

Pollution and its Effects on Development:

A Case Study of Kampala Central Division Council

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SPRING 2011

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Dedication:

Bar-ba-Loots, Swomee Swans and Humming Fish

The Truffula Trees

The Once-lers

And the Lorax

May we develop together towards a sustainable future

Abstract

The intent of the report is to identify how the environment influences development, particularly in regards to commerce, education and public health. This was done after investigating major types of pollution in Kampala Central Division and their sources, then determining how responsibility for community sanitation and general cleanliness is allocated. The result of the information gathered set benchmarks or identifiers to create an environmental health rubric with suggestions on how to improve the current situation.

The report will include information from the current reports and observations in order to assess the presence and implications of pollution in Kampala's Central Division. Interviews were obtained with permission and transcribed during the interview process then sent back for revision by the interviewee to ensure quality information. Pictures included in the Appendix were taken on a Sprint LG Rumor 2 cell phone.

The relationship pollution has with development is complex. While Kampala's central district is particularly polluted, and the effects of that pollution can be severe, the responsible parties often figure that improper methods of refuse disposal is a more economically feasible option. Development efforts are one of the sources of pollution while pollution hinders development.

Introduction

Pollution is the introduction of a contaminant into the environment. Pollution has a detrimental effect on any living organism in an environment, making it virtually impossible to sustain life.¹

The issue of pollution and waste management in Kampala's Central Division was chosen because of its effect on development. Visible parts of Kampala's landscape, trash and air pollution are sources of many of the city's problems. Therefore, the contributing factors were investigated so that the problem might be remedied. Plastic bags, debris and mud disrupt drainage channels and have become inlaid fixtures of Kampala's unpaved roads, sidewalks and pathways, creating road hazards and flooding. Citizens and politicians alike are aware that pollution is a problem.

As an asthmatic, I am sensitive to environmental factors relating to pollution, like smoke and exhaust. The medication I have required since arriving to Uganda has been considerably more than what I normally take in the United States. As one from San Francisco area, a place known for its environmental awareness and activism, I am also keenly aware of environmental health problems, particularly the black clouds of exhaust behind vehicles and refuse on the side of roads or in bodies of water. As a visitor to Uganda, I understand how people may be discouraged from coming to Uganda as an investor or a tourist when pollution is as prominent as it is.

Pollution is considered an environmental issue. Environment refers to all aspects of human surroundings including water, buildings, etc.². When pollution, created by humans, begins harms people, it becomes a problem that should not be ignored, but rather an issue that must be confronted and remedied. Pollution is often the negative result, or externality, of a positive force, such as development. As development progresses, more people are employed by various industries, allowing them to accumulate and discard a higher volume of waste. Industries that are the face of development also accumulate and discard a higher volume of waste, furthering the contamination of the environment.

Kampala Central Division is the epicenter of Kampala. It is the most densely populated district, located in the center of the five divisions within the district³. With a resident population of 117,000 people and a labile day population of above 2.7 million people, the population puts a lot of stress on the local

¹ (OTONetworks, LLC 2011)

² Pg 117 (Division Economic Planning Unit: Kampala Central Division 2010)

³ Pg 20 (Division Economic Planning Unit: Kampala Central Division 2010)

environment. Residents consume resources, dispose of both personal and consumer waste, impact the sanitation needs and generally impact the natural environment of the Kampala Central division.⁴

Originally, the region had natural vegetation like forests and wetlands, but rapid urbanization replaced the natural landscape with infrastructure, residential, commercial and industrial structures leaving only a small remainder of a few swamps⁵. The rapid urbanization has progressed without proper planning, creating challenges for government like providing adequate housing, water, and other amenities for lower income individuals and families in and near the urban center. The allocation of resources does not currently accurately reflect the current needs of the community⁶. The most important challenge for urban development in Central Division is transportation planning. As more personal cars are imported, problems like traffic congestion, parking difficulties, difficulties for pedestrians and massive air pollution arise⁷. The terrain and climate being hilly and tropical, pose challenges during the rainy season in regards to drainage and sanitation⁸.

Kampala Central Division has a surplus of human capital, both skilled and unskilled seeking employment in both the formal and informal sector from all over the country⁹. The majority of people in the division have physical access to piped water or protected springs. However, a survey revealed that most of the protected springs were contaminated¹⁰. The sewer distribution network, responsibility of the National Water and Sewage Corporation, mainly caters for the civic centre and its utilization capacity is estimated at only 11%. The majority of people within the division managed to construct septic tanks, but a high proportion of about 31% is reported not to be having proper disposal methods for their sewage especially in slum areas. Sewers burst in areas of Kamwokya II, Old Taxi Park, and Kitante primary school and other areas because commercial buildings are being developed on sewer lines¹¹.

Economic activities in the Central Division include hotels, lodges, banks, markets, restaurants, arcades, malls, petro stations, transportation, large and small scale industries and major entertainment centre, among others. The biggest sector of economic activity is in trade and commerce, followed by tourism, manufacturing and entertainment facilities¹². The Civic Centre Parish, for example, hosts a variety of

⁴ Pg 69 Ibid

⁵ Pg 20 Ibid

⁶ Pg 21 Ibid

⁷ Pg 21 Ibid

⁸ Pg 21 Ibid

⁹ Pg 22 Ibid

¹⁰ Pg 27 Ibid

¹¹ Pg 23 Ibid

¹² Pg 26 Main Economic Activities (Division Economic Planning Unit: Kampala Central Division 2010)

mechanic shops that carry various industrial and machinery parts; there are tire shredders that cut the rubber off of used tires and food vendors to cater for the laborers. The Civic Center Parish also contains many schools. Kamwokya II Parish holds a busy market day on Fridays.

In [Kampala Central Division] environmental concerns are mainly in areas of; increasing number of polythene bags, poor disposal of solid wastes, poor disposal effluent, vegetation cover degradation by clearing land for school, road and other building constructions leading to ecological destructions, pollution from industries, noise and dust etc. These and others must be managed in such a way that human beings live peacefully. This can be achieved if the environment is protected so that the coming generations can also enjoy a healthy state of well-being.¹³

Pollution is defined as the negative physical effect on the environment and the loss of human welfare that results from waste¹⁴. Biological effects of pollution include a loss of biological diversity, and range from biological pollution, chemical pollution, and auditory pollution. The result of pollution on human welfare includes a general unpleasantness, distress, distaste, concern or anxiety. Pollution is considered a negative externality to economic development.

Objectives:

1. Investigate major types of pollution in Kampala Central Division and their sources
2. Determine how responsibility for community sanitation and general cleanliness is allocated.
3. Identify how the environment influences development, particularly in regards to commerce, education and public health.
4. Create benchmarks or identifiers to create an environmental health rubric with suggestions on how to improve the current situation.

¹³ Pg 117 (Division Economic Planning Unit: Kampala Central Division 2010)

¹⁴ Pg 67 (National Environment Management Authority 1997)

Methodology

Prior to the research period, there was a basic understanding of pollution, environmental health and economic theory. Visiting key sites in the Kampala region prior to the study were vital to creating a basic understanding as to the level importance of pollution on development. Key sites included the Kitezi Rubbish Dumping post in Mpererwe, Plastic Recycling Industries, and various medical centers. At those key sites, initial observations were made, as were a few informal interviews. Articles found in newspapers, such as the Daily Monitor and the New Vision, were also used to understand the relevance of pollution in Kampala. This foundational information generated questions, themes and ideas that guided the research for the rest of the period.

The first two and a half weeks of the study were spent primarily creating an understanding of what information and documentation was already on record. This time was spent in order to create a solid foundation for the rest of the research period. Understanding what information was available to administrators and policy makers created an insight as to why and how the environmental status came to be. The majority of time during this initial period was spent reading environmental policies from the City Council, environmental assessments from the National Environmental Management Authority, newspaper periodicals from the National Environmental Authority Library, and seeking other sources of information on policies regarding waste in the Kampala Central District. Time during this period was also spent creating an initial network of contacts, including contacting an advisor and a few governmentally funded informants.

