



EFFECTS OF DISPOSABLE DIAPERS ON THE ENVIRONMENT: A LEGAL APPRAISAL

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Abstract

Disposable diapers, though convenient, have become a critical environmental hazard in Nigeria owed to the absence of effective disposal methods and loopholes in regulation. Non-biodegradable materials and toxic chemicals from disposable diapers contaminate the soil and water and expose people to harmful substances. These issues are worsened in Nigeria, where there is a near absence of strict environmental laws concerning the management of wastes particularly, the disposal of diapers which has presented serious hazards to public health. Again, the education of caregivers through regular programmes on appropriate methods for disposal of diapers, Environmental Health Literacy regarding proper disposal and the environmental consequences that are attended with the use of disposable diapers are lacking. This paper attempts a legal review of the impact of disposable diapers to the environment, with emphasis on the need for the urgent update of waste management laws to include disposal regulations and encourage sustainable alternatives. The paper advocated that by filling legal lacunas and pioneering public awareness, Nigeria will be best placed to mitigate environmental risks arising from disposable diapers.

Keywords: Disposable, Diapers, Environmental, Health literacy

1.0 Introduction

In recent years, there has been a growing recognition of pressing environmental challenges, including global warming, ozone depletion, air and water pollution, excessive resource consumption, and hazardous waste accumulation. These issues have far-reaching impacts on human populations, societies, and ecosystems. In response to this heightened awareness and its increasing political significance, governments worldwide are implementing legislative measures to mitigate environmental harm. Concurrently, corporations are striving to adopt more sustainable business practices, aligning with the rising demand for eco-friendly lifestyles and growing support for sustainable development.

Since the introduction of disposable baby diapers in the 1960s, their consumption has surged, resulting in numerous environmental consequences. In many African countries, water pollution from used diapers is becoming increasingly apparent, while disposable diapers globally contribute significantly to waste generation. Addressing this issue requires locally appropriate solutions and the involvement of all relevant stakeholders. Reports indicate that in 2016, annual global waste generation reached 174 million tons, yet by 2018, only 44% of this waste was collected through municipal solid waste systems.¹ The high volume of waste in Sub-Saharan Africa is largely attributed to rapid population growth and

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¹ S Kaza, 'What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050' (Washington, DC, USA: World Bank, 2018).



industrialization.² Projections suggest that by 2050, global waste production will double, with Africa and Asia expected to experience the largest increases. Moreover, despite growing waste generation, approximately 50% of urban waste remains uncollected, further exacerbating the problem.³ In countries like Nigeria, waste management challenges stem from inadequate infrastructure, high service delivery costs, insufficient governance, and weak enforcement.⁴ The situation is particularly dire in rural areas, where many communities lack access to waste management services altogether, resulting in widespread indiscriminate dumping.⁵ This points to significant gaps in Environmental Health Literacy (EHL).⁶

In Nigeria, environmental organizations have identified the indiscriminate disposal of diapers as one of the most pressing environmental concerns, second only to the impacts of mining and large-scale land transformation by agribusinesses. In many towns, cities, and densely populated rural areas across Africa, there is limited or no waste removal service. These environmental concerns are intensified by poor waste disposal practices, which include dumping in watercourses and open spaces. This not only affects the environment but also creates health threats through water, soil and air pollution caused by burning.⁷ Used diapers are frequently discarded along roadsides and bridges, often ending up in water systems, such as streams and rivers. This pollution, combined with other environmental stressors like mining, soil erosion, and land transformation, is pushing Nigeria's and Africa's rivers to their ecological limits. Beyond the plastic pollution they cause, used diapers also contain human waste, which poses serious public health risks if not properly managed. The World Health Organization (WHO) recommends rinsing diapers before disposal to prevent human waste from entering landfills, but compliance with this guidance appears to be minimal.

