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Abstract

Resource constraints are mainly blamed for environmentally unsustainable landfill management and inadequate public service provisions that prevails in many developing countries urban centres. Apparently, the assessment of Repi landfill management indicates that the poor management of the site and its environmental consequences are mainly linked to uncoordinated institutional set-up and lack of enabling policy environment in place. This article presents the impacts of poor landfill management on the local community, by investigating the performance of Repi landfill site and public reaction to its impacts. Stressing on sound urban policy and competent institutions, the article argues that addressing contemporary urban problems with limited resources needs sound policies, rules and regulations which are backed by appropriate institutional arrangements, a responsive administration, and political commitments.

Keywords: Landfill management; Residential satisfaction; Urban sustainability

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Introduction
To promote sustainable urban development at local scale, municipal governments play a crucial role in planning and provision of basic urban services and infrastructures. The development and efficient performance of urban services and infrastructures will minimize detrimental environmental impacts and improve the lives of urban dwellers. By contrast, when urban administrators are unable to provide adequate levels of urban services and infrastructures to all its citizens, the outcomes will adversely affect the physical and the social environments of a city.

Addis Ababa is inhabited by a population of more than 3 million and is one of the fastest growing cities of Africa. As a result of its rapid growth, the city cannot cope with high demands of basic urban services. Consequently, housing problems, poor sanitation, shortages of affordable services, and uncontrolled urban sprawl are common features of the city. Apart from this, Addis Ababa is also characterized by uncoordinated and less efficient institutions to cope with ever increasing socio-economic and environmental problems.

The Repi landfill site is located in the south-western expansion areas of Addis Ababa in Lafto-Nifas-Silk Kifile ketema\(^1\) (Map I). In 1960s, the site was considered to fall outside the city’s master plan since it was inhabited by only a few farmers. The municipal administration of Addis Ababa started to use the site in 1964. Even though it has been the only solid waste disposal site for 40 years, there is still no documented information regarding the site’s feasibility, geological and hydrological conditions, lifespan, and possible impacts on the local environment.

Most of the master plans that were proposed to guide the development of the city have had little influence since they have been rigid, less relevant and implemented in the absence of the necessary legal framework and institutional capacity. This haphazard, but rapid growth of the city which is not in accordance with the proposed master plans, has profoundly affected the management of the city and the overall quality of life in the city. The poor management of Repi landfill site and the incompatible land use activities near the site are explicit indicators of unsustainable growth and poor land use management in the area.

\(^1\) Administrative unit equivalent to a district.
The site is characterised by varied and incompatible land use activities. These land use activities, coupled with environmentally unsustainable waste disposal system, have exposed the local communities to great health risks. In the urban administrators’ reports resource constraints are listed primarily to justify the poor performances of urban services and infrastructures. Acknowledging that resource constraints are one of the factors, this article argues that there are other equally important issues that need to be given full attention by urban administrators in order to address urban problems effectively. Good urban governance, sound urban policy, institutional commitment to provide the minimum social and physical infrastructures for the public, and prioritization in addressing urban problems are some of the elements lacking in the developing countries’ urban administration. The presence of good urban governance enables cities to be more efficient, equitable, safer, and sustainable. To achieve these objectives requires urban governance systems to be responsive, transparent and accountable.

As urban environmental risks are increasing in many cities, the issues of social and geographical equities have become challenging tasks for urban administers and planners. Tackling urban environmental problems and inequalities requires the capacity to design sound policies and efficient instruments for their effective implementations. The Repi landfill site management and the growing public dissatisfaction with the actual performances of solid waste management appear to be the result of inefficient land use management, as well as lack of institutional concerns for the increasing health and environmental risks. In light of this, the article attempts to address the following research questions:

- How is the solid waste disposal system managed at the site?
- In what ways does the disposal system affect the sustainability of local environment?
- How do the local community perceive their residential environment in relation to the landfill site?
- Should scarcities of resources take the blame for the problem?

