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Ghanaian Kente Weaving As An Epitome Of Environmental Sustainability And Resource Efficiency

Boateng Solomon[1], Korang Dartey Danie[2], Elizabeth Danso Baafi[3], Abigail Nkansah[4]

[1,2,3,4]Faculty of Built Environment and Applied Arts, Sunyani Technical University

Abstract

Purpose: The study explores how traditional Kente weaving in Ghana serves as a model for resource efficiency and environmental sustainability. The study looks at how indigenous Knowledge systems and cultural values promote waste minimisation and material reuse in the circular economy's principles.

Design/Methodology /Approach: Three important weaving communities (Bonwire, Adanwomase and Agotime -Kpetoe) were selected as a case study for the fieldwork using the qualitative methodology. Primary data were gathered through semi-structured interviews with master weavers and in-person observation of workshop practices. Data was evaluated thematically to find patterns of material reuse, waste minimisation and cultural models that aligned with environmental sustainability

Findings: The findings of the study show that circularity is essential in kente weaving as weavers use manual wooden looms and repurpose cotton or silk yarns. Plant-based dyes such as indigo are usually used for dyeing, replacing synthetic ones. Durability is reinforced by cultural values as each pattern has a symbolic meaning that promotes cautious stewardship. However, according to artisans, cheap imported clothing or pirated kente fabrics, declining traditional knowledge, and a lack of institutional support pose a threat to these practices.

Originality/ Value: This paper offers a fresh perspective by enclosing Kente as a model of circular economy, resource-efficient. By linking cultural heritage to sustainability, it offers new insights for textile design and policy. The study recommends that embedding traditional knowledge and values can guide sustainable fashion initiatives.

Keywords: Ghanaian Kente weaving, Environmental sustainability, Resource efficiency, circular economy and indigenous Knowledge

Introduction

There is a global concern about the environmental effects the textile and fashion industries are causing, especially waste production, pollution and excessive resource usage (Singh et al., 2025, Benhatta et al., 2025, Leal Filho et al., 2024). According to Leal Filho et al. (2024), these industries contribute greatly to greenhouse gas emissions and water contamination, which is made worse by linear production models and a fast fashion attitude that promotes disposability. A linear economy acts as a revolutionary framework that promotes longevity, regenerative practices and resource efficiency throughout the supply chain

(Macarthur and Heading, 2019). Though the majority of the circular economy still focuses on industrial advancements and technical transformation, the potential contributions of the indigenous knowledge system are gradually gaining attention, particularly in the Global South(Muwanga-Zake and Kibukamusoke, 2024, Lam et al., 2020).

Traditional African crafts have garnered scholarly attention within this larger sustainability framework because of the ingrained cultural practices and low-impact production methods that promote environmental stewardship (Brown and Vacca, 2022). One such custom is Kente weaving, which is an indigenous textile technique that is historically rooted in the Ashanti and Ewe cultures of Ghana. Kenete weaving has transcended its ethnocultural origins to become a national and global icon because of its symbolic significance and ceremonial use. However, aside from its historic significance, Kente weaving is a prime example of environmentally conscious production techniques that fit in well with circular economy principles like hand-looming, natural dye usage, and reuse of leftover yarns.

Despite these attributes, there remains limited empirical research that looks into Kente weaving through the lens of resource efficiency or environmental sustainability. The study focuses on renowned Kente weaving communities such as Bonwire, Adanwomase, and Agotime- Kpetoe which are known to be the keepers of genuine Kente fabric. The study explores how these communities operationalised resource efficiency in their weaving practices via qualitative fieldwork, which includes semi-structured interviews and production site observation. By placing this methodology within the framework of CE theory and sustainability discussion, the study seeks to address a critical gap in the literature. This gap is the marginalisation of indigenous textile practices within the mainstream CE models and policy framework.

The research aims to 1. document and analyse the environmentally sustainable practices that are embedded in traditional Kente weaving, 2. to assess the extent to which these practices adhere to CE principles; and 3. Provide policy-relevant insights for integrating indigenous crafts into more understandable, sustainable development strategies.

