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CLOTHING WASTE MANAGEMENT: SUPPORTING EXTENDED PRODUCER RESPONSIBILITY IN UAE

Khawla Abughazyain, Moetaz El Sergany, Mohammad Aljaradin
Hamdan Bin Mohammed Smart University, School of Health and Environmental Studies, UAE

Corresponding Author email: m.aljaradin@hbmsu.ac.ae

ABSTRACT

This research explores the feasibility of implementing extended producer responsibility (EPR) to address the growing challenge of clothing waste management in the United Arab Emirates (UAE). With an increasing population and rising disposable incomes running the fashion industry, the UAE presents a viable market for recycled textile products. This research examines global practices of EPR in the textile sector, highlighting government-driven initiatives aimed at reshaping waste management in fast fashion.

The study employs online questionnaire to 65 consumers across various Emirates in the UAE to gauge general behaviors regarding clothing disposal. The results underscore a critical need for targeted government interventions to foster a recycling culture among UAE consumers. Key findings reveal that 60% of respondents cite lack of information as a barrier to recycling, suggesting opportunities for improved communication and education on recycling benefits and options.The findings indicate significant gaps in clothing collection, sorting, and recycling capabilities within the UAE, attributed to inadequate infrastructure, consumer behaviors, and limited sectoral collaboration in recycling initiatives.

The research underscores the potential of EPR frameworks to enhance sustainability in the UAE's fashion industry, advocating for integrated approaches to manage both pre-consumer and post-consumer textile waste effectively.

Keywords: Extended Producer Responsibility (EPR), Recycling, Textile industry in UAE.

1. INTRODUCTION

The global fashion industry is accountable for 10% of total global carbon emission. Nearly 12 million tons of clothing are estimated to be left in landfills annually. Therefore, promoting sustainable fashion and recycling clothing waste in the United Arab Emirates (UAE) can help reduce the amount of clothing ending up in landfills. The UAE's population growth is rapidly increasing, with the country reaching over 10.2 million people in 2023 (World Meters). The increasing population in the UAE poses a threat to its resources, including the escalating consumption of clothing and other vital resources. Despite the nation's recognition of sustainability's crucial role across its economic sectors, insufficient efforts have been made to ensure effective collection, treatment, and reuse of textiles.

Recycling remains a relatively new and under-explored concept in the country specifically in fashion industry. The UAE faces an urgent need to address its clothing waste management challenges to mitigate the environmental impacts of the expanding fast fashion industry. Characterized by low-cost production, frequent consumption, and short-lived usage, fast fashion poses significant environmental risks. A critical issue lies in the lack of proper classification of clothing waste, which often categorizes it as general waste. While a substantial amount of unwanted clothing is donated, a significant portion still ends up in landfills. Addressing consumer behavior towards unwanted clothing is crucial, particularly through the lens of EPR, which will be discussed further. Both the fashion industry and consumers bear responsibility in managing clothing waste effectively.

EPR is an environmental strategy where producers are held accountable for managing their products through the post-consumer phase of their lifecycle. Currently, France stands out as the sole country with an operational EPR program for end-of-use apparel, linen, and footwear. France's experience demonstrates the benefits of EPR, showcasing significant improvements in post-consumer textile collection and recycling rates since 2006, tripling the rates. Notably, up to 90% of post-consumer textile materials can be recovered, with 50% suitable for direct reuse. Researchers emphasize the need for sustainability efforts to extend beyond the point of purchase, involving consumers actively in the supply chain to promote sustainability. Cooperation among all stakeholders in the supply chain is essential to effectively implement sustainable practices (Rotimi, Topple, & Hopkins, 2021).

Hasse (2021) performed a policy assessment to highlight how the concept of EPR has been applied in the Danish textile industry. The assessment looks at textile producers' performance since the concept's implementation in 2007. According to the policy review, EPR has played an essential role in establishing a circular economy for clothing waste. The country's recycling scheme functions as a waste management strategy and a revenue generator for textile producers (Hasse, 2021). The findings of the policy review outline the importance of shifting the responsibility of recycling textiles back to the producers. The approach forces the business entities to brainstorm ways to financially benefit from the waste, thus facilitating local revenue generation. The article establishes that EPR implementation should focus on being circular and not linear. One of the important factors to take into account while pursuing a circular economy in textiles is the recycling of fabric waste. The need for recycling fabric waste is primarily fuelled by concerns about resource recovery and the negative effects of landfilling and disposal on the environment. Although circularity in textiles is highly desired and in demand, a comprehensive approach of recycling fabric waste is still not established. (Dissanayake, D., & Weerasinghe, D., 1970)

