table between Practice of respondents and respective determinant variables, Addis Ketema Sub City, Addis Ababa, May 2008.

			Where dispose refuse?					
			open field	*pit*	*burn*	*other*	*Total*	x^2
Discussion about local environment related to health	***Always***	**No.**	6	9	6	7	28	34.90*
		%	21.4%	32.1%	21.4%	25.0%	100.0%	
	Sometimes	**No.**	18	16	23	22	79	
		%	22.8%	20.3%	29.1%	27.8%	100.0%	
	seldom	**No.**	15	14	0	24	53	
		%	28.3%	26.4%	0.0%	45.3%	100.0%	
	Never	**No.**	62	33	24	95	214	
		%	29.0%	15.4%	11.2%	44.4%	100.0%	
Total		**No.**	101	72	53	148	374	
		%	27.0%	19.3%	14.2%	39.6%	100.0%	
Availability of solid waste container/dustbin	***yes***	**No.**	21	27	22	29	99	15.93*
		%	21.2%	27.3%	22.2%	29.3%	100.0%	
	no	**No.**	80	45	31	119	275	
		%	29.1%	16.4%	11.3%	43.3%	100.0%	
Total		**No.**	101	72	53	148	374	
		%	27.0%	19.3%	14.2%	39.6%	100.0%	
Availability of environment education in your kebele	***yes***	**No.**	16	16	19	33	84	8.00*
		%	19.0%	19.0%	22.6%	39.3%	100.0%	
	no	**No.**	85	56	34	115	290	
		%	29.3%	19.3%	11.7%	39.7%	100.0%	
Total		**No.**	101	72	53	148	374	
		%	27.0%	19.3%	14.2%	39.6%	100.0%	

P < 0.05

Table 11: An association table between Practice of respondents and respective determinant variables, Addis Ketema Sub City, Addis Ababa, May 2008

			Where dispose liquid waste						
			open field	*pit*	*septic tank*	*latrine*	*others*	*Total*	x^2
Association between local environment and health	***yes***	**No.**	26	125	79	18	8	256	20.29*
		%	10.2%	48.8%	30.9%	7.0%	3.1%	100.0%	
	no	**No.**	11	32	57	16	2	118	
		%	9.3%	27.1%	48.3%	13.6%	1.7%	100.0%	
Total		**No.**	37	157	136	34	10	374	
		%	9.9%	42.0%	36.4%	9.1%	2.7%	100.0%	

P<0.05

There is significant association (x2: P<0.05) between waste container use (practice) versus marital status, availability of waste storage container/dust bin in the selected kebeles. No significant association is found for other independent variables such as house hold income, educational status and availability of environmental education in their kebele with the dependent variable waste storage container use. (Table-11).

Table 12: An association table between practice of respondents and respective Independent variables, and other determinant variables Addis Ketema Sub City, Addis Ababa, May 2008

			Waste storage container use		Total	x^2
			yes	no		
Household income	*No income*	No.	15	18	33	
		%	45.5%	54.5%	100.0%	
	1-150	No.	49	38	87	
		%	56.3%	43.7%	100.0%	
	151-250	No.	40	35	75	
		%	53.3%	46.7%	100.0%	
	251-500	No.	56	55	111	3.39
		%	50.5%	49.5%	100.0%	
	501+	No.	42	26	68	
		%	61.8%	38.2%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	
Marital status	*Single*	No.	64	49	113	
		%	56.6%	43.4%	100.0%	
	Married	No.	121	95	216	
		%	56.0%	44.0%	100.0%	
	Separated	No.	10	6	16	
		%	62.5%	37.5%	100.0%	11.55*
	Widowed	No.	7	22	29	
		%	24.1%	75.9%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	
Educational status	*illiterate*	No.	39	35	74	
		%	52.7%	47.3%	100.0%	
	can read and write	No.	27	23	50	
		%	54.0%	46.0%	100.0%	
	primary	No.	46	47	93	
		%	49.5%	50.5%	100.0%	1.52
	secondary	No.	67	50	117	
		%	57.3%	42.7%	100.0%	
	above secondary	No.	23	17	40	
		%	57.5%	42.5%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	
availability of solid waste container/dustbin	*yes*	No.	72	27	99	
		%	72.7%	27.3%	100.0%	
	no	No.	130	145	275	18.9*
		%	47.3%	52.7%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	
Association between local environment and health	*yes*	No.	142	114	256	
		%	55.5%	44.5%	100.0%	
	no	No.	60	58	118	0.69
		%	50.8%	49.2%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	
Availability of environmental education in your kebele	*yes*	No.	50	34	84	
		%	59.5%	40.5%	100.0%	
	no	No.	152	138	290	1.33
		%	52.4%	47.6%	100.0%	
Total		No.	202	172	374	
		%	54.0%	46.0%	100.0%	

P <0.05

The cumulative knowledge, attitude and practice of the respondents were computed based on the procedures mentioned in the methodology part. Major proportions of respondents who do have moderate knowledge are (54.3%) followed by those who have poor knowledge (29.7%). The least number of them (16%) have good knowledge. Regarding their attitude (68.4%) of the respondents do have moderate attitude followed by those have poor attitude (15.8%). Only (15.8%) respondents have good attitude. On the other hand, those who have moderate practice were (55.6%) and (36.6%) respondents have poor practice. Those who have good practice were only (7.8%). (Table 12).

An association was done between the two dependent variables (cumulative knowledge and practice) using Chi-square test. The test result shows that there is significant association ($x2$: $P<0.05$) between the two variables which probably be the gap that exists between their knowledge and practice level. (Table 13).

Table 14: Cumulative Knowledge, Attitude and Practice of respondents about their local environmental sanitation, Addis Ketema Sub City, Addis Ababa, May 2008

Category	Knowledge		Practice		Attitude	
	No.	%	No.	%	No.	%
Poor	111	29.7	137	36.6	59	15.8
Moderate	203	54.3	208	55.6	256	68.4
Good	60	16	29	7.8	59	15.8
Total	**374**	**100**	**374**	**100**	**374**	**100**

Table 15: An association table between cumulative knowledge and practice level of respondents about their local environmental sanitation, Addis Ketema Sub City, Addis Ababa, May 2008

			Practice category			Total	x^2
			Poor	Moderate	Good		
Knowledge category	Poor	No.	40	68	3	111	14.7*
		%	36.0%	61.3%	2.7%	100.0%	
	Moderate	No.	74	114	15	203	
		%	36.5%	56.2%	7.4%	100.0%	
	Good	No.	23	26	11	60	
		%	38.3%	43.3%	18.3%	100.0%	
Total		No.	137	208	29	374	
		%	36.6%	55.6%	7.8%	100.0%	

$P < 0.05$

Based on the premises described in the methodology part to measure attitude, almost all the study subjects (98.1%) favor that every citizen should be responsible to protect environment. Those who are not in favor that the government is responsible to protect environment accounts (55.1%) where as those who agreed that government is responsible to protect environment accounts (37.4%). *More than Ninety percent of the respondents favor/agree that most community members should clean their local environment* (96.0%) and *most community members shall discuss openly about their local environment and its impact on health* (92.2%) respectively. The major portion of the respondents (64.2%) agreed that environmental protection is more of

individual affairs. Attitude of the respondents attitude about government in protecting respondents local environment were asked and almost equal percentage of the respondents agree (44.9 %)and disagree (47.3%) on this issue. Almost half of the respondents (52.7%) disagreed that there is a close link between government and the community to protect the respondents local environment and maintaining health. About (62.0%) of the respondents agreed that humans need not adapt to natural environment because they can remake it to suit their needs. Almost equal percentage of the study subjects agreed that they are ready and interested to attend environmental education program (94.1%) and willing to take part in community campaign of waste disposal activities in their kebele (91.4%). (Table-14).

Table 16: Attitude of respondents towards local sanitation Addis Ketema Sub City, Addis Ababa, May 2008.