Reading through government issued ordinances, created a context for questions as to what was allowing the city to be less clean than the laws ordain it to be. The use of the "City Council of Kampala Central Division's Three Year Rolling Division Development Plan" allowed for the efficient use of time, providing information and existing observations to create a base from which to proceed with the research. Information, though a government produced document, it was fair with frustrations, identified sources incompetence and other short comings, even within the government. Suggestions, challenges and needs of the community were expressed in the Development Plan. Other documents provided by the School for International Training's Resource center and the National Environmental Management Authority libraries were pursued to get a broader scope of sources to get a balanced academic perspective on the issue.

Challenges during this time period included discerning informants' biases. Informants and written sources frequently came from government officers or governmentally financed officers in other "independent" institutions, and blame from these sources was frequently deferred to other sectors or other levels of management. Literary sources offered similar biases as human informants as they were frequently from the same source. These literary sources, like ordinances or federal guidelines depicted thorough regulations, while in action such regulations were weakly enforced or neglected entirely. Other challenges included maintaining the informants' attention. Informants were interviewed in their professional environment, where they sometimes rushed or distracted by phone calls and colleagues entering the office.

Time was then spent contacting individuals for additional interviews and taking pictures around Kampala Central district. Theories were formed and presented to informants who would affirm or deny the theories validity. Tours of major pollution sites were also pursued at this time, but the lack of contacts with the suggested corporations within the School for International Training made contacting the industries difficult. Instead, appointments were made with the collection agency. The rain made transportation to polluted sites problematic as areas most impacted by pollution were most likely to flood or become severely muddy.

The final days of the practicum were spent filling in gaps of information in the report, seeking last minute interviews, pursuing unvisited key sites, and synchronizing interviews with the report. Communities living near the landfill, communities without access to waste collection sites, and communities created within various waste related work environments were identified as sources for focus groups. However, because of time constraints, in part because of the heavy emphasis on background research, and the broad scope of the research, efforts during the research period were diverted from focus groups. Walk to Work protests and the proceeding riots prevented some last minute research being done in a timely manner.

Challenges throughout the research process were many. The primary challenge included an overall deficit of information. The city council lacked the technology to obtain data relevant to the research, including a noise volume monitoring device and an air quality monitoring device. City financial records are confidential and therefore could not be published in the report. Not obtaining a map that clearly defined Kampala City's Central Division until late in the research period made evidence collection less thorough and more generic.

Justification

Location

Despite being arguably the most developed part of Kampala, the Central Division still has both obvious and subtle pollution problems. Changes made within Kampala Central Division effect citizens that reside outside the district lines as work, business and social ties. As the capital of Uganda, Kampala Central Division should be the model for the rest of Uganda on proper waste management and environmental policy. Because of the concentration of governmental leadership, Kampala Central Division is likely to improve before any other parts of Uganda. The severity of the pollution and close proximity to important national environmental and political agencies makes Kampala Central Division a strategic location for study on how environmental policy, environmental enforcement and development relate.

Objectives

Pollution in Kampala has an effect on development. Understanding what forms of pollution are most prominent and harmful in Kampala Central Division, allows priorities to be made as to what actions would be most effective in improving public health. Understanding the structure of authority and the allocation of responsibility clarifies where lapses in policy implementation are. Identifying where corruption and deficits exist opens the opportunity for suggestion and improvement.

Methods

Much of the initial research time was spent was spent preparing for interviews and researching the current organizations and policies relevant to Kampala Central Division. This was done out of respect of individuals who would be interviewed. The intention was that the questions posed would be more substantial and useful use of time, than requesting basic information that could be found elsewhere. Information obtained from documents was substantial and foundational to the research as a whole. The remaining research time was spent interviewing professionals and visiting important sites that effects waste disposal and pollution in Kampala Central District.

Findings:

Media Coverage and Recent Historical Records

The city of Kampala is not oblivious to the waste and pollution present within the city limits. The media, citizens, businesses and politicians are all aware to some extent of the pollution. An editorial in the Daily Monitor called for a cleaner Kampala, describing what citizens of Kampala see on a regular basis, as a shameful problem¹⁵. One of the candidates for mayor promised “a clean” Kampala in his campaign, ironically cluttering the city with posters that were not formally removed from public space. Despite peoples’ awareness of Kampala City Central Division’s need to improve its environmental health, the necessary actions for change have not been made.

In the early 1990’s, businesses were already moving in on the opportunity that waste management provided. In 1992, Bin-It Services LTD was created in order to supplement the city’s existing collection efforts¹⁶. Since then, the company has grown and works on educating the public, a strategic business move to increase the market for solid waste collection. Emphasizing the importance of regular and predictable collection of waste, the company has capitalized on the city’s shortcomings.

Gerald Tenywa of the New Vision specializes in environmental media coverage. Initially only assisting a staff reporter on environmental issues, he was then adopted by the New Vision as a full time staff reporter. Having observed the city’s waste functions, he explained how the current environmental status of Kampala is unacceptable. As a reporter, he investigates the different sectors of environmental responsibility, ranging from the private sector to government enforcement. He is aware of major industrial polluters and of the implications of environmental damage on the citizens of Kampala¹⁷. His articles amongst other environmental periodicals have been chronicled for years at the National Environmental Management Authority Library where books are filled with newspaper clips and pictures document the status throughout recent history.

In May of 1995, the National Environmental Management Authority (NEMA) was created. Located in Kampala Central Division, it is supervised by the Ministry of Water and Environment. NEMA is a “semi-autonomous government institution” that monitors, coordinates and supervises the management of environmental issues. It is equipped with specialists and inspectors in order to properly monitor and

¹⁵ (Amootie 2011)

¹⁶ (Bin It Services Ltd 2011)

¹⁷ (Tenywa, Staff Reporter 2011)

assess Uganda's environmental health. Among the organization's top priorities, aside from monitoring and compliances is educating the public about the importance of environmental health¹⁸. Educating the public about the significance of environmental health is the first step towards changing the behavior and priorities of Ugandans so that Kampala may actually become a cleaner, healthier, more prosperous city.

In 1997, the Clean Development Mechanism (CDM) was established by the Kyoto Protocol with the objective of assisting developing countries like Uganda in achieving sustainable development. Under CDM, projects that reduce greenhouse gas emissions and contribute to sustainable development can generate Certified Emission Reductions (CERs), a tradable commodity in international carbon markets. Various CDM projects have been implemented in various sectors in Uganda. The CDM projects have resulted in building technical capacity in key institutions and raising public awareness about the climate change; assessing national capacity building needs to implement the CDM, supporting the investment promotion agencies in Uganda in their efforts to attract CDM investments, developing skills on carbon finance and developing a portfolio of potential CDM projects and rehabilitating degraded forests¹⁹.

February of 2000, the Kampala City Council passed the Solid Waste Management Ordinance in order to "provide for the control, storage, collection, transportation, processing and disposal of solid waste generated within Kampala City; the control and establishment of such facilities and for connected matters²⁰." The ordinance was intended to apply to every part of the community, but the ordinance specifically mentions private premises, government owned properties, and council properties.

In 2001, The National Environmental Management Authority included Regulation 13, a tax on air pollution. The Ozone Depleting Substances and Products Regulations of 2001, empowers the Minister responsible for finance to administer a pollution tax on importers of controlled substances and products specified by the Minister. It also allows importers of ozone friendly substances and products are granted tax exemptions. This provision has not yet put into place because environmental issues are not that high on the federal agenda²¹.

In June of 2002, the Kampala City Council notified the public that people would be arrested for dumping garbage in the Centenary Park, located south of Garden City. The senior public relations officer at the time, Simon Muhumuza, questioned why people would come to a park with their garbage simply to

¹⁸ (Oule 2011)

¹⁹ Pg 9 (Mabasi 2009)

²⁰ Pg 3 (J. S. Kizito n.d.)

²¹ Pg 8 (Mabasi 2009)

dump it. The park is a common gathering point for many people in the Kampala area, tourists and locals alike. Muhumuza suggested in the article the community should band together to prevent such irresponsible acts²².