2.0 Literature Review

2.1 Cultural sustainability and Indigenous Textile Systems.

The importance of culture in sustainable development is increasingly gaining more attention lately. Some researchers revealed that aside from social, economic and environmental factors, cultural factors as the “fourth pillar” of sustainable development(Sabatini, 2019, Soini et al., 2015). (Bardhan and Bhattacharya, 2022) assert that traditional craftsmanship and historical practices are seen as valuable resources that promote resilient communities and sustainable livelihoods rather than just being cultural artefacts. In the Ghanaian context, Asante and Ewe kente weaving customs are maintained by festivals and community norms, strengthening cultural identity and transmitting

valuable knowledge. Cultural practices and symbolism, such as those found in kente motifs, foster values of stewardship and intergenerational equity(Oguamanam and Yeboah-Appiah, 2024, Adeloye et al., 2023, Badoe and Opoku-Asare, 2014). Thus, research on cultural sustainability has indicated that practices such as kente weaving can nurture attitudes that prioritise the preservation of resources over the long term.

2.2 Circular Economy principles in textiles

The circular economy framework has particularly gained prominence in the textile and fashion industries as a counterbalance to the linear: take-make-dispose production models. Ellen Macarthur Foundation (2021) posited that, through reuse, repair, remanufacturing and recycling, CE encourages the preservation of resources and products at their maximum worth. Although much CE research focuses on technological

innovation and industrial recycling, Ghana's established textile customs and unofficial garments markets offer practical examples of circular practices that are firmly rooted in indigenous knowledge and community resilience. For instance, Kente weaving in Ghana uses CE principles through manual production, local sourcing of materials, and waste minimisation(King et al., 2024, King et al., 2023). Artisans avoid energy-intensive machinery by using hand-powered looms and locally sourced cotton or rayon. Artisans use natural dyes obtained from plant sources such as Indigofera and Garcinia kola instead of synthetic dyes, which are very toxic (Alegbe and Uthman, 2024). Kente weaving practices also operated in the principle of zero waste, since leftover yarns are braided into ornamental cords.

Apart from artisanal weaving, Ghana's second-hand clothing trade, locally called "Obroni wawu" functions as a massive system of reuse, prolonging the lives of millions of garments. About 15 million second-hand clothes are imported into Ghana each month, providing apparel for an estimated 95% of the population and supporting over 2.5 million jobs(Skinner, 2019, Emefa et al., 2015) . A survey conducted revealed that traders sort and sell usable garments, while the unsellable garments are upcycled or repurposed by local designers into new products, thereby diverting a substantial amount of textile waste from landfills.

Interestingly, Ghana has begun by incorporating CE principles into textile regulations at the policy level. Clothing importers and local manufacturers are required to contribute to post-consumer waste management under an Extended Producer responsibility (EPR) programme that was implemented in 2023 to achieve a 50% recycling rate by 2025(Brown and Börkey, 2024, Kylänlahti-Harmaala, 2023). According to Ghana News Agency (2024), there is a dialogue on sustainable textile management between governments, industry stakeholders and NGO's, highlighting the importance of traditional crafts and informal actors in the national CE roadmap.

Notwithstanding, there are still a lot of challenges to overcome. The abundance of blended fibres in modern fabrics makes mechanical and chemical recycling more difficult. Moreover, limited recycling infrastructure and public awareness make large-scale circular practices difficult(Wójcik-Karpacz et al., 2023, Christensen, 2021). Kente weavers now rely on imported synthetic yarns due to the decline of local cotton cultivation, which introduces a linear supply chain into otherwise circular craft. It can be established that Ghana's textile industry serves as an example of how secondary markets and local craftsmanship may embody CE principles. The booming second-hand market and artisanal Kente weaving serve as examples of indigenous circularity that promote socioeconomic resilience and resource preservation.