Variables		Favorable	Undecided	Unfavorable	Total	χ^2
Every citizen is responsible to protect environment	No.	367	4	3	374	706.6*
	%	98.1	1.1	0.8	100.0	
Government is responsible to protect environment	No.	140	28	206	374	129.9*
	%	37.4	7.5	55.1	100.0	
Most community members should clean their local environment	No.	359	4	11	374	660.9*
	%	96.0	1.1	2.9	100.0	
Most community members shall discuss openly about their local environment and its impact on health	No.	345	12	17	374	584.9*
	%	92.2	3.2	4.5	100.0	
Local environmental protection is more of individual	No.	240	33	101	374	178.6*
	%	64.2	8.8	27.0	100.0	
Government is doing its best to protect your environment for better health	No.	168	29	177	374	110.4*
	%	44.9	7.8	47.3	100.0	
There is a close link between government and community to protect environment and maintain health	No.	122	55	197	374	81.0*
	%	32.6	14.7	52.7	100.0	
Humans need not adapt to natural environment because they can remake it to suit their needs	No.	232	80	62	374	139.9*
	%	62.0	21.4	16.6	100.0	
I am ready and interested to attend environmental education program	No.	352	8	14	374	622.0*
	%	94.1	2.1	3.7	100.0	
I am willing to take part in community campaign of waste disposal activities in my kebele	No.	342	4	28	374	570.6*
	%	91.4	1.1	7.5	100.0	

P< 0.05

CHAPTER FIVE

DISCUSSION

5.1. Discussion Based on Quantitative Data's

This community based study was conducted to assess the knowledge, attitude and practice of residents in Addis Ketema Sub city about their local environmental sanitation related to solid waste disposal and its association with health. In addition, the study tried to determine the environmental health conditions of the Sub City through observation and check list.

According to this particular study the knowledge level of the community towards local environmental sanitation particularly related with waste disposal system and its impact on health is not satisfactory as this study is conducted in the capital city of Ethiopia, Addis Ababa where the population has relatively better access for various information. The possible reason for this is probably lack of regular environmental health education in their kebele as it is evidenced by the findings of this study where only (22.0%) of the respondents replied that there is environmental health education in their kebele in contrast the other (78%) of the respondents replied that there is no regular environmental education in their kebele. This is substantiated by Feachem, 1978 as in societies with high general standard of health education sanitation system operates satisfactorily because of the safeguard awareness in the users, that they know how to operate the system and to correct minor malfunctions. On the other hand, in societies where community hygiene education is low this awareness is rudimentary so that there is often no efficient attempt to correct even the most elementary malfunction (Feachem et.al, 1978)

The knowledge level of respondents towards their local sanitation disagrees with a study conducted in Iran, Yazd University which might be due to being community and University based study or may be development issue. The study conducted in Yazd University revealed that the knowledge of more than (65%) of students was better than moderate unlike (54.3%) of respondents having just moderate knowledge in the current study.

Respondents are partially aware of about the importance of safe environment as majority of them (61.0%) replied that safe environment is important to prevent illness. The source of information about local environmental health for most respondents is from radio and television. This shows that how much the residents are in deficiency of regular environmental education in their kebeles. One hundred seventy three (46.3%) of the respondents knows that the most commonly transmitting disease is diarrhea related with improper waste disposal .This finding almost agrees with the study which was conducted by Federal Ministry of Health (FMOH) in Addis Ababa, woreda 14, 1997 as part of National study which revealed that diarrhea is most associated or occurring disease related with improper waste disposal (49.7%). It also agrees with study conducted in Awassa (Wasse Shiferaw, 2006). Both of above and current findings were better when compared with study done in Lesotho by International development Research Center and Science of Humanity which was about 16-18 %.(IDRCSH, 2002)

The very surprising thing in this finding is that the current result is almost the same as that of the finding ten years back by FMOH. This probably shows that either no measure has been taken after ten years to increase awareness about the possible disease to be transmitted if wastes are improperly disposed or there was intervention problem.

Houses where respondents had a poor knowledge or perception about environmental health are those who do not have environmental education in their kebeles as evidenced by the majority of respondents (91.7%) who have

better awareness have an access for environmental education in their locality. This data is supported by a national study conducted by FMOH, 1997 that hygiene education regarding safe water supply is usually provided at health facilities, however the study shows that only small proportion of other respondents had education through mass media, health personnel, school, etc.

Despite lack of solid waste container/dustbin in sample kebeles; the respondents are aware about how illness can be minimized significantly if waste storage is used. The existence of association in these variables is probably be, the gap which exists between supply and demand of resources to dispose wastes. In the same way those who have better access for environmental education in their kebeles are more aware of as to how illness can be prevented than those who do not have the access.

In addition to unsatisfactory level of awareness of the community, their practice is even in the lower achievement. This discordance agrees with the study conducted in Afghanistan where many responses of house hold heads regarding knowledge indicating that information on hygiene exists but is not being practiced (Maja Ulrich-Hebel, 2005)

According to the results of current study, most respondents practice disposing their solid waste disposal in an open fields and others usually to the near by rivers which might have adverse effect on the health of the community since at least few of the community members use the water source for different purposes. (WHO, 1974) in this regard has stressed that the unhygienic disposal of waste is one of the most serious environmental problems in many regions of Africa. Hence there is a need to change these practices through appropriate local environmental health education. Regarding solid waste disposal practice the findings of this study agrees with the study conducted by FMOH , 1997 in collaboration with UNICEF as a summary states that most of the respondents, be it in urban or rural areas,

said that they use "open field" for on site solid waste/refuse storage system. The difference in finding of FMOH, 1997 from current finding is that more than quarters of woreda 14, in 1997 respondents were disposing solid wastes by burning but the current finding shows that about 37.2 % of the respondents throw their solid waste in to the river. This difference might be due to difference in the study area.

Majority of the respondents in current study dispose their liquid waste (42.0%) in to Pit followed by septic tank (36.4%). Liquid wastes was mainly drained through the drainage lines found openly and /or open fields followed by septic tank; like a survey done by Ministry of Health (FMOH,1997).

The proper disposal of waste is affected by availability of discussion about environment related to health in respondents kebele. This is well evidenced by majority of the respondents (73.4%) who never make discussion are more prone to dispose their refuse in open fields and other places such as river, dumping in other villages and dispose in open field etc. The association which exists between availability of community or individual initiated discussion and techniques of refuse disposal shows that how much community discussion is important for proper disposal of refuses. There is also an association between availability of waste storage container and techniques of refuse disposal. The association in this case may probably be peoples dispose inappropriately (72.4%) because there is lack of resources such as waste storage container and dust bin to dispose refuse. In the same talken lack of environmental education in the kebeles has its own contribution for improper disposal.

An Association which exist between marital status and use of waste storage container may be due to the married respondents are more responsible. Almost the same percentage of single respondents use waste storage container most probably is because they get the information from school since majority of the respondents (66.9%) are from primary and secondary

and above secondary school. Respondents are more likely use waste storage container provided that there is the container/dust bin. This is shown by the association (x2: $P<0.05$) between the two variables.

In order to see whether there association between the cumulative knowledge and practice level of respondents using Chi-Square test (Table-13). The test result revealed that there is significant association (x2: $P<0.05$) between the two variables. This shows that there is a significant gap between the respondents' level of knowledge and their performance to maintain their local environmental sanitation

With respect to questions asked for the respondents to measure attitude, the most critical question from all was whether there is a good attitude towards the link between the community and government for maintaining good local environmental sanitation. But the result revealed that more than half of respondents are not favoring this idea. This shows that there is a gap between the community and the government to help each other for proper sanitation. Unless the negative attitude developed by the respondents is not resolved the problem of sanitation may even go worse. This idea is also supported by majority of respondents who do not favor that government is doing its best to protect local environmental sanitation related with waste disposal. There are various tier systems in the sub city that are responsible to narrow the gap regarding sanitation and improve community attitude but still there is negative attitude in this regard. This finding agrees with a study by (Milas S.1987) which says despite various programs by different tiers of government to address the issue of environmental sanitation, many Nigerians still have negative attitudes toward environmental sanitation and do not value personal or environmental sanitation.