A 2020 report by UNICEF highlighted that 1.7 billion people lacked access to basic sanitation services, with 494 million practicing open defecation.⁸ Open defecation, defined as the disposal of human feces in open environments such as fields, forests, and water bodies, often involves dumping feces along with municipal waste. In this context, soiled diapers effectively become a form of open defecation, as the fecal matter they contain contaminates the environment. This poses significant risks to public health, contributing to the spread of diarrheal diseases, particularly in children. The WHO identifies diarrhea as the second leading cause of death among children under five, accounting for 800,000 deaths annually, primarily in developing countries in Africa.⁹ Children's fecal matter is more likely to carry enteric pathogens, and unsanitary disposal practices can lead to the spread of diarrhea and cholera, particularly

² J. K. Debrah, G. K. Teye and M A P Dinis. 'Barriers and Challenges to Waste Management Hindering the Circular Economy in Sub-Saharan Africa' (Urban Science, 2022)6:57

³ D I W Diba, 'Estimating the Potential for Resource Recovery from Productive Sanitation in Urban Areas' (Stockholm, Sweden, 2016).

⁴ Ibid.

⁵ S H M Seopa, 'An Investigation of Practices and Effects of Disposable Infant Diapers on the Environment: A Case Study of Mashashane Village' (Polokwane: University of Limpopo; 2021).

⁶ S Ndlovu, S Naidoo & A P Level, 'Community-Led Waste Disposal in the Umkhomazi Catchment in KwaZulu-Natal' (South Africa: Joint Nature Conservation Committee; 2022).

⁷ D I Omang and others, 'Public Health Implication of Solid Waste Generated by Households in Bekwarra Local Government Area' *African Health Sciences* [2021] 21 (3) 1467-1473.

⁸ UNICEF, 'Water, Sanitation and Hygiene' <<https://www.unicef.org>> accessed September 20, 2024.

⁹ WHO, 'Diarrhea Disease' <<https://www.who.int>> accessed September 20, 2024.

in areas with limited waste management infrastructure.¹⁰ This highlights a critical gap in Environmental Health Literacy.

In Nigeria, the legal framework on waste management remains inadequate in addressing the specific challenges posed by disposable diaper waste. The laws on waste management and disposal such as the National Environmental Standards and Regulations Enforcement Agency Act¹¹ and the Harmful Waste (Special Criminal Provisions) Act,¹² amongst others, do not explicitly target disposable diaper waste. An all-encompassing waste management legal framework that provides for standard methods of disposing diaper, stricter liability on manufacturers including provisions for biodegradable alternatives and promotion of extended producer responsibility (EPR) schemes that mandate companies to take accountability for post-consumer waste, is lacking.

Again, the responsibility for addressing the environmental and health risks posed by disposable diapers largely rests with manufacturers, distributors, and retailers, whose promotion of these products has shifted consumer behaviors. The industry must take a proactive role in resolving the issues it has contributed to by developing and promoting safer, more sustainable products, and supporting the creation of waste disposal facilities where they do not currently exist. Solving the problem of diaper waste requires collective action involving households, communities, civil society organizations, government entities, and industry. Awareness campaigns are also essential to educate the public about the environmental impact of single-use sanitary products, the importance of safe disposal practices, and the availability of alternative solutions, such as traditional knowledge-based methods or reusable products.¹³ legal reforms must therefore be supplemented with public enlightenment and awareness on diaper disposal to mitigate this environmental menace.

2.0 Conceptual Clarification

2.1 Disposable Diaper

A diaper is a specialized form of underwear designed to manage bodily waste, allowing the wearer to urinate or defecate without the need for a toilet. It is made primarily from plastics, synthetic fibers, and absorbent gels, none of which break down easily in the environment. When dumped in landfills, they leach harmful chemicals, including dioxins, into the soil and water bodies. The primary function of a diaper is to absorb or contain waste, preventing the soiling of outer clothing and protecting the surrounding environment.¹⁴ Diapers are essential for maintaining hygiene and convenience in various scenarios, as they minimize the risk of exposure to waste, which could lead to discomfort, odors, or potential contamination.

Diapers require regular changing, especially once they become wet or soiled.¹⁵ The responsibility for changing diapers typically falls on a caregiver or parent, especially in the case of infants and individuals

¹⁰ UNICEF, 'Water, Sanitation and Hygiene' <<https://www.unicef.org>> accessed September 20, 2024.

¹¹ National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007 hereinafter, NESREA Act.

¹² Harmful Waste (Special Criminal Provisions, ETC.) Act, 1988.

¹³ M Kamat and R Malkani, 'Disposable Diapers: A Hygienic Alternative,' [2003] Indian Journal of Pediatrics, 70 (11) 879.

