Sustainability dichotomies of used clothes supply chains: a critical review of key concerns and strategic resources

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Abstract

Purpose – Used clothes supply chains are becoming increasingly complex, fragmented and less transparent due to rising volumes of discarded clothes and its dispersed reverse logistics operations across the Global North (GN) and Global South (GS). While it has a promising impact on circular economy and international trade growth, increasing exports of used clothes and overflowing landfills raise some negative concerns on its overall sustainability. This paper addresses the dichotomy that exists in terms of interpreting the sustainability credentials of used clothes supply chains.

Design/methodology/approach – A systematic literature review was carried out and 55 articles were examined to identify the triple bottom line (TBL) sustainability impacts of used clothes supply chains. TBL sustainability issues were identified, reflected through the lens of natural resource-based view and interpreted in the form of propositions.

Findings – The paper pinpoints seven TBL sustainability concerns and prescribes three sets of strategic resources required in glocal used clothes supply chains for mitigating these. These are (1) slowing the supply chain by tackling poor quality, overproduction and oversupply issues, (2) improving logistics/supply chain infrastructure and ecosystem collaboration and (2) embedding transparent environmental, social and governance (ESG) measures taken by both value chain actors and regulatory bodies, for embracing system-level sustainable development.

Originality/value – This is one of the first studies to analyse TBL sustainability of glocal north–south used clothes supply chains. The study is unique in terms of its scope and contribution to the sustainable supply chain literature.

Keywords Triple bottom line sustainability, Used clothes supply chain, Natural resource-based view, Glocal, Global North-South

Paper type Literature review

1. Introduction

The clothing industry, being one of the world's most polluting industries after food, housing and transport (EEA, 2019; GFA, 2020), has in recent years increased reverse logistics operations (e.g.

collection, sorting, reselling, recycling) in which the handling and value recovery of used clothes plays a vital role (Pal *et al.*, 2019; Sandberg *et al.*, 2018). Unlike reverse supply chains (SCs) of other consumer goods, such as that of electronic items, cars and toys which are operated either at local or regional levels, used clothes SCs are typically complex, globally dispersed and multi-tiered commodity chains consisting of fashion retailers and charities as the main collectors in Western economies or Global North (GN), as well as commercial sorters, resellers and recyclers in developing nations or Global South (GS) (Brooks, 2013; Pal *et al.*, 2019).

Historically, even though the global trade volume in used clothes SC represented about 0.6% of the clothing trade (Velia *et al.*, 2006), in recent decades this has substantially grown and is predicted to increase from US$ 96 billion in 2021 to US$ 218 billion by 2026 (ThredUP, 2022). This growth can be attributed to the rising production and consumption of fast fashion products, hence waste generation (Farahani *et al.*, 2022). While global trade has proliferated, for instance, exports from European Union (in GN) to African and Asian countries (in GS) in 2018 has been 1.5 million tonnes (3 kg per person) (Manshoven *et al.*, 2019), the second-hand market value in GN has also grown substantially, for example, in the United States it is estimated to grow from US$ 28 billion in 2019 to US$ 80 billion in 2029 (Farahani *et al.*, 2022), thus unlocking its glocal nature.

The above aspects make the sustainability impacts of the glocal used clothes SC dichotomous, and thus difficult to calibrate. On the one hand, the increase in production, consumption and disposal of fast fashion products in GN implies a promising trade growth in the used clothes to GS (Farahani *et al.*, 2022). Increasingly, the used clothes SC involves several for-profit actors, such as sorters, recyclers, traders and even retailers who engage in different reverse logistics operations, thus making it a commercial business (Pal *et al.*, 2019). In GN, traditional used clothes SC actors such as the non-profit organisations and charities have been a major source of job creation; for instance, in the United States, charities employ more than 10% of the domestic workforce, while the United Kingdom engages around 230,000 volunteers and 23,000 paid staff (Farahani *et al.*, 2022). The frequently disposed/donated clothes from GN also end up in the hands of the poor population in GS who cannot afford to buy new clothes; for instance, two-thirds of the East African population purchase at least a portion of their clothes from used clothes markets (USAID, 2017), leading to social sustainability spillovers. In recent times, thus used clothes SCs have increasingly gained traction with the rising priority of the textile circular economy (Hur, 2020; Shirvanimoghaddam *et al.*, 2020).

On the other hand, there has also been rising criticism of the clothing industry actors in the GN for their social and environmental impacts, specifically for their waste generation and exports of low-value textile "waste" to GS, often termed as dumping (Alonso-Almeida *et al.*, 2020; Farahani *et al.*, 2022). Consequently, there has been an open question as to whether the GN to GS used clothes trade really mitigates the environmental and social concerns of the clothing industry or is merely a greenwashing strategy to avoid the responsibility and costs of dealing with the problem of disposable clothes (Cobbing *et al.*, 2022). Nearly 40% of these exported clothes from GN to GS are of such poor quality that they are deemed worthless on arrival and end up dumped in landfills, rivers or are burnt in the open (Cobbing *et al.*, 2022). Other negative impacts reported include subverting the countries' own fashion economy in the GS (Katende-Magezi, 2017) and destroying native societies' traditional cloth cultures (Hansen, 2014).

An opportunity to minimise and avoid the negative impacts of glocal used clothes SC lies in managing triple bottom line (TBL) sustainability. TBL sustainability refers to going beyond delivering just economic value to include solutions that generate environmental and social values as well for a broader range of stakeholders (Elkington, 1997; Stubbs and Cocklin, 2008). From a sustainable SC perspective, managing TBL sustainability needs the development of sustainable practices by implementing life-cycle analysis, eco-balance, de-commoditisation, bottom of pyramid engagement and so forth (Gold *et al.*, 2013). In context to sustainable clothing SCs, Warasthe *et al.*'s (2022) review highlights that every fourth paper

incorporates all three dimensions of TBL sustainability; however, extant research on examining the reverse SCs of the clothing industry is sparse.

In addition, due to the glocal nature and complexity of the used clothes SCs, studies have been fragmented in terms of their geographical coverage spanning GN and GS, making TBL sustainability challenges less transparent (Norris, 2012, 2015). Given this limited systematic analysis, there is a dichotomy that exists in terms of interpreting TBL sustainability impacts of the GN-GS used clothes SC (Brooks, 2012; Cobbing *et al.*, 2022), which is the aim of this paper. There is a lingering question on how and up to what extent glocal used clothes SCs are sustainable, based on which we derive the research question: *What are the TBL sustainability impacts of the glocal used clothes supply chains distributed over global north and global south, and how can it be improved?*

To answer the research question, a three-stage literature review was carried out followed by a content analysis of 55 documents, thus revealing seven TBL sustainability concerns. We further clinically examine these sustainability concerns through the lens of natural resource-based theory (NRBV) to propose three sets of strategic resources which can help used clothes SCs improve its sustainability standing.

2. Methodology
To explore the TBL sustainability impacts of the glocal used clothes SC, a critical review was conducted in three stages. In the first stage, a systematic literature review (SLR) was deployed via various keywords and combined search strings in an explicit and reproducible manner for identifying and critically appraising relevant research (Snyder, 2019); in the second stage, bibliographical references in the paper corpus selected in stage 1 were scrutinised in order to identify additional relevant articles which were not picked by the SLR process. Finally, stage 3 drew upon grey literature search given the limited amount of research in the peer-reviewed literature specifically on the used clothes SC and its sustainability impacts.