2.3 Sustainability in Ghana's Textile Industry

Ghana's textile industry is characterised by a complex landscape where unsustainable industrial practices coexist with promising grassroots innovations based on circular economy principles. However, the extensive production of textiles, especially in Accra and Tema, has been a significant source of environmental degradation. Industrial facilities in Ghana's free zones mostly depend on imported synthetic fibres, petroleum-based dyes and mechanised equipment(Okai-Mensah et al., 2022). These activities are associated with high energy use, chemical effluent discharge and high water consumption, which put a great deal of stress on local water bodies and energy infrastructure. High pressure to compete in global fast-fashion markets makes unsustainable practices worse. Many Companies put cost-effectiveness and productivity above environmental responsibility, which leads to overproduction and unsorted textile waste. Notwithstanding these challenges, an opposing tide of sustainable innovation is gaining traction, especially among grassroots actors and local artisan-led initiatives. A key example is the work of The OR Foundation, a non-profit organisation based in Accra and Kantamanto Market, which tackles the negative

consequences of importing used garments(second-hand clothing), or "obroni wawu," from the Global North. Through a process known as textile upcycling, the foundation helps local designers and tailors in transforming imported waste garments into new items of clothing. This initiative not only reduces the load on landfills but also creates employment opportunities for people, enhancing innovation and creativity in the fashion industry and thereby expanding the industry's frontier. This aligns with the CE principles of "reuse" and "refashioning" existing materials to extend product lifespans. SMEs in the Ghana fashion industry are progressively experimenting with ecologically conscious production methods. Local brands like Osei-Duro, Studio, and Larry Jay have incorporated zero-waste pattern cutting, the use of organic or repurposed fabrics, and natural dying methods into their design philosophy. These brands are often active on social media platforms such as LinkedIn, where designers share updates on environmentally conscious practices. Kente and Ewe cloths are both hand-woven on traditional looms(Nunoo et al., 2021). This helps to reduce the carbon footprint compared to machine-made fabrics, referring to the minimal energy input required in their production. Remarkably, the community has been the driving force behind the revitalisation of plant dyes, depending on intergenerational knowledge transmission and local ecological awareness. For instance, Elders in Adanwomase, a village known for its high-quality Kente, train younger weavers on how mordants from clay or alum and process leaves for stable colour fastness. Such practices align with the fundamental ideas of the circular economy principles, which include "designing out waste and pollution" and "regenerating natural systems."

Previewing from the above, it can be established that traditional and innovative approaches show how indigenous textile systems can provide scalable and sustainable solutions. Through the usage of renewable materials, circular production and low-carbon techniques, Ghanaian weavers and small fashion enterprises are changing the textile narrative from an extraction model to a regenerative one. However, these efforts still face operational challenges like a lack of formal recognition, limited funding for innovation and a lack of legislative support incentives.

3.0 Methodology

A qualitative, case-study methodology was utilised in this study to document local kente weaving practices fully. The study was conducted in three major weaving communities, namely Bonwire, Adanwomase in the Ashanti region and Agotime-Kpetoe in the Volta region. A semi-structured interviews were conducted with 30 participants(10 from each community). Interviewees included local elders, apprentices, weavers, master weavers, dyers and cooperative leaders. Informal focus groups and involvement in local weaving festivals provided additional data. With the participants' consent, interviews were recorded, transcribed, and analysed thematically. Key themes that emerged from the narrative were identified through thematic analysis, which followed acceptable methods for qualitative inquiry (Ahmed et al., 2025). The study employed a purposive sampling technique to select participants with extensive experience in traditional kente weaving from Bonwire, Adanwomase and Agotime-Kpetoe. The towns were purposely chosen because they are known to be renowned for traditional kente weaving. The qualitative and exploratory nature of the study enabled the inclusion of people who are directly involved in key aspects of the craft, such as master weavers, dye experts, and cooperative leaders, who could provide deep insights into sustainable practices. These include material reuse, natural dyeing and energy-efficient handloom production. Purposive sampling was appropriate since it enabled the researcher to focus on individuals with culturally entrenched knowledge, thereby ensuring contextual relevance and enriching the data. This technique contributed to a deeper understanding of how Ghanaian indigenous textile systems reflect

circular economy principles and support environmental sustainability in the Ghanaian context. Observations and secondary literature on Ghanaian textiles were used to triangulate the findings from the interviews. Although findings are not statistically generalisable, the sample size and informant diversity provide a strong understanding of Kente practices in these important communities.