In January of 2003, City Council expanded the Kiteezi garbage site, where the city's refuses is dumped in Wakiso district²³. The expansion of the dump was funded by the World Bank and was expected to last until 2005, when more land would be required to accommodate the solid waste. "Residents at one time opposed the site, saying it was a health hazard and carried a bad scent. David Kiggundu, the KCC World Bank project coordinator, said Dott Services constructed a leachate treatment plant and a weighting bridge to protect the environment²⁴.

From 2003 to 2004 there was a study done regarding solid waste management in Kawempe Division by Professor Gombya of Makerere Faculty of Forestry and Nature Conservation and Mr. Mukunya, a research analyst in the Ministry of Finance²⁵. The purpose of the study was to determine how solid waste could be used to stimulate the economy and create a source of income for the community while studying waste disposal methods.

In May of 2004, Uganda Breweries Limited, outside of Kampala, took the initiative to construct a water treatment plant to meet international water standards²⁶. The use of the water treatment plant has been questioned by various sources²⁷, stating that it is possible and highly likely that the industry, though state of the art is not necessarily used on a consistent basis in order to cut costs. It has been suggested that large corporations, even those equipped to handle waste in the proper manners, dump waste at night, like many other individuals in the city, in order to cut costs. These accusations could not be verified independently. The names of these corporations could not be listed as they have close connections with powerful government authorities that allow them to continue their illegal behaviors²⁸.

In January of 2005, Wabigalo Parish was featured in The Monitor for the severe condition of solid waste presence in the environment and the cemetery. 70-year old Thereza Nakabugo, a resident of the area explained how around one thousand bodies are buried in the cemetery, and "what is disturbing is to see

²² (Ntabadde, KCC warns on littering 2002)

²³ (Ntabadde, City Council expands Kiteezi garbage site 2003)

²⁴ (Ntabadde, City Council expands Kiteezi garbage site 2003)

²⁵ (Gombya Ssembajjwe and Mukunya 2004)

²⁶ (Kasozi and Waiswa 2004)

²⁷ All sources wish to remain Anonymous

²⁸ Anonymous

now that the city authorities have allowed rubbish to be dumped on our beloved ones.²⁹” Garbage generated from across the city was brought to the neighborhood and illegally dumped there. Reports were made that companies and individuals licensed to collect garbage from other areas are dumping loads of trash from around the city at Wabigalo. Collection agencies were accused by a local chairman of chasing easy money and dumping illegally reduces transit costs, thus increasing their profits³⁰.

In the 2005/2006 year, Uganda passed an environmental levy on used vehicle imports. It targets used cars over 8 years old with a 20% tax. The purpose is to discourage the importation of obsolete items that are significant contributors to air pollution. However, the levy has not been an effective mitigation measure. It made it more difficult for people to rid themselves of old cars and acquire relatively new ones whose emissions may be less dangerous³¹.

In June of 2006, the New Vision reported that 90% of Kampala garbage remained uncollected³². The problem was contributed to the lack of funds available for solid waste management available to the Kampala City council. “Most residents wait for the rains that helps them to wash away the garbage that accumulates over time,” said Kiyingi, a resident in Kavule, Makindye³³. Private firms such as Bin-It were contracted to collect the garbage in Kampala Central Division.

In August of 2006, the Kampala Integrated Environmental Management and Project (KIEMP), was created as a joint project between the Belgians and the Ugandans to improve the city’s environmental health as a tool for development. Functioning on a localized level, it has a more hands on approach to environmental health in Kampala. It uses a multifaceted approach, working with the foundational understanding that the key to improving the health and economy of a community is by improving the local environment. The project is funded by the Kampala City Council, the Ugandan Federal Government, and the Belgian Technical Corporation³⁴³⁵. The project’s priorities include three primary objectives:

1. Strengthening the institutional capacity of KCC in environmental planning and management;
2. Behavior change of communities;
3. Improvement of environmental conditions in the project areas in which [it is] working³⁶

²⁹ (Kasita 2005)

³⁰ (Kasita 2005)

³¹ Pg 8 (Mabasi 2009)

³² (Tenywa, 90% of Kampala garbage uncollected 2006)

³³ (Tenywa, 90% of Kampala garbage uncollected 2006)

³⁴ (E. Kizito 2011)

³⁵ (Kampala Integrated Environment Management Project 2007)

³⁶ (E. Kizito 2011)

The result of the project has included the construction of toilet facilities, roads and drainage channels. KIEMP works to supplement and support the other projects managed by the Kampala City Council.

In 2007, the Traffic and Road Safety Act exempted motor vehicles from the requirement of road license under the 2005/2006 levy, when the government saw how old vehicles had been abandoned after failing to meet the requirements of road license. As a result, the rate of carbon emissions from these old vehicles is on the rise³⁷.

Currently, in the spring of 2011, Kampala Central Division functions around a waste management system that has been noted as a general problem. Solid waste, chemical contamination and air pollution are all part of the development of the city, being both the product of industrialization and a contaminant of the environment, a public good that the general population relies on to maintain a decent quality of public health.

Solid Waste:

In the last decade, Kampala's Central Division City Council has made several attempts at containing and managing solid waste. The laws in place are clear, specific and directly outline what qualifies as mismanagement of solid waste. Despite the existence of the local laws and ordinances, most of the problems not only exist but remain prominent in the division and in the surrounding areas. Solid waste includes recyclables such as plastics, metals, cardboards and paper, as well as decomposable raw waste such as green waste from gardens, banana or matoke peels, fruit and vegetable skins and palm leaves.

The terrestrial solid waste, garbage generated in households and institutions that remains on solid land, remains as much of a problem as when the Solid Waste Ordinance was passed in 2000. It remains a common eye sore in Kampala Central District, particularly along roads that remain unpaved or in crowded markets that lack proper waste disposal sites. Solid waste accumulates where proper disposal protocol is not adhered to, for a variety of reasons. Financial constraints, geographical proximity to a proper disposal site, and the neglect of personal responsibility for community cleanliness are all reasons that households and institutions alike, default to illegal methods of disposal, regardless of the consequences to the community.

³⁷ Pg 8 (Mabasi 2009)

The Central Division City Council is aware of the effects of pollution on its constituents, citing the importance of the environment in its development plan as well as stating its intention of making environmental issues a priority.

Since environment plays a crucial role in human kind survival there is need to integrate and mainstream environmental issues in development planning at all levels. Therefore Central Division shall aim at implementing program and activities geared towards the prevention of environmental protection, improvement and mitigation of damage.³⁸

Having taken responsibility for the collection of solid waste within central division, the city council lacks the resources to fully take on the solid waste collection needs of the entire division.

Licensed to collect refuse, Bin-It Services has six collection trucks and serves over 3,000 clients including residencies, industries, embassies and other private businesses. Industrial clients who subscribe to private collection services are generally require frequent collection that the city cannot offer³⁹. While city collection efforts are free, citizens and businesses must take their garbage to a collection point creating an opportunity cost for all those who use its services. Collection points are informal, forcing the community to improvise as to where garbage is deposited. Often solid waste is dumped in highly visible areas like in front of businesses or along main roads to attract the attention of the city to ensure collection⁴⁰.

The Solid Waste Ordinance of 2000 allocates responsibility of the solid waste management from generation to disposal as follows:

Every owner or occupant of dwelling or commercial premises is responsible for waste generated at those premises until it is collected by the Council, its appointed agents or operators licensed by the Council.⁴¹

The responsible parties, identified as the owners and occupants in the ordinance, of Kampala Central division generally dispose of waste in one of five ways⁴². The first method of solid waste disposal, the use of skips or private collection by a licensed company, is the only legal method available. Skips are supposed to be cleared out or collected by the city. A significant challenge regarding skips is that many formal collection bins are made of metals that have rusted through. The city cannot collect the waste at the rate the local communities produce. This creates the problem of City managed skips overflowing or becoming neglected entirely.

