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Working with Communities to Improve Dignity: The Case of Improved Bio-Centres in Kenya

George Wasonga

Abstract

This article presents the bio-centre technology, an innovative solution that addresses the fundamental needs of densely populated informal settlements, which has improved sanitation and energy access options for residents. The bio-centre technology not only arrests the myriad of health, social and environmental problems associated with poor disposal of human waste but it also reduces the energy burden of poor communities as well as introducing new opportunities for income generation and positive socialization amongst the inhabitants in the catchment area of the facility. This article discusses the sanitation challenges in informal settlements and the bio-centre initiatives, of community actors, to redress the attendant problems.

Introduction

As is the case in many developing nations, Kenya's urban areas are centres of innovation, industrialization, education, science and technology and culture. Many citizens are attracted to these urban areas to benefit from the attributes of modern living. However, these urban spaces house communities living in highly undignified conditions deprived of the very basic essentials necessary for meeting a minimum standard of living. Majority of Kenyans, estimated at over 60% of the urban population, reside in informal settlements where they not only deal with the ever looming threat of eviction, but they also bear a heavy social and health burden accentuated by the poor physical conditions they live in.

It was with hope and desire for a better urban space that Kenyans, including the majority of urbanites residing in informal urban spaces, overwhelmingly voted for a new constitution, promulgated in August 2010. Significant in this constitution is the recognition of urban areas and cities as provided for in article 184 (Government of Kenya [GOK], 2010) that has enabled subsequent legislation through an Act of Parliament on Urban Areas and Cities in August, 2011. Such is the importance of legislation, particularly when statistics show that one out of every three Kenyans lives in urban areas implying that out of the total 38.6 million population, 32.3% or 12.5 million Kenyans live in some 108 designated urban centres with populations ranging between 20,000 and 3 million (GOK, 2009). Kenya's development blue print, Vision 2030, estimates that by the year 2015, the level of urbanization will have reached 44.5%, and eventually it will reach 54% by 2030 with nearly 30 million people living in urban areas.

In this regard, the Bill of Rights, as enshrined in the constitution, clearly provides for respect, protection and fulfilment of human rights for all citizens regardless of their place of residence, ethnic origin, gender or any other status. It safeguards the right to food, health, education, housing, water and sanitation and a clean environment. With the provisions of article 43, the poor can claim their inalienable right to exist within the city, to access basic services and to participate in governance (GOK, 2010).

However, for the majority of urban Kenyans residing in informal settlements, the answers to the very conditions that make for undignified living in the urban spaces remain distant and these trends contribute to a sense of hopelessness. Nevertheless, it is encouraging to note that efforts are being made by both State and non-state actors to ameliorate the conditions, particularly in the provision of basic services, shelter and infrastructure. One such effort that is responding to the sanitation and energy question in informal settlements is being led by Umande Trust, a Non-Governmental Organization (NGO) based in Kibera, Nairobi, with support from the Civil Society Urban Development Programme (CSUDP) and related donors.

1. The Question of Sanitation and Energy

Communities residing in the ever growing expanse of informal settlements in Kenya continue to contend with serious environmental degradation and public health concerns precipitated by increased vulnerabilities due to exposure to unsanitary conditions. The magnitude of this concern can no longer be downplayed, especially since Nairobi alone houses more than 100 such informal settlements. It is increasingly obvious that if unchecked, these patterns are likely to undermine the country's efforts towards achieving the Millennium Development Goals (MDGs).

Figure 1: Poor garbage disposal



Source: Haki Jamii, 2009

Working through Umande Trust, communities in a number of informal settlements identified poor sanitation as a key area of concern which is compromising their quality of life. Containment of human waste in sanitized environments continues to elude inhabitants in these settlements who often lack space for the construction of appropriate sanitation facilities. Households are forced to employ risky disposal practices that have left the communities vulnerable to diseases such as diarrhoea and even outbreaks of cholera. This situation has been exacerbated by the poorly drained surfaces in the settlements, often causing overflows into the housing units during the rainy season. The question is and remains, what technological options, commensurate with the socio-cultural and economic conditions, are available?