Majority of respondent's attitude favoring individual action to maintain proper sanitation shows low/negative attitudes while maintaining good environmental sanitation is the joint effect of many stake holders such as

government, NGOs, and community themselves instead of independent role. This is probably associated with not having good knowledge which might in turn be associated with almost no environmental education in the respondents kebele. This idea matches with the study conducted in Nigeria by (Ukpong, 1991) who emphasized the importance of education in achieving the goals in environmental sanitation. He stressed strategies such as analysis, sensitization, information, education, and motivation, indicated that these strategies would provide knowledge and would change the people's attitudes toward environmental sanitation.

Though the above attitudes are very critical there are also promising results regarding attitude related with whom should be responsible to protect local environmental sanitation, whom should clean local environment, favoring availability of discussion though almost non existent, willingness to participate in local environmental sanitation campaign program and to attend environmental health education if available . These favorable attitude exist while most of the activities are not actually there which might have changed this result.

A chi-square goodness of fit test was conducted for all of the attitude item (table, 16). The result indicated that the distribution of all attitude variables are uneven ($p<5\%$).

5.2. Discussion Based on Observation with Its Check List and Qualitative Data's

In this part the general observation of the sub city, contribution of NGOs and private sectors for sanitation in the sub city, and the conditions of streets, latrines and rivers and finally response for open ended questions were reviewed.

Generally the environmental sanitation condition of Addis Ketema Sub City is very poor. This poor situation is usually as a result of being the Sub City constitutes the biggest market (Merkato) and the biggest bus station (Tiliku Menaheria) in the nation. In addition to these two service areas lack of waste disposal facilities and poor practice to dispose solid waste disposal may aggravate the problem. The two service area mentioned above contributes a lot for the population to be overcrowded which in turn could be the reason for improper disposal of solid waste. These resulted the streets to be mainly occupied by solid wastes having bad odor and unsightly condition. The main source of income for the house holds around bus station is giving bed room service for at least 10-15 peoples in very small and single house but a fair price not greater than one or two birr. All the above situations have a big impact on residents' health either for feco-oral or any other communicable diseases.

With regard to solid waste disposal technique and facilities to dispose solid waste, the usual solid waste collection systems of the residents in the sub city is door-to-door collection for households along accessible streets and container system. Although it is expected the container service 3 -4 times per week, containers are usually emptied more than a week period on average. Besides, some households are located 1 km away from their closest container that people tend to through their waste in rivers, and open fields. The capacity of the sub city to deploy adequate number of vehicles and waste containers is very low, which may cause the community to dispose else where hazardous to health. Other waste disposal method such as incineration and recycling of wastes are not used.

There are about three local NGOs in the selected kebeles of study area; namely MCDP, CCF, Abebech Gobena. All of them were working in environmental sanitation area by constructing latrine and providing environmental education but very rarely. For example MCDP constructed

nine common latrines for about 1500 beneficiaries. MCDP also provide environmental education very rarely through a special program called coffee ceremony by collecting about 15-20 neighbors. In this coffee ceremony much attention is given for HIV/AIDS and due attention is not given for environmental sanitation. CCF and Abebech Gobena also constructs latrines and almost nil participating in environmental education program. These NGOs working on sanitation area 3-4 years back but not active currently either in sanitation or environmental education. According to the focal person in each NGOs and the kebele representatives, the interruption of latrine construction is associated with lack of space and their drainage system. The reason for not having regular environmental education is because they give more attention for other services such as HIV/AIDS and for unjustified reasons.

Most rivers such as Michael bridge river, Alemesehay bridge river, Chew Berenda river, Ayra Sefer river and others in the selected kebeles are filled with solid wastes out sourced mainly from individual houses, some of it from commercial establishments and other areas. Some of the community of Addis Ababa population uses this water source for drinking and cleaning purpose. This condition could highly facilitate for the transmission of many communicable diseases. There are about six public latrines in kebele 01/02/03 for defined number of population. But currently one of them is not functioning because it is filled and not evacuated. In kebele 13/15 there are about 9 public latrines and all are functioning well. There are about–public latrines in kebele 14/21 again all functioning. The sanitary conditions of these public latrines are poor and their drainage for most of them is to the near by rivers where they can infect/contaminate lots of people. Private sectors such as few hotels and other business firms are participating in the maintaining the beauty of their near by surroundings and in the mean time they use the area for advertising their business. This activity has its own contribution for control of improper waste disposal since those individuals

are responsible to protect the area but the contribution of this private activity is not significant in the current status since it is not well practiced by many business firms. If this idea of privatization for sanitation is well practiced it could bring better achievement.

Most of the study subjects agreed that house holds are the main source of solid waste in their locality. They also emphasized that community and Government should work in an integrated manner for proper disposal of solid wastes and hence maintaining health of the society.

The large scale production and improper disposal of solid waste in the Sub-City may become a source of health hazard by causing many diseases like cholera, gastro- enteritis and other communicable diseases. All the above description indicates that the sub-city is suffering from sanitation problem which seek immediate measures to decrease morbidity and mortality.

5.3. Figures Showing Collected Solid Waste in Rivers, Main Streets and Public Latrines Taken as a Sample from the Three Selected Kebeles, Addis Aketema Sub City, Addis Ababa Town (The Picture are Taken by the Researcher on 29/09/2000 E.C.)

Fig. 9: Solid waste collected on Main Street and very near to the biggest bus station, Addis Ketema sub-city, Addis Ababa town

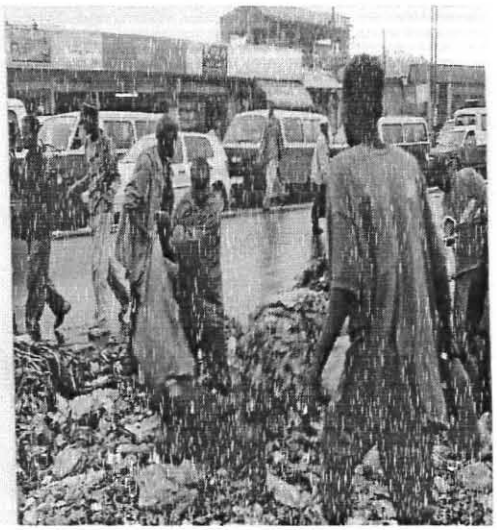


Fig. 10: Improper Wasted disposal by the residents, near the biggest bus station, Addis Ketema Sub City Addis Ababa Town

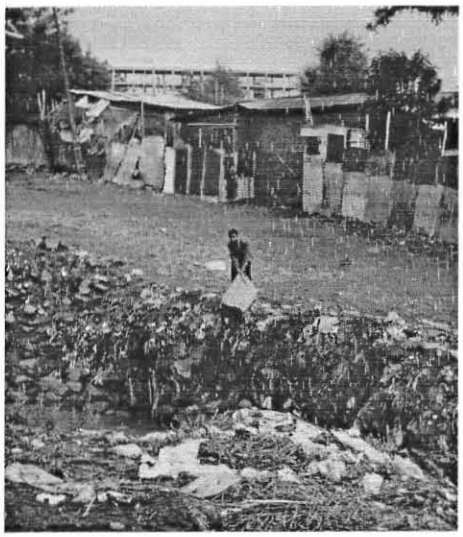


Fig. 11: Improper waste disposal in Chew Berenda River, Addis Aketema Sub City

Fig. 12: Public toilet around Chew Berenda

Fig. 13: Solid waste collected in the main street, Addis Ketema sub-city Addis Ababa Town

Fig. 14: Solid waste collected near Kebele 13/15 Addis Ketema sub-city Addis Ababa Town

Fig. 15: Containers filled with solid wastes, in kebele 14/21, Addis Ketema Sub city, Addis Ababa Town

Fig. 16: Solid waste collected around Berbere Tera, Tekle Haimanot, kebele 01/02/03 Addis Ketema sub city, Addis Ababa Town

Fig. 17: Solid waste collected within and Round River which border kebele 13/15 and 14/21 Addis Ketema sub city, Addis Ababa Town

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1. Conclusion

The objective of the study was to determine the knowledge, attitude and practice of the community in the selected kebele of Addis Ketema Sub City about sanitation particularly related with solid waste disposal and its association with health.

