

Review

Are Australian Consumers Ready to Wear Recycled Clothing to Practice Sustainable Consumption?

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Abstract: This paper presents a comprehensive review of the extant literature to explore if Australian consumers are ready to reuse clothing as a pathway to sustainability. In this study, sustainability aspects such as collaborative consumption, apparel disposal methods, acquisition of used clothing, consumer concerns and attitudes towards reuse, and sellers' readiness to offer sustainable solutions to clothing consumption have been explored in the context of the Australian market. The most important research contribution of this paper is the answer to whether Australia is ready to adopt the reuse of clothing through remaking and repurposing as a sustainable approach for the consumption of clothing at its end-of-life (EOL). Facilitators and challenges for the secondhand clothing sector have also been discussed. The findings highlight challenges including consumer awareness, an unwillingness to use secondhand clothing, limited recycling facilities, the availability of brand-new cheaper clothing, and the limited range of secondhand clothing. The facilitators include government policies towards recycling, fashion brands' initiatives, and high-quality rejected clothing with the potential for reuse. It has been established that creating consumer awareness of secondhand clothing is essential to penetrate the market. Furthermore, there are ample opportunities to research consumers and the clothing reuse and recycling sector in Australia.

Keywords: recycled clothing; Australian consumers; sustainability; challenges; consumer awareness

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1. Introduction

Clothing represents approximately 60% of textile consumption, which is projected to maintain its share of usage at above 53% by 2025 [1]. Global production of clothing doubled between 2000 and 2015, due to increased per capita income and a growing middle class [2]. Over 50% of the fast fashion garments produced annually are disposed of within a single year [3]. Worldwide clothing utilization increased by 36% within the period 2000–2015 [4]. It is estimated that, of the textiles produced for clothing, less than 1 percent is recycled for reuse in the fashion industry [5]. Global statistics indicate an average recycling rate of 13% for total textiles, while the remaining 87% find their way to landfills. This may be attributed to increased clothing consumption and rejection, underutilization, and a lack of recycling efforts.

Insufficient recycling facilities, consumer attitudes towards secondhand clothing, and cost-related factors are among the obstacles to the reuse of secondhand clothing. Although some fashion brands such as H&M, Patagonia, Savers, and North Face have implemented recycling programs, there has not been a significant rise in consumer demand for secondhand clothing. The demand is limited to environmentally conscious consumers willing to reduce the impact of unused clothing ending up in landfills. Despite increased pressure to embrace secondhand clothing, the amount of research addressing consumer attitudes towards this sector remains limited. Therefore, this study raises the following research questions (RQ):

- RQ1: Why does the demand for refurbished, repurposed, and recycled clothing for reuse remain low in Australia?
- RQ2: What are the barriers to the use of secondhand clothing?

The exploration of the topic within Australia would be incomplete without reviewing the global status of clothing reuse and assessing its viability. This review paper has presented the research findings as is, without altering them to conform to the waste hierarchy's prevalent use of the terms reduce, reuse, and recycle. Furthermore, the paper outlines the literature review, research methodology, conclusions, and limitations.

1.1. Global Statut Status on Reuse

The Ellen McArthur Foundation reported in 2017 that underutilization of clothing and a lack of recycling results in over USD 500 billion of lost value per year. The report outlines a vision for the textile economy that follows the fundamentals of a circular economy. The aim of the new textile economy is to keep textiles (clothes, fabric, and fibers) at their peak value throughout the usage phase. These textile products are intended to re-enter the economy after use, never ending up as waste. The report further states that the linear model of utilization of resources has numerous negative environmental and societal impacts. It has been projected that in 2050 clothing sales will total 160 million tons, more than triple today's figure. Hence, it is critical to act beyond the current wasteful system of linear textile consumption. Each year, 87% of textiles are either incinerated or end up in landfills. In the business-as-usual scenario, the report estimates that in 2050, more than 150 million tons of clothing will be incinerated or sent to landfills.

The concept of 3R (reduce, reuse, and recycle) is gaining increased attention in the textiles sector [6]. Most recycled materials are not reintegrated into clothing production but are instead used in low-value applications, such as mattress stuffing, insulation, and industrial cleaning clothes. Recovering textile fibers for reuse becomes difficult after multiple cycles or lifecycles. With regard to the USD 100 billion worth of materials lost per year, recycling holds the potential to enable the industry to salvage some of this value, excluding any savings from avoiding the additional costs of landfilling and incineration [7]. Research has recommended that in order to minimize waste in landfills, and to reduce the production of virgin fibers, the reusing and recycling of textiles offers a sustainable solution [8].