2.1 Material selection
Given the industry-specific purpose of this review, and based on the coverage and disciplinary focuses of the databases (Gusenbauer, 2022), dedicated searches were employed on four academic databases: Scopus, Web of Science (WoS), EBSCO (Business Source Premier, Textile Technology Complete, and World Textiles) and ABI/INFORM. Relevant keywords combinations were initially employed before the final search criterion was broadened. For instance, Boolean word strings ["used cloth*" OR "secondhand cloth*" AND "supply chain"] and ["used cloth*" OR "secondhand cloth*" OR "used textile" AND "sustainab*"] yielded only 11 and 42 articles, respectively, in Scopus, proving that the subject of sustainability impact of the used clothes SC has received very little attention in scientific research so far. Finally, a broader scope of search string was used ["used cloth*" OR "secondhand cloth*" OR "used textile"], which yielded 495 articles in Scopus, 285 articles in WoS, 48 articles in ABI/INFORM and 27 articles in EBSCO. The searches were restricted to the title, abstract and keywords; year-wise between 1990 and 2022; peer-reviewed; and to only English language publications. After removing 297 duplications, the remaining 557 articles were first screened by reading their abstracts to exclude the articles that do not cover the topic of used clothes SC's sustainability impact, thus defining the unit of analysis. For example, most of the excluded papers focused on technical aspects of textile recycling or consumer attitudes towards used clothes. Finally, the first screened 108 articles were subjected to full-text reading to analyse their relevance to the TBL sustainability impacts, resulting in the exclusion of further 81 articles. For example, Sandberg *et al.* (2018) discussed the used clothes reverse supply chain, but without an explicit discussion on its TBL sustainability aspects, and thus was excluded. The inclusion and exclusion criteria are

summarised in Table 1. Overall, the SLR protocol prescribed by Tranfield *et al.* (2003) was used to ensure the objectivity of the study and methodological rigors.

Stage 2 included cross-referring to the 27 articles from stage 1, and hand-picking a set of articles deemed topically relevant (e.g. Imo and Maiyo, 2012). First, references of 27 articles were screened, and potentially relevant articles were selected according to their title match. Secondly, full-text reading was carried out, following the same inclusion/exclusion criteria described in stage 1, and thus final selection included 7 articles. Some of the possible reasons for these articles not featuring in stage 1 search was that these were not published in the listed journals of the selected databases or did not meet the keyword search criteria.

As a final stage, grey literature comprising of used clothes trade-, industry- and supply chain-specific practitioner-oriented reports, newsletters, blogs and other informal communications was reviewed. Grey literature search is a commonly used approach in management studies, and is increasingly recognised as an appropriate method to broaden the evidence beyond scholarly conversation (Adams *et al.*, 2017). As commonly used engine for grey literature search, Google was used by following the procedure explained by Godin *et al.* (2015). Unlike in SLR strategy, Google search requires combining several search strategies, using multiple search terms (Godin *et al.*, 2015), and therefore, different combinations of keywords indicated in SLR have been used in three search rounds [(1) used or secondhand clothing supply chain, (2) used or secondhand clothing sustainability, (3) used textile supply chain and sustainability]. The search was conducted on specific dates in April 2022. Due to the large yield in Google searches, it is suggested to rely on the power of relevancy ranking in Google search engines and to set the number of pages to be screened in advance (Godin *et al.*, 2015). Therefore, the retrieval was limited to the first 10 search pages, and the retrieved sources were scrutinised to judge their relevancy in two steps: first by screening the document title, and, secondly, by reading the full texts and reflecting on their appropriateness. This search resulted in another 21 documents, which included 12 industry and research reports and 9 web articles.

The overall PRISMA flow diagram is demonstrated in Figure 1.

2.2 Analysis
The data analysis framework consists of two stages. In the first stage, qualitative content analysis of the selected articles was carried out to code and categorise data (Dresch *et al.*, 2015). Contents of the 55 articles were initially aggregated into categories based on three priori coding derived from the research question (Stuckey, 2015), which are environmental, economic and social impacts. Initial coding was done by cutting and sorting relevant texts (environmental, social and economic impacts), and searching for repetitions under each category (Ryan and Bernard, 2003). Initial codes were further expanded by re-reading texts, searching for similarities and differences across units of data and sub-categorising based on their pros and cons with respect to GN and GS. Coded excerpts under each subcategory were

Inclusion criteria	Exclusion criteria
Listed Scopus or WoS databases between 1990–2022	Beyond the defined period
Articles written in English	Articles written in other languages than English
Research articles, books, chapters and conference papers	Articles that do not explicitly discuss TBL impacts of the used clothing SC.
Articles that present at least one aspect of TBL sustainability	Articles that focus on consumer attitudes, without targeting GN-GS trade
Source(s): Authors' own work	

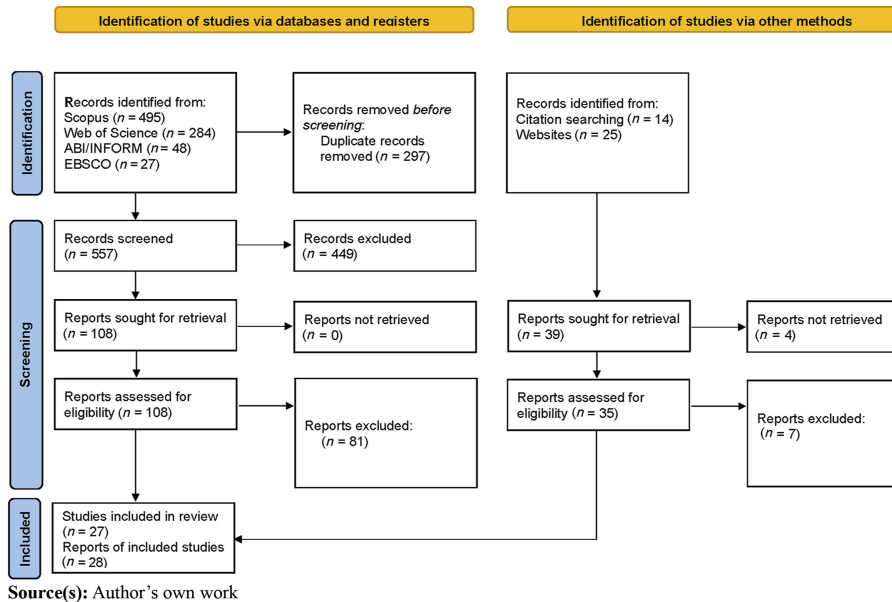Table 1.
Inclusion and exclusion criteria

Figure 1.
PRISMA flow diagram
of the 3-stage material
selection process

summarised using an excel spreadsheet and further evaluated to identify patterns and emerging themes. Secondly, by following an abductive approach (Kovács and Spens, 2005), thematic outputs of the first stage concerning cons were analysed with respect to an existing theory, NRBV, in order to identify and map possible future directions for improving TBL sustainability of the used clothes SC.

A summary of the review process is shown in Figure 2.