The cumulative knowledge, attitude and practice of the respondents were computed based on the procedures mentioned in the methodology part. Major proportions of respondents who do have moderate knowledge are (54.3%) followed by those who have poor knowledge (29.7%). The least number of them (16%) have good knowledge. Regarding their attitude (68.4%) of the respondents do have moderate attitude followed by those have poor attitude (15.8%). Only (15.8%) respondents have good attitude. On the other hand, those who have moderate practice were (55.6%) and (36.6%) respondents have poor practice. Those who have good practice were only (7.8%). This shows that the level of awareness is relatively better than their practice significantly, i.e. there is discordance between the levels of awareness and their practice. This was evidenced by cross tabulating the two dependent variables and testing using Chi-Square test. The test result showed that there is significant association (x^2:$P<0.05$) between the two variables. This indicates that there is clear gap between their awareness and level of practice.

Based on observation made, quantitative and qualitative findings this could probably be due to lack of facilities to dispose their wastes/refuses or their awareness/knowledge is uncritical that will not influence them for actual practice. Many study revealed that environmental education is a key activity

in order to increase people's awareness and attitude which may enable to improve practice. But environmental health education in respondents' kebele is almost non existent except they gain from different sources like mass media (radio and television) which could hinder them from having critical knowledge. According to the findings of respondent's attitude, there is a clear gap between government and the community in maintaining sanitation of the sub-city. Unless the government and the community work in collaboration, it might be very difficult to bring change. The sub city in general is suffering from sanitation particularly related with solid waste disposal problem which needs immediate solution.

Therefore collaboration/co-ordination of different stake holders including government, NGOs, health organizations, local businesses agencies, schools, and religious organizations in educating, participating in the actual practice of solid waste disposal or any other strategy which could minimize solid waste from the sub city may improve the current condition. From all regular and frequent environmental health education by any of the above mentioned stake holders should be the priority agenda in order to bring change in the respondent's awareness, attitude and their practice.

In general this study revealed that, the knowledge, attitudes and practice of the respondents related with solid waste disposal and its association with health are low but the level of awareness and attitudes are relatively better than their practice. There is a clear gap/discordance between respondent's knowledge and attitude versus their practice which requires attention from concerned body.

6.2. Recommendation

Improper solid waste disposal is a challenge to Addis Ketema Sub-City, which could directly or indirectly be affecting the health of the community. Therefore, designing an effective strategy to improve knowledge, attitudes, and practice on how to dispose of solid waste properly is essential to the community, and would help minimize health risks in the future. Improper waste disposal is an area requiring due attention by the concerned bodies. Based on this assumption the following recommendations were forwarded.

1. Environmental health education of the whole community may result in the general improvement of sanitation and ensure the communities participation. However, this study revealed that regular environmental health education is almost non-existent in the sub city except other means such as information from radio and television. Therefore, different concerned stake holders should discuss the seriousness of this problem and design strategies in the provision of environmental health education on a regular basis, instead of focusing only on a single community problem, such as HIV and AIDS.
2. Currently, most stake holders in the sub-city are not doing what is expected of them with regard to solid waste disposal. In addition to this little contribution, the study also revealed that different stake holders are working independently in rendering service related with solid waste disposal system. Therefore, in addition to giving due attention to the problem, by incorporating solid waste disposal issues into their program. They should also collaborate to avoid effort duplication and pay attention to who are beneficence.
3. Based on the observation of the researcher and qualitative data the majority of latrines drainage system is connected to near by rivers. This is very frustrating because the health of the community is at risk.

Therefore, the concerned bodies particularly the government, should seek some solution before devastating health conditions occur.

4. The other critical problem of the sub-city is shortage of facilities able to store and transport solid waste so that the community does not dispose their waste in open fields or near by rivers. In addition to promoting education to improve "KAP" of the community, it is also vital to access facilities, in order to store and dispose solid waste. The door to door solid waste collecting mechanism should be encouraged and strengthened, because this mechanism works well and could potentially reduce the amount of solid waste generated and improperly disposed of.
5. The local NGOs and the government were participating in construction of public latrines 3-5 years ago. Due to the lack of attention to solid waste disposal and great emphasis on health consequences of other problems such as HIV and AIDS, organizations have not been active in constructing public latrines. It is obvious that issues such as HIV and AIDS are important, but these problems should not cause officials to overlook the importance of proper waste disposal, which affects thousands of people. Therefore, increasing the number of latrines should be encouraged and may improve the heath conditions in this area.
6. Unless there is a close link and communication between the government and the community, it might be difficult to reach a common goal. This study revealed that it is evident there is a poor link between the two parties. Instead of working independently it is advisable to collaborate in order to achieve a common goal.
7. Since Addis Ketema Sub-City holds a large market (Merkato) and bus station in the nation, the government or other concerned bodies should work on decentralizing these service areas in different areas of Addis Ababa. Extensive awareness should be conducted in order to influence the communities attitude and practice how to dispose of solid waste properly. It is also essential to inform the people about the health risks involved in improper solid waste disposal.

8. Recycling some of the solid wastes may help in reducing the waste generated. In addition, recycling may also help in reutilization of resources, which could have a great impact in the development of individual, community, and the nation. Therefore, recycling some of the solid wastes may help to address the problem.
9. The researcher could not find empirical studies conducted to determine KAP of the community in Addis Ababa. The only source to be found, was a study conducted in only one woreda as part of a national study done ten years ago by MOH. Therefore, further research should be conducted on the entire city including all Sub-Cities since it could be difficult to generalize the current findings to all of Addis Ababa.

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Appendix - A

ADDIS ABABA UNIVERSITY

INSTITUTE OF EDUCATIONAL RESEARCH

QEUSTIONNAIRE

A questionnaire to assess knowledge, Attitude and Practice towards environmental sanitation of residents to health in the selected kebeles of the Addis Ketema Sub-City, Addis Ababa Town

This structured questionnaire is interviewer-administered.

Questionnaire Serial Number----------

To the interviewer, please inform the respondent about the aim of the study as described below. (Read out) If the respondent is not at home you can take appointment for second visit.