Although chemical recycling methods can produce virgin-quality fibers, these technologies are not yet mature. Recycled materials constitute around 4% of the total raw materials used for clothing production, which is mostly polyester recovered from recycled PET bottles [9]. It is reported that between 2017 and 2023, the global extraction and use of virgin materials totaled more than that of the entire 20th century. The alarming rate of material extraction and use can lead to the early exhaustion of synthetic polymers. The recommended approaches to overcome this problem include using less, using longer, using repeatedly, and recycling infinitely [10].

1.2. The Case for Reuse

Summarizing the research conducted between 2000 and 2013 in Australia regarding consumers' clothing disposal behavior, it was concluded that consumers exhibited a preference for reuse and recycling over landfilling [11]. Moreover, clothing reuse has been a common practice for retailers such as Op-shops, Savers, and Salvation Army as well as through sharing among families and friends. Researchers [12] have concluded that, compared to the incineration and landfill of clothing, reuse and recycling have a reduced environmental impact. Also, the reuse of clothing has been found to be more beneficial than recycling [13]. Researchers emphasize that the design of a textile product should focus on prolonging its service life, which would enhance its chances of reuse [14,15]. A study focused on finding solutions to zero-waste clothing by repurposing secondhand garments using product design and production approaches found that approximately 40% of EOL clothing could be repurposed into new clothing items [16].

The pandemic had a significant impact on the consumption of secondhand clothing, leading to reduced demand and supply chain disruptions. Further consequences in the future might be increased used clothing consumption coupled with the influx of new cheap clothing, creating a substantial stockpile of used clothing in the developed world that would either be landfilled or incinerated. The decrease in demand for used clothing from African and Asian markets was one of the challenges identified in a case study by the French national program for managing post-consumer textile waste [17]. With legal restrictions on the export of textile waste to developing countries, developed economies were recommended to adopt a closed-loop circular approach to manage their textile waste [14].

Researchers have studied consumer attitudes, participation, and community-based approaches to the reuse of clothing. A paper that reviewed publications related to the 'reuse' domain over a period of 20 years proposed a framework for a reuse-based clothing value chain [18]. It was stated that consumer attitudes have the highest impact on the economic viability of a reuse-based clothing value chain. A study conducted in Ecuador focused on a single disposal method—the reuse of clothing—from the perspective that it is a consumer value-creation behavior. It was concluded that demographic variables, including age (younger individuals), gender (women), and socio-economic group (lower-income groups and students) influenced the preferences for clothing reuse. The study further found that altruistic individuals had a lower propensity to reuse clothing, creating ethical psychological value by transferring their clothing to others in need [19]. Other research has found that consumers are willing to actively participate in circular economy programs, helping promote events for the exchange of used clothes [20].

It can be observed from the above discussions that a substantial body of research has been undertaken to explore textile reuse and recycling. However, the question of why clothing reuse has not been embraced by Australian consumers to create a complete recycling industry value chain remains unanswered. This review paper investigates whether Australian consumers are ready for clothing reuse as a pathway to sustainable consumption. The readiness of Australian consumers to embrace clothing reuse has been investigated as a potential solution to large-scale clothing waste at EOL. The study aimed to explore the inclination of Australian consumers to reuse clothing and their preparedness to limit purchases within a circular economy model.

2. Review of Literature

Numerous studies have analyzed various aspects of clothing reuse and recycling, such as collaborative consumption, renting the runway, the acquisition of used clothing, and brands' readiness to offer sustainable alternatives to clothing consumption. However, as the issue of clothing waste generation and its disposal is local, it is important to study these aspects of clothing recycling from the Australian market perspective. There is a gap in the knowledge about the readiness of Australian consumers to accept reused clothing as a sustainable alternative to clothing consumption. This is evident from the articles and reports listed in the bibliography.

2.1. Research Methodology

This review paper has been prepared based on an examination of research papers collected from peer-reviewed journals between 2012 and 2023 containing the two major keywords "clothing reuse" and "recycling of clothing". Out of a total of 264 results, 49 articles were chosen from 27 journals and referenced in the review paper. Additionally, nine industry reports, one conference paper, and one newspaper article were also reviewed. The details of all the articles are outlined in the bibliography under the heading References. The list of articles and other sources used is provided in Table 1.

Table 1. Literature researched for preparing the article.

