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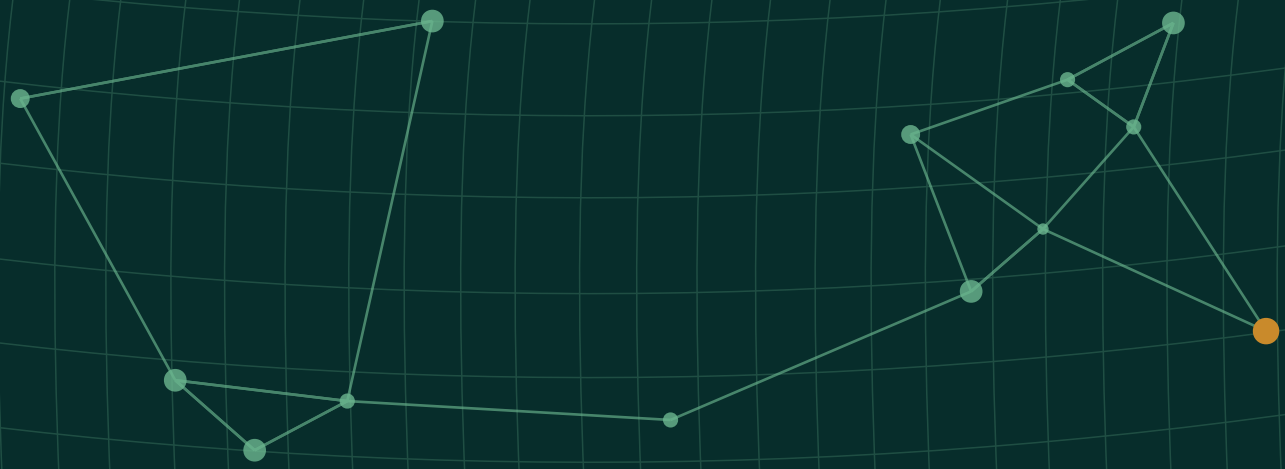
GFT RESEARCH / WARP AND SIGNAL

Cotton to Garment Across Africa

A comparative study of value-chain strategies in African cotton and apparel economies

wp19
RESEARCH EDITION

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HONG KONG SAR



THE GFT THESIS

Value is made where it is measured.

GFT engineers sustainable factories that capture their own data from the first shift, so raw-material economies can keep the value they grow.



Read the evidence before acting on the recommendation.

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The operating case runs from fibre to feedback.

01 / Africa grows a premier share of the world's hand-picked cotton yet surrenders most of the value chain before spinning 16

1.1 / Raw-lint export dominance locks West and Central Africa at the bottom of the value curve 17

1.2 / Global lint trade flows funnel African fibre into expanding Asian spinning hubs 19

1.3 / Enclave garment assembly in East and Southern Africa suffers the mirror-image disconnection 20

1.4 / African domestic and regional apparel demand is large enough to anchor local industrial scale 21

1.5 / Step-by-step value multiplication favours downstream entry paired with midstream partnerships 23

1.7 / Warp and Signal: measurement from the first shift separates viable factories from stranded assets 26

1.8 / Scope and comparative method of White Paper 19 27

02 / Four distinct value-chain strategies govern cotton and apparel industrialisation across the continent 30

2.1 / Archetype 1: West and Central African cotton-belt SEZ converters build co-located spinning and wet processing around smallholder lint 33

2.4 / Archetype 2: East, Southern and Indian Ocean preference-driven CMT hubs scale rapid employment on imported fabric but remain exposed to eligibility shocks 35

2.7 / Archetype 3: North African vertically integrated near-shoring powerhouses win European and US orders on transit speed yet face midstream yarn deficits 37

2.10 / Archetype 4: Domestic-market and regional import-substitution economies use tariff walls and retailer compacts to anchor factory utilisation 38

2.13 / Capital intensity versus speed of cash generation separates upstream megaprojects from modular garment entry across the four strategies 41

2.14 / Currency regimes and macroeconomic stability filter imported equipment risk and working-capital debt service across African corridors 43

2.17 / GFT's hybrid Cameroon model synthesises Archetype 1 cotton provenance with Archetype 4 regional tariff protection 44

03 / Agronomic organisation and smallholder verification give African lint a structural provenance advantage that raw export gives away 48

3.1 / Integrated ginning networks turn dispersed cultivation into an auditable production system 49

3.2 / Regional supply matters only when domestic conversion can buy and use the lint 50

3.4 / Hand-picking helps only when contamination and fibre condition are measured 52

3.5 / CmiA verifies defined practices, not a blanket environmental conclusion 53

3.6 / Physical custody preserves origin where accounting alone cannot 55

3.7 / Co-product economics strengthen the gin only when the whole mass balance is sold 57

3.8 / Bankable provenance joins contract terms, physical controls and claim approval 59

04 / West African special economic zones in Benin and Togo prove that co-located spinning, weaving and garmenting can compress the conversion gap 62

4.1 / Public-private zone governance aligns cotton policy with infrastructure execution 63

4.2 / GDIZ's planned lint conversion requires matched capacities at every stage 65

4.3 / The five-unit ambition is a dated investment proposition rather than an output series 67

4.4 / Fiscal incentives support a factory only when its transactions qualify 69

4.5 / Shared treatment makes wet processing a governed service rather than a label 70

4.6 / On-site training needs a demonstrated route into accepted production 72

4.7 / Cameroon should adopt accountable interfaces before committing to full integration 73

05 / Central Africa's cotton belt faces a choice between state-led megaprojects and modular private cut-make-trim ventures 76

5.1 / Cameroon's 95/5 paradox: a thriving northern cotton base paired with a hollowed-out domestic mill 77

5.2 / Anatomy of an incumbent decline: why CICAM fell from 85 percent to 5 percent market share 79

5.3 / Public megaprojects on a long clock: Camtext SA and the SODECOTON-CICAM merger pole 80

5.5 / Why public integrated poles are upstream partners rather than rivals to a private CMT entrant 82

5.6 / The GFT modular alternative: 3.0 million garments a year in cut, make, trim, finishing and own brand 83

5.7 / Competing against the import and contraband tide on provenance, freshness and institutional reliability 85

5.8 / The corridor-versus-north siting trade-off: Douala-Dibamba against Garoua 87

06 / East African export zones built on third-country fabric and unilateral US preferences suffer severe shocks when eligibility is revoked 91

6.1 / Ethiopia's Hawassa flagship: state-built plug-and-play sheds anchored by global brand commitments 92

6.4 / The January 2022 AGOA termination shock: why unhedged US export reliance broke the Hawassa model 94

6.7 / Agrarian-to-industrial workforce friction: lessons from ILO and World Bank evaluations in Ethiopia 96

6.10 / Kenya's Export Processing Zone resilience: US$470 million in AGOA apparel exports and 66,800 direct jobs 98

6.13 / The third-country fabric trap in Kenya: high export volume paired with minimal local cotton uptake 99

6.16 / Margin compression and unit-value squeeze in pure CMT assembly 100

6.18 / Comparative takeaway for GFT: never build the base case on a revocable unilateral preference 103

07 / Indian Ocean and Southern African clusters survive preference erosion only when they pair skilled assembly with regional fabric or retailer commitments 107

7.1 / Madagascar's Zone Franche: 180,000 formal jobs and 19.35 percent of GDP built on dual EU-US market access 108

7.4 / Madagascar's midstream dependency: US$104.6 million in fabric imports shows the limits of assembly-only growth 110

7.7 / Mauritius: upgrading from basic CMT to capital-intensive textiles, design and Indian Ocean co-production 111

7.10 / Lesotho's monoculture vulnerability: one-third of national exports tied to US apparel preferences 113

7.13 / South Africa's de-industrialisation lesson and the forty-five percent WTO bound tariff floor 114

7.16 / The South African R-CTFL Master Plan 2030: retailer demand commitments for eighty-one million additional local garments 116

7.19 / Strategic synthesis from the south: combine tariff protection with firm-level industrial engineering 118

08 / North African near-shoring hubs capture speed-to-market premiums but must close midstream spinning and circularity gaps to keep European buyers 123

8.1 / Egypt's dual export engine combines US Qualifying Industrial Zones with Mediterranean near-shoring 124

8.4 / The Egyptian cotton paradox pairs extra-long-staple heritage with multi-billion-dollar yarn and fabric imports 127