4.0 Findings

4.1 Use of Local and Renewable Materials

One of the most noticeable themes was the widespread use of renewable and locally sourced materials. The majority of the weavers stated that the threads used for kente, which are typically made from cotton and silk, originate from Ghana and other neighbouring African countries. Some older weavers described how cotton was previously grown in family farms and hand-prepared before being spun. Silk threads are often sourced from local dealers or native silkworm farmers. Agyapong (2025, Personal communication) asserted, "We don't rely on imported synthetics, our silk and cotton come from nearby farms and are woven by hand". This local sourcing lessens transportation burdens and promotes community farms. Kente is made using local raw materials and methods, reducing the effects of the global supply chain and transportation, thereby promoting sustainability(Enemuoh and Ph., 2021)

Moreover, the dyes utilised are almost exclusively botanical, making it very significant. It was observed that, in Bonwire and Adanwomase, dyers brew dyes in large pots by using plant parts such as indigo leaves, banyan barks, pigeon pea pods, mahogany bark, among others. One respondent in Agotime also attested that they use indigo from the river plant or the leaves of the Kukum tree to dye yarns. These plants provide rich, deep blue and green without the need for modants(Aseye, 2025, personal communication). This makes the water bodies stay clean without contaminating the soil, and also maintains nutrients in the local cycle by composting plant waste back into the field(Ansari et al., 2020, Barznji, 2014). Thus, Kente communities are prime examples of circular material flows as renewable fibres are grown (often organically), woven, and eventually return to the soil harmlessly. These resource-efficient material selections were consistently mentioned as one of the tradition's main sustainability advantages.

4.2 Advanced Techniques and Low-Energy production

The low energy intensity of kente manufacturing was another emergent theme for discussion. Every workshop that was observed used traditional or strap looms that operate without electricity. Weavers manually throw shuttles and beat the cloth by hand. Handwoven cloth on traditional looms reduces the carbon footprint compared to machine-made fabrics(Bhalla et al., 2020, Mishra and Mohapatra, 2020). Most workshops were seen drying their yarns in the sun without the use of machines or chemical baths. Water usage was also minimal because dyeing was done in the open vats using rain water or well water, frequently in shaded outdoor areas. One silver-haired weaver in Bonwire said, "We just need the sun and the rains, no power bills at my loom". Beyond energy, this manual process underlines an extra sustainable quality and durability. Because each cloth is methodically crafted, defects are rare to find, and the quality is consistently high. Knete cloth is noted to last longer and is handed down to generation. (Kraamer, 2020), affirmed that, Kente remains a durable, high-quality textile made to last for generations, contrasting with fast fashion trends. This extended product lifetime greatly lessens the resource intensity per use. Furthermore, the skill-intensive nature of handweaving creates jobs as multigenerational families were seen at work, with apprentices learning from elders. Several weaving centres operate as cooperatives, where profits are shared and reinvested locally, especially in Bonwire. This community-based approach ensures social sustainability and encourages long-term resource thinking, in contrast to exploitative

manufacturing settings. Discussions with cooperative leaders revealed, they preserve resources by repairing a damaged thread rather than dumping it. This practice strengthens a culture of resource mindfulness.

4.3 Waste Minimisation and Circular Practices

It can be stated that waste minimisation is a key value among Kente weavers in Ghana. Because weft threads like cotton and silk are expensive, artisans hardly throw any yarn. It saves the scrap thread whenever a piece is clipped or altered in the middle of weaving. For example, leftover silk cutoffs are braided or wound into twine for decorative cords or small accessories. In Agotime, one weaver showed a basket of tightly braided thread cords which she intends to use as handles for handwoven bags. Similarly, strip ends from loom casting, which would otherwise be discarded as waste by a factory, are used as filler for pillows or mini loom placemats.

