

Advocacy for Waste Management: Realization by Churches in Kenya for Improved Environmental Sustainability

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Abstract:- Waste management encompasses management of all processes and resources for proper handling of waste materials, from maintenance of waste transport trucks and dumping facilities to compliance with health codes and environmental regulations. Public awareness is key to successful waste management. A critical component in any waste management program is public awareness and participation, in addition to appropriate legislation, strong technical support, and adequate funding. Waste is the result of human activities and everyone needs to have a proper understanding of waste management issues, without which the success of even the best conceived waste management plan(s) becomes questionable. (NCBI, 2015) The need to manage waste in such a way that it does not affect our health and our environment is quite a new concept in many countries, especially in the rapidly growing urban centres of the developing world. The lack of awareness can be immense in some cases, and this is reflected in the lack of resources allocated to set up robust waste management systems (WHO, 2015). Rapid population growth especially puts an enormous strain on the sanitation and solid waste management capacities of cities, more so in the developing world where such infrastructure is already weak or stretched (WHO, 2016). According to the WHO (2016) report, all stakeholders need to work together at global and local levels for advocacy and project implementation as well as for raising awareness on urbanization in order to maintain environmental sustainability. Environmental sustainability involves the capability to maintain the qualities that are valued in the physical environment such as human life, living conditions for people and other species (e.g. clean water and air, a suitable climate), the quality of life for all people as well as the live-ability and beauty of the environment. Threats to these aspects of the environment mean that there is a risk that these things will not be maintained (Sutton, 2004). The goal of the environmental sustainability is to promote sustainable engineered systems that support human well-being and that are also compatible with sustaining natural (environmental) systems. These systems provide ecological services vital for human survival.

Key Words: Global, Environment, Waste, Sewers, Sustainability, Environmental depletion.

I. INTRODUCTION

More than half of the world's population lives in urban areas and by 2050, it is likely to increase to about 70%. Moreover over, 60% of the land projected to become urban by 2030 is yet to be built. Half of the population of Asia is expected to live in urban areas by 2020, while Africa is likely to reach a 50% urbanization rate by 2035 (United Nations, 2014). This therefore speaks of more than 70% of waste being

found in urban areas by the year 2035. As part of Biblical stewardship, Christians are expected to find a solution to the anticipated challenge of waste management before the situation gets out of hand.

The latest United Nations projections indicate that world population will reach 10 billion persons in the year 2056, (six years earlier than previously estimated). According to current statistics, 55% of the world's population of nearly 8 billion live in urban areas and is expected to increase to 57% by 2050. The same statistics show that 49% of the population of Asia is urban population while that of Africa is 41%. The East Africa region has 26% of its population living in urban areas while that of Kenya is almost the same at 27% (Worldometers, 2017).

More than 90% of future population growth will be accounted for by the large cities in the developing countries. In the developing world, Africa has experienced the highest urban growth during the last two decades at 3.5% per year and this rate of growth is expected to hold into 2050. Projections also indicate that between 2010 and 2025, some African cities will account for up to 85% of the population of their countries. The share of the African urban population is about 36% and is projected to increase to 50% and 60% by 2030 and 2050 respectively, (BBC, UK, 2016). Amid a rapidly growing world population, waste management issues are becoming increasingly crucial for the promotion of environmental sustainability (United Nations Environment Program, 2014).

Globally, solid waste management is one of the greatest environmental health challenges and continues to overwhelm local authorities and national governments as urban populations continue to rise and consumption patterns change. Cities of the world generate about 1.3 billion tonnes of solid waste per year, a volume expected to rise to 2.2 billion tonnes by 2025, with a more than double increase for developing countries (Worldometers, 2017). This has led to over-crowding with basic infrastructure and services characterized by poor solid waste management. This leads to numerous environmental and health risks including contamination of surface and groundwater, ecosystem degradation, and soil pollution as well as greenhouse gas emissions by anaerobic decomposition of waste. In many towns, poor management of solid waste contributes to flooding, air pollution, and spreading of diseases and health conditions such as respiratory ailments and diarrhoea, giving rise to severe economic and social losses.