8.7 / State-backed midstream modernisation at El-Mahalla El-Kubra targets the imported intermediate deficit 128

8.10 / Morocco's fast-fashion reactivity model anchors a quarter-million workers on European retail corridors 129

8.13 / Morocco's upstream contraction exposes fast-fashion exporters to imported fabric and EU Ecodesign mandates 130

8.16 / The IFC and AMITH Textile Circularity Exchange turns pre-consumer cutting waste into an upstream investment opportunity 130

8.20 / Strategic lessons for Sub-Saharan entrants show why assembly-only clusters hit a midstream value wall 133

09 / Trade policy and rules of origin decide which business model is bankable before a single machine is ordered 139

9.1 / AGOA's structural fragility makes short-dated unilateral US preferences non-bankable for ten-year capex 140

9.4 / Third-country fabric waivers versus double transformation dictate whether midstream mills get built 142

9.7 / The 2026 ECCAS-CEMAC Common External Tariff creates a 40 percent gross-margin shield for Central African producers 145

9.10 / Cameroon's EU and UK Economic Partnership Agreements grant zero-duty machinery imports and duty-free export access 148

9.12 / The AfCFTA textile rules-of-origin impasse leaves clothing inside the unresolved 7.7 percent tariff gap 149

9.13 / Second-hand clothing inflows and porous borders require product-mix insulation and customs discipline 150

9.15 / GFT's trade-resilient revenue portfolio anchors on CEMAC B2B workwear and local retail before export 151

10 / Low nominal African wages do not translate into low unit labour cost without a funded supervisor and technician pipeline 155

10.1 / Wage benchmarks only matter when their denominators match 156

10.2 / Unit labour cost follows earned minutes and accepted pieces 157

10.3 / Labour governance belongs inside the capacity calculation 160

10.4 / Supervisory training has measured value, but not a universal multiplier 161

10.5 / Park academies reduce duplicated recruitment, but factories still own certification 163

10.6 / Northern artisanal skills can feed the pipeline without being mistaken for industrial readiness 164

10.7 / GFT should staff capability before staffing the organisation chart 165

11 / Grid unreliability, captive solar-plus-storage economics and wet-processing water intensity dictate corridor versus cotton-belt factory siting 168

11.1 / The energy penalty strikes continuous midstream processes before dry assembly 169

11.2 / Falling solar and battery costs justify appraisal, not an automatic investment case 170

11.3 / A continental tariff league table conceals the factory bill 173

11.5 / Wet processing changes the site question from electricity to water, heat and effluent 174

11.7 / Corridor economics favour coastal assembly while solar resource favours the north 176

11.9 / Environmental standards require evidence, not a green-finance label 179

11.10 / GFT's dry-process entry makes utility measurement a production input 179

12 / European digital product passports and supply-chain due diligence turn farm-to-garment traceability from a marketing story into a market-access gate 183

12.1 / Delegated acts, not a blanket 2027 slogan, define the European gate 184

12.2 / CmiA supplies a verified origin baseline, not an automatic compliance certificate 186

12.3 / Physical segregation and volume reconciliation answer different questions 188

12.5 / Rain-fed provenance helps only when the footprint boundary stays visible 190

12.6 / Evidence governance prevents provenance from becoming greenwashing 191

12.7 / A lean event ledger can serve the passport without pretending to be an ERP 192

12.9 / Disclosure should follow verified operating gates, not a promotional calendar 196

13 / A sequenced performance-management and edge-first AI stack lets a greenfield African factory match Asian conversion efficiency without legacy data 199

13.1 / Artificial intelligence fails when the shop floor has no trustworthy denominators 200

13.4 / Six KPI families turn daily production into a governed operating record 203

13.6 / A fixed management cadence makes the workbook a system of record 206

13.8 / Edge vision can start early, but only local validation earns production use 207

13.11 / Demand forecasting waits for a usable order history, not a calendar announcement 209

13.13 / Selective pilots begin only after stable flow makes inventory and printing decisions legible 211

13.14 / Generative design remains behind pattern physics and a sewn-sample gate 212

13.15 / Conversion parity becomes a comparative audit, not a software promise 213

14 / GFT recommends a four-phase continental blueprint anchored on domestic and regional demand, partnered midstream capacity and day-one shop-floor measurement 215

14.1 / Ten empirical rules convert comparison into an investment discipline 216

14.5 / Ministries should make regional demand and clean conversion usable 218

14.9 / SEZ operators and DFIs should finance shared constraints and staged proof 219

14.10 / Four phases gate capital on demand, operations and compliance 221

14.15 / Early-warning indicators turn the risk register into a control system 224

14.16 / The Day-One Measurement Ledger makes every later claim auditable 226

14.17 / Companion tools support testing, while the notice preserves the decision boundary 227

Executive summary 14

Evidence register 229

Glossary 255

Term index 259

Method and imprint 261

Every exhibit states a testable claim.

EXHIBIT 01 / sankey
Cameroon's inherited fibre baseline sends about 95 percent to raw export 18

EXHIBIT 02 / bar
Two vendor series indicate rising African textile demand at different market levels 22

EXHIBIT 03 / waterfall
An illustrative revenue index shows how specification can multiply conversion revenue 24

EXHIBIT 04 / matrix
Demand anchoring and conversion depth distinguish the study's four archetypes 28

EXHIBIT 05 / radar
Each African textile archetype exhibits a distinct profile across fibre base, midstream depth, market access, speed and capital efficiency 32

EXHIBIT 06 / hbar
Direct textile and apparel employment ranges from 1 million in Egypt and 246,000 in Morocco to 66,800 in Kenya and 15,000 projected at Camtext 36

EXHIBIT 07 / table
Comparative structural matrix of twelve African cotton and apparel economies across the four archetypes 40

EXHIBIT 08 / range
Capital intensity per job and payback period rise sharply from cut-make-trim assembly to vertically integrated spinning and wet processing 42

EXHIBIT 09 / bar
Cameroon's approximate 2024 seed-cotton output recovered above 2022 after a contraction in 2023 50

EXHIBIT 10 / keyfigures
CmiA combines substantial farm-level coverage with a smaller physically traceable partner network 54

EXHIBIT 11 / flow
A controlled provenance chain preserves identity from contracted farm to garment record 56

EXHIBIT 12 / stacked
An illustrative 10,000-tonne gin lot yields lint and substantial co-product streams 58

EXHIBIT 13 / table
A provenance-ready offtake agreement binds commercial terms to auditable lot evidence 60

EXHIBIT 14 / keyfigures
Published park areas and planned lint intake describe different boundaries 64

EXHIBIT 15 / bar
BTEX has the largest published yarn capacity among the named GDIZ units 66

EXHIBIT 16 / waterfall
The illustrative local route removes 29 days of intermediate delivery time 68

EXHIBIT 17 / table
The cases offer different evidence for a supplier decision 70

EXHIBIT 18 / layered-architecture
A proposed park operating model joins physical conversion to service evidence 71

EXHIBIT 19 / bar
CICAM's July 2023 plant utilisation ranged from 10.83 percent to 48.9 percent, illustrating the cost of unmeasured legacy assets 79

EXHIBIT 20 / timeline
Cameroon's cotton-to-textile industrial timeline runs from the 2020 AGOA exit through the 2026 CEMAC tariff to Camtext's 2033 optimal capacity 81

EXHIBIT 21 / bar
Even at full 12,000-tonne capacity in 2033, Camtext SA absorbs less than a tenth of Cameroon's ginned lint, leaving a wide gap to the 50 percent target 83

EXHIBIT 22 / table
GFT's five-segment go-to-market sequence prioritises fast-turning domestic segments before regional and continental expansion 86

EXHIBIT 23 / matrix
Douala-Dibamba corridor siting trades cotton-belt proximity for port access, grid density and urban market reach 88

EXHIBIT 24 / dumbbell
Ethiopia's Hawassa Industrial Park and Kenya's EPZ apparel hub diverge sharply after the 2022 AGOA eligibility split 94

EXHIBIT 25 / flow
The AGOA Special Rule routes Asian fabric through East African EPZ sewing lines to US retail, bypassing domestic African cotton growers 99

EXHIBIT 26 / bar
Without AGOA preferences, trade-weighted US tariffs on African apparel exporters jump to 20 percent or higher 101