³⁸ Pg 117 (Division Economic Planning Unit: Kampala Central Division 2010)

³⁹ (Shilingi 2011)

⁴⁰ (Nsanyungura 2011)

⁴¹ 2.4.1 (J. S. Kizito n.d.)

⁴² APPENDIX A: Percentage Distributions of Household Waste Disposal Methods

In the same ordinance, the guidelines for solid waste containers, like skips, to be legal are described. Solid waste is supposed to be contained in such a way that it cannot be easily or blown by the wind like a durable container, or dustbin.

A solid waste container shall comply with the following:

- A solid waste container shall be constructed of durable non-absorbent non-combustible materials, and have suitable water tight covers.
- Containers shall be kept covered except when being loaded or emptied
- Dustbins and solid waste containers shall be maintained in a sanitary condition
- Containers shall be stored or maintained in such a manner as not to constitute a nuisance or health hazard

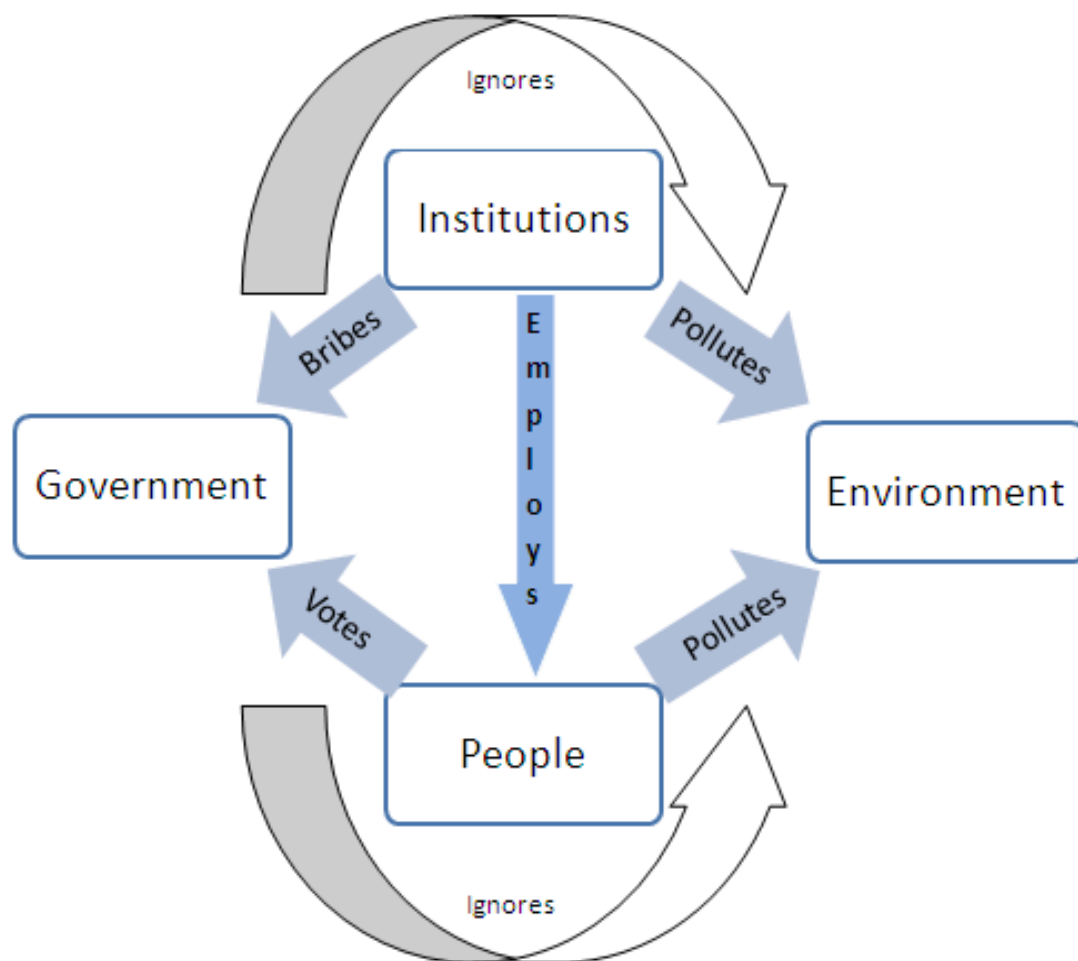
All solid waste containers provided by occupants of premises, business establishments or industries shall be subject to approval of the council⁴³.

A solid waste receptacle following the regulations described above, is a rare find in Kampala Central Division, waste is often found in piles or in large durable sacks that are emptied onto collection trucks. Skips are large and open metal containers, often rusted through due to the infrequent collection, allowing the moisture to accumulate and corrode the metal sides. The city's 104 skips were removed from the division in order to increase demand for privatized collectors⁴⁴. However, without adequate sensitization of solid waste responsibilities, the community still views solid waste as the city's problem so they continue to dump at informal and highly visible sites. The purpose of dumping at highly visible sites is to ensure collection.

⁴³ (J. S. Kizito n.d.)

⁴⁴ (Sebalamu 2011)

Legally collected solid waste is deposited at the landfill. The landfill operator has the responsibility to



provide adequate access to and from the site, including a road with proper directional signs in order to maintain an orderly flow of transport. Measures must be taken by the operator to make sure refuse does not blow away, prevent or eliminate vectors that could be a danger to public health, “prevent and control fires or pollution of the air by dust, smoke fumes, odor or from other causes,” prevent the pollution of runoff water, among other things.⁴⁵

Except as provided in this ordinance, no person shall bury, dump or depot, or cause to be buried, dumped or deposited upon any street, alley or premises, solid waste of any kind⁴⁶.

Four of the illegal alternative methods of waste disposal include burying, burning, allowing waste to accumulate and rot on personal property or dumping in public spaces⁴⁷. These methods account for

⁴⁵ Pg. 16 (J. S. Kizito n.d.)

⁴⁶ 1.13.2 (J. S. Kizito n.d.)

⁴⁷ APPENDIX A: Percentage Distributions of Household Waste Disposal Methods

approximately 57% of waste disposal in Kampala Central Division⁴⁸. These methods are cheaper and may be the only resort for places that cannot afford licensed collection and there is no local formal collection place to speak of. These alternative methods also create a noticeable pungent odor and contribute to local air pollution.

Because of how the political and economic systems are organized, there is a political cycle that prevents the reduction of pollution. The government depends on its citizens for votes and taxes, industries provide for many of the needs of the people, like jobs, goods and services as well as tax revenue for the government. Currently, government and private collection agencies have been accused of taking bribes from polluters, both citizens and business alike. The corruption of the system disrupts the cycle of policy enforcement that is meant to keep Kampala clean.

Despite their responsibility, there is a “significant proportion of the population in Kampala is not served by solid-waste collection services. Therefore, garbage and plant growth can quickly clog drains, leading to localized flooding with even light rainfall⁴⁹.” All of The urban poor, when access to a skip is limited, resort to depositing waste in trenches or drainage channels. The 31% of the waste that is disposed in heaps or buried in pits⁵⁰ poses the biggest threat to the community as much of it ends up in water streams and channels, creating environmental hazards⁵¹, the result is a disproportionate level of damage to low rent neighborhoods. Damage includes the flooding of people’s homes and hindering sanitation levels.

Although poverty levels in Kampala are falling, the benefits of overall increased wealth are not evident to the people who live in the slums. Common problems associated with poor sanitation include Cholera, Malaria, Diarrheal diseases, as well as property damage due to floods and accidents⁵². Poor health indicators lead to marked reduction in productivity, low household incomes and escalating health care costs⁵³. This contributes to individuals and families becoming trapped into a cycle of poverty, hindering community development.

Solid waste has accumulated on the roadside but remains a complicated issue. A newspaper article describes the degree to which solid waste has destroyed Kampala’s environmental health status.