Patnaik and Tshifularo expand on Christiansen et al.'s (2021) assessment of EPR. The authors conduct a secondary review of EPR practices by various fashion brands in the global textile industry. The review implies that the concept of EPR is not a policy-mediated practice in the fast fashion industry. Many multinational fashion brands have adopted the practice in pursuit of their green goals and objectives (Patnaik & Tshifularo, 2021). The review of industry practice highlights that EPR is well suited to enhance the value of the textile value chain. Moreover, the practice is applied to expand the brands' product portfolios. The finding mirrors Hasse (2021), who also found that EPR is more about driving circular change in the fashion industry as opposed to achieving sustainability in textile waste management.

Jacometti (2019) asserts that EPR is a concept positioned at the intersection between sustainability and the circular economy. The author performs a secondary literature review of the European Union's legal framework for enforcing producer responsibility in textile waste management. The research finds that the legal framework

focuses on creating avenues for producers to integrate pre-consumer waste (raw materials, processing waste) and post-consumer waste (textiles) into the textile value chain (Jacometti, 2019). The legal framework does not emphasize producer responsibility by establishing waste management targets. Instead, there is the use of economic instruments, such as tax policies, to incentivize producers to recycle and reuse textile waste. As a result, EPR is a government-promoted initiative that aims at changing the concept of waste in fast fashion. The approach makes waste be perceived as a critical resource, an input in the manufacturing of other textile products by fast fashion manufacturers.

Hertinayo (2022) performs a metadata analysis of research studies on the concept of EPR, including white policy papers, to identify what is missing from existing waste management policies. The author hypothesizes that while sustainability is not a new concept in the fast fashion industry, EPR is relatively new. The concept is still in its infancy stage of implementation, implying potential policy gaps. According to the article, one of the main impediments to EPR enforcement is the inability to enforce standardized recycling and reuse practices (Hertinayo, 2022). Each fashion brand has its unique supply chain, and each textile landfill presents its distinct challenges concerning the collection, transportation, and processing of textile waste. Moreover, EPR fees, fines, and taxes are low, which could discourage manufacturers from fully implementing the process (Hertinayo, 2022). The article highlights the need for further government incentives to encourage manufacturers to embrace responsibility for their waste.

Kent (2023) presents a qualitative review of stranger sentiment to highlight that the uptake of EPR in fast fashion is due to changing consumer behaviours and preferences. The modern consumer is more aware of their contributions to environmental pollution and will therefore not associate themselves with brands not known for their green efforts. However, an even stronger sentiment is shared among locals living near garment factories and textile landfills. Such communities believe it should be a political mandate for textile companies to implement EPR (Kent, 2023). Non-profits are increasingly lobbying that EPR policies become globally enforced for a more meaningful reduction of textile waste.

Xie et al. (2021) conducted a systematic literature review of articles on reused and recycled clothing to assess whether there are viable markets for EPR-based products. The authors include over 100 articles from Google Scholar and Web of Science in their review to find that there is a ready market for such products, especially in emerging economies. EPR results in products and clothes that are not perceived as second-hand (Xie et al., 2021). The clothes are also not perceived as high-quality or first-hand. The finding suggests that EPR-processed textiles have more monetary value than second-hand clothes. Therefore, they could fetch prices that impact a garment manufacturer's bottom line. Xie et al. (2021) contributes with a consumer's perspective on the feasibility of EPR as a distinct economic segment within the larger fast fashion industry.

Siddiqua et al. (2022) carried out a quantitative survey of UAE consumers to highlight their disposal practices. The longitudinal observation highlighted that there is a lack of consumer awareness of recycling practices associated with the circular economy. Age and occupation were factors identified to influence recycling and disposal practice in UAE homes (Siddiqua et al. 2022). Older respondents had little awareness regarding the practice and did not have knowledge on government initiatives associated with waste disposal. As a result, they did not participate in the disposal activities. The article highlights the need for targeted promotional exercises by the government of textile waste disposal. The awareness campaigns should seek to establish a recycling culture in the UAE as the success of the EPR process is dependent on the efficiency of waste collection and sorting.