Dear respondent, my name is _____and I am working with a researcher from Addis Ababa University

We are interested in learning more about your knowledge, attitude and practice related to environmental health conditions of the Sub-City. This questionnaire is designed for research work which will be approved by Addis Ababa University, Institute of Educational research to be conducted in partial fulfillment of Masters Degree in Educational Research and development. We hope you will help us by answering these questions. None of your answers will be available to any one. Do not give your name. We really need your honest response to better understand the knowledge, attitude and practice of residents about environmental sanitary conditions of your kebele.
The results of the study will hopefully serve as an important input to intervention program that aim at improving environmental sanitation and the Sub-City in particular

We thank you in advance for taking your time to answer our questions
Would you be willing to participate in the study? -----Agree ----Disagree
Interviewers name---------- Signature----------
Supervisor's name---------- Signature

Guiding Principles for most questions, possible answers are listed. Following the instruction fill the answers accordingly

- Questions should be asked as they are.
- Correctly, Observe if needed
- Listening carefully, Circle answers sheets exactly what the respondents answered

Identification

Kebele_____ House Number_____

Person interviewed
1. Husband
2. Wife
3. Other (specify)

House hold head
1. Yes
2. No

If no house hold head relation of respondent to household heads
1. Spouse
2. Son/Daughter
3. Relative
4. Others, specify _____

PART ONE

I. Background Characteristics				
Sr. No	**Question**	**Response**	**Code**	**Skip to**
101	Age of respondent (in years)			
102	Sex	1. Male 2. Female		
103	Marital status	1. Single 2. Married 3. Separated 4. Widowed		
104	Religion	1. Christian 2. Muslim 3. Others (specify)_____		
105	Ethnicity	1. Amhara 2. Oromo 3. Tigre 4. Gurage 5. Other (specify) _____		
106	Educational Status	1. Illiterate 2. Can read & write only 3. Primary education 4. Secondary education 5. More than secondary education		
107	Occupation	1. Merchant 2. Wage employed 3. Daily labourer 4. Others, (Specify)_____		
108	Estimated income of the family in birr per month _____			
	Duration of stay in the study area	1. <1 year 2. 1-5years 3. >5 years 4. Visitor		
II. General Environmental assessment (Knowledge)				
201	Have you ever heard about Environmental health?	1. Yes 2. No		
202	If yes (201), would you tell me where you heard?	1. Radio 2. Television 3 School 4. Community gathering 5. Informal association 6. Others 7. Private reading of books and newspaper		
203	Are you aware of the following environmental terms?	1. Ozone layer 2. Ecology 3. Green House effect 4. Biodiversity 5. Have no idea		

204	For any of your choice 1-4 (203), do you think they may affect your health?	1. Yes 2. No		
205	What is the importance of having safe environment?	1. To prevent serious environmental degradation 2. To prevent diseases 3. To have beautiful local environment 4. Others (Specify)_____		
206	Which one of the following disease do you think could be transmitted if your local environment is disrupted?	1. Eye diseases 2. Skin disease 3. Diarrheal disease 4. Intestinal parasites 5. Malaria 6. Other (specify)		
207	Does any of your family member experiences the above disease (206)	1.Yes 2.No		
208	What do you think is the source of environmental contamination in your locality in general?	1. Unclean containers 2. Improper waste disposal 3. Stagnant water 4. Overcrowding 5. Others (specify)		
III. Local Environmental assessment (practice)				
301	Who do you think should be responsible to protect your local Environment?	1. Government 2. Every Citizen 3. Community leaders' 4. Religious leaders 5. Others (specify)		
302	Whose role do you think is the role of Environmental Education Particularly?	1. Environmental experts 2. Government officials 3. Parents 4. Teachers from schools 5. Others (specify)		
303	What individual measure have you taken/are you taking to protect your environment?	1. Participate in hygiene campaign as organized by kebele officials 2. At least clean my home environment 3. Assumes it is not my role		
304	Are you using waste storage container?	1. Yes 2. No		
305	If No for question (304) where do you dispose?	1. Open space 2. Throw to the river 3. Burn 4. Take it to other village for dumping 5. Others (specify)		
IV. Waste disposal (Knowledge)				
401	Do you have latrine?	1. Yes 2. No		
402	If yes, what do you think is its importance to the family?	1. For privacy 2. To control disease transmission 3. To use in adverse weather(rain or sun) 4. To keep our environment clean 5. Others, Specify		

403	How did you come to know the importance of latrine for the first time?	1. Mass media 2. Health personnel 3. School 4. Imitation from persons and/or places 5. Others (specify) _____		
404	Do you think that refuse and garbage is a health hazard?	1. Yes 2. No 3. Don't know		
405	If yes(404) why?	1. Germ multiply in it 2. Fly feed and breed in it 3. Other, Specify		
406	In your Sub City which type of solid waste contributes the major share to solid waste generation?	1. Domestic waste 2. Commercial establishment 3. Industries 4. Street Sweeping 5. Hotels		
407	What types of disease are related to improper disposal of solid waste?	1. Diarrhea 2. Eye disease 3. Asthma 4. Don't know 5. Other (specify) _____		
V. Waste disposal (practice)				
501	If no latrine (401) why?	1. Lack of space 2. Lack of money 3. Lack of construction mate 4. Lack of skill, how to construct 5. Don't know the importance 6. Others, specify		
502	If no latrine where do you defecate?	1. Inside the compound 2. Out in the bush 3. In work place 4. Near river 5. Others, Specify		
503	Where do you dispose your refuse?	1. Open field 2. Pit 3. Burn 4. Other, Specify		
504	Where do you usually dispose your domestic liquid waste?	1. Open field 2. Pit 3. Septic tank 4. Latrine 5. Other (specify) _____		
505	How often do you throw rubbish when no body is watching?	1. Always 2. Sometimes 3. Seldom 4. Never		
506	How often did you see while your neighbors throw rubbish?	1. Always 2. Sometimes 3. Seldom 4. Never		

507	What do you do when you see your neighbors damp wastes in open space?	1. Advice him/her the hazard 2. Just see and ignore 3. Report to the concerned body 4. Others, specify		
508	How often do you discuss about your local environment related to health	1. Always 2. Sometimes 3. Seldom 4. Never		
509	How do you label the condition of your local Environment?	1. Properly managed 2. Partially managed 3. Not properly managed 4. I don't know		
510	If your answer to (509) is not properly managed, what do you think the reason is?	1. Lack of awareness 2. Negligence of the Community 3. Negligence of Local Governmental officials 4. Lack of resources 5. Others (Specify)_____		
511	Is there any solid waste storage container/ dustbin in your compounds?	1. Yes 2. No		
512	What measures should be taken to properly dispose solid wastes?	1. Burying 2. Burning 3. Composting 4. Other (Specify) _____		
VI. Environmental education program related to health (Knowledge)				
601	Do you think there is an association between your local environment and your health?	1. Yes 2. No		
602	If yes(601), which of the following association do you expect to exist?	1. Environmental education actually improves health 2. Environmental education may have little contribution for health 3. Could have association only if given by health professionals 4. Others (specify)		
603	Do you think environmental education program is useful to prevent illness?	1. Yes 2. No		
604	If yes, what do you think is its importance? (more than one answer is possible)	1. Increase awareness about disease transmission 2. Decrease morbidity rate 3. Decrease mortality rate 4. Other, Specify		
605	Which one of your local environment do you think is the most hazardous for your health if disrupted?	1. Home environment 2. Industries around your home 3. Community environment 4. I don't know		
606	Where do you think an environmental knowledge can be gained?	1. From Non formal Education 2. In an Informal way 3. Only from formal education 4.Other, Specify		

VII. Environmental education program related to health (practice)				
701	Is there any environmental education program in your kebele related to health?	1. Yes 2. No		
702	Have you ever attended environment education in your kebele?	1. Yes 2. No		
703	If yes, (701) how frequent?	1. Once per week 2. Once per two week 3. Once per three week 4. Once per month 5. Others (specify)_____		
704	If yes (702) where do you get it?	1. Health Institution on regular time per week/month 2. Health Institution only when Family members are there 3. Some where in the Kebele 4. Community Gathering 5. Others (specify)_____		
705	If yes, (702) who gives you the environmental education?	1. Personnel from NGOs in your Kebele 2. Personnel from Hygiene and beautification office 3. Personnel from health organization 4. Others (specify)		
706	If yes(702) what measures have you taken after getting the environmental health education program	1. Participated in the local environmental hygiene campaign program 2. Tries to educate family members and others		

VIII. Attitude related questions

For the next questions fill code in the box which has your choice.

