International Journal of Multidisciplinary Research and Growth Evaluation.

'Dress Recycling' for a More Resilient Economy (Arab World): An SDG Case Study

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Article Info

ISSN (Online): 2582-7138
Impact Factor (RSIF): 7.98
Volume: 06
Issue: 05
September - October 2025
Received: 24-07-2025
Accepted: 26-08-2025
Published: 22-09-2025
Page No: 568-576

Abstract
The global fashion industry, propelled by the fast fashion model, faces an escalating waste crisis with severe environmental and social consequences. This paper examines the critical role of dress recycling as a targeted intervention within the broader textile waste landscape, arguing for its viability as a scalable solution. Through a detailed case study of the "My Clothes" initiative in Abu Dhabi, UAE is a non-profit application in the Arab world specialising in dress lifecycle management—the study demonstrates a practical closed-loop system for collection, sorting, and redistribution. The analysis highlights the model's holistic impact and it's one of the main approaches for creating significant diversion of waste from landfills, reduction in carbon and water footprints, creation of green jobs, and fostering of community engagement. Furthermore, the paper explores how Industry 4.0 technologies—such as AI, blockchain, and digital twinning—can revolutionise waste management by enabling transparency, efficiency, and circularity across the fashion supply chain.
By integrating empirical data from the case study with a review of global waste challenges and technological innovations, this research positions dedicated recycling programs, supported by digital transformation, as essential strategies for advancing sustainable fashion, promoting environmental justice, and achieving the targets outlined in UN Sustainable Development Goal 12.

DOI: https://doi.org/10.54660/.IJMRGE.2025.6.5.568-576

Keywords: Dress Recycling, Textile Waste, Circular Economy, Sustainable Fashion, Industry 4.0, SDG 12

1. Introduction

The fashion industry stands at a critical juncture, where its celebrated creativity and global reach are shadowed by an escalating environmental and social crisis. Propelled by the rise of fast fashion—a model built on rapid production, low costs, and disposable consumption—the sector has become one of the world's largest polluters, generating over 92 million tonnes of waste annually and consuming vast quantities of water and energy. As clothing lifespans shorten and consumption grows, landfills swell with textile waste, while production continues to impose heavy burdens on ecosystems and vulnerable communities, particularly in low and middle-income countries, Niinimäki *et al*. (2020) [10]. In response, a paradigm shift toward circularity and sustainability is urgently needed—one that not only reimagines production and consumption but also prioritises practical, scalable solutions for waste reduction. Gupta and Saini (2020) [8], Shirvanimoghaddam *et al*. (2020) [11].

This study focuses on the strategic role of dress recycling as a targeted intervention within the broader effort to transform the fashion industry. Dresses, as garments often tied to occasion-based use and fleeting trends, represent a segment particularly prone to underuse and premature disposal. Through an in-depth case study of the "My Clothes" initiative—a digital-driven, non-profit effort based in the Arab world—this paper explores how specialised recycling programs can operationalise circular economy principles. The application of smart collection systems, transparent tracking, and community engagement demonstrates how technology can enhance the efficiency and impact of textile reuse and recycling.

Furthermore, this research situates such initiatives within the larger context of Industry 4.0, examining how technologies like artificial intelligence, blockchain, and IoT can enable smarter waste management, supply chain transparency, and consumer participation, Shirvanimoghaddam *et al*. (2020) [11]. By integrating real-world data from the "My Clothes" app with analysis of global trends and technological potentials, this paper argues that localized, tech-enabled recycling programs are not merely supplementary measures but essential components of a sustainable fashion future. In doing so, it highlights pathways for reducing waste, empowering communities, and advancing alignment with the United Nations Sustainable Development Goals—particularly SDG 12 for responsible consumption and production.
Gupta and Saini (2020) [8].