⁴⁸ (Division Economic Planning Unit: Kampala Central Division 2010)

⁴⁹ Pg 3 (Mabasi 2009)

⁵⁰ APPENDIX A: Percentage Distributions of Household Waste Disposal Methods

⁵¹ APPENDIX J, APPENDIX K

⁵² Pg 71 (Division Economic Planning Unit: Kampala Central Division 2010)

⁵³ Pg 67 (Division Economic Planning Unit: Kampala Central Division 2010)

New strata are forming – a layer cake of polythene and poisoned soil, through which Uganda's rains can never percolate. Instead, dotted around Kiteezi are stagnant pools where even the storks will not drink. Their fetid waters bubble with the methane brewing beneath them. In the slums and shanties buveera are breeding grounds for disease⁵⁴.

While outside the Central Divisions district, many of the problems are observable in many parts of Kampala, and because so much of Central Division's daytime population commutes from other parts of the district, the environmental health the areas immediately surrounding the area can be just as relevant as the environmental health within the division's borders. The poisoned soil can be easily observed in the pathways of the mechanic shops behind Central Division City Council's offices as petro sludge floats in puddles that eventually lead to the drainage channel.

Drainage in the division flows into the Nakivubo Channel, third largest in the district. The tertiary systems consist of road-side drains and some minor drainage channels between buildings which convey storm water to the tributaries, or secondary channels before joining with the primary drain. Most of the road culverts at curbs are undersized, incapable of handling the flow of water when it rains. The Kampala Drainage Master Plan (2002) has yet to be implemented. Solid waste is not the sole contributor to flooding, other man-made causes of regular flooding include: diverging rainwater away from its natural course and inadequate maintenance practices. Both of these other causes are worsened by solid waste hindrance.

The development of proper drainage channels has been neglected and inadequately enforced. The maintenance of existing channels has been less effective than necessary and curb inlets are blocked which cuts off access to the drainage systems. Unwanted material removed from channels is abandoned on the banks of drainage channels and not removed which prevents water from entering the channels and pours back into the channels clogging the flow of water when flooding occurs⁵⁵. Cholera, dysentery, trachoma and water-borne diseases are all a threat where solid waste and water contamination are present⁵⁶.

According the Kampala City Council, 43% of household waste being collected in a skip⁵⁷, but the collection agency and the New Vision suggests that only 30% of solid waste in the district is actually

⁵⁴ (BBC 2007)

⁵⁵ Pg 24 (Division Economic Planning Unit: Kampala Central Division 2010)

⁵⁶ (Kasita 2005)

⁵⁷ (Division Economic Planning Unit: Kampala Central Division 2010)

collected and sent to the dumping site⁵⁸⁵⁹. The Kampala City Council Central Division Development Report also reports that solid waste disposal services cover about 60% of the division, even if that is a high estimate of collection, the district is still admittedly forcing the remaining 40% to use alternative and more environmentally hazardous methods of solid waste disposal⁶⁰. These statistics reveal two things: first, that not all waste collected by waste disposal companies is actually deposited at the waste disposal site. The statistics also indicate that wealthier neighborhoods that can afford private solid waste collection are receiving the services while densely populated poorer neighborhoods or slums like Kisenyi, Kakugu bay and Bukesa⁶¹ do not have the same access.

Solid waste generated by commercial, institutional and industrial establishments shall not be deposited or disposed of into a skip, except where a disposal service is being provided to the establishment by the Council. Industrial collection sites provided by the council are infrequent and compromise the quality of the products produced⁶². Without regular privatized collection, the smell would create problems for neighboring companies as complaints would not go to the city, but the industry⁶³. Waste collected ranges from biodegradable coffee beans and wet burlap sacks to petroleum laced towels, all of which are taken to the landfill⁶⁴.

Unlike solid waste, there are no ordinances that specifically define chemical waste protocol. Toxic waste, like batteries, is dumped at the landfill like most other waste⁶⁵. Disposal of toxic waste and chemicals is monitored by the National Environmental Management Authority.

Chemical contamination of Kampala can be found in a variety of places. Soil is contaminated with petroleum, petrochemicals, agrochemicals, herbicides, pesticides, pharmaceuticals and other forms of chemicals. These chemicals are easily found on the ground and for sale near old taxi park and in various markets. When it rains, what once contaminated the soil then contaminates the water in the drainage system and becomes water pollution. Larger operations like factories and the landfill have also been accused of contaminating water supplies, despite their water treatment plants.

⁵⁸ (Bin It Services Ltd 2011)

⁵⁹ (Tenywa, Staff Reporter 2011)

⁶⁰ Pg 118 (Division Economic Planning Unit: Kampala Central Division 2010)

⁶¹ (Namazzi 2011)

⁶² (Albu 2011)

⁶³ (Shilingi 2011)

⁶⁴ (Albu 2011)

⁶⁵ (Sebalamu 2011)

Air Pollution:

A major problem in Central Kampala, air pollution that does not include chemical air pollution like exhaust and smoke, is noise and light pollution. It has been credited as the worst form of pollution in Kampala because the city has no way to enforce any policies and the effects on development can be severe. Air pollution cannot be quantified in Kampala due to the lack of technical capacity^{66,67}. However, sources of air pollution are prominent revenue producers in the Kampala district, like clubs, places of worship and construction sites.

Chemical air pollution is not generally considered a bad problem in Kampala. However, as the city grows and the economy develops, the current trends are very likely to allow it to become a severe problem. Vehicles are old or reconditioned and primarily use unleaded fuel. Construction generates a lot of dust that goes into the air and surrounding areas⁶⁸. Solid waste also contributes to the chemical air pollution as improper methods either release toxic smoke or foul odors and oftentimes both.

There is a high risk of air pollution in Kampala; this risk is presently undeterminable (due to lack of technical capacity). Most of the automobiles that transit the city roads are old/reconditioned and using unleaded fuel. There is indiscriminate noise pollution from city [clubs] and [taxi conductors]⁶⁹

Because of this, efforts are being made on the national level to prevent an increase in air pollution, but there are no visible implications within the city. Incentives required for sustainable measures need improvement and further study.

The implications of air pollution can be severe. Noise pollution can cause decreased productivity in work environments, detract from the quality of rest in residential areas, and generally harm the social tranquility of the community. Construction sites produce construction sounds like hammering and sawing at all hours of the day and night. Clubs blast music at extreme levels to attract night socialites looking for a place to go. However, few night clubs are equipped with soundproofing to minimize the disturbance to their neighbors. Noise pollution is on the increase in the city⁷⁰. Most instances the noise generators are licensed by the Kampala city council, and according to the city's development plan they are monitored, but without the proper tools to collect evidence violations, enforcement is nearly

⁶⁶ (Namazzi 2011)

⁶⁷ Pg 118 (Division Economic Planning Unit: Kampala Central Division 2010)

⁶⁸ Pg 118 Ibid

⁶⁹ Pg 72 Ibid

⁷⁰ Pg 72 (Division Economic Planning Unit: Kampala Central Division 2010)

impossible. The rate and impact of gas-pollution from industries is yet to be determined because the technology for

Health inspectors work with the community to take preventative measures in order to improve the public's health. Health inspectors' responsibilities include inspection of public health concerns and policy enforcement. They and the community have the function for the "greening, beautification, hygiene, air pollution and noise control, home visitation, improving household sanitation at the parish level, improving the management of solid waste, street waste (sweep & litter), Kavera/ polythene in the Division, drainage inspection and sewerage surveillance, to mitigate on potential environmental hazards, inspection of public toilets, to ensure public safety and control of communicable disease outbreaks, to foster health promotional strategies and to mobilize and involve communities towards health and development."⁷¹

In economics, capital generally has more utility in clean environments. Human capital is healthier and therefore more productive when they are not distracted, sick or injured by preventable environmental hazards. Fixed capital and structures lasts longer when the infrastructure is working at its peak efficiency. The topic is relevant to Uganda's development because of pollution's direct relationship with development.