Journals (Number of Articles 49)	Industry Reports (9)	Conference Papers (1)	Newspaper Articles (1)
Sustainability (4)	Australian Fashion Council 2022 (2)		
Journal of Fashion Marketing and Management (12)	McKinsey & Company 2019 and 2016 (2)		
Journal of Cleaner Production (7)	The Circularity Gap Report 2023 (1)	33rd International Cotton Conference, Bremen 2016 (1)	The Guardian 2017 (1)
International Journal of Consumer Studies (3)	Circular Fibers Initiative analysis 2017 (1)		
Other Journals—23 journals (1 article each)	Ellen MacArthur Foundation 2017 (1)		
	Euromonitor International 2016 (1)		
	Textile Exchange 2020 (1)		

The selected research articles have been reviewed for insights into clothing reuse and recycling, and consumers' concerns, attitudes, and intentions. The recycling and reuse industry associated with secondhand clothing, the processes involved, as well as factors that facilitate and hinder the embrace of clothing reuse have also been reviewed. For any market operation to be viable and sustainable in the longer term, there must exist sufficient consumer demand for the product that can be met through the supply provided by sellers. This research will provide new knowledge about the readiness of Australian consumers for secondhand clothing, to enable sellers to invest in creating viable and scalable businesses. The review of literature explored the consumers and sellers, to ascertain if the consumers are the drivers of the circular economy. Furthermore, the processes involved in the secondhand clothing market together with consumers' perspectives on some of these processes, and an industry example, are assessed for their relevance to the Australian market. The facilitators and barriers to the secondhand clothing sector are also discussed.

2.2. Consumers: Need for Information, Awareness, and Policy

Educating consumers about the benefits of using repurposed clothing would be beneficial in tackling the problem of EOL clothing. This raises questions such as: could this be done through awareness-raising campaigns by councils, trade associations, and manufacturers to increase community acceptance of recycled clothing? Could a holistic approach be taken through the lens of institutional incentives, public–private partnerships, better marketing, and communication strategies across the textile value chain? Researchers have examined diverse aspects of sustainable clothing consumption among consumers, such as attitudes, behaviors, knowledge, and associations with collaborative consumption.

An article aimed at increasing knowledge around the sustainable consumption of textiles and clothing acknowledged that reuse and recycling are part of the solution. However, the fundamental challenge is to increase consumption, a goal that necessitates changing consumers' lifestyles and consumption behaviors [21]. Furthermore, the effectiveness of clothing waste recycling varies across different countries, due to consumers' limited knowledge of recycling and access to recycling channels. These factors influence consumers' recognition of recycling [22]. In a study in India, it was found that environmental consciousness directly influences consumers' purchasing intentions and their acceptance of circular textile products [23].

Consumer preferences and attitudes towards reuse have been studied by numerous researchers. A study that addressed the contamination issue in collaborative consumption concluded that, in the context of secondhand clothing purchase and rental, consumers preferred a business-to-consumer (B2C) setting rather than a consumer-to-consumer (C2C) setting [24]. A literature review conducted on the enablers and barriers of collaborative fashion consumption established that low prices and sustainability facilitated collaborative fashion, whereas hygienic concerns and ownership acted as barriers [25]. A study involving female consumers in the US concluded that to overcome the association of used clothing with inferior goods and the negative relationship between income and the purchase of secondhand clothing, retailers of secondhand clothing should enhance the presentation of

used clothing, enhancing its appeal. Alternatively, marketers should intensify their efforts to promote used clothing as a sustainable clothing option [26].

A previous study investigating female consumers' clothing disposal behavior in Australia and Chile revealed that consumers with a predisposition for clothing recycling are more likely to donate to charity rather than to gift items to friends and family. Contrary to these findings, another research project concluded that Australian consumers who are environmentally conscious prefer to pass clothing on to friends and family rather than make charitable donations [27]. A case study on male consumers in the US regarding modes of apparel disposal indicated that consumer donations represented the most frequently used method of disposal. Compared to other disposal modes of used clothing, the sales disposal mode was found to be the least preferred by consumers [28]. A Canadian study found that participants were actively seeking ways to dispose of clothing that extended its use and minimized its environmental impact. They demonstrated a willingness to donate, mend, and take items to recycling bins rather than landfill, which is the most convenient option. Municipalities might leverage this willingness to give EOL clothing a second life rather than be sent to a landfill [29].