With decades of rapid urbanisation still ahead, health benefits will probably continue to accrue to urban populations, who have better access to health services and education and higher incomes than do their rural counterparts. However, urbanisation will continue to increase population exposure to major risk factors for disease, especially those that relate to the challenging environmental and social conditions (e.g., environmental pollution and physical inactivity) that dominate towns and cities.

The involvement of communities has a direct bearing on effective waste management and so do their awareness, attitudes, and practices. Participation is influenced by religious convictions, social pressures, environmental motivation, attitudes, and economic incentives. In the United Kingdom several intervention programs have been implemented including household waste prevention alluded to by Gorge, Sharp, Strange, Wilson and Blacked (2010). For successful development of any solid waste project, community participation in collection and design of facilities is essential for sustainability (World Bank, 2010).

China has seen the largest human migration in history, and the country's rapid urbanisation has important consequences for public health. An analysis of its urbanisation trends shows shifting and accelerating rural-to-urban migration across the country and accompanying rapid increases in city size and population. Urban environmental quality, including air and water pollution, contributes to disease both in urban and in rural areas, and traffic-related accidents pose a major public health threat as the country becomes increasingly motorised. To address the challenges and maximise the benefits that accompany this rapid urbanisation, innovative policies focused on the needs of migrants and research that could close knowledge gaps on urban population exposures are needed (Lancet, 2012).

In many regions and countries, national and international targets have been set for municipal solid waste recycling, recovery and diversion from landfill (Ali, 2009). To develop and implement effective strategies, to meet these targets requires reliable information on the composition of all parts of household waste streams. It is therefore necessary to examine the nature and quality of waste generated in order to contribute to improvement actions at the source.

Urban living is the keystone of modern human ecology. Cities have multiplied and expanded rapidly worldwide over the past two centuries. Cities are sources of creativity and technology, and they are the engines for economic growth. However, they are also sources of poverty, inequality, and health hazards from the environmental pollution. Urban populations have long been incubators and gateways for infectious diseases. The early industrializing period of unplanned growth and laissez-faire economic activity in cities in industrialized countries has been superseded by the rise of collective management of the urban environment. This occurred in response to environmental blight, increasing literacy, the development of democratic government, and the collective accrual of wealth. In many low-

income countries, this process is being slowed by the pressures and priorities of economic globalization. Beyond the traditional risks of diarrhoeal disease and respiratory infections in the urban poor and the adaptation of various vector-borne infections to urbanization, the urban environment poses various challenges. Global environmental changes are swamped by dramatic changes in the local environment. Urban ecology integrates natural and social sciences to study these radically altered local environments and their regional and global effects. Cities themselves present both the problems and solutions to sustainability challenges of an increasingly urbanized world (Grimm. et al, 2008), therefore, level of public awareness that enhance the existing, and usually unequally distributed, urban environmental health hazards and larger-scale environmental problems must not be presumed.

wareness is very vital in sustainable development. Sustainable development is development that lasts, because in addition to an economic component, there are social and environmental components. As it was proposed initially by the World Commission on Environment and Development (1987) sustainable development must meet "the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development requires mobilizing governments, the private sector, and the general public toward sustainable communities. Sustainable urban development is ultimately a cultural statement about ourselves, how we want to live, and our ability to manage our needs, desires, and dreams in ways that are effective and caring. (Environmental Issues of the UN Conference on Environment and Development, Rio De-Janeiro, June 1992).

Effective management of waste requires the cooperation of the general public. Lifting the priority of, and allocating more resources. The waste management sector needs to ensure that public and decision makers' awareness activities are integrated. The aim of these activities is normally long term and it takes some momentum to build up before the effects are realized. Once the interests of the public and decision makers in improving solid waste management are created, the sustainability of waste management will be significantly improved.