2. Literature Review

2.1. The Critical Role of Dress Recycling in a Sustainable Future

The global fashion industry stands as one of the largest polluters in the world, a sector grappling with the profound environmental consequences of its own success. The rise of fast fashion, characterised by rapid production cycles and an emphasis on disposable trends, has led to an alarming crisis of textile waste, Shirvanimoghaddam *et al*., 2020) [11]. Each year, millions of tons of clothing are discarded, with a significant portion ending up in landfills, where they contribute to environmental degradation for centuries. Within this urgent context, the specific practice of dress recycling emerges not merely as a niche environmental effort but as a critical and practical response to a global problem. This paper will explore the importance of dress recycling through a detailed case study, arguing that such initiatives are indispensable for building a sustainable, resilience economy and fostering a necessary shift in consumer consciousness. Buheji (2018) [3], Gupta and Saini (2020) [8].

2.2. The Value of Lifecycle Management of Dresses

To understand the real-world impact of dress recycling, we can examine a model case through a program that specialises in the lifecycle management of dresses in a non-profit organisation in Arab world. The focus of this study is on the garment category particularly vulnerable to short-term use due to occasion-based wearing and fluctuating fashion trends. Such a type of initiative usually operates on a sophisticated closed-loop system that begins with collection. Dresses are gathered through convenient drop-off bins at retail partners or collected directly or through community centres, or a mail-in system that incentivises participation. Once collected, the garments undergo a meticulous sorting process. Items in excellent condition are set aside for direct resale, while those with minor flaws are channelled to a repair and cleaning facility. Dresses that are beyond repair are not discarded; instead, they are carefully sorted by their material composition—separating cottons from polyesters and blends—to be prepared for recycling.

The operational model demonstrates the importance of dress recycling in today's world. Environmentally, the benefits are direct and significant. By diverting dresses from landfills, the initiative directly reduces methane emissions and prevents toxic chemicals from leaching into soil and groundwater. Furthermore, the recycling process conserves vital resources. The transformation of old cotton dresses into new materials like industrial rags saves the enormous quantities of water and pesticides required for virgin cotton cultivation. Similarly, recycling polyester garments reduces our reliance on petroleum, the fossil fuel from which polyester is derived. Simply by extending the active life of a single dress through resale, the initiative can reduce its carbon, water, and waste footprint by an estimated twenty to thirty per cent, making reuse one of the most effective sustainability strategies available. Gupta and Saini (2020) [8].

Beyond the clear environmental imperative, dress recycling generates substantial economic and social value. The processes of sorting, repairing, marketing, and selling recycled clothing create local employment opportunities in green jobs, contributing to a more resilient economy, Buheji (2018) [3]. For consumers, these initiatives make sustainable fashion accessible and affordable, challenging the elitist notion that eco-conscious choices are a luxury. The social impact extends further through partnerships with women's shelters and job-readiness programs, where donated dresses provide not just clothing but also dignity and confidence to individuals in vulnerable situations. This dual focus on environmental and social good embodies the principles of a truly inclusive, resilient economy. Buheji (2020) [4].

Perhaps the most profound importance of dress recycling initiatives lies in their power to catalyse a cultural shift. They serve as tangible, accessible entry points for consumers to engage with the circular economy, moving the concept from an abstract idea into a daily practice. When an individual chooses to return a dress to a recycling program, they become an active participant in a sustainable system. This action fosters a new mindset—one that values longevity, care, and resourcefulness over disposability and thoughtless consumption. It educates the public about the hidden costs of fashion and empowers them to be part of the solution, creating a groundswell of demand for more responsible industry practices. Niinimäki *et al*. (2020) [10].

Fig 1: Sample of the MLABSY Initiative and its App

2.3. The Environmental Scrutiny of the Fashion Supply Chain

Niinimäki *et al*. (2020) [10] highlight that the fashion industry is under increasing global scrutiny for its environmentally polluting supply chain operations. Despite widespread awareness of its detrimental effects, the industry continues to expand, fueled by the rise of the fast fashion model, which depends on cheap manufacturing, frequent consumption, and short garment lifespans. The review identifies critical environmental impacts across the value chain, including excessive water use, chemical pollution, CO2 emissions, and the generation of over 92 million tonnes of waste annually, alongside the consumption of 79 trillion litres of water. The authors argue that addressing these issues requires fundamental changes to the business model, such as decelerating production, integrating sustainable practices, and shifting consumer behaviour toward fewer purchases and longer garment use. They stress an urgent transition back to 'slow' fashion to minimise environmental harm and enhance the long-term sustainability of the supply chain. Bailey *et al*. (2022) [1].