It is important to recognize that labor is often the only asset that poor households have and that sickness and death can have intergenerational effects. Any improvements in environmental health can have long-term impacts on households' ability to move out of poverty. Environmental changes can contribute to unexpected shocks over the longer run. Climate change can increase the variability of returns, for example: greater variation in rainfall patterns is likely to increase the variability of crop yields. New disease vectors emerging from climate change may make households more vulnerable. Exogenous shocks, such as floods or hurricanes, can also wipe out household assets and contribute to loss of life.⁷²

Pollution can have both positive and negative effects on the community's development, as new industrial efforts may create pollution while simultaneously creating jobs.

Challenges include the inability to publicize and fully operate according The Solid Waste Ordinance (2000), the lack of public education and sensitization of the public, inefficiencies at all levels of the disposal process, the lack of enforcement of existing policies and "illicit activities of most private collectors that lack capacity"⁷³.

⁷¹ Pg 70 Ibid

⁷² Pg 6 (The World Bank 2008)

⁷³ Pg 77 (Division Economic Planning Unit: Kampala Central Division 2010)

Conclusions:

The worst type of pollution in Kampala Central Division is debatable and requires further research. However, each type of pollution is considered major or significant. According to Mariam Atuzuyo “The single biggest challenge is the final disposal of the waste generated by the numerous households.⁷⁴” The most visible form of pollution is the solid waste is generated by households who are not a part of the demand for collection services. Noise pollution remains unmonitored and can be a significant hindrance to development as it reduces the quality of workers’ rest at night and productivity during the day.

The responsibility of monitoring and reducing pollution levels within Kampala Central division is shared by everyone. Citizens who come to the city that discard their waste haphazardly in the streets or in drainage systems are responsible. Citizens who live in or around the city, that dump or burn their household waste at illegal sites, are responsible. Drivers who do not maintain their vehicles and allow clouds of smog to fill the city’s atmosphere are responsible. Solid waste collectors who dump waste at illegal sites in order to cut costs and increase profits are responsible. City Council fails to follow the laws that they set for themselves, assuming more responsibility than manageable, is responsible. Individuals in Uganda’s federal government that accept bribes for dismissing major polluting cases are responsible. International corporations that have the tools to manage their waste but dump waste illegally anyway are responsible. Everyone involved and passively refusing to become involved is responsible.

The environment acts as both a supplier and a buffer for development. It naturally provides clean air, fresh water, and fertile soil, all key ingredients for human life and economic growth. It cleans and filters our air, water and waste before it provides us with more of what we require to survive. If the environment is healthy and remains unpolluted, the people that comprise the labor force for industries can be healthier and more productive, increasing output and cutting healthcare costs. An environment that is conducive for productivity in the labor force is also conducive for productivity in the classroom, enabling the future workforce to become better equipped for higher skilled jobs.

There are a variety of ways of identifying if environmental health is improving. The method of ensuring improvements actually happen would be internalizing external costs. Without economic incentives, change cannot be sustainable. A system already exists in NEMA’s publications. The objectives are as follows: first, to integrate environmental costs and benefits into economic planning and development at all levels of government in order to reflect the true costs and benefits of development; second, to ensure

⁷⁴ (Kasita 2005)

that individuals, groups, businesses and other economic entities have appropriate incentives and disincentives with regard to sustainable resource use and environmental protection; third, to incorporate the cost of producing or maintaining natural resources into the costs incurred by (and benefits derived from) resource users through the use of appropriate management mechanisms such as leases, management contracts, users' fees, concession agreements and similar pricing mechanisms; and finally to mobilize increased private sector resources to achieve environmental conservation and management objectives⁷⁵.

Evidence of environmental health improvement could be observed in a variety of ways. First, would be the elimination of roadside trash. 100% of the city would have convenient access to a waste collection site. Second, would be the reduction of noise pollution at quantifiable levels. With a sound monitoring device ordered by City Council, the city can enforce the soundproofing places within the community that earn profits from creating a social atmosphere for their clients, like nightclubs, bars and places of worship. Newer, more fuel efficient vehicles would replace the current ones on the road, reducing carbon emissions and noise pollution. Ideally, all vehicles would be able to pass an emissions test.

As Simon Muhumuza hypothesized in 2002, until citizens begin to value the cleanliness of community space and had access to alternative methods of solid waste disposal, the behavior would continue⁷⁶. Trash on the roadside and in drainage ways could be eliminated or at least significantly reduced if there was a single map of the central division that identifies all collection points with indicators of who is responsible for each site, whether that be the city council or a private collection agency. The map with could then be marketed to the community and eliminate the excuse for households dumping or burning waste. The map would also communicate which areas still have a market for collection services, allowing private industries to earn profits in new collection areas. With marketing the map of collection sites, all environmentally interested organizations could contribute to changing the local mindset regarding community cleanliness.

In response to the overflowing landfill, a compost project could be initiated by the city to absorb the biodegradable waste that comprises 80% of the solid waste generated. This would significantly reduce the rate the landfill expands. Having pre-sorted the compostable waste from the more permanent forms of waste at the site of generation, would make the scavengers' work easier as valuable waste would compose a higher percentage of waste taken to the landfill. Compost creates nutrient rich soil that could

⁷⁵ Pg 1 (National Environment Management Authority 1997)

⁷⁶ (Ntabadde, KCC warns on littering 2002)

then be sent back to farms as fertilizer. The process of decomposition also creates methane, a gas that can be used for energy generation, an opportunity that is already being taken advantage of at the landfill, revealing Uganda's capacity for such economic activity.

Even with monetary value, many plastic bottles are being discarded illegally. With cyclical unemployment in Kampala as high as it is, it is possible that people are unaware of the value of these plastics, or they are unaware of where these plastics can be taken. If recycling industries had collection sites, also listed on the single city map, people could deposit plastics locally, further reducing the volume of waste taken to the landfill. People would also have the opportunity to receive a small refund for their own plastic consumption.

As Mr. Kizito Emmanuel said, "At the end of the day, we need development, but we can confidently say that development causes pollution⁷⁷." To stop economic development in Kampala Central Division would reduce pollution. However, development is good and necessary for the division and therefore should continue and be encouraged. At best, the pollution of Kampala is simply a side effect, evidence of how Kampala has evolved so quickly. Without the progress Kampala has made, the pollution would be less evident.

⁷⁷ (E. Kizito 2011)

Recommendations for Future Study:

As an exploration of pollution in Kampala Central Division there is very little existing information as to what extent pollution has affected Kampala's citizens. There are many opportunities for future research that should be exploited so the city can grow sustainably without endangering the health of its people or its environment.

Future studies may wish to pursue the effect of industries have on Uganda or the Kampala region. There are many industries in the Kampala region including a brewery, a textile factory and many food processing plants. Files of correspondence between industries and monitoring agencies should be found in the NEMA library in Kampala. The letters should include information regarding corporate environmental abuse accusations and evidence. Businesses generally provide tours of their factories. Communities around the industrial area would also be excellent sources of information as to how economic development is affecting their lives. Water testing can be done at Makerere University.

A case study should be done on the communities directly involved with the landfill just north of Kampala. The case study could determine what the scavengers education levels are, the frequency and severity of when they fall ill and an overall examination of how solid waste impacts their personal daily lives. Tests could be done of the runoff water from the landfill, testing for heavy metals and toxins that cannot be boiled out of the community's drinking supply. These contaminants could then be followed through water ways that pass through Kampala to Lake Victoria. If the water is safe at any point in its path to the lake, the filtering spots should be identified as vital for conservation and perhaps even replicated closer to the landfill.

Environmental education efforts can also be examined to determine the effectiveness of sensitization programs. Because many organizations and projects claim to provide sensitization efforts, it would be possible to do a SWOT (Strengths Weaknesses Opportunities Threats) analysis of each one. This research could be followed by a proposal for a cooperative effort by all special interests. A collaborative effort could increase the sensitization more than the current smaller scale efforts.

A juxtaposition of communities could compare the solid waste management of Kampala with that of Gulu, which at the time of this research project had no licensed solid waste collectors or with that of Kigali in Rwanda, a place that is observably less polluted than Kampala in terms of solid waste and air pollution.

A practicum could be done with a solid waste collector would be done alongside an independent research in order to produce a solid waste collection map for Kampala City Council. A list of licensed solid waste collectors is on file at the NEMA library, as well as through the solid waste engineer in Kampala City Council.