2.3 Descriptive statistics

Out of the final set of 55 documents, 47 focused on country-specific studies, while the remaining ones provided general overview of TBL sustainability impacts of used clothes SC (see Table 2). Majority focused on the used clothes SC in GS and specifically the African countries, a reason for which is Africa being a major destination market for used clothes exports from GN. For instance, according to Oxfam, 70% of donated clothing in Europe is estimated to end in Africa (Baraka, 2021). Historically used clothes donations has been targeted to least developed countries, and this trend continues even today when it has grown into a profitable business. Beyond Africa, other destination markets are little studied so far.

Figure 3 presents the year-wise distribution of all the publications over the years. Very little theoretical and empirical research has been carried out on the used clothes trade and its TBL sustainability impacts. While the highest number of publications were recorded in 2012, the topic looks almost neglected in the recent peer-reviewed literature. Out of 34 peer-reviewed articles selected for the study, *Textiles: The Journal of Clothes and Culture* has the highest number of represented papers (4), followed by *Geoforum* (2) while the other 28 articles represented one source each. The main reason for the spike in the publication of the topic in 2012 was due to a couple of special issues published in journals such as *Textile: The Journal of Clothes and Culture* and the *Journal of Critical Arts*. Other than the spike in 2012, this topic remained stagnant in the literature; this may be mainly due to the fact that used clothes
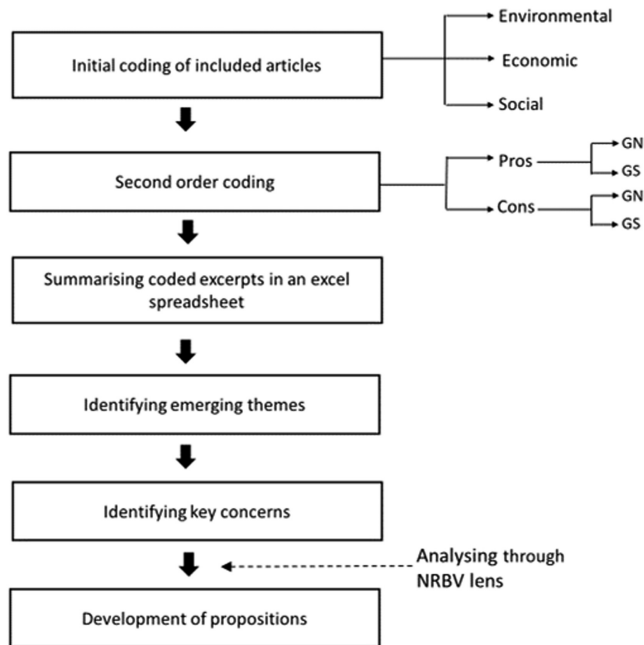
Source(s): Author's own work

supply chains are less transparent, operate on a global scale underpinned by complex, informal relationships and are mostly considered as an unorganised sector in the GS, and, therefore, there are difficulties in accessing empirical data. As Kinyua (2018) stated, stakeholders are not willing to disclose information due to feelings of contempt, insecurity and suspicion. These facts might possibly have affected the scholarly investigations.

Table 3 highlights the number of papers for each TBL sustainability pillar and primary research method followed by each of the article. Economic aspects are mostly discussed, while environmental concerns of glocal used clothes SCs are least highlighted. Regarding primary research methods, field studies and interviews are the mostly used methods to collect data, which are qualitative in nature. However, 5 studies drew secondary data from industry and government reports to provide a quantitative analysis of the trade statistics.

3. Environmental sustainability impacts of glocal used clothes SC
Used clothes SC has often been viewed as environmentally sustainable, yet concerns arise due to increasing GN-GS flows that contradict environmental sustainability.

3.1 Diverting wastes from landfills in GN
The fashion industry is driven by consumerism, which is excess spending and accumulation of goods, and clothes are often bought and discarded before reaching their lifetime (Hur, 2020). Clothing consumption is steadily increasing, for example, the amount of clothes bought per person in the EU has increased by 40% in the last few decades (Šajn, 2019); however, if the producer is not responsible for the end-of-use products, their destination would be landfills or incineration (Abraham, 2011). As such, the used clothes SC provides a market-based solution

Number of publications	Target country	Author(s)
8	**GS** - Africa (miscellaneous)	Baden and Barber (2005), Baraka (2021), Brooks (2015), Brooks and Simon (2012), Davis (2020), Fields (2005), Frazer (2008), Goldberg (2016)
7	**GS** - Zambia	Hansen (2004), Hansen (1994), Hansen (1995), (Hansen, 2000), Hansen (2003), Hansen (2008), Hansen (2014)
6	**GS** - East Africa	Cobbing *et al.* (2022), (Katende-Magezi (2017), USAID (2017), Wetengere (2018), Wolff (2021), Kuwonu (2018)
6	**GS** - Philippines	Isla (2013), Milgram (2008), Milgram (2012a), Milgram (2012b), Milgram (2012c), Milgram (2014)
4	**GS** - Kenya	Chalhoub (2012), Imo and Maiyo (2012), Kinyua (2018), IEA and MCAK (2021)
2 each	**GS** - Mozambique; India; Ghana	Abraham (2011), Brooks (2012), Brooks (2013), Norris (2015), Huang (2022), Kaledzi (2022)
1 each	**GS** - Rwanda; Ethiopia; Iran; Tanzania; South Africa	Haggblade (1990), Velia *et al.* (2006), Bazzi (2012), Calabrese *et al.* (2017), Khurana and Tadesse (2019)
	GN - Sweden and Estonia	Farrant *et al.* (2010)
	GN and GS - West Africa and Britain; the US and Mexico; Austria, Germany, and Morocco; Nordic, Poland, Malawi and Pakistan	Abimbola (2012), Gauthier (2007), Lampel (2020), Watson and Palm (2016)
8 in total	No specific countries	Bigsten and Wicks (1996), Gregson *et al.* (2016), Hall (2016), Nuwer (2014), Šajn (2019), WRAP (2012), (Lewis, 2015), Norris (2012)

Source(s): Authors' own work

Table 2.
Country-wise
distribution of the
article corpus
(descending order)
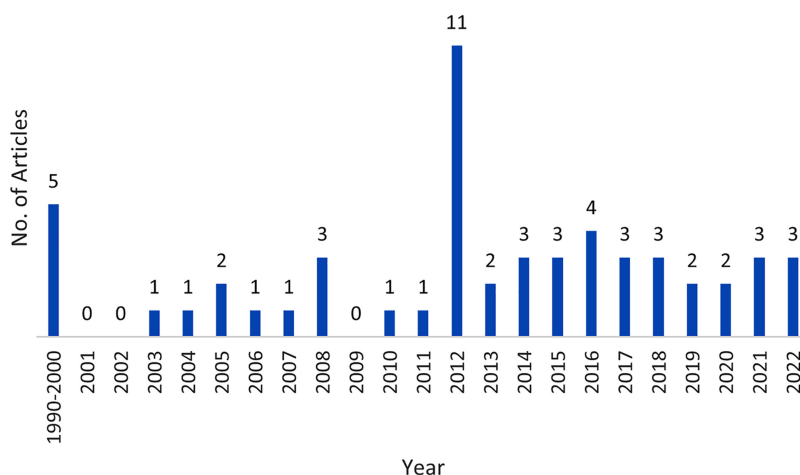
Source(s): Author's own work

Figure 3.
Distribution of articles
by year

for the management of post-consumer "wastes", which diverts reusable clothes from landfills and delivers clear environmental benefits (Norris, 2012), according to waste hierarchy model. The glocal SC starts with the consumers donating their unwanted clothes to charities or commercial collectors, which are then sorted; best-quality items are locally resold, and the rest are shipped to the GS, intending to be reused (Farrant *et al.*, 2010). For instance, over 100,000 tonnes of used textiles are collected in the Nordic countries annually and 71% of them are reused both locally and overseas (Watson and Palm, 2016). WRAP (2012) report estimates 540,000 million tonnes of unwanted clothing being collected annually in the UK for reuse, around 70% of which goes overseas. This way, extending the garment lifetime is much desirable as it contributes to sustainable and socially responsible fashion.

