

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

Report by Consortium for Development Policy Research (CDPR)

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ABBREVIATIONS

| | |
|-------|---|
| APTMA | All Pakistan textile mills association |
| ARE | Alternative Renewable Energy |
| B2B | Business to business |
| BCI | Better cotton initiative |
| CABI | Centre for agriculture and bioscience international |
| CBAM | Carbon border adjustment mechanism |
| COP | Communication on progress |
| CSA | Climate smart agriculture |
| CTBCM | Competitive trading bilateral contracts market |
| CTPAT | Customs trade partnership against terrorism |
| DDT | Duty drawback rates |
| DFIs | Development finance institutions |
| EE | Energy efficiency |
| EPA | Environment protection authority |
| ESG | Environmental, social, and governance |
| GCF | Green climate fund |
| GDP | Gross domestic product |
| GHG | Greenhouse gases |
| GLOF | Glacial lake outburst floods |
| GM | Genetically modified |
| GOP | Government of Pakistan |
| GRS | Global recycled standard |
| ICA | International cotton association |
| ILO | International labour organisation |
| KII | Key informant interview |
| KW | Kilowatt |
| kWh | Kilowatt-hour |
| LTFE | Long-term financing facility |
| MMF | Man-made fibre |
| MMS | Manmade cellulosic fibres |
| MOCC | Ministry of climate change |
| MSP | Minimum support price |
| MWh | Megawatt-hour |
| NAP | National adaptation plan |
| NCC | National compliance centre |
| NDCs | Nationally determined contributions |
| NDMA | National disaster management authority |
| NDRMF | National disaster and risk management fund |
| ODCs | Ozone depleting chemicals |

ABBREVIATIONS

| | |
|-------|--|
| PCGA | Pakistan cotton ginner's association |
| PPP | Public private partnership |
| PV | Photovoltaic |
| P3A | Public private partnership authority |
| RE | Renewable energy |
| REC | Renewable energy certificate |
| RPM | Revolutions per minute |
| SBP | State Bank of Pakistan |
| SbTi | Science based targets initiative |
| SECP | Security & exchange commission of Pakistan |
| SME | Small and medium enterprise |
| SMETA | Sedex members ethical trade audit |
| TVC | Textile value chain |
| UNGC | United Nations global compact |

EXECUTIVE SUMMARY

Pakistan's Textile Value Chain (TVC) is vital to the nation's economy, linking agriculture and textile production to exports. It is the country's economic backbone, contributing to 60% of total exports and 8.5% of the GDP while employing 40% of the industrial workforce. The TVC is also one of the most complex and environmentally polluting value chains in Pakistan and globally. Historically, the global textile sector is a significant polluter responsible for 8%-10% of global greenhouse gas (GHG) emissions. Dependent on natural resources, the sector is also facing the rising threats of climate change. As global markets increasingly prioritise sustainable consumption and production practices to address the growing threats of climate change and build resilient supply chains, Pakistan's textile industry has a significant opportunity to benefit from this sustainability transition. Despite being the world's seventh-largest cotton producer, Pakistan has yet to fully capitalise on its potential as a major global textile player due to its various social, economic, political, and environmental constraints. The sector faces ongoing requirements for technological upgrades and investments, escalating energy and interest costs, unpredictable climate risk and the challenge of operating in a highly inflationary and politically unstable environment. Despite these formidable challenges, the TVC remains the most significant sector in Pakistan, showcasing its resilience amidst social, economic, and environmental turbulence. The private sector sits at the heart of the TVC from cultivation of cotton to the processing, manufacturing, and export of textile products for global retail and consumption. Addressing these challenges by the private sector is crucial for increasing Pakistan's textile exports and revitalising its economy. Integrating sustainability into Pakistan's TVC is essential not only for mitigating climate change impacts but also for maintaining competitiveness in the global market. This study provides insights into Pakistan's TVC, identifying barriers and opportunities for private sector investment to transition towards a low-emission and climate-resilient value chain.

NAVIGATING TVC SUSTAINABILITY TRANSITION IN PAKISTAN

The Pakistan TVC faces numerous barriers hindering its transition to sustainability. These include the absence of price premiums for sustainable products, complicating investments and alignment with global sustainability goals. Growing demand for transparency and traceability in the TVC presents challenges due to fragmented efforts and lack of central oversight, affecting sustainability goals and cost efficiency. Complex sustainability reporting standards and certifications further burden textile firms, particularly smaller entities, impacting growth potential. High initial investment costs limit renewable energy adoption and investment in energy-efficient technology, compounded by high energy tariffs and finance costs. Complex challenges in cotton cultivation, inadequate cross-learning, lack of stakeholder representation, and weak enforcement of environmental regulations impede the TVC's sustainable transition.

Pakistan has passed numerous laws and has implemented policies and guidelines to demonstrate dedication to addressing climate change and fostering sustainable development. However, the challenge lies not in the absence of legal and regulatory frameworks but in the persistent shortcomings in implementation and enforcement, hindering the intended effectiveness of sustainability initiatives.

Despite these challenges, Pakistan's TVC offers a unique opportunity to drive the country's economic development while advancing sustainable practices. Addressing these barriers and policy implementation gaps requires unified goals and collaborative efforts that prioritise sustainability across the TVC.

INVESTMENT OPPORTUNITIES, PROPOSED STRATEGIES AND RECOMMENDATIONS:

Overcoming the identified barriers will not only unlock attractive investment opportunities but will also facilitate the scaling of climate and sustainable initiatives within the Pakistan TVC, positioning the country as a leading global producer and exporter of sustainable textiles. These opportunities extend across various segments of the TVC, from raw materials to finished products, offering strategic intervention points for the private sector at every stage.

Investing in sustainable materials, traceability, and circular practices presents a significant opportunity. Global retailers increasingly prioritise using sustainable materials, making investments in climate-smart agriculture practices essential for meeting their demands. Similarly, the scaling of recycled materials and innovative solutions like biodegradable materials and recycled filament yarns position Pakistan as a creative player in the global market. Investment in sustainable chemical practices, recycling of dyes and chemicals, and water treatment technologies not only offer avenues for saving costs and reducing environmental impact but also enhance brand reputation. Efforts to transition to renewable energy sources, such as solar PV and biomass, are critical for reducing emissions and ensuring operational supply security. Policy reforms like expanding net-metering schemes present lucrative investment opportunities for sustainable energy transition within the TVC.

While large integrated textile firms benefit from the identified opportunities because of their control over supply chains and financial strength, their successes have not catalysed the widespread transformation of the Pakistan TVC towards sustainability. A systems approach is recommended to overcome this, focusing on holistic analysis and collaborative action. This approach entails defining clear TVC economic, social collaboration, and environmental outcomes, identifying key drivers, mapping relevant stakeholders, and building multi-stakeholder collaboration to align action and achieve planned outcomes. Key recommendations include establishing a TVC Public-Private

Partnership for leading action, promoting experimentation and innovation, and enhancing stakeholder collaboration across the value chain. Actions by stakeholders, including the government and private sector, are crucial for driving this transformation. See Table 1 below for recommendations.

FROM PROJECT TO SYSTEMS APPROACH

The implementation of a holistic systems approach covering the entire Pakistan TVC is recommended for building and positioning a robust TVC within the global textile sector with clear outcomes aligned with the national development plans, industrial policy and global sustainability trends as shown in Figure 1. This approach offers a holistic view of the TVC, understanding its drivers, relationships, and feedback loops, thereby shaping intended outcomes effectively. To leverage this approach, several action steps are recommended. Firstly, building multi-stakeholder collaboration models can help align the TVC around expected outcomes. Establishing a TVC Public-Private Partnership (PPP) entity under the Public-Private Partnership Authority Act (P3A) can formalise activities, set guidelines, and ensure stakeholder representation, thus facilitating effective transformation. Secondly, securing climate finance through international and national sources is crucial to fund sustainability efforts, incentivise private sector investments, and ensure equitable allocation across the supply chain. Lastly, encouraging experimentation and innovation within the TVC through data-driven metrics, technology adoption, research and development on sustainable materials and processes, and support for climate-tech and agri-tech start-ups can drive sustainable practices and drive the TVC towards a greener future.

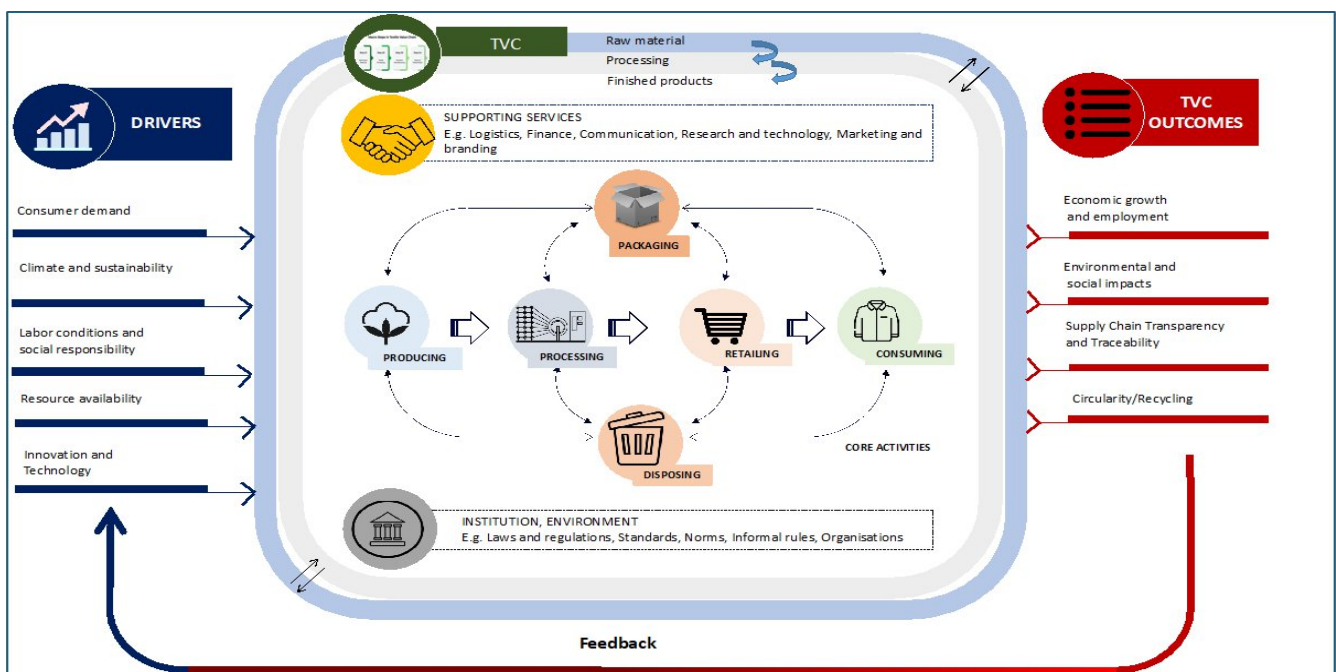


Figure 1: TVC Systems Map (Adapted from Woodhill et al 2020)

ROLE OF PRIVATE SECTOR

The private sector can play a crucial role in driving sustainability within the TVC following the approach in Figure 2. By investing in promising sustainable initiatives like renewable energy, sustainable materials, and conservation techniques, they can back and de-risk strategic investments, demonstrating commitment and inspiring industry-wide adoption. Additionally, they can navigate the value chain by identifying gaps, investing in critical infrastructure like traceability technology, and promoting transparency through data sharing. Furthermore, they can crowd in investment by encouraging participation from other investors and establishing incubators and funds to support innovative projects. The private sector can also address the talent shortage by investing in training programs and highlighting opportunities in sustainability careers. Finally, they can build the TVC ecosystem by bridging global retail demands with TVC capabilities building collaborations and promoting sustainable brands to customers, thereby advancing the sustainability transition across the entire value chain.

| Domain | How it works | Sample indicators |
|-----------------------------|---|--|
| 1. Back and de-risk | Identifying and investing in green technologies and processes in the TVC that have the potential to support in mitigation, adaptation and resilience efforts | <ul style="list-style-type: none"> Investment dollars allocated Introduction and scaling of green technologies in TVC |
| 2. Navigate the value-chain | Private sector can help other stakeholders, startups and entrepreneurs in the TVC to build sustainable practices and gradually ascend their value-chain to gain larger funding amounts as well as more strategic partnerships | <ul style="list-style-type: none"> Sustainable practices adopted Subsequent funding rounds raised Strategic partnerships formed Growth opportunities |
| 3. Crowd-in investors | Private Sector Climate-focused investments can help encourage and attract new investors to back initiatives, building out a more diverse investor pool and growing all-around capital availability | <ul style="list-style-type: none"> Investors engaged New/number Investor classes engaged Total funding amounts |
| 4. Signal for talent | Private sector can help signal potential upside in the TVC and impact to job-seekers and skilled workforce, helping TVC attract green talent | <ul style="list-style-type: none"> Skilled workforce trained Jobs facilitated New market segments for talent |
| 5. Build TVC ecosystem | Improving the connective tissue between different players the TVC ecosystem as a wide range of stakeholders must be involved from farmers to exporters | <ul style="list-style-type: none"> Stakeholders engaged New/number stakeholder groups engaged |

Figure 2: TVC domain and indicators

ROLE OF GOVERNMENT

To ensure the long-term sustainable growth of Pakistan's TVC, the government must develop a comprehensive industrial policy and implementation strategy, in collaboration with all stakeholders, to guide its advancement and align with global sustainability standards. Establishing specialised textile clusters equipped with sustainable amenities will enhance efficiency and lower production costs while promoting sustainability. Through proactive engagement in international trade diplomacy and the establishment of local traceability and sustainability standards, Pakistan can elevate its global standing in sustainable textile exports. The government should align green policies, offer targeted tax and financial incentives, and support the adoption of sustainable practices, especially in cotton production and processing, to drive sustainability across the TVC. Furthermore, accessing global climate finance through strategic partnerships and accreditation with funds like the Green Climate Fund will be crucial for financing climate-related initiatives and ensuring the TVC's long-term sustainability goals are met.

CONCLUSION:

The TVC offers Pakistan a tremendous opportunity to position itself as a leader in global sustainable textiles. Yet, currently, it operates below potential due to various economic, environmental, and social challenges. Fragmented actions and policy gaps hinder progress, exacerbated by insufficient financial support. Climate and environmental challenges further influence the TVC's trajectory, emphasising the need for proactive measures and initiatives. Transforming the TVC towards sustainability requires a holistic, systems-based approach, prioritising expected outcomes and aligning private and public stakeholders. The private sector is key to unlocking the TVC's potential through investments and expertise, leading to sustainability-driven economic growth and job opportunities. The public sector is key to offering supporting policies to catalyse private investments. Formal public-private partnerships are crucial for coordinated action, addressing fragmentation and mobilising resources. Embracing sustainability will position Pakistan as a leader in this space.

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

Table 1
Executive Summary of Challenges and Recommendations

| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed Timeframe | Relevant Actors /Ministries/ Divisions |
|------------------|---|---|---|---|--------------------|--|
| Production | Cotton is sensitive to climate change, which makes cotton farmers switch towards other crops like sugarcane. | Lack of policies and regulations encouraging investment in new, climate resilient cotton seed varieties. Poor enforcement of laws safeguarding cotton seed intellectual property rights. Limited promotion of CSA best practices, programmes, and projects. | Government should prepare a comprehensive cotton revival plan to promote cotton cultivation, encourage private investment in seed varieties, enforce existing laws safeguarding intellectual property rights and establish an Institute of Climate Smart Agriculture. | CSA initiative can boost cotton production, provide organic inputs to farmers and improve cotton yield and offer technical, financial and monitoring support. | Medium-term | Ministry of National food security & research, provincial agriculture departments, APTMA, BCI and other relevant entities. |
| Green technology | Lack of new and energy efficient machinery in many textile companies. SMEs, in particular, cannot import expensive green technology and face high initial costs and net-metering etc. | Lack of public-private partnerships policies for technological upscaling, lack of funding opportunities for private stakeholders, insufficient tax incentives and subsidies, limited awareness amongst stakeholders on existing technological solutions. | Develop technology infrastructure, invoke financial institutions to invest in technology, raise awareness on the benefits of green technology and provide financial incentives to SMEs through grants, loans and subsidies. | Improved sustainability reporting and adoption of sustainability initiatives, new job opportunities, improved energy efficiency, reduced GHG emissions and improvements in human health and safety. | Long-term | Ministry of Energy, provincial governments' energy departments, National Electric Power Regulatory Authority (NEPRA). |

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| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed Timeframe | Relevant Actors /Ministries/ Divisions |
|-------------------|--|---|--|--|--------------------|--|
| Capacity-Building | Lack of stakeholder engagement/ coordination between public-private and federal-provincial stakeholders. | Limited cross-learning events and lack of discussion forums to engage various stakeholders within the TVC. Overlapping and conflicting jurisdictional boundaries between provincial and regulatory authorities and capacity, communication and resource challenges. | Establish formal coordination mechanisms such as task forces and joint committees with equal representation, clearly define the respective roles and responsibilities, enhance communication channels through meetings, workshops etc., offer capacity building and training programs to enhance institutional capacities, improved inter-governmental coordination mechanism. | Improved coordination between all stakeholders will create a stable business environment and facilitate policy implementation, clearly defined mandates will reduce duplication of effort and improve resource and cost efficiency, increased stakeholder engagement will foster greater transparency. | Medium-term | Ministry of Climate Change, Board of Investment, Provincial planning departments and public private authority. |
| Regulation | Lack of monitoring and evaluation frameworks to hold the textile industry accountable for its adverse climate change impact. | Most of the SMEs lack monitoring and evaluation frameworks which can help them set and monitor sustainability targets and report to the government. | The Environment Protection Authority should make the textile industry comply with certain monitoring and evaluation frameworks, to ensure they follow the sustainability regulations. Enforce compliance with sustainability laws and enhance data transparency and reporting. | Monitoring frameworks can help SMEs follow sustainability and allow them a comparative advantage within the global market, improve transparency and accountability, reduce the carbon footprint of the textile industry. | Long-term | Environment Protection Authority (EPA) and the textile industry. |

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| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed Timeframe | Relevant Actors /Ministries/ Divisions |
|-----------------|---|--|--|--|--------------------|---|
| Climate finance | Price neutrality of sustainable textile products entails that achieving investment into sustainable products is a significant challenge for exporters, especially SMEs. | Despite rising demand for sustainable products, textile exporters face challenges due to the lack of price premiums by the government. | Need for government and private investment in sustainable products to encourage TVC to invest in sustainability. TVC should also produce the products with high demand in the global market. | Suitable price premiums can enable Pakistan to become a premier sustainable supplier of textiles, with a strong global outreach. | Long-term | Textile manufacturers and international global retailers. |

INTRODUCTION

TEXTILE VALUE CHAIN AND THE TRANSITION TOWARDS SUSTAINABILITY:

The Textile Value Chain (TVC) is one of the most complex and polluting value chains within the global industrial system. Due to the lengthy supply chain and energy-intensive production processes, the TVC generates 8-10% of global greenhouse gas (GHG) emissions and 20% of industrial wastewater pollution from dyeing and finishing products¹. This complex value chain journey starts with cultivating raw cotton nourished by rainfall and irrigated waters. It extends through the delicate process of separating seeds from cotton lint in ginning. It then progresses through the energy, chemical and water-intensive manufacturing stages of spinning, weaving, and dyeing. The journey culminates with producing and transporting finished textile products destined for global and local markets. Adding the growing threats of a rapidly changing climate adds a layer of complexity to an already intricate process.

Despite its complexity, TVC is Pakistan's most economically significant value chain, as the country benefits from the entire value chain, from raw cotton cultivation to textile export within its geographic boundaries. Pakistan ranks as the seventh largest global producer of raw cotton and the 10th largest exporter of textile goods², representing nearly 60% of the country's total exports, contributing around 8.5% to its GDP and accounting for 25%³ of the industrial value-added products. Moreover, the TVC is the largest employer in the country, engaging 40% of the industrial workforce and it continues to be a key source of employment for women, providing opportunities to 30% of Pakistan's female labour force⁴. These factors highlight TVC's significant impact on Pakistan's socio-economic landscape⁵.

The complexity within the Pakistan TVC also raises numerous social, economic, and environmental challenges across its various value chain stages. In 2023, around 7 million

¹The impact of textile production and waste on the environment (infographics) | European Parliament. (2020). Retrieved from: <https://www.europarl.europa.eu/topics/en/article/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographics>.

²Cotton production by country worldwide 2022/2023 | Statista. (2023, September 19). Statista. Retrieved from: <https://www.statista.com/statistics/263055/cotton-production-worldwide-by-top-countries/>.

³Ministry of Finance. (2023). Chapter 3: Manufacturing and mining. Retrieved from:

https://www.finance.gov.pk/survey/chapters_23/03_Manufacturing_and_Mining.pdf.

⁴Sattar, S., & Karim, S. (2023, May). Beyond the Needle and Thread: Women's Empowerment through Textile Exports. Retrieved from: <https://aptma.org.pk/beyond-the-needle-and-thread-womens-empowerment-through-textile-exports/>.

⁵ILO. (2023). Decent Work Country Programme for Pakistan 2023-2027. Islamabad: International Labour Organisation. Retrieved from: https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-islamabad/documents/publication/wcms_882381.pdf.

layoffs occurred due to the pandemic, cotton shortages, global recession, lack of government incentives, and import bans⁶. Further, the sector faces competition with other cash crops, ongoing requirements for technological upgrades and investments, escalating energy and interest costs, unpredictable climate risk and the challenge of operating in a highly inflationary and politically unstable environment. Despite these formidable challenges, the TVC remains the most significant sector in Pakistan, showcasing its resilience amidst social, economic, and environmental turbulence.

The Pakistan TVC faces the dual challenge of high GHG emissions from textile production and increasing climate change threats throughout its value chain. Textile processes rank as the third-largest source of GHG emissions in Pakistan, contributing over 20% of industrial emissions⁷. These emissions originate from cotton cultivation, chemical use, and reliance on high-emission fuels in manufacturing, exacerbated by an inefficient transportation system. This poses a formidable obstacle to Pakistan's global commitment to reducing GHG emissions by 50% by 2030⁸.

Climate projections for Pakistan indicate a significant increase in mean temperatures, ranging from 1.4°C to 3.7°C by 2060⁹, presenting imminent threats to its ecosystems and population. Warming temperatures diminish cotton yields, floods disrupt supply chains, and higher temperatures lead to adverse working conditions, resulting in health and social costs. Fluctuating water supplies and a depleting irrigation system add further risks to cotton crops and textile manufacturing.

At the same time, the global demand for sustainable textile products is increasing, with leading retailers requiring significant emission reductions and enhanced traceability of the products. Sustainability is becoming essential for securing export orders, making it imperative for the Pakistan TVC to address these demands by reducing GHG emissions and enhancing sector resilience. The private sector can play a critical role in achieving these sustainability goals, giving Pakistan a unique opportunity to position itself as a global leader in sustainable textile production.

⁶Ansari, P. L. (2023). Pakistan's textile industry is in crisis - and women are bearing the brunt of its decline. The Guardian. Retrieved from: <https://www.theguardian.com/global-development/2023/feb/01/pakistan-textile-industry-crisis-women>.

⁷Boyle, R. (2024). Greenhouse gas emissions in Pakistan - Emission Index. Emission Index. Retrieved from: <https://www.emissionindex.com/countries/pakistan#:~:text=Energy%20produced%20201m%20of%20greenhouse.6.5%25%20of%20total%20GHG%20respectively>.

⁸Government of Pakistan (2021) Updated Nationally determined contributions (NDCs). Retrieved from: <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>.

⁹NAP (2023) National Adaptation Plan Pakistan. UNFCCC. Retrieved from: https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf.

ROLE OF THE PRIVATE SECTOR IN TVC SUSTAINABILITY TRANSITION:

The private sector sits at the heart of the TVC, encompassing many different stakeholders, including farmers, input providers, processors, traders, manufacturers, exporters, transporters, and funders. Each stakeholder contributes to various value-addition stages and interacts with others within the value chain. These interactions are influenced by policymakers who establish the regulatory framework, thereby shaping the TVC's landscape. This complex network leads to fragmented actions and outcomes, as no single stakeholder has complete authority over the TVC and its transition to a low-emission, resilient pathway.

Despite growing climate-related risks to the TVC and global demand for low-emission products, the private sector, except for a few industrial groups, has primarily neglected investing in climate-focused solutions. Further, while Pakistan's Nationally Determined Commitments (NDCs) encourage private-sector climate initiatives, actionable steps are lacking in the NDC. This study offers an opportunity to delve deeper into the barriers to private sector engagement aimed at unlocking critical investment opportunities for building a sustainable and resilient TVC sector.

AIM AND SCOPE OF STUDY:

This CPDR study aims to identify barriers hindering private climate investment in TVC and position Pakistan as a globally respected producer of sustainable textile products. Climate investments encompass various forms of capital allocation by the private sector, including investments in sustainable agriculture practices and inputs, renewable energy, low-emission technologies, recycling materials, material traceability, improved business processes, and robust measurement and reporting approaches. Through in-depth analysis and expert stakeholder consultations, the report identifies key barriers and offers strategic opportunities to unlock crucial private sector climate investments, facilitating the TVC's transition towards a resilient, low-emission pathway.

METHODOLOGY AND LIMITATION:

Due to the complex nature of the TVC, obtaining primary data across the various activities is challenging and often sparse. Primary data on climate change activities within the TVC is limited, as is industry data regarding investments and the impact of climate change on the TVC. Accessing stakeholders in the TVC was challenging due to the wide breadth of stakeholders, from farmers to exporters and their remote locations.

Therefore, this study's research methodology was carefully crafted to gather data through interviews from a range of stakeholders across the TVC to develop a fuller view and confirm insights from multiple stakeholders. The interview data was complemented

by a thorough review of available secondary literature, including grey literature, research articles, laws and policies, project and analysis reports, and sustainability reports issued by a few leading textile companies.

Over 30 interviews were conducted with a broad range of participants, including cotton farmers, service providers, cotton traders, textile manufacturers, retailers, trade organisations, non-governmental organisations, global supply chain companies, and representatives from both provincial and national government ministries and departments. These interviews were conducted both remotely and in person. Each interview typically lasted for 60 minutes.

The interview questions were customised according to each stakeholder's expertise and organisational background but were broadly framed around the following themes:

1. What are your organisation's current activities to address climate change in the TVC and build sustainable practices?
2. What are the main barriers inhibiting private sector participation and investment in climate change measures for Pakistan's TVC?
3. What are the challenges and opportunities for Pakistan's TVC in building low-emission and climate-resilient textile products?

The detailed list of interviewees is provided in Table 1 of the Annexure.

SIGNIFICANCE AND RELEVANCE OF STUDY:

Pakistan's TVC is the backbone of the nation's industrial sector and economy, linking agriculture and apparel production to exports. Despite being the world's seventh-largest cotton producer, Pakistan has yet to realise its potential as a major textile and apparel exporter due to various social, economic, political, and environmental constraints. Addressing these challenges is crucial to enhancing Pakistan's textile exports and revitalising its economy.

As global markets shift towards sustainable consumption and production practices in response to tackle the impending climate challenge, there is a growing emphasis on climate-friendly trade of goods and services. Historically, the global textile sector is a significant polluter responsible for 8%-10% of global GHG emissions¹⁰ and is undergoing a transformative shift towards sustainability. The global apparel industry, a key player in

¹⁰ World Bank Group. (2022). How much do our wardrobes cost to the environment? World Bank. Retrieved from: <https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente>.

the textile sector, contributes 20% of global wastewater and sees 85% of textiles end up in landfills or incinerated¹¹, highlighting the urgent need for sustainability measures.

Integrating sustainability into Pakistan's TVC is essential not only for mitigating climate change impacts but also for maintaining its competitiveness in the global market. This study offers valuable insights into Pakistan's TVC, identifying barriers and opportunities for private sector investment to transition towards a low-emission and climate-resilient TVC.

STRUCTURE OF REPORT:

Following this introduction, Chapter 1 overviews the TVC and examines the climate challenges encountered within this sector. Chapter 2 delves into the barriers encountered and the initiatives undertaken by the private sector within the TVC. Chapter 3 discusses the local and global regulatory frameworks that impact the TVC. Lastly, Chapter 4 presents recommendations for private sector actions aimed at transitioning the TVC into a low-emission and climate-resilient sector. The study concludes with a way forward.

¹¹ World Bank Group. (2022). How much do our wardrobes cost to the environment? World Bank. Retrieved from: <https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente>.

CHAPTER 1:

TEXTILE VALUE CHAIN (TVC) IN PAKISTAN AND CLIMATE CHANGE

1.1 OVERVIEW OF THE TEXTILE VALUE CHAIN IN PAKISTAN:

The TVC in Pakistan can be divided into various sub-sectors, as shown in Figure 3, from fibre production (cotton cultivation, processing, ginning), yarn and fabric production (spinning, weaving and knitting), textile production (bleaching, dyeing and finishing) to assembly of made-ups and garments (stitching). The consumption and end-of-life phase of exported textiles, although integral to the global TVC, extends beyond the scope of this study, which focuses primarily on the Pakistan TVC from fibre to textile production. The transformation from raw materials to finished textile products demands significant use of natural resources and energy. This involves the utilisation of water, fertilisers, chemicals, and fossil fuels, contributing to increased GHG emissions and resource depletion across the entire value chain.

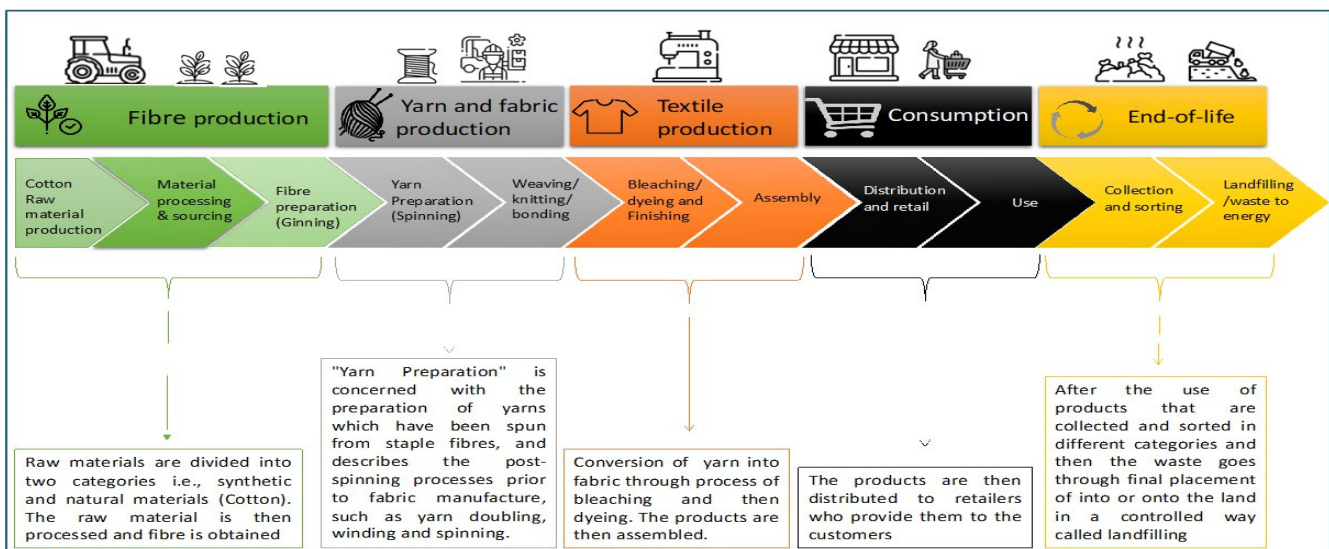


Figure 3: Mapping of TVC activities in Pakistan. Source: Authors

Pakistan's TVC shows promising performance in its initial value chain stages, with over 350 spinning units operating at a commendable 70% utilization rate. However, alongside these achievements, the sector faces notable challenges, including technological inefficiencies, low-quality cotton and yarn, and insufficient financing. Moreover, the industry faces declining cotton production, which is driven by the effects of climate change, such as pests, floods, and water scarcity, which worsen productivity and resilience issues within the sector. As a result, the industry primarily produces lower-value grey cloth, with only a few leading exporters prioritising investment in innovations to compete globally. This exception underscores the potential for other textile manufacturers to enhance their practices and capitalise on the growing market for sustainable textile products.