II. MANAGING WASTES IN DEVELOPING COUNTRIES

In developing countries, the haphazardly growing town areas are a challenge for MSWM. Lack of educational programs related to solid waste management indicates that, there is a need of professionals to fill this existing gap. In Malaysia, the amount of waste generated continues to increase due to growing population, increasing development and modern lifestyle has led to more acute waste problems. Careless habits associated with greater affluence lead to greater quantities of waste as demonstrated by discarded wrappers and non-degradable materials such as plastics. The waste is sent to small incineration plants, diverted to recyclers/re-processors or is dumped illegally. However, an alarming 19% of waste ends up in drains, which then cause flash floods and drainage blockage. (InTech Open, 2012). According to a Case Study of a

University in Malaysia, litter at the roadside, drains clogged up with rubbish and rivers filled with filthy garbage indicate that solid waste is a major environmental problem in Malaysia. Furthermore, lack of awareness and knowledge among Malaysian community about solid waste management (SWM) issues, and being ignorant about the effect that improper SWM has definitely worsened the problem. In Zimbabwe, Saungweme (2012) found out that most residence of Mbare, in Harare, were not aware of regulatory policies on waste management thus causing environmental degradation.

III. RAISING AWARENESS ABOUT WASTE MANAGEMENT AND COMMUNITY PARTICIPATION

The need to improve public awareness of, and community participation in, waste management has been widely recognized. The World Bank has included this aspect in their guidelines for the Mediterranean region (METAP 2005) and UNICEF initiated a national campaign in Brazil in 1999 involving Waste and Citizenship Forums (Dias 2006). World Bank engagement in solid waste management is supported through valuable partnerships, including funding from the Climate and Clean Air Coalition, Korean Green Growth Trust Fund, and the Global Partnership on Output-Based Aid (GPOBA), as well as collaboration on capacity building and knowledge sharing through a memorandum of understanding with the International Solid Waste Association (ISWA). The World Bank supports designing incentives and awareness systems to motivate waste reduction, source-separation and re-use, for example in Morocco, a series of Development Policy Loans totalling \$500 million have improved citizen engagement and transparency, strengthened private sector partnerships and accountability, increased fee collection, and supported better working conditions for and the social inclusion of 20,000 informal workers (World Bank, 2017).

Solid waste management (SWM) is a major public health and environmental concern in urban areas of many developing countries. For successful development of any solid waste project, community participation in collection and design of facilities is essential for sustainability (World Bank, 2010). The World Bank notes that in developing countries, 20-50% of budgets are directed towards solid waste management while 30-60% of the waste is not collected. This is an indication that the channelled financial resources are not being effectively utilised. Intervention programmes that are not grounded on the reality of a situation have often collapsed the world over (Saungweme, 2012 and World Bank, 2012). Therefore, establishing a baseline against which solid waste management strategies would be implemented is an important first step in making progress towards community participation in solid waste management.

IV. WASTE MANAGEMENT CHALLENGE IN KENYA

Kenya has several challenges from clogged drainage and sewers which lead to environmental pollution. As a result, there are high incidences of waterborne diseases like typhoid, cholera and diarrhoea, increased upper respiratory diseases from open burning of garbage and malaria. Waste management has been

the responsibility of local authorities but the scenario is changing with the realization that local authorities on their own are not capable of managing waste. The major emerging environmental problem affecting human settlement in the country especially in urban centres is inadequate liquid and solid waste disposal facilities (Entrepreneurs Toolkit, 2011).

To respond to the environmental challenges, Kenya reviewed its laws and related policies and enacted the Environmental Management and Coordination Act (EMCA) of 1999. The Act gives rights and confers duties to individuals to safeguard and enhance the environment. It guarantees every Kenyan a clean and healthy environment. These provisions also envisage protection of the environment for the benefit of the present and future generations. This is also envisaged in Kenyan Vision 2030. The Constitution of Kenya under section 42 provides the right of every person to a clean and healthy environment which includes the right to have the environment protected for the benefit of present and future generations. Section 69(2) confers duties on every person to cooperate with state organs and other persons to conserve and protect the environment and ensure ecologically sustainable development and use of natural resources.

For Kenya, major gains have been made at policy level and enactment of legislations such as EMCA 1999 which enhanced formation of regulatory institutions like NEMA which ensures that precautionary principles are applied to mitigate or minimize negative impacts on the environment. Some of these regulatory measures have been applied in many fields such as in the construction industry, manufacturing, mining and infrastructure development. However, on matters of awareness of waste management, a number of regulations have been formulated by different institutions and applied sparingly thus the impacts have been so minimal (UON, 2012).