EXHIBIT 27 / waterfall
A 20 percent US tariff shock on full FOB value wipes out the 8 percent operating margin of an imported-fabric CMT factory 102

EXHIBIT 28 / table
AGOA eligibility, fabric rules and strategic market anchors across major African cotton and apparel economies (2025 to 2026) 103

EXHIBIT 29 / bar
Madagascar's Zone Franche imports over US$104 million of cotton fabric annually while exporting US$2.6 million, showing the midstream gap 110

EXHIBIT 30 / flow
The Mauritius-Madagascar co-production corridor pairs capital-intensive island spinning and design with Malagasy Zone Franche garment assembly 112

EXHIBIT 31 / slope
South Africa's tariff and IDC competitiveness interventions cut annual clothing job losses by two-thirds before the Master Plan pivot to growth 115

EXHIBIT 32 / keyfigures
South Africa's R-CTFL Master Plan 2030 quantifies the employment and output prize of domestic retail localisation 116

EXHIBIT 33 / table
Comparative structure of Indian Ocean and Southern African textile clusters against the Cameroon CEMAC baseline 118

EXHIBIT 34 / table
North African near-shoring benchmark compares industrial scale, factor costs and midstream balance in Egypt and Morocco 126

EXHIBIT 35 / bar
Egypt's textile complex generates 30 percent of manufactured exports while public mills hold 50 to 60 percent of midstream capacity 128

EXHIBIT 36 / flow
Morocco's IFC and AMITH pre-consumer textile circularity loop converts cutting-room offcuts into EU-compliant recycled yarn 131

EXHIBIT 37 / dumbbell
Incorporating mechanically recycled cutting waste in Morocco cuts water and climate impacts against virgin cotton baselines 132

EXHIBIT 38 / matrix
GFT applies North Africa's midstream alignment and cutting-waste segregation lessons to its phased Cameroon programme 136

EXHIBIT 39 / table
Comparative matrix of trade regimes governing African textiles and apparel in 2026 142

EXHIBIT 40 / flow
Single transformation versus double transformation across African and European preferential rules of origin 144

EXHIBIT 41 / waterfall
The 2026 ECCAS-CEMAC 40 percent Common External Tariff creates a decisive landed-cost buffer for Douala garment assembly 148

EXHIBIT 42 / bar
Import penetration, used-clothing waste and underutilisation highlight why tariff walls require B2B product insulation 151

EXHIBIT 43 / table
Published labour figures answer different questions and cannot be treated as one wage ranking 157

EXHIBIT 44 / line
Efficiency changes direct labour cost per garment even when monthly pay stays fixed 159

EXHIBIT 45 / keyfigures
Training evidence becomes useful only when outcomes, enrolment and plans stay distinct 162

EXHIBIT 46 / layered-architecture
A gated skills architecture connects production demand to verified capability 166

EXHIBIT 47 / line
Utility-scale battery installed cost fell 93 percent between 2010 and 2024 171

EXHIBIT 48 / waterfall
Benchmark inputs give a US$1.477 million screening envelope, not a microgrid quotation 172

EXHIBIT 49 / range
Fabric construction and process route change the freshwater benchmark 175

EXHIBIT 50 / flow
The northern fibre base and coastal factory market meet through a long intermodal corridor 177

EXHIBIT 51 / bar
Garoua offers 24 percent more modelled annual PV output than Douala 178

EXHIBIT 52 / table
Utility intensity and interruption risk rise as the chain moves into wet processing 180

EXHIBIT 53 / timeline
Textile evidence duties arrive through separate legal instruments, not one 2027 deadline 185

EXHIBIT 54 / keyfigures
CmiA provides scale, while the physically traceable HIP network has a narrower reported boundary 187

EXHIBIT 55 / table
HIP supports physical-origin claims, while Mass Balance verifies volumes rather than garment content 189

EXHIBIT 56 / layered-architecture
A five-layer evidence architecture keeps physical custody separate from publication and access 193

EXHIBIT 57 / waterfall
The illustrative shirt lot closes only when shipped product, offcuts and rejects reconcile to fabric input 195

EXHIBIT 58 / table
External disclosure advances only when the underlying evidence gate closes 197

EXHIBIT 59 / layered-architecture
The proposed stack separates production events, local inference, governed learning and management decisions 202

EXHIBIT 60 / table
Six KPI families assign every proposed measure a formula, owner and decision cadence 204

EXHIBIT 61 / bar
The illustrative line converts the same attended minutes into more accepted output at higher SAM efficiency 205

EXHIBIT 62 / keyfigures
Published inspection benchmarks justify a local pilot, not an assumed factory result 208

EXHIBIT 63 / roadmap
AI deployment follows demonstrated data maturity rather than the purchase calendar 211

EXHIBIT 64 / flow
Generated garment concepts cannot reach cutting without structured pattern, simulation and physical-sample gates 213

EXHIBIT 65 / matrix
Demand compacts and phased entry carry the highest evidence burden 220

EXHIBIT 66 / roadmap
Four gated phases move from preparation to regional scale 221

EXHIBIT 67 / sankey
A measured Phase 3 batch accounts for products and every recovery stream 224

EXHIBIT 68 / table
Twelve risks require explicit signals and predetermined responses 225

EXHIBIT 69 / table
Twelve risks require explicit signals and predetermined responses, continued 225

Build the factory and its evidence as one system.

Africa occupies a structural contradiction in the global cotton and apparel economy. Sub-Saharan Africa is a leading exporter of hand-picked, rain-fed cotton lint, with the CFA franc zone producing 2.3 million tonnes in 2024/25 (R05) and Cameroon harvesting 314,455 tonnes in 2023 and about 340,000 tonnes in 2024 (R01). Yet the Cotton-4 countries process roughly 2 percent of their lint domestically (S02) and Cameroon processes about 5 percent while exporting 95 percent raw (R06). [S1115] Conversely, East, Southern and Indian Ocean apparel hubs in Ethiopia, Kenya, Lesotho, Madagascar and Mauritius scaled garment exports by sewing imported Asian fabric under unilateral trade preferences, exposing thousands of factory workers to tariff shocks and preference suspensions (S07, S12, S20). This comparative study examines four distinct African value-chain archetypes across twelve economies: West and Central African special-economic-zone industrialisers (Benin, Togo, Cameroon), East and Southern African export-processing assemblers (Ethiopia, Kenya, Lesotho, Madagascar, Mauritius), North African vertically integrated near-shoring clusters (Egypt, Morocco), and large domestic-market import-substitution economies (South Africa, Nigeria). Drawing on official trade, agronomic and factory-level evidence, Green Future Tech demonstrates that neither capital-heavy state megaprojects nor enclave assembly on imported cloth secures lasting margins. The durable African strategy starts with a capital-disciplined cut-make-trim and brand operation anchored on domestic and regional demand, partners for midstream spinning and fabric conversion, and installs line-level performance and sustainability measurement from the first shift.

01 West and Central African cotton economies suffer a severe conversion deficit: the Cotton-4 states process an average of 2 percent of lint domestically and Cameroon processes about 5 percent against 95 percent exported raw, forfeiting the five-to-tenfold value uplift between ginned lint and finished apparel. [R01] [R05] [R06] [S02] [S30]

02 Enclave apparel export hubs built on the African Growth and Opportunity Act (AGOA) third-country fabric rule achieve rapid job creation, such as 66,800 direct jobs in Kenya and 30,000 to 40,000 in Lesotho, but face immediate order collapse when country eligibility is revoked, as seen in Cameroon from 2020 and Ethiopia from 2022. [R18] [S07] [S11] [S12] [S20] [S24]

03 Co-located industrial parks in Benin (Glo-Djigbe Industrial Zone, 1,640 hectares, 40,000 tonnes Phase I lint conversion) and Togo (Plateforme Industrielle d'Adetikope, 400 hectares) prove that public-private infrastructure and shared effluent treatment can attract integrated spinning, weaving and knitting investment. [S03] [S04] [S06] [S14] [S15]

04 State-owned legacy textile mills in Central and West Africa suffer chronic underutilisation and obsolescence, exemplified by CICAM's drop from 85 percent to 5 percent market share and plant utilisation between 10.83 and 48.9 percent, making modular private cut-make-trim entry paired with partnered upstream mills far more capital-efficient. [R08] [R09] [R10] [R11] [R12] [R13]