¹⁴ 'Diaper' *Wikipedia* (2010) <<https://en.m.wikipedia.org/wiki/Diaper>> Accessed September 20, 2024.

¹⁵ S. L. Leverich, 'The Improved Containment and Convenience in a Double gusset Cloth Diaper. (2022),



unable to perform the task independently. Neglecting timely diaper changes can lead to skin irritation or more severe skin conditions such as diaper rash, particularly in areas where the skin is in prolonged contact with moisture or waste.

There are two main types of diapers: cloth and disposable. Cloth diapers are made from layers of fabric, such as cotton, bamboo, hemp, or microfiber. These diapers are designed to be reusable and can be laundered multiple times. Some cloth diapers incorporate synthetic fibers like polylactic acid (PLA) or polyurethane (PU) to enhance durability and absorption.¹⁶ On the other hand, disposable diapers are designed for single use. They contain absorbent chemicals, such as superabsorbent polymers (SAP), which can hold large quantities of liquid. Once soiled, disposable diapers are discarded, making them convenient but also raising concerns about environmental waste.¹⁷

While diapers are most associated with infants and toddlers who have not yet developed full toilet training, they are also used by older children who experience bedwetting. Additionally, diapers play a crucial role for adults in various situations. For instance, individuals suffering from incontinence whether due to age, medical conditions, or disabilities rely on diapers to manage their condition discreetly and comfortably.¹⁸ Diapers are also essential for patients confined to hospital beds, who may be unable to access restroom facilities independently.

Beyond medical and caregiving uses, diapers find applications in other specialized circumstances. For instance, astronauts wear specially designed diapers, known as Maximum Absorbency Garments (MAGs), during extended space missions or extravehicular activities, where access to restroom facilities is impossible. People working in extreme environments, such as deep-sea divers or individuals wearing dry suits, may also utilize diapers to manage bodily functions in conditions where removing gear is impractical.¹⁹

2.2 Environmental Health Literacy

Environmental Health Literacy is increasingly recognized as a vital tool for improving public health by addressing the prevention of diseases and disabilities associated with environmental factors. This multidisciplinary field intersects health literacy, risk communication, environmental health, communication research, and safety culture.²⁰ At its core, EHL begins with the basic understanding of the relationship between environmental exposures such as pollutants, toxins, and climate change and their corresponding health outcomes. However, the scope of EHL extends far beyond this foundational knowledge, encompassing complex and interrelated topics across various fields.²¹

As a growing area of research and practice, EHL holds immense potential, especially as more professionals enter the field of environmental health with the goal of improving community and

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ J. B Stack, 'When you've Gotta Go, You Gotta Go. (2001) Muscular Dystrophy Association. <<https://www.muscular-dystrophy-ass.com/when-you-ve-gotta>> accessed 20 September 2024.

¹⁹ Leverich, (n 15).

²⁰ S Finn and L O' Fallon, 'The Emergence of Environmental Health Literacy From its Roots to its Future Potential, *Environmental Health Perspective*. [2017] 125, 495–501.

²¹ Ibid.



population health on a global scale. Institutions like the Community Engagement Cores of the National Institute of Environmental Health Sciences view the enhancement of EHL within populations as an empowering tool, enabling individuals to take charge of their own health. By gaining knowledge about environmental impacts on health, individuals are better equipped to make informed choices about their actions and how these might affect not only their personal well-being but also the surrounding environment.²²

As the field of environmental science and health literacy continues to evolve, it is crucial to acknowledge the profound influence that EHL can have on public health and environmental stewardship.²³ One of the most important aspects of EHL is its role in educating the public about environmental risks, particularly for communities that are disproportionately affected by environmental hazards. Studies have demonstrated that EHL education can have a positive effect on protecting these vulnerable populations, offering them the knowledge needed to navigate environmental threats.²⁴

By enhancing EHL, individuals and communities can make better, more informed decisions regarding environmental risks, leading to improved health outcomes. This is especially important for marginalized communities, including communities of color and low-income populations, who often face a higher burden of environmental injustices, such as exposure to pollutants, poor living conditions, and limited access to health resources. EHL not only equips individuals with the knowledge they need to protect themselves and their families, but it also fosters a sense of empowerment and agency. With a clearer understanding of how their environment influences health, people gain the power to advocate for cleaner, safer conditions and engage in social actions that promote environmental justice.²⁵

