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The Negative Environmental Impact of Disposable Diapers: The Case of Mberengwa District, Zimbabwe

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Abstract: **Diapers were adopted to easy the problem of baby clothing in different societies of the world. The existence of such clothing provides health and hygiene in such provision societies. Thus they play a major role in the development of communities across the world. However, disposable diapers present environmental problems. Though there are providing relief on clothing aspects, there are no sustainable procedures to regulate the disposal of diapers in the environment. Thus disposable diapers are posing serious health hazards in several communities and in Mberengwa District is not an exception in this regard. This study aims to investigate the challenges caused by diapers on the environment. Through questionnaires and laboratory analysis, the researchers managed to gather information about the negative impacts of diapers in the environment and communities. A number of problems are emanating from the use and mismanagement of disposable diapers. The study thus recommends for the need to consider environmentally sustainable methods disposing diapers.**

Keywords: **Negative Environmental Impact, health and hygiene, Case of Mberengwa District.**

1. INTRODUCTION

Most developing countries are facing problems in the management of solid waste unlike in the developed ones. Developing countries such as Zimbabwe generally face serious challenges in the handling and disposal of solid waste and disposal of diapers in particular is not an exception. The word *diaper* originally referred to the type of cloth rather than the use; "diaper" refers to a pattern of repeated, diamond shapes, and later it came to describe a white cotton or linen fabric with this pattern (Webster, 1990). Diapers are made from super absorbent material which is mainly composed of polymers known as Sodium Polyacrylate (Wambiu et al., 2015). Wambiu et al., (2015) also indicated that diapers have an amazing water absorbing quality and can absorb 200 to 300 times its weight and hold it in a gooey gel. Unlike natural polymers which are broken down by micro organisms to get smaller molecules, the C-C single bond of polymers like polyethylene found in diapers cannot be easily degraded by most microorganisms (Morris et al., 1993). Diapers can be classified as hazardous waste. Such waste has immediate or long term negative health effects. Diapers contain faecal matter and urine, and are likely to contain pathogenic microorganisms. Pathogens excreted in human faeces can pose health problems in the long term (Wambiu et al., 2015). Wambiu (2015) put forward that with rising population growth, babies in Africa, West Africa and India will use 8 billion diapers by 2017. Against such a background, there is indication that challenge of handling diaper waste is going to be greater. Indiscriminate disposal of diapers (commonly known as pumpers) is posing serious environmental problems in Zimbabwe and in Mberengwa district particularly. The current study examines the negative environmental impact of the disposal of diapers in Mberengwa district.

2. MATERIALS AND METHODS

Data collection was done through the questionnaires and laboratory analysis. Three hundred (300) questionnaires were distributed across Mberengwa district in order to solicit data on the modes of disposal of diapers. The questionnaires were mostly targeted at those people with babies and who used diapers. To establish the location of the mothers who had babies less than one and half (1½) years old, data was collected from clinics and hospital. The study employed random sampling technique in an effort to give every mother with a baby an opportunity to participate in the study. The laboratory analysis method was also employed to augment the questionnaire responses. Samples of diapers were collected from Mberengwa district centre and Mataga growth point waste disposal sites for laboratory analysis. The data gathered from questionnaires and laboratory analysis were then presented and discussed.

3. RESULTS DISCUSSION

3.1 Disposal of diapers:

Out of the sampled respondents in the district 50% indicated that they use open dumping especially in bushes and also road sides in the disposal of used diapers. 25% of the respondents were indicated the use of burning as a method of disposal. While 13% indicated that they use latrines. Disposal with other garbage as an avenue of disposal was indicated by 10% and 2% indicated other less popular methods such as composite pit. The largest percentage of the sampled population indicating open dumping is serious cause for concern. Open dumping of solid waste seems to eradicate and control pollution, but it may only hide it- temporarily. There is need to put in place proper methods of diaper disposal so as to minimise the danger of infection to those who come into contact with them. This implies that communities in Mberengwa district are showing little knowledge towards handling and disposal of diapers.