05 North African near-shoring leaders Egypt (1 million textile workers, 30 percent of manufactured exports, over 1,000 Qualifying Industrial Zone firms) and Morocco (246,000 workers, US$7.4 billion revenue, 93 percent EU export share) win on speed to market, yet still face midstream spinning and circularity bottlenecks. [S10] [S19] [S22] [S23]

06 Domestic-demand localisation compacts, led by South Africa's Retail-Clothing, Textile, Footwear and Leather Master Plan 2030 (targeting 65 percent local retail share, 333,000 sector jobs, and 81 million additional local garments a year), show how structured retail offtake and bound 45 percent tariffs stabilise factory utilisation. [S16] [S17] [S18]

07 Regional customs harmonisation, notably the ECCAS-CEMAC Common External Tariff effective 1 January 2026 with a 40 percent top rate on imported fabrics and ready-to-wear clothing, creates a protected regional runway while African Continental Free Trade Area (AfCFTA) textile rules of origin remain unresolved. [R23] [S21] [S27] [S35] [S36]

08 Low nominal African statutory wages, such as Cameroon's XAF 43,969 a month (about US$76) against Cambodia's US$204 a month, do not yield low unit labour costs unless paired with structured supervisor and technician training pipelines modelled on ILO Better Work, zone academies and northern weaving centres. [R14] [R16] [R17] [S06] [S29] [S31]

09 African cotton enjoys a verified sustainability baseline, with Cotton made in Africa (CmiA) covering nearly 40 percent of continental output across 715,000 smallholder families, positioning African makers to satisfy the European Union Ecodesign Regulation (EU) 2024/1781 and 2027 Digital Product Passport when paired with factory-floor metering. [R03] [S08] [S09] [S10] [S34]

10 Greenfield African garment ventures overcome cold-start data deficits and grid instability (affecting 93.3 percent of surveyed Cameroonian firms) by combining captive solar-plus-storage (after a 93 percent battery cost drop since 2010), a six-family KPI data spine, and edge computer-vision inspection above 90 percent accuracy. [R27] [R28] [R29] [S32] [S33]

GREEN FUTURE TECH

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01

Africa grows a premier share of the world's hand-picked cotton yet surrenders most of the value chain before spinning

Africa's cotton paradox is a conversion deficit, not a fibre deficit. Durable value retention requires downstream demand, partnered midstream capacity and measurement at every transfer of ownership.

CHAPTER 01
DECISION TEST

Africa's cotton paradox is a conversion deficit, not a fibre deficit. Durable value retention requires downstream demand, partnered midstream capacity and measurement at every transfer of ownership.

Africa's central cotton problem is not the absence of competitive fibre. It is the repeated decision to sell that fibre before its quality, origin and manufacturing potential have been converted into products that African customers buy. The Cotton-4 countries supply around 8 percent of world cotton trade, yet domestic use averages only 2 percent of their production. Cameroon exports about 95 percent of its cotton fibre raw. [S02] [R06] The answer is neither a larger raw-export programme nor an immediate jump into fully integrated mills. It is a sequenced industrial system: secure demand for finished goods, enter through modular garment operations, contract reliable yarn and fabric supply, and measure physical and commercial performance from the first shift.

This chapter establishes the continental mechanism. Raw-export economies and garment-export enclaves look different, but both break the link between African fibre and African demand. One exports before spinning. The other sews imported cloth for a distant market. Both leave the highest-risk coordination problem to someone else. The comparison that follows treats value capture as a chain of operating decisions, not as a slogan about moving upmarket.

1.1

Raw-lint export dominance locks West and Central Africa at the bottom of the value curve

The scale of the conversion gap is visible at two levels. In the CFA franc zone, cotton output reached 2.3 million tonnes in the 2024/25 season, down 11.5 percent from the previous season. [R05] Within that zone, Cameroon harvested about 340,000 tonnes of seed cotton in 2024. [R01] These figures describe agricultural supply. They do not measure spinning capacity, fabric output or garment sales. Confusing seed cotton with ginned lint would overstate or understate every subsequent calculation, so this chapter keeps the source units intact.

At the fibre boundary, the inherited Cameroon baseline records about 95 percent exported raw and about 5 percent processed locally. The national development strategy sets a target of 50 percent local processing by 2030. [R06] [R07] The baseline is approximate and its original publication date was not recorded in the shared evidence register. It should therefore be read as a sector diagnosis, not as a current statistical release or a GFT operating measure. The target is also a policy ambition, not commissioned capacity.

A separate Cameroonian ministerial report published in September 2022 described an even more severe position: 99 percent of national cotton production exported and 1 percent processed locally. [S30] This chapter does not average that observation with the inherited 95/5 split. The sources have different dates and may use different boundaries. Their disagreement is useful. It tells an investor to obtain a reconciled mass balance from the ginner, rather than select the most convenient percentage for a financial model.

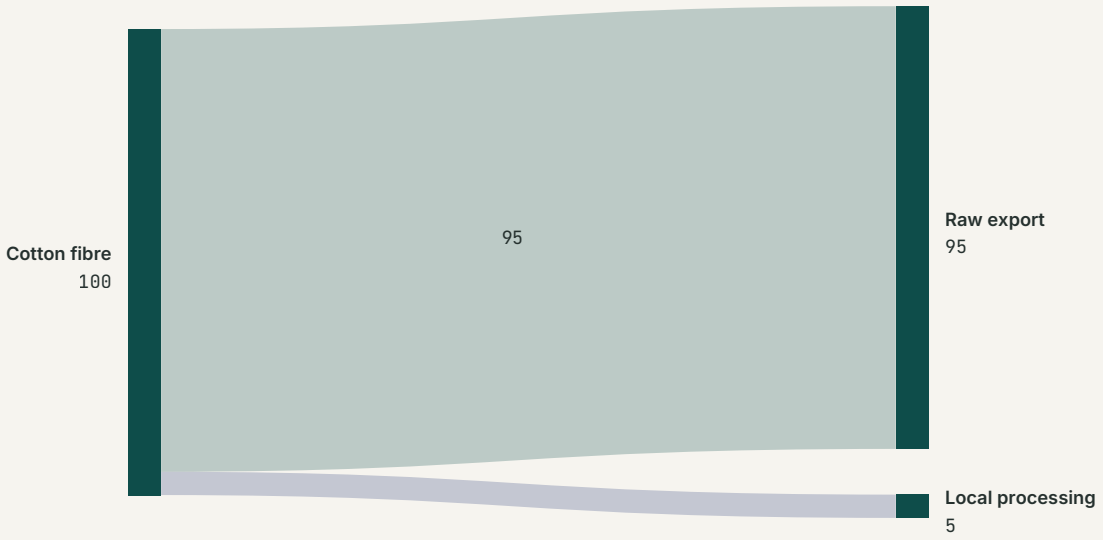
The Cotton-4 diagnosis is broader but just as clear. Benin, Burkina Faso, Chad and Mali together account for about 3 percent of world cotton production and around 8 percent of world cotton trade. In 2020, cotton represented 69 percent of agricultural export revenue in Benin and 47 percent in Burkina Faso. Yet domestic utilisation

across the four countries averaged only 2 percent of production in the FAO assessment. [S02] Here, domestic utilisation means the share of cotton production used domestically. It is not a measure of factory capacity utilisation. Those two denominators must never be exchanged.

Exhibit 1, p. 18 isolates the Cameroon fibre split without converting it into a fabricated tonnage.

EXHIBIT 01 / PERCENT OF COTTON FIBRE

Cameroon's inherited fibre baseline sends about 95 percent to raw export



SOURCED [R06] Approximate inherited sector baseline. Original publication date not recorded. Values describe cotton fibre, not seed cotton. They do not measure value added, employment or continent-wide flows.

The exhibit establishes allocation, not destiny. A bale exported raw carries the farm and ginning system into the world market, but it does not carry a national spinning line, a fabric-finishing recipe or a garment brand with it. The missing stages are where product specifications become industrial knowledge. They are also where defects can be traced back to a process rather than absorbed as an unexplained discount.

