STATUS OF ENVIRONMENTAL HEALTH EDUCATION IN THE EASTERN AFRICA REGION: OPPORTUNITIES, CHALLENGES AND THE WAY FORWARD
The Status, Constraints and Environmental Health Implications of Service Provision and Management in Informal Settlements of Eldoret Municipality, Kenya by S.C. Letema and P.K. Koskey

Abstract
One of the major challenges facing local authorities in developing countries is how to meet the ever-rising demand for urban environmental services. The problem is prominent in urban informal settlements where service provision and management seems to have failed to cope with rapid expansion and intensification of land-use development. This paper discusses environmental services provision and management in informal settlements of Eldoret Municipality. Stratified random and purposive samplings were used to sample the study sites. Data were collected through the use of questionnaires and urban report cards, interviews, traverse observations and secondary data were also used.

Results indicate that there was dismal environmental services provision and management in urban informal settlements of Eldoret, and recommends partnerships in development, extension, operation, and maintenance of environmental services; subcontracting services under build-operate-transfer arrangements; environmental health education; establishment of service tariff distinguishing consumer categories and privatisation.

Introduction
Developing countries, Kenya included, are experiencing unprecedented urbanisation and growth of densely populated informal settlements. Informal settlements accounts for a substantial share of urban population and have become dominant growth centres of major urban centres (Haar, 1968; Berry, 1976). Poor conditions in urban informal settlements present major environmental health challenges. Infectious, gastrointestinal and degenerative diseases continue to prevail (WHO, 1988; Tulchin, 1986). These disease incidences are determined, in part, by the quality and availability of basic services such as safe water supply, sanitation and solid waste management.

The services available within major urban centers in Kenya such as Eldoret have been over stretched. More so, the financial base of local authorities has been deteriorating for a number of years resulting in diminished investments in provision of urban environmental services (Kenya, 1978-83). Weak financial base, inefficiencies, high operation costs and deterioration of urban environmental services led to emerging patterns of services provision especially privatization and partnerships in the 1990s with little success.

Eldoret has experienced phenomenal population growth and horizontal land use expansion for the last four decades coupled with deterioration of urban services. Attempts to control developments and improve settlements conditions through boundary extensions in 1974 and 1988 have been made with little success. This paper, therefore, explores environmental services provision and management status, constraints and their environmental health implications in urban informal settlements of Eldoret Municipality.

Methodology
Data were collected from five informal settlement estates and key service providers, self-help groups, associations and community leaders in Eldoret Municipality. Estates were stratified then randomly sampled based on municipal zone classification. Purposive sampling was used in interviewing key institution staff involved in service provision, particularly Eldoret Municipal Council (EMC), Eldoret Water and Sanitation Company (ELDOWAS) and Government Departments. Tools for collection of data included questionnaires, urban report cards, interview schedules, traverse observations, focused group discussions, and review of corporate reports and publications. Descriptive and inferential statistics were used to summarise and present data. Content analysis was applied to analyse information from interviews, corporate reports/documents, and publications.

Results
Status of Water Services Provision
Population served with portable water supply in Eldoret municipality was 45.57% (ELDOWAS, 2002). A large number of informal settlements were poorly provided with piped water supply. The estate with scanty water supply included Langas, King'ong'o, Ngomomogo, Jerusalem, Munyaka, Ya Mumbi and Maili Nne. Water kiosks were provided (Figure 1) to serve informal settlements that could not access yard connection. The people covered by water kiosks, however, were very low, accounting for 4.2% of informal settlement residents.
Source: Field Data, 2002

The study showed that 57.7% of informal settlement residents used borehole water. Borehole water, however, was perceived by 62.5% and 100% of informal settlement residents as unreliable and of poor quality respectively. The study further showed that 41% of the residents were not satisfied with water supply arrangements citing high tariff charges on water from kiosks, high costs for house connections and long distances to water kiosks.

The level of environmental services provision and management in informal settlements was observed to hinge on existing municipal capacities. Eldoret Municipal Council invested heavily on water supply capacities through a number of projects, namely Ellegerini Intake, Two Rivers Dam, Naiberi Dam, and Chebara Dam. Water supplies in the municipality were also developed and implemented over a period of time under phases I and II. After the commissioning of Phase II Water Project in 1997, the municipality has had reliable and surplus water supply, which was expected to meet the demands beyond the year 2005. Water demand in the year 2002 was approximated at 28,000 m$^3$/d, leaving a surplus of 3,200 m$^3$/d (Sewe, 2002). Surplus water supply led to 34-kilometre water extension and an increase in the number of water kiosks from 15 to 48 in informal settlements.

Status of Sewerage Provision

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Year of Construction</th>
<th>Life Span in Years</th>
<th>Remaining Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewers 1977</td>
<td>40</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Sewers 1982</td>
<td>40</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Sewers 1987</td>
<td>40</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Quarry T. works 1979</td>
<td>50</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Waste stabilisation</td>
<td>1985</td>
<td>15</td>
<td>-2</td>
</tr>
</tbody>
</table>

Source: Eldoret Municipal Council, 2002

Most informal settlements had ventilated improved pit latrines (VIP). Kimumu residents (middle-income neighbourhood) ventured into exhaustible pit latrines in which residents pumped well water to raised plastic storage tanks to flush toilets. Over 71.7% of informal settlement residents were dissatisfied with sewerage services, citing scanty reticulation and unavailability of exhauster services to empty filled pit latrines on requests.