1.2 GLOBAL SUSTAINABLE TEXTILE OPPORTUNITY FOR PAKISTAN'S TVC:

Revenue from the global apparel market has seen healthy increase over the years, rising from \$1.58 trillion in 2018 to \$1.73 trillion in 2023, as shown in Figure 4. Projections suggest that this figure will continue to climb, reaching an estimated \$2 trillion by 2028. Figure 5 shows that the US and China offer the biggest market opportunity, with revenues of over \$300 billion each from apparel. These growth trends highlight significant opportunities for Pakistan TVC to expand its market share and boost its export revenues.

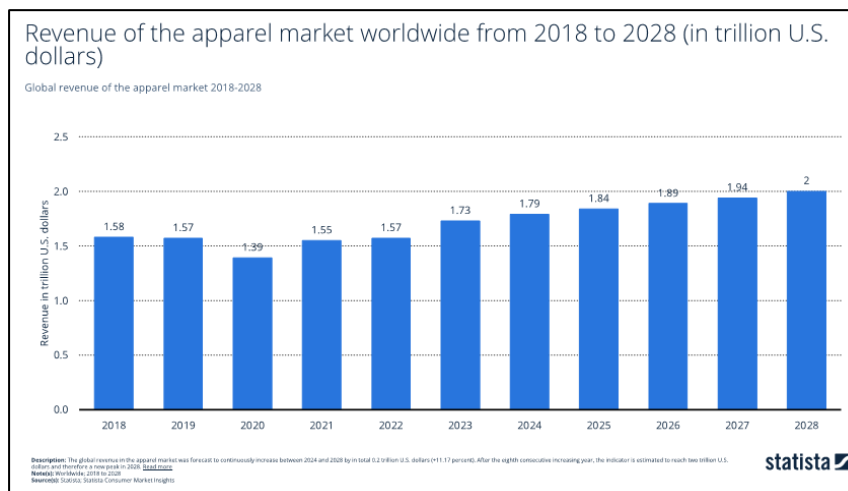


Figure 4: Revenue of Apparel Market Worldwide – Source:(Statistic 2023)¹²

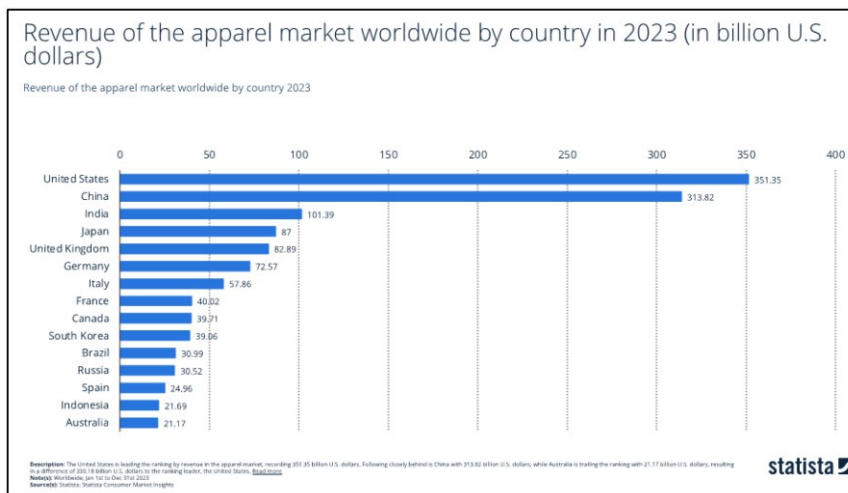


Figure 5: Revenue of Apparel Market Worldwide by Country – Source: (Statistic 2023)¹³

¹² Statista. (2024). Global revenue of the apparel market 2018-2028. Retrieved from: <https://www.statista.com/forecasts/821415/value-of-the-global-apparel-market>.

¹³ Statista. (2024). Revenue of the apparel market worldwide by country 2023. Retrieved from: <https://www.statista.com/forecasts/758683/revenue-of-the-apparel-market-worldwide-bycountry#:~:text=Revenue%20of%20the%20apparel%20market%20worldwide%20by%20country%202023&text=Following%20closely%20behind%20is%20China,ranking%20leader%2C%20the%20United%20States.>

Pakistan is the 10th largest exporter of clothing after China, Bangladesh, and India in the region, as shown in Figure 6. Within Pakistan's textile categories, knitwear leads in export volume, followed by bedwear and cotton cloth¹⁴. The apparel division in Pakistan stands out as the segment with the most significant potential for value addition, strategically targeting major export markets such as the US, Europe, and China¹⁵. However, when considering the global market scale, there exists substantial untapped potential for Pakistan's textile industry to expand further. This is particularly evident when comparing Pakistan's exports to those of countries like Bangladesh and Vietnam, which currently boast textile exports four times greater than Pakistan's, as reflected in Figure 6.

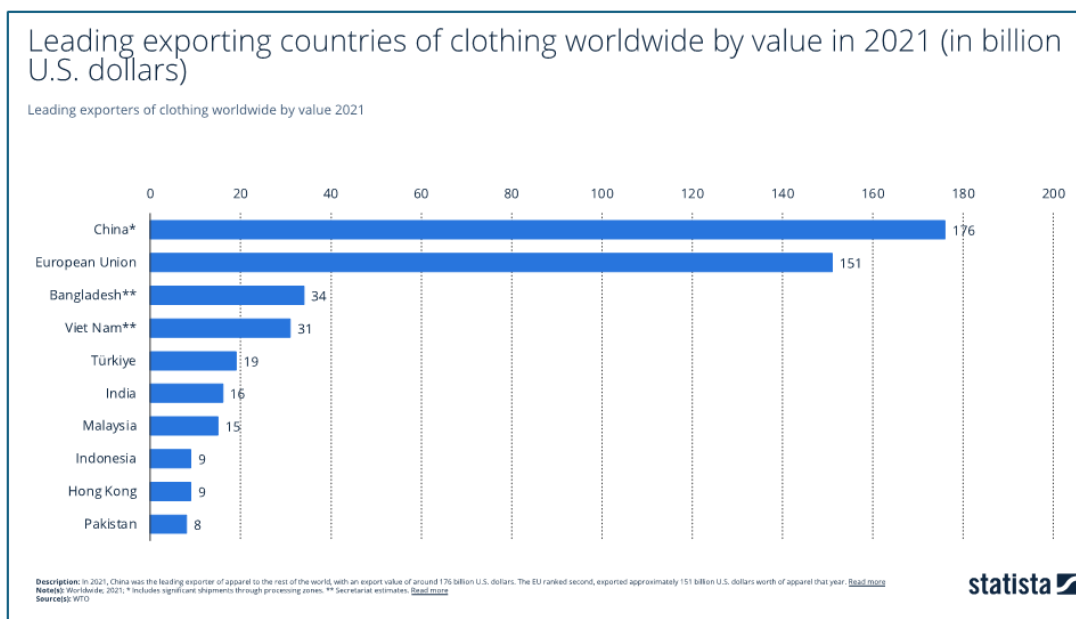


Figure 6: Leading Textile Exporters – Source Statista 2023¹⁶

The share of sustainable apparel in the global market is on the rise and is expected to surpass 6% by 2026, as depicted in Figure 7. With access to Pakistan's entire TVC, from cotton cultivation to garment production, the private sector has a unique opportunity over its competitors to manage its TVC and transition strongly towards sustainable products. This will position Pakistan as a credible global player in the sustainable textiles segment¹⁷.

¹⁴ SBP. (2023). Annual Report FY2023 – External Sector. Retrieved from: <https://www.sbp.org.pk/reports/annual/aarFY23/Chapter-06.pdf>
¹⁵ World Bank. (2021). Pakistan Textiles and Clothing Exports by country 2021 | WITS Data. World Integrated Trade Solution (WITS). Retrieved February 19, 2024, from: https://wits.worldbank.org/CountryProfile/en/Country/PAK/Year/LTST/TradeFlow/Export/Partner/by-country/Product/50-63_TextCloth
¹⁶ Statista. (2022). Vale of leading exporters of textile worldwide 2021. Retrieved from: <https://www.statista.com/statistics/1054452/textile-apparel-goods-leading-exporters-worldwide/>
¹⁷ Akhtar, N., & Urooj, A. (2024). Pakistan's textile industry embraces ESG practices: Sustainability that lasts. Breccorder. Retrieved from: <https://www.breccorder.com/news/40290663>.

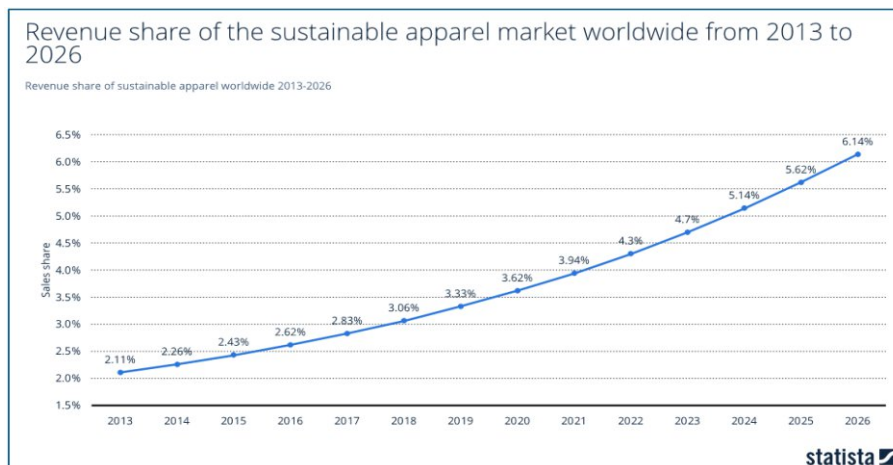


Figure 7: Revenue share of the sustainable apparel market worldwide by country – Source: (Statistic 2023)¹⁸

Despite this growing market opportunity, Pakistan's TVC experienced substantial setbacks with a sharp 15% decline in exports from 2022 to 2023¹⁹. This decline was attributed to challenging economic conditions, both domestically and globally, the 2022 floods, climate change impacts, high energy and interest costs, and escalating inflation rates. Figure 8 shows that Pakistan's textile exports grew by over 50% between 2020 and 2022, declining by 15% from \$ 19.3 billion in 2022 to \$16.5 billion in 2023²⁰. This underscores the export markets' vulnerability to shocks and underscores the urgent need for the sector to implement proactive measures to sustain and enhance its share in exports.



Figure 8: Textile exports of Pakistan – Source:(Pakistan Bureau of Statistics 2023)²¹

¹⁸ Statista. (2023). Revenue share of sustainable apparel worldwide 2013-2026. Retrieved from: <https://www.statista.com/forecasts/1307848/worldwide-sales-of-sustainable-clothing-items>.

¹⁹ SBP. (2023). Annual Report FY2023 - External Sector. Retrieved from: <https://www.sbp.org.pk/reports/annual/aarFY23/Chapter-06.pdf>

²⁰ Pakistan bureau of statistics (PBS). (2023). Annual Analytical Report FY2023. Retrieved from: https://www.pbs.gov.pk/sites/default/files/external_trade/Annual_Analytical_Report_On_External_Trade_Statistics_Of_Pakistan_2021-22.pdf

²¹ Sattar, S. And Majeed, U. (2022). Failing textile exports in Pakistan. APTMA. Retrieved from: <https://aptma.org.pk/falling-textile-exports/>.

1.3 IMPACT OF CLIMATE CHANGE IN PAKISTAN:

As the 5th most populous country of over 240 million people, Pakistan emits less than 1% of the global GHG emissions. Yet the country is ranked as the eighth most vulnerable nation to the climate crisis, according to the Global Climate Risk Index²². Pakistan's high vulnerability to the adverse impact of climate change emanates from its geographic location, high dependence on agriculture and water resources, low adaptive capacity of its people and weak system of emergency preparedness²³. Rapid population growth and unplanned urbanisation add to the vulnerability²⁴. Due to rising temperatures, Pakistan has already experienced an increase in the frequency and intensity of extreme climate events such as floods, droughts, cyclones, heavy rain spells and extremely high temperatures. Between 1992 and 2021, according to the World Bank, climate- and weather-related disasters in Pakistan resulted in a total of \$29.3 billion of economic losses (inflation-adjusted to 2021 US dollars)²⁵. In 2022, torrential rains and a combination of riverine, urban, and flash flooding led to an unprecedented disaster in Pakistan.

According to the National Disaster Management Authority (NDMA), around 33 million people, one in seven in Pakistan, were affected by the 2022 floods, including nearly 8 million displaced²⁶. The floods sadly took the lives of more than 1,700 people, one-third of which were children. According to the Post-Disaster Needs Assessment of the 2022 floods, total damages were estimated to exceed \$14.9 billion, total economic losses were estimated to be worth \$15.2 billion, and the potential cost for rehabilitation and reconstruction in a resilient way was estimated to be at least \$16.3 billion²⁷. As a direct impact of the floods, loss in GDP had been projected to shrink by around 2.2% in 2022²⁸. The World Bank warns of a projected 18–20% decline in Pakistan's GDP by 2050²⁹ due to severe climate events, environmental degradation, and air pollution.

²² Schäfer, D. E. V. K. L. (2021, January 25). Global Climate Risk Index 2021. Germanwatch e.V. Retrieved from: <https://www.germanwatch.org/en/19777>.

²³ Malik, S., Awan, H., & Khan, N. (2012). Mapping vulnerability to climate change and its repercussions on human health in Pakistan. *Globalization and Health*, 8(1), 31. Retrieved from: <https://doi.org/10.1186/1744-8603-8-31>.

²⁴ UN Habitat (2023) Pakistan country report. Retrieved from: [Pakistan Country Report 2023 B5 final.cdr \(unhabitat.org\)](https://unhabitat.org/pakistan-country-report-2023).

²⁵ UN Habitat (2023) Pakistan country report. Retrieved from: [Pakistan Country Report 2023 B5 final.cdr \(unhabitat.org\)](https://unhabitat.org/pakistan-country-report-2023).

²⁶ Pakistan | Interactive Country Fiches. (2023). Retrieved from: <https://dicf.unepgrid.ch/pakistan>.

²⁷ World Bank Group. (2022). Pakistan: Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs Over USD 16 billion - New Assessment. World Bank. Retrieved from: <https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme>.

²⁸ NAP (2023) National Adaptation Plan Pakistan. UNFCCC. Retrieved from: https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf.

²⁹ Asad S. and Lauren D. (n.d.). Climate Silence in Pakistan : Understanding socioeconomic factors in climate change awareness and action. World Bank. Retrieved from: <https://documents.worldbank.org/pt/publication/documents-reports/documentdetail/099620311302337812/idu0953f1629051e04abb0af26053e6738baa31>

1.4 GHG EMISSIONS AND CLIMATE RISKS ACROSS TVC:

The Pakistan TVC confronts a dual challenge posed by climate change. Firstly, as a high GHG emitting and environmentally polluting sector, the TVC faces the risk of becoming less attractive to global retailers who increasingly prioritise low-emission and sustainable products. The sector's projected growth may exacerbate emissions without concrete measures, further diminishing its appeal in the global market.

Secondly, the TVC is vulnerable to significant climate risks due to its reliance on natural resources for cotton fibre production that are highly sensitive to climate change effects. To safeguard the TVC, adaptive measures are necessary to mitigate these risks effectively.

While Pakistan, with its low global GHG emission footprint, may not prioritise immediate emission reduction efforts, the rising global demand for sustainable textiles necessitates proactive measures from the TVC. Embracing and investing in emission reduction technologies and protecting against climate risks is crucial for the sector to maintain competitiveness and expand its share in the global export market.

1.5 GHG EMISSIONS BY TVC:

Within the operational confines of an organisation and throughout its extended value chain, GHG emissions are classified into Scope 1, 2, and 3 categories³⁰ as shown in Figure 9. These classifications entail:

- › Scope 1 emissions refer to direct GHG emissions from sources owned or controlled by an organisation. These emissions typically result from fuel combustion in owned or controlled boilers, furnaces, vehicles, and other equipment.
- › Scope 2 emissions refer to indirect GHG emissions associated with the consumption of purchased electricity, steam, heating, or cooling by an organisation. These emissions occur from activities outside of the organisation's direct control but are related to its energy consumption.
- › Scope 3 emissions encompass all other indirect GHG emissions that occur in the value chain of an organisation, including both upstream and downstream activities. These emissions result from activities such as purchased goods and services, transportation and distribution, waste generation, employee commuting, and business travel. While not directly controlled or owned by the organisation, they are associated with its operations and are often significant contributors to its overall carbon footprint. Scope 3 emissions are typically the largest and most complex category of emissions for many organisations.

³⁰ What are scope 1, 2 and 3 emissions? (n.d.). Deloitte United Kingdom. Retrieved from: <https://www2.deloitte.com/uk/en/focus/climate-change/zero-in-on-scope-1-2-and-3-emissions.html>

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

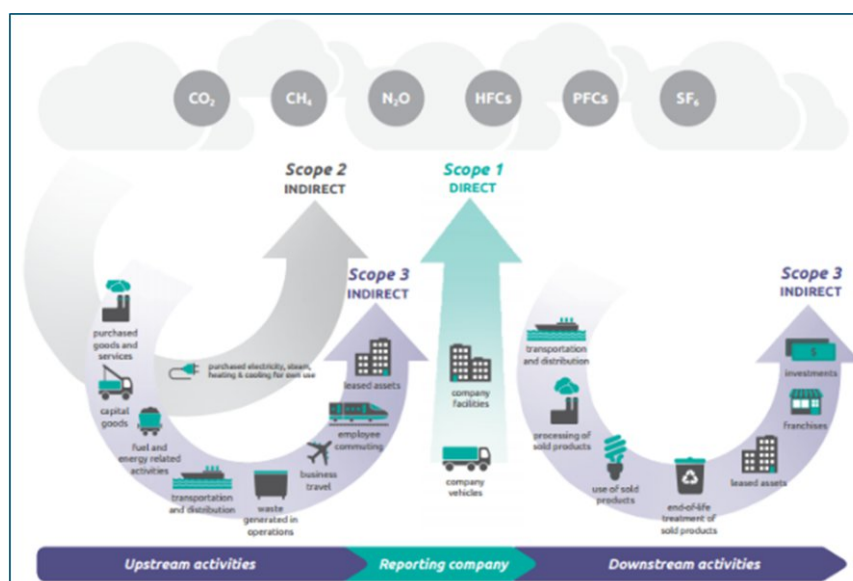


Figure 9: GHG Emissions Scope 1, 2 and 3³¹

Pakistan's TVC emissions essentially constitute scope 3 emissions for global retailers importing textile products from the country. Therefore, it is crucial for Pakistan textile exporters to accurately measure the total GHG emissions for each product exported i.e. scope 1, 2 and 3 emissions (total scope 1,2 and 3 GHG emission on textile product export = Scope 3 emission for importing retailer). Textile production accounts for approximately 9%³² of Pakistan's total GHG emissions. This does not capture emissions from cotton cultivation and transportation. To manage emissions and promote low-carbon consumption, textile firms track their carbon footprint (CFP), energy footprint (EFP), and water footprint (WFP). While some major textile exporters like Interloop, Gul Ahmed, Sapphire, and Sarena Group report on their scope 1 and 2 emissions in their annual sustainability reports, there is often less emphasis on measuring and reporting scope 3 emissions that account for significant emission footprint in the TVC. For instance, Interloop aims to reduce its absolute scope 1 and 2 GHG emissions by 51% by 2032 from a 2022 base year³³. Gul Ahmed focuses on reporting scope 1 emissions for their plant facilities and does not report on scope 2 as they fulfil all energy requirements through in-house energy generation. Sarena and Sapphire Group mention their scope 1, 2, and 3 emissions in their annual sustainability report but with limited information. This raises concerns among global retailers seeking precise emissions data and reduction strategies for textiles imported from Pakistan.

³¹ You, too, can master value chain emissions | GHG Protocol. (2019). Retrieved from: <https://ghgprotocol.org/blog/you-too-can-master-value-chain-emissions>.

³² Imran, S. & Abbas, Muhammad Mujtaba et al (2023). Assessing the potential of GHG emissions for the textile sector of Pakistan: A baseline study. Heliyon. 9. e22404. 10.1016/j.heliyon.2023.e22404.

³³ TEXTalks. (2023). Interloop the textile sector Pakistani company on an expansion path with SBTi approval. Retrieved from: <https://textalks.com/interloop-the-textile-sector-pakistani-company-on-an-expansion-path-with-sbti-approval/>.

Figures 10 and 11 highlight the primary hotspots of GHG emissions and their contributing factors within the Pakistan TVC. GHG emissions are widespread throughout the TVC, primarily stemming from three key sources. Firstly, in cotton cultivation and processing, GHGs are emitted through the use of fertilisers, pesticides, soil management practices, and changes in land use. Secondly, captive power generation in cotton processing and textile manufacturing, utilising coal, oil, and natural gas for heat and power, contributes significantly to emissions. Thirdly, the TVC heavily depends on electricity generated from the national grid, where over 80%³⁴ of energy is derived from high-emission fossil fuels. Moreover, transporting products across the TVC via diesel trucks and inadequate road infrastructure further exacerbates emissions. Consequently, the sector emerges as a high emitter of GHGs, necessitating proactive measures to decarbonise the TVC.

While exporters that are part of international supply chains must adhere to increasing environmental regulations, textile manufacturers producing solely for the local market in Pakistan or low-value addition products often operate with fewer regulations and oversight. This lack of regulatory enforcement poses a challenge to reducing GHG emissions within the overall TVC.

³⁴ Ritchie, H., Roser, M., & Rosado, P. (2022). Energy. Our World in Data. Retrieved from: <https://ourworldindata.org/energy/country/pakistan>.

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

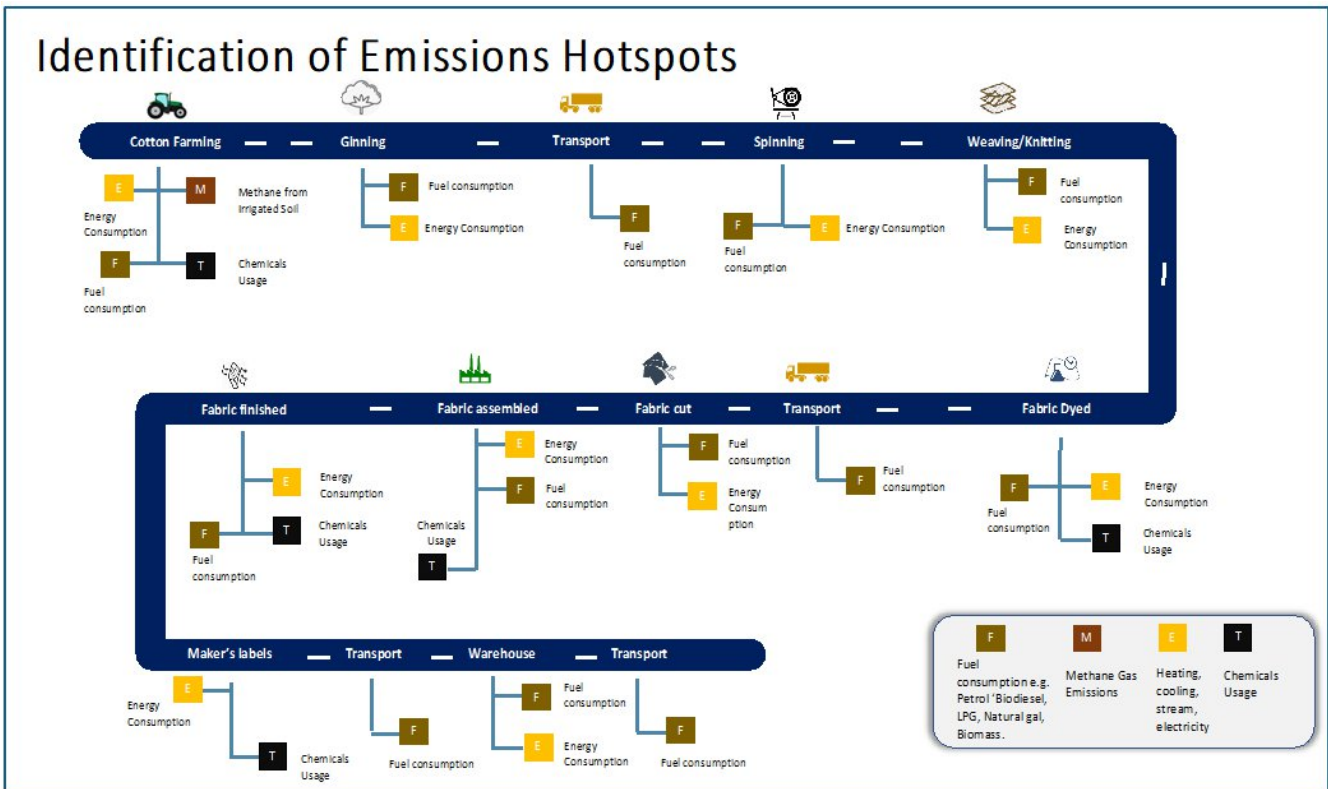


Figure 10: Emissions Hotspots in TVC – Source: Authors

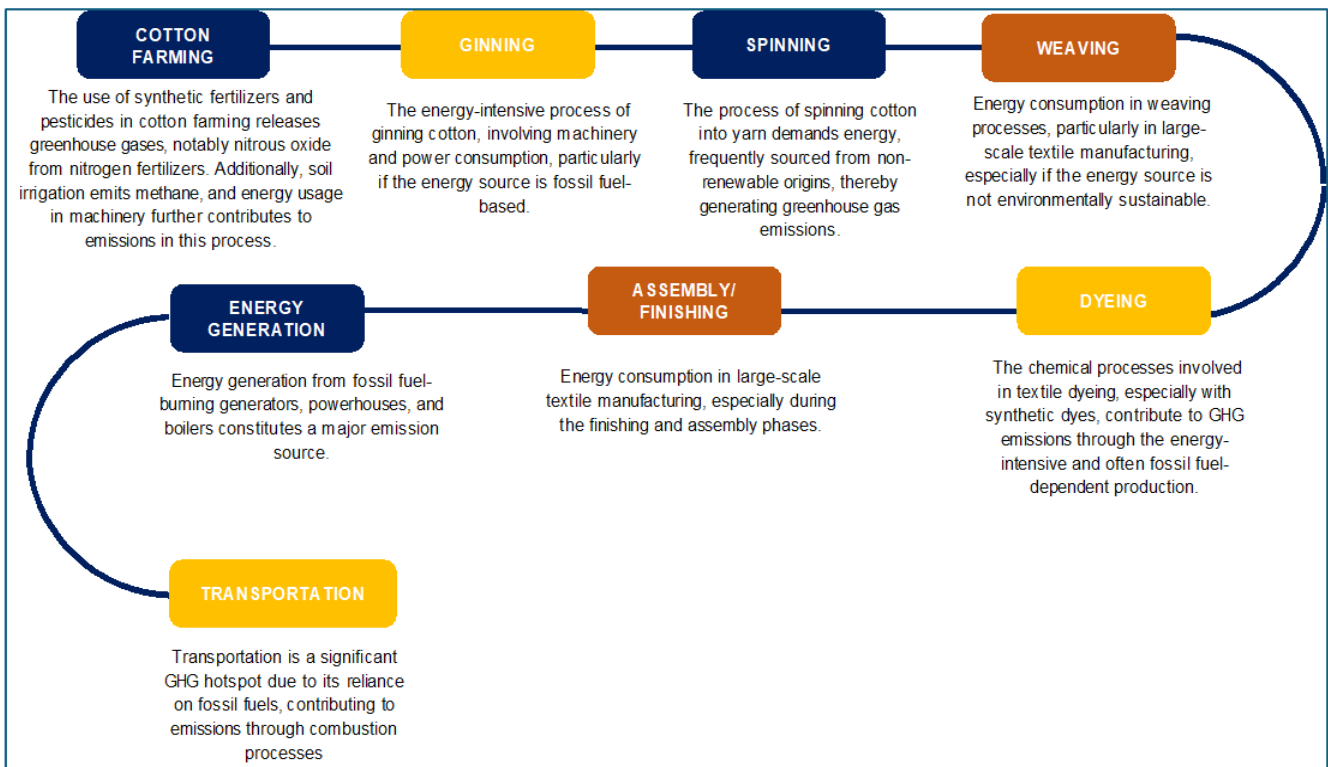


Figure 11: Emissions Details in TVC – Source: Authors

1.6 ESTIMATING PAKISTAN'S TEXTILE INDUSTRY EMISSIONS:

Accurately calculating the TVC's GHG emissions requires accounting for GHGs emitted throughout the textile product's lifecycle, from cotton cultivation to the export of the finished product. The TVC's length and complexity make it very hard to access accurate data and confirm its validity.

Based on the most recent estimates³⁵, Pakistan's total GHG emissions reached 490 million tonnes of CO₂ equivalent (MtCO₂e), positioning it as the 19th largest emitter globally. Notably, Pakistan demonstrated relatively low per capita emissions, registering only 2.4 tonnes of CO₂e per annum compared to 7.7 tonnes of CO₂e per annum by OECD member countries.

Few studies have quantified TVC emissions, but according to one study³⁶, Pakistan's total textile manufacturing emissions in 2022-23 amounted to 42.6 Mt CO₂e, representing 9% of the national GHG emission total. Scope 2 emissions accounted for 80% of this total, primarily due to the industry's reliance on purchased electricity generated from fossil fuels. Renewable energy sources constituted only 5.4% of the national energy mix in 2021, as reported by the National Electric Power Regulatory Authority (NEPRA).