**Methodology**

This study is based on data obtained from documents, aerial photographs, and critical observations and monitoring of the area between the period of 2001 and 2004. During this
time, I had regular contacts with local people and some of the workers at the site. Informal interviews and discussions were carried out on many occasions, especially with the local residents. People’s attitudes towards their residential environment were gathered at different times. Working as a school teacher not far from the site, I frequently had the opportunity to have discussions with young people living near the site. This has given me insight into understand people’s attitude towards the site. More importantly, my observations from the inside as ordinary witness and from outside as a researcher, have considerably helped me to follow up the increasing incompatible land use activities, the emerging environmental risks, and the public reaction to the problem. I considered my personal experiences and observations as first-hand information for this discussion. To map land use and other phenomena, I used GIS packages such as Arc/View, Surfer, and ERDAS-orthoBASE to produce orthophotos.

Map I Addis Ababa Sub-Cities

**Theoretical overview**

The theoretical argument presented in this article is that different actors and interest groups can influence what happens within cities through formal and informal processes of decision-making and implementation at different levels. However, this influence is unequal and greatly dependent on many factors. The relative power of the actors, the structure and operation of the political system, and the social and physical spaces of the actors are the most common factors that can affect people’s decision-making. Based on these factors, actors can act on and
influence actions made by decision makers. The success of the actors in influencing a certain course of action or decisions is determined by the socio-economic, political and environmental constraints under which the actors act or respond to a given phenomenon. The performance of urban services and infrastructures greatly affect urban social and physical environments. The way urban services function in a given area will influence people’s perception of their residential environment and decisions made based on the outcomes of the performance of urban infrastructures and services. The level of satisfaction or dissatisfaction with residential environment and existing socio-economic services can be taken as an indicator of the successes or failures of urban governance in addressing urban socio-economic and environmental problems in a sustainable way. I will use the residential perception model and locational conflict models to explain public reaction to environmental risks induced by the landfill site and incompatible land use activities in the area in the light of urban sustainable development.

**Urban Sustainable Development**

The concept of sustainable development has been a central focus for many agencies, international organizations and governments. Sustainable development entered academic and political debates in the early 1980s. Though it has been used widely as a policy goal and as a theoretical concept for academic research, there is no universally accepted definition for sustainable development. Most of the definitions of sustainable development are either too broad, ambiguous or confusing (NJOH, 1999: 21).

Sustainable development in urban contexts highlights the mismanagement of cities, which is manifested in environmental degradation and social marginalization. Therefore, the main focus of urban sustainable development is on developing systems of urban governance that maintain social and spatial equity through sound urban polices and efficient institutions. In other words, sustainable development should meet the needs of urban dwellers with minimum social and environmental costs that may bypass the dwellers in favour of other people and ecosystems both now and in the future (HARDOY et al., 2001: 338). The development of basic urban infrastructures and provision of affordable urban services for urban citizens in general and for the urban poor in particular are the key efforts to promote urban sustainability at local scale.
Residential Satisfaction and Environmental Externalities

Many studies have revealed that there is a direct relationship between residential satisfaction and the physical structures of the residential environment (ARAGONÈS, 2002: 164). The availability of social services and decent social and physical spaces in urban environments profoundly affect the choice, level of satisfaction and behaviour of individuals in deciding where to live. Undesirable performances of socio-economic services and residential environment can result in dissatisfaction on the part of the residential environment and may lead individuals to react in different ways.

Environmental psychologists have attempted to study the residential environment from two perspectives. Some focus on the physical conditions and others emphasize the social aspects of the environment. The physical aspects of the environment include the existing socio-economic services and the physical qualities of the environment, which highly influence satisfaction and the residents’ quality of life. Based on this, many models have been developed to explain residential satisfaction/dissatisfaction. One of the models developed by R.L. Oliver (cited in GÄRLING & FRIMAN, 2002) has explained residential satisfaction from the perspectives of purpose and standards of comparison. Purpose implies the various attributes, levels and focuses of people in terms of their residential satisfaction. This includes the available facilities, environmental quality and security. The standards of comparison refer to the comparison between the ‘actual’ residential environment and the ‘ideal’ one which individuals have in mind. The discrepancies between the perceived and preferred residential attributes are used in predicting residential satisfaction or dissatisfaction (AMÈRIGO, 2002: 70). In other words, people occupying a certain space as a residential environment have different levels of expectation regarding the performance of the social and physical infrastructures and quality of the environment. The gap between people’s expectations and actual performances of the existing social and physical infrastructures together with the quality of the physical environment indicates residential satisfaction/dissatisfaction as well as the achievements or failures of urban administrations in addressing socio-economic and environmental problems in a sustainable way.