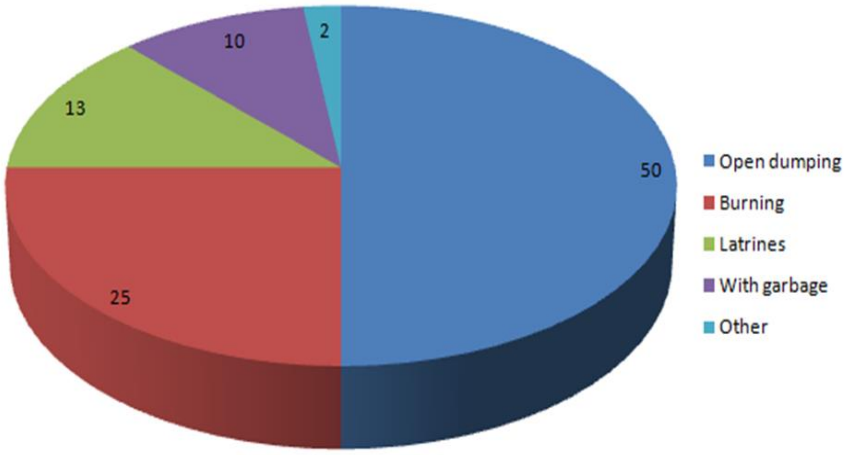

Figure 1: Methods of diaper disposal used

3.2 Environmental impacts of diapers:

It emerged from the laboratory results that diapers contain harmful chemicals such as dioxins. According to WHO (2014) dioxins are persistent environmental pollutants that can cause an array of health problems including developmental delays, damaged immunity, hormone interference, skin diseases and certain types of cancer. In addition, Wambiu et al., (2015), indicated that the inner absorbent layer of a diaper is treated with chemicals, which can trigger allergic reactions among babies. When released into the environment, the dioxins can accumulate in humans.

It also emerged from the laboratory analysis and observations that diapers contain human faeces and urine. Such waste generally contains pathogenic microorganisms such as viruses and bacteria. Such pathogens can lead to numerous infectious diseases in humans. According to WHO (2014), human excreta has been implicated in the transmission of many infectious diseases including cholera, typhoid, hepatitis, polio, cryptosporidiosis, ascariasis, and schistosomiasis. Human excreta in the disposable diapers in Mberengwa district therefore, contains pathogens which can lead to different diseases.

Field observations also disposed diapers accumulate in the environment forming solid waste. This is because most of the diapers discarded are not easily biodegradable. According to Wambiu *et al*., (2015) diapers have an estimated period of up to 500 years to decompose. Disposable diapers thus have bad effects on the environmental as they are a form of solid waste. Disposable products have ramifications on municipal waste management. Disposable diapers are the third largest contributor to municipal solid waste in the United States of America accounting for 1.5% - 4% of the total waste (Pham & Brown, 2009). Apart from the solid waste problem, chemicals released by decomposing solid wastes can leak from dumping sites and landfills to ground water. They can contaminate water wells, soil and nearby water streams (Rubenstein, 1999).

4. RECOMMENDATIONS

The following recommendations were made based on the findings of this study:

- **Government:**

The government should introduce waste management fund to specifically cover waste management in the administrative districts. The fund should be used in local people capacitation and reinforcement in terms of waste management issues. Government should introduce policies in an inclusive manner at the local levels. It is necessary to institute a disposable diaper tax or pay as you throw to mitigate the challenge of diaper waste in the environment.

- L**ocal authority:**

The local authority should introduce by-laws that enforce proper disposal of used diapers. By-laws at local level have an impact towards waste management. Generally, implementation drive on the part of the local authority is lacking due to the lack of resources. Financial resources can be got from fines on offenders. In addition to by-laws, the local authority should put in place proper waste management action plans. In whatever platform, sustainable management is always supported by proper planning and therefore the local authorities are encouraged to have sustainable waste management action plan in areas under their jurisdiction. The action plan should be participatory in nature and all inclusive so as to encompass various stakeholders in solid waste management.

- **Community:**

The business community should take part in diaper recycling converting the organic materials in the disposable diapers into energy and various other products. The 500-year span which is the estimated time taken for a diaper to decompose should be reduced. According to Cowan (2011), oyster mushrooms can be used to accelerate the breakdown of diapers by a period of 4 months.

The People in Mberengwa and other districts in Zimbabwe should also use the modern cloth diaper which is more eco-friendly. The diaper is reusable and is made from natural fibres, or man-made materials and is less environmentally damaging. These home-washed reusable diapers are washed in water or washing machine and line-dried. They use less energy and land resources and produce similar or lower quantities of solid waste, compared to the disposable diapers. According to Light *et al.,* (1995) solid waste produced over the disposable diaper life cycle was found to be more than 20 times the solid waste associated with home-washed and commercially-washed reusable diapers. The community is therefore urged to use reusable diapers rather than the disposable ones. Though a reusable diaper drains a lot of water it is a more environmentally type than the disposable one.

5. CONCLUSIONS

It emerged from this study that disposable diapers are popular among the care givers in the Mberengwa district. Due to the rising population, the problem of disposable diapers is likely to increase. This is because, as it emerged from this study, many people dispose diapers in the open. Diapers therefore, are proving to be a serious environmental problem in Mberengwa District. A lot needs to be done as to mitigate the environment challenge posed by disposable diapers. Some recommendations have been suggested in this study. It is hoped that if the recommendations are adopted, the challenge of disposable diapers to the environment would be significantly minimised.

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