As shown in Figure 12, the spinning sector emerged as the leading GHG emitter within the textile industry, responsible for 60% of total emissions. This was followed by weaving (23%), processing (8%), garment (6%), and knitwear (3%). These findings underscore the imperative for Pakistan's textile industry to reduce fossil fuel dependency and embrace sustainable practices. This would involve transitioning to renewable energy sources, enhancing energy efficiency, and adopting greener industrial techniques.

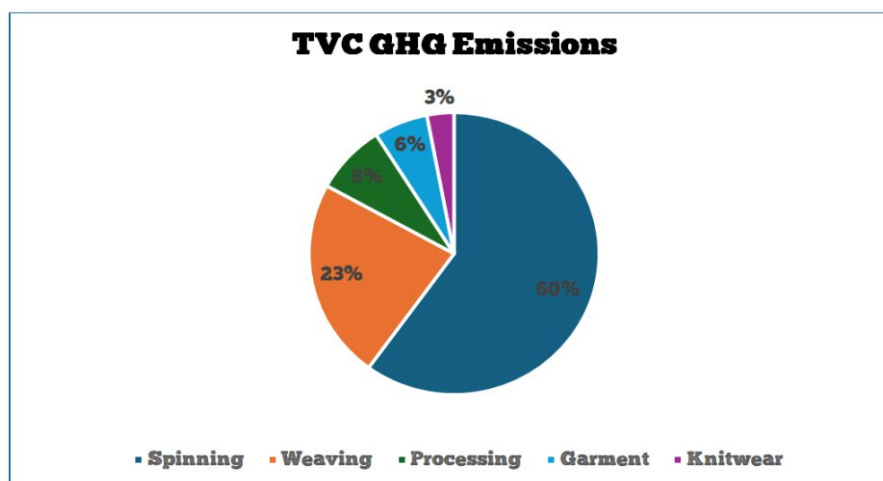


Figure 12: Pakistan's TVC GHG emissions by sector

³⁵ Government of Pakistan (2021) Updated Nationally determined contributions (NDCs). Retrieved from: <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>.

³⁶ Imran, S. & Abbas, Muhammad Mujtaba et al (2023). Assessing the potential of GHG emissions for the textile sector of Pakistan: A baseline study. Heliyon. 9. e22404. 10.1016/j.heliyon.2023.e22404.

1.7 KEY CLIMATE RISKS TO TVC:

Along with significant GHG emissions from industrial production, Pakistan's TVC also faces significant climatic risks at every production stage, with persistent structural issues spanning the entire value chain. These climate risks manifest in various forms, including rising temperatures, extreme heat events, shifts in rainfall patterns, droughts, strong winds, and frequent flooding. This section discusses the specific climate risks associated with cotton production, manufacturing processes, and transportation within the TVC.

Production – Cotton Raw Material

Globally, cotton cultivation occupies 2.5% of cultivable land, with Pakistan's cotton covering 15% of the cultivated area, revealing significant production efficiency gaps³⁷. Despite once being the world's fourth largest cotton producer (now ranked seventh), over the past decade, Pakistan's production has declined by over 50%, as illustrated in Figure 13. This decrease is attributed to operational inefficiencies, competition from other crops, and the impacts of climate change, resulting in a direct economic loss of up to \$30 billion³⁸.

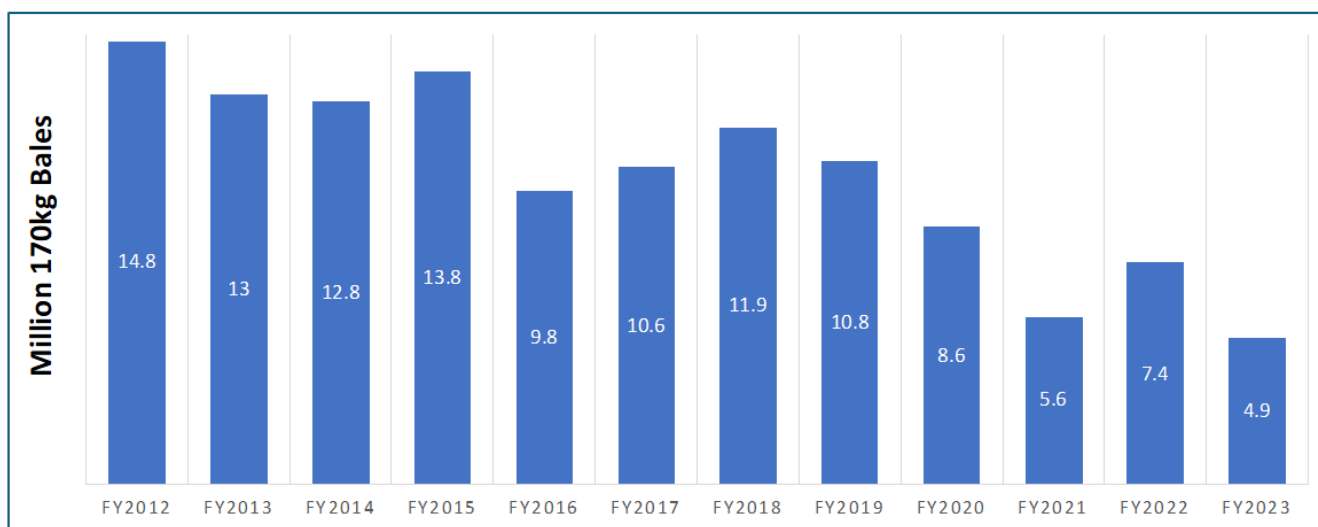


Figure 13: Cotton production in Pakistan³⁹

³⁷ Cotton | Ayub Agricultural Research Institute. (2022). Retrieved from: https://aari.punjab.gov.pk/crop_varieties_cotton.

³⁸ Rizvi, O. (2023). Textile in trouble. Macro Pakistan. Retrieved from: <https://macropakistan.com/textile-in-trouble/>.

³⁹ APTMA (2024) Textile and Apparel - A policy roadmap for the incoming government. Retrieved from: <https://aptma.org.pk/wp-content/uploads/2024/01/Textiles-and-Apparel-Policy-Roadmap-for-the-Incoming-Government-Digital-Version-Final.pdf>.

The increasing frequency of heatwaves, droughts, and floods presents significant challenges for farmers, especially those cultivating cotton, which is highly vulnerable to temperature variations and extreme weather events. Climate-induced pest attacks like cotton and pink bollworm, exacerbated by multi-cropping in core cotton areas, significantly declined Pakistan's cotton production. Farmers respond by increasing the number of sprays to tackle the pest attack, affecting the quality of cotton, and polluting the environment and soils. Additional effort is required to clean the cotton⁴⁰. The high temperatures during the summer season worsen the working conditions for the farm workers, affecting their health and productivity.

Water scarcity poses another serious challenge, as Pakistan heavily relies on an inefficient and costly irrigation system, leading to mismanagement of water resources and lower-quality cotton yields. Additionally, high input costs, limited access to credit, and lack of government support further hamper textile productivity in Pakistan making it difficult for farmers to invest in modern technology, better seeds, and sustainable inputs to increase cotton yield and quality. The catastrophic floods in 2022 further exacerbated Pakistan's dwindling cotton output, resulting in a staggering 45% loss in production⁴¹.

Resultantly, Pakistan's reliance on cotton imports has increased due to insufficient domestic production. The dependence on imported cotton not only diminishes the competitiveness of local farmers but also compromises the quality of the crop, impacting the textile industry's sustained reliance on imports. Moreover, the steep depreciation of the Pakistan Rupee, nearly 100% against the US Dollar since 2019, has inflated the cost of imported cotton. This has escalated the import bill, strained foreign reserves, and subsequently raised overall production expenses, thereby eroding manufacturers' profit margins.

Improving cotton production and its quality is crucial for revitalising Pakistan's export sector, which currently lags 2 to 6 times behind international cotton production benchmarks⁴². Despite the government setting the cotton support price at Rs8,700/40 kg for 2023/2024, prevailing market prices have fallen below this level due to financial liquidity challenges prompted by high interest rates. Despite recent declines in production, Pakistan continues to rank among the world's largest cotton producers,

⁴⁰ Ansari, P. L. (2023). Pakistan's textile industry is in crisis - and women are bearing the brunt of its decline. The Guardian. Retrieved from: <https://www.theguardian.com/global-development/2023/feb/01/pakistan-textile-industry-crisis-women>.

⁴¹ Mathews, B. (2022). Pakistan floods could cost 45% of cotton crop. Apparel Insider. Retrieved from: <https://apparelinsider.com/pakistan-floods-could-cost-45-of-cotton-crop/>.

⁴² NAP (2023) National Adaptation Plan Pakistan. UNFCCC. Retrieved from: https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf.

primarily attributed to its favourable environmental conditions conducive to cotton cultivation⁴³.

Table 2 outlines the climatic challenges affecting cotton production in Pakistan. Given the critical role of cotton in the TVC, focused policy and investment interventions are needed to safeguard and expand the sector.

| Challenges in Cotton Production | Impact |
|---|---|
| 1. Sensitive Cotton Growing Cycle | Cotton's growth cycle is vulnerable to temperature fluctuations, water scarcity, and pests, leading to reduced quantity and quality, impacting farmer livelihoods and chain sustainability. Health risks to farmers and workers rise due to high temperatures. |
| 2. Shortened Growing Season | Climate change shortens the cotton growing season, affecting plant health, yields, and workforce pressure for planting and harvesting |
| 3. Extreme Weather Events | All cotton-producing regions face elevated heat risks. Increased wildfires pose threats. |
| 4. Water Scarcity and Droughts | Global water scarcity and droughts, disrupt groundwater recharge, causing water stress. Irregular precipitation patterns and climate change influence water reservoir replenishment, necessitating drought-resistant cotton varieties. |
| 5. Extreme Rainfall and Flooding | Increased and extreme rainfall during the growing season elevates flooding risks in cotton-producing, along with river flooding. |
| 6. Wind and Storms | Strong winds and storms threaten cotton crops, with higher wind speeds observed in the region in 2022 |
| 7. Water Availability and Soil Conditions | Climate impacts water availability, crucial for cotton production. Higher temperatures increase water demand, affecting irrigation practices. Sustainable water usage and soil health management become imperative amidst soil deterioration from extreme weather events and pesticide use. |

Table 2: Challenges in Cotton Production⁴⁴

⁴³ Better Cotton. (2021). Better Cotton sign agreement with Pakistan's largest textile trade association. Retrieved from: <https://bettercotton.org/bci-sign-agreement-pakistans-largest-textile-trade-association/>.

⁴⁴ Hoek, T. (2023). Cotton and Climate. Solidaridad Network. Retrieved from: https://www.solidaridadnetwork.org/wp-content/uploads/2023/11/Cotton-and-Climate-Paper_-Solidaridad-Nov-2023.pdf

Manufacturing– Textile Products

The challenges of climate change on cotton production have cascading effects throughout the TVC. High temperatures, reaching up to 47°C in various cotton-growing regions of Pakistan, have led to dropped cotton flowers and bolls⁴⁵. This poses a major challenge for ginning, as the increased presence of 'trash' material such as sand, dust, nylon threads, and cotton plant leaves, coupled with low moisture content within cotton bolls, cannot be adequately addressed with outdated machinery, unskilled labour, and conventional methods.⁴⁶ Currently, only 10-20% of ginning factories use modern machinery. Increasing the price premium for sustainable quality cotton could encourage investment by ginners in modern and efficient technology⁴⁷.

The spinning, weaving, and stitching units in Pakistan face challenges in efficiently processing the lower quality, climate-affected cotton. They are exacerbated by outdated and inefficient machinery and processes, resulting in the production of lower value-added products⁴⁸. Moreover, water-intensive processes in cloth and garment dyeing and washing contribute to Pakistan's water stress, with textile dyeing being a major water pollutant due to inefficient wastewater treatment. Rising temperatures worsen hazardous working conditions for factory workers, leading to increased health costs and the need for investment in cooling infrastructure to ensure a safe working environment. Extreme weather events like flooding can devastate crucial infrastructure, including storage facilities, manufacturing plants, and transportation networks, leading to severe disruptions in the supply chain. These climatic challenges and existing operational gaps hinder Pakistan's TVC competitiveness, impacting its ability to meet domestic and international demand and maintain a strong global market position.

Shipping and Transportation

Textile firms in Pakistan face prolonged export order fulfilment durations due to the country's inadequate transport infrastructure and logistics performance. While railways are recognised globally as an environmentally friendly mode of freight transportation, Pakistan's railway system faces numerous challenges, impeding its ability to support the export-oriented textile sector⁴⁹. Consequently, transit times have lengthened, and

45 Saleem, O., Abideen, Z., Shafique, M., And Majeed, Z. (2019). PAKISTAN: Cotton production in consequence of climate change. Thrakika. Retrieved from: <https://thrakika.gr/en/post/pakistan-cotton-production-in-consequence-of-climate-change-XR>.

46 Tanveer, M. A., Aslam, H. D., Farooq, U., & Habib, M. B. (2012). Challenges and issues for ginning industry in Pakistan. ResearchGate. Retrieved from: https://www.researchgate.net/publication/320016498_Challenges_and_Issues_for_Ginning_Industry_in_Pakistan.

47 APTMA (2024) Textile and Apparel - A policy roadmap for the incoming government. Retrieved from: <https://aptma.org.pk/wp-content/uploads/2024/01/Textiles-and-Apparel-Policy-Roadmap-for-the-Incoming-Government-Digital-Version-Final.pdf>

48 PACRA (2020). Spinning sector study. Retrieved from: https://www.pacra.com/sector_research/Spinning%20-%20PACRA%20Research%20-%20September'23_1695735963.pdf.

49 Khan, K. and Khaliq, A. (2020). Pakistan Railways: Why not on Rails? A Revisit. PIDE Blogs. Retrieved from: <https://pide.org.pk/blog/pakistan-railways-why-not-on-rails-a-revisit/>.

reliability has diminished, eroding the competitiveness of Pakistani exports on the global stage. Textile firms often heavily depend on outdated diesel fueled truck fleets for road transportation to evade lengthy waiting times, encountering numerous issues like unregulated fares, escalating congestion, and elevated GHG emissions and air pollution. This strains the road network, causing congestion and infrastructure degradation, while also inflating transportation costs due to reliance on imported fuel. Extreme weather events further exacerbate the already vulnerable infrastructure.

Air shipments are limited due to high costs and emissions. Most textile imports and exports pass through Karachi and Qasim seaports, which suffer from congestion and insufficient infrastructure to handle port traffic. Therefore, Pakistan must quickly transition to green transportation, such as utilising electric vehicles for industrial goods transport⁵⁰.

1.8 KEY ACTORS AND THEIR ROLES IN TVC:

The TVC in Pakistan consists of numerous private and public actors, from farmers to exporters, each focused on their specific segment in the TVC. However, the complex and fragmented nature of the TVC results in certain segments holding greater influence than others, particularly the formal manufacturing sector. Table 3 categorises stakeholders by their interest in and influence on the TVC towards sustainability transition. Larger textile manufacturing firms wield significant political and economic influence, enabling them to directly communicate with the government and connect with global exporters compared to small and medium-sized companies (SMEs) and cotton farmers, who often rely on intermediaries to access local and export markets.

These smaller stakeholders face challenges due to their limited market access, low financial investments, and informal operations, resulting in lower prices for their textile products. In contrast, large textile firms, represented by bodies like the Pakistan Textile Council (PTC) and the All Pakistan Textile Mills Association (APTMA)⁵¹, have strong lobbying power and connections to global retailers and customers. They also benefit from government incentives to expand their trade, comply with international standards, and advocate for their interests to policymakers. However, these large textile companies also face criticism for lobbying the government for subsidised energy and financing⁵².

⁵⁰ Sohail, M. T., Ullah, S., Majeed, M. T., & Usman, A. (2021). Pakistan management of green transportation and environmental pollution: a nonlinear ARDL analysis. *Environmental Science and Pollution Research*, 28(23), 29046–29055. Retrieved from: <https://doi.org/10.1007/s11356-021-12654-x>.

⁵¹ Omer, S. (2024, March 8). Minister, industry advocate, media baron, philanthropist, or real estate tycoon – Who is Gohar Ejaz? Profit by Pakistan Today. Retrieved from: <https://profit.pakistantoday.com.pk/2024/02/18/how-gohar-ejaz-used-textile-lobbying-to-become-a-real-estate-tycoon-and-political-power-broker/>.

⁵² Alam, K. (2023, May 28). Is textile a rent-seeking industry? DAWN.COM. Retrieved from: <https://www.dawn.com/news/1756347>.

In Pakistan, there are few initiatives aimed at aligning the many actors in the TVC towards the low emission and climate resilient sector. The 'Net Zero Pakistan' initiative⁵³, a notable example of the largest net-zero coalition of leading textile firms in the country, is striving to foster stronger collaboration across the sector. However, there is a pressing need for greater integration involving smaller textile firms, which serve as the backbone of the industry, but yield low power and interest towards sustainability. Despite their keen interest in expanding market share and addressing operational and climatic challenges, smaller stakeholders like cotton farmers and independent traders wield limited influence in the value chain and are constrained in their actions.

| | | |
|---|---|---|
| + Interest of Stakeholders - | Highest interest but little power <ul style="list-style-type: none"> > Cotton farmers > Traders > NGOs | Highest interest and high power <ul style="list-style-type: none"> > Large textiles > Global Retailers > Trade organisations |
| | Low interest and little power <ul style="list-style-type: none"> > Small and medium textiles | Low interest but high power <ul style="list-style-type: none"> > Government and policy > Funders > Input suppliers |
| - Influence/power of stakeholder+ | | |

Table 3: Power/interest matrix

In Pakistan, farmers face significant crop price risks due to a flawed agricultural marketing system, limiting their price control. Immediate post-harvest sales are common to settle debts and purchase inputs for the next crop⁵⁴. Addressing these challenges requires Non-governmental organizations (NGOs) support to advocate farmers' concerns to policymakers. Globally, many countries have restructured crop-marketing systems to empower farmers and boost agricultural development. Pakistan can follow suit by implementing structural changes to strengthen farmers' market power, such as announcing minimum support prices for crops with a comparative advantage and significant local production. NGOs such as WWF-Pakistan and development partners like GIZ are supportive of Pakistan's textile industry in its sustainability journey. However, their impact remains confined within the broader scope of the TVC.

Table 3 in the annexure showcases the TVC stages with their relevant stakeholders.

⁵³ Pak Environment Trust. (2021). Renewable Energy Certificates - Pakistan Environment Trust. Retrieved from: <https://www.pakenvironment.org/carbon-pathways/renewable-energy-certificates/>.

⁵⁴ PT Profit. (2023). Weak agricultural marketing system in Pakistan: Exploitation of farmers and buyers. Profit by Pakistan Today. Retrieved from: <https://profit.pakistantoday.com.pk/2023/05/19/weak-agricultural-marketing-system-in-pakistan-exploitation-of-farmers-and-buyers/>.

CHAPTER 2:

PRIVATE SECTOR CLIMATE INVESTMENT IN TVC

This section presents a concise overview of global and climate finance landscapes, highlighting the existing gap in funding requirements. Barriers associated with private sector investments in climate within TVC are identified, and actions proposed to promote private climate investment and engagement in the TVC are discussed.

2.1 CLIMATE FINANCE LANDSCAPE:

Global Climate Finance Landscape

Climate finance has emerged as a critical source of funding to support the transition of the global economy towards low-emission and climate-resilient pathways. According to UNFCCC, Climate finance is broadly defined as “local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change”⁵⁵. The total global climate finance flows doubled to \$1.27 trillion between 2019–2020 and 2021–2022, as shown in Figure 14. Most of the financing was for mitigation initiatives to reduce GHG emissions representing \$1.15 trillion or 90% of total finance, primarily to decarbonise the energy and transport systems. Only \$114 billion or 10% of total finance was allocated for adaptation and dual benefits to build resilience of communities and systems to deal with the adverse impacts of climate change. Recent climate finance trends also reveal that over three-quarters of finance originated from domestic sources⁵⁶, highlighting the importance of strengthening national policies and regulatory frameworks to encourage domestic investments and mitigate risks. Public institutions have been significant contributors, with just over half of recent climate finance coming from them, particularly in East Asia, where national development finance institutions (DFIs) play a crucial role. Multilateral DFIs such as the World Bank and the Asian Development Bank are increasingly committing to allocating a significant portion of their financing to climate-related projects by 2025⁵⁷. Despite the rapid growth in green bond issuance worldwide, with issuance increasing approximately 13 times from 2013 to 2020, mitigation projects in developing countries face challenges in accessing lower interest bond rates due to the dominance of green bond issuance by developed governments and financial institutions, primarily for energy mitigation projects.

⁵⁵ UNFCCC (n.d). Introduction to climate finance. Retrieved from: <https://unfccc.int/topics/introduction-to-climate-finance#:~:text=Climate%20finance%20refers%20to%20local,that%20will%20address%20climate%20change>.

⁵⁶ Buchner, B., Naran B. Padmanabhi R., Stout S. Strinati C., Dharshan W., Gaoyi M., Connolly J., Marini N., (2023). Global Landscape of Climate Finance 2023. Retrieved from: <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf>.

⁵⁷ CDPR (2017) Recent Developments in Climate Finance: Implications for Pakistan. Retrieved from: <https://cdpr.org/pk/wp-content/uploads/2022/08/Recent-Development-in-Climate-Finance.pdf>

Grant financing and concessional debt are scarce and mainly directed towards vulnerable countries or sectors such as agriculture, forestry, or other land-use projects.

Grant funding is key for developing economies and represents merely 5% of the total funding, with the balance funded as concessional and commercial loans and equity. The global adaptation funding gap continues to widen even as the scale of the adaptation challenge is growing exponentially for developing economies. The costs of adaptation in developing countries are estimated at \$215 billion per year this decade, whereas the adaptation finance needed to implement domestic adaptation priorities is estimated at \$387 billion per year⁵⁸. Climate disasters exponentially impact developing countries that have a low capacity to absorb shocks, rely on sectors sensitive to climates such as agriculture and forestry and public support is limited⁵⁹. The current climate financing needs to scale 6 times to nearly \$6 trillion to limit the temperature rise target to 1°C-2°C under the Paris Agreement. However, progress to scale funding remains painfully slow, especially for developing countries. The commitment of \$100 billion per year by 2020 by industrialised nations to developing countries under the Paris Agreement is yet to materialise fully⁶⁰, while the scale of the climate challenge and its associated costs are increasing exponentially. At UAE COP28, only \$700⁶¹ million was pledged for the newly established loss of damage fund for climate emergency in most vulnerable countries, representing less than 2%⁶² of the irreversible economic and non-economic losses vulnerable countries face from global warming every year. Pakistan alone estimated \$30 billion in damage from the 2022 flooding. This highlights the serious gap between the availability and need of climate finance in developing countries.



Figure 14: Global climate finance in 2011-2022⁶³

58 UNEP (2023). Adaptation gap report. Retrieved from: [https://www.unep.org/resources/adaptation-gap-report-2023#:~:text=As%20climate%20impacts%20accelerate%2C%20finance,Environment%20Programme%20\(UNEP\)%20report](https://www.unep.org/resources/adaptation-gap-report-2023#:~:text=As%20climate%20impacts%20accelerate%2C%20finance,Environment%20Programme%20(UNEP)%20report).

59 Pearce O., Sharma S. (2023). Counting the Cost 2-23 – A year of climate breakdown. Retrieved from: https://www.christianaid.org.uk/sites/default/files/2023-12/counting_the_cost_2023.pdf

Buchner, B., Naran B, Padmanabhi R., Stout S, Strinati C., Dharshan W., Gaoyi M., Connolly J., Marini N., (2023). Global Landscape of Climate Finance 2023. Retrieved from: <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Global-Landscape-of-Climate-Finance-2023.pdf>.

60 Timperley, J. (2021). The broken \$100-billion promise of climate finance – and how to fix it. Nature, 598(7881), 400–402. Retrieved from: <https://doi.org/10.1038/d41586-021-02946-3>.

61 UNFCCC (2023) COP28 Agreement Signals “Beginning of the End” of the Fossil Fuel Era. UNFCCC. Retrieved from: <https://unfccc.int/news/cop28-agreement-signals-beginning-of-the-end-of-the-fossil-fuel-era>.

62 World Bank Group. (2022). Pakistan: Flood Damages and Economic Losses Over USD 30 billion and Reconstruction Needs Over USD 16 billion – New Assessment. World Bank. Retrieved from: <https://www.worldbank.org/en/news/press-release/2022/10/28/pakistan-flood-damages-and-economic-losses-over-usd-30-billion-and-reconstruction-needs-over-usd-16-billion-new-assessme>.

63 Climate Policy Initiative. (2024). Global Landscape of Climate Finance 2023 – CPI. Retrieved from: <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/>.

Figure 15 illustrates that private sector finance is the largest source of financial flows for climate action, particularly in mitigation while contributing less than 1% towards adaptation and dual benefits of the total finance. The private sector often perceives fewer business opportunities for investment in adaptation compared to the commercially promising prospects provided by mitigation sectors like energy and transportation, which offer tangible units of measure for GHG emissions that can be monetised. Unlike mitigation, adaptation lacks a comparable unit of measure, making it subjective to private sector investors. However, climate-related disruptions significantly increase business costs, prompting investors to seek insights into the climate risks affecting companies, as these factors directly influence business valuations. Moreover, mounting pressure from customers for transparent and sustainable supply chains further accentuates the urgency for businesses to address climate concerns and enhance transparency measures. Given its central position in the economy and direct exposure to the impacts of climate change, the private sector has an opportunity to play a crucial role in addressing the overall financing gap.

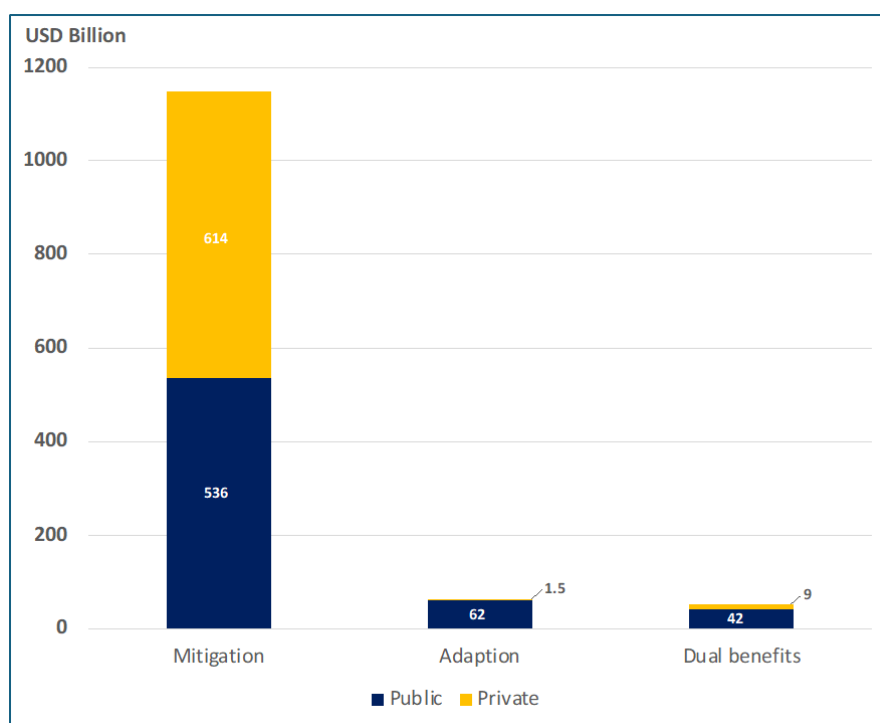


Figure 15: Uses of climate finance with private-public splits⁶⁵

⁶⁵ Climate Policy Initiative. (2024). Global Landscape of Climate Finance 2023 - CPI. Retrieved from: <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/>

Pakistan's Climate Finance Landscape

The World Bank has projected that addressing Pakistan's climate challenges from 2023 to 2030 requires approximately \$348 billion in total investment. This includes \$152 billion (44%) for adaptation and resilience and \$196 billion (56%) for decarbonisation or mitigation. Despite contributing just 0.6% of global CO₂ emissions in 2018, Pakistan faces a significant challenge as its annual GHG emissions are projected to triple by 2030 without new initiatives. To align with Paris Agreement goals, the Government of Pakistan aims in its NDCs⁶⁶ to reduce emissions by 50%, with 35% subject to international financial support, amounting to projected costs of \$101 billion by 2030, primarily for transitioning to renewable energy sources. However, the NDCs lack clarity on achieving these goals, prompting reliance on concessional international climate finance⁶⁷.

The recent developments in climate finance carry significant implications for Pakistan. Despite Pakistan's low emissions-to-income ratio, climate finance is likely limited for mitigation and adaptation projects, requiring substantial private climate finance, particularly for renewable energy projects, to achieve emissions reduction targets. However, the focus on bankable projects raises concerns about attracting private climate finance. The country has a successful track record of private participation in infrastructure, especially in the electricity sector, albeit largely dominated by fossil fuel projects negotiated at high energy tariffs. To enhance its attractiveness to renewable energy investors, Pakistan needs to improve its framework for public-private partnerships (PPPs). Additionally, reviewing and potentially reducing requirements for green bond sponsors and aligning with international standards, as well as improving the country's overall country risk rating, could further bolster Pakistan's appeal to potential global and domestic private investors⁶⁸.

Securing funding for climate action, especially in the TVC remains a significant challenge in Pakistan, with public financing constrained by competition from traditional development sectors of infrastructure, health, education, and security. The government is exploring various funding mechanisms, including Green Bonds and carbon pricing instruments, with recent initiatives like Pakistan's first Green Bond issuance by The Water and Power Development Authority WAPDA raised \$500 million at a 7.5% market yield in 2021. Additionally, conservation finance and carbon pricing applications targeting sectors like forestry, coal-fired electricity generation, and cement are being considered to manage emissions.

⁶⁶ Government of Pakistan (2021) Updated Nationally determined contributions (NDCs). Retrieved from: <https://unfccc.int/sites/default/files/NDC/2022-06/Pakistan%20Updated%20NDC%202021.pdf>.

⁶⁷ Mako, W. Nabi, I. Mahmood, A. And Khan, S. (2022). Recent developments in climate finance: Implications for Pakistan. IGC. Retrieved from: <https://www.theigc.org/sites/default/files/2022/09/Mako-et-al-2022-Working-paper.pdf>.

⁶⁸ FCDO (2023) Accelerating green and climate resilient financing in Pakistan report. Retrieved from: https://growthgateway.campaign.gov.uk/wp-content/uploads/sites/138/2023/11/231120_Accelerating_Green_Climate_Financing_Report_vFinal-003.pdf

Pakistan has limited success in securing global climate finance. In 2021, Pakistan secured only \$4 billion in climate finance, with 84% sourced internationally⁶⁸ and only 16% from domestic channels, highlighting the enormous gap in the funding needed and the urgency to scale funding. To date, Pakistan has secured seven climate projects from the Green Climate Fund (GCF) with a total financing of \$249 million⁶⁹, 13 currently approved projects from the Global Environment Facility (GEF) with a total financing of \$41 million⁷⁰ and only two projects from the Adaptation Fund (AF) with a total financing of \$8 million⁷¹. Pakistan has thus far not accessed Climate Investment Funds (CIFs), major bilateral climate funds, or facilities except for one project⁷². None of the projects specifically target the TVC. Only two of the seven GCF projects focus broadly on climate- resilient agriculture and water management. Bangladesh on the other hand has successfully secured \$257 million in concessional climate finance from the GCF to decarbonise its textile sector. Access to capital is incredibly challenging for small and medium-sized enterprises within the TVC that often face financial constraints and lack collateral that prevents them from investing in renewable energy and energy efficiency upgrades. Securing funding at the farm level remains a persistent challenge, particularly for smallholders, due to the lack of organisation within the agriculture sector. The absence of available capital, combined with a lack of access to external financing options, further impedes the adoption of greener practices in TVC.