People evaluate the performance of services and infrastructures based on factors that have direct, indirect or combined effects on satisfaction (GÄRLING & FRIMAN, 2002: 70-72). The outcome of the performance could be either negative or positive, resulting in satisfaction or dissatisfaction depending on the expected objectives and goals. A performance outcome
that is better than expectation increases levels of satisfaction, while performances below expectation will lead to dissatisfaction (ibid, 2002). The model is not sensitive to changes of perception, adaptation and external factors that bring about changes in individuals’ socio-demographic characteristics. Nevertheless, it is more appropriate to explain neighbourhood satisfaction or dissatisfaction in a given time frame.

The model of satisfaction, which is a modified version of Oliver’s model, assumes that the perception of a residential environment is dependent on the performances of the overall aspects of the social and physical environments, and the available environmental infrastructures and services. This includes housing conditions, quality and reliability of services, environmental qualities, and security. The way these components function and their outcomes have profound impacts on the residential satisfaction of individuals. Residential areas which are underserved by the basic social services and physical infrastructures compared to what is expected by residents usually lead to dissatisfaction. Meanwhile, people who are dissatisfied with the poor performance of public services, infrastructures, public institutions, and physical environment may use different options to narrow down the gap between expectations and actual performance.

It is important to admit that this model is not strong enough to explain the relationship between satisfaction and residential environment. The selection of variables that affect residential environment is subjective and people attribute theirs satisfaction and dissatisfaction with their residential environment to many factors. The factors are subject to changes over time and among people with different socio-economic and demographic

Fig. I. Residential satisfaction model (partly adapted from Oliver in Gärling & Friman, 2002.)
backgrounds. In this study, the way local services, infrastructures, and the local environment are performing are considered to be the main factors affecting residential environment in the area. With this reservation, the above model is found out to be useful to show the general link between landfill management, the performance of local services and residential satisfaction.

**Locational Conflict Model**

The quality of residential environment is an important element of peoples’ socio-economic status and in sources of life satisfaction. People react to any phenomena or events that will reduce the quality of their residential environment. Poor and inadequate urban services and land use activities with negative externalities, such as landfill sites, have adverse impacts on public health and property values. People will react to such adverse impacts differently, based on the social and physical spaces they have as well as the relative power they have to influence policies and decision makers. People act strategically in order to access scarce resources, social services, or to avoid social and environmental threats posed by others’ decisions or actions. Communities that are dissatisfied with their residential environment due to negative externalities that affect their quality of life and property values will use different strategies to change pre-existing affairs or courses of events. The most commonly available options to demonstrate public dissatisfaction with urban services or environmental threats include: *Exit, Voice, Resignation, Illegal action, and formal participation* (DEAR & LONG, 1978: 117-121). This model will be used to explain how the local people at the Repi landfill site reacted to the poor management of the site and its effects on the local environment.

**Discussion**

**Characteristics of Waste Disposal System in Developing Countries**

The problems of solid waste management in many developing countries are relatively recent phenomena, and are the outcome of explosive urbanization. In many developing countries, the most important public services providing clean water, energy, shelter, and sanitation services are irregular, inadequate and inefficient, both in their operation and in their geographical coverage. The municipal solid waste management service is one of indispensable services for the proper functioning of any city. However, inefficient use of resources, lack of appropriate policies, and poor solid waste management systems have worsened the problem of waste in cities in developing countries. The collection coverage is low, irregular and ranges between 40-70%, of the total generated wastes (YIRGALEM, 2001: 77). The disposal system is also
unsafe, with high social and environmental costs. Most of the disposal systems that are often used by developing countries cities fall into one of the following categories.