3.2 Resource conservation and emission reduction in GN and GS

Reusing discarded clothes displaces the purchase of new clothes to some extent, and thus reduces the requirement of virgin materials, energy, harmful chemicals and emissions that result from producing a new garment. Farrant *et al.* (2010) calculated that the purchase of 100 used clothes would save between 60 and 85 new clothes, a displacement factor between 0.6 and 0.85, resulting in a 14% reduction in carbon footprints from producing a new cotton T-shirt and 45% reduction in human toxicity for the polyester/cotton trousers. WRAP (2012) reported that by extending the lifetime of clothes by an extra nine months would reduce carbon-, waste- and water-footprints by about 20–30% each, and the resource cost by 20%. Exports of Nordic used textiles are estimated to give an annual net saving of 193,000 tonnes of CO_{2equiv} and 72 million cubic metres of water use (Watson and Palm, 2016). The carbon emission due to transportation of used clothes is found to be less compared to the carbon emitted during production of new clothes (IEA and MCAK, 2021).

3.3 Waste colonisation of GS by GN

Regardless of the well-documented environmental benefits of glocal used clothes SC, it is increasingly argued to be prompting environmental hazard in GS. Even though used clothes are shipped to be reused, there is limited transparency of their fate in GS (Norris, 2015). Today, the supply of used clothes between GN-GS is not driven by demand, but by the unsustainable consumption of fast fashion (Lampel, 2020), resulting vast quantities of fast fashion "waste" making its way to GS (Cobbing *et al.*, 2022). Wetengere (2018) argues that East African countries are becoming a dumping ground for used clothes because of the oversupply of out-grown, fast fashion clothes. The bales contain poor-quality, unsellable items that end up as "waste" in GS without being reused (Chalhoub, 2012). Such "waste"

Category		Count
TBL sustainability pillars	Environmental	19
	Economic	41
	Social	34
Research method	Field study	15
	Interviews	13
	Secondary data analysis	5
	Literature review	5
	Case study	4
	Survey questionnaire	4
	Other (web articles)	9

Table 3.
Publication count by
TBL sustainability
pillars and primary
research methods

Source(s): Authors' own work

trading is increasing between GN and GS to avoid the responsibility and cost of dealing with it in the GN (Cobbing *et al.*, 2022). This means used clothes that should have been disposed of in the GN now end up in the dumpsites of the GS, referred to as "waste colonisation", where high-income nations use their power and privilege to exploit the least developed countries by overflowing the used clothes markets with cheap and poor-quality fashion items (Huang, 2022).

3.4 Unregulated dumping in GS
When used clothes are not saleable in GS due to unsuitable styles, quality or size, and with no viable option for re-export, importers and traders are required to manage the disposal of excess clothing (Lewis, 2015). In absence of proper textile waste management system or infrastructure to dispose the massive "waste", these clothes are dumped everywhere (Cobbing *et al.*, 2022). Such clothes include toxic chemicals and microfibres that are released from polyester, causing soil and water pollution, and finally entering the human food chain (Cobbing *et al.*, 2022; Kaledzi, 2022). It is estimated that nearly half of the exported used clothes end up in dumpsites or are burnt in the open (Cobbing *et al.*, 2022). For instance, Ghana receives 15 million items of used clothes every week, but 40% is discarded in landfills due to poor quality (Kaledzi, 2022). On the outskirt of Accra, there is a 30 feet mountain of rotting discarded clothes that were once sold in high street shops in GN (Davis, 2020). Furthermore, it was found that more clothes bales go to landfills directly from ports than from markets (Baraka, 2021). To control excess waste, such landfills are lit on fire, which can last up to 11 months, releasing dark smoke and toxic emission into the air (Huang, 2022).

3.5 Encouraging wasteful consumption in GS
With the exponentially increasing flow of used clothes in GS, overconsumption is often encouraged as used clothes are widely available cheaply (Isla, 2013). Affordability provokes GS consumers to frequently purchase used fast fashion items, thus emulating Western consumer culture and style. Young consumers often search for used clothes due to the designer labels and brand names associated with them (Imo and Maiyo, 2012), while wealthy consumers often shop for branded used clothes and unique styles; for example, in the Philippines, upscale boutiques carry branded and vintage items for higher-class consumers (Isla, 2013). Overall, this implies that the used clothes SC has gone beyond supplying basic needs to promoting fast fashion and wasteful consumption.

4. Economic sustainability impacts of glocal used clothes SC
The main economic impacts of the glocal used clothes SC arise in the form of job creation and revenue generation, yet there is continuous criticism that it also undermines the local manufacturing base in a number of ways.

4.1 Source of revenue tariffs and jobs in GS and GN
Used clothes trade plays a vital role in bottom of the pyramid (BoP) employment generation and contribution to national GDP (Watson and Palm, 2016). The trade provides government revenues in GS (IEA and MCAK, 2021) and funds for local city councils by issuing trading licenses and renting stalls for the traders (Fields, 2005). For instance, the government income of East African countries from the used clothes trade is estimated at US$ 140 million per year (USAID, 2017). Trading licenses in Nairobi provide the second-highest income for the city treasury (Fields, 2005), import taxes in Kenya added up to US$ 15,000 per 40 ft container and the turnover tax is 3% of gross sales (IEA and MCAK, 2021).

Employment opportunities are created, both in GN and GS, along various used clothes reverse logistics processes, such as collection, sorting, packaging, transportation and trading. For instance, used clothes trade in the USA accounts for an estimated 150,000 jobs in the charity sector (Katende-Magezi, 2017). In the GS, used clothes SC employs nearly 5 million people (Fields, 2005), while East African Community partner state alone provides 355,000 jobs, which sustain 1.4 million households (USAID, 2017). Khurana and Tadesse (2019) provide an account of how used clothes SC in GS creates an estimated 87,000 jobs in Tanzania, 87,000 jobs in Uganda, 24,000 jobs in Senegal and 22,000 jobs in Rwanda. In Kenya, the used clothes industry employs more people than domestic manufacturers (Wolff, 2021). However, it has been highlighted that the used clothing trade adversely affected the local apparel production in GN and related employment opportunities; for example, between 1981–2000, Africa reported 50% decline in apparel manufacturing-related job opportunities (Brooks, 2013). The literature does not provide sufficient statistics to compare whether the loss of job opportunities due to the decline of local apparel production was reinstated by the opportunities created by the used clothing trade or not.