Accessing global climate finance for TVC is vital but demands substantial effort and capacity, especially with intensified global competition for these funds. Given the significance of the TVC to the Pakistani economy and society, as well as its substantial growth potential, it is imperative for the private sector in Pakistan to step up and play a pivotal role in investing in the industry to advance its sustainable development.

⁶⁹ Fund, G. C. (n.d.). Pakistan. Green Climate Fund. Retrieved from: <https://www.greenclimate.fund/countries/pakistan>.

⁷⁰ Projects | GEF. (n.d.). Retrieved from: <https://www.thegef.org/projects-operations/database>.

⁷¹ Afadmin. (2015). Projects Data Table View. Adaptation Fund. Retrieved from: <https://www.adaptation-fund.org/projects-programmes/project-information/projects-table-view/>

⁷² CDPR (2022). Development in climate finance. Retrieved from: <https://cdpr.org.pk/wp-content/uploads/2022/08/Recent-Development-in-Climate-Finance.pdf>

2.2 BARRIERS FOR PRIVATE SECTOR CLIMATE INVESTMENT IN TVC:

This section outlines the barriers that impede private sector engagement and investment across each segment of the TVC. It begins by examining the pressures and challenges originating from the global textile retail sector, which subsequently trickle down into the Pakistan TVC, affecting manufacturing, and extending all the way to cotton cultivation along the TVC.

Global Textile Retail

a) Lack of Green Premium - Price Neutrality of Sustainable Textile Products:

For the last two decades, prices in the international clothing market have remained stagnant from 1997 to 2019 before experiencing a surge due to the COVID-19 pandemic as shown in Figure 16. In the European Union, the inflation rate for clothing peaked at 5.9% in February 2023 but has since steadily declined, reaching 2.8% by December of the same year⁷³.

However, amidst this backdrop, Figure 16 indicates a rising demand from retailers for low-emission products driven by consumer preferences, emphasising transparency and sustainability in the TVC. Textile exporters are under increasing pressure to make substantial capital and operational investments in upgrading their factories and producing sustainable products to secure orders. However, despite these efforts, there is little evidence of price increases, indicating that product prices offer limited green premiums and have remained unaffected by sustainability demands.

This leads exporters to face downward cost pressure to recover investments in sustainable product production. While many large exporters recognise that these investments are necessary to protect market share and will ultimately reduce costs and improve industry competitiveness, the initial investment remains a significant challenge, particularly for small and medium-sized manufacturers. Consequently, manufacturing often postpones these investments, posing a challenge in aligning actions with required timelines.

⁷³ Statista. (2024). Clothing inflation rate UK. Retrieved from: <https://www.statista.com/statistics/318469/clothing-inflation-rate-uk/>

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

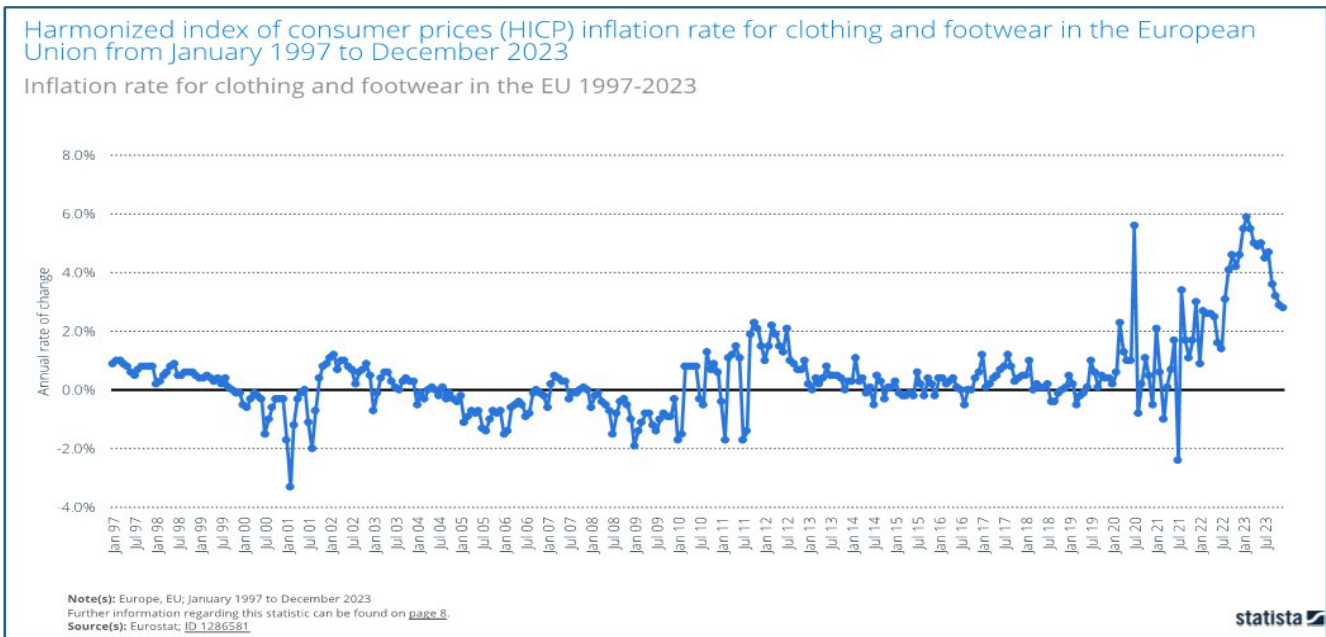


Figure 16: Harmonized index of consumer prices inflation rate for clothing and footwear in EU⁷⁴

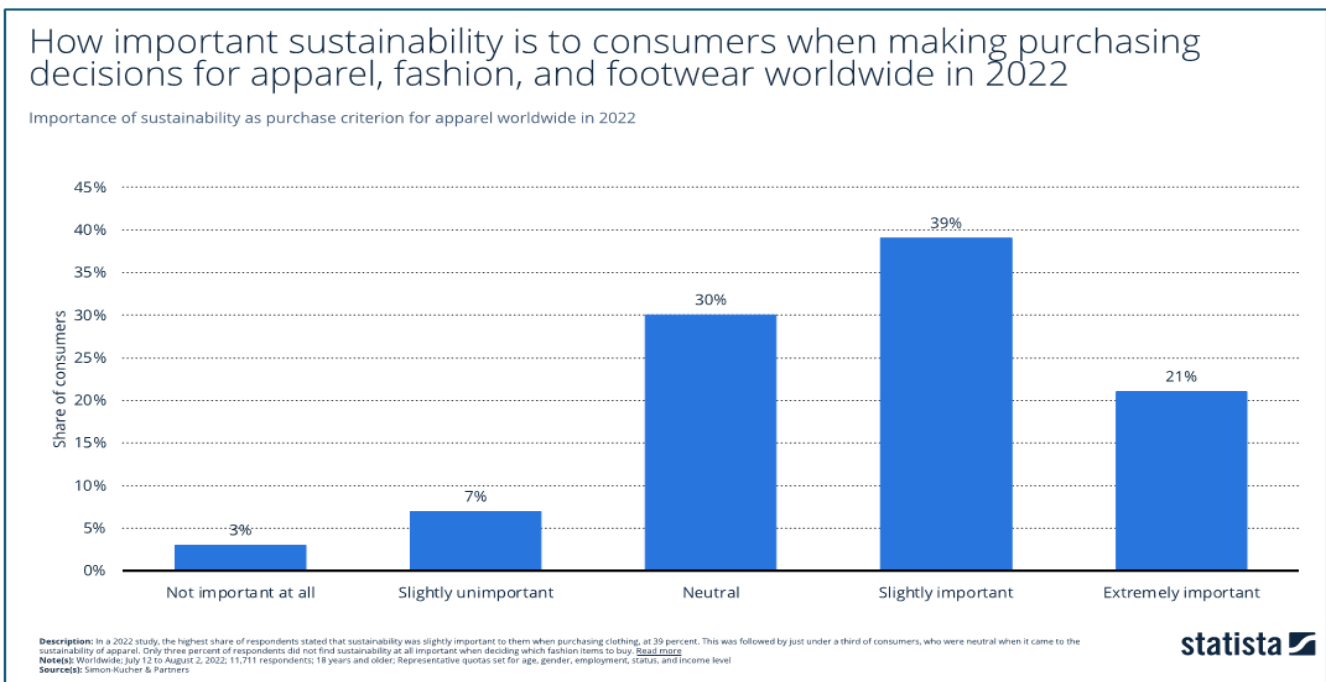


Figure 17: Importance of sustainability to consumers while purchasing clothes⁷⁵

⁷⁴ Statista. (2024). Inflation rate for clothing and footwear in the EU 1997-2023. Retrieved from: <https://www.statista.com/statistics/1286581/eu-clothing-inflation-rate/#:~:text=Inflation%20rate%20for%20clothing%20and%20footwear%20in%20the%20EU%201997%2D2023&text=The%20inflation%20rate%20for%20clothing,reachin%202.8%20percent%20in%20December>

⁷⁵ Statista. (2022). Sustainability importance to apparel purchase. Retrieved from: <https://www.statista.com/statistics/1303946/sustainability-importance-apparel-purchase/>

b) **Fragmented Action by Stakeholders on Sustainability:**

The global commitment to combating climate change is evolving in alignment with the Paris Agreement, with major industrialised export markets like the European Union and the UK setting ambitious targets to achieve net zero emissions by 2050. To meet national and international goals, this transformative goal encompasses all sectors, including textiles, which must now confront emissions across their entire supply chains, especially Scope 3 emissions.

Figure 19 shows that emissions from the apparel industry are on track to rise by 30% between 2023 and 2030. Currently, nearly a quarter⁷⁶ of Scope 3 emissions for global apparel companies stem from the production of imported purchased goods from countries like Pakistan. To mitigate these emissions, a primary strategy involves transitioning towards using more recycled materials and sustainable raw materials in textile products. This shift is crucial not only for environmental sustainability but also for maintaining competitiveness in the global market.

To meet national and retailer targets of achieving net-zero emissions, it is crucial for exported textile products from Pakistan to align with these sustainability goals. This is challenging as many retailers set more ambitious targets than their respective countries. For instance, major retailer H&M aims to achieve net zero emissions by 2040⁷⁷, while ZARA has committed to reducing emissions by 50% by 2030 and reaching net zero by 2040⁷⁸. Each retailer has its own unique targets and reporting requirements, posing complexity for exporters to meet. According to data from Statista, only 19%⁷⁹ of the fashion companies they surveyed are tracking and utilising their emission data. With nearly 40% of companies planning on tracking their emissions, the requirement for emission tracking will go up and directly impact Pakistani products and will become a precondition for exports.

⁷⁶ Statista. (2023). Scope three emission sources of clothing companies worldwide 2023. Retrieved from: <https://www.statista.com/statistics/1395176/clothing-companies-scope-three-emissions-sources-worldwide/>.

⁷⁷ H&M Group. (2024). Climate - H&M Group. Retrieved from: <https://hmgroupp.com/sustainability/circularity-and-climate/climate/#:~:text=Our%20priority%20is%20to%20reduce%20our%20emissions%2056%25%20by%202030.>

⁷⁸ Zara. (2024) About - Zara. Retrieved from: <https://www.zara.com/uk/en/z-join-life-mkt1399.html>.

⁷⁹ Sustainable fashion worldwide | Statista. (n.d.). Statista. Retrieved from: <https://www.statista.com/study/111665/sustainable-fashion-worldwide/>.

Additionally, Pakistan has pledged to reduce emissions by 50% by 2030, with a 15% reduction funded domestically and a 35% reduction reliant on international grant finance. These divergent targets across countries and global brands present substantial challenges for exporters producing multiple products for different companies, increasing their compliance costs. This necessitates a collective effort from all stakeholders in the Pakistan TVC to adopt innovative practices, sustainable technologies, and prioritise environmental stewardship in production processes. By doing so, Pakistan can become a leader in sustainable textile manufacturing, aiding global efforts to reduce emissions.

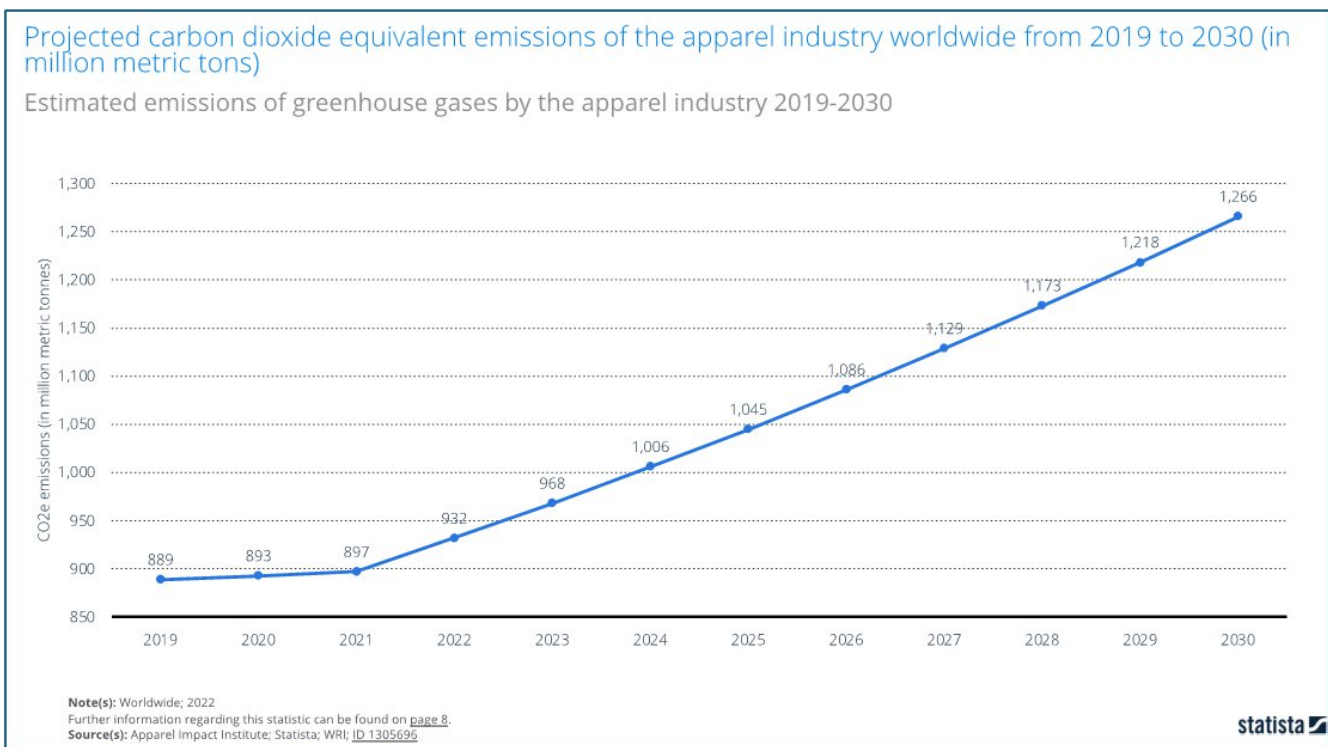


Figure 18: Projected CO2 equivalent emissions of the apparel industry worldwide⁸⁰

⁸⁰ Statista. (2023). Apparel industry CO2 emissions. Retrieved from: <https://www.statista.com/statistics/1305696/apparel-industry-co2e-emissions/>

c) **Complex Sustainability Reporting Requirements:**

New sustainability reporting standards, like those from the International Sustainability Standards Board (ISSB), are emerging globally as part of efforts to calculate, report and reduce emissions and climate risks. Implementation of the standards is underway worldwide, including in Pakistan, increasing reporting costs and complexity as companies must calculate, account for, and audit emissions and sustainability data. Textile firms must calculate emissions across the TVC. They can calculate direct emissions within their factories (Scope 1 and 2) as reported by several leading textile groups in their sustainability reports. However, obtaining accurate scope 3 data throughout the value chain, particularly in cotton production, is challenging. Initiatives like the Better Cotton Initiative provide some data but are limited in scope. A shortage of technical expertise for emission calculation and reporting necessitates costly training and consulting to meet complex requirements.

In addition to these reporting standards, many large textile firms pursue international sustainability certifications required by their buyers, such as Oeko-Tex, SGS, BCI, CTPAT, SMETA, GRS, and GOTS, among others, with some having committed to setting science-based targets aligned with limiting global warming to 1.5°C-2°C under the Science Based Targets initiative (SBTi). While these certifications add to the complexity of operations and upfront investment cost, large textiles recognise these as necessary to demonstrate their sustainability commitment to secure orders from global retailers. However, smaller textiles find these high compliance requirements challenging and costly, restricting themselves to lower-value export markets or local markets, thus missing out on opportunities for value addition and export growth.

d) **Increased Demand for Transparency and Traceability in TVC:**

In addition to reporting requirements, retailers are increasingly demanding transparency and traceability of materials within the TVC. These demands encompass more than just climate considerations, extending to issues like child labour or the use of pesticides in organic cotton to have full information on the products. Managing the TVC is complex, involving multiple stakeholders from farmers to producers, each contributing to different stages of the value chain. Even where information exists, it may not be available to everyone who has a responsibility to contribute to materials. Textile and global exporters need access to information to make informed decisions about who they buy from. Governments and civil society need transparent supply chains to track companies' compliance with policies and pledges. However, as there is no central actor monitoring or in control of the TVC, efforts by different textile exporters on traceability are fragmented, with duplications or gaps in the process leading to higher costs and breakdowns in the sustainability objectives.

Trade associations like APTMA, Pakistan Readymade Garments Manufacturers & Exporters Association (PRGMEA), and Pakistan Cotton Ginners' Association (PCGA) focus on specific segments of the value chain such as spinning and weaving, garments, and ginning respectively, catering to their respective members. This fragmentation poses challenges in tracing the origin of products. Larger textile companies address this issue by engaging in the entire TVC, from garments to cotton cultivation, to establish traceability. On the other hand, some textiles argue against this vertical integration as they lack expertise in certain areas of the TVC, especially cotton cultivation, and investing resources to build capabilities in those areas would be wasteful, moving them away from their core competencies.

Pakistan's TVC

e) Low Production of Sustainable Materials:

Global fashion companies' main climate action strategy to reduce their scope 3 emissions, as shown in Figure 19, is to use more recycled and sustainable raw materials in their products.

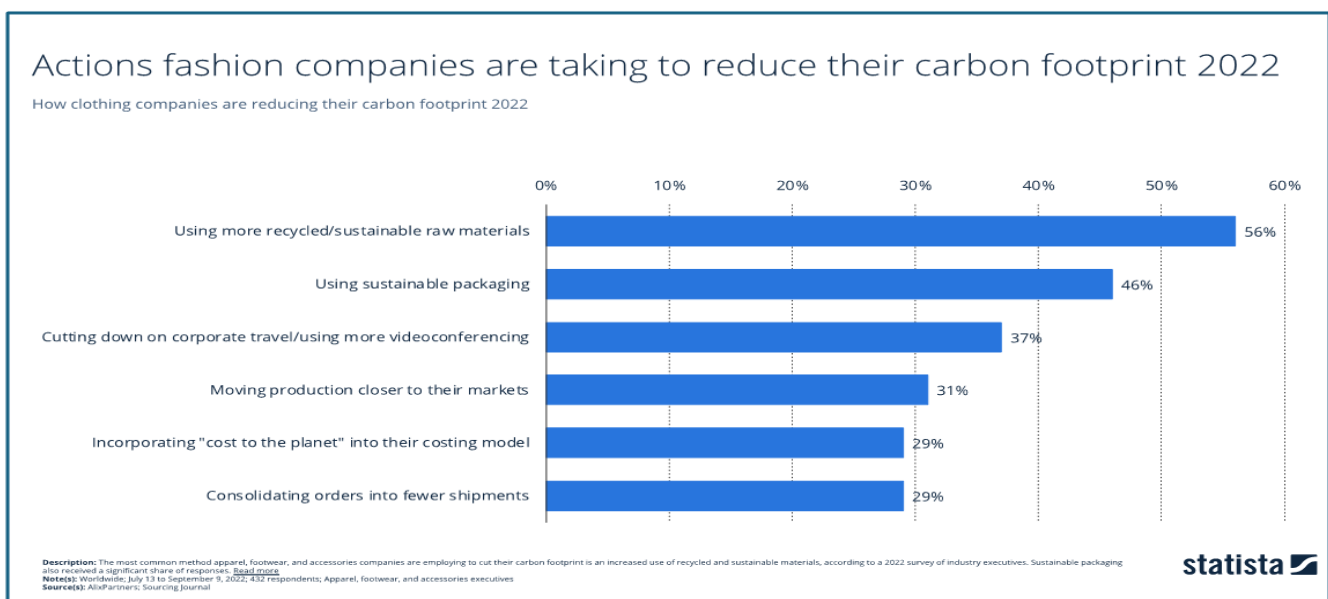


Figure 19: Actions fashion companies are taking to reduce carbon footprint⁸¹

Most textile manufacturers in the TVC are standalone entities with limited influence beyond their direct suppliers, except for a few large textile groups that operate vertically in the TVC. This hierarchical control structure restricts the ability of many industries to exert influence to produce sustainable raw materials, especially without a green premium offer in the supply chain. Thus, sustainability efforts are confined to limited spheres of influence, hindering manufacturers' ability to obtain sustainable

⁸¹ Statista. (2022). Fashion company carbon footprint reduction. Retrieved from: <https://www.statista.com/statistics/1360324/fashion-company-carbon-footprint-reduction-actions/>

materials and produce sustainable products competitively for the global market.

Initiatives like Better Cotton offer visibility from the bottom up but have limited impact in certain production areas. Some textile manufacturers opt to purchase imported raw materials, such as 'Cotton Made in Africa⁸²,' to bypass local traceability efforts and costs. Consequently, sustainability efforts often take a fragmented approach, focusing more on compliance than sustained climate action and building a sustainable material value chain.

f) **Lack of Investment in Renewable and Low Emission Energy:**

Despite the urgent need to cut emissions, particularly from the energy-intensive spinning and weaving processes responsible for over 80% of textile industrial emissions, TVC faces several hurdles in shifting to renewable and low-emission energy sources. An in-depth sector analysis highlights the limited adoption of alternatives like solar electricity and biomass. Moreover, critical equipment such as motors and boilers operate below optimal efficiency, and innovative energy-saving measures are largely untapped. Below are three barriers hindering TVC's expansion of renewable energy adoption.

High Initial Investment: The high initial cost of solar infrastructure is a significant barrier, especially for smaller stand-alone textile units looking to integrate solar energy. However, there is a positive trend as solar installation costs have declined due to technological advancements and government incentives. Despite this, the average investment of around \$0.6 million per megawatt (MW) for renewable energy installations remains financially burdensome for many textile units. Although the State Bank of Pakistan offers concessional interest rates of 6% for solar projects, smaller units struggle to afford upfront costs and collaterals, making them less competitive against larger counterparts.

Larger units reap the benefits of low emissions, cost savings, and shorter payback periods from renewable energy investments, enhancing energy security and reducing costs, giving them a competitive edge over smaller units. Some large export units are transitioning from coal-fired boilers to biomass with short payback periods. However, securing a consistent biomass supply at scale remains a challenge.

Limited Space for Solar Installations and Integrations: Despite short payback on investment, textile manufacturers are constrained by limited roof space and adjacent areas suitable for solar energy installations within their production facilities. Rooftops in many cases are already occupied or unsuitable for solar panels, while open spaces may be insufficient or allocated for other purposes.

⁸² Cotton Made in Africa. The Mass Balance System. Retrieved from: <https://cottonmadeinafrica.org/en/massbalance/>

Further, incorporating solar energy into existing textile infrastructure can pose integration challenges, particularly when retrofitting older structures or equipment with solar systems. This process may require modifications and adjustments to ensure seamless integration, adding to the cost of solar power systems.

Limit of Net-Metering Scheme: A critical policy barrier limiting the scale of solar installation is the current net-metering scheme, which restricts solar power systems for industrial use to 1 MW. However, the demand of the large-scale manufacturing industry typically ranges between 1.5 to 5 MW, surpassing the capacity allowed by the scheme. Removing this barrier is imperative for scaling renewal investments and decarbonising the TVC.

g) **Expensive Energy Efficiency Technology:**

Several large textile units have either upgraded or are in the process of upgrading their machinery to improve energy efficiency. This initiative aims to reduce energy consumption and subsequently lower emissions in the spinning, weaving and dyeing processes. However, importing energy-efficient machinery and technology is costly for smaller units, particularly when the borrowing cost is around 25%. Despite the expense, investing in energy-efficient machinery is crucial for maintaining a competitive edge and exporting low-emission, sustainable products in the future.

In addition to the high investment costs, many textile firms lack the technical capacity to identify and invest in climate-friendly technology. While trade associations could potentially fulfil this role, no centralised body currently supports building capacity and introducing climate-friendly technologies to the TVC to facilitate the transition to energy-efficient and low-emission production.

h) **High Energy and Finance Costs:**

The high energy and finance costs make it challenging for the TVC to operate profitably. Sustainability investments take the second stage as manufacturing businesses prioritise immediate operational and working capital needs. This is especially challenging for smaller entities with little financial cushion to support shocks and meet the growing sustainability requirements of the buyers. Many of these textiles focus on local or low-value-added markets that do not focus on sustainability. However, growing trends show that sustainability will become a necessary condition for export.

All Pakistan Textile Mills Association (APTMA⁸³) analysis reveals a concerning trend: industrial power tariffs surged by 25% from 14 cents/kWh to 17.5 cents/kWh due to quarterly adjustments, rendering production financially unfeasible. This rate is more

⁸³ Sattar, S. and Urooj, A. (2024). Deindustrialization amid rising energy costs. APTMA. Retrieved from: <https://aptma.org.pk/deindustrialization-amid-rising-energy-costs/>

than double the average faced by competitors in neighbouring economies like Bangladesh (8.6 cents/kWh), India (average of 10.3 cents/kWh; 6 cents/kWh for textile and apparel firms in Maharashtra), and Vietnam (7.2 cents/kWh).

Furthermore, industrial gas prices have surged by over 200% since January 2023, severely affecting the financial feasibility of captive generation, which is heavily relied upon due to the absence of competitively priced grid electricity. As a result, monthly textiles and apparel exports remain stagnant at \$1.4 billion, significantly below the installed capacity of \$2 billion per month. Approximately \$5 billion invested in capacity upgrades and expansions sits idle, leading to diminished investor returns, sentiment, and confidence in the economy.

i) **Complexity in Cotton Cultivation and Processing:**

Challenges such as lack of innovation in farming practices, competition with other crops, low-quality seeds, soil degradation, water shortages, pest infestation, financial constraints, input expenses, and climatic variations have led to low cotton yields in Pakistan compared to the region. Refer to Table 2 for the detailed impact of climate change on cotton production. During 2022-23, the cotton crop also suffered significantly due to extreme weather conditions, including a temperature rise of 7 to 10°C and water shortages, which negatively affected cotton growth. This decline in cotton production resulted in the import of raw cotton, draining precious foreign exchange reserves. Consequently, the cotton sector's contribution to GDP is only 0.3%, with a 1.4% contribution to agricultural value added. High interest rates have made it costly for textile manufacturers to hold cotton for future use, reducing demand and lowering raw cotton prices. Delayed tax refunds to the textile industry have also strained cash flows, which is further decreasing the demand and affecting cotton prices. Maintaining a cotton stock requires substantial working capital, limiting businesses' ability to engage in large-scale buying. Cotton sells at lower prices than the government-set control price. This further reduces farmers' demand, impacting their income and economic well-being. Combined, these issues negatively impact cotton cultivation and the overall sustainability of TVC.

j) **Narrow Project Focus Approach with Limited Cross-Learning Across the TVC:**

The textile manufacturing sector within the TVC, renowned for its resource-intensive operations, is witnessing a shift towards sustainability-driven innovations and investments among large integrated textile units. These efforts aim to mitigate emissions, reduce costs, and optimise resource utilisation across raw materials, energy, water, and waste. Notably, initiatives such as recycling waste materials, implementing water-saving measures, and adopting energy-efficient machinery are becoming increasingly prevalent.

While these efforts yield competitive advantages and cost efficiencies for individual textile firms, the dissemination of sustainability knowledge remains largely confined within organisational silos, primarily within the scope of dedicated sustainability departments. Although trade organisations like APTMA and the Pakistan Textile Council facilitate knowledge exchange, these platforms often cater to specific segments of the value chain, such as spinning and weaving, or predominantly benefit more prominent industry players.

Accordingly, many TVC stakeholders, especially farmers, are unaware of the potential benefits of renewable energy sources and energy efficiency measures in reducing GHG emissions. Without understanding the advantages of these technologies, businesses may be hesitant to invest in them.

This fragmented knowledge-sharing approach results in isolated actions and curtails the broader textile value chain's collective ability to affect a sustainable transition. To unlock the full potential of sustainability initiatives and enhance the industry's competitive edge, concerted efforts are needed to foster cross-learning and collaboration across diverse stakeholders within the TVC.

k) **Lack of Representation of Key Stakeholder Groups in TVC:**

When large textile firms do act towards sustainability, it is common for critical stakeholders like smallholder farmers to be excluded from the decision-making process and neglected in firms' sustainability plans. Integrating different stakeholders into discussions and action plans is crucial for fostering sustainable actions across the TVC. However, broadening participation presents its own set of challenges, as it introduces diverse interests that may not necessarily align with those of global firms. The question then arises: can shared sustainability values and actions be cultivated amidst these differing perspectives? Furthermore, if shared value proves challenging, are large textile firms prepared to prioritise sustainability across the TVC over maximizing their profits?

l) **Weak Enforcement of Environmental Regulations:**

In Pakistan, environmental regulations are often inadequately enforced at the local level, allowing many textile factories to operate without implementing necessary environmental measures. The policy section covers the policies and implementation challenges in more detail.