This research aims to explore the feasibility of implementing EPR in clothing waste management in the UAE. It seeks to develop a tailored framework for effective clothing waste management within the country. The study will achieve these objectives by analyzing consumer behaviors related to clothing disposal, evaluating current waste management practices, and assessing the viability of introducing EPR.

The outcomes of this project will be advantageous for municipalities striving to reduce landfill waste and curb greenhouse gas emissions, particularly concerning unclassified and poorly managed clothing waste. Private stakeholders stand to benefit as well, as they can bolster their public image and reputation through active involvement in sustainable initiatives aimed at improving clothing waste management practices.

2. MATERIAL AND METHODS

This research employs a mixed methods approach to comprehensively explore clothing waste management in the UAE. The quantitative phase involves collecting data through a questionnaire to quantify the volume of clothing waste generated and assess consumer behaviors towards disposal. This approach aims to highlight the significance of the issue.

Additionally, qualitative data will be gathered using a descriptive research design to delve into current practices and initiatives addressing clothing waste and pollution in the region. This method seeks to achieve a nuanced understanding necessary to meet the research objectives effectively.

A descriptive survey tool, administered online without sample size limitations, will be used to capture insights into consumer behaviors related to clothing disposal practices. Emphasis will be placed on understanding disposal frequency, methods employed, and broader implications for waste management practices in the UAE.

The initial quantitative method involved online questionnaire to 65 consumers across various Emirates in the UAE to gauge general behaviors regarding clothing disposal. The questionnaire, comprising 8 questions, covered several aspects of the topic. For instance, respondents were queried about their residential Emirates, frequency of annual clothing disposals, and the approximate annual weight of disposed clothing. Notably, a significant majority of respondents indicated disposing approximately 30 kg of clothing annually

3. Results AND DISCUSSION

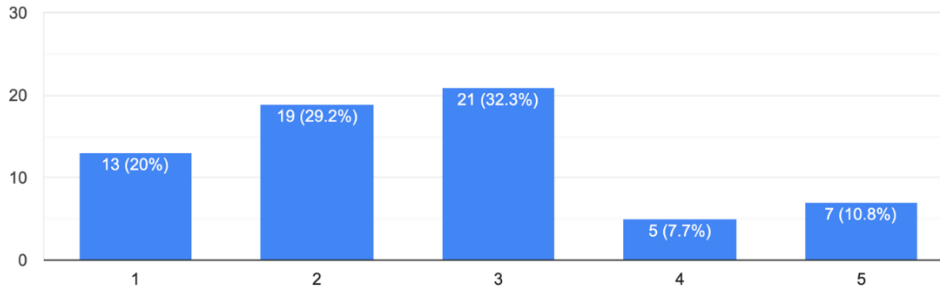

Figure 1: How much cloths do you dispose of annually (kg)

Figure 1 underscore the significant variation in clothing waste generation among individuals in the UAE, the results reveal a spectrum of disposal behaviors, with 20% of participants disposing of 1 to 10 kg annually, 29.2% disposing of 11 to 20 kg, and the largest group (32.3%) disposing of 21 to 30 kg. Smaller percentages include 7.7% disposing of 31 to 40 kg and 10.8% disposing of 41 to 50 kg annually.

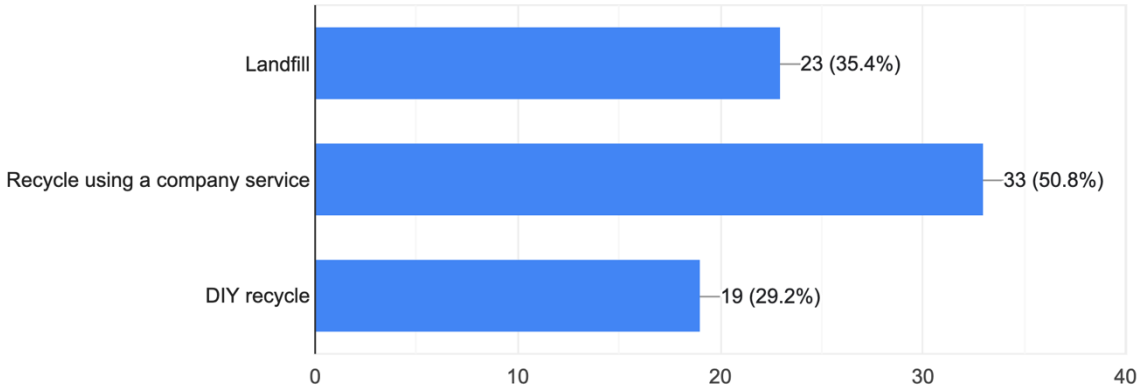

Figure 2: methods do you use to dispose clothing

Figure 2 reveals that half the respondents use services provided by recycling companies. 23 respondents (35.4%) dispose of their clothing by sending it to landfills. This method is the least environmentally friendly, contributing to waste and pollution. 33 respondents (50.8%) use company services to recycle their clothing. This is the most popular method, indicating a preference for professional recycling services, which are likely perceived as more convenient and effective.