Expanding and deepening EHL education in underserved communities is, therefore, a critical strategy for addressing environmental inequalities. This educational approach can provide the foundation for individuals to understand the complex interplay between environment and health, equipping them with the tools they need to fight against the structural inequities that contribute to poor health outcomes. Through increased awareness and knowledge, communities can rally for policy changes and interventions that reduce their exposure to environmental hazards, ultimately creating healthier environments for all.²⁶

3.0 Legal Framework on Waste Management and Control in Nigeria

There are various laws on waste management in Nigeria. The Nigerian Constitution²⁷ is the beacon for the protection of the rights of the citizens. Regrettably, this provision which mandates the state to protect the environment, is non justiciable.²⁸ Again the rights to life and dignity under sections 33 and

²² (n 20)

²³ K M Gray, 'From Content knowledge to Community Change: A Review of Representations of Environmental Health Literacy' *Int. J. Environ. Res. Public Health* [2018] 15, 466.

²⁴ *Ibid.*

²⁵ D. W Hursh and others 'Teaching Environmental Health to Children: An Interdisciplinary Approach' (Springer: New York, NY, USA, 2011).

²⁶ *Ibid.*

²⁷ Constitution of the Federal Republic of Nigeria 1999 (as amended) s 20.

²⁸ CFRN, s 6 (6) (c).



34 of the CFRN 1999, has been interpreted to include the right to a clean and healthy environment.²⁹ Other laws peculiar to this study are the National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007³⁰ and the Harmful Waste (Special Criminal Provisions) Act 1988.³¹

3.1 National Environmental Standards and Regulations Enforcement Agency Act, 2007

The NESREA Act is a n Act establishing the National Environmental Standards and Regulations Enforcement Agency³² saddled with the chief responsibility of environmental protection, development and sustainability and the enforcement of environmental standards and regulations.³³ Its duty also extends to the creation of public awareness and education regarding sustainable environmental management.³⁴ Failure to comply with waste regulation laws attracts penalties for owners and occupiers of premises and business owners.³⁵ The couching of these provisions however does not contemplate domestic and household wastes which includes used diapers. In furtherance of the mandate of the NESREA to make regulations on environmental protection,³⁶ a number of regulations have been made by NESREA.³⁷ This study will however, focus on the National Environmental (Sanitation and Waste Control) Regulations, 2009.³⁸

3.2 National Environmental (Sanitation and Waste Control) Regulations, 2009

The National Environmental (Sanitation and Waste Control) Regulations are aimed at the adoption of sustainable and environmentally friendly practices in sanitation and waste management in order to mitigate pollution.³⁹ The Regulations apply to matters of environmental sanitation, particularly food, market and industrial sanitation and all classes of wastes generated therein.⁴⁰ It prohibits littering and disposal of wastes except at designated waste bins.⁴¹ and encourage persons whose activities produce waste to segregate such wastes by separating all recyclables from non-recyclables and disposing them accordingly.⁴² Household wastes are to be properly disposed using waste collection bins.⁴³ Every waste generator is obligated to apply sustainable waste management practices to reduce pollution.⁴⁴ The regulation further enjoins producers and manufacturers to incorporate environmental concerns in the design, process and disposal of a product.⁴⁵ Any person whose activities generate waste must ensure

²⁹ *Jonah Gbemre v Shell Petroleum Development Company of Nigeria & 2 Ors.* Unreported Suit No. FHC/B/Cs/53/05, delivered on 14 November 2005.

³⁰ NESREA Act, 2007 (n12).

³¹ Harmful Waste (Special Criminal Provisions) Act 1988 (n13).

³² NESREA Act 2007, s 1.

³³ *Ibid*, ss 2, 63 (a) (b) (h).

³⁴ NESREA Act 2007, ss 2, 7, 63 (g).

³⁵ *Ibid*, ss 94-104.

³⁶ *Ibid*, s 34.