2.3. Sellers: Complex Supply Chains for Local Solutions

Brands, retailers, and points of sale for secondhand/repurposed clothes represent the other end of the market and have been researched for their capacity and preparedness to offer sustainable alternatives to clothing consumption. Developing managerial competencies for innovation, supply chain integration, and collaboration with consumers is needed to manage repurposed clothes. Earlier investigations into the practices of fashion providers concerning clothing reuse and recycling in the post-retail phase identified the importance of engaging with a wider stakeholder group in finding sustainable approaches for EOL clothing. Companies applied secondhand retailing and product take-back schemes as strategies to address their responsibility [30]. A study involving a fashion brand that launched an in-store take-back program found that brands must confront internal and external issues. Challenges include limited internal expertise and capabilities among personnel, poor alignment of the initiative with the existing brand strategy, and low consumer interest [31].

To achieve environmental gains through collaborative consumption implemented through clothing libraries, it is important to substantially increase garment service life [32]. Researchers have provided economic sustainability support to the concept of clothing libraries by showing that microeconomic forces lead companies to choose the option of lower profits through participation in clothing libraries under a durability standard for clothing. This choice is preferable to the even lower profits that firms would earn if subjected to a monetary tax on clothing equivalent to the quantified environmental damage [33]. A case study of a large clothing recycling enterprise operating for 30 years in Poland revealed that, for developing circular business models, the main drivers are relevant regulations, technologies, digitization, managerial capabilities, and increasing consumer awareness of social and environmental concerns.

While the circular economy strives to transform the linear economy into one with a more ecologically and environmentally balanced approach, the practice of collecting and exporting to low-developed countries for extended use, where most of the clothing ultimately goes to landfills, is like delegating responsibility to an incompetent society. Technological innovation is required to promote upcycling and to reuse post-consumer materials for producing new products [17]. Research conducted in Australia to minimize clothing waste in landfills concluded that fibers extracted from fashion waste and treated with eco-friendly flame-retardant finishes could be used as filling material in children's mattresses. This could be a pathway to the sustainable reuse of clothing waste, diverting it from landfills and utilizing innovative technology in other products where flame retardancy is needed [34].

The complexity of supply chains and collaborations relating to the reuse model were identified as the main barriers [35]. Other barriers to clothing reuse models include consumer disposal practices, producer disposal practices, and recycling technologies, which restrict closing the loop [36]. Recent research in Sweden explored strategies for a circular economy model in the fashion industry, covering the three stages of take, make, and dispose. The findings indicate that brands must integrate these strategies across their complex and deeply interconnected supply chains, rather than limiting them to the waste management stage [37].

When implementing collaborative consumption business models, it is important to account for logistics, as there is a likely risk of shifting the problem: the benefits gained from reduced production can be completely offset by increased customer transportation [32]. A study of literature on sustainability in the fashion industry's supply chains underscored the importance of involving the entire supply chain and emphasized the value of enhanced collaboration between retailers and consumers for achieving better engagement. Furthermore, retailers are encouraged to work towards closed-loop supply chains, for better managing EOL waste [38].

An exploratory study in Sweden focused on the reverse logistics activities of clothing examined collection, sorting, and reuse. It found that in the presence of repairing and cleaning facilities, a large proportion of used clothes can be sent for reuse [18]. A study in Finland explored partnerships between firms in reverse supply chains and non-profit organizations for the value enhancement of EOL clothing and textiles. The study revealed that textile exports to developing countries produce emissions in transportation that diminish the net gains of textile valorization, thus emphasizing the need for the development of domestic valorization practices [39]. This study and its recommendations are of significance in the Australian context, where the Government has engaged stakeholders to help develop a National Clothing Product Stewardship Scheme.

2.4. Is the Circular Economy Consumer Driven?

Research over the last few years in the areas of clothing sustainability, circular economy, and consumer behavior has provided insights into consumers' concerns over transparency and consumer awareness, attitudes, and intentions. A research paper that claims to have investigated empirically for the first time whether consumers morally support the idea of a circular fashion economy concluded that consumers expect to see fashion businesses take greater moral responsibility for the products they make, before and after sale, compared to the moral responsibilities that individual consumers need to bear [40]. The change to a circular economy strategy is a result of a consumer trend towards sustainable textile consumption, which has been shaped by increased consumer awareness of the social and environmental effects of their decisions [41]. Sentiments of nostalgia have negative impacts on throw-away intention. Personal nostalgia relates to consumers being more inclined to keep and reuse products, and collective nostalgia relates to consumers being more inclined to donate and recycle products [42].