Raw export still performs useful functions. It earns foreign exchange, connects growers to international demand and avoids forcing farmers to bear the cost of mills that cannot operate competitively. The critique is not that trade is harmful. It is that a system with almost no domestic conversion has no industrial counterweight when commodity prices fall, freight rates rise or buyers change origin. The 11.5 percent seasonal decline in CFA-zone cotton output illustrates why agricultural volume alone is an incomplete resilience strategy. [R05]

The pricing mechanism can reinforce the trap. Cameroon's 2022 sector report said local spinners bought domestically produced fibre at the world price, as if importing it. [S30] Export parity may be rational for a ginner with alternative buyers. It does not automatically create an affordable input for a local mill. Industrial policy therefore

needs transparent offtake terms, quality-based pricing and logistics credits where justified. Simply instructing the ginner to sell cheaply would transfer the problem to farmers or the ginning enterprise rather than solve it.

> **GFT NOTE**
>
> Before naming a local-processing percentage as an investment input, reconcile three boundaries with the ginner: seed cotton harvested, lint ginned and lint actually sold to domestic mills. Record the season, stocks and co-products. Use the resulting mass balance in the feasibility model. Do not derive lint tonnage from seed-cotton headlines without a sourced ginning outturn ratio.

1.2

Global lint trade flows funnel African fibre into expanding Asian spinning hubs

Raw-export dependence also has a forward pull. OECD and FAO project global lint trade to grow by 2.1 percent a year, reaching 12.4 million tonnes by 2033. They expect Bangladesh and Viet Nam to drive much of the import growth as their textile industries expand, while China is projected to remain the largest cotton-processing country. [S01] This is a projection, not a purchase order for African cotton. It nevertheless indicates where incremental spinning demand is expected to sit.

The same outlook identifies South and Southeast Asia as the major destinations for Sub-Saharan African exports. [S01] The commercial logic is straightforward. Large spinning clusters can offer mills diverse yarn counts, established chemical and machinery supply chains, export finance and dense shipping connections. An African ginner selling lint into that system receives a relatively standardised commodity transaction. An African entrepreneur attempting to sell finished fabric must meet much more specific requirements on shade, hand feel, defect rate, delivery and documentation.

That difference explains why raw export can persist even when local conversion appears attractive in a presentation. The bale has a liquid international reference market. The fabric does not become saleable merely because a loom has been installed. It needs a buyer-approved construction, reliable lot quality and working capital through production and shipment. The industrial task is therefore to build demand and operating capability together. A supply-first strategy can strand machines before a single acceptable roll reaches a customer.

For Benin and Burkina Faso, the high cotton shares of agricultural export earnings in 2020 show how much rural and foreign-exchange income depends on this transaction structure. [S02] A conversion strategy must protect that income during the transition. Domestic mills should win supply through reliable payment, transparent grades and lower avoidable logistics cost, not through administrative allocation that leaves the ginner unable to finance the next crop. Cotton industrialisation is a working-capital chain before it is a machinery chain.

The re-import side completes the paradox at the level of individual markets. Ghana provides a documented example: it imported 111,329 tonnes of used textiles in 2022, with 63 percent transported to Kantamanto market. [S28] Ghana is not offered here as a proxy for every African market. The example demonstrates the physical scale that a mature second-hand channel can reach and the waste burden that can accompany it.

The strategic consequence is not autarky. African factories will continue to need imported machinery, dyes, trims and some specialised fabrics. The objective is to make imports deliberate. Import a loom because domestic production cannot make one. Import a specialised fabric because a customer specification requires it. Do not import an ordinary garment solely because the domestic chain never organised the conversion of its own lint. Each import category should have a reason, a measured cost and, where feasible, a localisation pathway.

1.3

Enclave garment assembly in East and Southern Africa suffers the mirror-image disconnection

The mirror image of the raw-lint exporter is the garment factory that imports its fabric. Under AGOA's Special Rule for lesser-developed beneficiary countries, qualifying apparel can receive duty-free and quota-free United States access even when the fabric originates anywhere in the world. [S11] This rule lowers the barrier to creating sewing employment. It does not require a domestic spinner, weaver or cotton grower to participate in the order.

The distinction matters because employment creation and value-chain formation are not identical outcomes. A cut, make and trim plant can train operators, pay wages and generate export receipts while leaving fibre conversion, fabric design and much of the materials spend abroad. Those are real benefits, but they are not proof of a domestic cotton-to-garment chain. The correct assessment asks which processes occur locally, which suppliers receive repeat orders and which capabilities remain when a preference changes.

Lesotho shows the exposure created when a narrow assembly base meets a concentrated market. UNCTAD reported in October 2025 that approximately one third of the country's exports were tied to AGOA, predominantly in apparel, with the sector employing between 30,000 and 40,000 workers, primarily women. [S12] The figures describe both achievement and concentration. A shock to eligibility or tariffs is not confined to an export statistic. It reaches payrolls, household income and the utilisation of factory sheds.

Madagascar reveals the midstream gap in monetary terms. In 2024, its fabric imports were US$104.602 million against fabric exports of US$2.633 million. Yarn imports were US$23.388 million. The underlying customs table covers cotton fabrics under specified tariff headings and reports values in thousands of United States dollars. [S26] These flows do not mean that every imported metre served an export enclave, nor do they prove the absence of all local textile capability. They do show that assembly and fabric supply can expand at very different rates.

The resulting vulnerability is operational as well as financial. Imported fabric ties up cash before cutting begins. It exposes the factory to shipping delays, minimum order quantities and shade-lot variation across consignments. A domestic or regional fabric partner can shorten that loop, but only if it meets the same quality and delivery requirements. Local content imposed without those capabilities would replace a foreign dependency with a domestic bottleneck.

Preference risk then compounds the materials problem. UNCTAD's 2025 analysis warned that the end of AGOA preferences could double average trade-weighted tariffs to 20 percent or more for small exporters specialising in apparel, including Lesotho, Kenya and Madagascar. [S12] This was a scenario assessed at that date, not a permanent tariff schedule. The investment lesson is to separate market-access upside from the base case. Debt service, labour training and utility contracts continue even when a preference is revised.

A cotton-producing country should not read this evidence as an argument against garment assembly. It is an argument against disconnected assembly. Cutting and sewing are the stages closest to the customer, where size curves, styling, replenishment and quality approval become visible. Those capabilities are necessary. The weakness arises when they are the only local capabilities and when one external rule determines whether the order remains economic.

The continental comparison therefore produces a symmetry. Cameroon has fibre without enough conversion. The documented apparel cases show that assembly can instead depend heavily on imported fabric. [S11] [S26] Neither position is a complete industrial model. A durable strategy joins the two through regional supply contracts, product development and measured production, rather than waiting for a single vertically integrated project to perform every function at once.

1.4

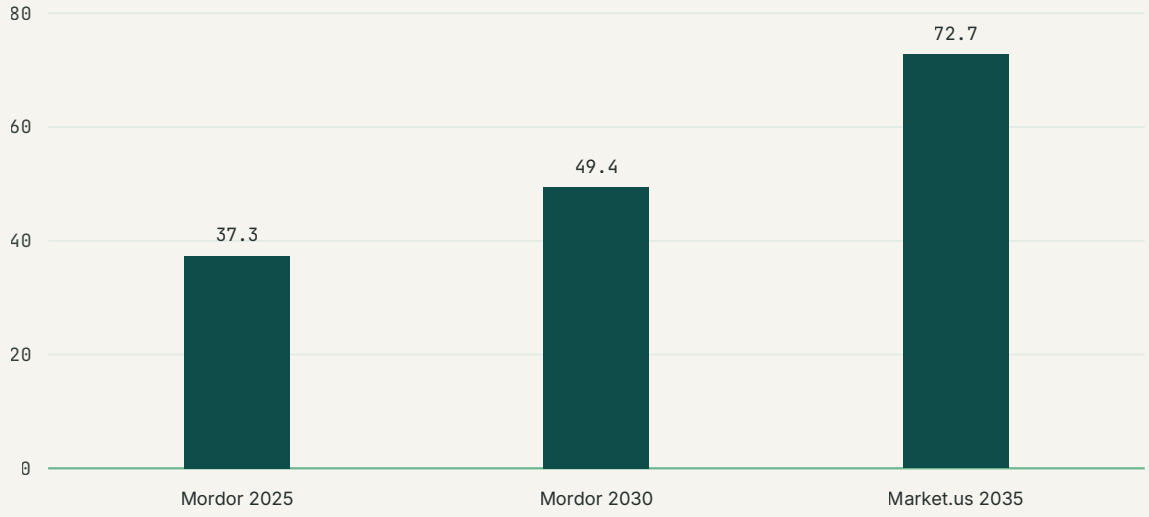
African domestic and regional apparel demand is large enough to anchor local industrial scale

A conversion strategy needs a customer before it needs a larger machine. Vendor estimates point to a substantial and growing African textile market, although their series are not interchangeable. Mordor Intelligence places the market at about US$37.3 billion in 2025 and projects US$49.41 billion by 2030. Market.us projects about US$72.7 billion by 2035 and reports fashion and apparel at 48.1 percent of the market in 2024. [R24] [R25] The shared register does not provide a common methodology that would allow these observations to be treated as one continuous forecast.