2.4. Fast Fashion as a Global Environmental Justice Crisis

Bick *et al*. (2018) [2] frame fast fashion as a significant global environmental justice issue. This business model, characterized by rapid, low-cost production, leverages international supply chains that outsource manufacturing to low and middle-income countries (LMICs), thereby shifting environmental and occupational burdens from high-income nations to under-resourced communities. The scale of the problem is vast, with the industry valued at $1.2 trillion annually and the United States—the largest consumer—discarding billions of pounds of clothing each year, primarily to landfills, Niinimäki *et al* (2020) [10]. Injustices permeate every lifecycle stage: production pollutes local environments with toxic wastewater, while workers face severe hazards, exemplified by disasters like the Rana Plaza collapse, Bailey *et al*. (2022) [1]. Post-consumption, the waste crisis is exported to LMICs, overwhelming their waste systems. Solutions proposed include developing sustainable fibres, combating corporate "greenwashing," implementing equitable trade policies, and fostering responsible consumer habits. The authors conclude that the extensive damage categorises fast

fashion as a critical global environmental justice issue, demanding alignment with UN Sustainable Development Goal 12. Bick *et al*. (2018) [2].

2.5. Key Impacts of the Fashion Supply Chain

The fashion supply chain is long and complex, beginning with agriculture and petrochemical production for fibres and extending through manufacturing, logistics, and retail. Each stage carries significant environmental impacts due to intensive water, material, chemical, and energy use. Many chemicals used in manufacturing are harmful to the environment, workers, and consumers, Yalcin-Enis *et al*. (2017) [12]. While most production impacts are concentrated in manufacturing countries, textile waste is a global problem, Shirvanimoghaddam *et al*. (2020) [11]. The rise of fast fashion has drastically increased material throughput, with brands now producing nearly double the amount of clothing compared to before 2000. Current consumption patterns lead to immense textile waste, most of which is incinerated, landfilled, or exported to developing countries, exacerbating environmental and social inequities. Bailey *et al*. (2022) [1].

This text highlights the growing global challenge of textile waste, driven by population growth, rising living standards, and the overconsumption fostered by fast fashion. It cites a World Bank prediction of a 70% increase in municipal solid waste by 2025, posing a significant risk, particularly for developing countries with insufficient waste management systems. The chapter outlines a review focusing on three main areas: the types of textile waste (production, pre-consumer, and post-consumer), with post-consumer waste being the primary concern due to fast fashion's short clothing lifecycle; the top five waste management strategies, prioritized as reduction, reuse, recycling, energy recovery, and disposal; and the utilization of waste in novel products. It emphasises that a vast majority of post-consumer textile waste (75%) can be reused as second-hand clothing or industrial rags, underscoring the importance of diverting it from landfills and promoting innovative recycling solutions by designers and engineers. Yalcin-Enis *et al*. (2017) [12].

2.6. Importance of Effective Dress Recycling Initiatives in the Arab World

In the Arab world, the role of dress recycling is poised to become a significant pillar of a sustainable future, uniquely blending environmental necessity with deep-seated cultural and religious values. The region's relationship with clothing is profound, characterised by high consumption driven by festive seasons like Eid, weddings, and the pilgrimage of Hajj, alongside a strong tradition of modest fashion, including items like the abaya and thobe. This creates a substantial volume of textile waste that often ends up in landfills, contributing to environmental strain. However, the principles of Islam, which emphasise stewardship of the Earth (khalifah), which is the human role is to build and construct (Emar) rather than to destroy or to harm. Also, Islam prohibits wastefulness (israf), or provides a powerful cultural foundation for recycling initiatives. Framing sustainable fashion not as a foreign import but as a fulfilment of these religious duties can drive widespread acceptance and participation, turning a practical environmental effort into a meaningful act of faith. Long and Nasiry (2022).