**Open Landfill:** An open landfill is a poorly sited disposal and devoid of infrastructures. This kind of site is often without prior studies of capacity, leachate management, gas management, and fence and cell planning to estimate its lifespan. Such sites have considerable impact on humans and the environment due to high levels of environmental contamination, human health risks, ground and surface water contamination, and the overuse of the site due to its unknown capacity. Given these drawbacks, open landfills are easy to access and need minimum capital and operational costs (UNEP, 1996). In many respects, the Repi landfill site is a good example of open landfill.

**Sanitary Landfill:** A sanitary landfill is sited on the basis of environmental risk assessment. It has full leachate and gas control management, with planned capacity and cell development. A sanitary landfill requires extensive site preparation, and covering materials on daily basis as well as fencing with gates for accurate recording and control of illegal access. Thus, sanitary landfills have the minimum social and environmental risks. The preparation of such sites demands a considerable amount of money, and hence may not be affordable for the developing countries.

**Solid Waste Generation and Collections**

According to the report of Addis Ababa health bureau, the main sources of waste in the city are households, hotels, industries, street sweep, commercial centres, and hospitals. Household waste accounts about 76% of the total generation. The bureau estimated the average waste generation per person in the city as 0.171 kg/person per day. The collection system is carried out using 16 side loaders 10 compactor trucks and 38 container lifter trucks (Addis Ababa Health Bureau, 1997). Taking the total population of the city as 3.3 million and the average family size of a household as 5, one truck serves about 10,313 families or about 51,562 people. This implies that the geographical coverage and frequency of disposal is by far below expectation (YIRGALEM, 2001: 75).

**Actors in Solid Waste Collection System**

The municipality of Addis Ababa is the major actor and the sole institution responsible for collection and disposal of the city’s solid waste. The involvements of NGOs and other private
actors are very minimal. In 1994 there were 118 environmental sanitation projects operating by 23 NGOs and 19 governmental organizations. Of these organizations, only four were directly involved in solid waste related activities (HAILE, 1999). Currently, the administration of the city has decentralized the solid waste management system to the lowest administrative units. Most of the collection activities from the households to the containers are carried out by small community-based organization and private firms. Nevertheless, the municipality is still the major actor of solid waste management in the city.

**Physical and Chemical Characteristics of Solid Waste**

In most cases, municipal solid wastes can have organic substances such as nitrogen, carbon, and hydrogen, and inorganic substances such as potassium, and phosphorous. The chemical composition of solid waste in Addis Ababa is not well known yet. Nevertheless, one study estimated that the organic substances (carbon, nitrogen and hydrogen) constitute about 40-50%, while inorganic substances (phosphorous and potassium) account for 20-30% of the total waste composition (Addis Ababa Health Bureau, 1997). Domestic waste varies in physical composition both geographically and from season to season. A report from Addis Ababa Health Bureau in 1997 indicated that fines and grass are the major components of domestic waste in Addis Ababa (Fig. II).

![Fig. II. Percentages of domestic waste generation by type](image)

**Repi Landfill Emission and Leachate Production**

There has never been any planned leachate-collection system and treatment at any stage in the entire operation of the Repi landfill site, and therefore the amount of leachate production for the site is not known. However, the physical composition of waste generated from different sources, indicate the presence of some pollutants that can potentially degrade the environment. During the field visits I have observed high amounts of liquid escaping from the
site, forming temporary streams that pass through residential areas and farmlands. There are also many leachate ponds throughout the site. Insufficient cover and compaction, coupled with lack of storm water control, have resulted in many problems such as frequent fire, high amount of leachate production and development of leachate ponds. The topographic characteristics of the site have also facilitated the possible leakage of leachate into the surrounding settlements and agricultural lands.