19 respondents (29.2%) recycle their clothing themselves. This method shows a significant portion of respondents are willing to take personal responsibility for recycling, though it is less popular than using company services. The data suggests that while a majority of respondents prefer using company services for recycling, a considerable number still rely on landfills or DIY methods. This highlights the need for increased awareness and accessibility of recycling services to reduce landfill usage.

The study reveals that 52.3% of respondents in the UAE have recycled used clothes, while 33.8% have not, and 13.8% are uncertain about their recycling habits. Among those who recycle, 71.4% engage in downcycling, 19% use recycling companies, and 9.5% practice upcycling. Barriers to recycling include lack of information (60%) and lack of time (40%). The data does not specify respondents' interest in using a third-party service for sustainable clothing disposal. These findings emphasize the need for awareness campaigns to address information gaps, convenient recycling options, and potentially introducing services that could promote sustainable clothing practices effectively.

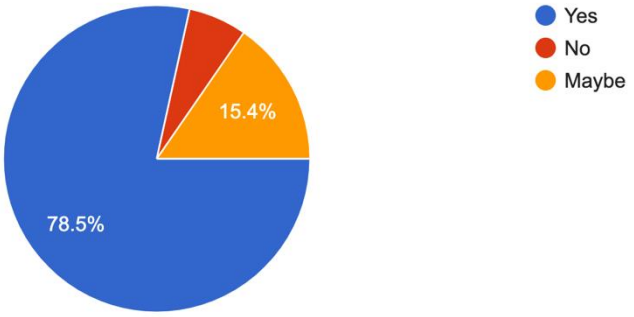

Figure 3: If third party service exists, would you use it?

According to Figure 3, 78.5% of respondents expressed a willingness to use facilitative applications for sustainable clothing disposal, indicating strong interest in such services. Among respondents, 15.4% indicated a lack of interest in these services, while 6.1% were uncertain and may require more information or have concerns. These findings underscore significant market potential for sustainable clothing disposal services, highlighting a consumer readiness to adopt environmentally friendly practices. The data suggests a need for businesses and policymakers to address information gaps and potential barriers to further encourage adoption of sustainable practices in clothing disposal.

The data evaluation reveals that the majority of consumers in the UAE dispose of their unwanted clothes 1-2 times annually, suggesting a cautious approach among respondents. However, there is some uncertainty regarding the accuracy of reported annual disposal amounts, as it is unlikely that consumers weigh their unwanted clothing. Notably, 33 respondents utilize recycling company services, indicating a higher level of environmental awareness. Half of the respondents have previously recycled clothes, predominantly through downcycling methods. When asked about barriers to recycling, 60% cited lack of information, despite the availability of clothing banks and convenient recycling services that are not widely known to the public. This suggests a gap in public awareness and accessibility to existing recycling options.

Despite the absence of a formal classification system for textile waste, the issue is compounded by the high fashion consumption prevalent among UAE residents. Many assume that donating used clothing mitigates environmental impact, facilitated by numerous clothing banks across the Emirates. However, a lack of public awareness about these facilities often results in clothes being sold to recycling companies rather than donated, contributing to landfill accumulation. Comparisons drawn with consumer behaviors in countries like the USA underscore the inevitability of clothing ending up in landfills, despite efforts like repurposing old garments as wiper rags. The

UAE's legal framework, as outlined in Federal Law No. 12 of 2018, addresses waste management broadly without specific provisions for textile waste, while Dubai Municipality classifies textiles under domestic solid waste. Charitable initiatives like the Islamic Affairs and Charity Activities Department's Clothes Bank program and private services like Kiswa and Malabes illustrate ongoing efforts toward sustainable clothing disposal, albeit within an unstructured framework. Challenges during data collection included the lack of comprehensive data on clothing waste quantities and the difficulty in sourcing relevant literature due to the nascent research landscape in this area.