The environmental benefits of establishing a robust dress recycling system are particularly critical for the region. By diverting textiles from landfills, Arab countries can reduce methane emissions and conserve precious water and energy resources that are otherwise expended in the production of new garments. This is especially vital in a part of the world facing significant water scarcity. Furthermore, recycling presents a considerable economic opportunity by fostering a circular economy. It can create new green jobs in collection, sorting, and, most importantly, in the creative industries of repair and upcycling. Local designers and artisans can revitalise traditional crafts by transforming discarded fabrics into unique, high-value products, positioning the Arab world as a leader in the burgeoning global market for sustainable modest fashion. Buheji (2018) [3], Long and Nasiry (2022).

Overcoming the challenge of social stigma associated with second-hand clothing is essential for success. This requires strategic awareness campaigns that reframe recycled and upcycled garments as chic, ethical, and intelligent choices rather than symbols of need. Initiatives like clothing swap events during Eid, brand-led take-back programs, and collaborations between fashion influencers and upcycling designers can make sustainable practices fashionable and socially desirable. Simultaneously, strengthening charity networks ensures that gently used clothing supports low-income families and migrant workers, reinforcing community solidarity. Ultimately, for the Arab world, dress recycling is more than waste management; it is a pathway to harmonising modern consumption with traditional values, ensuring that cultural expression through clothing continues in a way that honours both heritage and the health of the planet. Long and Nasiry (2022).

3. Methodology

This research adopts a qualitative case study approach, enriched by descriptive quantitative data analysis, to provide a comprehensive examination of the role and efficacy of specialized dress recycling initiatives. The methodology is structured in three sequential phases to ensure a thorough investigation. The first phase involves a systematic literature review to establish a robust theoretical foundation, focusing on the environmental impact of fast fashion, the principles of the circular economy, and the potential of Industry 4.0 technologies in waste management. This review contextualises the study within existing scholarly and industry discourse. The second phase constitutes the core of the research, centring on an in-depth intrinsic case study of the "My Clothes" initiative. Data for this phase is drawn from documentary analysis of internal project records and a detailed evaluation of operational data generated by the application, including metrics on collection volumes, environmental impact calculations, and user engagement trends. The final phase involves a synthesis of the empirical findings from the case study with the theoretical insights from the literature review. This synthesis aims to evaluate the practical application of circular economy principles, identify transferable strategies, and formulate actionable recommendations for stakeholders seeking to implement similar tech-driven solutions for textile waste. This multi-phased design ensures the research is both theoretically grounded and empirically supported, offering a holistic analysis of dress recycling as a viable model for sustainable fashion.

4. Case Study

4.1. Introduction to "My Clothes" App

The "My Clothes" initiative in Abu Dhabi in UAE was established in 2016 as a direct response to the growing challenge of textile waste. Its primary mission is the reuse and recycling of used clothing, thereby reducing environmental impact. The initiative began with a straightforward model of direct clothing collections utilising drop boxes placed in local neighbourhoods. A significant evolution occurred in 2022 when the initiative embraced digital transformation by launching a dedicated electronic application for both Apple and Android systems. This strategic shift aligned with a broader directive from the Abu Dhabi Department of Community Development, which mandated the digital transformation of third-sector services. The application now operates alongside the physical drop boxes, creating a hybrid system that broadens accessibility and convenience for donors.

The overarching goal of the initiative is to collect used clothing to support both environmental and volunteer projects. This effort is designed to promote a culture of reuse, recycling, and waste reduction throughout the community. By engaging students, volunteers, and companies in environmental and charitable work, the initiative also aims to strengthen the concepts of social responsibility and giving. A key long-term objective is the introduction of a circular economy culture, which not only enhances the association's image as a leading institution in environmental and social projects but also delivers tangible benefits by reducing the amount of clothing waste sent to landfills and lowering the associated carbon footprint.

The journey for a donor begins by downloading the "My Clothes" application, where they input data regarding the category, quantity, and location of their donation. Upon scheduling a pickup, a team or logistics partner collects the items, with each bag coded for tracking purposes. The collected items are then meticulously sorted by type, condition, size, and season. Based on this sorting, each item is directed towards its most appropriate destination: either reuse through donation or social resale, or physical recycling. Donors are kept informed throughout the process, receiving notifications upon receipt of their donation and later feedback on the destination and overall impact of their contribution.

