

Effects of Effluents on the Health of Urban Dwellers

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Abstract

Increasing poor human health is becoming a serious concern, due mainly to the rapid increase of human development activities and turnout of waste especially household effluent. This paper addresses the impacts of poor disposal of effluent on the health of urban dwellers by way of their effect on the environment. The interest on urban dwelling is due to the existing poor household wastewater management and increasing population in the urban areas coupled with urbanization; that are evidence in the obvious activities carried out in the area. These activities include indiscriminate discharge of household and industrial wastewaters (effluents) in open space, river and streams. These activities no doubt can create adverse impact on the environment; like the land, river and air and cause their pollutions and in turn have adverse effects on health of the inhabitants; urban dwellers. This paper therefore documents the effect of effluents on the health of urban dwellers by exploring the causes of poor disposal of effluent, the effect on health and possible remedies. It employs the review of literature as a means of data collection.

Keywords

Household, Effluent, Urban, Health

1. Introduction

The environmental public health concern has become a prominent, but complex and multi-dimensional issue on the public policy agenda of states and international organisations; an issue that began in 1992 in Rio. Although this issue is perceived simple and narrow ecological problem by some countries, others have started war against environmental degradation. This emanated the metaphor “sustainable development” in a report by World Commission on Environment and Development and titled “Our Common Future” after considering the psychological, political, developmental, sociological, and scientific and health implications of the environment.

According to the World Health Organization (WHO), environmental health addresses all environmental (physical, chemical and biological) factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health and is targeted towards preventing diseases and creating health-supportive

environments (WHO, 2013). Although methods for wastewater management for centuries simply relied on the self-purification mechanisms of natural waterways for the renovation, dispersion and redistribution of low concentration wastes (Craggs *et al.*, 1996), whilst these natural mechanisms might have historically provided adequate treatment, current effluent discharge volumes and concentrations now exceed effective treatment thresholds of these natural ecosystems (Harlin and Darley, 1988). Most countries, especially those in the developing world, are still struggling to address the existing environmental health problems and new challenges and risks are emerging which require complex solutions. Advances in technology, population growth, changes in standard of living, increase in industrialization and climate change are some of the factors that lead to emergence of challenges in environmental health.

Of interest is effluent; an untreated discharged into the receiving environment causing major health and pollution threats to downstream waters. Effluent is also that which flows out or forth a building, it is like a stream flowing out from another. It can also be defined as an outflow from a sewer or sewage system, a discharge of liquid waste, as from

a factory (Alamu, 2012). Duncan (2004) explored that, household wastewater sources are black water (toilets) and gray water (slullage), which are wastewaters resulting from personal washing, laundry, food preparation and the cleaning of kitchen utensils. The industries which discharge effluents of serious and immediate environmental concern are those involved in tanning, petrochemicals, sisal, pesticides formulation, asbestos, metal processing, battery manufacture, textiles, foam production, and paint and plastic manufacture. Rosenthal (2005) reported that, most of the household wastewater generated in developing countries, are discharged in to the environment such as river and open space without treatment, which contaminating downstream water supplies used for drinking water, irrigation, and recreational activities.

One of the major problems facing urban areas today is the contamination of soil, groundwater, surface water and air with effluents discharged from households as well as industries. The effect is complicated with increased population and industrialization in addition to the effluents from household and industries in the urban areas. Considering the fact by Walid *et al.* (2008) that around 300 million urban residents have no access to sanitation and they are mainly low-income urban dwellers that are affected by lack of household wastewater discharging infrastructure, it therefore means that majority are at risk. Thus this study aimed at documenting the effect of effluents on the health of urban dwellers.

2. Why Urban Dwellers

For search of greener pasture, there has been a shift of human population from rural to urban settlement. The major cause of most environmental problems has been said to be due to the rapidly growing human population, this population increase couple with industrialization put stress on the urban center and results in increased production of effluents by human and from industries. In addition, most of the population growth takes place in urban areas, which means more pressure to the rural people to produce food for the growing amount of urban people (Varis 1998, Vakkilainen and Varis 1999). Due to the growing population, demands for water, food, housing, heat, energy, clothing, and consume goods are increasing alarmingly. Rapid population growth not only lessens available calorie supply from food per person but also risks the present food production with pollution.

Although polluted water and air are common throughout the world, pollution reaches its most serious proportions in the densely settled urban-industrial centers. Industry; an agent of pollution, clustered in urban and semi-urban areas surrounded by densely populated, low-income localities, and their activities continues to pollute the environment with impunity (European Public Health Alliance, 2009).