**Land use Activities Near and Around the Site**

In sitting and managing a landfill site, other existing and future land uses must be taken into consideration. There must be a buffering zone between the site and other incompatible land use activities such as settlements, market, schools, agriculture, public gatherings, and recreational areas. Consideration must therefore be given to long-term planning projections to ensure that the establishment of the site will not jeopardise any environmentally sensitive areas or have a negative impact on existing or future land uses. Buffer distances should be measured from the closest proposed tipping point to any incompatible land use activities. If incompatible land use activities already exist within the buffer zone, the tipping schedule should be planned so that the landfill face moves progressively away from such development areas. Some solid waste management guidelines consider a buffer zone of 500 m between tipping point and settlements in urban areas and a buffer of 1000 m in rural areas. It is also considered that there should be a minimum distance of 100 m between the site and the nearest public transport road. These criteria are mostly used for controlled and sanitary landfill for open and uncontrolled landfill sites, but a buffer zone even larger than this is needed to minimize the risk (Environmental Health Program, 1995).

Prior to the 1990s, the area close to the site was not settled except for the slum area occupied by former leprosy patients (Map II). However, after 1990s residential houses started to encroach on the site. These settlements were considered illegal by the Addis Ababa Health Bureau, which handles solid waste management in the city. However, interviews and discussions with the settlers showed that they have occupied the land legally through housing cooperatives. The land close to the site was allotted to housing cooperatives by the Public Work and Urban Development (PWUD) without considering the potential health risks on the settlers. Regardless of who is to be blamed, the episode is the manifestation of uncoordinated and fragmented actions by different institutions in urban land use management. Ten years later, the promise made by the municipality to relocate the site is still a promise, despite the
increasing health and environmental threats posed by the site. From my observations and discussions with elementary school teachers not far from the site (Map III), it is very difficult to run classes during the dry season due to high air pollution in the form of noxious smells and smoke from the site. A buffer zone made within 500 m from the centre of fresh tipping (Map III) shows that most of the land uses (which are incompatible with the landfill) are within unacceptable distances.

The landfill site has detrimental effects on the daily activities of the school. The noxious smell from the site is the most serious problem both for the staff and the students. Common colds and some respiratory infections seem to be more prevalent in this school. Unrestricted access to the site has attracted large number of human scavengers, including some of our students who came from low-income families. Robberies and some other criminal acts are also emerging problems ... For me, the school is functioning in a marginal environment where one cannot get fresh air to breathe ... (school teacher)

A buffer zone made from the outer limit of the site also indicated that quite a large number of people are exposed to the negative externalities of the site directly or indirectly (see Map IV). On the top of chronic shortages of physical and social infrastructures, which are common in the city, inappropriate management of the site has highly deteriorated the quality of life and the physical environment of the area.

**Residential Dissatisfaction and Public Reactions**

Residential environment satisfaction can be derived from living in a specific place or from the feeling that we have towards the place where we live (AMERIGO, 2002: 86). This satisfaction with residential environment varies based on the socio-economic status of an individual. The study of residential environment has indicated that there are many variables which can affect residential satisfaction. Even though it is not practical to identify all variables, key variables which are most affecting residential satisfaction can be used as key sources of information for policy intervention (PARKES et al., 2002). These variables differ from one locality to another, based on the socio-demographic characteristics of the residents, housing characteristics, and variables that describe the characteristics of their neighbourhood (ibid, 2002). Identifying the most important attribute among the wide range of attributes that affect residential satisfaction is not an easy task. Variation in people’s expectations and in values that people attach to their residential environment, and more importantly, in the socio-demographic characteristics of residents all greatly influence residential satisfaction studies.
The objective of this article is not to discuss all of these wide-ranging variables, but rather to assess the residential dissatisfaction which is caused by Repi landfill site, its various negative externalities, and its implications for urban sustainability. The various factors that need to be considered in selecting a landfill site have made it very difficult to find appropriate sites for solid waste disposal. At the same time, health is a basic human right, and all people deserve to live in a clean environment. It is obvious that the way Repi landfill site functioning is without any regard to these basic human rights and people’s well being. Local people hold different perceptions of the site, mainly due to the socio-demographic characteristics and housing conditions.
Map III Buffer Zone at 500 metres from the Centre of Fresh Tipping
Map IV Buffer Zone at 500 metres from the Site
For the purpose of this discussion, I have divided the settlements into two groups: the old and the new settlements. The old settlements refer to those settlements existing before 1990s and mainly inhabited by rehabilitated ex-leprosy patients. The new settlements include newly built-up areas after 1990 (Map II). The old settlement area is characterized by substandard housing conditions and inhabited by people with low economic profiles. It is generally described as slum area with very few physical infrastructures and inadequate social services. The interviews with older people in this area revealed that there is no serious concern about the negative externalities of the site. This is mainly because of the benefits that the residents have in the form of scavenging and recovering some materials from the site. Most people from this area use the site for grazing and growing vegetables to generate income. The new settlements are much closer to the site and the impacts of the site are more severe than on the old settlement. Interviews made with some local people in this area indicated that the site has many impacts on the local people. They also attributed their residential dissatisfaction to the negative externalities of the site:

*For me, it is unfair to dump somebody’s waste in others’ backyards and to expose them to high health and environmental risks ...* (local resident)

One local health professional also further explained the poor management of the site and its potential health and environmental risks:

*It is beyond professional ethics and a violation of human rights to use Repi landfill with the existing infrastructures and physical set-up, where incompatible land uses are encroaching beyond the minimum buffering distance between tipping and other land use activities ...*

A report obtained from the local health office indicated that typhoid and malaria are the most commonly reported cases from the area (see Table I). Further, apart from its health impacts, the site also has a significant impact on property values. From personal experience and discussions with local people, house rents are much lower in this area than corresponding areas in other localities. Low house rents are mainly attributed to the negative externalities of the site. The level of residential dissatisfaction seems to be higher here than in the old settlement area. Even though the new settlement area is also served by inadequate social services and physical infrastructures, the landfill site is the primary cause for their residential environment dissatisfaction. Almost all people from the new settlement area who were contacted linked their residential environment dissatisfaction to the various negative externalities of the site. In addition to this, the poor performance of other infrastructures and inadequate social services were also considered as another source of dissatisfaction.
Table I. Reported Cases of Major Epidemics from the Area in 1999 (local health office)

<table>
<thead>
<tr>
<th>Epidemics</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhoid</td>
<td>141</td>
<td>59</td>
</tr>
<tr>
<td>Malaria</td>
<td>38</td>
<td>15.9</td>
</tr>
<tr>
<td>B. dysentery</td>
<td>25</td>
<td>10.5</td>
</tr>
<tr>
<td>Fever</td>
<td>16</td>
<td>6.7</td>
</tr>
<tr>
<td>Measles</td>
<td>19</td>
<td>7.9</td>
</tr>
<tr>
<td>Total</td>
<td>239</td>
<td>100</td>
</tr>
</tbody>
</table>

Public Reactions to Residential Dissatisfaction

People react to the poor performance of urban services and residential environmental dissatisfaction based on the available options to influence institutions that are responsible for providing urban services and infrastructures. Based on a survey of 40 households during 2001 and on personal observations over the last three years, some of the strategic actions that have been taken by the local communities in the new settlement areas are:

1. **Public protest.** In 1993, the residents from the new settlement areas organized themselves and protested publicly by stopping vehicles carrying waste to the site. An agreement was reached between the protestors and the municipality on the condition that the municipality would relocate the site, though this has not been yet realized.

2. **Relocation.** When local people realized that their voices were being ignored by the municipality some of them managed to relocate their residences. However, this strategy is not feasible for most people as it is more expensive than other strategies. People reported that their investment on housing lost its intended value due to the negative externalities generated by the landfill site. Therefore, only very few people from the area were able to move to elsewhere by selling their properties. Most people failed to relocate their homes because of the relatively higher price of land in other parts of the city.

3. **Adaptation.** Depending on their aspirations regarding their residential environment, individuals experiencing a certain degree of satisfaction or dissatisfaction respond internally by adjusting to the existing situation. In this process, people tend to reduce their level of expectation to the actual residential environment (AMÈRIGO, 2002: 89). This response to
residential environment dissatisfaction occurs when individuals or communities are not in a position to use other strategies. People who cannot afford to relocate their residences have shown adaptive behaviour to their objective residential environment, regardless of the various negative externalities from the landfill site. This empirical study reveals that people from the new residential areas are more affected by the negative externalities of the site. They have reacted and have demonstrated their residential dissatisfaction using different strategies (protests, petitions, and relocation) based on their socio-economic status and political power.