³⁷ National Environmental Standards and Regulations Enforcement Agency, Laws and Regulations <<https://www.nesrea.gov.ng>> accessed 25 September 2024; B Onu and others, 'Solid Waste Management: A Critique of Nigeria's Waste Management Policy', *International Journal of Knowledge, Culture and Change Management* [2012] 11, 373.

³⁸ National Environmental (Sanitation and Waste Control) Regulations No 28 of 2009.

³⁹ *Ibid*, reg. 2.

⁴⁰ *Ibid*, regs. 1, 107.

⁴¹ National Environmental (Sanitation and Waste Control) Regulations, reg. 3.

⁴² National Environmental (Sanitation and Waste Control) Regulations reg. 11.

⁴³ *Ibid*, reg. 13.

⁴⁴ *Ibid*, reg. 15.

⁴⁵ *Ibid*, reg. 16 (1).

that the waste is handled by a person licensed to transport and dispose of the waste in a selected waste management facility.⁴⁶ Additionally, the need for intensive education and campaign on sound waste management practices by NESREA, is reiterated.⁴⁷ The regulations are to be enforced at all levels of government.⁴⁸ Offences and penalties ranging from six months to two years imprisonment and fines ranging from N20,000.00 to N500,000.00 are provided under these regulations.⁴⁹ Despite the robust provisions of the regulations, the problem of enforcement still lingers.

3.3 Harmful Waste (Special Criminal Provisions) Etc. Act, 1988

The Harmful Waste Act was enacted in response to the famous Koko incident. The Act prohibits the carrying, deposition or dumping of hazardous wastes in the Nigerian Environment.⁵⁰ Offenders are liable to life imprisonment and a forfeiture of any carrier, land or structure where such harmful substance was deposited.⁵¹ Diapers have high level of toxicity, and thus, falls within the ambit of hazardous wastes as defined by the Act.⁵² It is however regrettable that the implementation of these laws, remain a problem.⁵³

4.0 Environmental and Health Risk Impact Caused by the Disposal of Soiled Diapers

Disposable diapers have a significant environmental impact, contributing heavily to greenhouse gas emissions and creating both health and ecological hazards. According to estimates, each diaper could account for as much as 630 kg of greenhouse gas emissions, comparable to driving a car over 1800 miles. One of the primary concerns is the slow decomposition rate of disposable diapers. While some components like cotton or wood products break down in about five months, the plastic and superabsorbent gels take at least 500 years to decompose. During this time, they may leak hazardous chemicals, such as methane a potent greenhouse gas into the environment, exacerbating global warming.

Beyond their carbon footprint, disposable diapers pose a substantial threat to public health. These diapers, particularly those soiled with human waste, can contain harmful viruses and microbes.⁵⁴ When improperly disposed of in landfills or along roadsides, these pathogens can leach into the soil and groundwater, potentially causing outbreaks of gastrointestinal diseases.⁵⁵ Viruses like enteroviruses, rotaviruses, and other human pathogens can survive in the feces contained in diapers for months. Infants, who are particularly susceptible to carrying enteric pathogens, contribute to the increased microbial load in waste, further elevating the risks of disease transmission. Improper handling of diapers exposes both individuals and waste management workers to these health risks.

⁴⁶ *Ibid*, regs. 4, 27.

⁴⁷ *Ibid*, reg. 63 (g) (h).

⁴⁸ *Ibid*, reg. 63 (a) (b).

⁴⁹ *Ibid*, regs. 71-93, 94-104.

⁵⁰ Harmful Waste (Special Criminal Provisions) Etc. Act, 1988.

⁵¹ Harmful Waste (Special Criminal Provisions) Etc. Act, 1988, s 6.

⁵² *Ibid*, s 15.

⁵³ T U Akpoghome, 'Managing Domestic Waste In Nigeria: Legal Framework, Problems And Solutions,' *International Journal of Environment, Ecology, Family and Urban Studies* [2014] 4 (6) 7-28.

⁵⁴ C Miller and others, 'Disposing of Dirty Diapers. Diapering (D3)' [2013]1-2.

⁵⁵ E Tembo and E Chazireni, 'The Negative Environmental Impact of Disposable Diapers: The Case of Mberengwa District, Zimbabwe' *Int J Health Sci* [2017] 4(2)58-61.