4.2 BoP business opportunities in GS

New business opportunities are created around the used clothes SC in GS, for instance, when used clothes traders employ tailors to repair, restyle or remake them (Abraham, 2011). Literature highlights that in many countries in GS, for example Philippines (Hansen, 2004), Kenya (IEA and MCAK, 2021) and India (Abraham, 2011), imported used clothes with a high potential sales value are remade into new clothes (e.g. dresses, shorts), packed and sold with fake brand labels. In Zambia, such refashioned clothes are produced by young, creative entrepreneurs in specific commercial spaces (Hansen, 2014). Repurposed clothes are either sold locally or exported back to GN. Mima-te, a Mozambican upcycling fashion brand, takes dresses from the Xipamanine market and remakes them into unique fashion clothes to have them re-exported to Germany (Brooks, 2015). Another start-up based in Haiti redesigns used clothes sourced from the local market and exports them to Canada (Lewis, 2015). Such small-scale initiatives show the potential for developing new BoP business opportunities that bring back remanufactured used clothes into the original markets.

4.3 Operational inefficiencies and inadequacies in GN and GS

Often used clothes SC traders in the GS face uncertainties related to quality and quantity of the bales, which lead to low-profit margins. Due to lack of standardisation in the reverse logistics processes such as sorting in the GN, there is high-level of subjectivity, and hence variability, in the quality of used clothes (Brooks, 2015). For instance, used clothes categorised as "grade A" quality by one sorter can be categorised as poor grade by another (Abimbola, 2012), and therefore, the level of quality is highly unpredictable (Abraham, 2011). Due to lack of procumbent information, importers do not get an opportunity to know what is inside the bale (Abimbola, 2012); thus, purchasing of a bale does not always lead to recovery of incurred costs (Brooks, 2012; Huang, 2022). Moreover, clothes are often found to be ripped, stained and dirty (Chalhoub, 2012); a study of Kenyan used clothes SC suggests that up to a quarter of clothes may be unsaleable (Baden and Barber, 2005). Importers most often hedge this risk by selling the bales to the local traders unopened (Hansen, 1994).

Additionally, lack of proper reverse logistics and waste management infrastructure in the GS often affects the business activities. Used clothes markets are less developed in terms of logistics infrastructure and consist of narrow roads and limited space for storage and trading. Chalhoub (2012) depicts the condition in the Gikomba market, the largest used clothes market in Kenya, undermined by unpaved roads, which becomes an unsuitable place to carry out the

business, especially in bad weather conditions. Absence of proper drainage system causes mud and overflow of water. There are still limited efforts from the local governments to support related infrastructure development due to the perception that used clothes trade in the long run undermines the local manufacturing industry.

4.4 Disrupted indigenous industry in GS

Used clothes imports have been argued by several authors to be undermining the local apparel manufacturing industry in GS (Baden and Barber, 2005; Velia *et al.*, 2006; Wetengere, 2018). Used clothes are considerably cheaper than locally manufactured clothes, which has led to closure of several garment factories in African countries (Brooks and Simon, 2012; Imo and Maiyo, 2012). Once used clothes gain the market share, it is impossible for local industry to emerge, thus disrupting the GS economy (Wetengere, 2018). In 1981–2000, Africa reported around a 40% decline in apparel production (Brooks, 2013), while in Kenya the number of large garment manufacturers has dropped from 110 to 55 between 1990 and 2006 (Goldberg, 2016). Another study highlighted that generalist tailors in Senegal had been wiped out by the imports of used clothes (Baden and Barber, 2005). However, Wetengere (2018) argues that sometimes used clothes can be as expensive as new ones, yet consumers tend to buy them due to the quality, fashion and brand image, an opportunity not offered by indigenously produced clothes (Calabrese *et al.*, 2017). The vast amount of used clothes supply can devastate the local industry in that case (Wetengere, 2018).

4.5 Fraudulent trade practices in GN and GS

Custom fraud is a common affair many times in glocal used clothes SCs that are less regulated. Often new textile and apparel items are passed as used clothes which can reduce government revenue and increased competition for low-cost new clothes (Baden and Barber, 2005). Poor regulation allows exporters to ship "waste", or undesirable items for African or Asian climate (e.g. heavy coats), which reduce profits of the retailers in GS (Brooks, 2015). Apart from that, smuggling of used clothes to officially banned destinations is evident, such as to Nigeria and South Africa (Brooks and Simon, 2012), Mexico (Gauthier, 2007) or Iran (Bazzi, 2012). These imports are not usually recorded in official statistics, but it is estimated that around 75–80% of used clothes imported to West Africa end up in Nigeria, while there is an unauthorised flow from the USA to Mexico, and nearly half of the total imports in Ghana and Senegal are undeclared (Baden and Barber, 2005). Re-exportation in GS is also observed, for instance, Mozambique to South Africa and Zimbabwe, regardless of the trade restrictions (Brooks and Simon, 2012). Individual "suitcase traders" are seen to be operating in GS, who transfer used clothes as their own garments across the border to large-scale traders who take advantage of corrupted custom officers (Brooks and Simon, 2012).

Because the used clothes business is profitable in GN, there are fraudulent practices associated with collection schemes such as fake charity bins, claiming that they are for the humanitarian relief or to protect the environment (Isla, 2013). In the UK, fake bins are kept in public places to collect used clothes that are later sold in second-hand stores or exported at a profit (Hall, 2016). The number of fake bins in New York City increased from 91 to more than 2,000 between the years 2010 and 2014 (Nuwer, 2014). It is hard to trace the legitimacy of many collectors because the used clothes collection schemes have grown substantially over the years, and various organisations have entered the business.

5. Social sustainability impacts of glocal used clothes SC

Beyond environmental and economic impact of used clothes SCs, social impact is of major significance. While used clothes SCs provide clothes for poor and marginalised people, the trade is not exempted from negative social impacts.

5.1 Basic need fulfilment in GS
Used clothes play a vital role in satisfying a basic need of low-income consumers, mainly in the least developed countries. Affordability is the main reason for used clothes purchase, as they are sold for around 10–20% of the original price (Baden and Barber, 2005). Data from Maputo demonstrate that the price of used clothes is 37.7% of new clothes (Brooks and Simon, 2012), and a used pair of jeans can be bought at as little as US$ 1.5 in Kenya (Goldberg, 2016). By 2017, two-thirds of the East African population purchased at least a portion of their clothing from used clothes markets (USAID, 2017), and in some countries such as in Ghana even more (closed to 90%) (Baden and Barber, 2005). It is estimated that total clothes consumption in Tanzania is 720 million per year, out of which 540 million pieces are used clothes (Calabrese *et al.*, 2017), while it accounts for 65% of all clothing purchased in Rwanda (Haggblade, 1990). Used clothes SCs provide these low-income consumers an opportunity to buy better-quality clothing at an affordable price (Hansen, 2004).