Research has found that consumers across different countries vary in their attitudes, behavior, and intentions towards the clothing circular economy. While donation is widely practiced among Canadian consumers, fashion consumers and non-fashion consumers manage their textile waste differently. Fashion consumers willingly participate in waste removal through reselling, swapping, or take-back. Although fashion consumers produce more waste, the rate of disposal to landfills is higher for non-fashion consumers (50%) than it is for fashion consumers (38%). This suggests that to minimize waste consigned to landfills, appropriate strategies need to be developed [43]. A study in Finland concluded that consumers perceive circular clothing as new, and although those consumers would not wear secondhand clothes, they would purchase circular garments. Providing value-neutral and fact-based information and transparency of the production process are essential to gaining the trust of consumers. The study further concluded that the availability of circular

clothing on the market, branded as luxury items and made easily recognizable with the creation of special editions, would be beneficial [44].

A study in Brazil that explored the relationship between personality traits and consumers' intention to purchase collaborative fashion concluded that innovativeness is a precursor to consuming collaborative fashion, recommending repair and revitalization services to engage such consumers. Moreover, consumers with higher levels of spending self-control are not inclined to consume collaborative fashion [45]. A study of Czech consumers revealed that respondents shared the pleasure of shopping for used clothes only with their family and friends. Meanwhile, affordably acquired secondhand clothes imported from the West allow people to negotiate the modern, more demanding, and fashionable workplace dress codes. These garments are culturally condemned as dirty and backward [46]. A study in The Philippines found that budget allocation and environmental value are the drivers for the buying behavior of millennials with respect to secondhand clothes [47].

A research project comparing traditional retail stores to secondhand fashion stores in the US found that secondhand clothing stores identify customers as their primary suppliers. Further, this study identified cheaper prices, value for branded products, great deals, and choice as the major reasons for shopping for secondhand clothing [48]. Collaborative consumption has witnessed the emergence of swap shops. A study explored swap shops in the UK, Finland, and Germany regarding the impact of customers as suppliers to the swap shops, and how this influenced fashion supply chain management. The study concluded that consumers were primarily concerned about the quality of clothes and the availability of suitable sizes, while the organizers' major concern was the uncertainty of merchandise [49].

Sellers should enhance electronic word of mouth (eWOM) since communication has a direct effect on consumer attitudes, engagement, and mindful consumption behavior toward secondhand clothes [50]. Research into consumers' greenwashing concerns, purchase intentions, and behavior has found that the relationship is negatively influenced by these concerns. Furthermore, consumers' purchase intention-behavior relationship is negatively impacted by aesthetic risk, though it is not influenced by economic risk. To generate a positive attitude towards sustainable clothing and a stylish perception of such clothing, a shift within consumers' mindsets is much needed [51].

This review article has explored the extant literature to investigate Australian consumers' readiness to reuse clothing as a pathway to sustainable consumption. There is a research gap in the Australian context and this paper addresses the same through a review of existing literature and offers findings that point towards further research. Based on the literature review, there appears to be a lack of research that discusses: (a) how clothing recycling markets can be expanded, (b) how community acceptance of reused clothing might be increased, and (c) how manufacturers might differentiate their products. Answers to these questions seem to have practical merits and offer solutions. Identifying technical and engineering solutions to textile recycling alone might not be sufficient to increase usage.

3. Processes Involved for Secondhand Clothing

It has been reported that the average Australian consumer purchases 27 kg of new clothing and textiles each year, out of which, 23 kg is discarded into landfills [52]. While we discuss below the processes involved in secondhand clothing, researchers studied the case of VTR (Vernooy Textile Recyclers) in Poland, one of the world's largest producers of secondhand clothing. VTR is well known for producing high-quality and stylish secondhand clothing directly from Western European wholesalers through its online store. Over a 30-year period, VTR has developed a position of strength in this industry.

VTR separates clothing and textile wastes using the most modern, fully computerized lines, able to process 500 tons of materials while assuring sustainability and quality standards, such as ISO 14001 (2015) [53] and ISO 9001 (2015) [54], respectively. Finished products are sorted and packed from 700 different assortment groups, with secondhand clothing

sold to over 70 countries and several dozen VIVE Profit stores throughout Poland [35]. The Australian clothing recycling industry can learn from VTR to restrict the disposal to landfills and exporting of EOL clothing. Could VTR Poland's processes and best practices help Australia develop a viable and sustainable reuse and recycling value chain?