These practices align with broader findings that Ghanaian designers have begun embracing upcycling and zero-waste techniques(Adom, 2024b). In dyeing, weavers reported a low level of chemical waste throughout the dyeing process. Plant colouring waste is normally not thrown away; rather, they are composted or given to animals as feed. The study revealed that spent indigo leaves are repurposed as mulch and returned to the fields. There is no extra synthetic dye that needs to be disposed of, as might happen in industrial settings.

Furthermore, several designers who were interviewed point out that old textiles and Kente scraps are currently being reincorporated into fashion. In keeping with circularity, linked local businesses mentioned collaborating with Kente weavers to cut used Kente pieces into patchwork clothing and accessories. In the broader sense, the existence of a secondary market for Kente, where cloth is restyled into a new outfit, indicates lifecycle thinking. These circular practices demonstrate that Kente weaving maintains material loops at the loom, at the workshop, and in communal reuse.

4.4 Value and Environmental Consciousness

The study has demonstrated how Kente's cultural significance promotes preservation of the environment beyond technical methods. It can be established that respect for the originality of nature is deep-rooted in the Kente origin stories, expressly among the Ashantis, for example, learning from spider webs. Many weavers discussed Kente weaving as not just a business but as a heritage to protect. This worldview has a greater impact towards resource use. For instance, Dela (2025, Personal communication) noted that one must be humble with threads and colours because wastefulness is seen as dishonouring ancestors.

Values are also communicated through the content of Kente motifs. Many symbols, such as the Adinkra symbols in the fabric, refer to sayings about steadiness, patience, and prudence. For example, the symbol "Asase Ye Duru" in Adinkra, meaning "the Earth has weight," is closely related to the significance of the earth (Korankye, 2021, Adom et al., 2018). According to Adom et al. (2018), this image symbolises the earth as a representation of power, providence, and divinity. It highlights how the Earth is the source of life and how we should treat it with respect. Interviewees impulsively linked their craft to community and land: One dyer asserted, “our trees and rivers give us colours, so it is our core duty to give them back”. Kente's intangible heritage fosters care and respect for natural resources. These beliefs and knowledge that surround the craft promote sustainable practices. By recognising Kente as not just a fabric but a source of collective wisdom, we see how cultural sustainability reinforces environmental sustainability.

4.5 Challenges

In spite of these positive practices, a number of challenges surfaced. The lack of resources was a recurrent subject. The supply of high-quality cotton and natural dye plants is limited. According to most weavers.

Deforestation and climate change have made it more challenging to get some dye supplies.Agyapong(2025, personal communication) mentioned that the good indigo that used to grow everywhere is now also being used to feed goats, and this has created a competition between weavers and goats. Similarly, cotton production in Ghana has also decreased in recent years, making the supply of thread dependent on imports or a small local harvest(Atieno, 2024, Ochou et al., 2021). In view of this, several weavers are now using synthetic threads to weave especially during the dry season as observed in Bonwire.

Another challenging factor confronting the weaving industry is the flood of low-cost, mass-produced textiles that compete with artisanal kente. The sustainability and preservation of original Kente weaving in Ghana are being threatened by the influx of counterfeit textiles(King et al., 2024, Phea, 2023). Phea (2023) opined that pirated textiles, which are often mass-produced using digital printing technology in countries such as China, imitate kente designs without following the traditional handweaving techniques or cultural protocols that give their legacy value. The economic sustainability of original Kente production is threatened by these imitations, which are typically cheaper and accessible in local marketplaces(Adeloye et al., 2023, Mithelman, 2019). Because of this, traditional weavers in Bonwire and Adanwomase report a decrease in the market for handwoven cloth, which has resulted in declining incomes and a decrease in the youth's desire to pursue the trade(King et al., 2024, Quainoo, 2020). Moreover, the patterns, colours and the meanings embedded in the genuine designs are often misrepresented by these counterfeit fabrics, which weakens the cultural symbolism of kente. Phea (2023) affirmed that this not only threatens the intangible cultural heritage status of Kente but also erodes its significance as a representation of Ghanaian pride and custom.