The public health risks associated with disposable diapers are profound. When not disposed of correctly, these diapers can harbor pathogens that spread diseases such as cholera, typhoid, hepatitis, and dysentery.⁵⁶ According to the ENVIS Centre on Hygiene, Sanitation, and Sewage Treatment Systems, human excreta in diapers have been implicated in the transmission of many infectious diseases.⁵⁷ For instance, residents living near sites of indiscriminate diaper dumping frequently report symptoms like diarrhea, skin infections, vomiting, and abdominal pain. These symptoms are clear indicators of the health hazards posed by soiled diaper waste in uncontrolled environments.

Adding to the complexity, disposable diapers are often discarded improperly, further escalating their environmental and health hazards. In many rural areas, where waste collection systems are either ineffective or nonexistent, caregivers often resort to open burning of used diapers. This practice releases harmful pollutants, including toxic gases and particulates, that contribute to respiratory diseases, lung infections, and chronic obstructive pulmonary disease (COPD). The release of chemicals like sodium polyacrylate, chlorine, dioxins, and tributyltin (TBT) during the production and disposal of diapers further pollutes the air and water systems, leading to long-term environmental damage.

Open dumping of soiled diapers attracts disease vectors such as flies and dogs, which may tear into bags containing diaper waste, scattering the contents and creating unsanitary conditions. As dogs carry soiled diapers back to their homes or into open spaces, this littering becomes both a public nuisance and a health threat.⁵⁸ Additionally, diapers disposed of in water bodies or household environments can lead to outbreaks of waterborne diseases such as cholera, hepatitis A, and polio.⁵⁹ This risk is heightened in developing regions, where inadequate sanitation and waste management practices increase the spread of infectious diseases. For example, cholera a disease caused by the ingestion of contaminated food or water can spread rapidly in areas where soiled diapers are dumped into open landfills or water sources. The World Health Organization (WHO) reports millions of cases of cholera annually, with significant numbers of deaths, especially in vulnerable communities lacking proper sanitation.⁶⁰

The decomposition of disposable diapers in landfills also contributes to methane emissions. As they decompose anaerobically (without oxygen), they release methane, a potent greenhouse gas that accelerates climate change. Furthermore, when incinerated, soiled diapers emit toxic chemicals such as dioxins and furans, contributing to air pollution. These emissions pose significant health risks to nearby communities, especially in regions where waste incineration practices are unregulated.

In many developing countries, where waste collection infrastructure is inadequate or absent, soiled diapers are often discarded in illegal dump sites or burned in open fields. These practices lead to both

⁵⁶ J Mutura, 'Counties Agonize over Piling 'Diaper' Waste' *The Standard* (2011).

⁵⁷ ENVIS Centre on Hygiene, 'Sanitation, Sewage Treatment Systems and Technology: Pathogens in Human Excreta' (International Institute of Health and Hygiene, New Delhi 2016).

⁵⁸ V. Ramaswamy & H. R. Sharma, 'Plastic bags - threat to environment and cattle health: A retrospective study from Gondar City of Ethiopia' [2011], *The IIOAB Journal* [Special issue on environmental management for sustainable development. 2(1):7-12.

⁵⁹ D. Kusumawati, & S. Mangkoedihardjo, 'Promising approach for composting disposable diapers enhanced by cyanobacteria' *Global Journal of Environmental Science and Management* [2021] (7)439-456.

⁶⁰ M. V. Remigios 'The environmental health implications of the use and disposal of disposable child diapers in senga/nehosho suburb in Gweru City, Zimbabwe' *Global Journal of Biology, Agriculture and Health Sciences* [2014] 3(2)122.



environmental degradation and direct health risks for local populations.⁶¹ Open-air burning of diapers releases not only harmful gases but also particles that can cause respiratory issues, particularly among children and the elderly.⁶²

It is evident that the disposal of disposable diapers requires urgent attention, both in terms of public health education and improved waste management practices. Environmental health education (EHL) is crucial in raising awareness about the proper handling and disposal of diapers. Communities must be educated on the dangers of improper diaper disposal, not only to reduce the spread of disease but also to mitigate the long-term environmental impacts. Moreover, governments and local authorities need to implement more robust waste management systems, particularly in rural areas where these systems are lacking. The establishment of proper waste disposal facilities, combined with public health campaigns, can help reduce the risks associated with soiled diaper waste.