3.1. Collection

As detailed below, the reviewed research indicates that consumers might drive the collection of EOL clothing. A research paper has highlighted challenges for operations management in developing reverse supply chains involving fast fashion firms and charities. Fast fashion firms can enhance their capacity to develop reverse supply chains by working with charities that have been the primary link in the supply chain for the collection and recycling of used clothes at their EOL. However, such a partnership has not yet been established as charities (1) prefer to sell high-quality used clothing to produce revenue and (2) consider that fast fashion companies produce low-quality products that are difficult to sell. The rise of fast fashion has significantly increased the flow of low-value returns, increasing logistical and sorting costs for charities. However, only a small fraction of their revenue-generating clothing is suitable for reuse [55]. Other researchers have similarly concluded that logistics forms a major component of business models predicated on collection and resale, such as secondhand clothing sales. Companies aiming to develop such business models typically face considerable costs for collection and sorting, while generating relatively low reselling revenues [56].

A study in Sweden concluded that with the growth in for-profit firms that offer financial incentives for used clothing, consumers may be tempted to sell their quality clothing, donating only lower-quality clothing to charities. This would result in even larger quantities of clothing being either exported or destroyed [57]. For the large-scale execution of circular business models, it is essential that reverse logistics—the return of EOL clothing from consumers—is implemented. It is recommended that collection systems for EOL clothing be established by clothing companies to enable reuse. Returned materials would be resold as used clothing, donated to charities, or recycled, with the consumer receiving compensation for each used item returned [41]. Researchers studied reverse logistics and concluded that the collection process could be improved with better access to collection bins and enhanced availability of inbound logistics. Furthermore, reverse logistics could be strengthened through greater public awareness of clothes collection opportunities. Moreover, an EOL clothes collection system driven by the government is needed [18].

3.2. Sorting

Research was conducted to determine the most appropriate sorting method for EOL clothing before undertaking remanufacturing. Specifically, clothes were sorted by: (1) category; (2) evaluation of worn-out condition (high, medium, low), and (3) selection by fiber used (cotton, linen, wool, synthetics). Results indicated that sorting by category maximizes the recycling rate. Remanufacturing costs are minimized by sorting by worn-out condition [58].

3.3. Repair and Washing

Repair is an indispensable element of the circular economy. Repair underpins the waste hierarchy components of reduce, reuse, and recycle. Repair enables reuse and the reduced consumption of new clothing. When repair is carried out by the initial garment owner, environmental gains are greater as the repaired item remains in their ownership for a longer period. As consumers are an enabler of the circular economy, it is essential to comprehend consumer behaviors such as repair [59]. Researchers anticipated that the sale of used clothing should not increase the number of clothing items that consumers possess but would instead substitute for new garment purchases. However, the substitution rate was often low as used clothes were not recognized as a high-value purchase. Moreover,

consumers continued with increased consumption levels by using resale as a justification to do so. This situation might be improved if repairs to damaged garments were more accessible, enabling garments to be used for longer [60].

In a commercial repair facility, sorted clothes are examined for damage such as holes, open stitches, and stains. Faults are repaired by skilled personnel before the clothing is ready for retail. Clothing is then washed and disinfected in industrial machines. A high-temperature washing cycle is recommended wherever possible to kill any bacteria. Any stains must be removed using special chemicals.

3.4. Ironing and Tagging

In the next step, clothing is ironed at an appropriate specified temperature. Cotton and linen, for instance, may be ironed at relatively high temperatures compared to synthetics. Following ironing, price tags and brand tags are attached, and the clothes are ready for retailing.

3.5. Retailing

Retailing is the process of selling a product to the final consumer. Secondhand clothes in Australia are most commonly retailed through brick-and-mortar retail stores. The demand for online retail has increased in recent years, particularly post-COVID-19. Research into the Swedish used clothing market revealed increased competition and profit-seeking as more for-profit firms enter the secondhand market, challenging charities that have traditionally dominated the sector. Research has suggested that, compared to for-profit firms, charities can better influence the transformation towards a socially just circular economy, as charity firms are legally required to reinvest profits. In contrast, some for-profit firms financially support their secondhand business models with revenue from the sale of new clothing [57].

4. Facilitators and Barriers for Secondhand Clothing

This section will discuss factors that facilitate reuse and the barriers to secondhand clothing use in the Australian context. To put the review paper in the context of the Australian market, clothing and textile industry, and recycling sector, we present statements and data from the Clothing Data Report and the Global Scan Report submitted by the Australian Fashion Council—the objectives of which are the formulation of a National Clothing Product Stewardship Scheme [61,62].