Exhibit 2, p. 22 therefore displays the published levels as separate benchmarks, not as a calculated growth curve.

EXHIBIT 02 / US$ BILLION, NOMINAL MARKET ESTIMATES

Two vendor series indicate rising African textile demand at different market levels



SOURCED [R24] [R25] Mordor Intelligence supplies the 2025 and 2030 values. Market.us supplies the 2035 value and the separate 2024 apparel share discussed in prose. Vendor definitions and forecast methods may differ. Do not splice these bars into one time series or infer a common growth rate.

The useful conclusion is directional: domestic and regional demand deserves a place in the industrial base case. The figures cannot establish the addressable demand for a particular garment factory. A sponsor still needs product-level research on sizes, price points, channels, import competition and customer service. Continental market size is a reason to investigate, not a substitute for an order book.

Cameroon provides a more specific demand signal. The inherited register records clothing and footwear expenditure of about US$94.70 and about 8.0 pieces per person in 2024. It also records an apparel e-commerce projection rising from US$20.32 million in 2023 to US$33.61 million in 2027. [R26] The per-person measure combines clothing with footwear, while the e-commerce measure concerns one channel. Neither should be presented as total apparel demand. Together they show why consumer research must preserve category and channel boundaries.

Regional demand adds another route to scale. The World Bank's June 2025 barometer reports a combined CEMAC population of 63.3 million and GDP of US$125.9 billion in 2024. [S36] Population and GDP do not equal garment purchasing power. They indicate a market large enough to justify cross-border product and distribution testing, especially where common customs and settlement arrangements reduce friction.

Cameroon's trade regime changes the relative price of some imported and locally made products. The Common External Tariff entered into force in Cameroon on 1 January 2026. Its maximum 40 percent rate applies to cotton and polyester fabrics and ready-to-wear clothing, among other products. [S35] That is a customs fact, not a guaranteed gross margin. National taxes, product classification, customs valuation, enforcement and the prices of local inputs still affect the landed-cost comparison.

Demand anchoring should consequently be built product by product. Institutional uniforms require consistent sizing, repeat colours and delivery documentation. Urban ready-to-wear requires design, fit and replenishment. Traditional and occasion wear requires fabric aesthetics and cultural relevance. These segments give a local manufacturer different ways to compete beyond the lowest sticker price. They also create repeat data on returns, defects and sell-through, which a raw-lint exporter never receives.

The strongest industrial signal is therefore not the largest continental forecast. It is a repeat order with an acceptable contribution margin. Local and regional customers provide the demand pull that can keep garment lines occupied while midstream partners improve yarn and fabric supply. That sequence converts market research into utilisation, and utilisation into the cash and evidence required for further investment.

1.5

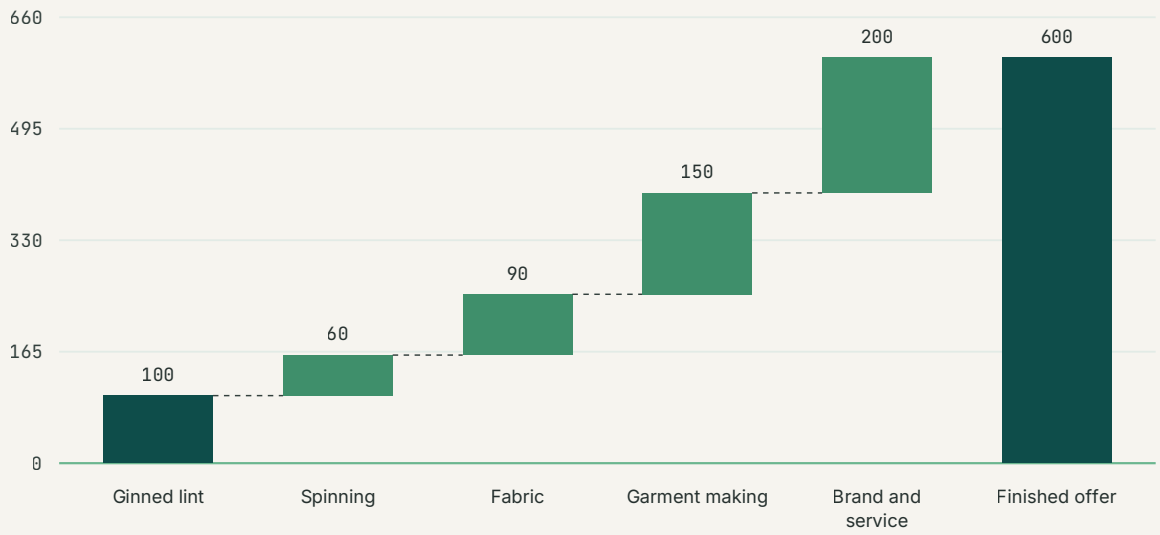
Step-by-step value multiplication favours downstream entry paired with midstream partnerships

The commercial case for conversion rests on a simple mechanism: each successful stage turns a more generic input into a more specified product. Lint is traded against grade and staple characteristics. Yarn adds count, evenness and strength requirements. Fabric adds construction, width, shade and finishing. A garment adds fit, sizing, workmanship, packaging and delivery. A brand or institutional contract adds assurance and service. Revenue can rise across those stages, but so can cost, loss and working-capital exposure.

Exhibit 3, p. 24 makes the mechanism visible without pretending that a universal price multiplier exists. It is an illustrative revenue index, not a report of market prices or factory margins.

EXHIBIT 03 / ILLUSTRATIVE REVENUE INDEX UNITS

An illustrative revenue index shows how specification can multiply conversion revenue



ILLUSTRATIVE [R06] [S01] Illustrative model, not observed prices, value added or profit. Opening lint revenue is set to 100. Assumed increments are spinning 60, fabric formation and finishing 90, garment making 150, and brand or contract service 200. Closing index = 100 + 60 + 90 + 150 + 200 = 600. R06 establishes the Cameroon conversion gap and S01 the global lint-flow context; neither supplies these stage increments. Costs, process losses, freight, tax, discounts and working capital are excluded.

The bridge demonstrates why a fivefold to tenfold revenue ambition should be treated as a hypothesis to test, not an entitlement created by installing equipment. The illustrative closing index is six times the opening index. It says nothing about earnings because the same stages introduce energy, labour, chemicals, depreciation, rejects, inventory and sales costs. Value added is not the final selling price, and profit is not value added. A credible feasibility model must build each bridge from dated quotations and product-specific yields.

A second error is to assume that a kilogram of lint becomes a kilogram of saleable garments. Ginning, spinning, fabric formation, cutting and sewing have different loss boundaries. Fabric may be rejected for shade or defects. Cutting markers leave offcuts. Garments fail inspection. Returns and unsold stock reduce realised revenue. The mass balance and the revenue bridge must therefore be solved together, with each yield stated beside its process.

1.6 A VALUE-RETENTION BRIDGE MUST SEPARATE REVENUE, DOMESTIC VALUE ADDED AND PROFIT

The first accounting boundary is gross revenue. It records what a customer pays for the product at a named stage. The second is domestic value added, which removes purchased inputs and services that do not represent domestic production. The third is operating profit, which also absorbs labour, energy, depreciation, maintenance, finance and other operating costs. A garment can command a much higher selling price than its fabric input while producing less cash than expected. The revenue waterfall must never be allowed to stand in for these separate calculations.

Local processing does not guarantee local value retention either. Imported dyes, trims, machinery parts and specialised services can sit inside a garment sewn domestically. Ownership and financing arrangements also affect where returns ultimately accrue. The analysis should therefore report both the location of production and the residence of the supplier receiving each major payment. This is not an argument against foreign inputs or investors. It is a requirement to describe the actual retention mechanism rather than infer it from a factory address.

