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Rethinking textile and apparel as a sunrise industry in South Africa: Technological innovations and catch-up industrialisation

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Introduction

The South African textile industry as it stands today does not have the textile base to support localisation or regional value chains. The country's spinning capacity is low, with just two firms that sell yarn, and the weaving segment is also very small and not geared towards fashion. There are more knit mills, but many of them are quite small and produce low quality fabric. Dyeing capacity is also an issue, as many knit and woven mills do not have their own dyeing facilities and there are only a few standalone dyehouses. While several textile mills have started investing in new machinery that can produce more fashion fabric and fabric of a higher quality, the size of investments to date is not on a level that is going to have a significant impact.

Focussing only on the domestic market has limited the growth and specialisation of South African textile and apparel firms, which in turn has hampered the growth of the industry as a whole and allowed textile and apparel firms to fall behind the technological frontier. The result is an insufficient domestic supply chain in fashion fabrics and other intermediate inputs, which gives other countries a competitive advantage even when they have higher wages, such as Turkey and China.

Consequently, the South African textile and apparel industry is not competitive internationally, nor is it competitive nationally against imported clothing. The system of trade protection through tariffs, combined with rebates on inputs that cannot be sourced locally, further complicates the problem rather than ameliorating it, especially through the abuse of the system and illegal imports. The government's current vision for the sector and its industrial policy approach laid out in the R-CTFL Master Plan do not identify these structural constraints and consider the lack of competitiveness at an industry level. The

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industrial policy measures outlined in the Master Plan are unlikely to solve the competitiveness issue, even if individual textile, apparel and retailer firms adopt more 4IR and sustainability technologies. This policy brief suggests a different approach.

4IR and sustainability technologies in the textile industry

Clothing production has doubled in the past 20 years due to the fast fashion business model of global apparel brands and retailers. As a result, the global fashion industry accounts for anywhere from 6% to 10% of global greenhouse emissions, and for 20% of global wastewater discharge to rivers and seas. More than half of clothing ends up in landfills and incinerators in less than a year. Faced with the prospect of this negative environmental impact of global clothing production being set to triple by 2030, interesting changes are occurring in the global fashion industry. There is a noticeable sustainability shift happening, driven by European and US legislation as well as the competitive strategies of a handful of large global apparel brands and retailers. National legislation has catalysed this shift by mandating greater sustainability in the fibre, fabric and clothing segments of the value chain, creating demand and thus markets that did not exist previously. The first-mover buyers are investing in textile innovations and start-up companies driving them. Sustainable fibres and textile production will become the global norm in the next five to ten years.

This sustainability shift embraces technological innovations that combine digitalisation, biotechnology and chemistry in ways that will have more disruptive effects in the global textile and apparel industry than 4IR technologies alone. Textile technologies were previously what we would call long-cycle technologies in that they did not experience much innovation. This is changing. New fibre technologies that create man-made cellulosic fibres from virgin and recycled materials and new textile machines and production processes that reduce energy, water and material use are emerging on the market and are in a phase of fast innovation. They now resemble short-cycle technologies in that successive rounds of innovations will displace previous rounds, creating opportunities for emerging economies to enter when the technology is still young and build competitive advantages. We need to rethink textile and apparel as a sunrise and not a sunset industry.

Advancements in chemical, recycling and bio-fabrication technologies to produce alternative, sustainable fibres mostly likely will have spillovers into other manufacturing sectors, resulting in something similar to the technological advancements in chemistry that led to the polymer revolution in the 1930s, where the use of polymers started with the production of nylon (initially for women's hosiery) and then led to the 'world of plastics'. Synthetic fibre production based on the petrochemical industry led to linkages and knowledge spillovers in the domestic economies of Northeast Asian countries. More generally, innovations that drove industrialisation historically occurred in textile, where fast technological change was occurring in textile equipment, and then in petrochemicals and fibre production. Apparel assembly was never the source of dynamism behind catch-up industrialisation.