5.2 Social entrepreneurship at BoP in GN and GS
In GN, used clothes sorting facilities employ immigrant workers, thus being a source of sustenance. In the UK, for example, women working in sorting facilities often come from Eastern Europe (Lithuania, Bulgaria, Russia), West Africa and Pakistan (Gregson *et al.*, 2016). Sorting facilities in USA employ immigrants from GS (Hansen, 2000). Apart from that, many wholesale exporters of used clothes in GN are immigrants from Africa, India and Pakistan (Brooks, 2013). Used clothes SCs in GS engage a number of micro-entrepreneurs along various reverse value chain processes, such as in trading, distributing, repairing and remaking, thus allowing them to generate income and support their families financially at BoP (Abimbola, 2012; Khurana and Tadesse, 2019). Other indirect engagements are also evident, such as many people earning their living by preparing meals and tea for the traders in the used clothes markets (IEA and MCAK, 2021). This trade in GS also provides opportunities for women; in particular, nearly 60% of the traders of used clothes are women in several African nations mainly because the trade is accessible to anyone without formal training or initial capital, and thus entry barriers are low (Chalhoub, 2012; Fields, 2005; Milgram, 2008). This provides way for women to support their family income as well as to become self-reliant (Fields, 2005; Imo and Maiyo, 2012).

5.3 Growing consciousness of used clothes purchase in GN and GS
Consumer attitudes towards purchasing used clothes have changed considerably during the recent years, from being worn by poor to that of showing environmental responsibility and social accountability. Traditionally, the main reason for purchasing used clothes was low price point, but there is an increasing demand for quality, fashion and trend underlying used clothes (Chalhoub, 2012; Hansen, 2008), together showcasing environmental and social consciousness. For instance, two-third of consumers in the UK wear used clothes, which shows a significant willingness to reuse (WRAP, 2012). Even in GS, white-collar workers often spend time visiting used clothes stores and making purchases. This has also resulted in growing collaborative consumption in GN as product-service business models led by retailers and brands, such as leasing, renting, and swapping, are increasingly becoming popular among wearers.

5.4 Hygiene and health concerns in GN and GS
There is a concern in general that used clothes are unhygienic as these are often donated without being cleaned, and thus associated with skin diseases, especially undergarments and shoes (Bazzi, 2012). Some countries have banned the import of used clothes due to such

hygiene and health concerns, for example, Philippines (Hansen, 2004). In early-2020, Kenya also banned used clothes imports to prevent the potential spread of coronavirus (Kaledzi, 2022). Doctors warn that there are potential dermatological health risks associated with used clothes, such as skin candidiasis, scabies, body lice and ringworm (Kuwonu, 2018).

In addition, the physical well-being of the people engaged with used clothes SC operations is also a concern. Huang (2022) reported that when used clothes' bales arrive in Ghana, these are transported on foot between importers and retailers, particularly by women and girls as young as 14 years old. As a result, many suffer from chronic injuries in their back and neck in the long-term and risk their lives for a low wage without any social protection. In the GN's sorting facilities, workers often experience allergies to dust, skin problems, sneezing and running noses, because of handling dirty and soiled clothes (Gregson et al., 2016). Sorting is a physically demanding job leading to fatigue as it demands workers standing in the same place for 8–11 h continuously for handling, inspecting and classifying items (Gregson et al., 2016).

### 5.5 Workers' rights violation in GS and GN

Used clothes SCs face several labour-related issues including long working hours, poor working conditions and lack of support from the government. Employees in the GS are excluded from the mainstream economy and thus unsecured as they have little or no access to credit facilities, basic worker rights, training or government protection (Lampel, 2020). Due to the decline in the quality of bales, many traders face high amounts of debt over time (Huang, 2022). The sector is also hindered from reaching its maximum potential due to harassment from local authorities, and misconception regarding the importance of the sector (Chalhoub, 2012).

Similarly, in GN's sorting facilities, workers are paid less than the standard average. For example, sorters in the UK sorting facilities are paid £ 5.73 per hour, resulting in a take-home salary of less than two-thirds of the UK median average (Gregson et al., 2016). Sorting facilities in the USA are equipped with poor working conditions and low wages as well, with the majority of the sorters being recent immigrants from GS (Hansen, 2000; Norris, 2015).

Figure 4 presents a summary of the TBL impacts of the glocal NS used clothes SC, and the key sustainability concerns that emerge.

6. Integrating natural resource-based view for critical examination of key sustainability concerns and proposing strategic resources

NRBV responds to the growing need for ecological and societal developments in business operations and is composed of three integrated strategies of pollution prevention, product stewardship and sustainable development (Hart, 1995; Mcdougall et al., 2019). In the NRBV, opportunities and threats derive from ecological and societal issues to form sustainability resources for competitive exploitation (Mcdougall et al., 2019). The three interconnected strategies of NRBV recognise pollution prevention as a resource that promotes minimisation of waste and pollutants (Hart and Dowell, 2011), product stewardship as an approach to enable sustainability throughout the life cycle, and sustainable development by seeking economic and social development in GS striving to achieve global equality (Hart et al., 2016). Weaving NRBV within sustainable supply chain management allows underpinning the implementation of sustainability for competitive gain, and firms to tailor sustainable operations to suit their needs (Johnsen et al., 2014). This way, NRBV supports uptake and management of sustainability within SCs while providing practical applicability and contextualisation of NRBV (Golicic and Smith, 2010), resulting in bridging theory-practice gap (Hart and Dowell, 2011).
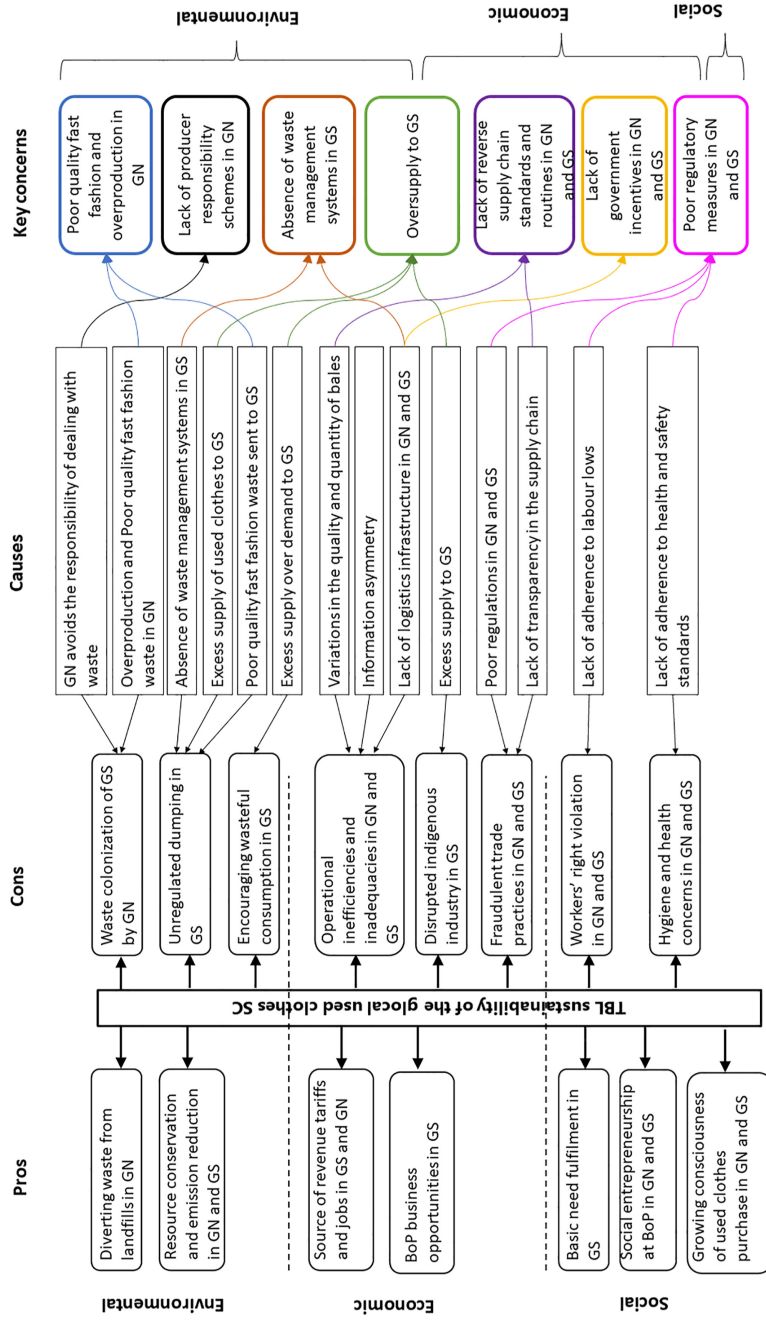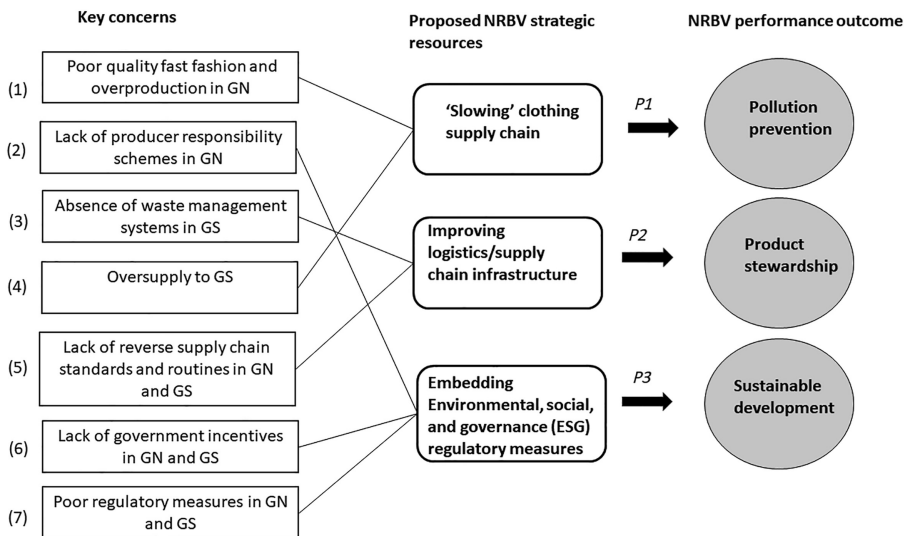
Figure 4.
TBL sustainability
impacts of the glocal
NS used clothes SC