1. A report estimated the amount of clothing in use in Australian households at 3.75 times the yearly sales, i.e., 1.44 million tons, with an annual 5–8% increase in owned clothing.
2. Australia has some of the highest rates of donation among developed countries. Estimations based on customs data on new clothing imports and secondhand clothing exports report that charities receive 190,000 tons or over 720 million items of clothing annually.
3. The charity sector has 2676 outlets operating across the country, including St. Vincent de Paul's Australia 'Vinnies' (650 stores), the Salvation Army 'Salvos' (340 stores), Lifeline (120 stores), Save the Children and Australian Red Cross (178 stores), Anglicare, and others resulting in 51,000 tons of donated clothing to be used locally.
4. An estimated 62% or 105,900 tons of donated clothing is exported to developing countries, primarily as wearable clothing—to Asia, the Middle East, and Pacific nations.
5. Other than charities, an estimated 20,000 tons or 75 million units of clothing are contributed via a host of informal reuse channels such as online sales and family hand-me-downs.
6. No local monitoring of recycled fiber content in clothing was conducted. The National Product Stewardship Scheme will prioritize increased recycled content in clothing. Charities discard an estimated 14% or 27,000 tons of unwearable clothing, highlighting the need for developing fiber recycling for reuse.

Global research on the reuse sector has been focused on the Western world, and as a developed Western economy, Australia needs to research more in the sector. A systematic literature review of sustainable practices related to clothing waste at garment's EOL suggests that existing research mostly focused on Europe and the USA, which underlines the prospect for research into other regions [38]. The following section highlights the major facilitators and barriers for secondhand clothing.

4.1. Facilitators

4.1.1. Favorable Government Policies on Secondhand Clothing

Initiatives taken by secondhand clothing businesses and government policies are the major facilitators in the development of the reuse and recycling sector. A case study in 2018 examined the French national program for managing post-consumer textiles and clothing. It found France to be the only country that had implemented laws to enforce an extended producer responsibility (EPR) policy for EOL clothing. The EPR policy resulted in a threefold increase in the collection and recycling rates of post-consumer textiles, contributing to an average annual increase of 13% since 2006 [17].

4.1.2. Fashion Brands' Initiatives

Research exploring diverse circular business models noted that completely substituting widespread fast fashion consumption with alternative business models appeared distant. Responsible enterprises could offer repair services or assist consumers in learning how to perform 'do it yourself' repairs. This approach increases the likelihood of repairs being carried out before a garment reaches an unwearable state and is discarded [60]. The secondhand clothing markets in Western Europe have been led by charities such as the Red Cross and the Salvation Army. However, the conventional retail sector that primarily offers new and novel products to consumers has demonstrated a growing interest in selling secondhand goods e.g., Zalando and IKEA [57]. Researchers concluded that transforming the industry towards circularity through the establishment of take-back programs by brands is only one initiative. From a brand's standpoint, these initiatives need to be supplemented by strategies for circular design, slowing down consumption by offering repair, lease, and resell services, and waste management [31].

4.1.3. Availability of Quality and Cheap Clothing for Secondhand Purposes

The quality of rejected clothing in Australia is generally high, enabling it to be reused. The reusability of clothing depends on its quality in the EOL stage. In many developing countries, the quality of EOL clothing is not sufficient to enable reuse. As Australian consumers generally have the means to purchase new clothing, old clothing is often discarded prior to its EOL. Such clothing is easily collected due to stricter waste disposal regulations. As a result, recycling businesses can more readily collect secondhand clothing, facilitating the secondhand clothing market segment.

4.2. Barriers

Limited recycling facilities, consumer mindset, and awareness are the major barriers to the development of the reuse and recycling sector. Some of the factors are discussed in this section.

4.2.1. Consumer's Mindset towards Secondhand Clothing

Researchers found that the perception of corporate hypocrisy is a negative morally rooted feeling that emerges when consumers believe that fashion companies falsely claim to be circular [40].

Researchers found that although respondents conveyed no issues about purchasing other used items in the secondhand market, they were reluctant to purchase used clothes due to the perception of secondhand clothes as being of poor quality. The consumer mindset and level of awareness are not yet ready to accept secondhand clothing. Given

that Australian consumer demographics indicate the predominance of Chinese and Asian nationals, cultural influences inhibit the use of secondhand clothing.

4.2.2. Limited Recycling Facilities

There are a number of retail stores across Australia that deal with secondhand clothing. According to the Global Scan Report, while the Australian industry has limited capacity for the sorting, recycling, or remanufacturing of clothing, functioning charity organizations and for-profit firms drive the used clothing resale markets [62]. This can be attributed to the low profit margin in secondhand clothing, rising labor costs, and an increase in utility and rental costs which lead to reduced interest in processing secondhand clothing. Furthermore, establishing secondhand clothing processing facilities requires investment in infrastructure, technology, and the completion of lengthy legal documentation. As a result, secondhand clothing is often transported to countries in the Asian region and the Middle East for reuse and recycling.