Summary of Barriers

Table below summarises the key barriers discussed in this section hindering private sector climate investments within the Pakistan TVC. These barriers stem from various factors, including the TVC's numerous stages, distinct climate considerations

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at each stage, and the involvement of multiple actors, each with their own interests, thus rendering the landscape complex. The impetus for establishing sustainable TVCs typically originates from top-down pressure driven by global retailers' demand for sustainable textile products. However, this momentum cascades down the supply chain, posing unique challenges for each segment that no single stakeholder can address independently. Consequently, there's a crucial need for the private sector to step in and play a pivotal role in overcoming these barriers.

| Barriers | Description |
|---|---|
| a) Lack of Green Premium - Price Neutrality of Sustainable Textile Products | Despite rising demand for sustainable products, textile exporters face challenges due to the lack of green price premiums, delaying investments and hindering alignment with sustainability goals. |
| b) Fragmented Action by Stakeholders on Sustainability | Fragmented sustainability targets and reporting requirements pose challenges for Pakistani textile exporters, necessitating collective efforts across stakeholders to align with global sustainability goals and reduce emissions. |
| c) Complex Sustainability Reporting Requirements | Complex sustainability reporting standards and international certifications pose challenges for Pakistani textile firms, with larger companies prioritising compliance for global orders while smaller firms face barriers to growth. |
| d) Increased Demand for Transparency and Traceability in TVC | Growing demand for transparency and traceability in the textile value chain presents challenges due to fragmented efforts and lack of central oversight, impacting sustainability objectives and cost efficiency. |
| e) Low Production of Sustainable Materials | Limited influence and absence of a green premium hinder Pakistani textile manufacturers' access to sustainable materials, leading to fragmented sustainability efforts focused on compliance rather than climate action. |
| f) Lack of Investment in Renewable and Low Emission Energy | TVC struggles to shift to renewable energy due to high initial costs, space limitations, and policy barriers like restricted net-metering schemes hindering scalability. |
| g) Expensive Energy Efficiency Technology | Small textile units struggle with costly imports of energy-efficient machinery, compounded by a lack of technical expertise and centralised support for transitioning to climate-friendly technology in the value chain. |
| h) High Energy and Finance Costs | High energy and finance costs impede profitability in the textile value chain, prioritising immediate operational needs over sustainability investments, especially challenging for smaller entities facing financial constraints amidst surging tariffs. |
| i) Complexity in Cotton Cultivation and Processing | Complex challenges in cotton cultivation, including weather extremes, financial constraints, and market fluctuations, hinder Pakistan's cotton sector, impacting both GDP contribution and the sustainability of the textile value chain. |

| Barriers | Description |
|---|--|
| j) Narrow Project Focus Approach with Limited Cross-Learning Across the TVC | Limited cross-learning within the textile value chain restricts the widespread adoption of sustainability measures, hindering collective efforts to achieve a sustainable transition and maximise competitive advantage. |
| k) Lack of Representation of Key Stakeholder Groups in TVC | Engaging diverse stakeholders, including smallholder farmers, is crucial for sustainable actions in the textile value chain. Overcoming challenges requires shared values prioritising sustainability. |
| l) Weak Enforcement of Environmental Regulations | Weak enforcement of environmental regulations in Pakistan enables textile factories to operate without necessary environmental measures, undermining sustainability efforts. |

Table 4: Summary of Barriers

2.3 OPPORTUNITIES FOR PRIVATE SECTOR CLIMATE INVESTMENT IN TVC:

Overcoming the identified barriers is crucial for the Pakistan TVC to transition towards a sustainable and environmentally friendly model. This will not only unlock attractive opportunities for private sector investment but also facilitate the scaling of climate initiatives within the TVC. These opportunities span from raw materials to finished textile products, fostering a comprehensive approach across every segment of the TVC.

a) Sustainable Materials, Traceability and Circular Practices:

Global retailers are prioritising sustainable materials as a key climate action in their sustainability efforts. This entails reducing emissions throughout the lifecycle of cotton, from cultivation, manufacturing, use to recycling, while also minimising waste and employing low-emission energy in processing and transportation. Private sector investments in developing a traceable, sustainable materials supply chain present significant growth potential, catering to local manufacturers, and unlocking new export markets. Below are specific opportunities.

Investment in Climate Smart Agriculture (CSA) Practices:

Climate-smart agriculture (CSA) practices integrate cotton cultivation with climate considerations to achieve the triple goal of enhancing productivity, resilience, and reduction of GHG emissions⁸⁴. By building careful planning and a forward-thinking strategy, the productivity and sustainability of cotton cultivation can be enhanced to meet the requirements of global retailers. Better Cotton⁸⁵ offers a strong example of CSA activities in Pakistan. It trains farmers in Sindh and Baluchistan and ensures the availability of non-GM cotton seeds and organic inputs for farmers. This initiative aims to reduce pesticide and water usage, improve yields and soil health and uplift farmer livelihoods.

⁸⁴ World Bank (2019) Climate smart agriculture (CSA) in Pakistan. World Bank Climate knowledge portal. Retrieved from: <https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA-in-Pakistan.pdf>.

⁸⁵ Better Cotton. (2014). Better Cotton sign agreement with Pakistan's largest textile trade association. Retrieved from: <https://bettercotton.org/bci-sign-agreement-pakistans-largest-textile-trade-association/>

An increasing number of agricultural technology firms, like SAWiE⁸⁶, are offering CSA services. SAWiE's digital platform employs remote sensing data, sensors, and satellite technology to provide real-time crop and soil management solutions. These advancements boost productivity and cut GHG emissions, potentially convertible into valuable carbon credits. This creates extra income streams for farmers and investors. Scaling such initiatives, however, requires investment and support from broader TVC stakeholders to enhance acceptance and mainstream these services.

While the scale of initiatives like Better Cotton and SAWiE is limited and lacks immediate financial incentives for farmers, the demand for sustainable cotton fibre products is expected to increase. Some textile firms are already assisting cotton farmers with CSA training and modern machinery to enhance climate-compatible yields. Increased private sector investment in CSA practices, alongside research for resilient cotton varieties, can further boost production.

Improving Traceability of Sustainable Materials:

A related opportunity in scaling sustainable cotton lies in the traceability of materials, which is pivotal for ensuring sustainability in TVC and accurately calculating emissions of the final textile products. Traceability addresses a critical pain point of global retailers by enabling them to track emissions and other social metrics throughout the value chain as demanded by their customers.

Efforts on traceability are starting to emerge in the Pakistan TVC. Interloop, a leading textile company, has introduced the 'Looptrace' platform, empowering its supply chain stakeholders to track, trace, and access transparent information about raw materials. Such efforts are often limited to individual textile groups. Global solutions, like traceability via satellite data, are growing but require substantial initial investments and training.

While a green premium might not be immediately attainable in the TVC for traceable materials, investing in traceability can protect market share and open new markets for the private sector investor, yielding returns on initial investments. Smaller textiles would also benefit from the development of a traceability ecosystem and generate additional revenues for the private investor. Such efforts would benefit from policymakers' support in setting standardised local traceability standards and offering financial support for building the material traceability ecosystem. This would offer a level playing field to all stakeholders, large and small, in the TVC and grow the export potential.

⁸⁶ SAWiE. (2023, August 3). SAWiE Ecosystems - Smart Farming in Pakistan. SAWiE Ecosystems - Sawie Ecosystems Info. Retrieved from: <https://sawie.net/>

Scaling Recycled Materials:

Global demand for recycled materials in textile products is rising, sometimes constituting up to 30% of the materials used. Rather than disposing of their waste, some textile companies are now upcycling 100% of their cutting leftovers, reducing waste and meeting customer demand simultaneously.

Innovating examples are emerging on recycled materials in Pakistan. 'Biodegradable Polyester', a sustainable material that mimics natural fibres, is used to create eco-friendly products like bedsheets, duvets, and pillows while reducing the environmental impact of synthetic fibres. Additionally, Gatron Industries, a local polyester company has introduced 'Ecoron'⁸⁷, a high-quality polyester filament yarn made from recycled PET bottles. This innovation significantly reduces the carbon footprint of traditional polyester production, benefiting various apparel applications. Moreover, sustainable innovations in manmade cellulosic fibres like viscose and lyocell are emerging and are derived from renewable plant-based sources. Scaling production and use of such recycled and circular materials would position Pakistan as a formidable innovative player globally.

b) Sustainable Chemicals and Water Recycling:

In addition to GHG emissions, chemicals and water usage considerably impact textile products. Chemical use contributes to emissions and water body pollution. The diminishing water supply in the country will lead to imminent shortages, disrupting textile manufacturing. This presents an opportunity for private sector investment in sustainable chemicals and water recycling to cut costs and maintain uninterrupted manufacturing processes.

Using Sustainable Chemicals:

Interloop, a leading textile manufacturer, launched a pioneering 'Sustainable Textile Bleaching' initiative to reduce its environmental impact. Upgrading processing machines with advanced fills and drain systems allows the company to recycle bleached water and chemicals across cycles, significantly cutting water usage and chemical waste. Implementing these sustainable practices enhances environmental stewardship, yields cost savings and improves the brand's reputation as a sustainability leader in the industry.

Recycling of Dyes and Chemicals:

Some textile firms aim to recycle all effluents by 2030, utilising 100% of their discharge. This approach minimises harmful pollutants released into the environment while cutting fresh water and raw material consumption. Recycling efforts also yield cost savings by reclaiming expensive chemicals and dyes, boosting manufacturing process efficiency, and contributing to a circular economy transition.

⁸⁷ GATRON. (2023). Ecoron Landing Page - GATRON. Retrieved from: <https://gatron.com/ecoron/>.

Water Treatment and Wastewater Conservation:

Some textile firms have established their own water treatment plants to manage processing and wastewater. Regular testing by the Environmental Protection Agency (EPA) can ensure the treated water meets environmental standards. These facilities effectively remove pollutants, safeguard against water pollution, and preserve local water bodies. Moreover, treated water can often be recycled within production processes, reducing overall water consumption, costs, and environmental impact. Others have integrated sustainable technologies like 'E-flow' machines with nanobubble technology into their operations, achieving cost and environmental efficiency. Additionally, some textiles have installed 'SharkBite' fittings on their washing machines, providing a swift, secure, and heat-free pipework connection solution for their washing processes.

c) Renewable and Energy Efficiency:

Energy is the largest contributor to emissions in the TVC, particularly during the spinning, weaving, and dyeing stages. With over 80%⁸⁸ of Pakistan's national grid energy sourced from fossil fuels, reliance on grid electricity results in significant emissions within the TVC. To meet the emission reduction demands of global retailers, decarbonizing energy through adopting off-grid renewables is essential. Investment in solar photovoltaic (PV) systems, battery storage, biomass, and other emerging clean energy technologies is necessary for the TVC to maintain market competitiveness and unlock future growth opportunities. Additionally, investing in renewable energy infrastructure offers strategic advantages by safeguarding against inflationary pressures and ensuring operational supply security.

Scaling Investment in renewable energy:

Numerous large textile companies are shifting towards renewable energy, typically with an installed solar power capacity ranging from 500KW to 1MW. However, the industry faces barriers such as the net-metering cap of 1MW on solar capacity, space constraints, and integration challenges, hindering the TVC from fully leveraging renewables to produce low-emission goods. Furthermore, some of these textiles are moving away from coal and adopting biomass as an alternative fuel source for their boilers. Additionally, there are pilots of large-scale Battery Energy Storage Systems (BESS) initiated under the UNIDO Sustainable Energy Initiative for Industries. Investing in renewables presents a lucrative opportunity for private sector investment to expand the market for sustainable products.

⁸⁸ Ritchie, H., Roser, M., & Rosado, P. (2022). Energy. Our World in Data. Retrieved from: <https://ourworldindata.org/energy/country/pakistan>.

Shifting to Net-Metering System:

The current net-metering scheme for solar power systems in the industry is capped at 1 MW, insufficient for meeting the energy demands of large-scale manufacturing industries, which typically require between 1.5 to 5 MW. Raising the cap on solar net-metering for industrial consumers from 1 MW to 5 MW would facilitate the transition to net-zero emissions by adding over 3000 MW of clean energy at the point of usage without requiring investment or guarantees from the government. This would support the industry in enhancing its energy efficiency sustainably and independently.

This net-metering limitation presents an opportunity for private sector investment in net-metering, particularly for industries aiming to transition entirely to solar energy. Expanding the capacity of the net-metering scheme to accommodate larger manufacturing facilities' energy needs would allow private sector investors to capitalise on the growing demand for renewable energy solutions and support the industry's sustainable energy transition.

APTMA⁸⁹ has also proposed the adoption of the Competitive Trading Bilateral Contracts Market (CTBCM) to facilitate business-to-business (B2B) power contracts with a System/Wheeling Charge of 1-1.5 cents/kWh, excluding cross-subsidies and stranded costs. This initiative aims to enable the industry to procure green energy at competitive end-use prices through captive generation from sources like geothermal plants in depleted oil fields or hybrid solar/wind plants.

In the interim, the textile manufacturing units can acquire a Renewable Energy Certificate (REC) to offset their emissions and meet their reduction targets. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the grid from a renewable energy resource⁹⁰. Entities selling RECs can benefit from the additional revenue stream to lower their investment costs in renewables.

Installing Waste Heat Recovery:

To reduce the energy footprint associated with natural gas usage in steam-generating operations, some major textile companies have transitioned from conventional boilers to highly efficient Waste Heat Recovery Boilers (WHRB). This strategic shift has enabled them to satisfy over 50% of their total steam requirements through WHRBs.

⁸⁹ APTMA (2024) Textile and Apparel - A policy roadmap for the incoming government. Retrieved from: <https://aptma.org.pk/wp-content/uploads/2024/01/Textiles-and-Apparel-Policy-Roadmap-for-the-Incoming-Government-Digital-Version-Final.pdf>

⁹⁰ Pak Environment Trust. (2021). Renewable Energy Certificates - Pakistan Environment Trust. Retrieved from: <https://www.pakenvironment.org/carbon-pathways/renewable-energy-certificates/>

Investment in Advanced Energy Efficient Spinning and Weaving Machinery:

Despite significant upfront costs in energy-efficient machinery upgrades, the long-term benefits, including cost savings, improved competitiveness, and meeting market demand for sustainable products, outweigh initial investments. Leading textile firms are prioritising investments in state-of-the-art spinning technology to improve cost-effectiveness and energy efficiency throughout their production processes.

Striving for LEED Platinum Certification:

Several major textile companies aspire to achieve LEED Platinum certification, adhering to their rigorous sustainability standards across categories including sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation in design. These investments would reduce the operational costs and carbon emissions, enhancing the attractiveness of exported products.

d) Transportation:

Transportation is often overlooked as an investment opportunity but plays a critical role in emissions reduction and product quality maintenance. The TVC spans multiple steps from cotton cultivation to product export. Throughout this process, goods are transported in high-emission diesel trucks over poor road infrastructure, resulting in significant emissions.

Investment in Low Emission Transport:

The private sector has an attractive opportunity to develop a low emission transport sector by investing in electric and low-emission transport vehicles. Enforcing government policies that ban high-emission vehicles while offering incentives for low-emission ones would significantly boost the transition towards sustainable transport. Some textile companies are investing in electric bikes and cars for on-premises transportation. While the emission reduction from these efforts may not be significant, they signal the company's commitment to sustainability to employees and buyers.

e) Monitoring and Reporting:

The adage 'what gets measured, gets managed' holds particular relevance for complex TVC. However, most stakeholders within the TVC are not currently measuring their GHG emissions. This poses a pressing issue, especially for textile exporters who link the TVC and global retailers. Without accurate data, actions taken by the TVC stakeholders remain speculative and potentially wasteful. This gap presents a significant opportunity for development of robust monitoring and reporting standards and solutions.

Sustainability Reporting and GHG Calculations:

A select few leading textile firms have developed their sustainability reports and conducted assessments of their GHG emissions. This enables these firms to establish targets, monitor progress, and demonstrate their commitment to sustainability to their buyers. Such actions present marketing opportunities for securing orders and expanding market share. As regulators increasingly mandate sustainability reporting, it will become a necessity for all TVC stakeholders. Those already engaged in reporting will have a competitive advantage.

Leveraging the complete TVC within the country presents an opportunity for private-sector technology companies. Not only can they develop solutions tailored to the local TVC, but they can also export these solutions to other countries and adjacent industries, such as food and beverages. Agricultural organisations like 'SAWiE' use a carbon calculator and remote sensing technology to assess GHG emissions from Pakistan's cotton agriculture sector, while also providing insights into soil health, canopy coverage, yield mapping, and field monitoring.

f) Offsetting Initiatives:

Export-oriented textile firms in the TVC can mitigate GHG emissions through offsetting initiatives, and engaging with voluntary markets due to the lack of a formal carbon market in Pakistan. However, registration and verification are challenging in terms of cost and time. Nonetheless, opportunities exist to build nature-based carbon credit programmes like afforestation and mangrove restoration. Certain prominent textile firms in Pakistan have shown commitment by planting trees, with some pledging up to 100,000, enhancing the local environment and carbon sequestration. Further research is needed to understand the carbon credit potential, especially in cotton cultivation.

g) Global Industry Collaboration:

Participation in international trade events such as Heim Textile 2024 and the 31st Dakar International Trade Fair 2023 strengthens Pakistan's textile industry and enables the TVC to highlight its sustainability initiatives to global retailers, reinforcing its status as a prominent player in the global textile market.

Summary of Opportunities

Table below summarises the opportunities for private-sector climate investments in the TVC.

| Opportunities | Description |
|---|--|
| a) Sustainable Materials, Traceability and Circular Practices | Investing in sustainable materials like recycled cotton and polyester, alongside climate-smart agriculture and traceability initiatives, enhances competitiveness and sustainability in Pakistan's TVC. |
| b) Sustainable Chemicals and Water Recycling | Investing in sustainable chemicals, water recycling, and treatment technologies offers cost savings, environmental benefits, and enhances brand reputation in the textile industry. |
| c) Renewable and Energy Efficiency | Investment in renewables like solar PV, biomass, and battery storage, alongside enhancing net-metering systems and adopting energy-efficient technologies, fosters sustainability and competitiveness in the TVC |
| d) Transportation | Investing in low-emission transport, including electric vehicles, presents an opportunity to reduce emissions and signal commitment to sustainability within the textile industry. |
| e) Monitoring and Reporting | Monitoring and reporting GHG emissions in the textile value chain offer opportunities for innovation, sustainability, and competitive advantage, with potential for exportable solutions. |
| f) Offsetting Initiatives | Export-oriented textile firms in the TVC can mitigate GHG emissions through offsetting initiatives, and engaging with voluntary markets due to the lack of a formal carbon market in Pakistan. |
| g) Global Industry Collaboration | Participation in International Trade Fairs and events boosts Pakistan's textile industry and showcases TVC's sustainability efforts, solidifying its global textile market position. |

Table 5: Summary of Opportunities for Private Sector Climate Investments

The 'impact potential and investment required' matrix in Figure 20 serves as a valuable tool for prioritising climate investment opportunities within the private sector. Numerous quick-win options exist, emphasising Climate-Smart Agriculture practices, material recycling, waste management, and effective monitoring and reporting systems. However, strategic investments are essential for a sustainable transition within the TVC. These investments should target the traceability of sustainable materials, adopting renewable energy sources, and technological upgrades.

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| | | |
|--|---|---|
| <p>+ Impact Potential -</p> | <p>Quick Wins</p> <ul style="list-style-type: none"> > Climate Smart Agriculture (CSA) Practices > Recycling of materials > Zero waste discharge > Monitoring and reporting | <p>Strategic Investments</p> <ul style="list-style-type: none"> > Traceability of Sustainable Materials > Renewable and Energy Investments > Upgradation in energy efficient technology |
| | <p>Green Marketing</p> <ul style="list-style-type: none"> > Offsetting Initiatives | <p>Law Impact Investments</p> <ul style="list-style-type: none"> > Ebikes and EVs |
| | <p>- Investment Required +</p> | |

2.4. EXAMPLES OF GLOBAL TVC CLIMATE PROJECTS:

The Pakistan TVC stands to gain valuable insights by studying global climate projects within the textiles sector. Several such projects, funded by global climate funds and multilateral organizations, serve as exemplary models. By emulating these initiatives, the private sector can develop similar projects and tap into global climate finance opportunities.

| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|---|---|--|---|
| 1 | Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh. | GCF Financing 75.3% and Co-Financing 24.7 % | Under implementation and USD 340.5 Million | It is a technical assistance programme to provide an integrated package of concessional financing for textile and RMG manufacturers and create an enabling environment to reduce 14.5 million tonnes of carbon dioxide equivalent (MtCO ₂ eq) in emissions. This is facilitated through capacity building, awareness raising, policy development and support in loan disbursement, monitoring, and evaluation of the programme parameters |
| 2 | High Impact Programme for the Corporate Sector | GCF Financing 25.4% and Co-Financing 74.6 % | Under implementation and USD 1 Billion | This programme aims to promote the uptake of low-carbon technologies in the industrial sector. It was designed to facilitate a transformational shift within the energy-intensive industries, agribusinesses and the mining sector in Armenia, Jordan, Kazakhstan, Morocco, Serbia, Tunisia, and Uzbekistan. It seeks to form a low-carbon pathway by promoting the uptake of high climate impact technologies and stimulating behavioural change at the corporate governance and management level. This includes integrating climate change considerations into strategic, financial and technological decision making |

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| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|---|---|--|--|
| 3 | The Africa Integrated Climate Risk Management Programme: Building the resilience of smallholder farmers to climate change impacts in 7 Sahelian Countries of the Great Green Wall (GGW) | Co-financing 42.2% and GCF financing 57.8% | Under implementation and USD 143.3 Million | The Sahel region in Western Africa faces heightened vulnerability to climate change, including rising temperatures and extreme weather events. The program aims to enhance resilience among smallholder farmers and rural communities across seven least developed countries. It focuses on capacity building, institutional development, and improving access to agricultural insurance and climate information services. Ultimately, the goal is to mitigate climate risks and bolster food security in the region |
| 4 | Increase Resilience to Climate Change of Smallholders Receiving the Services of the Inclusive Agricultural Value Chains Programme (DEFIS + | GCF Financing 35.7% and Co-Financing 64.3 % | Approved and USD 150.8 Million | DEFIS+ aims to mitigate climate change effects in Madagascar, focusing on the drought-prone Southern region. It targets smallholder farmers with adaptation measures, leveraging past IFAD successes. Key outcomes include bolstering climate resilience in agriculture, enhancing market access for income, and improving food security. By empowering smallholders, DEFIS+ aims to enhance overall resilience and well-being in vulnerable communities. |
| 5 | GEF Promotion of Circular Economy in Textile and Garment Sector of Lesotho, Madagascar and South Africa. | GEF Financing USD 7.4 Million and Co-Financing USD 47.4 Million | Approved for Implementation and USD 54.8 Million | The project aims to promote a circular economy within the textile and garment sector by utilizing a value chain approach to address the upstream resource usage within the sector, as well as utilize green chemistry, promote reuse and recycling of textile waste into economically and socially viable products. |
| 6 | IFC/GEF Green Global Supply Chain Decarbonization Platform | GEF Financing USD 14.6 Million and Co-Financing USD 150.6 Million | Approved and USD 165.2 Million | IFC, in collaboration with GEF and a multinational Brand Client, proposed a pioneering initiative to pilot the first Supply Chain Decarbonization Platform in the Textile and Apparel sector, addressing Scope 3 emissions which account for over 95% of total emissions. The project aimed to establish a financing structure to drive decarbonization investments while transitioning supplier factories to safer chemical alternatives. Gender-specific engagement strategies were integrated to enhance economic opportunities for women, supported by gender-responsive monitoring and evaluation frameworks. GEF resources were crucial to mitigate perceived risks, alongside a 15 percent first loss guarantee from the Global Brand, ensuring the platform's success. |

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| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|---|---|--|--|
| 7 | Eliminating hazardous chemicals from textile fashion supply chains in India | GEF Financing USD 7.8 Million and Co-Financing USD 48 Million | Approved and USD 56 Million. | The "Eliminating hazardous chemicals from textile fashion supply chains in India" project targets eradicating harmful substances. Goals include reducing environmental impact, enhancing worker and consumer safety, and promoting sustainable practices. It aims to advocate for sustainable chemical management and transparency, fostering a more ethical and sustainable fashion industry. Overall, the project anticipates significant positive outcomes, including improved environmental sustainability, enhanced health and safety standards, and increased transparency in the textile fashion supply chain |
| 8 | Promotion of Circular Economy in the Textile and Garment Sector Through the Sustainable Management of Chemicals and Waste in Ethiopia | GEF Financing USD 3 Million and Co-Financing USD 30.6 Million | Approved and USD 33.6 Million. | To promote the concept of circular economy (CE) in the textile and garment (TG) sector of Ethiopia through value chain approach that addresses the sector's upstream: resource use; green and sustainable chemistry as well as downstream by the reuse, recycling and conversion of textile/garment discards and related wastes into economically viable and socially beneficial products and services. |
| 9 | Tanzania Agriculture Climate Adaptation Technology Deployment Programme (TACATDP) | GCF financing 50.0% and Co-financing 50.0% | Under implementation and USD 200.0 Million | This program aims to bolster Tanzania's agricultural resilience against climate change impacts, recognizing its vulnerability due to extreme weather events and changing temperature patterns. It focuses on providing affordable access to climate adaptation technologies for smallholder farmers and rural women, supported by a lending and de-risking facility and government assistance. Additionally, it aims to raise awareness about climate threats among stakeholders in the agriculture sector to mitigate risks effectively. |
| 10 | Heritage Colombia (HECO): Maximizing the Contributions of Sustainably Managed Landscapes in Colombia for Achievement of Climate Goals | Co-financing 70.4% and GCF financing 29.6% | Under implementation and USD 145.2 Million | HECO aims to address Colombia's climate change challenges by securing perpetual financing for ecosystem management through public-private partnerships. It empowers local governance for effective resource monitoring and promotes sustainable practices from the Amazon to the Caribbean coast, emphasizing water security for multiple benefits. |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|--|---|--|---|
| 11 | Inclusive Green Financing for Climate Resilient and Low Emission Smallholder Agriculture | GCF financing 74.1% and Co-financing 25.9% | Under implementation and USD 12.4 Million | The project aims to enhance access to credit for smallholder farmers in Niger, enabling them to adopt climate-resilient and low-emission agriculture practices. With agriculture employing 85% of Nigerians and facing a 20% production drop, the initiative addresses the reluctance of local financial institutions to invest in such endeavours. By collaborating with commercial banks and microfinance institutions, it provides financial support alongside technical assistance, mitigating risk and fostering sustainable farming practices. |
| 12 | Scaling Up Energy Efficiency for Industrial Enterprises in Vietnam | Co-financing 82.6% and GCF financing 17.4% | Under implementation and USD 497.2 Million | This project aims to address energy efficiency barriers in Vietnam, a country with increasing energy intensity. By focusing on the industrial sector, it aims to mitigate greenhouse gas emissions and enhance energy security through a combination of GCF guarantee instruments, technical assistance, and a dedicated credit line. Leveraging government initiatives, it seeks to promote efficient electricity use and reduce consumption and emissions over its estimated 15-year lifespan. |
| 13 | GCF-EBRD Kazakhstan Renewables Framework | Co-financing 80.3% and GCF financing 19.7% | Under implementation and USD 557.0 Million | This project aims to construct 8-11 renewable energy projects in Kazakhstan, totalling 330 MW capacity, to reduce reliance on fossil fuels. With 91% of electricity currently generated from fossil fuels, the initiative aligns with government priorities for energy diversification and decarbonization. Leveraging GCF investment and supporting policies like feed-in tariffs, it aims to accelerate renewable energy development over a 20-year period, alongside technical assistance for institutional capacity building. |
| 14 | Partnership for Cleaner Textile (PaCT) | World Bank Group's International Finance Corporation (IFC) and Levi Strauss & Co. | USD 635 Million | 'In 2016, IFC partnered with Levi Strauss & Co. to develop a global program for environmental sustainability in the textile industry. Based on IFC's successful PaCT program in Bangladesh, it aimed to implement cleaner production practices in factories across countries like Bangladesh, India, Sri Lanka, and Vietnam. LS&Co piloted the program in six facilities with the goal of reducing water, energy, and chemical usage in their supply chain. Through PaCT, LS&Co conducted cleaner production assessments and used PaCT Advantage, a web-based |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|--|---|-------------------|---|
| | | | | tool, to drive continuous improvement among suppliers. This collaboration highlighted the importance of sustainable practices in the textile sector for long-term efficiency and competitiveness. |
| 15 | Green Fund for Textile Sector | World Bank Group's International Finance Corporation (IFC) and The Central Bank of Bangladesh | USD 500 Million | The Bangladesh central bank intends to allocate \$500 million from its green fund to aid textile factories in adopting eco-friendly technologies. This initiative, spurred by recommendations from a seminar jointly organized by the World Bank Group and the Policy Research Institute of Bangladesh, aligns with the Partnership for Cleaner Textile (PaCT) project. PaCT focuses on mitigating environmental and social impacts in the textile sector, addressing issues like water pollution and energy misuse. Through stakeholder engagements, policy recommendations were made, including the requirement for financial institutions to allocate 5 percent of their lending to green finance by 2016 |
| 16 | Sustainable Projects in the Textile and Garment Sector | Asian Development Bank | USD 20 Million | The Asian Development Bank (ADB) provided a \$20 million senior unsecured term loan to Eastern Bank over 5 years to support socially and environmentally sustainable projects in the textile and garment sector. The loan aimed to finance the construction or expansion of factories meeting high safety standards and encouraged energy efficiency. It also assisted Eastern Bank in enhancing its environmental and social management systems, including gender mainstreaming efforts. This project involved incorporating gender elements to improve facilities and working conditions for women in the ready-made garment industry in Bangladesh, including features such as day care and health clinics in RMG factories. |
| 17 | Envoy Sustainable and Energy Efficient Textile Manufacturing Project | Asian Development Bank | USD 11.2 Million | ADB supports Envoy Textiles Limited's second spinning unit in Jamirdia, Dhaka, aiming to modernize the textile industry. The project targets increased denim fabric production, reduced wastewater sludge, and lower electricity consumption. Aligned with ADB's Strategy 2030, it fosters job creation, gender equality, and environmental sustainability. This initiative bolsters Bangladesh's competitiveness, employment, private sector, and green growth goals. |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Project | Name of the Project | Funder | Amount of Funding | Description |
|---------|---------------------------------------|---------------|-------------------|--|
| 18 | Ethiopia's Textile and Garment Sector | GEF and UNIDO | USD 28 Million | UNIDO, in collaboration with the Global Environmental Facility (GEF), is spearheading a \$28 million initiative to bolster Ethiopia's Textile and Garment Sector. With GEF providing the majority of funding, amounting to the lion's share, UNIDO will oversee \$3 million of the project's funds. This endeavor aims to foster the circular textile industry in Ethiopia, showcasing UNIDO's dedication to advancing sustainable industrial development and curbing the environmental footprint of the textile sector through circular economy approaches. |

Table 6: Global climate projects in textiles

CHAPTER 3:

LAWS/ REGULATIONS/ POLICIES

This section presents an overview of Pakistan's climate change, textile and agricultural laws and policies, focusing on identifying thematic areas where private investment is encouraged in the TVC. Regulatory policies involved in promoting and safeguarding private investment are discussed, as are Pakistan's global commitments towards sustainability and the environment, upkeeping which are essential for availing trade concessions. Please refer to Annexure for details, including the barriers and enablers for the enforcement of relevant laws and policies.