4.2. The Way the Clothes are Collected

The collected clothing follows one of two primary pathways. Garments in good condition are designated for reuse and are distributed to needy families outside the UAE in cooperation with relevant authorities. Items that are no longer suitable for wear are sent to specialised recycling companies, ensuring that the materials are recovered and kept within a circular system. The initiative measures its success through a comprehensive framework that includes stakeholder surveys and an impact dashboard. Surveys gather crucial feedback from donors, beneficiaries, and volunteers, while the dashboard tracks key indicators such as the quantity of clothing diverted from landfills, carbon emissions avoided, water saved, and volunteer hours contributed.

A sample project data entry illustrates the process in action, detailing a collection of 12.4 kg of mixed clothing in good condition that was received on a specific date and transported a short distance for reuse. The initiative's impact is further quantified through a detailed performance indicator matrix, which measures outcomes across environmental, social, and economic dimensions, Buheji (2018) [6]. These indicators include the volume of clothing processed, emissions avoided, the value of reused materials, and monthly active application users. The results reported from these measurements show an annual increase in the clothing donation rate and a growing active donor base, demonstrating the initiative's positive trajectory and tangible contribution to waste reduction and community engagement.

Table (1) provides a detailed snapshot of a single donation transaction, illustrating the operational workflow of the "My Clothes" initiative. A typical entry, recorded on September 3, 2025, at 10:30 AM, details a collection of 12.4 kilograms of mixed clothing for children, men, and women. The items were assessed to be in a condition suitable for either direct reuse or recycling. After being transported a distance of 14.2 kilometres to the sorting facility, the donation was processed and assigned a final destination of "Reuse/Recycle," confirming that all collected materials were successfully diverted from the landfill and channelled back into the circular economy. This record exemplifies the project's efficient tracking from collection through to final disposition.

Table 1: Sample Project Data

Clothing Category	Children/Men/Women/Mixed
Weight in Kilograms	12.4 kg
Condition	Excellent/Good/Recyclable
Receive Time	2025-09-03 / 10:30
Distance Travelled	14.2 km
Destination	Reuse/Recycle
Final Destination	Reuse/Recycle

4.3. Impact Measurement Matrix for the "My Clothes" App

The Impact Measurement Matrix for the "My Clothes" App outlines a comprehensive set of performance indicators designed to quantify the project's multi-dimensional impact. Each indicator is clearly defined with a specific unit of measure and a data source, ensuring consistent and reliable tracking. The matrix captures environmental benefits through metrics such as the total weight of clothing diverted from landfills and the corresponding emissions avoided. Social value is measured by the volume of water saved and the number of direct beneficiaries who receive clothing. Furthermore, economic and operational dimensions are assessed through indicators like volunteer hours contributed, the cost savings from reduced waste processing, and the market value of reused and recycled materials. This structured framework allows for a holistic evaluation of the application's effectiveness across its environmental, social, and economic goals, turning operational data into meaningful evidence of its contribution to a circular economy.

Table 2: Impact Measurement Matrix for "My Clothes" App

Indicator	Unit of measure	Definition	Source/Method	Dimension
1-Clothing diverted from landfill	kg/ton	Total weight processed	Application Logs	Environmental
2-Emissions avoided	kg/CO_2e	Footprint difference between production and reuse or recycling	Transfer Transactions	Environmental
3-Water saved	L/kg	Primary production water avoided	Reliable Industry References	Social
4-Direct beneficiaries	Person	Individuals/households received clothing	Distribution Databases	Social
5-Volunteer hours	Hour	Community effort	Volunteer Records	Economic
6-Cost of waste processing at landfill	Costs/ton	Municipal waste management estimate	Cost Study	Economic
7-Value of reused clothing	AED/year	Market estimate	Invoices/Market Prices	Digital
8-Value of recycled clothing	AED/year	Market estimate	Invoices/Market Prices	Dimension
9-Monthly active users	User		Application Analytics	Environmental

4.4. 'My Clothes App' Results

The implementation and ongoing development of the "My Clothes" application have yielded a consistent and positive set of outcomes. The initiative has successfully achieved an annual increase in the clothing donation rate of 15%, demonstrating growing user engagement and contribution frequency. This growth is further supported by a 7% annual expansion of the active donor base, indicating the app's effectiveness in attracting and retaining a broader community of participants. Operationally, the digital platform has streamlined logistics, leading to a notable reduction in clothing donation processing time, which enhances efficiency and the donor experience. As a direct result of these improvements, the total weight of textiles diverted from landfills has seen a significant increase. This tangible environmental achievement directly translates into a reduced carbon and water footprint, underscoring the project's core mission of promoting sustainability through the principles of a circular economy.