3. Causes of Poor Disposal of Effluent in Urban Areas

Although urban areas are generally perceived to have a

higher coverage of safe water than rural areas, but with the dense population of urban area couple with industrialization, the reverse is the case. This is supported by the fact from Oluwande *et al* (1993) and Atubi (2009a) that even within the urban area, there are variations in the quality of water as much of the water get contaminated in many different ways, through industrial effluent and untreated municipal sewage. Many cities in developing countries have problem in managing the household wastewater, especially in big and densely populated cities. According to Briscoe (1993), one-sixth of the world's population lives in urban area with inadequate sanitation infrastructure like; toilet, septic tank, drainage canal and wastewater treatment plants. By implication, effluents from this one- sixth population are poorly disposed.

The cause of the poor management of effluent cannot be far from shortage of vacuum trucks to empty toilet, septic tank and sucker ways as well as absence of central sewer system, improper drainage systems, low income and lack of awareness. This indicates the multifactorial phenomenon of waste management in Africa and in Nigeria in particular. Although the provision of effective and efficient wastewater management service can be of help, however, without effective coordination between Institutions and other sectors effort to manage effluents from household and industries will not be effective. Based on this, the causes of poor disposal of effluents can be summarized into the following but are not limited to that itemized here;

1. Poor knowledge of waste disposal mechanism can also be contributory to the cause of poor disposal of effluents. This is suggested considering the country's illiteracy level.
2. Management of household wastewater is poor due to less accessibility facilities like less access to toilet, lack and poor drainage canal and shortage of truck to collect wastewater.
3. Poverty and low income of inhabitation seem to be a cause of poor effluent disposal in African and in Nigeria in particular. Although on the long run it is cheaper when one look at the benefit of managing once waste and effluent, but in a situation where majority live in poverty, this cannot be achieved. Thus, the need for coordination and integration among institutions and the participation of stakeholders and the government.

4. Effect of Poor Disposal of Effluent on Health

Considering that health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity, the effect of effluent on health will look at several aspect of human relationship and not just on diseases. The World Health Organization (WHO) estimates that about a quarter of the diseases facing mankind today occur due to prolonged exposure to water pollution and most of these water pollution-related diseases are however not

easily detected and may be acquired during childhood and manifested later in adulthood (cited in Chikogu et al., 2012).

Effluent irrigation has been practiced for centuries throughout the world (Shuval et al., 1986; Tripathi et al., 2011). Their continuous disposal on agricultural soils has resulted in soil sickness (Narwal et al., 1988) and accumulation of some of the toxic metals in soil (Adhikari et al., 1993; Antil and Narwal, 2005, 2008; Antil et al., 2004, 2007; Gupta et al., 1986, 1994, 1998; Kharche et al., 2011; Narwal *et. al.*, 1993) which may pose serious human and animal health. The problems of environmental degradation resulting from rapid industrial development and largely unrestrained urban population growth have been unprecedented in many West African countries. In Nigeria, the post-independent period, particularly the oil boom of the 1970s, has been characterized by a rapid expansion in the urban population and a rapid increase in industrial, commercial and construction activities. This, in turn, has led to a phenomenal increase in the volume and diversity of hazardous wastes and the consequent contamination of water, air and land (Ojo, 1994). This degradation of the environment, through air pollution, noise, chemicals, poor quality water and loss of natural areas, combined with lifestyle changes, may be contributing to substantial increases in rates of obesity, diabetes, diseases of the cardiovascular and nervous systems and cancer — all of which are major public health problems.

Deterioration of urban environment has become obvious because, most of the households are directly discharging their wastewater into the environment through drainage line, from overflowing and seeping pit latrines, septic tanks, public toilets, open ground excreta defecation and grey water from kitchens and bathrooms flow through drainage lines that connect to river and open spaces near to them without any treatment (Feyera, 2007). The discharge of industrial effluent into water bodies has become one of the main causes of environmental pollution and degradation in many cities, especially in developing countries as many of these industries lack liquid and solid waste regulations and proper disposal facilities despite the fact that their waste may be infectious, toxic or radioactive (WHO, 2004). The waste water released from the refineries are characterized by the presence of large quantity of crude oil products, polycyclic and aromatic hydrocarbon, phenols, metal derivatives, surface active substances, sulfides, naphthalene acids and other chemicals (Suleimanov, 1995). As a result of ineffectiveness of purification systems, waste water may become seriously dangerous, leading to the accumulation of toxic products in the receiving water bodies with potentially serious consequences on the ecosystem (Beg et al, 2003; Aghalino and Eyinla, 2009).

Air pollution occurred due to improper management of household and industrial wastewater and majorly occurs due to stagnant at drainage canal and decays. Oxygen demanding wastes such as sewage are one of the more serious pollutants in our natural environment due to their health effect. Poor effluent management can have impact on social aspect of

health and directly and indirectly contribute to disease or ill health. For example, discharging of untreated household wastewater on the environment has been reported to have adverse environmental impacts on the human health by unpleasant odor and diseases like typhoid and diarrhoea (Environmental Protection Authority, 2005). Offensive odor from mismanagement of effluent has been described to cause common cold and reaction for asthmatic patients. Household wastewater has been tagged as principal vector by which a large number of communicable diseases are transmitted and spread in urban areas (Sien, 2001). Stagnant of wastewaters discharged from households and industries at road side and drainage canal not flowing creates bad smell and reduces the aesthetic value of the air within the environment and thus the environment is unsuitable for social activities.