3.1 CLIMATE CHANGE LAWS AND POLICIES:

Pakistan's climate change landscape, distinct from its environmental laws, operates in two parallel and overlapping regimes. Meanwhile, the federal government under the Ministry for Climate Change and Environmental Coordination has a mandate over the main climate laws and policies, including all international agreements, and each province also has its own provincial climate change policy. A list of the main climate change laws and policies is provided below: funding, with the balance funded as concessional and commercial loans and equity. The global adaptation funding gap continues to widen even as the scale of the adaptation.

- a) **The Climate Change Act, 2017:** Pakistan's primary legislation dealing with climate change was promulgated to meet the country's obligations under international climate conventions, like the Paris Agreement, and establishes Pakistan's Climate Change Council, Pakistan Climate Change Fund and the Pakistan Climate Change Authority which may provide services or give guidance to private entities on climate related matters.
- b) **National Climate Change Policy, 2021:** The ensuing and potential climate change action plans, programmes, and projects by the Government of Pakistan (GoP) are detailed here. The Policy recognises textiles as a key player in Pakistan's industrial sector, outlines GoP commitments to reduce emissions and enhance industrial processes and technologies, and guides towards potential areas that can benefit from private sector investment. These include creating CSR guidelines for corporations to establish funds for carbon emission reduction, preparing aerosol emission impact assessment reports for new industries, investing in 'Cleaner Production' strategies, energy-efficient motors and low-emission technologies and conducting energy efficiency audits.

- c) **The National Adaptation Plan, 2023 (NAP):** This roadmap for adaptation planning and actions in Pakistan does not specifically mention textiles. However, it acknowledges challenges in cotton production without offering specific solutions. The NAP also advocates for an enabling policy and regulatory environment for private sector investment in adaptation for building systemic climate resilience, supporting the agriculture-water nexus, supporting the agricultural growth sector and for additional initiatives through (1) Innovations in products or services; (2) Channelling adaptation finance through public-private partnerships; and (3) Supporting small and medium enterprises for transitioning to sustainable practices (See Annexure for details).
- d) **Pakistan's Updated Nationally Determined Contributions, 2021 (NDCs):** The NDCs pledge to promote bottom-up actions by the private sector and develop plans for emissions reductions from major sectors, particularly cement and textile. They encourage textile mitigation measures through clean production technologies, implementation of eco-standards, and incentivising carbon trading between industries to limit GHG emissions. Furthermore, the GoP has pledged to foster the development of appropriate economic incentives to encourage public and private sector investment, including through (1) Climate proofing risk for new public/private sector finance projects; and (2) Implementing a climate screening appraisal mechanism for public/private funded projects.
- e) **The Alternative and Renewable Energy Policy, 2019:** This does not mention textiles specifically but envisages private investment in the Alternative Renewable Energy (ARE) sector in Pakistan to contribute its share in strengthening and improving the power supply position of the country, and help in fuelling rapid and environmentally sustainable economic growth.
- f) **Provincial Climate Change Policies:** Except for Baluchistan, the remaining three provinces have their own climate change policies. The Khyber Pakhtunkhwa Climate Change Policy, 2022, recognises that local industry needs protection but fails to identify specific measures for private sector involvement. Its policy objective is to encourage public and private sector investment in adaptation and mitigation measures through economic incentives and awareness campaigns on the benefits of conservation. Alternatively, The Sindh Climate Change Policy 2022 recommends building partnerships with the private sector for the implementation of meeting its policy goals. Private investment in the agricultural sector is encouraged to enhance resilience by: (1) discouraging unproductive and unsustainable use of fertile agricultural land; (2) facilitating financial mechanisms for farmers to adopt climate-

resilient technologies; (3) improving irrigation and land management for sustainable agricultural productivity; and (4) introducing climate-tolerant crops and livestock through genetic engineering. Lastly, Punjab's Climate Change Action Plan, March 2021, is still a 'draft-suggested actions'. It neatly segregates and details the investment opportunities by the private sector for both adaptation and mitigation measures (see Annexure tables 4 and 5).

3.2 TEXTILES AND APPAREL POLICY, 2020-2025:

The Textile and Apparel Policy, 2020-25, ('TextilePolicy'), now under the ambit of the Ministry of Commerce, aims to revive Pakistan's textile sector by addressing its existing shortcomings, including by dealing with the aftermath of disrupted supply chains due to the Covid-19 pandemic and strengthening the textile and apparel supply chain through financial incentives and subsidised amenities.⁹¹

The Textile Policy's key strategic objectives include the following measures which will also help safeguard and protect any private investment in the TVC:

1. Promote value addition across the supply chain, focusing on finished products.
2. Improve cotton farmers' profitability by enhancing yield, quality, and reducing production costs.
3. Boost the export-oriented Man-Made Fibre (MMF) sector.
4. Strengthen the textiles and apparel value-chain, including Business Management and Research (BMR) and capacity-building.
5. Facilitate manufacturing through temporary importation schemes and regulatory support.
6. Ensure a level playing field to enhance export competitiveness and increase market share domestically.
7. Prioritize Small and Medium Enterprises (SMEs) for infrastructure, compliance, energy efficiency, quality assurance, productivity, and e-commerce-related projects.

The Textile Policy also mentions consultations with private stakeholders to achieve its objectives, including the predictability and stabilisation of cotton prices, the initiation of mass-level female exclusive textile and apparel training programmes, and marketing exhibition plans. However, there is no specific reference to attracting private investment in these areas.

⁹¹ Ministry of Commerce (2020) Pakistan textiles and Apparel policy 2020-25. Retrieved from: <https://www.commerce.gov.pk/wp-content/uploads/2022/02/Textiles-and-Apparel-Policy-2020-25.pdf>

3.3 LAWS TO PROMOTE PRIVATE INVESTMENT IN THE SEED INDUSTRY:

The primary laws for attracting private investment in the agricultural seed sector, including researching and developing high-yield cotton seeds, and safeguarding intellectual property rights for the same, are:

1) The Plant Breeders' Rights Act, 2016

According to the State Bank of Pakistan report "Investigating Pakistan's Seed Industry Dynamics, 2022,"⁹² the absence of stringent intellectual property rights has been one of the leading causes of a decrease in cotton production over the years, as breeders lack the incentives to invest in researching and developing high quality seed varieties. The solution rests in the strict implementation of the Plant Breeder's Rights Act, 2016 ('PBR Act') which propagates a viable seed industry in Pakistan, by granting intellectual property protection to plant breeders who register specific seed varieties in the Plant Breeders Rights Registry and by protecting farmers from the provision of substandard seeds. Furthermore, the registry 'certificate' granted under section 24 of the PBR Act is for a limited time, thereby avoiding seed monopolies and encouraging new entrants to invest.

2) The Seed Act, 1976

A lack of investment in improved cotton seeds has been identified as a key barrier to producing high cotton yields in Pakistan. Generally small, private companies have a role in seed multiplication and distribution but do not have the capacity to develop new seed varieties. The current seed sector is governed by a complex set of regulations and multiple entities operating under the Seed Act, 1976 (the '1976 Act'). The 1976 Act was amended by the 2015 Seed (Amendment) Act, which seeks to offer a level playing field to both the public and private sectors by catering to innovations in hybrid technology and genetically modified crops. Under the 2015 Amended Act, the private sector will be allowed to produce basic seeds to multiply, certify and establish accredited seed testing laboratories. However, the problem rests mostly in the varietal testing system which is unable to enforce intellectual property rights, mostly due to a slow and complicated registration process, which also causes a leakage of the breeder's seeds during the registration process due to poor controls. This in turn discourages the private sector from investing in R&D on seeds. The obligation to maintain seed quality may be shifted to private companies that can develop and test seed varieties and self-report their characteristics on labels. A regulator may conduct checks and balances and impose fines and sanctions on false claims.

⁹² State Bank of Pakistan (2022) Investigating Pakistan's Seed Industry Dynamics. Retrieved from: <https://www.sbp.org.pk/publications/staff-notes/Investigating-Pakistans-Seed-Industry-Dynamics.pdf>

3.4 PROVINCIAL AGRICULTURAL POLICIES:

The following table lists the thematic areas for which the provincial agricultural policies of Punjab and Sindh encourage involvement/ investment by the private sector.⁹³

| Punjab Agriculture Policy, 2018 Policy goal includes enhancing sustainability and resilience in the wake of climate change and its implications. | Sindh Agriculture Policy (2018- 2030) The Policy aims to create resilient and climate smart agriculture to cope with climate change impacts and reduce greenhouse gas emissions |
|--|--|
| <ul style="list-style-type: none"> ● Develop efficient agricultural markets, independently or through public-private partnerships to reduce state burden. ● Operate wholesale markets with minimum safety standards. ● Arrange farmer credit and farming opportunities. ● Boost agriculture value chains with increased investment, technology, and management resources. ● Provide quality inputs and services competitively. ● Develop, manage and maintain infrastructure for warehouses. ● Form public-private partnerships for warehouses with treatment facilities in selected districts based on pilot studies. ● Invest in storage facilities with professional management expertise. ● Provide farm technologies, including mechanisation, quality seed, certified nurseries, digital information, and advisory services. ● Offer eco-friendly packaging and transportation. ● Utilize managerial and financial resources of agribusinesses for sustainable growth. ● Provide financial services, especially the E-Credit Scheme. ● Set research priorities and monitor performance. ● Equip farmers with required knowledge and technical skills. ● Lead farm mechanisation technology commercialization. | <ul style="list-style-type: none"> ● Invest in technological innovations in production, processing, storage, and marketing. ● Ensure secure and equal access to productive resources especially by small agriculture, livestock & fisheries producers. ● Promote suitable agriculture practices, including new livestock breeds and seeds, along with modified cultivation and animal husbandry practices which reduce emissions and are suitable for the emerging weather conditions. ● Upgrade or build suitable infrastructure, particularly at farm level, to deal with higher, more variable rainfall and floods and droughts. ● Improve dissemination of up-to-date weather information and early warning of disasters. ● Launch agriculture and livestock insurance programs to reduce income variability for farmers. ● Prepare strong contingency plans and set aside funds in case of unforeseen disasters. ● Introduce latest crop storage and preservation techniques. |

⁹³ Note: There is a proposed Balochistan Agriculture Policy, 2021 and there is no agricultural policy for Khyber PakhtunKhwa.

3.5 POLICIES FROM REGULATORY AUTHORITIES:

The following is a list of policies by Pakistan's national regulatory authorities integral to attracting and protecting private investment and fostering public-private partnerships in the sustainability sphere.

1) The State Bank of Pakistan Green Banking Guidelines, 2017

The State Bank of Pakistan (SBP) Green Banking Guidelines, 2017 ('2017 Guidelines') are designed to encourage lending towards environmentally friendly projects whilst safeguarding against environmental risks emerging from the operations of banks and domestic financial institutions (DFIs). This includes financing projects and borrowers who meet provincial, national and global environmental standard benchmarks, and putting in place mechanisms which identify, assess and mitigate environmental risks to prevent undue financial losses. The 2017 Guidelines further require all banks and DFIs to make their infrastructure and operations environment friendly and enunciate the role of the board, management and organisational arrangements of banks and DFIs to deliver on environmental responsibilities.

2) The Environmental and Social Risk Management Implementation Manual

In 2022 the SBP vide a circular⁹⁴ introduced the Environmental and Social Risk Management (ESRM) Implementation Manual, which is a procedural guide, that provides tools and procedures to strengthen and accelerate the implementation of the risk management section of the 2017 Guidelines. The SBP has given banks and DFIs three years to fully implement the ESRM, which will conclude in November 2025. This allows banks and DFIs sufficient time to adopt the ESRM and, through it, the 2017 Guidelines, during which period the SBP will also play a facilitative role through training, awareness sessions and other support measures.

3) State Bank of Pakistan Financing Scheme for Renewable Energy (2016)

As part of the Green Banking Initiative, the SBP issued a scheme to promote renewable energy by providing financing for renewable energy projects at a concessional rate of 6%. The validity period of this scheme has been extended till June 30th, 2024.⁹⁵

4) National Financial Inclusion Strategy (NFIS), 2015

The strategy's objective is to set a national vision for achieving universal financial inclusion in Pakistan. The NFIS lays out the vision, framework, action plan, and target outcomes for financial inclusion. The strategy aims to enhance formal financial access to 50% of the adult population by 2020.

⁹⁴ State Bank of Pakistan. (2022). Environmental & Social Risk Management (ESRM) Implementation Manual for Financial Institutions. Retrieved from: <https://www.sbp.org.pk/sme/d/circulars/2022/CL12.htm>.

⁹⁵ State Bank of Pakistan. (2022). SBP Financing Scheme for Renewable Energy. Retrieved from: <https://www.sbp.org.pk/sme/d/circulars/2022/CL9.htm>.

5) Public Private Partnership Authority, Environment and Social Management System (ESMS)

The Public Private Partnership Authority (P3A) recognizes that attracting private investment is integral for meeting Pakistan's international climate and sustainability commitments under the Paris Agreement and its Updated NDCs, 2021. In light of this, the P3A has sought to create an enabling environment for private sector involvement in development projects by establishing the Environment and Social Management System (ESMS) in October 2023.⁹⁶ The ESMS formulates environmental and social safeguard requirements and facilitates the flow of green-financing for implementing the NDCs and for meeting the adaptation and mitigation priorities under the Green Climate Fund. Furthermore, the ESMS is designed to attract financing from different multilateral and financing agencies by meeting international best practices. The ESMS applies to all qualified projects and any other projects the P3A intends to include in its scope.⁹⁷ It will apply to all stages of a project's life cycle, from project identification to contract expiry of the Agreement. It will extend to all parties involved in the transaction, including the implementing agency and the private party as well.

6) Securities and Exchange Commission of Pakistan, ESG Regulatory Roadmap, 2022

The Securities and Exchange Commission of Pakistan (SECP) prioritizes sustainability through its Listed Companies (Code of Corporate Governance) Regulations, 2019, mandating boards of directors to have an Environmental, Social, and Governance (ESG) policy and also disclose its implementation. Failure to comply requires the company to 'explain' its approach to the SECP. To meet the growing demand for sustainability alignment, the SECP proposed the ESG Regulatory Roadmap in 2022, aiming to enhance ESG best practices for sustainable capital markets. The roadmap includes extensive awareness sessions, a dedicated ESG dashboard, and ESG disclosure guidelines to be implemented by December 2024.

In October 2023, the SECP released the Draft Guidelines on ESG Disclosures for Listed Companies, which are voluntary and serve as a baseline disclosure framework.⁹⁸ While voluntary, the ESG report must be accurate, transparent, and comprehensive. In Pakistan, the ESG Draft Guidelines make reporting of ESG performance voluntary on an annual basis in one of three formats: a sustainability report, an integrated sustainability report with financial statements in the annual account, or online disclosures.

⁹⁶ P3A(2021) Environment and social management system. Retrieved from:

<https://www.p3a.gov.pk/kn/PPP%20Environmental%20and%20Social%20Management%20System%20-%20Draft.pdf>

⁹⁷ The ESMS requires all projects to be assessed based on its type, location, scale and sensitivity and the magnitude of its potential environmental impacts. The environmental impacts include those related to the natural environment (air, water and land), human health and safety and transboundary and global environmental aspects.

⁹⁸ SECP (2023). Draft Guidelines on ESG Disclosures for Listed Companies. Retrieved from: <https://www.secp.gov.pk/document/draft-guidelines-on-esg-disclosures-for-listed-companies-2/?wpdmdl=49529&refresh=65c1ec3509ad21707207733>.

3.6 MONITORING AND REPORTING:

The 18th Amendment to the Constitution of Pakistan made environmental protection a provincial subject, which resulted in each province having its own Environment Protection Act. The provincial Environment Protection Agency (EPA) is designated with the regulatory task of monitoring and implementing the Provincial Environment Act. The EPA's functions include legal, administrative and monitoring, ensuring that textile industries comply with environmental laws.

Environment protection acts: These prohibit certain discharges or emissions of 'any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the [provincial] Environmental Quality Standards.' Contravening or failing to comply with provisions may allow the government to levy a pollution charge, which is calculated at the rate and in accordance with the procedure prescribed under the Pollution Charge for Industry (Calculation and Collection) Rules, 2001. An Environmental Tribunal or Magistrate may impose imprisonment or factory closure. Textile firms are required by law to submit monthly effluent treatment reports to the Environmental Protection Agency (EPA) under the National Environmental Quality Standards (Self-Monitoring and Reporting by Industry) Rules, 2001⁹⁸ ('NE9Qs'). To comply with the aforementioned legislative requirements, the textile industry needs to invest in sustainable mechanisms, including waste disposal and pollution control.

Environmental Impact Assessment: The provincial EPA also functions as a regulator under the Environment Protection Department and is responsible for, inter alia, conducting the Environmental Impact Assessment (EIA) under the Provincial Environment Protection Act. The EIA obtains and evaluates environmental information prior to the developmental phase of any project, with the aim to identify and reduce the environmental impact of a project and design projects that complement the local environment and meet requisite laws and regulations. This makes investing in EIA approved projects a safer and environmentally friendly bargain. Textile industries require an EIA¹⁰⁰ and the EPA must grant approval within four months of receiving a complete EIA submission. While the EIA process is crucial for safeguarding Pakistan's environment and socio-economic fabric, it faces criticism for weak integration into decision-making, inadequate impact coverage, poor final report quality, insufficient stakeholder participation, and weak monitoring implementation.

⁹⁹ The NEQs classify units into category A, B and C for liquid effluents and into categories A and B for gaseous emissions. Category A units emitting either liquid or gaseous effluents, such as the textile processing industry, are required to submit monthly Environmental Monitoring Reports.

¹⁰⁰ Schedule II of the "Review of IEE and EIA Regulations," 2000, outlines projects requiring an EIA. Included are "man-made fibers with a total cost of Rs. 100 million and above" (Schedule II(B)(6)) and "plastics and man-made fibers, textiles (excluding apparel) with a total cost exceeding Rs. 10 million" (Schedule II(B)(9)) of the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000

3.7 INTERNATIONAL COMMITMENTS:

Pakistan's international climate and sustainability commitments underpin domestic efforts to develop climate-resilient measures. Upholding these commitments is also essential for boosting trade and obtaining trade concessions.

a) Article 6 of the Paris Agreement

Pakistan became a signatory to the Paris Agreement in 2016, the global umbrella instrument to tackle climate change and the successor to the 1997 Kyoto Protocol¹⁰¹. The Paris Agreement allows countries to offer their own pledges to curtail GHG emissions (detailed in each signatory state's nationally determined contributions) instead of having the goals enforced on a state through the UN. Article 6 of the Paris Agreement in particular, could boost efforts for sustainable development by allowing countries to cooperate with each other in order to voluntarily reach the emission targets specified in their respective NDCs through transferring carbon credits earned from the reduction in their GHG levels. This may involve the private sector, where carbon markets have to be established through bilateral agreements between countries.

Currently, most carbon credits are issued in the Global South and are primarily sold to entities in the Global North. If companies are involved, the carbon credits are traded in secondary markets, generating profit for the initial buyer¹⁰². Private companies operating in the TVC can use this finance stream to invest in climate adaptation and mitigation initiatives¹⁰³.

b) Generalized System of Preferences (GSP+) Scheme

The European Union's GSP+ Scheme offers extensive trade concessions to help developing countries, selected on the basis of a criterion in adopting principles of sustainable development and good governance in their national policies through the effective implementation of 27 UN Conventions, including those pertaining to the environment. The present GSP+ Scheme became operational in 2014 and was extended in October 2023 for developing countries, including Pakistan, for an additional four years until 2027. This will continue to benefit Pakistan from complete duty suspensions for products, including textiles, across approximately 66% of all EU tariff lines¹⁰⁴. In 2021, textiles (apparel and clothing) constituted the largest sector in Pakistan's export composition to the EU at 45%, followed by home textiles at 23%¹⁰⁵.

¹⁰¹ UNFCCC, Official text of the Paris Agreement in English https://unfccc.int/sites/default/files/english_paris_agreement.pdf

¹⁰² However, this often means that the original issuers in the Global South do not receive adequate compensation from profits gained in the value chain. If equitable trading mechanisms and financial streams are put in place, the carbon markets can generate an invaluable stream of funding to address climate impacts.

¹⁰³ The UNDP's Carbon Payments for Development Facility operates under the ambit of Article 6 and generates innovative ways to boost public-private partnerships and encourages private and state-owned entities to invest in providing products and services whilst reducing carbon emissions.

¹⁰⁴ GSP Hub, Pakistan. Retrieved from: <https://gsphub.eu/country-info/Pakistan>.

¹⁰⁵ Ministry of Commerce, GSP+ Booklet, 2022. Retrieved from: <https://www.commerce.gov.pk/wp-content/uploads/2022/03/GSP-Booklet-17-03-22.pdf>.

c) The European Green Deal

The European Union's (EU) Green Deal is its growth strategy to transition the EU economy to a sustainable, resource-efficient, and competitive model by becoming a climate-neutral continent by 2050. The Green Deal will phase out products with high carbon footprints and only import carbon-neutral textile products manufactured in accordance with the EU's eco-design requirements.

For Pakistan to uphold its GSP+ obligations and continue to export to the EU and the global market, it is compelled to meet the requirements levied under the respective Green Deal related legislations and directives. The following table lists different ways through which Pakistan can meet its commitments under the three EU Green Deal regulations, especially with the assistance of private sector investment:

| The EU Strategy on Sustainable and Circular Textiles | Corporate Sustainability Due Diligence Directive (CS3D) | Carbon Border Adjustment Mechanism (CBAM) |
|--|---|--|
| <ul style="list-style-type: none"> ● Establishing a waste sorting hub to collect and redirect used clothing to the resale markets. ● Transferring textile waste to any interested companies for them to generate recycled content for manufacturing. ● Develop Extended Producer Responsibility protocols for companies to recycle their textile waste in their own facilities. ● Acquiring new certifications by companies, especially as evidence of avoiding plastic pollution and for adopting technologies which capture microplastics emitted during manufacturing. ● Product labelling to reflect the level of microplastics emission. ● Science based targets to avoid misrepresentation of environmental performance of a company's products. | <ul style="list-style-type: none"> ● Developing upstream databases to collect information regarding raw material providers and manufacturing processes. ● Improving occupational health and safety and grievance redressal mechanisms for workers. ● Collaborating with independent intergovernmental bodies to comply with sustainability standards. ● Identifying the most critical labour and environmental risks in the industry. | <ul style="list-style-type: none"> ● Develop emissions trading or carbon credit system in alignment with EU requirements. ● Shift to solar and clean geothermal energy sources (raising the cap on solar net metering for industrial consumers). |

Table 8: EU Green Deal

3.8 SUSTAINABILITY REPORTING:

Sustainability reporting has become an integral part of financial reporting and gives stakeholders, specifically the public, an opportunity to preview an organisation's non-financial contribution towards society, ranging from customer service to climate change, and make informed investment decisions. The goal of reporting non-financial issues remains to increase profitability by augmenting an organisation's reputation encouraging positive innovation and value creation. As financial and non-financial information continue to integrate, mandatory reporting requirements, such as for carbon emissions, and voluntary reporting tools and standards recognized globally have emerged. Amongst the latter, the three most commonly used reporting frameworks include¹⁰⁶:

| 1. Global reporting initiative (GRI) | 2. IFRS |
|---|--|
| <p>The GRI Standards are a modular system comprised of three series of Standards which should be used together: (1) Universal Standards (for all organisations); (2) Sector Standards (applicable to specific sectors); and (3) Topic Standards (listing disclosures relevant to a particular topic).</p> <p>Organisations may prepare a sustainability report either in accordance with all three Standards or use selected Standards or even a part of the content within them. This gives organisations leverage to disclose specific information for designated users, such as on climate change impacts for investors and consumers. The complete list of Standards available for reporting is accessible on the GRI website¹⁰⁷.</p> <p>Textile and apparel are being considered as a separate Sectoral Standard by GRI and is awaiting approval from the Global Sustainability Standards Board. If approved, the new Textile and Apparel Standard will enhance sustainability by reporting on clothing, footwear, fabrics and other textile manufacturers and retailers on a global scale¹⁰⁸.</p> | <p>The IFRS S1; General Requirements for Disclosure of Sustainability-related Financial Information list disclosure requirements to enable companies to communicate to investors about the sustainability related financial risks and opportunities they face over the short, medium and long term. These require industry specific disclosures.</p> <p>The IFRS S2 Climate-related Disclosures set out requirements for a company to disclose information about its climate related risks and opportunities, while building on the requirements listed in IFRS S1. These require disclosure of material information about climate related risks and opportunities, including physical and transition risks. The IFRS S2 also integrates the requirements of the TCFD (above) and requires disclosure of information on both cross-industry and industry specific climate related risks and opportunities.</p> <p>The ESG Draft Guidelines under Appendix-B make reference to the above without explicitly stating that they are used for reporting.</p> |

¹⁰⁶ Till October, 2023 the Task Force on Climate-Related Financial Disclosure (TCFD) was used to report on the company's climate-related financial disclosure. However, the TCFD has fulfilled its remit and disbanded, with the IFRS taking over its monitoring of a company's climate-related financial disclosures. In March, 2022, the International Sustainability Standards Board (ISSB) of the International Financial Reporting Standards (IFRS) Foundation took responsibility of the SASB Standards.

¹⁰⁷ Global Reporting Initiative, GRI Standards in English. Retrieved from: <https://www.globalreporting.org/how-to-use-the-gri-standards/gri-standards-english-language/>

¹⁰⁸ GRI Standards, The need to understand impacts of textiles and apparel, 28 February, 2023. <https://www.globalreporting.org/news/news-center/the-need-to-understand-impacts-of-textiles-and-apparel/#:~:text=Textiles%20and%20apparel%20is%20to,reporting%20standard%20for%20the%20sector.>

3. United Nations Global Compact

The UNGC is a United Nations initiative, operating on Ten Principle values, which promotes the SDGs and invites corporations to commit to responsible business practices in the areas of human rights, labour, the environment, and corruption. The Ten Principles for businesses under the UNGC include Principle 7 'Adopting a precautionary approach to environmental challenges,' and Principle 8 'Conducting environmentally responsible activities' and Principle 9 'Encouraging the development and diffusion of environmentally friendly technologies.'

The UNGC requires that companies produce an annual report called Communication on Progress (COP), which details their work to embed the Ten Principles into their strategies and operations.

Table 9: GRI, IFRS and UN Global Compact

3.9 BARRIERS AND ENABLERS FOR IMPLEMENTATION:

As discussed above, Pakistan has over the years developed multiple laws, policies and guidelines to showcase its commitment towards combating climate change and promoting sustainable development, whilst balancing the country's growing economic and social challenges. It is therefore not a dearth of legal and regulatory instruments but an entrenched lag in implementing and enforcing said regulatory measures, preventing them from having their desired impacts. The main barriers and enablers for implementation are discussed in the Annexure.

CHAPTER 4:

RECOMMENDED ACTION STEPS

In Chapter 2 we identify barriers and strategic opportunities for scaling private sector climate investments in the TVC. The current TVC structure, however, benefits large integrated textile firms with stronger control over their supply chains and the financial strength to make the necessary investments for producing sustainable products. This has translated into success for these large firms, yet these successes do not translate into the wider transformation of the TVC towards sustainability. The recommendations below aim to build a sustainable and economically robust TVC, moving away from an opportunist project approach to building a systems approach for the TVC.

4.1 LEVERAGING SYSTEMS APPROACH:

The Systems approach offers a holistic and comprehensive framework for analysing the Pakistan TVC operating within the broader global textile system. It facilitates an understanding of what drives the TVC, how these drivers influence the TVC and the relationships and the feedback loops interconnecting the TVC, shaping the intended and unintended outcomes of the TVC, as shown in Figure 21. The systems approach offers a proactive means to envision and revamp the TVC, aligning outcomes with robust industrial and economic strategies while addressing the key sustainability and other drivers at play. By systematically reshaping the activities and relationships within the TVC, planned outcomes can be effectively achieved.

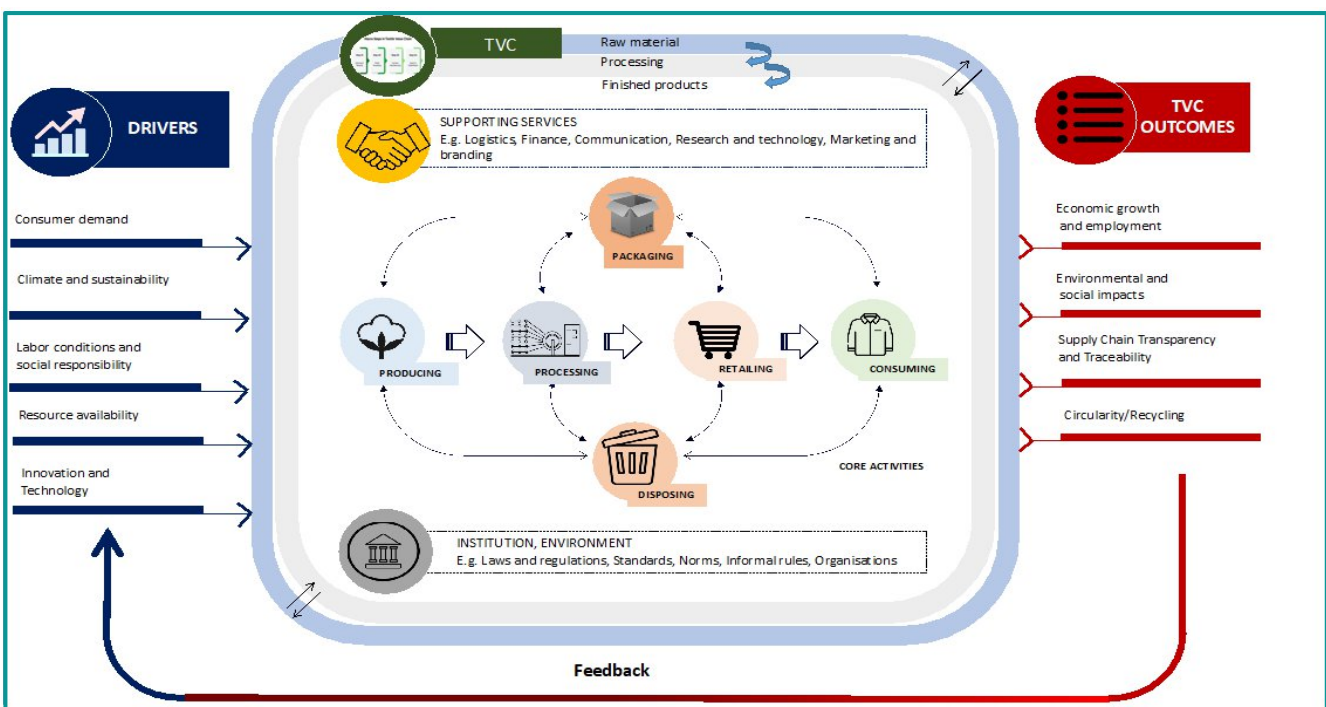


Figure 21: TVC Systems Map (Adapted from Woodhill et al 2020)

Step 1 –Develop TVC Outcomes: The first step in building the systems approach is to develop a set of clear and robust TVC outcomes, involving the TVC stakeholders and policymakers. These outcomes should target various objectives, including encouraging strong economic growth and employment, promoting environmental sustainability, ensuring social justice, enhancing transparency and traceability in the supply chain, and advancing circularity and recycling efforts, amongst others. The ultimate measure of success lies in positioning Pakistan as a leading and credible global sustainable textile of choice.