V. SOLID WASTE MANAGEMENT IN NAIROBI

Nairobi's solid waste situation is largely characterized by low coverage of solid waste collection; these include pollution from uncontrolled dumping of waste, inefficient public services, unregulated and uncoordinated private sector and lack of key solid waste management infrastructure (Kimani, 2014). According to a recent survey by UNEP, Nairobi with a population of 4.0 million generates 3,200 tons of waste daily. Only 850 tons reach Dandora dumpsite with the rest remaining unaccounted for. The collection rate is as low as 33% (JICA, 2010); which leaves about 2,690 tonnes uncollected (almost equal to the total daily waste generation as predicted by JICA (1998). Apart from Nairobi County Council (NCC), the body that has the primary responsibility for the provision and regulation of SWM services in the city, other actors have come into play such as private companies and community based organizations among others. To stem the problem, Nairobi with help of both JICA and UNEP has developed a ten year Solid Waste Management Plan which the County Council of Nairobi plans to implement (UNEP, 2014).

As the urban population in Nairobi and elsewhere in East Africa grows, so does the solid waste management burden, a

situation worsened by poor funding for urban sanitation departments and a lack of enforcement of sanitation regulations. At least 100 million people in East Africa lack access to improved sanitation (UNEP, 2014). Due to budgetary deficiencies, town authorities find it difficult to address solid waste management in a sustainable manner. In addition, insufficient public awareness and enforcement of legislation is also a hindrance (United Nations, 2014).

In Nairobi, a large percentage of solid waste is managed by the private sector and NGOs due to public-private partnerships, The County Council's solid waste department, is not well equipped, with transport vehicles few and often poorly serviced, despite increasing waste quantities due to rapid urbanization. Understaffing and a lack of skilled staff in waste management is also a challenge. Without proper controls, solid waste is often dumped in abandoned quarries or similar sites. In Nairobi, for example, municipal waste is taken to the Dandora dumping site, a former quarry some 15 km east of Nairobi (IRIN, 2013).

Although Nairobi has a sanitation policy, the Environmental Sanitation and Hygiene Policy 2007, which recognizes the role of NGOs, community-based organizations (CBOs) and the Kenya Water and Sanitation Network (KEWASNET), often there is little collaboration in service delivery (IRIN, 2017)

VI. WASTE MANAGEMENT IN PRI AND PERI URBAN TOWNS AROUND NAIROBI

Many municipalities, Counties and towns continue to grapple with the problem of Solid Waste Management. Ngong, a setlight town where I stay in 'Kajiado County', is no exception. Kajiado County population is growing rapidly; this has resulted in much greater solid waste generation and thus the need for improved solid waste management methods. The county has two local authorities namely Olkejuado County Council and Kajiado Town Council that are mandated with the task of managing its solid wastes (Kajiado District, 2005). As such, the authorities can no longer rely on traditional solid waste management thus a need for the development of alternative approaches towards the solid waste management.

The county has not been spared from effects of environment degradation and climate change. The impact of environmental degradation has already proven to be devastating on the social, economic, and environmental systems in the County. Environmental degradation has contributed to water pollution and worsened the quality of the already scarce water. The increase in degraded areas has resulted to decrease of pasture for livestock and low productivity of agricultural land. This has led to resource conflict due to competing demands. Air pollution from human activities poses a health risk and has made Upper Respiratory Tract Infection (URTI) a common disease in the affected areas (Kajiado County Integrated Development Plan 2013-2017). It is thus important that waste management awareness be raised among communities living in my town of Ngong.

VII. THE DETERIORATING ENVIRONMENTAL SITUATION GLOBALLY

Scientists have dutifully released statistics showing the deterioration of the environment (Cook et al., 2013). These have shown us the extent to which our mother earth and the whole universe at large have been and are deteriorating at an alarming rate. The implications of failing to address environmental destruction is becoming more serious leading to species extinction, depletion of natural resources, global warming among other consequences. Because of this therefore, consolidated effort is required for us to be able to face this challenge. Faith is one of the approaches that humanity must use to tackle this challenge.