5.0 Environmental and Health Risk Assessment Process and Environmental Health Literacy

The process of conducting an environmental and health risk assessment is critical for enhancing Environmental Health Literacy, which is essential for ensuring that communities and stakeholders can effectively understand and address environmental health risks. EHL involves not only the ability to recognize and comprehend these risks but also the capacity to take appropriate actions to prevent environmental degradation and protect public health. To facilitate this, a structured assessment process is implemented to establish the baseline level of EHL, which forms the foundation for developing effective interventions aimed at achieving sustainable health and environmental outcomes. The key steps in the environmental and health risk assessment process are:

5.1 Identification of Environmental and Health Risks

This initial step focuses on identifying activities within a community that could potentially cause environmental degradation and related health risks. It involves the development of an observation checklist to assess areas where harmful activities, such as improper diaper disposal, are occurring. The goal is to recognize all risks associated with these activities, including their legislative and regulatory context. This process empowers the community to actively identify and understand risks present in their environment, fostering greater awareness of local environmental health challenges.

5.2 Assessment of Environmental Health Knowledge

After identifying the risks, the next step is to evaluate whether the affected communities and stakeholders have sufficient knowledge about the consequences of environmental contamination. Interviews and surveys may be conducted to assess their understanding of how certain actions, such as the improper disposal of waste, impact both health and the environment. This knowledge assessment also includes gauging the awareness of individuals directly involved in these activities, such as local waste handlers, and identifying any gaps in indigenous knowledge or regulatory awareness. By

⁶¹ E. Tembo & E. Chazireni, 'The negative environmental impact of disposable diapers: The case of Mberengwa District, Zimbabwe' [2016] *International Journal of Healthcare Sciences* (4)2158-2161.

⁶² M. Mathe, 'Environmental pollution-perceptions and views on usage and disposal of diapers: A case study of Gwanda urban' (Environmental Pollution. 2018)3.



determining the level of EHL within the community, this step provides insight into how informed stakeholders are and what educational interventions may be necessary.

5.3 Identification of Environmental and Health Impacts

Once the knowledge assessment is complete, the focus shifts to identifying specific environmental and health impacts resulting from the harmful activities. Inspections and observations can reveal the extent of land, water, and air contamination, such as the pollution caused by burning or improperly disposing of soiled diapers. This step underscores the direct health consequences, such as increased cases of waterborne diseases like cholera, and the long-term effects of exposure to hazardous chemicals like dioxins, which are linked to cancer. This comprehensive identification of impacts serves as a basis for further action.

5.4 Identification of Key Stakeholders

A crucial part of the risk assessment process is identifying the key stakeholders responsible for addressing the environmental and health issues. This includes local authorities, environmental and health practitioners, community leaders, and policymakers. Stakeholders are essential for providing the resources and making decisions necessary for interventions. At this stage, it's important to engage all affected parties to ensure a collective understanding of the problem and to encourage collaboration in developing solutions. Stakeholders should also be responsible for drafting and implementing policies aimed at mitigating environmental health risks.

5.5 Development of an Action Plan

Based on the identified impacts, a detailed action plan is developed to guide intervention efforts. This plan outlines specific activities to address the environmental and health risks, identifies the stakeholders involved, and establishes clear objectives for the intervention. It specifies the “what, who, why, where, how, and when” of the intervention, ensuring that all elements of the problem are addressed systematically. This step also includes setting timelines and geographic targets for action, ensuring that the intervention is both timely and effective in mitigating risks.

5.6 Implementation of the Action Plan

The action plan is then implemented with the participation of all stakeholders. It is essential that the plan is communicated clearly to the community, emphasizing the benefits of the intervention and encouraging behavior change. For example, those engaged in improper waste disposal must be educated about how their actions contribute to health risks and environmental degradation, and be encouraged to adopt proper disposal practices. This phase focuses on collaboration and ensuring that stakeholders are motivated to take action to protect the environment and public health.