Step 2 Identify TVC Drivers: The next step is to identify and analyse the local and global drivers shaping the TVC to understand their influence on the activities in the TVCs and the actions and interests of the stakeholders, resulting in both intended and unintended outcomes. These drivers include global consumer demand for sustainable products, the growing impact of climate and sustainability on TVC operations, labour conditions and social responsibility within the sector, resource availability (such as materials, energy, and water), and the funding landscape. Additionally, the evolving landscape of innovation and technology presents both opportunities and challenges for transparency and data sharing. By understanding the drivers, appropriate actions and strategies can be developed to achieve the planned outcomes.

Step 3 Map TVC Stakeholders and Relationship: In the final step, the TVC stakeholders and their relationships are mapped. Building robust TVC outcomes necessitates engaging with all key stakeholders across the TVC spanning from farmers to textile exporters, to ensure inclusivity and holistic representation. By mapping the system and identifying the key stakeholders along with their interconnections, as well as both intended and unintended outcomes stemming from these interactions, insight is gained into the system's gaps and overlaps. This understanding enables the TVC stakeholders to align with the desired planned outcomes and identify strategic intervention points within the TVC for effective investments and action.

4.2 RECOMMENDED ACTION STEPS FOR LEVERAGING SYSTEMS APPROACH:

Developing a systems approach for building an economically robust and sustainable TVC necessitates a series of carefully curated and strategically planned action steps.

Building TVC Multi-stakeholder Collaboration Model

Aligning the TVC around the planned outcomes will require cooperation among various stakeholders with differing interests, priorities, and resources. Although such collaborations are challenging, there is a rising trend of innovative collaboration methods emerging in the sector, and valuable insights can be gained from multi-stakeholder collaborations in other fields.

For instance, the Bangladesh Accord¹⁰⁹ in the ready-made garment sector united workers, trade unions, and global retail companies to jointly tackle factory safety, acknowledging safety as a collective responsibility. This joint endeavour not only emphasised the importance of minimum standards but also tackled power imbalances by involving garment sector workers, unions, and global brands in decision-making processes. In 2023, the Pakistan Accord was established on similar principles, with 100 global brands and retailers joining hands. This model can be replicated to build the TVC sustainability outcomes by engaging all stakeholders in the TVC, including global retailers.

One recommendation is establishing a TVC Public Private Partnership (PPP) entity under the Public Private Partnership Authority Act (P3A) to lead the TVC transformation. The TVC PPP should ensure representation from all relevant stakeholders, including trade associations such as APTAMA, PRGMEA, and PTC, which currently cater to only specific segments within the TVC. The TVC PPP secretariat, in consultation with the TVC stakeholders, can define the desired outcomes, identify the drivers influencing the TVC, set and monitor operational and sustainably guidelines and standards, align financing mechanisms, and offer capacity building initiatives grounded in the latest scientific knowledge and global best practices, among other measures. The overarching objective is to formalise all TVC activities within a structured framework, promoting alignment between TVC activities and stakeholders to achieve planned outcomes effectively.

Securing Climate Finance and Ensuring Equitable Allocation

Building a sustainable TVC requires significant investment commitments across the various TVC segments. While the private sector entities play a crucial role in investing in the TVC to secure their own supply chain, such as through investments in renewable energy and efficiency measures, financing the transformation of the entire TVC is resource-intensive and underfunded. International and national climate finance, through grants, concessional loans, equity, subsidies and tax breaks can mitigate costs and incentivise private sector investments by reducing the risk associated with decarbonisation and building resilience, particularly in neglected and higher-risk areas of the supply chain. For instance, implementing Climate-Smart Agriculture (CSA) practices in cotton cultivation and processing in ginning remains challenging. Additionally, high-emission transport continues to operate in the unorganised sector to transport materials across the TVC segments, outside the formal investment structure. Funding schemes can be developed to reward those adopting sustainable practices through concessional and impact linked financing and advocating for changes in tax codes to tax unsustainable practices while offering credits for sustainable practices can further incentivise adoption. For instance, the government's Export Development

109 The Bangladesh Accord. (n.d.). The Bangladesh Accord on Fire and Building Safety. Retrieved from: <https://bangladeshaccord.org/>

Fund (EDF) could fund innovative sustainable pilot projects to establish their business case for scaling.

Furthermore, fair redistributing resources with the TVC is equally crucial. Smallholder farmers are critical for cultivation and the small and medium firms struggle to raise financing that can be supported by linking them directly to the supply chain and developing targeted funding schemes based on TVC outcomes. Redirecting existing agriculture subsidies towards sustainable climate-smart practices, while also factoring in the costs associated with global warming, presents a promising pathway forward.

Experimentation and Innovation

Transforming the TVC towards sustainability demands a fresh perspective, revamped procedures and data, and a set of new activities in the TVC. For instance, beyond the conventional quantitative metrics like the production volume of bales or units of garments, data metrics of water usage and GHG emissions have to be measured throughout the product lifecycle. Innovative technology such as sensors or satellite technology can be applied to accurately measure these impacts at low costs but requires open data sharing rules and protocols.

To effectively bridge existing gaps and scale good practices, investments in innovative climate-tech and agri-tech start-ups and supportive policies and regulations are needed. The TVC PPP entity can support climate-tech and agri-tech incubators and accelerators to create a robust pipeline of promising projects aligned to achieving the desired sustainability outcomes within the TVC. Research and development centres aligned with universities can be set up to research new sustainable materials, traceability and other TVC needs. By nurturing such innovative initiatives, supported by funding and policy, necessary capabilities and scale-up efforts in key areas can be cultivated, ultimately steering the industry towards a more sustainable future.

4.3 ACTIONS BY STAKEHOLDERS FOR LEVERAGING SYSTEMS APPROACH:

While numerous actors play important roles within the TVC (refer to Table 1 in the Annexure), this study focuses primarily on the transformational impact of two key stakeholders: the Private Sector and the Government. However, it is important to acknowledge the contributions of other actors such as farmers, who are essential for the adoption of sustainability practices in cotton cultivation, as well as researchers who develop new breeds and improved practices, or NGOs that address critical implementation gaps in social and environmental areas on the ground.

Actions by Private Sector

Major textile manufacturers and exporters are crucial links between the Pakistan TVC and global markets. They must take a leading role in implementing sustainability measures throughout the supply chain and making strategic investments, supported by other stakeholders. Based on the insights from the identified barriers and opportunities outlined in this report, they should move beyond investing solely in their own firms and instead focus on building system-wide transformations. Promising opportunities to initiate sustainability transitions, though feasibility studies are needed to assess their financial and environmental viability. The private sector can strategically intervene throughout the TVC. Below is a tiered model for private sector engagement and investment in the TVC.

| Domain | How it works | Sample indicators |
|-----------------------------|---|--|
| 1. Back and de-risk | Identifying and investing in green technologies and processes in the TVC that have the potential to support in mitigation, adaptation and resilience efforts | <ul style="list-style-type: none"> • Investment dollars allocated • Introduction and scaling of green technologies in TVC |
| 2. Navigate the value-chain | Private sector can help other stakeholders, startups and entrepreneurs in the TVC to build sustainable practices and gradually ascend their value-chain to gain larger funding amounts as well as more strategic partnerships | <ul style="list-style-type: none"> • Sustainable practices adopted • Subsequent funding rounds raised • Strategic partnerships formed • Growth opportunities |
| 3. Crowd-in investors | Private Sector Climate-focused investments can help encourage and attract new investors to back initiatives, building out a more diverse investor pool and growing all-around capital availability | <ul style="list-style-type: none"> • Investors engaged • New/number Investor classes engaged • Total funding amounts |
| 4. Signal for talent | Private sector can help signal potential upside in the TVC and impact to job-seekers and skilled workforce, helping TVC attract green talent | <ul style="list-style-type: none"> • Skilled workforce trained • Jobs facilitated • New market segments for talent |
| 5. Build TVC ecosystem | Improving the connective tissue between different players the TVC ecosystem as a wide range of stakeholders must be involved from farmers to exporters | <ul style="list-style-type: none"> • Stakeholders engaged • New/number stakeholder groups engaged |

Table 10: Tiered Role of Private Sector in TVC – Source: Adapted from Wyne& Chaudhury 2022¹¹⁰

¹¹⁰ TechCrunch is part of the Yahoo family of brands. (2022). Retrieved from: <https://techcrunch.com/2022/01/20/5-areas-where-vcs-can-play-an-outsized-role-in-addressing-climate-change/>

Back and De-Risk The TVC

The private sector holds significant potential in driving sustainable practices throughout the TVC, beginning with its own operations. By investing in promising sustainable initiatives like renewable energy, sustainable materials, local manufacturing facilities for improved seeds, Integrated Pest Management, green fertilizers, water conservation solutions, and sustainable packaging, they not only showcase their commitment, and establish the feasibility of the initiatives but also inspire other industry players to follow suit and enhance their investments in sustainable operations by demonstrating lower risk of failure.

Navigate the Value-Chain

Beyond individual investments, the private sector can spearhead sustainability in the TVC by pinpointing gaps, and strategic intervention points, and actively involving wider stakeholders. This involves investing in critical infrastructure like traceability technology to track materials from cotton to textile export and developing local certifications for traceable cotton. Moreover, establishing technology infrastructure for data connectivity and optimising operations, along with open data portals for sharing information, can enhance efficiency. Services such as monitoring and verification, certification, and consulting support the transition to sustainability by measuring and reporting environmental, social, gender and governance metrics.

Crowd in Investors

The private sector can drive investment in the TVC by encouraging other investors and funders to participate. Acting as anchor investors, they can pave the way for others by demonstrating the viability of investments in the sector. Moreover, establishing and operating incubators to develop local climate and sustainability solutions, including climate-tech and agri-tech, would enable the private sector to promote innovation and build accelerators to scale these solutions. This would create a promising pipeline of investable projects in the TVC for other investors. Additionally, setting up innovative climate and sustainability funds across various segments of the TVC, from cotton cultivation to textile export, with a focus on supporting startups, SMEs, farmers, and other stakeholders, would accelerate investment and sustainability within the industry.

Signal for Talent

A significant hurdle in the sustainability transition of the TVC is the scarcity of skilled sustainability professionals and workforce. Through investment in new initiatives and the expansion of sustainability efforts, the private sector can highlight the increasing opportunities for talent in this field. This can be strengthened by investing in and developing green curriculum and training programmes in collaboration with institutions and training centres, equipped with tailored programmes to nurture sustainability talent. Additionally, customised training programmes and delivery services can be

designed for TVC stakeholders from farmers to exporters, focusing on policies, practices, and technologies pertinent to their needs.

Build Ecosystem

Private sector exporters serve as the bridge between global retailers and the TVC, holding a pivotal role in aligning retailer requirements with TVC capabilities. They can facilitate the sustainability transition by establishing systems, processes, and relationships. Building joint ventures and collaborative partnerships, both domestically and internationally, can enable the exchange of best practices, research and development, technology transfer, infrastructure, and logistics expertise. Moreover, developing marketing and promotion strategies for local and global sustainable textile brands and effectively communicating sustainability efforts to customers can further solidify their commitment and contribution to the sustainability transition.

Actions by Government

Develop a Long-Term Sustainable Industrial Policy and Implementation Strategy:

The TVC presents a lucrative potential for exponential export expansion, acting as a catalyst for job creation and contributing significantly to the strength of the economy. The government needs to establish a long term, textile-focused industrial policy and implementation strategy grounded in data and laying out clear actionable steps that harmonise all aspects of the TVC for its advancement and sustainable growth. The government should facilitate the strategy development to set clear and ambitious TVC outcomes in partnership with all the TVC stakeholders.

Establish Textile Clusters and Special Zones:

To align and harmonise the TVC, the government should set-up and repurpose existing specialised textile zones and clusters to align on delivery of the TVC outcomes, especially sustainability outcomes. The clusters should be equipped with shared sustainable amenities like renewable energy and wastewater treatment facilities, data centres, testing laboratories, alongside efficient and clean transport networks, to lower production costs and emissions while enhancing sustainability.

Promote TVC Sustainability Globally:

By actively engaging in international trade diplomacy and negotiating favourable trade agreements with key markets, Pakistan can significantly boost its sustainable textile exports, elevate its global standing, and make a positive impact on the economy and society. This requires the government to collaborate closely with its embassies, textile associations, trade organisations, SMEs, and cotton farmers, ensuring equity and equality in policy reforms and incentives. Such unified efforts will cater to all stakeholders' interests and pave the way for a sustainable expansion of the textile and apparel industry.

Develop Traceability and Sustainability Standards:

The government should establish traceability and sustainability reporting standards aligned with international benchmarks on centralised open data platform. This would streamline operations and reporting methodologies throughout the TVC, counteracting the prevalent practice of disparate reporting influenced by global retailers. Such a fragmentation approach results in unnecessary expenses and duplicated efforts. With clear guidelines, centralised and shared data centres should be developed to consolidate production, sustainability, and operational data, making them accessible to all stakeholders. This approach enables robust traceability of products and data and facilitates the identification of emission and climate hotspots within the TVC, allowing for informed decisions making towards sustainability efforts. Novel technology solutions can be built by private sector on the back of the open data platform for supporting the TVC's transition towards sustainability.

Align Green Policies:

The government should align and promote the various green policies and programmes such as SBP's green finance policy within the TVC to encourage greater awareness and adoption of sustainable practices among the TVC stakeholders. By offering financial incentives such as preferential loan terms, subsidies, or grants for green projects, these policies can motivate TVC stakeholders to prioritise sustainability in their operations.

Promote Incentives and Redirect Subsidies:

The government should devise and execute targeted incentives and subsidies tailored to the TVC segments aimed at scaling sustainability practices and encouraging private sector investment. These incentives could encompass various initiatives, including the adoption of Climate-Smart Agriculture practices, the utilisation of clean transport, the integration of renewable energy technologies, and the implementation of sustainable packaging solutions. Such measures would not only incentivise stakeholders to prioritise sustainability but also stimulate broader investment in environmentally friendly practices across the textile industry.

Support and Scale Sustainable Practices:

The government should lead the way in promoting sustainable practices, especially in cotton production within TVC. Initiatives like farmer field schools and collaborating with reputable local and research institutes can help scale up sustainable practices effectively. Furthermore, strategic investments are needed in underfunded areas to attract private sector participation. This includes implementing stringent quality control measures across the seed chain to ensure seed purity, along with developing storage facilities and low-emission transport infrastructure to support sustainability efforts and reduce environmental impact.

Access Global Climate Finance:

The government holds a crucial position in accessing global climate finance by aligning financial strategies with national priorities. Given the multifaceted nature of climate challenges, establishing climate finance units within key ministries and provinces would facilitate access to global climate funds. Accreditation with the Green Climate Fund (GCF) and collaboration with existing GCF accreditation units are vital steps in securing funding for climate-related initiatives.

CONCLUSION

The TVC presents Pakistan with a remarkable opportunity to emerge as a global leader in sustainable textiles, driven by exponential growth prospects and grounded in principles of social justice and environmental sustainability. While Pakistan stands out for having the entire TVC within its geographical boundaries—a distinction not many countries can claim—its TVC is currently operating well below its potential. Numerous challenges plague each segment of the TVC, with multiple actors pursuing narrow interests, resulting in misaligned and fragmented actions. Policy gaps and insufficient financial support especially at the early stage of the value chain exacerbate the situation, leaving the majority of the TVC stakeholders at a disadvantage. Moreover, growing climate and social pressures further impede the TVC from reaching its full potential.

There is no silver bullet solution to transform the complex TVC. Addressing these challenges requires a departure from the current fragmented project and sector-focused approach to a systems approach, recognising the interconnectedness of the TVC's segments and the collective influence of its stakeholders. These stakeholders, in turn, are shaped by the various drivers influencing the TVC. Prioritising common outcomes and aligning stakeholders with these outcomes is essential. The private sector, with its investments, entrepreneurial drive, and expertise, holds the key to unlocking the TVC's potential, offering significant economic multiplier effects that can bolster government revenue and employment opportunities.

To realise this transformation and steer the TVC towards desired economic and sustainable outcomes, it is essential to establish formal public private partnership operating models that facilitate collective action. These models should be empowered and adequately resourced to address the fragmentation within the TVC, ensuring the mobilisation of necessary resources, knowledge, and policy measures for sustained and aligned action.

Looking ahead, the TVC's growth trajectory will be significantly influenced by climate and environmental challenges, necessitating proactive system wide measures and building a foresight approach to adapt activities and prioritise sustainability initiatives based on multiple scenarios. Embracing this shift presents a unique opportunity for the TVC to lead by example, embedding sustainability at the core of its operations. This strategic move will position Pakistan as a leader in sustainable textiles, establishing it as the preferred partner for global retailers seeking environmentally responsible textile supply chains.

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ANNEXURE:

Table 1: List of Stakeholders Interviewed

| Sr# | Industry | Name | Designation | Organisation |
|-----|------------------|----------------------|---|--------------------------|
| 1 | Farmer | Aamer Bhandra | Co-founder | Digital Dera |
| 2 | Cotton Trader | Amir Jehangir | Independent Trader | |
| 3 | Farming Services | Dr. Khalid Mahmood | Founder | SAWiE |
| 4 | Manufacturing | Sajid Saleem Minhas | CEO | Delta Garments |
| 5 | Manufacturing | Ahmed Shafi | CEO | Crescent Textile Mills |
| 6 | Manufacturing | Abdul Jabbar Athar | Director Projects and Sustainability | US Apparel and Textiles |
| 7 | Manufacturing | Shoaib Mukhtar | Director | Sadaqat Limited |
| 8 | Manufacturing | Mubashir Naseer Butt | CEO | Body Media International |
| 9 | Manufacturing | Anees Khawaja | CEO | MG Apparel |
| 10 | Manufacturing | Muhammad Fauz Azeem | General Manager, Corporate Sustainability & Chemical Management | Interloop |

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| Sr# | Industry | Name | Designation | Organisation |
|-----|--------------------------|-----------------------|--|---|
| 11 | Buying House | Shahrez Khan | Country Head | Simba Global |
| 12 | Manufacturing and Retail | Shayan Abdullah | Director | Sapphire |
| 13 | Manufacturing and Retail | Zainab Shahzad | Sustainability Lead | Nishat Apparel |
| 14 | Manufacturing and Retail | Hamid Zaman | Managing Director | SEFAM |
| 15 | Trade Organisation | Dr. Ayyazzudin | Convenor of PRGMEA's Decarbonization Committee and CEO Pakistan Circular Fashion Council | PRGMEA and Pakistan Circular Fashion Council |
| 16 | Trade Organisation | Ali Sarfraz | Ambassador of Pakistan | World Trade Organisation |
| 17 | Global Supply Chain | Ankit Sethi | COO India and SE Asia | Li and Fung |
| 18 | NGOs and Research | Hina Fauzia | CEO | Better Cotton Initiative |
| 19 | NGOs and Research | Sheikh Muhammad Iqbal | CEO | Pakistan Textile Council |
| 20 | NGOs and Research | Adnan Arshad | Director – Cotton Expert | Potohar Organisation for Development Advocacy |
| 21 | NGOs and Research | Maha Qasim | CEO | Zero Point |

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| Sr# | Industry | Name | Designation | Organisation |
|-----|----------------------|---------------------------|----------------------|--|
| 22 | Government of Punjab | Saba Ali | Chief Environment | Planning and Development Board, Punjab |
| 23 | Federal Government | Malik Muhammad Ahmed Khan | CEO | Public Private Authority |
| 24 | Federal Government | Dr. Qaiser Imran | Manager Research | National Institute of Disaster Management |
| 25 | Federal Government | Sarah Saeed | Special Secretary | Ministry of Commerce |
| 26 | Federal Government | Ambreen Iftikhar | Additional Secretary | Board of Investment |
| 27 | Federal Government | Bilal Anwar | CEO | National Disaster and Risk Management Fund |
| 28 | Federal Government | Dr. Mazhar Hayat | Deputy Secretary | Ministry of Climate Change |
| 29 | Federal Government | Jawad Rabbani | Deputy Chief | Ministry of Planning, Development, and Special Initiatives |

Table 1: Stakeholders Interviewed

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| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|------------|--|---|--|--|--------------------|--|--------------------------------------|
| Production | Cotton is sensitive to climate change which makes cotton farmers switch towards other crops like sugarcane. | Lack of policies and regulations for CSA activities, or promotion of CSA best practices, programmes and projects. | The Government should prepare a comprehensive cotton revival plan to promote cotton cultivation. As well as establish an Institute of Climate Smart Agriculture. | CSA initiative can help boost cotton production, ensure the availability of non-GM cotton seeds, provide organic inputs to farmers and improves cotton yield overall. As well as offer technical and financial support and monitoring. | Medium-term | Ministry of National food security & research, Agriculture Policy Institute (API), Department of Plant Protection (DPP), Pakistan Central Cotton Committee (PCC), Federal Seed Certification and Registration Department (FSC&RD), provincial governments agriculture departments, Pakistan Agriculture Research Council (PARC), APTMA and Better Cotton Initiative (BCI). | |
| Production | Lack of innovative farming practices. | Limited implementation of awareness campaigns/ initiatives designed to educate farmers about modern farming techniques. | The use of international certifications would enable recognition of the TVC's sustainability efforts. | Increase in cotton production and improved quality of yield. | Short-term | Same as above | |
| Production | Complex cotton cultivation and processing due to climate change, financial constraints and market constraints. | | Capacity building to develop sustainability talent, training programs and technology infrastructure for connecting the supply chain. | | | Research institutes. | |

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| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|-------------------|---|---|---|--|--------------------|---|--------------------------------------|
| Production | There is low production and traceability of sustainable materials. Demand for traceable and transparent TVC is growing. | | Technology solutions to trace cotton and other materials through the value chain to textile export. Local certifications to brand traceable cotton. | Improve the sustainability processes and encourage data sharing and transparency within the value chain and enhance expertise. | Medium-term | Whole value chain. Research institutions and retailers. | |
| Production | Limited cross-learning across the TVC and fragmented TVC efforts. | Lack of investment and awareness of laws, policies and regulatory mechanisms from a grass root level. | Joint ventures and collaborations to promote best practices. Open data sharing between TVC. | Alignment with global sustainability goals. | | Same as above | |
| Green technology | Lack of upgraded and energy-efficient technology and machinery in many textile companies. Expensive technology. High initial costs, net metering etc. | Lack of public-private partnerships policies for technological upscaling. | Develop technology infrastructure for optimizing operations. Invoke financial institutions and large industries to advance technology transfer and provide incentives for transferring to renewable technology. | Improved sustainability reporting and adoption of sustainability initiatives. | Long-term | Ministry of Energy (power division), provincial governments' energy departments, National Energy Efficiency & Conservation Authority (NEECA), National Electric Power Regulatory Authority (NEPRA). | |
| Capacity Building | Lack of investment in renewable and low emission energy and high energy and finance cost. | | | | | | |

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| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|-------------------|---|--|--|---|--------------------|---|--------------------------------------|
| Capacity-Building | There is a lack of stakeholder engagement and coordination between the public-private stakeholders, as well as the federal-provincial sector. | Limited cross-learning events and a lack of discussion forums to engage various stakeholders within the TVC restricts widespread adoption of sustainability measures. | It's essential to establish a coordination mechanism to reduce the overlap and maximize private-public partnerships and encourage federal-provincial authorities to uniformly enforce laws and tackle challenges. This will require capacity building and institutional strengthening. | Improved coordination and enforcement between the public-private sector, as well as federal-provincial sectors, will create a stable business environment and improve time, resource, and cost efficiency by coordinated efforts. | Medium-term | Ministry of Climate Change, Board of Investment, Ministry of Commerce, National Institute of Disaster Management, Provincial Governments' Planning and Development Board, Public Private Authority, | |
| Capacity-Building | Many retailers set more ambitious sustainability targets than their respective countries. Therefore, sustainability efforts are not aligned among all stakeholders. | Due to a mismatch between the existing infrastructure of Pakistan and the innovative sustainability targets adopted by some textile companies, there is limited progress overall in achieving those targets. | All stakeholders need to make a combined and cohesive effort to adhere towards sustainability goals and adopt sustainable practices, standards, technology, and environmental stewardship as their primary targets. | By implementing sustainable practices and investing in upgrading their technologies, it will ensure the long-term viability and success of textile firms in the global market. | Medium-term | Textile manufacturers, international global retailers, and government authorities. | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|------------|--|---|---|--|--------------------|---|--------------------------------------|
| Regulation | Regulations impacting the textile industry and the environment, face issues of short-termism and lack of enforcement for laws, policies, regulations and authorities. | Lack of regulatory mechanisms and their enforcement often result in TVCs operating without complying with the sustainability targets. | <ol style="list-style-type: none"> 1. Need for awareness of the policies. 2. Need for long-term policies. 3. Need for accountability for corruption or lack of implementation of laws and policies. 4. Need for policy scalability. 5. Need for laws and policies to account for a wider jurisdiction. 6. Need for enforcement and specific-policy solutions. | A new, reformed system of laws and policies, that are built up from the grass-root, and each department is aware of its jurisdictional requirements in enactment of the legislations and is accountable to the public. | Long-term | All relevant public bodies for policy and regulation. Such as the Ministry of Agriculture, Ministry of Climate Change, Provincial Planning and Development Boards, Ministry of Commerce, etc. | |
| Regulation | There is a lack of monitoring and evaluation frameworks to measure and hold the textile industry accountable for its climate change impact and promote environmentally friendly practices. | Apart from some large textile companies, many SMEs lack monitoring and evaluation frameworks which can help them set and monitor sustainability targets and report to the government as well. | The Environmental Protection Authority, supported by the government and private authorities, need to hold the textile industry accountable to the monitoring and evaluation frameworks, to ensure that their sustainability regulations, operations, and data – is up to standard. | This will enhance the sustainability efforts of the textile industry in greening their supply chain and allow manufacturers a competitive advantage for their sustainability learnings within the global market. | Long-term | Environmental Protection Authority (EPA) and the textile industry. | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|-----------------|--|--|---|---|--------------------|--|--------------------------------------|
| Climate Finance | There is a lack of an enabling environment for private sector involvement and investment in capital, technology, and policy drafting. As well as lack of access to international climate finance from foreign entities such as UNFCCC etc. | | <p>There is a need for engaging private sector participation for channelling adaptation finance, technology transfers, and upscaling. As well as exploring innovative financing options such as green bonds, nature bonds, blue bonds, etc.</p> <p>This can be done via government incentives and the promotion of a stable and conducive business environment.</p> | By enhancing the ease of doing business for the private sector actors and promoting a stable business environment for knowledge -sharing, the private sector will be incentivized to invest capital and technology in climate-proofing the textile value chain. This will also diversify the financing options and instruments available for the textile value chain. | Medium -term | Private organisations, international finance commissions, research organisations, and the government | |
| Climate Finance | The bulk of access to international climate finance is limited to public sector finance or international multilateral /bilateral funding. Currently, they do not specifically target the textile value chain. | Lack of specific policies and financing opportunities for SMEs in the climate finance landscape at both national and international levels. | There is a need for scaling up funding up to six times to nearly \$6 trillion. It's crucial to support the sector's sustainability transition and facilitate participation in carbon markets. Climate Finance Units can also be established within key ministries to tap into global climate funds. | This will mobilize Pakistan's finances for climate change mitigation and allow the state to enforce laws and regulations, as well as technological upscaling and capacity building. However, expertise is needed to mobilize and manage this funding. | Short-term | Ministry of Finance, Ministry of Commerce, Ministry of Climate Change, GCF, GEF, Adaptation Fund (AF). | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|-----------------|---|---|---|---|--------------------|--|--------------------------------------|
| Climate Finance | Price neutrality of sustainable textile products entails that achieving investment into sustainable products is a significant challenge for exporters, especially small and medium-sized enterprises. | Despite rising demand for sustainable products, textile exporters face challenges due to the lack of price premiums. | Need for greater investment into sustainable products to encourage textile companies to invest in sustainability. TVC should produce those products that are compatible and have a growing demand in the global market. | This will enable Pakistan to become a premier sustainable supplier of textiles, with a strong global outreach. | Long-term | Textile manufacturers and international global retailers. | |
| Climate Finance | The bulk of access to international climate finance is limited to public sector finance or international multilateral /bilateral funding. Currently, they do not specifically target the textile value chain. | Lack of specific policies and financing opportunities for SMEs in the climate finance landscape at both national and international levels. | There is a need for scaling up funding up to six times to nearly \$6 trillion. It's crucial to support the sector's sustainability transition and facilitate participation in carbon markets. Climate Finance Units can also be established within key ministries to tap into global climate funds. | This will mobilize Pakistan's finances for climate change mitigation and allow the state to enforce laws and regulations, as well as technological upscaling and capacity building. However, expertise is needed to mobilize and manage this funding. | Short-term | Ministry of Finance, Ministry of Commerce, Ministry of Climate Change, GCF, GEF, Adaptation Fund (AF). | |
| Climate Finance | High investment cost of energy efficient technology, as well as renewable and low emission energy. | High energy and finance costs impede profitability in the textile value chain, prioritizing immediate operational needs over sustainability investments . | The textile industry must prioritize the transition to renewable energy technologies. The industry must also enhance its technical capacity for climate friendly technology. This can be facilitated by a centralized body, as well as use of Competitive Trading Bilateral Contracts. | By expanding to solar power systems, the industry can accommodate their energy needs and meet the industry's sustainable energy transition. This shift could allow textile companies to move towards Net Zero. | Long-term | Government and textile manufacturers. | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Category | Barriers | Implementation Failures | Measure/Proposed Recommendations | Potential Impact | Proposed TimeFrame | Relevant Actors/ Ministries/Divisions | Potential Funding Mechanism/ Sources |
|-----------------|--|--|--|---|--------------------|---|--------------------------------------|
| Climate Finance | High financial costs of energy creates challenges for the TVC to operate as industrial power tariffs and gas prices have surged. | Lack of incentives for shifting to solar power and subsidies for electricity consumption for industrial consumers. | There is a need for lowering the rates of energy such as electricity and gas for industrial consumers. Moreover, industry players should also shift towards energy-efficient technology such as Waste Heat Recovery Boilers etc. | This will increase the capacity of the TVC especially through the enactment of SBP's Green Finance Policy which can encourage awareness on the adoption of sustainable technology and practices, as well as facilitate loans, grants, policies etc. | Medium-term | Government, SBP, and textile manufacturers. | |