4.2.3. New Clothes Available at Cheaper Prices

Many Australian consumers prefer to buy new clothing, as it is available at a price comparable to secondhand clothing. Some brands sell heavily discounted merchandise, often at a cheaper rate than secondhand clothing. Quality issues, hygiene concerns, durability, and fit-related issues influence consumers' purchase intentions for secondhand clothing. Concepts such as 'renting the runway' have been preferred by some consumers for specialty clothing, such as wedding apparel, due to their high cost and limited use.

4.2.4. Limited Range and Trend of Secondhand Clothing

In terms of product range, color, size, and fit, secondhand clothing is unable to meet consumer demand. Secondhand clothing is available only in limited quantities, sometimes just one piece that is in a specific size. Brand-new clothing, on the other hand, offers a wider range of products in different designs, colors, and styles. Furthermore, secondhand clothing does not represent contemporary fashion trends. The secondhand market is subsequently not a viable option for those who wish to keep abreast of recent fashion trends.

5. Conclusions and Limitations

Australian academia must lead research in the area of clothing reuse and recycling, and the willingness of consumers to reduce consumption. For Australian policymakers, who have initiated the formulation of a National Clothing Product Stewardship Scheme, it is imperative to address consumer awareness around reuse. The Australian consumer holds a pivotal role in the pathway toward sustainable consumption and the disposal of clothing at its perceived EOL. Questions about post-retail responsibilities must be asked of retailers and brands. Finally, success in averting EOL clothing waste and disposal via landfills and incineration will rely on the creation of a viable recycling value chain within Australia, with the objective of remaking, refurbishing, and repurposing clothing for reuse.

5.1. Main Findings and Recommendations

- (i) There is a need for research into the clothing reuse industry in Australia from the consumers' perspective. In particular, research into consumer attitudes, concerns, behaviors, and intentions needs to be conducted. Furthermore, the capacity of Australian consumers to limit their buying of new clothes as a pathway to sustainable consumption is a pertinent question that needs to be researched. This comprehensive review paper has explored existing research and has found that, while the reuse and recycling sector has been researched extensively in the Nordic countries, Europe, and the Americas, and more recently in China, there is a gap in research in this sector in Australia. Research into Australian consumer attitudes towards limited buying of new clothing and the embrace of used clothing as a conscious choice towards a pathway to sustainable consumption could be one of the areas that need more study.

- (ii) The reuse and recycling industry value chain needs to be developed in Australia. The processes followed for recycling secondhand clothing including collection, sorting, repair, washing, ironing, and tagging have been discussed. While Australia has a well-developed charity sector, a significant quantity of clothing is exported. Locally based solutions are imperative. The example of VTR in Poland has been discussed to investigate the capacity of the Australian industry to follow its lead in creating a local recycling value chain.
- (iii) Increased consumer awareness towards reuse through the use of secondhand clothing to help replace new purchases is needed. Several challenges relating to the use of secondhand clothing include consumers' mindsets for using secondhand clothing, limited recycling facilities, the availability of cheaper brand-new clothing, and the limited range of secondhand clothing in terms of style, color, and fit. Facilitators in Australia include favorable government policies, brand initiatives, and the availability of quality clothing at reduced prices in the secondhand sector. Creating enhanced consumer awareness for secondhand clothing remains essential.

5.2. Limitations

- (i) The scope of the study is limited to the clothing recycling value chain within Australia. The accumulation of clothing waste in this country is a problem requiring solutions that are practical and viable. Furthermore, while recycling through mechanical means is an established technology, chemical recycling is a nascent solution that lacks commercial viability and scalability. This study explores the recycling of clothing through the remaking and repurposing of salvageable clothing at its perceived end-of-life. The study is limited to examining clothing recycling operations within Australia that involve minimal manufacturing: the sorting of clothing, washing, cleaning, mending, and refinishing to make the clothes at their end-of-life reusable.
- (ii) The research cited in this review paper primarily covers the period from 2012 to 2023 and uses the terms reuse and recycling either in the same statement or at times interchangeably. As the concept of a circular economy has developed and a clearer distinction is being made between reuse and recycling, it is a limitation of this study that these two terms do occur within the same statements.
- (iii) Another major limitation of the review paper was the relative lack of research within Australia on the clothing reuse and recycling sector. This limitation opens up opportunities for future research.

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