In the used clothes SC, characterised by the GN-GS spread of its multi-tiered "system of provision" (Fine, 2002; Pal *et al.*, 2019), the key sustainability concerns relate to complex TBL issues, such as low share of collected clothes, low fraction of reusable clothes, low quality/value of recycled clothes, high waste dumping, high degrees of fraudulent practices and social risks, to name a few. Hence, TBL sustainability concerns tend to be increasingly stemming from the underlying deficiencies in the inherent structures, relationships and governance underlying the used clothes SC, and effective response can only be achieved by proper coordination and preparation of GN and GS. Given this, NRBV proves to be useful to insert in clinically examining the used clothes SC operations and practices, as it helps to understand the pros and cons of it, and what strategic resources need to be devised to mitigate these.

In this context, our review identified seven key TBL sustainability concerns that emerge from glocal used clothes SC (Figure 4) and how these can be mitigated by better planning of three strategic resources in line with the NRBV theory. Figure 5 illustrates the interconnection of the NRBV theory to the key concerns through proposal of three resources that could facilitate improving TBL sustainability in the used clothes SC.

Pollution prevention, the first NRBV strategy, attempts to reduce emissions using continuous improvement methods (Mcdougall *et al.*, 2019). In context to used clothes SCs which is undermined by high volume of poor-quality items being shipped from GN to be dumped as "waste" in GS (concerns #1, #4), pollution prevention is pre-emptive. In fact, the used clothes SC must be a solution to growing amount of discarded clothes rather than creating an extra burden for sustainability efforts. Exporters should not ship "waste" from GN to GS if these cannot be valorised, that is, processed or resold. Pollution is nothing more than a form of waste, which can be eliminated with the improvement of quality (Hart, 1995).

The quality management approach requires continuous support from environmentally conscious clothing brands and retailers, together with other stakeholders, to develop a "slow' clothing system, which focuses on creating low-volume, yet high-quality, durable clothes (Niinimaki *et al.*, 2020), which, in turn, can avoid the oversupply of poor quality used clothes

as "waste" from GN to GS. Otherwise, the glocal used clothes SC is overwhelmed by the never-ending supply of poor-quality discarded items because the existing markets are not capable of absorbing the excess produced by the clothing industry. Exporting used fast-fashion clothes to GS does not appear to solve the problem of sustainability, but aggravates it by accumulating waste in GS and creating greater environmental and social impacts (Alonso-Almeida *et al.*, 2020). A viable solution is to slow down the entire SC by designing durability/longevity to enable all clothes to go through their maximum potential use life. We propose:

P1. TBL sustainability of the glocal used clothes SC can be enhanced by "slowing" its throughput, and by addressing the quality, overproduction and oversupply concerns.

As a product stewardship strategy of NRBV, firms are required to minimise the life cycle environment cost of their product-process systems. This can be achieved through three strategies: exiting environmentally hazardous businesses, redesigning existing products and developing new products with low-life cycle costs (Hart, 1995). Rather than exporting used clothes from GN to GS – a mere risk hedging approach – it is pre-emptive for the used clothes SC actors to take responsibility in improving the reverse logistics infrastructure for handing "waste" in a standard and efficient way (concerns #3, #5), and in close collaboration with an ecosystem of stakeholders that includes governments, NGOs, collectors, sorters, manufacturers, brands and traders (Pal *et al.*, 2019). However, currently, such public-private partnership (PPP) is minimal with limited government interventions (concern #6).

In response to these concerns (e.g. in Cobbing *et al.*, 2022; Chalhoub, 2012), development of a well-connected reverse logistics infrastructure to collect, sort and supply used clothes for appropriate reuse and recycling is necessary. Recent investigation of European textile recycling ecosystem (see Mckinsey and Company, 2022) highlights how PPP can play a vital role in this regard, by promoting collaboration among various stakeholders and the government to develop a joint action plan. This can work well when private sector funding and technology combine with public sector incentives such as tax exemptions (Hodge and Greve, 2017); more specifically, PPP is effective in solving supply chain issues (Samii *et al.*, 2002). Government and legislative systems that offer incentives are vital to make reverse logistics operations economically viable for all supply chain players (Heydari *et al.*, 2017). In response to the EEA Directive that requires separate collection of textile waste by 2025, Hole and Hole (2020) highlight the importance of introducing incentives for collection, sorting, transportation and recycling of textile waste. In this case, government can work as a facilitator and a motivator for SC partners to conduct effective reverse logistics operations (Heydari *et al.*, 2017).