Lack of formal training and infrastructure for weavers to experiment with efficiency enhancements also poses another challenge. For instance, none of the communities has a dye workshop with a water recycling system. King et al. (2024) buttressed that many emerging weaving communities lack the capital and infrastructure necessary to expand their art. This was also confirmed during an interview with respondents. According to them, they need solar dryers and better spinning tools to cut down the labour-intensive work done by them.

Although Kente fabric is commonly viewed as a sign of Ghanaian identity and heritage, its sustainability advantages are seldom discussed on a national scale. Though Kente weaving is celebrated during state ceremonies, cultural festivals, and as a tourism attraction, the broader environmental and socio-economic benefits implanted in the practice remain underappreciated. Field interviews with weavers from Bonwire and Adanwomase revealed a predominance of undervaluation. Despite the fact that their works are widely displayed at cultural events, artisans said that not much institutional assistance is given to acknowledge Kente as a model for circular and sustainable production systems. One seldom states that, "We are celebrated for tradition, but nobody talks about how we conserve materials or use no electricity,".

Arguably, it can be stated that Indigenous knowledge systems, or IKS, are celebrated for their cultural significance but are not integrated into formal sustainability frameworks. This has led to the undervaluation of Kente's environmental benefits, such as low waste production, its low carbon and the use of biodegradable fibres (Mithelman, 2019). This devaluation has harmed Kente by limiting access to funding, policy supports and innovative collaborations. For traditional textile systems to survive in the contemporary era, they must be acknowledged not only as cultural artefacts but as practical solutions to environmental and developmental challenges

5.0 Discussion

The results of the study have demonstrated that traditional Kente weaving comes in line with the circular economy's principles and cultural sustainability. Because Kente is regarded as a cultural treasure, communities naturally maintain its resource base with care, supporting the belief that culture itself serves as the basis of sustainability (Soini and Dessein, 2016). In a practical view, it can be stated that the three R's of the circular economy, which are: Reduce (low energy production, limited input), Reuse (cloth repair, scrap repurposing), and Recycle (soil-returning organic dyes, possible thread reuse), are aligned with kente weaving. Using plant-based dyes is in line with sustainability standards. Seidu et al. (2023) affirmed that the continuation of traditional natural dyeing encourages the concept of sustainability in Ghana's textile industry. The findings of the study indicate that traditional weavers in Ghana actively uphold this practice, indicating that Kente weaving observes Indigenous Knowledge Systems (IKS). This affirms Mawere's (2014) assertion that African fabrics use IKS to preserve the environment. According to (Burke et al., 2023), this is an example of bicultural collaboration, in which production is informed by local environmental knowledge (soil, dye plants). This study can establish that Kente weavers indirectly practice cradle-to-cradle theory in the sense that indigenous weaving communities perceive waste as a resource that may be used again (Sherry and Myers, 2002). Moreover, practices which are similar to "designing out waste" are also being practised as threads are used completely, by-products are repurposed, and strips are woven into their entire length without cut-offs.

However, the study revealed that the sustainability profile is being compromised as indigenous cotton is substituted with imported rayon. Afriyie et al. (2021) affirmed that indigenous cotton yarns were the most used material; conversely, weavers have replaced them with synthetic yarns such as rayon, lurex, and polyester. The production of rayon is typically a linear, import-dependent process that involves the use of chemical processing and does not promote local farming.