Fig 1: Shows Children Participating in Cloth Waste Delivery

4.5. Application of Industry 4.0 in Fashion Waste

The fashion industry's waste problem is a monumental challenge, but Industry 4.0—the fusion of digital, biological, and advanced industrial technologies—offers a powerful toolkit for tackling it at its roots. Rather than just managing waste after it's created, Industry 4.0 enables a shift towards a circular, on-demand, and transparent system that dramatically reduces waste generation in the first place.

The fashion industry's linear "take-make-dispose" model is fundamentally broken, generating monumental waste that pollutes ecosystems and squanders resources. Industry 4.0, characterised by the integration of technologies like the Internet of Things (IoT), Artificial Intelligence (AI), big data, and advanced robotics, presents a paradigm shift. It moves the industry from a reactive stance on waste to a proactive one, creating a system where waste is designed out and value is extended. The contribution of Industry 4.0 can be seen across the entire product lifecycle, from design and production to consumption and end-of-life.

First, at the design and prototyping stage, digitalisation eliminates physical waste before a single thread is spun. Traditionally, designing a new collection involved producing countless physical samples, which were often discarded after presentations. Technologies like 3D prototyping and digital twinning allow designers to create and refine garments in a virtual space. They can visualise drape, texture, and fit on digital avatars, making adjustments without creating physical waste. This not only saves immense amounts of sample fabric but also significantly reduces the carbon footprint associated with shipping samples across the globe for approval.

Furthermore, generative design AI can be employed to create patterns that optimise material usage, minimising off-cuts from the very beginning.

Second, production becomes highly efficient and demand-driven through smart manufacturing. The old model of mass-producing garments based on flawed forecasts leads to overstock, which often ends up incinerated or in landfills. Industry 4.0 introduces on-demand and micro-factory production. Enabled by additive manufacturing (3D printing) for accessories and components, and advanced robotic cutting systems, brands can produce items only when an order is placed. This "make-to-order" model slashes overproduction, the single biggest source of fashion waste. IoT sensors on production lines can also monitor material usage in real-time, identifying inefficiencies and further reducing textile waste during cutting and sewing.

Third, supply chain transparency powered by AI and Blockchain ensures responsible sourcing and tracks a garment's journey. A major hurdle in recycling is a lack of information about a garment's composition. Blockchain technology can create a secure, immutable digital passport for each item, detailing its material makeup, dyeing processes, and manufacturing origin. This transparency allows consumers to make informed choices and, crucially, enables automated and accurate sorting at the end of a garment's life. AI-powered waste sorting systems can use cameras and sensors to identify fabric compositions more accurately than humans, efficiently separating cotton, polyester, and blends for proper recycling, which is currently a major bottleneck.

Fourth, the retail and consumer experience are revolutionised to promote longevity and circularity. Smart tags, such as QR codes or NFC chips, linked to a garment's digital passport, can provide consumers with care instructions, repair tutorials, and authentication services. This encourages proper care, extending the garment's life. Moreover, these tags can facilitate resale and recycling. A customer can easily access information on how to return a garment to the brand for recycling or resale, creating a closed-loop system. AI-driven recommendation engines can also promote styling of existing garments rather than always pushing new purchases, fostering a culture of "rewearing" and creativity over constant consumption.

Finally, at the end-of-life stage, advanced recycling technologies offer a solution for post-consumer waste. Traditional mechanical recycling often downgrades fabric quality. Industry 4.0 introduces chemical recycling processes, which can break down fabrics like polyester and cotton to their molecular level to create new, high-quality fibres equivalent to virgin materials. AI and robotics are essential in scaling these processes, ensuring precision and efficiency in sorting and processing the complex stream of textile waste.