Since the forward-thinking clothing retailers/brands are looking for ways to mitigate the problem of post-consumer "waste" and the governments are exploring the possibilities to address environmental impacts, facilitating infrastructure development through PPP in the used clothes SC can enable TBL sustainability of the trade. PPP can collaboratively develop market-driven business models to achieve product stewardship of the glocal used clothes SC. Hence, we propose:

P2. TBL sustainability of the glocal used clothes SC can be enhanced by improving reverse logistics infrastructure, public-private partnerships and funding.

Sustainable development strategy of the NRBV involves reducing negative links between environmental and economic activities by (1) recognising the link between material consumption in GN and environmental degradation in GS, and (2) building markets in GS while reducing the environmental burden created by new economic activity (Hart, 1995). Glocal used clothes SCs are often called sustainable, yet it could simply be interpreted to be greenwashing and increasingly a convenient way to offload the overproduced and

overconsumed clothes from GN (Baraka, 2021; Huang, 2022), in the absence of environmental responsibility and social accountability measures taken both voluntarily by SC actors (concern #2) and mandatory schemes laid by governmental institutions (concern #7).

Policymakers need to pay attention to the challenges of the glocal used clothes SC and understand what characteristics lead to the TBL sustainability of the trade. For instance, European Commission is currently preparing towards a mandatory Extended Producer Responsibility (EPR) for textiles, which aims to restrict export of textile "waste" and incentivise local valorisation of textile "waste" in Europe, which can positively contribute to achieving sustainable development of the used clothes SC (European Commission, 2022). Clothing retailers should be obligated to formulate new business models through the introduction of such EPR schemes.

Beyond these regulatory nudges, the used clothes SC actors should also adopt appropriate environmental, social and governance (ESG) approaches, which have gained prominence in objectifying targets for reducing environmental pollution and contributing to an ethical supply chain (Dai and Tang, 2022). The used clothes SC actors should take into consideration appropriate ESG approaches that bring sustainability credentials to SC practices. For instance, retailer-based initiatives such as take-back systems and offering in-store facilities for re-purchase can increase the rate of local reuse to facilitate regional circularity. Furthermore, sorting and remanufacturing operations can be extended globally by exploring value-adding possibilities in GS together with recycling facilities for low-grade clothes, which can reduce landfills in GS. Shifting such operations that incorporate the workforce from GS can contribute to advancing TBL sustainability. We propose:

P3. Glocal used clothes SC can embrace system-level sustainable development by embedding transparent ESG measures taken by both value chain actors and regulatory bodies.

7. Conclusion

Our study contributes to the ongoing investigations on TBL sustainability of the burgeoning glocal used clothes SC operating in and between GN and GS, by clinically examining the pros and cons of the impacts of its current operations. This leads to deriving seven key concerns that currently undermine the TBL sustainability, and subsequently proposing three specific strategic resources in line with NRBV theory. Although extant literature has identified several pros and cons of the glocally distributed used clothes SCs (Abimbola, 2012; Norris, 2015), largely due to the dichotomy persisting in terms of clarifying whether its practices facilitate or challenge TBL sustainability, research has till date not been able to take an explicit stance towards identifying clear strategic resources that are necessary to be undertaken.

The findings suggest that pollution prevention should be considered as a more important aspect of the GS, while product stewardship can play a prominent role on the GN supplier side. Focus on downstream waste reduction to create key pollution prevention capabilities can promote environmental performance in the GS, while product stewardship can have a positive influence on economic performances. This study also points out that due to weak regulatory measures, environmental and social impacts along used clothes SC are largely neglected. Therefore, it is important that governments impose laws and regulations to drive sustainability of used clothes SCs. Even though used clothes SCs started with the intention of improving livelihood and reducing poverty in the GS, these findings reveal that it is no more considered as a strong driver because used clothes SC has become more commercialised. BoP social entrepreneurship rather evolved implicitly. With a significant portion of world's population still living in poverty, stronger level of entrepreneurship orientation around used clothes SCs can positively contribute to influence sustainable development in the long-term.

By contextualising these key TBL sustainability concerns within the three interconnected strategies of pollution prevention, product stewardship and sustainable development

proposed by NRBV theory (Hart, 1995), our study shows how TBL sustainability can be designed in glocal used clothes SCs by:

(1) slowing the clothing SC by tackling poor quality, overproduction and oversupply issues,

(2) improving logistics/supply chain infrastructure and ecosystem collaboration and

(3) embracing system-level sustainable development by embedding transparent ESG measures taken by both value chain actors and regulatory bodies.

Thus, we were able to provide a nuanced examination of the dichotomy that arises while interpreting the sustainability of glocal used clothes SCs and propose a set of NRBV strategic resources to tackle these key concerns.

7.1 Theoretical and managerial implications

By presenting a comprehensive analysis of TBL sustainability of used clothes SCs, our study is not only summarising the key sustainability concerns in a structured way, that is across contrasting economic geographies (GN and GS), but also illuminating the spillover effects of GN occupation on GS. In addition, the paper also proposes a set of possible actions to mitigate such sustainability concerns, which have not been distinctly identified in previous literature, by drawing upon NRBV theory.

From a SC management perspective, our findings provide a means to understand the different levels of strategic resources required to mitigate the sustainability concerns, and design and manage more sustainable SCs, through the lens of NRBV. We thus shed light on how SC management literature can gain from operationalising NRBV strategies. By applying NRBV theory to examination of a complex reverse supply chain, as studied here, we broaden its scope and applicability in reverse SC operations and its sustainability domain.

From a practitioner's perspective, our study is particularly important because clothing waste is growing in the GN with a significant spillover effect on the environment in the GS. Thus, the paper provides meaningful insights to actors engaged with the used clothes SC. First, we provide a concise understanding of all TBL sustainability concerns emanating from activities of the used clothes SC actors, and what strategic resources are crucial to mitigate these in order to improve sustainability performance. Second, through our developed propositions, we prescribe a set of actions by which the actors can create sustainable SC practices by enabling higher degrees of collaboration within and beyond the system boundaries to achieve system-level gains, balancing power struggles between upstream and downstream players, deciding on investment portfolio in environmentally sustainable practices in developing and developed economies and so forth. Finally, the paper also highlights the necessary interventions required by governments and inter-governmental organisations in playing a regulatory role in controlling the exploitation of sustainability of used clothing SCs, and PPP that can help to work synergistically to achieve better sustainability performance.

7.2 Limitations and future research

This study entails a few limitations. Both theoretical and practical contributions are limited by the conceptual nature of the study. Importantly, this study does not seek to provide a framework for competitive SC strategies; rather, it defines the capabilities required to execute pollution prevention, product stewardship and sustainable development. The propositions emanating from our study are not empirically verified yet serve as a first step of a broader research agenda for the NRBV in used clothes SCs. SLR findings are more biased towards African countries as peer-reviewed articles on this topic coving various geographical regions are limited, and therefore, results may show a bias view. More empirical studies are required to provide wider scope of

insights and knowledge that supports better understanding of the topic and categorisation of data. LCA studies can be carried out to determine environmental impacts, and case studies can be a valuable data source to understand social concerns. Future research should also include multiple stakeholders and various geographical locations. While this study is built on NRBV theory, other useful theories can be explored to bring new insights into the used clothes SC.

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