A practical stage account has four reconciliations. The physical account tracks accepted input, good output, rework and waste. The commercial account tracks invoiced price, discounts, returns and receivables. The cost account tracks materials, labour, utilities, depreciation and logistics. The cash account tracks when suppliers are paid and customers settle. Each reconciliation answers a different question, and none can replace the others. Positive accounting margin with delayed customer payment can still leave a factory unable to buy the next fabric lot.

The same discipline exposes false comparisons between raw export and local conversion. A raw-lint transaction may have lower revenue per kilogram but faster settlement and fewer process losses. A finished-garment transaction may carry higher revenue but longer inventory, more rejected units and greater after-sales obligations. The decision should compare risk-adjusted contribution and cash conversion across the whole cycle. It should not compare a lint price with a retail shelf price and call the difference an investable margin.

This is where the first measurement system earns its place. Production records supply good-unit denominators. Quality records show how much input failed to become saleable output. Procurement and sales records establish realised rather than quoted prices. Utility and labour records explain conversion cost. Together they turn the value-retention thesis into a testable operating account, allowing the sponsor to expand only where higher revenue survives contact with yield, service and cash collection.

> **WORKED EXAMPLE: QUANTIFY THE ALLOCATION GAP BEFORE PRICING THE OPPORTUNITY**
>
> Take an *illustrative* 1,000 kilogram lot of cotton fibre solely to demonstrate the arithmetic. Applying the inherited Cameroon baseline gives 950 kilograms exported raw and 50 kilograms processed locally. Applying the national target share instead gives 500 kilograms processed locally. The additional local allocation is therefore 500 minus 50, or 450 kilograms per 1,000 kilogram lot. [R06] [R07] This is not a forecast of mill intake. It assumes a common fibre denominator and does not prove that domestic capacity, quality or demand exists to absorb the changed allocation.

The case supplies the right first question for a sponsor: which physical volume must move through each stage? Only after that question should the model attach prices. The next question is which stage the entrant should own. Full vertical integration offers control, but it concentrates capital and commissioning risk. Cameroon's announced Camtext SA project illustrates the scale and duration involved: the inherited register records a US$300 million project and an estimated return on investment near 11 years. [R09] [R10] Announcement cost, realised cost and realised return remain different categories.

GFT's comparative position is to begin where customer learning and cash generation can be made modular: cutting, making, trimming, finishing and brand or contract development. The programme's reference design uses an *illustrative* nameplate of 3.0 million garments a year. It is a planning case, not an achieved output or a public commitment by an operating factory. Yarn and fabric are sourced through qualified partners until utilisation, quality and demand justify selective backward integration.

This sequence does not abandon midstream manufacturing. It makes midstream expansion evidence-led. The garment operation generates fabric specifications, consumption forecasts, defect records and payment history. Those outputs reduce uncertainty for a spinning or knitting partner. In return, the partner reduces inbound lead time and gives the garment operation more control over material performance. The partnership becomes investable because both sides can inspect the same production and demand signals.

1.7

Warp and Signal: measurement from the first shift separates viable factories from stranded assets

A conversion asset creates value only when it operates at a saleable level of quality and utilisation. Cameroon's legacy textile experience shows why installed capacity is not the same as productive capacity. A July 2023 report in the inherited register placed utilisation at 33.7 percent for Garoua, 48.9 percent for CICAM 1 and 10.83 percent for CICAM 2. [R12] These observations concern specific plants and dates. They are not representative efficiency estimates for every African mill.

The mechanism is nevertheless general. Low utilisation spreads fixed costs over fewer good units. Unrecorded defects consume fabric and labour before anyone prices the loss. Weak lot identification prevents a customer complaint from reaching the shift, machine or material lot that caused it. Nominal capacity then becomes an accounting statement rather than a supply capability. More capital cannot correct a process whose losses remain invisible.

GFT's Warp and Signal approach treats production and measurement as one design. Production is the warp: fibre, fabric, garments and orders move through defined physical stages. Measurement is the weft: each stage records quantity, quality, time, cost, resource use and ownership. The performance-management component of GFT's Cameroon textile programme organises these signals into six families: Production, Quality, Delivery, Cost, People and Sustainability.

The important design choice is the decision boundary. A bale certificate belongs with a bale. A fabric roll needs its inspection result and supplier lot. A sewing bundle needs its operation, operator and defect history. A customer order needs its promised date, shipped quantity and acceptance result. Aggregating these records into a monthly total would preserve accounting while destroying the ability to act. Line-level records make the cause visible while correction is still possible.

Measurement also disciplines the digital sequence. Sector evidence records substantial potential benefits from fashion forecasting and inventory analytics, but those benefits are not automatic outcomes for a new factory. [R27] A greenfield operation first needs stable product identifiers, timestamped orders and reconciled inventory. Only then can an algorithm learn from its history. The practical priority is therefore a reliable system of record before a more ambitious analytical layer.

> **GFT NOTE**
>
> Install the measurement contract with the production contract. For every transfer from lint to yarn, yarn to fabric, fabric to garment and garment to customer, name the lot identifier, responsible owner, quantity unit, quality release and timestamp. Review exceptions at the shift or lot boundary. A dashboard that receives unreconciled monthly totals is reporting, not operational control.

1.8

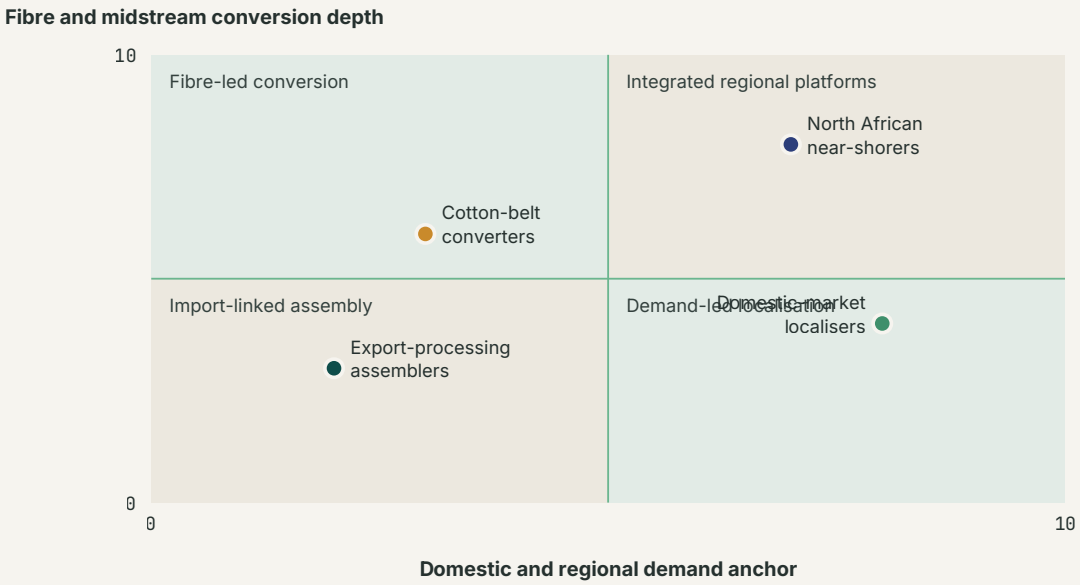
Scope and comparative method of White Paper 19

This paper compares twelve African economies through four structural archetypes. Benin, Togo and Cameroon represent cotton-belt industrialisers seeking to convert domestic or neighbouring fibre. Ethiopia, Kenya, Lesotho, Madagascar and Mauritius provide export-processing and regional assembly cases. Egypt and Morocco are included as the near-shoring cases. South Africa and Nigeria provide the domestic-market localisation cases. The selection is deliberate and mechanism-led. It is not a statistical sample for estimating continental averages.

Exhibit 4, p. 28 summarises the comparison on two analytical dimensions: the strength of the domestic or regional demand anchor and the depth of local fibre and midstream conversion. The positions are illustrative codes for navigation, not measured country scores.