Catch-up industrialisation requires reading global technology trajectories, mastering emerging technologies, and eventually producing local proprietary knowledge through product and process innovations. Taking advantage of the technological changes occurring in the global textile and apparel industry requires that South African industry actors and the government look forward (not backwards) and build a new industry that engages with global actors. There are opportunities to create wealth as well as jobs by helping domestic firms gain a position at the technological frontier that includes new

technologies in alternative sustainable fibres and textile production.

Challenges in South Africa's textile and apparel industry

After the end of apartheid in 1994, the new government adopted trade liberalisation. In a context of reduced tariffs and the elimination of quotas, South African textile and apparel firms struggled to compete with imports from Asian countries with more competitive industries. South African firms were less efficient because they were far behind the technological frontier in the industry due to a lack of re-investments and their focus on the domestic market, which led to diversified product portfolios with smaller runs and thus did not reach the economies of scale of large factories in China or in another Asian countries that exported. The industry declined, but also went through a period of restructuring. Vertically disintegrated firms broke apart and focussed on specific activities. Many apparel factories closed, which had a knock-on effect in terms of demand for fabrics. As a result, many textile factories closed or reoriented to industrial, technical and niche areas where there was less international competition. Clothing firms outsourced the labour-intensive assembly part to many small and informal firms or set up assembly firms in Lesotho and Eswatini, where production costs were lower, and then focused on the design element.

South African retailers had been content to import cheaper clothing and fabric from Asian countries and neighbouring Southern African countries. However, retailers also began to face higher competition in the domestic market from international clothing retail corporations. They have sought to build a competitive advantage based on quick response, which requires greater localisation of production, including textile production for fabrics made up in South Africa. As a result, retailers have made a commitment to localisation and investments in building the local supply base, which shaped the new government sector policy – the South Africa Retail-Clothing, Textile, Footwear and Leather Value Chain Master Plan to 2030 – that was signed in 2019.

A survey of South African textile firms was carried out in August 2022 to examine the extent to which textile firms were adopting 4IR and sustainability technologies in their business strategies. The findings of the survey point to structural constraints within the South African textile and apparel industry and the general domestic economy that limit the adoption of 4IR and sustainability technologies.

The domestic market orientation of almost all firms seems to be a limiting factor for several reasons. The extremely high level of inequality in South Africa leads to the low purchasing power of a large portion of the population, and thus the relatively small size of effective demand. As a result, many South African retailers focus on providing low-cost products, and this kind of buyer demand for low-cost, low-quality clothing does not provide an incentive for textile mills to invest in new machinery and production processes, because it is not necessary for low-cost products and their profit margins cannot cover the increased overheads. Even among the higher end retailers and brands aimed at higher value products, cost will still be an issue, especially when it comes to sustainable fibres, where cost parity has not yet been achieved with conventional fibres (but is likely to do so in the future).

The new motivation among South African retailers to source more apparel locally to implement their quick-response business models has highlighted bottlenecks in the local supply chain, including not enough yarn, a narrow range of domestically produced fabrics, and not enough dyeing capacity. This nearshoring shift has led to recent local and some foreign private investments in the textile segment, which may increase, although it is

too early to draw any conclusions. Some firms are investing in catching up, but those firms are still far from the technological frontier of digitalisation, as well as sustainability. Many firms still demonstrate a survivalist mentality and have limited resources with which to make investments; they demonstrate a dependence on government initiatives such as the Production Initiative Programme, instead of being proactive.

Focusing only on the South African market has also allowed textile and apparel firms to fall so far behind the technological frontier. One of the most important reasons to engage in exporting is that it requires, even forces, local firms to adopt and adapt foreign production process and machinery (soft and hard technologies), and thus build their capabilities and keep up with technological changes.