**Residential Dissatisfaction, Urban Governance and Sustainability**

The implications of poor urban governance and unsustainable urban growth are felt in many developing countries as a result of unreliable and poor urban services. People with low incomes and who are living in marginal environments are most affected because of the limited options they have and because they are least likely to obtain compensation or alternative services. Sound urban policy goal should focus on the integration of environmental factors to promote sustainability and the well being of residents. Environmental problems which emanate from inadequate infrastructures and poor urban services are becoming pressing urban problems that mainly affect people living in marginal environments.

Policy design related to urban land uses and infrastructure development is one of the major responsibilities of urban governance. Such policies should be designed by considering distributional effects. A policy that is not sensitive to geographically equitable distribution can result in social and environmental marginalization. Policy makers should be aware of some of the key factors that cause dissatisfaction among people, mainly with regard to their residential environment, and instead should prioritize their actions and to design sound policy to improve people’s quality of life. In the study area, poor urban services and high environmental risks are identified as primary causes of residential dissatisfaction. For policy makers and urban authorities this is a good indicator of what to prioritize with respect to socio-economic services. With the existing limited resources, it is not possible to address all urban socio-economic problems but much could be done in the study area if there was an efficient use of resources, public commitment, enabling policies, and institutional arrangements. The emerging landfill crisis and high level of residential dissatisfaction are not only attributed to resource scarcities. Rather, inefficient urban policies, inappropriate institutional arrangements, lack of prioritization, and inefficient urban administration are the most common problems prevailing in the management of the city. These are manifested in
poor performance on the part of the urban services and infrastructures, which have gradually deteriorated the quality of life and environment in the study area.

1. Policies and regulations related to solid waste management

Solid waste management in Ethiopia has been operating for more than three decades without any policy or well-defined rules and regulations. Repi landfill site started as an informal site for burning dead animals prior to 1964. When it became a formal landfill site, there were no proper studies and plans with regard to its feasibility, capacity and potential environmental risks. The site operated until 1986 without effective rules and regulations to maintain the minimum standards of safe waste disposal.

In 1986, the Addis Ababa Health Bureau enacted ‘Regulation Number One’ on hygiene and environmental sanitation. The regulation particularly prohibits the dumping of waste in open spaces, streams and ponds. It also stipulates the amount of fines for those who violate the regulation. The regulation has never been effectively implemented due to lack of institutional framework and legal enforcement. The regulation highly simplified the issue of solid waste management and ignored many issues related to collection systems, site management, institutional capacities, and implementation strategies.

The first environmental policy in Ethiopia was formulated in 1997. The policy clearly stated that priority is to be given to waste collection services and the safe disposal of waste. The policy urges the establishment of safe limits, standards and regulation systems for landfill sites. It also calls upon the review and development of guidelines for waste disposal systems, the handling of hazardous wastes, and control systems to enforce them (Environmental Protection Authority 1997). ‘Like Regulation Number One’, the environmental policy of Ethiopia has paid very little attention to institutional arrangements, capacity, and authorities of different actors that significantly affect the implementation of the policy.

The Addis Ababa city government amended Regulation number One/86 in February 2004 to harmonize with the current sanitation conditions of the city. The revised regulation gave much emphasis to issues such as waste collection and transfer without saying anything about waste disposal and site management (Addis Ababa city administration, 2004). Even though the revised regulation tried to elaborate on some vague issues in the previous document, it
appears that the city administration overlooked the most important aspects of waste management, which needs urgent solutions in the case of Repi landfill site.