Status of Solid Waste Management

Eldoret Municipality had a Department of Environment. Daily refuse collection was 60 tonnes on average. Refuse collection served about 42.4% of the municipal population (Rotich, 2002A). However, the study showed that 83% of informal settlement population was not served by municipal waste collection systems. The frequency of collection was 1 to 2 times per month in informal settlements, as compared to 2 to 3 times per week in urban core residential quarters and daily in central business district. Dismal attempts were made to supply estates with bins (Table 4). The bins, however, were 10-15 years old. The supply of bins was scanty in informal settlements except those supplied under urban upgrading programme.
Table 4: Distribution of Bins per Estate

<table>
<thead>
<tr>
<th>Estate</th>
<th>Number</th>
<th>Estate</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Langas*</td>
<td>31</td>
<td>Pioneer</td>
<td>22</td>
</tr>
<tr>
<td>Elgon view</td>
<td>2</td>
<td>Khaova*</td>
<td>13</td>
</tr>
<tr>
<td>Munyaka*</td>
<td>1</td>
<td>Kamugunji*</td>
<td>10</td>
</tr>
<tr>
<td>Maili Nne*</td>
<td>-</td>
<td>Bacon</td>
<td>16</td>
</tr>
<tr>
<td>Kimumu*</td>
<td>-</td>
<td>West Indies</td>
<td>10</td>
</tr>
<tr>
<td>Ya Mumbi*</td>
<td>-</td>
<td>Kapsoya</td>
<td>5</td>
</tr>
<tr>
<td>Huruma</td>
<td>55</td>
<td>Shauni Yako*</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Municipal Environment Department, 2002

Informal Settlement Neighbourhoods

Most informal settlement residents dumped their solid waste to either rubbish pits or open spaces such as roadsides and undeveloped land (Table 5). The residents attributed this behaviour to lack of designated waste storage, collection, and transfer sites in informal settlement neighbourhoods or where it exists, inaccessibility of refuse collection vehicles during wet seasons.

Table 5: Household Waste Disposal Methods

<table>
<thead>
<tr>
<th>Disposal mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>17</td>
</tr>
<tr>
<td>collection</td>
<td></td>
</tr>
<tr>
<td>Open space</td>
<td>11</td>
</tr>
<tr>
<td>Rubbish pit</td>
<td>72</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Data, 2002

Constraints to Provision and Management of Environmental Services in Informal Settlements

It is apparent from the foregoing discussion that informal settlements were poorly served with environmental services. Several factors were attributed to this scenario, which includes the haphazard settlement structure, lack of environmental health education, obsolete facilities and systems, rapid growth and lack of funds. Environmental health implications of the existing services provision and management levels on informal settlements.

Environmental Health Diseases Prevalence

Environmental health diseases, such as diarrhoea (Figure 2), typhoid and malaria were prevalent in informal settlements of Eldoret Municipality.

Source: Eldoret Municipal Health Department, 2002

Note: Only data for diarrhoeal cases were available.

The diseases were attributed to a number of factors, namely poor provision of portable water supply, bacteriological contamination of borehole water that were in close proximity to pit latrines, poor drainage creating stagnant water that breeds malaria vectors, use of filled pit latrines that predisposed residents to infectious and disease vectors, decomposing solid waste heaps that provided suitable breeding ground for disease vectors i.e. bowl flies, cockroaches and houseflies, and lack of roads and service way leaves, which constrained solid waste collection and emptying of filled pit latrines. Diarrhoea and typhoid was spread through faecal-oral routes because of poor sanitary conditions and water supply distribution.

Crowding of Informal Settlements

Crowding was two fold, space use and environmental services. Crowding was observed to make people more vulnerable to multiple infection and risk of disease transmissions. Crowding caused poor ventilation, lack of drainage and household waste disposal. Crowding was also associated to illnesses such as diarrhoea, respiratory infections, gastrointestinal, whooping cough and hepatitis.

Conclusion and Recommendations

Big service provision backlog hits informal settlements of Eldoret due to poor environmental services provision and management hence affecting environmental health. Consequently, environmental health diseases prevailed in informal settlements. To alleviate existing environmental health problems, the paper recommends partnerships between Eldoret Municipal Council, ELDOWAS, private sector and the community in extension, operation and maintenance of environmental services. Second is subcontracting of informal settlements’ water reticulation by ELDOWAS, as provided for in the covenant agreement, under built-
operate-transfer arrangements to enhance resource mobilisation. Third is establishment of tariffs distinguishing consumer in order to enable low-income residents’ access environmental services. Fourth, privatisations of some refuse collection zones needs should be undertaken to enable existing capacities to manage the remaining waste load. Fifth is the upgrading of informal settlements and finally frequent environmental health education should be staged in informal settlements to control disease occurrence due to ignorance.

References


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