1. Strongly agree
2. Agree
3. Undecided
4. Disagree
5. Strongly Disagree

		Strongly agree	Agree	Undecided	Disagree	Strongly
801	Every citizen is responsible to protect environment					
802	Government is responsible to protect the environment.					
803	Most community members should clean their local environment					
804	Most community members shall discuss openly about their local environment and its impact on health					
805	Local environmental protections is more of individual					
806	The government is doing its best to protect your environment for better health					
807	There is a close link between government and the community to protect environment and maintain health					
808	Humans need not adapt to the natural environment because they can remake it to suit their needs					
809	I am ready and interested to attend environmental education program (if available)					
810	I am willing to take part in community campaign of waste disposal activities in my kebele					

APPENDIX – B

PART TWO: Interview questions for residents, heads of health office, sanitation beautification and parking delegates in selected

1. Would you describe about the sanitary conditions of latrine, rivers and open fields in your kebele?

2. Would you explain about the storage, disposal and transportation of solid wastes in your kebele and its association with health if disposed improperly?

3. Would you describe the status of environmental health education in your kebele?

4. How do you describe the involvement of all stake holders such as NGOs, governments and others in maintaining your local environment clean and decrease transmission of disease?

5. Would you explain about the possible measure to be taken to reduce improper disposal of solid waste?

APPENDIX – C

Observation check list to determine the sanitary conditions related with solid waste disposal of the sub-city and the status of environmental health education

Items	Yes	No
Is solid waste properly stored, transported, disposed, and protected from vermin's?		
Is excreta disposal system satisfactory?		
Is there a responsible person, association or organization responsible to clean and see the hygienic conditions of all streets (main and village streets) regularly?		
Are streets, home compounds, rivers free of solid wastes?		
Is public toilets are adequate per users?		
Is toilet functional, properly maintained, convenient, clean, free of odors, and ventilated?		
Is drainage system of toilets appropriate?		
Is the population overcrowded and at health risk?		
Is there a door to door solid waste collection system in the kebele?		
Is there regular environmental health education program some where in the kebel?		
Are NGOs in your kebele have a good participation towards environmental sanitation particularly with solid waste disposal?		

APPENDIX – D

አዲስ አበባ ዩንቨርሲቲ
የስነ ትምህርትና ምርምር ተቋም
መጠይቅ

የቀበሌው ስም _____ **የቤት ቁጥር** _____

ይህ መጠይቅ በአዲስ አበባ ከተማ በአዲስ ከተማ ክፍል ከተማ በተመረጡ ቀበሌዎች በቤት ውስጥ የሚገኙትን አባወራ/እማወራ /ሌላ መልስ መስጠት የሚችል ሰው የሚመልሱት ሲሆን መጠይቁ የመላሽ የዕውቀት፡፡ አመለካከትና ተግባር በቤታቸውና በአካባቢያቸው ቆሻሻ አወጋገድና በጤናቸው ላይ የሚያደርስውን ተጽዕኖ ለመመዘን የተዘጋጀ መጠይቅ ነው፡፡

ይህ መጠይቅ የሚሞላው የምርምሩ ባለቤት በመደባቸው ሰዎች ይሆናል፡፡

ቃለ መጠይቁን የሚጠይቁ ሰዎች መጠየቀ ከመጀመራቸው በፊት የጥናቱን/የምርምሩን አላማ እንዲያስረዱ በትህትና ይጠየቃሉ፡፡

አቶ/ወ/ሮ /ወ/ሪት _____ እኔ _____ እባላለሁ፡፡
ከአዲስ አበባ ዩኒቨርሲቲ በመጡት በምርምሩ ባለቤት ተወክዮ ነው የመጣሁት፡፡ ዚህ ጥናት/ ምርምር አላማ በክፍል ከተማው ውስጥ በተመረጡ ቀበሌዎች የቤት አባወራዎች የቤታቸውንና የአካባቢያቸውን የቆሻሻ አወጋገድና በጤና ላይ የሚያደርሰውን ተጽዕኖ ዕውቀት አመለካከትና በተግባር ስለሚያደርጉት ለመመዘን የተዘጋጀ መጠይቅ ነው፡፡ ይህ ጥናት /ምርምር በአዲስ አበባ ዩኒቨርስቲ እውቅና ያለውሲሆን ምርምሩ የሚካሄደው ደግሞ በስነ ትምህርትና ምርምር እድገት ለማስተርስ ዲግሪ መመረቅያ ማሟያ ነው፡፡ ለመጠይቆቹ መልስ ይሠጡን ዘንድ በትህትና እንጠይቃለን፡፡ የሚሰጡን መልስ ለማንም አይገለጽም፡፡ ስምዎን ለጠያቂው መስጠት ግዴታ አይደለም፡፡ እኛ የህብረተሰቡን ትክክለኛና ታማኝ ምላሽ የምመንፈልገው የማኅበረሰቡ የቆሻሻ አወጋገድና በጤና ላይ የሚያደርስውን ተጽዕኖ ለመረዳት ነው፡፡ የዚህ ጥናታዊ ጽሁፍ ውጤት ለኅብረተሰቡ ጤና መሻሻል እርምጃ ለመውሰድ ያስችላል የሚል የጎላ ተስፋ አለን፡፡ በመጀመር ለጥያቄያችን መልስ ለመስጠት ጊዜዎን ስለሠጡን እናመሠግናለን፡፡ በምናደርገው የጥናት ስራ ላይ ለመሳተፍ ፍቃደኛ ነዎት?

አዎ _____ አይደለሁም _____

መጠይቅ ያደረገው ሰው ስምና _____ ዓ.ም _____

የሱፐርቫይዘር ስማና ፊርማ

የመጠይቅ አሞላል መመርያ

የእንዳንዱ ጥያቄ መጠይቁ ላይ እንደሠፈረው በትክክል መጠየቅ አለበት፡፡
መታየት ያለባቸው ቦታዎች ካሉ በትክክል መታየት አለባቸው፡፡
ተጠያቂዎች የሚሰጡትን መልስ በትክል ማዳመጥና ለተሰጡት መልሶች
ከተቀመጡት አማራጮች አንዱ ለኮድ በተገ/ጋጀ ቦታ ላይ ይሞላል፡፡

ተ.ቁ	ጥያቄ	መልስ	ኮድ	ይለፉ
ክፍል አንድ: የተጠያቂው ዴምግራፊያዊና ሶሲዮኢኮኖሚያዊ ሁኔታ				
101	እድሜ (በአመት) ----------			
102	ፆታ	1. ወንድ 2. ሴት		
103	የጋብቻ ሁኔታ	1. ያላገባ/ች 2. ያገባ 3. የተፋታ/ች 4. ባል/ሚስት የሞተበት/ባት		
104	ሃይማኖት	1. ክርስቲያን 2. እስልምና 3. ሌላ (ይገለጽ)		
105	ብሔረሰብ	1. አማራ 2. ኦርሞ 3. ትግሬ 4. ጉራጌ 5. ሌላ (ይገለጽኦ		
106	የትምህርት ደረጃ	1. ያልተማረ/ች 2. መጻፍና ማንበብ የሚችል/የምትችል 3. የመጀመርያ ደረጃ 4. የሁለተኛ ደረጃ 5. ከሁለተኛ ደረጃ በላይ		
107	የስራ አይነት	1. ነጋዴ 2. ደሞዝተኛ /ተቀጣሪ 3. የቀን ሰራተኛ 4. ሌላ ይገለጽ		
108	አማካይ ወርሃዊ ገቢ በብር ሲተመን			
109	በዚህ አካባቢ የነበረ/ሽ የቆይታ ጊዜ	1. ከአንድ አመት በታች 2. ከ1-5 አመት 3. ከ5 አመት በላይ 4. እንግዳ		
ክፍል ሁለት: ተጠያቂው ስለ አካባቢው ያለው አጠቃላይ ግንዛቤ				
201	ስለ አካባቢ ጤና ሰምተው ያውቃሉ?	1. አዎ 2. አይደለም		
202	ለጥ.ቁ. 201 መልስህ//ሽ አዎ ከሆነ ከየት?	1. ሬድዮ 2. ቴሌቪዥን 3. ት/ም ቤት 4. ማኅበራዊ ስብሰባዎች 5. ማህበራት 6. መጽሃፍትና ጋዜጦች 7. ሌላ ይገለጽ		
203	ስለሚከተሉት አካባቢያዊ ቃላቶችና ትርጉም ሰምተው ያውቃሉ?	1. የኦዞን ንብርብር 2. ኢኮሎጂ 3. ግሪን ሃውስ ኢፌክት 4. ባዮ ዳይቨርሲቲ 5. አላውቅም		
204	በጥ.ቁ. 203 (1-4) ስር የተጠቀሱት ጉዳዮች በጤናህ/ሽ ላይ ተጽእኖ ሊያሳርፉ ይችላሉ ብለህ/ሽ ታስባለህ/ታስቢያለሽ	1. አዎ 2. አይደለም		
205	የጤናማ አካባቢ ጥቅም ምንድን ነው?	1. የአካባቢን ውድመት ለመከላከል 2. በሽታን ለመከላከል 3. ጽዱና ውብ አካባቢ እንዲኖር ስለሚያስችል 4. ሌላ (ይገለጽ)		
206	ከሚከተሉት በሽታ አይነቶች በአካባቢ ብክለት ምክንያት ከአንድ ወደ ሌላ ሰው ሊተላለፍ የሚችለው የቱ ነው?	1. የአይን በሽታ 2. የቆዳ በሽታ 3. ተቅማጥ 4. ጥገኛ ተሐዋስያን		