In conclusion, Industry 4.0 does not merely offer incremental improvements; it enables a systemic overhaul of the fashion industry. Connecting digital and physical systems, it creates a transparent, efficient, and responsive model where waste is no longer an inevitable byproduct but a design flaw that can be eliminated. The transition requires significant investment, but the potential reward is a future where fashion is not in conflict with the planet's health, but in harmony with it.

4.6. Foresighting the Effectiveness of 'Dress Recycling Projects' on the SDGs of the Arab World

A comprehensive dress recycling initiative in the Arab world directly advances a significant number of the United Nations Sustainable Development Goals (SDGs) by addressing environmental, economic, and social dimensions simultaneously.

Firstly, it directly addresses SDG 12: Responsible Consumption and Production. This is the core goal it impacts. The project tackles the entire lifecycle of clothing, promoting a circular economy that reduces waste. By encouraging recycling, upcycling, and clothing swaps, it directly targets the fashion industry's wasteful linear model, aiming to "substantially reduce waste generation through prevention, reduction, recycling, and reuse."

On an environmental level, the project strongly supports SDG 13: Climate Action, Buheji (2018) [3]. The fashion industry is a major contributor to greenhouse gas emissions. By extending the life of garments and reducing the demand for new production, the initiative lowers the carbon footprint associated with manufacturing, dyeing, and transporting new clothes. It also contributes to SDG 6: Clean Water and Sanitation and SDG 7: Affordable and Clean Energy by conserving the vast amounts of water and energy used in textile production, a critical consideration for the water-scarce Arab region. Furthermore, by diverting textiles from landfills, it reduces soil and air pollution, supporting SDG 15: Life on Land.

Economically and socially, the project fosters SDG 8: Decent Work and Economic Growth. It creates new green jobs in collection, sorting, repair, upcycling design, and retail within the sustainable fashion sector. By empowering local tailors, artisans, and designers, it promotes entrepreneurship and supports small and medium-sized enterprises. The charitable dimension of redistributing quality used clothing to low-income families and vulnerable communities, including refugees and migrant workers, directly tackles SDG 1: No Poverty by providing essential goods and SDG 10: Reduced Inequalities by fostering social inclusion. Moreover, by creating economic opportunities for artisans and designers, many of whom are women, it can also contribute to SDG 5: Gender Equality.

In conclusion, a dress recycling project in the Arab world is far more than a waste management solution. It is a powerful, multi-faceted intervention that weaves together environmental stewardship, economic innovation, and social equity, making it a potent catalyst for achieving a significant portion of the 2030 Agenda for Sustainable Development. Long and Nasiry (2022).

5. Discussion and Conclusion

5.1. From Waste to Worth: Dress Recycling as a Catalyst for a Sustainable Future

The case for dress recycling is compelling and urgent. As illustrated by the Circular Wardrobe case study, this specific focus within the broader textile recycling movement offers a viable and scalable model for addressing the fashion industry's waste crisis. The importance of such programs today cannot be overstated; they are practical mechanisms for reducing environmental harm, engines for local economic

development, and powerful catalysts for an essential change in how we view and value our clothing. In a world facing resource scarcity and climate change, supporting and expanding dress recycling is not just a choice but a necessity, weaving a new narrative for fashion that prioritises the health of our planet and its people. Buheji (2018) [3].

5.2. Measuring the Impact of the "My Clothes" Project

The impact of the "My Clothes" project is measured using a multi-faceted approach that quantifies environmental, economic, and social benefits. The foundational method involves calculating the total weight of clothing collected and multiplying it by established impact factors. For instance, in 2024, the project diverted 79,220 kg of clothing from landfills. Using a standard emissions factor, this achievement avoided an estimated 285 tons of carbon dioxide equivalents (CO_2e) from being released into the atmosphere. Furthermore, by reusing cotton items, the project saved an estimated 792 million litres of water that would have been consumed in the production of new cotton garments.

Economically, the project generates significant value. By diverting 79,220 kg of waste, it saved an estimated 23,766 UAE dirhams in municipal landfill disposal costs, based on a disposal cost of 300 dirhams per ton. Additionally, the collected clothing holds intrinsic market value. When calculated as 20 kg bags with an estimated value of 50 dirhams per bag, the total financial value of the reused and recycled materials reached 198,000 dirhams. Socially, this volume of collections, equivalent to 3,961 standard 20 kg bags, provided significant benefit to needy families. The project also thrives on community engagement, with contributions measured through volunteer hours, exemplified by an annual total of 200 hours from a dedicated team. Together, these metrics provide a clear and comprehensive picture of the project's substantial positive impact.