Religion has been shown to influence attitudes towards environmental conservation (Beck & Miller, 2000). Further, there is growing recognition that effective, long-term solutions to environmental problems and issues require moral basis for action. God's word as found in the Bible provides this moral basis (Fred et- al 2007). Both the Old and the New Testament affirm, "The earth is the Lord's and everything in it" (Psalm 24:1 and 1Cor10:26). According to God, "every animal of the forest is mine, and the cattle on a thousand hills." He further says I know every bird on the mountains, and the creatures of the field are mine (Psalm50:7-12). This is a confirmation that God knows and owns every environmental and natural resource. Among the Western Kenya communities, there is a saying that confirms this, "God first sees the trees before seeing peoples' heads". Such phrases emphasize the importance of environment and the context in which we live.

VIII. STEWARDING THE ENVIRONMENT

God also cares for and provides for the physical needs of his creatures (Holsman 2002). At the creation of man, God commanded that man takes control over the earth and rule over the animals and vegetation. Having dominion does not mean to pillage and plunder, but to take care of the earth, its creatures and resources. Man is therefore a steward to care for the environment and the resources therein. Immediately after creating Adam, God put him in to the Garden of Eden that He had planted and put him to work in "taking care" of the garden. This also meant to preserve or to keep it with an aim of defending and attending the garden (Silvanus 2005). The nature of man's dominion of the earth is clarified in Psalm 8, which says that man is to have dominion over all of God's work on earth, including animals, plants and all natural resources. Hence protecting God's creation is not just the responsibility of a particular organization or a group of specific people, but should be the responsibility of all Christians as a select group of people who fully understand the mandate of Eden.

According to the National Association of Evangelicals:

'Just as we show our love for the savior by reaching out to the lost, we believe that we show our love for the creator by caring for His environment, because clean air, pure water, and adequate resources are crucial to public health and civic order. Governments have an obligation to protect its citizens from the

effects of poor environmental exploitation. This involves both the urgent need to relieve human suffering caused by bad environmental practices (John 2005).'

Many Christian communities and organizations have recognized the need to start environmental programmes alongside other social projects (Conradie, 2011). Environmental projects therefore compete for resources with other programmes. Some organizations have regarded environmental concerns as a dimension of any other concern without turning the environment into a separate agenda.

Some scholars have questioned environmental concerns as elitist and not relevant in Africa and the world over, given so many other urgent priorities. In spite of this, Christians have initiated a wide variety of environmental projects such as recycling, tree planting, urban greening, water harvesting, conservation of fauna and flora, sustainable agriculture, indigenous church gardens, living graveyard campaigns among others. However, these projects are still few though they serve as an inspiration to others. In engaging in environmental projects, Christians are doing what many other organizations and groups are also doing. However their motivation may be different and derived from the Bible.

In 1989, Pope John Paul II addressed the issue of environmental degradation by announcing it as a moral issue (John Paul, 1989). He stated that, faced with the widespread destruction of the environment, people everywhere are coming to understand that we cannot continue to use the resources of the earth as we have in the past. He further opined that when man turns his back on the Creator's plan, he provokes a disorder which has inevitable repercussions on the rest of the creation. If man is not at peace with God, then the earth itself cannot be at peace. The pope recognized the importance of non-human life and called on Christians to change their behavior towards the environment.

IX. FACING THE ENVIRONMENTAL CHALLENGE AS A FAITH COMMUNITY

The scope and seriousness of environmental destruction is shocking with the possible collapse of ecosystems such as the Mau Forest in Kenya and other water towers. What is more shocking is that warnings in this regard do not come from churches or Christians. The level of involvement of Christians in environmental conservation is wanting with some scholars claiming that Christianity is anti-environment (Watt, 1992). There are major differences with denominational social teachings on how their religion affects action toward treatment and care of the environment. Leiberman (2004) concludes that Christianity is not inherently anti-environmental; in fact many Christians believe that God has in fact called us to protect the environment and respect it as God's creation. However, she found that only a very small percentage of religious communities are doing anything to tie together their faith to environmental concerns.