		5. ወባ 6. ሌላ (ይገለጽ)		
207	ከቤተሰብ መካከል ከላይ (206) ከተጠቀሱት በሽታ የተጠቃ አለ?	1. አዎ 2. አይደለም		
208	በአካባቢህ/ሽ ያለው የአካባቢ ብክለት መንስኤ ምንጭ ምንድን ነው ብለህ/ሽ ታስባለህ/ሽ	1. የቆሸሹ ኮንቴይነሮች 2. ግዴለሽ የቆሻሻ አወጋገድ 3. የተጠራቀመ ውሃ 4. የሕዝብ መጨናነቅ 5. ሌላ (ይገለጽ)		
ክፍል ሶስት፡ ተጠያቂው አካባቢውን ለመንከባከብ የሚያደርገው ተግባር				
301	አካባቢን መንከባከብ የማን ተግባር ነው፡፡	1. የመንግስት 2. የእያንዳንዱ ዜጋ 3. የማህበረሰቡ መሪዎች 4. የሃይማኖት መሪዎች 5. ሌላ (ይገለጽ)		
302	የአካባቢ እንክብካቤ ትምህርት የማስተማር ሚና ማን መጫወት አለበት?	1. የአካባቢ ጤና ባለሞያ 2. የመንግስታ ባለስልጣናት 3. ወላጆች 4. መምህራን 5. ሌላ (ይገለጽ)		
303	አካባቢህን ለመጠበቅ በራስህ/ሽ ተነሳሽነት የወሰድከው/ሽው እርምጃ ምንድን ነው?	1. በቀበሌ የሚመራ የጽዳት ዘመቻ ላይ መሳተፍ 2. መኖሪያ ቤቴን ማጽዳት 3. ይመለከተኛል ብዬ አላስብም		
304	ቆሻሻ ማጠራቀሚያ ኮንቴይነር ትጠቀማለህ/ሽ?	1. አዎ 2. አይደለም		
305	ለጥ.ቁ. 304 መልስህ/ሽ አይደለም ከሆነ የቤት ቆሻሻ የት ነው የሚጣለው?	1. በአካባቢ በተገኘ ክፍት ቦታ 2. ወደ ወንዝ 3. ማቃጠል 4. ራቅ ወዳለ ቦታ 5. ሌላ (ይገለጽ)		
ክፍል አራት፡ ተጠያቂው ስለ ቆሻሻ አወጋገድ ያለው እውቀት				
401	መጸዳጃ አላችሁ?	1. አዎ 2. አይደለም		
402	ለጥ.ቁ.401 መልስ አዎ ከሆነ ለቤተሠቡ ያለው ጥቅም ምንድን ነው?	1. ለራስ ነጻነት/ሰው እንዳያየን 2. በሽታን ለመከላከል 3. በአስቸጋሪ የአየር ጠባይ ወቅት ለመጠቀም 4. አካባቢን ላለመበከል 5. ሌላ (ይገለጽ)		
403	ለመጀመርያ ጊዜ ስለ ሽንት ቤት ጥቅም የሠማኸው እንዴት ነው?	1. ከመገናኛ ብዙሀን 2. ከጤና ባለሞያ 3. ከት/ቤት 4. ከጎረቤት በማየት 5. ሌላ (ይገለጽ)		
404	ቆሻሻ የጤና ጠንቅ ነው ብለህ/ሽ ታስባለህ/ሽ?	1. አዎ 2. አይደለም 3. አላውቅም		
405	ለጥ.ቁ.404 መልስ አዎ ከሆነ ለምን?	1. ተሃዋስያን ስለሚራቡበት 2. ዝንብ ስለሚያርፍበት/ ስለሚራቡበት 3. ሌላ (ይገለጽ)		
406	በክፍለ ከተማችሁ ከፍተኛውን የደረቅ ቆሻሻ ድርሻ የያዘው ምንድን ነው?	1. የቤት ቆሻሻ 2. ከንግድ ድርጅቶች የሚወጡ ቆሻሻዎች 3. የኢንዱስትሪ ቆሻሻ 4. የመንገድ ጥራጊ 5. የሆቴሎች ቆሻሻ		

	ስርዐት በሌለው መንግድ ቆሻሻን ማስወገድ ምን አይደለምነት የጤና እክል/ችግር ያስከትላል?	1. ተቅማጥ 2. የዓይን በሽታ 3. አስም 4. ሌላ (ይገለጽ)		
ክፍል አምስት፡ የተጠያቂው የቆሻሻ አወጋገድ ስርዓት				
501	ለጥ.ቁ.401 መልስ አይደለም ከሆነ ለምን?	1. ቦታ ስሌለን 2. ገንዘብ ስለሌለን 3. የግንባታ ዕቃ እጥረት 4. የግንባታ ክህሎት ማነስ/ማጣት 5. ጥቅሙን ስለማናውቅ 6. ሌላ (ይገለጽ)		
502	ለጥ.ቁ.401 መልስ አይደለም ከሆነ የት ነው የምትጸዳዱት?	1. በግቢ ውስጥ 2. ውጭ ባለ ስርጥ 3. ስራ ቦታ 4. ወንዝ ዳር 5. ሌላ (ይገለጽ)		
503	ቆሻሻ የት ነው የምትጥሉት ?	1. በተገኘው ክፍት ቦታ 2. ጉድጓድ ውስጥ 3. ይቃጠላል 4. ሌላ (ይገለጽ)		
504	ፈሻስ የቤት ቆሻሻ የት ነው የሚደፋው?	1. በተገኘው ክፍት ቦታ 2. ጉድጓድ ውስጥ 3. ለፈሳሽ በተዘጋጀ ገንዳ ውስጥ 4. ሽንት ቤት ውስጥ 5. ሌላ (ይገለጽ)		
505	ሠው ሳያይህ/ሽ ቆሻሻ ወደ ውጭ ትጥላለህ/ትጥያለሽ?	1. ሁል ጊዜ 2. አንዳንድ ጊዜ 3. አልፎ አልፎ 4. ፈጽሞ		
506	ከጎረቤት ቆሻሻ ሲጣል አይተህ/ሽ የምታውቅ/ቂ ከሆነ ድግግሞሹ	5. ሁል ጊዜ 6. አንዳንድ ጊዜ 7. አልፎ አልፎ ፈጽሞ		
507	ጎረቤቶችህ/ሽ ቆሻሻ በጋራ መጠቀምያ ቦታ ላይ ሲጥሉ ብታይ/ዪ ምን ታደርጋለህ/ታደርጊያለሽ?	1. ለጤና ጠንቅ መሆኑን ምክር አለግሳለሁ 2. አይቼ ማለፍ 3. ለሚመለከተው አካል አሳውቃለሁ 4. ሌላ (ይገለጽ)		
508	ከአካባቢህ ሰዎች ለአካባቢ ጤና አጠባበቅ የውይይት ድግግሞሽ	1. ሁል ጊዜ 2. አንዳንድ ጊዜ 3. አልፎ አልፎ 4. ፈጽሞ		
509	አካባቢያችሁ በምን ሁኔታ ላይ ይገኛል ብለህ/ሽ ታስባለህ/ታስቤያለሽ?	1. በጥሩ ሁኔታ የተያዘ 2. በመጠኑ በጥሩ ሁኔታ የተያዘ 3. በጥሩ ሁኔታ ያልተያዘ 4. አላውቅም		
510	ለጥ.ቁ.509 መልስህ/ሽ «3» ከሆነ ምክንያቱ ምንድን ነው?	1. በቂ መነቃቃት/ እውቀት አለመኖር 2. የማህበረሰቡ ግዴለሽነት 3. የመንግስት ባለስልጣናት ትኩረት እጦት 4. የግብኣት እጦች 5. ሌላ (ይገለጽ)		
511	የደረቅ ቆሻሻ ማጠራቀምያ በአካባቢያችሁ አለ?	1. አዎ 2. አይደለም		
512	ደረቅ ቆሻሻን ለማስወገድ ምን መደረግ አለበት?	1. መቅበር 2. ማቃጠል 3. ማበስበስ 4. ሌላ (ይገለጽ)		