5.3. Role of Projects similar to 'My Cloth App' in Building a more Resilient Economy

Integrating Buheji's theory of the "Resilience Economy" provides a powerful and sophisticated lens through which to view the role of dress recycling in the Arab world. Buheji theory moves beyond mere sustainability to focus on building proactive, adaptive, and psychologically robust systems. Buheji (2018) [6].

A dress recycling initiative in the Arab world is not merely an environmental project; it is a practical manifestation of building a Resilience Economy. According to Buheji (2018) [6] resilience economics is about creating systems that are not just efficient but are antifragile—meaning they gain from shocks and volatility. This project aligns perfectly with this concept by transforming the "shock" of textile waste into an opportunity for community learning, economic diversification, and cultural reaffirmation. It moves beyond mere coping mechanisms to establish a self-reinforcing cycle of value creation that strengthens the community's ability to withstand future disruptions, whether economic, environmental, or social.

A core tenet of Buheji's theory is the conversion of "problems into projects." The pervasive issue of textile waste, exacerbated by high consumption patterns, is not seen as a terminal burden but as the foundational resource for a new economic stream. This waste becomes the raw material for upcycling enterprises, sorting facilities, and educational workshops. By doing so, the project builds systemic resilience by creating a circular model that reduces dependency on volatile global supply chains for new textiles and insulates the local economy from external price shocks and resource scarcities. It fosters a mindset of resourcefulness over mere resource consumption. Buheji (2018) [3].

Furthermore, the project directly contributes to psychological and social resilience, as it raises the capacity of the community vs. the demand for cloth waste, and this is the bedrock of a resilience economy, Buheji (2018) [6]. The act of repairing, redesigning, and swapping clothes is not just transactional; it is a capacity-building exercise. It revives practical skills (sewing, mending) and fosters creativity, problem-solving, and self-reliance. When communities engage in collective recycling or swap events, it strengthens social capital and networks of trust. This transforms citizens from passive consumers into active, engaged producers and stewards, which is crucial for a community's long-term ability to adapt and thrive in the face of change. Buheji *et al*. (2024) [7].

Finally, the initiative builds economic resilience by diversifying livelihoods and creating niche markets. It supports a new class of "resilience entrepreneurs"—local designers who specialise in upcycled modest wear, technicians maintaining recycling machinery, and managers of circular supply chains. This diversifies the economy beyond traditional sectors. By aligning with Islamic principles against waste, it also builds cultural resilience, grounding economic activity in deeply held values, Buheji (2020) [4]. This creates a more authentic and durable model than imported solutions, ensuring the project is not just accepted but cherished as a reflection of the community's identity and ingenuity, making the entire socio-economic system more robust and adaptable for an uncertain future.

5.4. Alignment of 'My Cloth App' with Sustainable Development Goals (SDGs)

The "My Clothes" application generates significant added value by directly contributing to several key Sustainable Development Goals. Its core function of collecting and redistributing used clothing actively reduces textile waste by extending the useful life of garments, thereby lessening the environmental and societal costs associated with waste management. Furthermore, the initiative serves as a powerful tool for raising public awareness and understanding of the circular economy, demonstrating a practical model of sustainable consumption. The application also expands the circle of beneficiaries by efficiently channelling resources to those in need, both locally and internationally. On an operational level, it builds a robust and analyzable database that provides valuable insights for strategic decision-making and impact assessment. Finally, by streamlining the donation process and creating clear volunteer opportunities, the application effectively motivates and facilitates broader community participation in social and environmental action, fostering a stronger culture of civic engagement.

The "My Clothes" app experience demonstrates that smart transformation is not just about adopting technology, but rather building a data-driven decision-making system that maximises environmental and social impact and improves resource efficiency. By applying a maturity model, a robust impact measurement methodology, and a phased roadmap, the Friends of the Environment Association can expand its impact and provide a national model that can be replicated in the nonprofit sector.

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