2. Institutional arrangements
An effective municipal solid waste management begins with establishing efficient institutional structures and arrangements, a critical evaluation of organizational procedures, and responsible institutions’ capacity to manage. Distribution of functions, responsibilities and authorities at different levels of solid waste management is one of the prerequisites for effective solid waste management. The relationship between municipal solid waste management and other municipal service sectors (sewage, public works, roads, public health, etc.) need to be well defined. In the light of this, the management approaches and techniques employed by the municipality of Addis Ababa to manage solid waste are largely inadequate. Compared to other sectors, solid waste management has been given too little attention in terms of budget allocation, skilled manpower and establishing effective institutional arrangements. Solid waste management is organized under the city’s health bureau in the Department of Environmental Health Care, where it has received scant attention to date (Fig. III). As can be seen from the organizational structure of Addis Ababa Health Bureau, solid waste management seems to be overshadowed by many other activities carried out by the bureau. The other organizational problem is related to the dual roles of the department; both policy implementing and regulating bodies are organized in the same office. This has led to compromises in the implementation of environmental policies, rules and regulations. The organization of the solid waste management section highly incapacitated the office’s ability to coordinate different actors and stakeholders for better solid waste management.

The long bureaucratic chain has also hindered efficient mobilization and use of resources. For instance, due to a centralized financial system, simple vehicle maintenance takes up to 15 days, yet the city needs at least 22 vehicles per day to empty the communal containers. The low attention paid to solid waste management is also reflected in budget allocations. In 1990/91 the municipality allocated only 1.2% of its total income. Many studies estimated that solid waste management costs 10-40% of the total incomes of municipalities. Compared to this, the budget allocated by Addis Ababa Municipality seems to be marginal, which further marginalizes the services offered by the office (HAILE, 1999).
Conclusions

The growing concerns of health and environmental risks in the landfill area are now becoming more serious as different incompatible land uses are surrounding the site. By any standards of waste disposal systems, it is not acceptable to use the Repi site for disposal purposes. Incompatible land use activities such as settlements and other public assembly areas are located within unacceptable distances from the site. The fact that the site has no appropriate cover means the noxious smells are carried as far as 2 kilometres away by prevailing winds.

Policies, rules and regulations need appropriate institutional arrangements, a responsive administration, and political will for their effective implementation. The Repi landfill site crisis is one of the outcomes of fragmented and incompetent institutional set-ups, and inefficient city administration and resource utilization. Resource constraints are mainly blamed for environmentally unsustainable landfill management and inadequate public service
provisions. In the case of Repi landfill site, without any additional resources, much could be achieved with more efficient resource utilization and a better coordinated institutional framework. Most of the health risks and residential dissatisfaction could be minimized if there is coordinated land use planning and actions between the municipality and other institutions responsible for providing social and physical infrastructures, including housing, roads and water supply. If encroachment on sensitive land use in the vicinity of the site were restricted, the site could operate to its full capacity and in a more safe way.

Open access to the site by people and animals has made management more difficult and sometimes waste compaction is interrupted by scavengers. Fencing the site and restricting access could improve many of the site’s adverse impacts on the local people. Residential dissatisfaction in the study area is very much linked to the poor management of the site and the reluctance of the municipality to hear public voices. The relocation of the site is the most acceptable solution proposed by the municipality but none of the proposed sites fulfil the minimum requirements for sanitary landfill and they have been selected in the absence of public participation. Currently, the municipality seems to be unable to start a new sanitary landfill since the selection process is in its very early stages. What seems to be more feasible now is to make improvements to the existing site in order to minimize the risks for the local people and environment even if there are still some risks remaining.

Residential dissatisfaction assessment helps urban governance to identify key areas of intervention and prioritization for a timely response. Although the level of life satisfaction varies between communities with different socio-economic and demographic backgrounds, this empirical study has revealed that most of the variables that affect residential satisfaction are common to almost all people in the new settlement areas, regardless of their socio-economic and demographic backgrounds. This implies that there is a strong relationship between residential dissatisfaction and prevailing socio-economic and environmental problems in a given space and time frame. Satisfaction with residential environment also correlates highly with the performance of urban infrastructures and services. Thus, any policy intervention to improve urban infrastructures and services will also improve the quality of the local environment, which can be one way of addressing urban sustainable development at local scale.
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