Table 2: Summary of Challenges and Recommendations

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

For Pakistan to uphold its GSP+ obligations and continue to export to the EU and the global market, it is compelled to meet the requirements levied under the respective Green Deal related legislations and directives. The following table lists different ways through which Pakistan can meet its commitments under the three EU Green Deal regulations, especially with the assistance of private sector investment:

| Cotton Production | Ginning | Spinning | Weaving and Knitting | Dyeing and Finishing | Garments and Made-Ups | Wholesale and Retail | Consumers |
|--|--|--|--|--|--|--|--|
| Farmers: Cotton Production and use of fertilisers, pesticides, irrigation. | Ginning Units: Separate cotton fibres from the cotton seed. | Spinning Units: Spin cotton fibres into yarn. | Weaving Units: Convert cotton yarn into fabric through interlacing of threads. | Dyeing and Finishing Units: Consists of a set of processes for dyeing and finishing textile products. | Textile Units: These assemble and create various textile articles out of the textile fabrics. | Retail Units: These can consist of retail outlets and warehouses both internationally and domestically. | Customers: Demand trends and compliance on sustainability standards. |
| Input Suppliers: Pesticides, seeds suppliers provide a direct supply to the farmers. | Farmers: Their supply of cotton directly impacts the ginning process as contaminate cotton (that with debris, hair, dirt) is of low quality when ginned. | Textile Manufacturing Companies: Invest in energy efficient spinning technologies. | Knitting Units: Convert yarn into fabric through a series of yarns. | Input Suppliers: Dyes and mechanical processes are used to complete this stage and quality of dyes and their chemical composition is dependent on the investment made within them. | Input Suppliers: These can include value-added inputs of zips, buttons, embroidery, patchwork, design etc. As well as machinery and tools for development. | Input Suppliers: transport of the garments to their respective buying houses, companies and countries is a capital-intensive process dependent on fuel and labour. | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Cotton Production | Ginning | Spinning | Weaving and Knitting | Dyeing and Finishing | Garments and Made-Ups | Wholesale and Retail | Consumers |
|---|--|--|---|--|--|---|-----------|
| <p>Government: May offer incentives to farmers through subsidies on inputs (fertilisers, pesticides, seed varieties and machinery for farming) Agricultural policy also impacts the production of cotton.</p> | <p>Input Suppliers: Machinery and looms are often outdated and inefficient.</p> | <p>Government: Electricity loadshedding and high energy prices adversely impact the ginning process and cause delays within the value chain. Tariffs and duties on yarn export also impact the spinning units.</p> | <p>Input Suppliers: Pakistan's weaving units are usually inefficient and time-consuming machinery, but bigger firms might invest in shuttle-less looms that have a greater capacity of RPM.</p> | <p>Textile Manufacturers: Firms with the capital to invest in sustainable dyeing and finishing processes may opt for more less hazardous dyes or demand so from the suppliers, according to their standards of sustainability.</p> | <p>Government: Export subsidies and tariffs on electricity, gas, solar etc. all have a direct impact on textile manufacturing units.</p> | <p>Government: Fuel prices, international trade policies and duties, all impact the sale of the finished products.</p> | |
| <p>Research Entities: Research different sustainable farming practices and disseminate practices, technologies, services</p> | <p>Government: Electricity loadshedding and high energy prices adversely impact the ginning process and cause delays. Tariffs and duties also adversely impact this sector as supply of imported cotton and machinery is impacted.</p> | <p>Transporters: The yarn is transported to the weaving and knitting units, and the cost of packing and transport is impacted by fuel prices within the country.</p> | <p>Government: Energy loadshedding and high prices are hindrances to weaving units' outputs.</p> | <p>Global Textile Customers: Standards and regulations for chemical dyes and processes entail that the wastewater produced should not be discharged untreated and/or use of more environmentally friendly chemicals.</p> | <p>Global Customers: Sustainable demands for wastage, electricity usage, water usage, chemical usage etc. are all considered during the textile manufacturing process.</p> | <p>Global Customers: Select suppliers from the textile industry based on compliance, quality of goods and trade policies.</p> | |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Cotton Production | Ginning | Spinning | Weaving and Knitting | Dyeing and Finishing | Garments and Made-Ups | Wholesale and Retail | Consumers |
|---|---|----------|--|--|--|--|-----------|
| Global Textile Customers: Standards and regulations on cotton production, such as organic cotton supply – impact the cotton production and use of chemicals | Transporters: The cotton seeds are transported to the spinning units and the cost of packing and transport is impacted by fuel prices within the country. | | Textile Manufacturers: These firms will suffer if there is a delay in supply of yarn from the weaving mills or may invest in backward integration to invest in efficient weaving technology. | Transporters: The finished products will be sent for producing garment-made ups. | Environmental Protection Authorities: Monitor and regulate carbon emissions, water discharge and environmental impact of the textile manufacturing plants. | Research Entities: Research and analyse sustainable practices to ensure less adverse environmental impact. | |
| | | | Transporters: The woven fabrics are transported to the manufacturer and the cost of packing and transport is impacted by fuel prices within the country. | Environmental Regulation Authorities: Monitor the wastewater discharge from the units to ensure that it is not harmful for the environment | Transporters: The finished goods are either sent to local retailers or exported to the retail customers overseas. | | |

Table 3: TVC Stages and Stakeholders

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--|--|---|
| <p>Pakistan’s Updated Nationally Determined Contributions, 2021 (NDCs) 2021 (NDCs)</p> | <p>The NDCs pledge to promote bottom up actions by the private sector and develop plans for emissions reductions from major sectors particularly cement and textile.</p> <p>They encourage mitigation measures for textiles through:</p> <ol style="list-style-type: none"> 1) Clean production technologies, 2) Implementation of eco-standards, 3) Incentivizing carbon trading between industries to limit the production of GHGs | <p>Pakistan encourages the private sector to play a crucial role in implementing its climate ambition across sectors and for the development of nature based Solutions that address its mitigation and adaptation potential.</p> <p>The Government of Pakistan (GoP) has pledged to foster the development of appropriate economic incentives to encourage public and private sector investment, including through:</p> <ol style="list-style-type: none"> 1) Climate proofing risk for new public/private sector finance projects. 2) Implementing a Climate screening appraisal mechanism for public/private funded projects. <p>The Government of Pakistan (GoP) has currently engaged the private sector for:</p> <ol style="list-style-type: none"> 4) Energy supply 5) Farm forestry 6) Indus Delta plantation 7) Mangrove Plantation |
| <p>National Adaptation Plan, 2023 (NAP)</p> | <p>Does not mention the textile industry specifically.</p> <p>NAP mentions the challenges faced in cotton production, without providing direct solutions for it.</p> <p>Wheat is the staple crop of Pakistan and cotton production is critical to Pakistan's export regime. However, the yields of major crops are 1.5 to 4.2 times below field potential, and 2.1 to 5.6 times below international best practice.</p> <p>Irrigated agriculture accounts for 75 percent of Pakistan's cultivated area and 95 percent of water withdrawals, supporting 90 percent of wheat production and almost all rice, sugarcane, and cotton production. These four crops account for fully 80 percent of water use in agriculture.</p> | <ul style="list-style-type: none"> > Advocates an enabling policy and regulatory environment for private sector investment in adaptation for: <ol style="list-style-type: none"> 1) Innovations in products or services. 2) Channeling adaptation finance through public-private partnerships. 3) Supporting small and medium enterprises in transitioning to sustainable practices. > Wants Private sector involvement in Building Systemic Climate Resilience through: <ol style="list-style-type: none"> 1) Fostering collaboration between government, private sector, civil society, and communities. 2) Responsible Corporate Practices, including: adopting sustainable business models, reducing greenhouse gas emissions, minimizing environmental impacts, and respecting human rights. 3) Establishing a coordination mechanism to reduce overlap and maximize synergies between various public sector and private institutions working on CSA. 4) Monitoring and Evaluation of NAP > Private sector involvement in supporting the Agriculture–Water Nexus through: <ol style="list-style-type: none"> 1) Creation of forums, such as producer groups, that facilitate collaboration between small farmers and other actors in crop-specific value chains, including private sector that can help farmers access national and international markets |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--------------------------------------|---|--|
| | | <ul style="list-style-type: none"> › Role of the private sector for formulating a Long-Term Agriculture Growth Strategy through: <ol style="list-style-type: none"> 1) Increase access to credit for on-farm technology adoption and purchase of inputs that support CSA, which includes establishing institutions that provide information to the farmers regarding finances available for technologies, equipment, and climate resilient crops (through private banks) 2) Identifying and developing a risk management system including crop insurance (through private banks) › Private Sector Involvement is also encouraged for the following additional initiatives: <ol style="list-style-type: none"> 1) Sustainable Land Management in Ecosystem Services 2) Income-generating infrastructure in priority -protected areas (through private sector and banks) 3) Strengthening Municipal Financial Capacity, especially through Public-private partnerships (PPPs) in infrastructure 4) Air Pollution |
| National Climate Change Policy, 2021 | <p>Textile is included as one of the key players in Pakistan's industrial sector. The GoP will take the following measures for the industrial sector in the country, including textiles:</p> <ol style="list-style-type: none"> a. Incorporate economic incentives to promote emission- reduction by upgrading industrial processes and technologies; b. Prepare voluntary CSR guidelines and encourage the corporate sector to create a CSR fund to cover carbon emission reduction efforts in the industrial sector. c. Detailed aerosol emission impact assessment studies must be made a requirement prior to the installation of any new small and large industry that may be considered a potential source of pollution; | <p>Pakistan encourages the private sector to play a crucial role in implementing its climate ambition across sectors and for the development of nature based Solutions that address its mitigation and adaptation potential.</p> <p>The Government of Pakistan (GoP) has pledged to foster the development of appropriate economic incentives to encourage public and private sector investment, including through:</p> <ol style="list-style-type: none"> 1) Climate proofing risk for new public/private sector finance projects. 2) Implementing a Climate screening appraisal mechanism for public/private funded projects. <p>The Government of Pakistan (GoP) has currently engaged the private sector for:</p> <ol style="list-style-type: none"> 4) Energy supply 5) Farm forestry 6) Indus Delta plantation 7) Mangrove Plantation |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--|--|--|
| | <p>d. Promote integration of the “Cleaner Production” strategy in the Industrial sector by making more efficient use of inputs such as energy, water and raw materials;</p> <p>e. Promote the use of energy efficient motors in the industrial sector;</p> <p>f. Encourage the industrial sector to have periodic “Energy Efficiency Audits”;</p> <p>g. Develop capacity to monitor and estimate emissions locally for each industry;</p> <p>h. Ensure that technology transfer is accelerated for industries like cement manufacturing, to control emissions without hampering the production process;</p> <p>i. Explore and introduce incentives for industries to adopt low-emission technologies e.g. dual- functional materials for Carbon capture, utilization, and storage (CCUS);</p> <p>j. Legislate opportunities for the industry to facilitate the transition to a circular economy model and boost the market demand for recycled products.</p> | <p>Policy Objective includes fostering the development of appropriate economic incentives to encourage public and private sector investment in adaptation and mitigation measures, such as:</p> <ol style="list-style-type: none"> 1) Health 2) Road Transport (which would help reduce emissions through the provision of environmentally friendly transport services, especially for factory labour and raw material transport) 3) Urban Planning (incentivizing the private sector for designing zero emission buildings through renewable energy technology 4) Waste Management: |
| <p>National Climate Change Policy, 2021</p> | <p>No mention of Textiles.</p> | <p>Establishes the Pakistan Climate Change Authority to borrow money, enter into contracts and discharge the obligations under the Act.</p> <p>10(2)(c)- where necessary or on request, provide services or give guidance to public and private entities in relation to climate change matters;</p> <p>10(2)(d)- solicit, gather, obtain and verify any relevant information and data from any Federal or Provincial Ministry, Division or Department, or any public or private entity in connection with the performance of the functions of the Authority.</p> |
| <p>The Alternative and Renewable Energy Policy, 2019</p> | <p>No mention of Textiles.</p> | <ul style="list-style-type: none"> • Envisages private investment in the Alternative Renewable Energy (ARE) sector in Pakistan as it is envisaged to contribute its share in strengthening and improving the power supply position of the country and help in fueling rapid and environmentally sustainable economic growth. |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--|---|---|
| | | <ul style="list-style-type: none"> • Enable private sector investment and participation in on-grid and off-grid ARE Projects (AREPs) and innovative supply solutions. • Unsolicited AREPs may be proposed to AEDB by the Provinces or by private sponsors for interconnection with the national grid and power offtake by FPUs only for new technologies. • Sharing the power purchase obligations of being the sole purchaser and supplier with the private sector • Municipal authorities can work with the private sector for a variety of AREPs, such as solar parking lots (also useable for electric vehicle charging), municipal lighting, waste-to-energy projects, mosques and school lighting (which is currently offered at subsidized rates by FOPUs), and the like, under public-private partnership mode that can address civic and environmental issues in parallel. The key obstacles to such initiatives are lack of capacity and issues of transparency. • Privately finance the system augmentation for wheeling. |
| <p>Khyber Pakhtunkhwa Climate Change Policy - 2022</p> | <p>No mention of Textile</p> <p>Talks of industry and what it needs and how it can be helped but makes no mention of private investment to do so.</p> | <p>Policy Objective includes encouraging public and private sector investment in adaptation and mitigation measures by developing suitable economic incentives, by raising awareness in both the public and private sector of the benefits of conservation, including reduced land degradation, heat waves, high winds, intense rainfall and floods, as well as the protection of existing forests and the benefits of afforestation.</p> <p>The Policy seeks to engage the private sector in:</p> <ol style="list-style-type: none"> 1.Forest Management 2.Human Health 3.Renewable Energy Production and uptake 4.Waste Management <p>(Develop proper collection, storage, transport and disposal system for municipal waste and wastewater and involve private sector in implementation of the system)</p> <ol style="list-style-type: none"> 5.Technology Transfer 6.Securing Climate Finance |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--|--|---|
| <p>Sindh Climate Change Policy, 2022</p> | <p>Mentions that 50% of Pakistan's industry is located in Sindh, including textiles</p> <p>The Policy identifies the impacts of climate change on agriculture in Sindh and how that impacts the supply chain for agro-based industries, such as textile, leather, and food processing. These include:</p> <ol style="list-style-type: none"> 1) Changes in household income based on changes in agro-based income impact the household consumer demand from other sectors. 2) The changing climate may affect both crop yields and returns to the farmers. 3) Due to its diverse geography, climate variability is likely to create a great deal of uncertainty about agriculture sector, and the economically related sectors that depend on agriculture, causing a great impact on income, poverty, and livelihood in Sindh. <p>In Pakistan, the impacts of climate change on agriculture are projected to be highest in Sindh, as compared to other provinces and regions.</p> | <p>Climate Financing -. Exploring public, private, domestic, and international financial resources and funding mechanisms are essential for strengthening the existing response practices and for implementation of mitigation and adaptation measures identified in the provincial policies and plans.</p> <p>-The financial needs of the province to address low carbon, and climate resilient related measures in all the sectors and develop investment plans should be assessed and partnerships with the private sector should be developed for implementation of these measures. It would be prudent that to further this, a medium-term expenditure framework be developed and put in place, to provide for the required resources in a more predictable manner and duly aligned with the short-, medium- and long-term strategies of this policy.</p> <p>Lack of Youth Representation -Poor engagement of youth in productive political, educational, economic and socio-cultural activities indicates the ineffectiveness of the public and private sector policies especially at the state level.</p> <p>Resilience Building of Agricultural Systems by using the private sector:</p> <ol style="list-style-type: none"> 1. Discouraging the use of fertile agricultural land for unproductive and unsustainable practices. 2. Enabling financial mechanisms for farmers to invest and adopt the technologies to overcome the climate related stress 3. Creating sustainable agricultural productivity by improving irrigation and land management 4. Utilizing genetic engineering for introducing climate tolerant crops and livestock <p>Other private sector involvement suggestions include:</p> <ol style="list-style-type: none"> 1. Management of the Fisheries sector 2. Restoration and Conservation of Rangelands 3. Promotion of grazing management systems 4. Enabling Green Energy Growth through the private sector by increasing access to information (research, data collecting and monitoring, and awareness raising) and institutional development (governance, partnerships and institutions) 5. Alternative means to produce energy 6. Road Transportation 7. Increasing Railway Efficiency 8. Management of waste |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| Name of Instrument | Main Provisions on the Textile Industry | Thematic Areas for Private Sector Involvement |
|--|---|--|
| <p>Punjab Provincial Climate Change Action Plan, March 2021 (Draft-Suggested Actions)</p> | <p>Does not mention textiles specifically.</p> <p>Punjab industrial sector provides employment opportunities to 23% of the provincial labour force and accounts for 24 % of total provincial GDP. More than 48,000 huge industrial units are located in Punjab. Almost 90 % of private enterprises are small and medium in size and employ around 78 % of Punjab's non-agricultural workforce. Overall, the province is a home to 39,000 small and cottage size industrial units.</p> | <p>Investment opportunities by the private sector in adaptation measures may include the following:</p> <ol style="list-style-type: none"> 1. Efficient Irrigation Techniques to enhance the line capacity (develop indigenously low-cost energy and water efficient devices such as trickle and sprinkle irrigation system) 2. Encouraging active participation of famers in water management along with line departments 3. Promoting public-private partnership for enhancing access of safe drinking water and sustainable operation & maintenance of water supply systems. 4. Health <p>Investment opportunities by the private sector in mitigation measures may include the following:</p> <ol style="list-style-type: none"> 1. Promoting development of renewable energy resources 2. Solar Panels: promote and install solar panels in both public and private sector buildings to conserve energy 3. Transportation <ul style="list-style-type: none"> - Develop public private partnership for the provision of fuel efficient local transport - Identify and design financial incentives for the private commercial transport systems to reduce emissions 4. Urban Planning: In commercial areas and shopping malls, encourage the corporate sector to build a public-private partnership for replacing fuel-based water heating and energy needs with solar energy. |

Table 4: Climate Change Laws and Policies

| Punjab Agriculture Policy, 2018 | Sindh Agriculture Policy (2018- 2030) |
|--|---|
| <p>-Implement an appropriate policy and regulatory framework to encourage private sector participation, collaboration, and investment in agriculture innovation and research</p> <p>-Has set up the Punjab Agriculture Market Regulatory Authority (PAMRA) as a regulator and for the collection and dissemination of market information; and to play a role in private sector development as a facilitator and enabler.</p> <p>-Provide more information on potential investment opportunities in storage facilities for the private sector to invest and receive profit</p> <p>-Matching grants: The Government designates funds to high priority agribusiness SMEs crucial to the development of the agriculture sector. The agribusiness SMEs apply for grants and those selected through a competitive process receive the Government's in-kind grants of up to 50% of the project's cost in the form of technology transfer (machinery, equipment and software are given to SMEs by the Government) and technical assistance (business development and advisory services are given to SMEs by business development experts on Government's subsidy). The government grant is matched by the private sector. The private contribution in the project is in cash or in-kind, which can include any existing assets such as land, building or machinery etc. owned by the private investor being assigned for use in investment project.</p> <p>The matching grant scheme allows two selection streams for flexibility and ensures inclusivity of small agribusinesses.</p> <p>-The policy proposes a transparent organisation framework by having separate governance and management functions. Owing to the specialised nature of the matching grant scheme, and limited capacity within the Department for managing such schemes, the management and implementation can be outsourced through a competitive process to a private firm having experience in execution of private sector development grant programs, while the governance function will remain with the Government through putting in place an appropriate institutional mechanism.</p> <p>-The Department of Agriculture is recommended to create / designate a specialised unit as Agriculture Innovation and Development Entity (AIDE) Fund for</p> | <p>-The Government of Sindh will promote suitable agriculture practices, including new livestock breeds and seeds; upgrade or build suitable infrastructure, particularly at farm level, to deal with higher, but more variable rainfall and consequent floods and droughts; improve dissemination of up-to-date weather information and early warning of disasters; launch agriculture and livestock insurance programs; prepare contingency plans and set aside funds in case of major unforeseen disasters; and introduce improved crop storage and preservation techniques.</p> <p>-Public investment, accompanied by regulatory and institutional changes, will focus on facilitating and encouraging private investment.</p> <p>- The overall process of implementation of the Policy will be overseen by an Agriculture Policy Implementation Commission comprising concerned Government institutions, farmers' associations, private sector and academia.</p> <p>-The Policy was prepared with participation from the private sector.</p> <p>-The adoption of a policy for a relatively long period would also provide stability and predictability and help encourage private longer-term investment.</p> <p>-Restructure the sector and create a regulatory framework to encourage the banks and private sector to enhance investments and finance into agriculture.</p> <p>-Change the level and composition of public expenditure to efficient and effective programs.</p> <p>-Reform the legal and regulatory system governing agriculture and livestock marketing. Redesign the price support system into one that promotes competition and enhances transparency, market integration and competition, such as electronic trading and direct sales to private markets and supermarkets.</p> <p>-Attract private investors, both domestic and foreign, into rural areas, through fiscal incentives; a better legal/regulatory environment for commercial farming and for medium and large-scale storage including cold chain, and agro-based industry; and promoting public-private partnerships, including through establishment of</p> |

| Punjab Agriculture Policy, 2018 | Sindh Agriculture Policy (2018- 2030) |
|---|---|
| <p>governance and execution of the grant scheme. It will be a lean structured organisation governed by a committee with majority representation and a chairman from the private sector.</p> <p>-The Policy recommends diverting funds to high priority areas including agriculture research and technology for a sustainable increase in yields; promotion of high value and climate smart agriculture; and incentives for the private sector in the development of efficient agriculture produce markets and agro-processing businesses etc.</p> <p>-The policy recommends expansion in e-Credit through an increase in outreach to farmers by adding new banks to the system; new crop loan products are introduced, especially for the horticulture, oilseeds and pulses categories to encourage a shift in crop mix; and new farmers groups such as 12-25 acres landholding and 25-75 acres landholding are added to the e-Credit scheme to support a broad-based growth in the agriculture sector. Similarly, loans for the purchase of farm machinery and postharvest storage of produce (linked to the grain warehouse receipt model) can also be introduced in the following years. The subsidy on loan interest should be continued so farmers are encouraged to borrow from the formal lending sector.</p> <p>A major strength of the e-Credit scheme is that it leverages private sector capabilities in the provision of financial services to farmers, appointment of experienced farmers, processors and exporters from the private sector to the Commodities Research Boards is a step toward engaging stakeholders in setting the research agenda.</p> <p>-The Connected Agriculture Platform Punjab (CAPP) is a digital information and advisory platform linked with the e-Credit scheme, which through a range of smartphone apps provides easy to understand information and advisory to e-Credit farmers. The CAPP apps include real-time weather updates, pesticide warnings, best crop practices (articles and videos), subject matter expert's advice etc. to name a few. The policy recommends expansion in scope and quality of CAPP programs to cover for the shortage in physical extension services through digital platforms. This policy recommends further development of CAPP apps and to populate it with good quality content so more meaningful support is provided to the farmers through digital platform. It further recommended to open CAPP to</p> | <p>agro-processing parks and special zones in major production clusters.</p> <p>-Reform the public research and extension systems for crops, horticulture, livestock and fisheries, particularly their governance mechanism, and enhance competitive funding for their activities with strong involvement of the private sector and academia. Launch special training and extension programs, in close collaboration with the private sector, to minimize the post-harvest losses and proper packing, handling, storage and transportation.</p> <p>-Increase public development and research funding for climate smart-agriculture, and control of new pests and diseases.</p> <p>-Improve productive infrastructure in rural areas, both public and private, to deal with bigger and more frequent floods and with seawater intrusion</p> <p>-Provide timely weather forecasts through SMS and other channels to farmers.</p> <p>-Provide for disaster relief and rehabilitation, with a particular focus on vulnerable areas and on the poor.</p> |

Punjab Agriculture Policy, 2018

all farmers of Punjab and not limit it only for e-Credit farmers so the benefit of the program is widespread.

-The policy recommends improving the relevance, efficiency, quality, and effectiveness of the technological and innovation system of agriculture, offering proper incentives and regulatory framework to all actors and institutes for technology and innovation in the system.

- The Government's role as an enabler, facilitator and catalyst in the development of the private sector is also being recognized in the Policy. A strengthened Agriculture Mechanization Research Institute (AMRI) can play a constructive role in the R&D of mechanization technologies by being responsive to market demands and development needs of the agriculture sector. The policy recommends significantly increase the institutional capacities at AMRI and support it with increase in spending for R&D on farm mechanization. A private sector-led governance structure with strong monitoring and impact-based performance management of AMRI is recommended to ensure value for money.

-The policy proposes the establishment of an Institute for Climate Smart Agriculture (ICSA), recruited with a pool of technical personnel (human resource) with expertise in CSA, to strengthen the role in formulization and review of policies and regulations for CSA activities, establishing oversight and accountability systems and incentive mechanisms for promotion of CSA best practices according to the provisions of the Climate Change Act, 2017.

This can be facilitated by building strategic partnerships with private sector, NGOs, CSOs and other development partners with provision of technical and financial support for CSA activities, programs and projects. All of this needs support of an integrated communication strategy for its internal and external stakeholders, including the private partners and farmers.

-Area Yield Index Insurance (AYII) of Government of Punjab is a safety net scheme for small / sustenance farmers against the yield loss from natural calamities and effects of climate change. The AYII is based on an effective and efficient mechanism, compared to CLIS, relying and leveraging on the private sector capacities in insurance services, and also playing the role of catalyst in introducing

Sindh Agriculture Policy (2018- 2030)

| Punjab Agriculture Policy, 2018 | Sindh Agriculture Policy (2018- 2030) |
|---|---------------------------------------|
| <p>insurance among farmers in a manner that is sustainable and scalable. It simply links insurance with the average yield at the tehsils, where the insurance payments are triggered, if the yield drops below 80% of past average (based on routine crop cutting experiments of Crop Reporting Services in Agriculture Department) without need for declaration of calamity and minimizes procedural hurdles. The crop yield insurance covers farmers with landholdings of up to 12.5 acres, where 100% premiums for the farmers having a landholding of 5 acres or less is paid by the Government of Punjab, and the cost of premium payments is shared on a 50-50% basis in case of landholding above 5 acres and up to 12.5 acres.</p> <p>The policy recommends expansion in the AYII by including all small farmers with less than 12 acres landholding in the scheme, and not only the e-Credit loanee farmers. The policy also recommends to increase the number of crops insured by including minor crops as well, and finally expanding AYII to the entire Punjab in four years to provide a safety net to small / subsistence farmers from potential yield losses caused by climate change and other calamities.</p> <p>The crops insured during the pilot were cotton and rice.</p> <p>-Strengthen private sector led Commodity Boards to ensure that they have a role in setting the demand-based research agenda and monitoring performance.</p> | |

Table 5: Interventions To Facilitate Private Investment

| MAIN BARRIERS TO IMPLEMENTATION | ENABLERS FOR IMPLEMENTATION |
|---|--|
| <ol style="list-style-type: none"> 1. Stakeholder Engagement and Coordination Challenges which prevent or delay implementation, including among relevant government agencies, the private sector, academia, civil society organisations, and other stakeholders. 2. Lack of coordination between national and provincial level regulatory authorities. 3. Capacity challenges within government departments and regulatory authorities to understand and uniformly enforce laws. | <ol style="list-style-type: none"> 1. Establishing a coordination mechanism to reduce overlap and maximize synergies between various public sector and private institutions working on legal and regulatory enforcement mechanisms. 2. Developing coordination and synergy between national and provincial level regulatory authorities. 3. Capacity building and institutional strengthening for uniform and timely enforcement of laws. |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| MAIN BARRIERS TO IMPLEMENTATION | ENABLERS FOR IMPLEMENTATION |
|---|--|
| <ol style="list-style-type: none"> 4. Insufficient resources present as obstacles in legal enforcement, including the absence of diverse financing mechanisms such as large provincial domestic budgets, international climate finance, and innovative financing instruments. 5. Inadequate expertise to plan for and raise additional financing for climate change adaptation and mitigation projects. 6. Limited public-private partnerships to build climate resilience. 7. Lack of monitoring and evaluation by government agencies, communities, technical experts and the private sector. 8. Inadequate involvement of the private sector which is essential for bringing expertise and resources, offering innovative solutions and contributing to the scalability and effectiveness of legal measures. 9. Lack of an enabling environment for private sector involvement in legislative and policy drafting. 10. Private sector investments from households, corporations and commercial financial institutions have largely been channelled towards climate mitigation, rather than adaptation and resilience, amounting only to US\$1.4 billion or 0.5 percent of GDP in 2019. Pakistan's total investment-to-GDP ratio remains around 15 percent, compared to South Asia's regional average of over 30 percent. 11. Limited awareness of existing laws, policies regulatory mechanisms and authorities. 12. Imperfect investment in awareness raising initiatives for climate change, sustainable development and mitigation and adaptation measures. 13. Laws, regulations and policies without long term objectives. Short term policies do not permit enough time for the desired objectives to be achieved. 14. Broad policies that fail to account for different jurisdictional needs and requirements; | <ol style="list-style-type: none"> 4. Identifying funding gaps and mobilizing financial resources to enforce laws. 5. Increasing access to international climate finance, including from the UNFCCC financial mechanisms such as GCF, GEF, and Adaptation Fund (AF). 6. Promoting more public-private partnerships for climate-resilient infrastructure and climate-smart agriculture, to effectuate enforcement of laws and policies. 7. Periodically reviewing and updating the investment plans based on new data and changing circumstances. 8. Encouraging the private sector to implement adaptation actions in collaboration with the government and development partners. 9. Promoting public private partnerships for technology transfer and technological up scaling; 10. Engaging private sector participation for channeling adaptation finance to raise awareness on climate laws and policies. 11. Raising awareness on laws, policies and regulatory mechanisms from a grass root level. 12. Raising awareness on the presence and mandate of responsible government departments and regulatory authorities. 13. Preparing both long- and short-term laws, policies and regulations which are jurisdiction and climate sensitive. 14. Having new and reformed gender sensitive laws and policies, which account for a jurisdictions cultural, societal and religious constraints. 15. Preparing grass root level, detailed policies. 16. Performance based reward incentive for regulatory authorities. 17. Invoking financial institutions and large industries to advance technology transfer and bankable products. |

ADDRESSING CONSTRAINTS LIMITING THE FLOW OF PRIVATE SECTOR INVESTMENTS FOR CLIMATE CHANGE ACROSS THE TEXTILE VALUE CHAIN

| MAIN BARRIERS TO IMPLEMENTATION | ENABLERS FOR IMPLEMENTATION |
|---|---|
| <p>15. Climate change policies that give broad direction without providing details on how to achieve the stated policy objectives.</p> <p>16. Corrupt government officials failing to uphold the rule of law and enforce legal and regulatory requirements.</p> | <p>18. Exploring innovative financing options, such as green bonds, blue bonds, nature bonds etc.</p> |

Table 6: Barriers And Enablers for Implementation of Climate Laws

A. List of type of products produced by the TVC

| Sr. No. | Type of products produced by TVC |
|---------|---|
| 1. | Raw materials: Cotton, yarn, fabrics and synthetic fibre. |
| 2. | Finished goods: Garments, bedsheets, woollen and silk fabrics and bags etc. |