Moreover, market competition and inadequate technical support present a great challenge to the sustainability of traditional kente weaving. The influx of mass-produced, machine-printed imitations of the fabric, which are often from China and sold at lower prices, has flooded the local markets, making it difficult for original handwoven kente to compete(Ankora, 2022, Hansen and Madison, 2013). Phea (2023) stated that these counterfeits erode consumer appreciation for the craftsmanship and undermine the economic viability of indigenous weavers. Field data revealed that many weavers lack access to vital technical resources and institutional support that could enable them to practice sustainably. For instance, the study findings revealed that there is minimal assistance in areas including eco-dyeing technologies, digital marketing tools, financial assistance for small-scale textile innovation, and most artisans also operate independently or within cooperatives with limited infrastructure. The absence of such support systems discourages artisans' ability to innovate while preserving traditional standards, thus decreasing their resilience in a fast-evolving, universal fashion economy.

5.1 Contribution to Theory and Practice

This study contributes to theory by establishing a concrete connection between the results of the local artistry and the circular economy. While literature on CE mostly focuses on industrial innovation. this study demonstrates how centuries-old practices can naturally embody CE thinking. It extends the idea of circularity to include cultural aspects, a practice that promotes community resilience by recycling not only material but also knowledge and values. The study also supports the idea that sustainability depends on local resource stewardship, as asserted by (McLeod et al., 2024). The study findings provide a template for policymakers and development professionals. They highlighted that there are environmental

advantages to promoting cultural industries through GI preservation, craft education and access to green financing. By redefining national identity within the context of sustainability, integrating Kente weaving into the circular economy policy positions Ghana as a pioneer in blending innovation and tradition, while also supporting craftsmen. This is also in line with the larger objectives of the African Circular Economy Alliance, which prioritise local economic empowerment, inclusion, and indigenous knowledge (Koech et al., 2023, Chineme et al., 2022).

Limitations of the Study

The study focused on Bonwire, Adanwomase, and Agotime-Kpetoe because these communities are historically and culturally noted as the leading centres of Kente weaving in Ghana. Bonwire and Adanwomase, both located in the Ashanti Region, are famed for their rich symbolism, royal heritage and constant practice of handloom weaving skills that have been passed down through generations(Adom, 2024a). Similarly, Agotime-Kpetoe, which is in the Volta region, is renowned for its unique patterns and cultural meanings. Focusing on these communities ensured rich, authentic insights into Kentes's sustainability potentials by enabling the study to examine established, living examples of indigenous knowledge systems and cultural continuity(Keats, 2020, Lam et al., 2020).

The qualitative method was employed to document the multifaceted, situation-specific practices and cultural meanings that are deep-rooted in Kente weaving. Participant observation and semi-structured interview techniques made it possible to probe deeper into artisan viewpoints on cultural values, waste reduction, and material reuse.

Due to a lack of resources and time factor, as well as the exploratory nature of the study, systematic environmental impact assessments like carbon footprint analyses were not conducted. Conducting rigorous life-cycle assessments would require specialised tools, extended timelines, and substantial financial resources that were beyond the scope of the study. Instead, the study focused on using field-based inquiry to document local knowledge and practices to establish the foundation for future multidisciplinary research that might incorporate in-depth environmental measurements.

Conclusion

The study has established that traditional Kente weaving in Ghana exemplifies core principles of the circular economy through its practice of material reuse, waste minimisation, and cultural stewardship. The research has demonstrated that Kente weavers rely on manual looms, locally obtained materials and plant-based dyes to produce durable, meaningful textiles with low environmental impact.

However, the study findings highlight significant challenges, including the loss of traditional expertise, competition from mass-produced counterfeit fabrics, and limited institutional support. These obstacles threaten the continuity of Kente as a sustainable craft and highlight the urgent need for specific policy measures, such as certification schemes, financial support for eco-friendly production, and educational initiatives that strengthen traditional skills while introducing innovative sustainable technologies.

Acknowledging and supporting Kente weaving as a real example of the circular economy's principles offers a chance to integrate indigenous knowledge systems. By appreciating these cultural practices not only as a legacy but as viable, scalable solutions, Ghana and the universal textile industry can move toward more inclusive, locally grounded approaches to environmental sustainability.

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