ክፍል ስድስት: የተጠያቂው የአካባቢ ጤና (ትምኅርት) ግንዛቤ				
601	በጤናህ/ሽ እና በአካባቢህ/ሽ መካከል ግንኙነት አለ?	1. አዎ 2. አይደለም		
602	ለጥ.ቁ. 601 መልስህ/ሽ «አዎ» ከሆነ ምን ዓይነት ግንኙ ነት አለው ብለህ ታምናለህ?	1. ግንዛቤ ጤናን ያሻሽላል/ያስጠብቃል 2. የአካባቢ ጤና ትምህርት ለጤና መሻሻል ያለው አስተዋጸኦ አነስተኛ ነው 3. የአካባቢ ጤና ትምህርት አስተዋጽኦ የሚኖረው በጤና በለሞያ ከተሰጠ ብቻ ነው 4. ሌላ (ይገለጽ)		
603	የአካባቢ ጤና ትምኅርት ከበሽታ ይከላከላል ብለህ ታምናለህ?	1. አዎ 2. አይደለም		
604	ለጥ.ቁ. 603 መልስህ/ሽ «አዎ» ከሆነ ጠቀሜታው ምንድን ነው ብለህ ታምናለህ? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. ስለ በሽታ ስርጭት ግንዛቤን ይፈጥራል 2. የህመም ስርጭት ይቀንሳል 3. የሞት ስርጭት ይቀንሳል 4. ሌላ (ይገለጽ)		
605	ከሚከተሉት ውስጥ የምትኖርበት አካባቢ ለጤና ጠንቅ ምንጭ ነው ብለህ የምታስበው የትኛው ነው?	1. መኖሪያ ቤትህ/ሽ 2. ኢንዱስትሪዎች 3. የአካባቢው ማህበረሰብ 4. አላውቅም		
606	ስለ አካባቢ ጤና ትምኅርት ዕውቀት የት ይገኛል ብለህ ታምናለህ?	1. መደበኛ ካልሆነ ትምህርት 2. ከአካባቢ 3. ከመደበኛ ትምህርት 4. ሌላ (ይገለጽ)		
ክፍል ሠባት: ተጠያቂው ስለ ጤና ት/ም መርሃ ግብር አካባቢውን ለመንከባከብ የሚያደርገው ተግባር				
701	የአካባቢ ጤና ት/ም መርሃ ግብር ከጤና ጋር በተቀናጀ መልኩ በቀበሌያችሁ ይሠጣል?	1. አዎ 2. አይደለም		
702	በትምህርቱ ተሣትፈህ/ሽ ታውቃለህ/ሽ ?	1. አዎ 2. አይደለም		
703	701 መልስህ/ሽ አዎ ከሆነ ለምን ያህል ጊዜ?	1. በሳምንት አንዴ 2. በሁለት ሳምንት አንዴ 3. በሶስት ሳምንት አንዴ 4. በወር አንዴ 5. ሌላ (ይገለጽ)		
704	702 መልስህ/ሽ አዎ ከሆነ ከየት ?	1. ከጤና ተቋማት በመደበኛና ተከታታይ ሁኔታ 2. ከጤና ተቋማት ቤተሰብ በሚታመምበት ጊዜ 3. ከቀበሌ 4. ከማህበራዊ ስብሰባዎች 5. ሌላ (ይገለጽ)		
705	702 መልስህ/ሽ አዎ ከሆነ ትምህርቱን የሚሠጠው ማን ነው	1. ከመያድ (NGO) በሚመጡ ሰራተኞች 2. ከጽዳትና ውበት ቢሮ በሚመጡ ሰራተኞች 3. ከጤና ድርጅት በሚመጡ ሰራተኞች 4. ሌላ (ይገለጽ)		
706	ለጥ.ቁ. 702 መልስህ/ሽ አዎ ከሆነ ከትምህርቱ በኋላ በራስህ ዓይነት እርምጃ ወስደሃል?	1. በጽዳት ዘመቻ በመሳተፍ 2. የቤተሰብ አባላት እና ሌሎችን በማስተማር		

ክፍል 8 የተጠያቂ አመለካከት ለመለካት መጠይቆች

ለሚከተሉት ጥያቄዎች ቀጥሎ ከተዘረዘሩት ይስማማል የምትለውን/ይውን ቁጥር በባዶ ሳጥን ውስጥ አስቀምጥ/ጪ

1. በጣም እስማማለሁ
2. እስማማለሁ
3. እኔ እንጃ
4. አልስማማም
5. በጣም አልስማማም

ጥ.ቁ.	ጥያቄ	በጣም እስማማለሁ	እስማማለሁ	እኔ እንጃ	አልስማማም	በጣም አልስማማም
801	እያንዳንዱ ዜጋ አካባቢውን የመንከባከብ ኃላፊነት አለበት፡፡					
802	አካባቢን የመንከባከብ ኃላፊነት የመንግስት ነው፡፡					
803	የጎብረተሠቡ አባላት አካባቢያቸውን ማጽዳት ግዴታ አለባቸው					
804	የጎብረተሠቡ አባላት ስለ አካባቢያቸውን ጽዳት እና በጤናቸው ላይ ስለሚያደርሰው ጉዳት በግልጽ መወያየት አለባቸው					
805	የአካባቢ እንክብካቤ በአመዛኙ ግለሠባዊ ነው					
806	መንግስት በተቻለው አቅም ስለ ሕዝበ ጤና ሲል አካባቢውን እየተንከባከበ ነው					
807	አካባቢን ለመንከባከብና የጎብረተሠቡን ጤና ለማስጠበቅ በመንግስትና በሕብረተሠቡ መካከል የጠበቀ ግንኙነት አለ፡፡					
808	ሠዎች ተፈጥሮን ከመላመድ ይልቅ ተፈጥሮን እንደ ፍላጎታቸው ማሠማመር ይሻላቸዋል					
809	በአካባቢ ጤና ት/ም መርሃ ግብር ለመሣተፍ ዝግጁ ነኝ					
810	በቀበሌዬ በሚካሄድ የጽዳት ዘመቻ ላይ ለመሳተፍ ፍቃደኛ ነኝ					