Interestingly, technology that not only contains and sanitizes human waste but generates energy from the same exists. Yet, energy for household use remains a major concern in the informal settlements with families directing a significant amount of their earnings in acquiring energy for cooking and lighting. Most of the households use kerosene lamps and stoves exposing themselves to risks of contracting upper respiratory tract infections. The bio-digester technology provides an important solution that Umande Trust, through the support of CSUDP and other agencies, has mobilized communities to construct. Presently, there are over 40 bio-centres constructed through community participation in informal settlements of Nairobi, Kisumu and Kakamega.

2. The Bio-Centre Option

The bio-centre technology provides multiple social, environmental and economic benefits to the communities residing in informal settlements. This technology answers to the call for provision of dignified sanitation and responds to the high energy demand through supply of safe bio-gas for household application and natural compost for improved urban gardening hence improving household nutrition. Biogas use, replacing conventional fuels like kerosene or wood fuel, allows for the conservation of the environment by protecting forests. In addition, the containment of human waste reduces the pollution of water bodies thereby curbing water-borne illnesses.

Figure 2: A Bio-sanitation facility at Katwekera village, Kibera



Source: Umande Trust, 2010

3. Towards A Green Economy

The green economy concept, as described by the United Nations Environment Programme (UNEP), is aimed at economic growth that reduces carbon emissions and pollution while enhancing energy and resource efficiency. Bio-centres are designed to contain human waste and transform it into energy and compost by-products for domestic application and farm input respectively.

The bio-centres are constructed by communities who contribute their labour (skilled and unskilled) and the facility yields a whole range of benefits for its users, the society and the environment in general. Currently, the 40 bio-centres are serving a combined population of over 100,000 informal settlement inhabitants with associated benefits that include:

- *Turning waste into a resource*

Bio-sanitation has closed the loop in the waste management process by turning human waste into a resource. The bio-centres apply ecological sanitation principles to ensure that human waste in ablution blocks is turned into wealth by producing gas through bio-digester systems and producing fertilizer as a by-product.

- *Production of clean energy (heat, light, electricity)*

One standard bio-digester produces at least 12m³ of bio-gas whereby 1m³ of bio-gas will generate 4,500 – 5,500 Kcal m² of heat energy when burning effectively. This heat is sufficient to boil 100 litres of water or light a lamp with a brightness of 60-100 watts for 4-5 hours. Furthermore, 30m³ of biogas is equivalent to 18 litres of diesel oil.

Figure 3: Meal preparation at the community kitchen



Source: Umande Trust, 2010

The bio-gas is piped to a community kitchen that serves an average of 50 households per day, thereby almost substituting the complete consumption of charcoal and kerosene for the households neighbouring the facility in informal settlements.

- *Environmental advantages through protection of forests, soil, water and air*

Estimating an average per capita consumption of 3 kg of wood per day for energy (cooking, heating and boiling water) per household, the daily per capita demand of energy equals to about 6 kWh which could be covered by about 1m³ of biogas. This translates into the conservation of trees in the surroundings of informal settlements. Biogas use, replacing conventional fuels like kerosene or firewood, allows for the conservation of the environment. In addition the containment of human waste reduces the pollution of water bodies.

- *Global environmental benefits of biogas technology*

A bio gas digester effectively reduces the amount of methane directly released into the atmosphere, by trapping it and facilitating its use as a green fuel.

- *Transformation of organic wastes into high quality fertilizer*

The Kenya Agricultural Research Institute (KARI) lab tests have proven that the fertilizer which comes from bio-gas digesters contains triple the nitrogen than the best compost fertilizers made through open air digestion. Bio-fertilizers are cost effective and eco-friendly supplements to chemical fertilizers. They provide a sustainable source for nutrients and healthy soils and are seen as an important input to urban farming practices evident in the informal settlements.

- *Income generating opportunities*

The bio-centres are hygienically established and have provided spaces for petty trading and community social hall space for mobilizing community savings groups.

Conclusion

The dignity of most urban residents occupying informal settlement areas of urban spaces is a fundamental right that can be partly fulfilled through innovative solutions to the sanitation question such as the one offered by bio-centres. The multiple benefits that communities in these settlements derive from the bio-centres provide further incentive for this choice of sanitation solution. CSUDP and Umande Trust are convinced that the advantage of bio-digestion technology is no longer in question as its viability and utility is well-proven. Nevertheless, this is a solution that is yet to be widely embraced as an answer to the informal settlement sanitation question so as to uphold the dignity of the majority of Kenyans, occupying the least space in urban centres.

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