Rivers, streams, lakes, oceans and seas appear to be the most recipient of household, industrial and municipal wastes globally (Defew et al., 2004; Bryan, 1976). Thus, improper management of household and industrial wastewater has great impacts on the quality of water. Indeed, studies have indicated that household wastewater is directly discharged to the river and streams, which pollutes the water. The situation becomes worsen when river and stream are found in such urban area as the water bodies can be used for washing cloth, bathing, fishing, boating, swimming, defecating and as a means of waste disposal; especially for those low income inhabitants within the community who lived near and around the river and streams.

Kuehn et al (1995) observed that refinery effluent contaminated with aromatic hydrocarbons produces poor health and lethal toxicity in fishes. On the other hand, Onwumere and Oladimeji (1990) demonstrated the accumulation of heavy metals with accompanying histopathology in fish exposed to treated petroleum refinery effluent from the Kaduna refining and petrochemical company. Considering that the fishes serve as food for man, it therefore means that they become toxic to man too. Indeed, studies agree petroleum refinery effluents pose a serious problem to both aquatic and human life form. This is supported by the fact that oil pollution of water constitute a potential health risk to humans who use water for domestic and drinking purposes and consume fish found therein (Nwilo and Badejo, 2001; Helmer, 2006; Atubi, 2009b).

In addition, water bodies receiving untreated or partially treated effluent and sewage have been reported to be highly acidic (Vijay et al., 2010). This acidic pH range appears to be unsuitable for the survival of freshwater fish and bottom dwelling invertebrates (Arimoro, 2007) and also below values recommended for good quality water (WHO, 1984). By implication, discharges of untreated effluent on water bodies can result to food and water scarcity. On the other hand, pH affects many chemical and biological processes in the water as the largest variety of aquatic animals prefers a range of 6.5-8.0 (KWW, 2001). Thus, pH outside this range reduces the diversity in the stream because it stresses the physiological systems of most organisms and can reduce reproduction. This indicates low productivity which can lead to hunger in man.

Water is essential for the development and maintenance of the dynamics of every ramification of the society (United Nations Development Program, 2006). Water is indeed life and thus is the most important natural resource, without which life would be non-existent. However, drinking contaminated water has been reported to cause various diseases such as typhoid fever, dysentery, cholera and other intestinal disease (Udoh, 1987; Adeyemi, 2004). According to Rim-Rukeh, et al. (2007), scarcity of clean water and pollution of freshwater has led to a situation in which one-fifth of the urban dwellers in developing countries and three quarters of their rural dwelling population do not have access to reasonably safe water supplies. This is despite the fact that availability of safe and reliable source of water is an essential prerequisite for sustained development (Asonye et al, 2007). Water polluted by sewage or effluents from sewage treatment plant is associated with heavy disease burden (Okoh, *et al.*, 1997).

5. Possible Solutions

Based on review of literatures there following possible solution for effluent management and disposal are suggested and recommended.

1. Education and awareness creation in the community serves as solution to the management of effluents. The concerned bodies and authorizes such as the health professionals, environmental sanitation offices and waste management offices can create and increase public awareness in English and native languages about proper wastewater management and its impacts on the environment and health. Same awareness can be dissimilated through mass media, demonstration, bill board, pamphlets and films.
2. There is need to increase household inaccessibility to waste and wastewater management facilities. For example, to alleviate the current toilet access problem, agencies concerned can construct public toilet in areas that problems are commonly observed and those that practice open space and river bank defecated. Thus, provision of sewerage management system and facilities and the maintenance of existing drainage canal are importance in the management of effluent and in the alleviation of their effect on health.
3. Considering the multifactorial phenomenon of waste and effluent generation, a single institution cannot perform the required service and thus the need for coordination and integration among institutions aimed at health and sanitation. Participation of stakeholder in this regards cannot be over emphasized.

6. Conclusion

Although Africa has experiencing urbanization through fast population and urban growth, she has at the same time, the lowest economic growth. Its urbanization is said to be a demographic one as she has not been able to accompany such

with infrastructural transformations (Escallier, 1988). According to Songsore (2004), this is one major reason why the economic, social and health benefits of urbanization have so far failed to materialize.

Human health can be affected through a lack of access to safe drinking water, inadequate sanitation, the consumption of contaminated freshwater food, as well as exposure to contaminated bathing water, all due to poor effluent management. Indiscriminate discharge of industrial and household wastes into rivers calls for monitoring procedures aimed at protecting human health and aquatic species especially as the people rely heavily on water sources of doubtful quality in the absence of better alternatives, or due to economic and technological constraints to adequately treat the available water before use.

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