Building an internationally competitive textile industry in South Africa

South Africa is relatively well placed to capitalise on the window of opportunity and move to the technological frontier in fibre and textile technologies. Doing so means taking an industry perspective that is not only grounded in the needs of domestic retailers, but also outward-looking in terms of engaging with global technologies and international partnerships. This requires a different set of industrial policy measures to what has been tried in the past. Such industry policy measures must facilitate local and foreign investments in diversified textile production, with specialisation among firms; support collaboration between domestic firms in the textile and apparel industry and domestic firms with knowledge in chemistry and biotechnologies that can bring in new capabilities; and forge partnerships with foreign firms that have the latest technologies. Ideas on putting this into practice are outlined below.

To create a textile and apparel industry that can supply local retailers requires massive investments in spinning, knitting, weaving, dyeing and printing. These investments should be made in a strategic way that selects higher value clothing to be produced in South Africa, and thus higher quality fabrics and sophisticated ancillary services in dyeing and printing. The more basic products, with lower unit values, can be imported from SADC or other African countries. In other words, South Africa should be part of, and even lead, the move to more of a regional value chain that is strategic and complementary, rather than competing in the same products and importing the rest from Asia.

For existing firms and new firms to invest in the textile and apparel industry, and to access finance, they need security of orders. To assist in this, South African retailers need to commit to long-term sourcing contracts with local manufacturers. For apparel and textile firms to achieve greater efficiency, and thus be profitable with unit costs comparable to those of Asia, they need to tap into the efficiency gains from scale and agglomeration. The South African apparel and textile industry currently is fragmented into small-sized mills and garment firms that operate in various parts of the country.

As a first step, industry actors could focus on creating the 'Turkish model', while investments in yarn, weaving and knitting are under way in new or renovated industrial parks. The Turkish model is where textile firms import the greige fabric (rather than knitting or weaving it) and instead focus on sophisticated finishes in collaboration with apparel firms and designers. The competitive advantage is to be able to produce a wide range of finished, high value fabrics in a short turnaround time of four to five weeks.

Industrial parks that locate spinning, fabric, finishing, trims and garment production in close proximity benefit from lower transaction and transport costs, from higher productivity from knowledge spillovers in product and production process, management and skilled

labour, as well as from economies of scale – either from large factories or by grouping small factories next to each other and sharing orders. Sharing large investments in a zero-liquid discharge effluent treatment plant and renewable energy would also reduce the costs of shifting to these sustainability technologies.

The national and local government could invest in modernising the infrastructure in the existing industrial zones in Ladysmith and Harrismith based on private firm commitments to invest in the parks. The recent investment by the Mauritian firm, CMT, in a dyeing facility in the Ladysmith industrial park is evidence that foreign investment could be attracted to South Africa if South African retailers commit to orders. A critical mass of textile and apparel firms could attract an independent provider of renewable energy, and it could pull in further investments in apparel assembly, trims and ancillary services from local and foreign investors.

New industrial parks could be built in Hammarsdale and on the outskirts of Cape Town. Such parks would not have to be built by the government, but rather the government could leverage international portfolio financing and direct infrastructure investment. One model to follow is that of the PIA industrial park in Togo, which is a public-private partnership between Arise Integrated Industrial Platform and the Togolese government (see https://pia-togo.com/). Arise plays the main role in the construction and operation of the park, as well as investing in textile mills in the park using West African cotton and incorporating some of the latest sustainability technologies. Government provides the land and subsidises the training facilities for textile and apparel firms. Local firms investing in the parks could seek co-financing through joint ventures with foreign firms.

The final step would be local investments in new sustainable fibre technologies, such as manmade cellulosic and recycled fibre technology to supplement cotton. Local investors could enter partnership agreements with new fibre technology firms in Europe and India to license their technology. These local investors could link with existing chemical firms and technical institutes in South Africa that have chemistry expertise, and they could link with waste management companies in South Africa on sourcing textile waste. Through partnership agreements, local firms can leverage the knowledge to commercialise existing alternative fibre technologies, which will create the foundation for incremental innovation and later proprietary technology innovations. These new fibres would feed into the industrial parks, positioning South Africa at the technology frontier of the new sustainable global apparel and textile industry.

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