A specific study of how pollution directly affects the public's health could be done with Mulago Hospital in Kampala, but primarily with smaller health clinics. Data obtained would include the number and severity of burns from burning waste, the frequency of seasonal diseases that arise from contaminated water and statistics about new respiratory disease cases. Understanding what actually contributes to the physical harm of the people of Kampala would also be valuable.

There have been no published studies prior to spring of 2011 about the effects of noise pollution in Kampala Central on productivity in schools and in the workforce. Information included in this report about noise pollution is based speculation shared in interviews. Places that generate the most noise could be identified as well as the neighborhood affected. While the correlation between noise pollution and decreased productivity is convincing and has been proven in other studies, a more in depth study in Uganda could be helpful in the city's development.

Overall, there are many opportunities for further study and exploration. All of which could be interesting and helpful in the sustainable development of Uganda's policies as well as Kampala's implementation and execution of its own policies.

Glossary:

Applied Benefit Cost Analysis: to take the interest of future generations fully into considerations in taking present decisions in using Benefit Cost analysis. Environmental economics ensure two things, namely; sustainability in addition to economic efficiency and Intergenerational (future generations) equity in addition to intra-generational equity

Clinical waste – waste material that has come into contact with bodily fluids or tissues

Commercial solid waste – any solid waste produced by stores, shops, hotels, restaurants, markets, multiple residential units and similar concerns operated for profit

Composting – a controlled condition or process under which organic material decomposes and waste stabilizes in a manner that does not create a public nuisance

Construction and demolition waste – rubble and spoils resulting from the construction, remodeling, repair and demolition operations on commercial, institutional and industrial establishments, dwelling units, garages, pavements, streets alleys, trenches and other structures

Contained solid waste – garbage and trash generated by a household and placed in prescribed containers

Dustbin – movable receptacle for the deposit of refuse

Externalities: These arise when the utility (satisfaction) or production of one person affects or is affected by the activities of other persons, in other words, costs of those activities are passed on to third parties.

General Equilibrium Theory: This theory recognizes that a change or “disturbance” in one sector of the economy will have repercussions throughout the economy by changing relative prices, and thereby changing incentives to produce and consume various goods and services. Applied general equilibrium analysis is almost always based on the standard national accounts. Unfortunately, Uganda like most countries, have not yet adjusted its national accounting framework to incorporate the costs to and benefits from the environmental resources. Gross Domestic Product (GDP) may therefore not depict a true picture of a country’s performance. Thus environmental economics introduces the concept of environmental (green) accounting which basically is a modification of the System of National Accounts to incorporate the use or depletion of natural resources.

Incineration – the process of burning waste to ash

Medical waste – waste consisting of human or animal tissue, any part of a human or animal body that has been removed by surgery, and any contaminated material such as, but not limited to, bandages and hypodermic needles;

Objectionable waste – hazardous and dangerous waste

Pollution – the negative physical effect on the environment and the loss of human welfare that results from waste

Protective clothing – includes gumboots, industrial gloves, masks, overalls and head covers

Public goods: Goods are called public goods when their units are not divisible and distinct. Their services are available to many people at the same time, including those who do not pay for them. Unlike private goods the use of their services by one person does not diminish their availability to others.

Public Nuisance – anything which is injurious or obnoxious to health or offensive to the senses, or is an obstruction to the free use of property as to interfere with the comfortable enjoyment of life or property of a considerable number of persons, or which obstructs free passage or use in the customary manner

Reclamation – the process of treating waste so that it can be used again

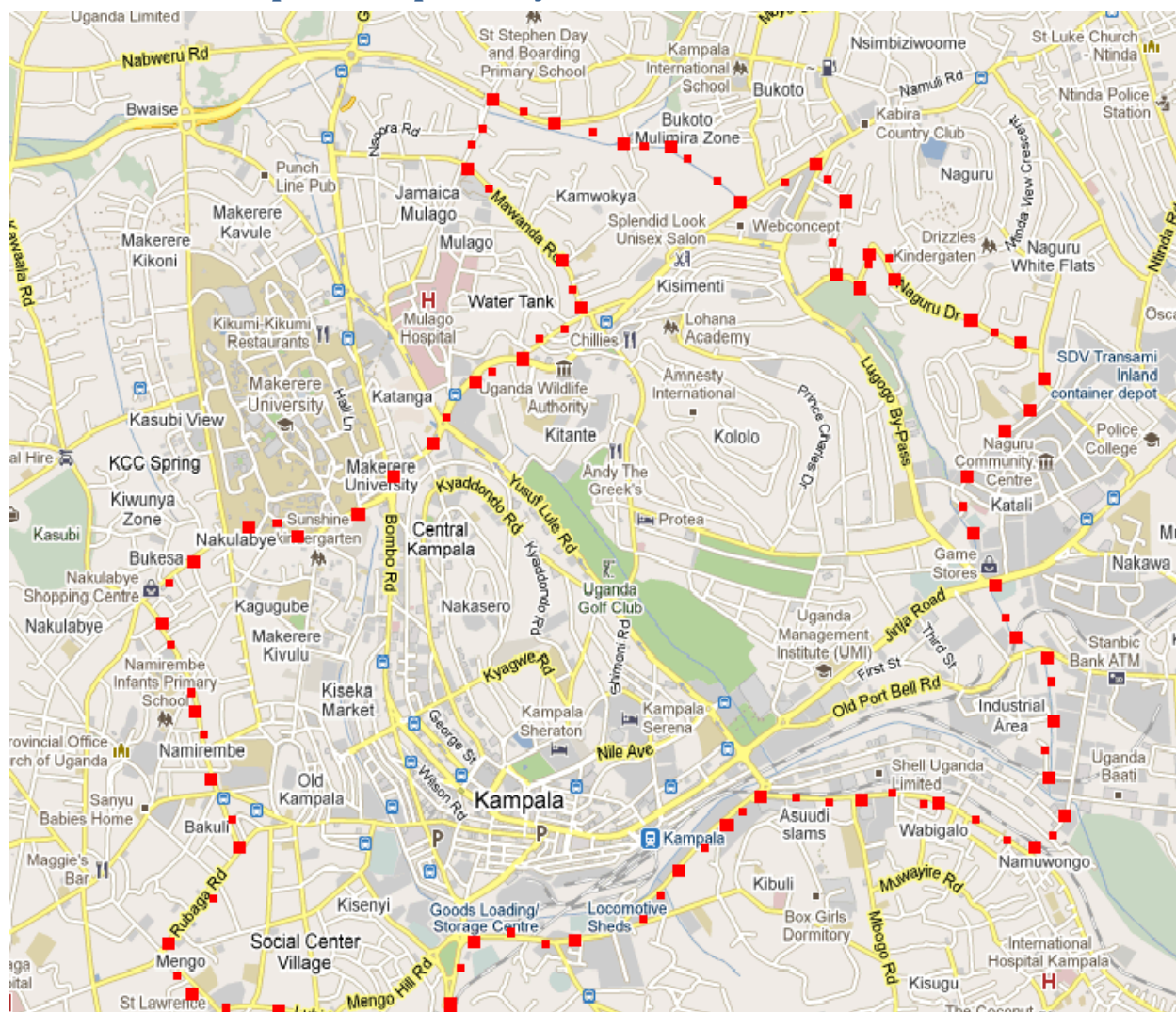
Refuses – any waste, whether liquid or solid which is discharged, emitted or deposited in the environment