An important concept of Christian environmental conservation is that those involved in conservation are corrupted by sin

(Francis, 1999). To effectively meet this challenge, Christians must apply Biblical values and guidance to positively manage the environment. The Christian must also acknowledge that God will redeem both people and all creation in the new heaven and earth (Rom 8: 18 – 24). Knowing that God intends to redeem nature rather than completely destroying it as some in the church today may think should motivate Christians to view and act differently towards environment. Donald & Pierce (1998) commenting on this view stress that, just as Christians should be actively involved in their own process of redemption by "living out their faith", Christians should also be involved as much as possible in the process of redeeming nature. For example, being involved in the restoration of a healthy forest ecosystem is consistent with and honors God's ultimate plan for redeeming environment. In contrast, being responsible for widespread and complete destruction of a particular forest ecosystem does not seem consistent with nor honors God's plan for redeeming nature.

To practice effective Christian environmental conservation, we must work on increasing Christian's knowledge of the Biblical principles, scientific, practical policy and management perspectives. God in His abundant grace has made this knowledge available to us. According to Schaeffer (1990), our Christian faith, though having a strong element of personal commitment, demands that we soon move to the level of community, taking care of each other and the surrounding. These management responsibilities are described by Jesus in the parable of the servant in Lukes 12:35-48 while The Old Testament ties the covenantal responsibilities directly to resource conservation.

A common perception is that the Bible shows little concern for our relationship to environment and has perhaps even encouraged its exploitation. This perception is often supported by reference to the biblical commands to "subdue" the earth and "have dominion" over all living things (Genesis 1:28), which are interpreted to mean that human beings can treat the non-human world in whatever way they please. White (1994) claims that Christianity accepted this biblical view of creation, fostering the attitude that human beings transcend nature and may exploit it. This has posed threats to the environment.

Christian responsibility of the environment under God implies that we are morally accountable to Him for treating creation in a manner that best serves the objectives of the kingdom of God. Speaking of morality and accountability, Coralizza (2011), is of the opinion that both moral accountability and dominion over the earth depend on the freedom to choose. The exercise of these virtues and this calling, therefore, require that we act in an arena of considerable freedom—not unrestricted license, but freedom exercised within the boundaries of God's moral law revealed in Scripture and in the human conscience (Exod. 20:1—17; Deut. 5:6—21; Rom. 2:14—15).

Both by endowing them with His image and by placing them in authority over the earth, God gave men and women superiority and priority over all other earthly creatures. According to Bergstrom (1998) this implies that proper environmental

conservation, while it seeks to harmonize the fulfillment of the needs of all creatures, nonetheless puts human needs above non-human needs when the two are in conflict. Therefore our responsibility in caring for environment is to do the expectation of the creator.

There is need for responsible stewardship of all material resources and possessions so that the local congregation can become a model of a sustainable community (Rasmussen, 1996 & Wellman, 2001). For example in South Africa and England there is major campaign around what is termed eco-congregations. The South African Faith Communities' Environment Institute (SAFCEI) is leading the way in developing models and resources for the establishment of such eco-congregations. The idea is that the local church council should come to the decision that it wishes to portray itself as an eco-congregation, recognizing what would be demanded to get to such a decision and to remain true to this claim.

X. CONCLUSION

Environmental literacy is one of the components lacking within the Christian community. A lot has been said and done concerning the Trinity, evangelism, missions and salvation to mention but a few of what Pastors have dwelt on. However what the faith community forgets is that they are still on earth and that they have a responsibility to nurture and maintain the space in which they live. They are the 'already not – yet' in heaven. This concept has made Christians not to be concern over the environment. Yet it is from the environment that our lives are nourished. One asks a simple question, 'how much do Christians know about the environment?' If they do, then how much do they care about it? This caring then, looks at the aspect of waste management within the environment by the house of faith. We must remember that environment degradation knows no faith and does not forgive, it doesn't therefore matter whether one is a Christian or not, what needs to be done in matters of waste management has to be done and in the right way. The house of faith therefore has no option but prudently manage the wastes we generate for a safer mother earth. For this to be done, then Christians in Kenya need to know how other people do it. This paper therefore looked at what is done elsewhere only at a knowledge level.

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