The UAE faces significant challenges in effectively managing the collection, sorting, and recycling of discarded clothing, as highlighted by the accumulation of substantial amounts of old clothes in households and around communities. Clarke (2019) underscores this issue by reporting that one recycling plant alone received 4000 tonnes of clothing in a year, overwhelming its processing capacity and leading to a backlog of materials. This situation is exacerbated by the booming fast fashion industry in the UAE, which further strains garment manufacturers and households with a continuous supply of new textiles and discarded items.

A major factor contributing to these challenges is the country's inadequate recycling infrastructure, as noted by Hasse (2021) in the context of the Danish textile industry's struggles with under-capacity. This limitation similarly hampers the efficiency of Extended Producer Responsibility (EPR) initiatives in the UAE. Moreover, the UAE consumer culture currently does not promote the widespread consumption of second-hand textile products, creating a barrier to developing a robust domestic market for recycled textiles. Consequently, EPR products often lack a ready market in the UAE, resulting in their export to third-world countries instead (Clarke, 2019).

To address these issues, there is an urgent need to raise awareness among UAE residents about the importance of good recycling practices and the benefits of using second-hand textiles. Transforming consumer behavior is crucial for sustainability in the fast fashion sector and for ensuring the viability of EPR as an economic sector in the UAE. Furthermore, enhancing sectoral collaboration is essential. While the government incentivizes recycling through tax credits, there is a lack of coordinated efforts among garment manufacturers, who often view recycling primarily as a commercial opportunity rather than a social and environmental imperative (Hertinayo, 2022). The fragmented nature of collaboration may stem from each clothing factory operating within its unique supply chain, highlighting a need for more concerted efforts among private organizations to establish and support recycling facilities. Additionally, greater involvement of non-governmental organizations in partnership with authorities could improve public disposal systems and bolster the overall volume of textiles recycled under EPR schemes. These steps are critical for fostering a sustainable textile recycling ecosystem in the UAE that aligns with global best practices and addresses local environmental challenges effectively.

4. CONCLUSION AND RECOMMENDATION

Sustainability efforts are gaining significant momentum across various economic sectors in the UAE, presenting entrepreneurs with ample opportunities to champion sustainable practices within the fast fashion industry. The implementation of EPR can play a pivotal role in introducing effective collection schemes aimed at reducing the vast volumes of textiles destined for landfills. However, to maximize the economic feasibility of these sustainable practices, there is a critical need for harmonizing EPR regulations nationwide. By aligning

regulatory frameworks, the UAE can expedite its transition towards a circular economy centered around clothing waste.

EPR represents a holistic approach that requires collaboration among multiple stakeholders to ensure efficiency across the textile recycling chain. Inter-agency cooperation is essential to streamline collection, sorting, recycling, and manufacturing processes of textile products under EPR schemes. Additionally, targeted marketing efforts are necessary to bolster consumer awareness and drive demand for second-hand textile materials. Garment manufacturers, in particular, have a significant role in promoting ethical textile disposal practices and showcasing the viability of recycled products in sustainable fashion.

As sustainable fashion gains traction in the UAE, there is an opportunity to cultivate a robust domestic market for recycled textiles. Kent (2023) emphasizes that recycled clothes and textile products are not only environmentally friendly but also more affordable, catering to a broad segment of the local population. To capitalize on this potential, the Ministry of Climate Change and Environment could spearhead awareness campaigns leveraging local media and celebrity endorsements to promote second-hand products effectively.

Moreover, government intervention through supportive monetary policies can incentivize the exportation of EPR products, further enhancing market opportunities and reinforcing the circular economy principles associated with recycling. However, addressing recycling challenges in the UAE necessitates comprehensive inter-agency collaboration. By leveraging human capital, education, expert collaboration, and strategic investments, the UAE can modernize its infrastructure to significantly increase daily output of recycled textiles.

A critical barrier to the efficiency of UAE's EPR initiatives is the current under-capacity of recycling plants. To address this, the government could mandate that each garment manufacturer establishes an internal division dedicated to recycling. Such a policy would integrate EPR seamlessly into existing supply chains, aligning with the prevailing trend of commercializing recycling practices.

The UAE stands poised to enhance its sustainability efforts through robust EPR implementation and strategic collaborations. By fostering a culture of responsible consumption and disposal behaviors among local communities, supported by strong regulatory frameworks and proactive government policies, the country can achieve international standards in textile recycling and pave the way for a more sustainable future.

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