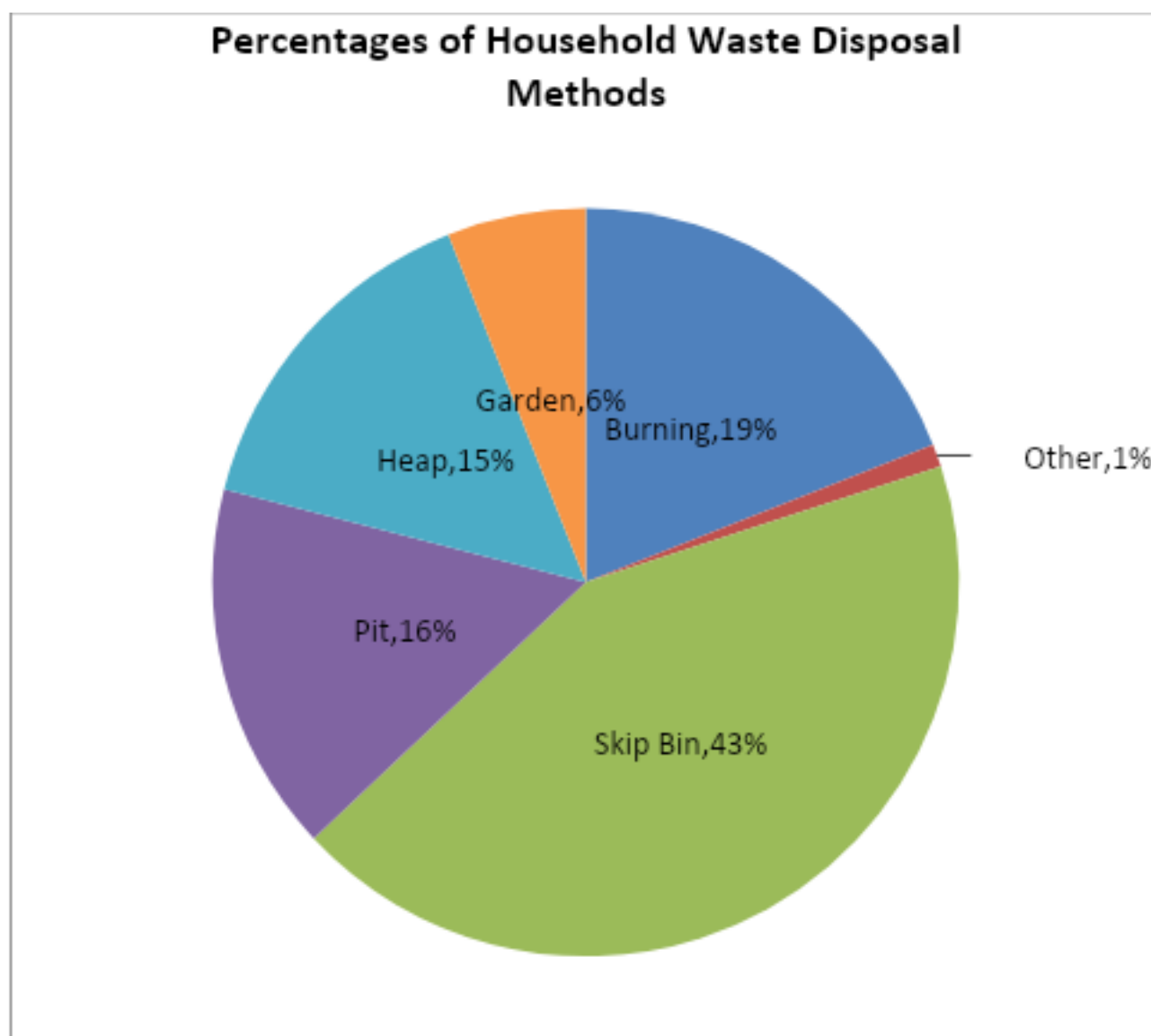
Responsible person – the owner, occupant, resident, landlord, lessee, manager, licensee, or other person having control of premises or over a structure or a parcel of land

Skip – a container owned by the Council and made available to residents for their use as part of the Council's solid waste collection system;

Solid waste – garbage, refuse, trash, and other materials or products including putrescible and non-putrescible wastes, organic and inorganic waste, combustible and non-combustible waste, and liquid non-hazardous waste, but does not include hazardous waste or human body parts.

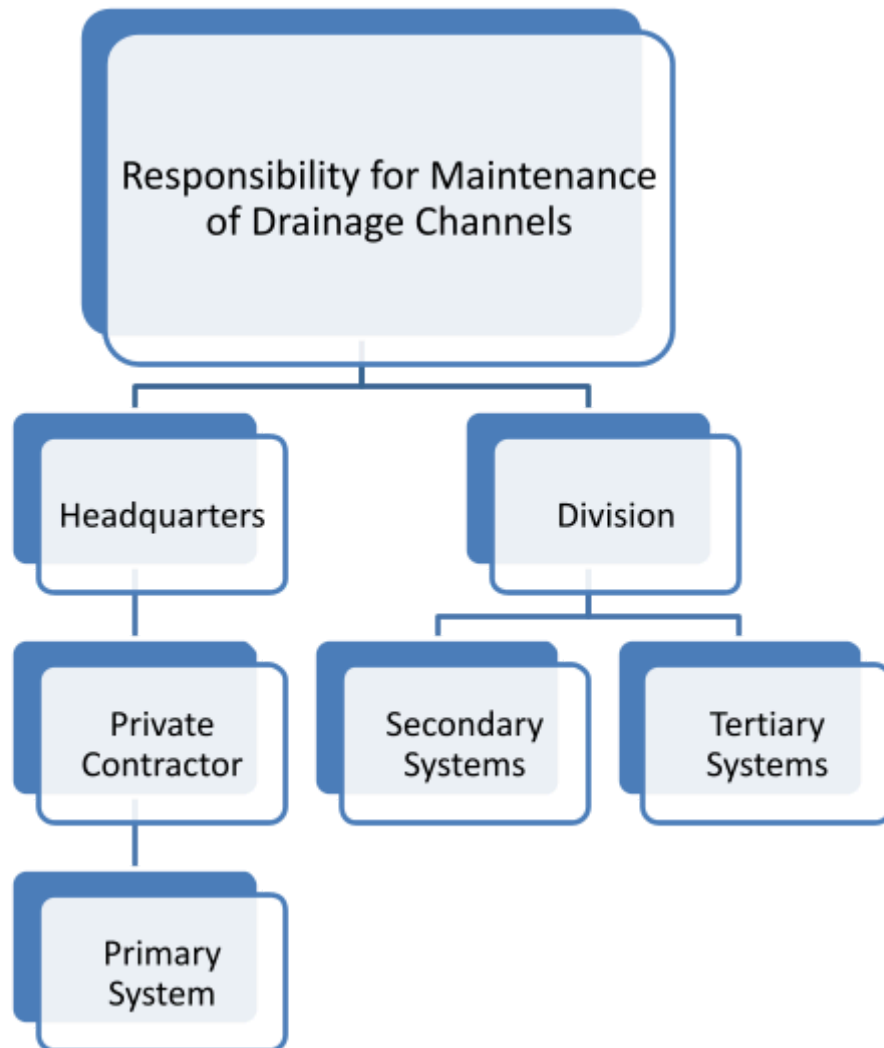
APPENDIX A: Map of Kampala City Central



APPENDIX B: Percentages of Household Waste Disposal Methods⁷⁸

⁷⁸ Pg. 76 (Division Economic Planning Unit: Kampala Central Division 2010)

APPENDIX C: Drainage Responsibility Allocation



APPENDIX D: Photograph of Waste Collection Site



Larson, April 11, 2011

Location: Kamwokya, Kampala

APPENDIX E: Photograph of Waste Collection Site in Process



Larson, April 11, 2011

Location: Kamwokya, Kampala

APPENDIX F: Photograph of Burning Waste at Collection Site



Larson, April 12, 2011

Location: Kamwokya, Kampala

APPENDIX G: Photograph of Dead Stork and Solid Waste in Drain



Larson, April 12, 2011

Location: Jinja Road, Kampala

APPENDIX H: Burning Solid Waste



Larson, April 20, 2011

Location: Off Northern Bypass near Bukoto, Kampala

APPENDIX H: Burning Solid Waste and Illegal Dumping Site

Larson, April 22, 2011

Location: Kampala



APPENDIX I: Aquatic Solid Waste



Larson, April 22, 2011

Location: Northern Bypass, Bukoto, Kampala

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