5.7 Coordination and Monitoring of Activities

Effective coordination among stakeholders is necessary to prevent conflicting messages and duplicative efforts. A monitoring strategy should be established, complete with goals, targets, and expected outcomes. Monitoring ensures that interventions are being implemented as planned and that any conflicts or challenges are addressed promptly. This continuous evaluation allows for adjustments to be made as needed to improve the effectiveness of the intervention.



5.8 Evaluation of Outcomes and Environmental Health Literacy

The final step in the assessment process is the evaluation of outcomes. This involves comparing the set goals and targets with the actual results of the intervention, assessing both environmental changes and health improvements within the community. The number of individuals affected by the intervention, the reduction in harmful environmental practices, and the improvement in health outcomes are all measured. This evaluation helps in identifying best practices and areas needing further improvement, and ultimately, it assesses the progress in the community's level of EHL. It ensures that future interventions can be more targeted and effective, with the aim of fostering long-term environmental health sustainability.

By following a structured environmental and health risk assessment process, communities can increase their EHL, better understand the risks posed by activities such as improper waste disposal and take informed actions to protect both their health and the environment. This systematic approach not only addresses immediate health and environmental concerns but also promotes long-term sustainability by ensuring that communities are engaged, knowledgeable, and capable of contributing to meaningful change.

6.0 Conclusion

Disposable diapers have become a staple in households globally due to their perceived advantages, primarily convenience, over cloth diapers. However, despite their widespread use, there is an alarming lack of attention given to their disposal after use. The predominant disposal methods such as unregulated dumping, burying, and burning of soiled diapers pose significant environmental and health risks. The accumulation of human fecal matter in landfills, compounded by the presence of harmful pathogens, raises serious concerns. In areas with poor waste management practices, leachates from disposable diapers can contaminate groundwater, potentially leading to outbreaks of communicable diseases like cholera.

Community involvement is critical in promoting proper waste management practices, particularly in the context of diaper disposal. Additionally, clean-up campaigns organized by both authorities and community members can demonstrate the harmful effects of improper diaper disposal while providing practical guidance on proper practices. Programs such as Water, Sanitation, and Hygiene (WASH) initiatives, which aim to reduce disease through improved access to safe water, sanitation, and hygiene, should also be expanded to include proper diaper disposal methods.

Furthermore, the mass media plays a vital role in disseminating information to the public about the risks associated with improper disposal of soiled diapers and the best practices for mitigating these risks. Public communication campaigns can raise awareness about the environmental and health consequences of improper diaper disposal and encourage behavioral changes. Waste management authorities and relevant stakeholders must collaborate to develop sustainable and effective disposal methods for soiled diapers that align with environmental protection standards. Only through such concerted efforts can we mitigate the long-term health and environmental impacts associated with disposable diapers, ensuring a cleaner and safer environment for future generations.



7.0 Recommendations

This paper revealed that disposal of diapers in landfill has several environmental and health effects. Considering these issues, the following recommendations are proposed to address both environmental and health concerns associated with diaper disposal:

7.1 Women-Centric Educational Initiatives

Comprehensive programs must be implemented to inform women about sustainable disposal practices. Policymakers should create clear, enforceable guidelines for the proper disposal of baby diapers, with a strong emphasis on segregating soiled diapers from other household and municipal waste streams. These initiatives should empower women as primary caregivers to become active participants in environmental stewardship.

7.2 Enforcement of Sustainable Diaper Disposal Practices

Practical, enforceable measures are urgently needed to regulate how diapers should be handled to promote sustainable development. Local authorities, such as urban councils, should adopt systems that promote the separation of waste at the household level. Households should be encouraged to segregate soiled diapers from other refuse, and individuals responsible for changing baby diapers must be made aware of the importance of cleaning off waste before disposal. This would help minimize the proliferation of flies and other disease vectors that are attracted to soiled diapers.

7.3 Corporate Responsibility and Accountability

At both international and national levels, it is crucial to emphasize corporate responsibility for companies that produce disposable diapers. Manufacturers should be held accountable for the entire lifecycle of their products, from production to disposal. Companies must include clear instructions on product packaging regarding proper disposal methods that are environmentally sustainable. Such guidelines will help consumers make informed decisions and reduce the environmental footprint of disposable diapers. Additionally, policymakers should engage manufacturers in discussions on creating more eco-friendly alternatives or take-back programs to ensure a more sustainable approach to diaper disposal.