EXHIBIT 04 / ILLUSTRATIVE ANALYTICAL POSITION, 0 TO 10

Demand anchoring and conversion depth distinguish the study's four archetypes



ILLUSTRATIVE Illustrative synthesis, not a country ranking or statistical index. Horizontal position represents the primary demand anchor in the study design. Vertical position represents the breadth of fibre and midstream conversion examined in later chapters. Positions are assigned at archetype level and conceal variation between and within countries.

The map prevents a false single ranking. A country can have strong fibre supply but weak downstream demand. Another can have efficient assembly but little local material conversion. A third can possess a large consumer market but unreliable utilities or customs enforcement. The relevant comparison is how each configuration affects bankability, value retention and resilience. Later chapters test those mechanisms country by country rather than treating the illustrative coordinates as findings.

The method uses three evidence classes. Observed values retain the source's geography, unit and period. Derived values show their cited inputs and arithmetic. Planning cases are labelled illustrative and state their assumptions. Announcements, design capacities, national targets and realised output remain separate. Where sources disagree, the chapter preserves the disagreement and identifies the reconciliation required.

This method also limits what the continental argument can claim. The evidence supports a diagnosis of disconnection and a sequenced response. It does not prove that one ownership model, tariff or technology will succeed everywhere. Project decisions

still require site studies, customer commitments, supplier quotations, legal review and financial sensitivity analysis. This white paper is industrial research, not investment, legal or tax advice.

Value stays where fibre, demand and measurement meet.

CHAPTER SOURCE NOTES

S02 Food and Agriculture Organization of the United Nations (FAO). 2022.
R06 Cameroon Trade Hub. Publication date unrecorded; inherited source-text check.
R05 Ecofin Agency. Publication date unrecorded; inherited source-text check.
R01 Business in Cameroon. Publication date unrecorded; inherited source-text check.
R07 Ecofin Agency. Publication date unrecorded; inherited source-text check.
S30 Ministry of Small and Medium-Sized Enterprises, Social Economy and Handicrafts (MINPMEESA), Republic of Cameroon. 2022-09.
S01 OECD and Food and Agriculture Organization of the United Nations (FAO). 2024.
S28 Ellen MacArthur Foundation. 2024-09-25.
S11 International Trade Administration, U.S. Department of Commerce. 2019-04-04.
S12 UN Trade and Development (UNCTAD). 2025-10-01.
S26 International Trade Administration, U.S. Department of Commerce. 2025-08-04.
R24 Mordor Intelligence. Publication date unrecorded; inherited source-text check.
R25 Market.us. Publication date unrecorded; inherited source-text check.
R26 Statista. Publication date unrecorded; inherited source-text check.
S36 World Bank Group. 2025-06.
S35 Cameroon National Shippers' Council (CNCC). 2026-01.
R09 Ecofin Agency. Publication date unrecorded; inherited source-text check.
R10 Ecofin Agency. Publication date unrecorded; inherited source-text check.
R12 Business in Cameroon. Publication date unrecorded; inherited source-text check.
R27 McKinsey, The State of Fashion 2025. Publication date unrecorded; inherited source-text check.

02

Four distinct value-chain strategies govern cotton and apparel industrialisation across the continent

African textile industrial policies divide into raw-cotton SEZ converters, preference-driven CMT enclaves, Mediterranean fast-fashion near-shorers and domestic retail localisation compacts.

CHAPTER 02
DECISION TEST

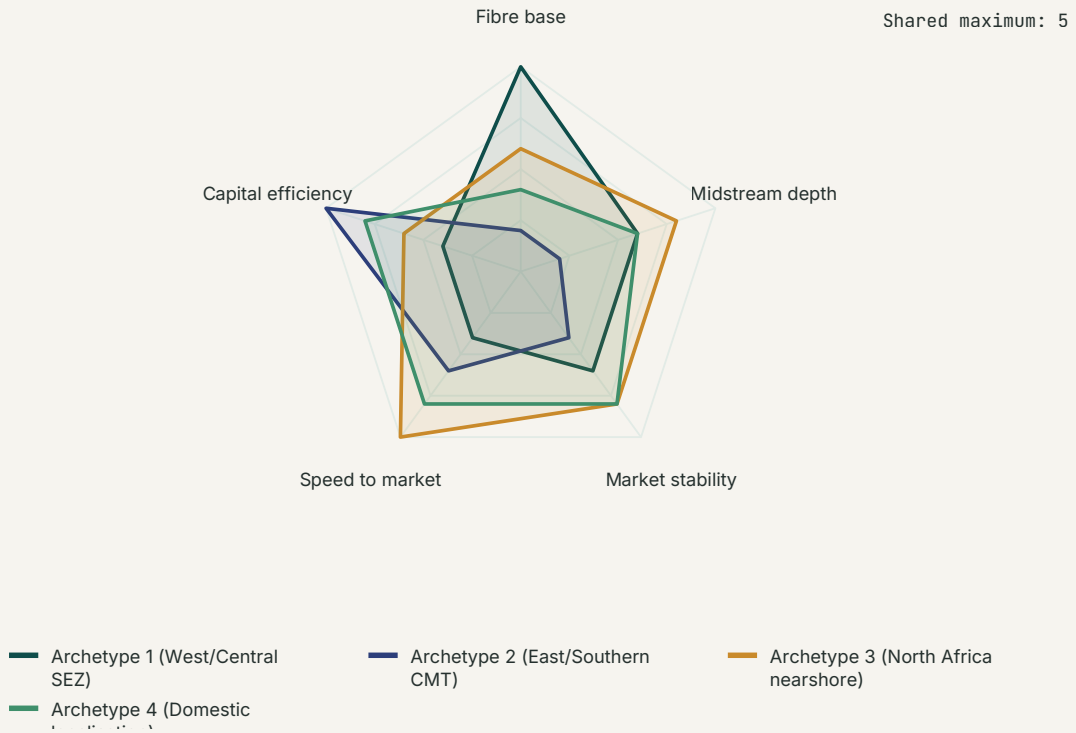
African textile industrial policies divide into raw-cotton SEZ converters, preference-driven CMT enclaves, Mediterranean fast-fashion near-shorers and domestic retail localisation compacts.

Industrial sponsors and ministries evaluating African textile investments face a choice among four structural value-chain strategies rather than a single continental model, and no single archetype resolves the conversion gap on its own. [R06] [S02] Across twelve major cotton-producing and apparel-exporting economies, industrial policy divides into West and Central African special-economic-zone (SEZ) cotton converters (Benin, Togo and Cameroon), East, Southern and Indian Ocean preference-driven cut-make-trim (CMT) assemblers (Ethiopia, Kenya, Lesotho, Madagascar and Mauritius), North African vertically integrated near-shoring clusters (Egypt and Morocco), and large domestic-market import-substitution economies (South Africa and Nigeria). [R01] [S04] [S07] [S12] [S16] [S22] [S23] [S24] [S25] [S37] Neither capital-heavy upstream megaprojects built without downstream brand pull nor enclave garment assembly reliant on imported Asian fabric and revocable trade waivers delivers resilient returns. [R09] [R10] [S12] [S20] Durable industrialisation combines the traceable smallholder fibre base of the first archetype with the protected regional and domestic retail demand of the fourth archetype, sequencing a capital-disciplined downstream entry in cut, make, trim and own-brand marketing ahead of partnered midstream spinning and wet processing. [R03] [R09] [S35]

To make this taxonomy operational for capital allocation, Green Future Tech (GFT) evaluates each archetype across five measurable engineering and commercial dimensions: raw-fibre provenance, midstream spinning and fabric-finishing depth, market-access permanence, transit speed to consumer markets, and upfront capital efficiency per workstation. [R01] [R06] [R10] [S04] [S12] [S22] [S23] As summarised in **Exhibit 5**, p. 32, each regional model solves one part of the industrial equation while exposing investors to a distinct structural vulnerability if copied uncritically. [R10] [S12] [S23] [S37]

EXHIBIT 05 / COMPARATIVE SCORE (1 TO 5 SCALE)

Each African textile archetype exhibits a distinct profile across fibre base, midstream depth, market access, speed and capital efficiency



DERIVED [R01] [R06] [R09] [R10] [S02] [S04] [S12] [S16] [S17] [S22] [S23] [S24] Derived comparative index on a 1 to 5 ordinal engineering scale synthesising reported lint output (R01, R05, S02, S05), domestic conversion capacity (R06, R10, S04, S22, S26), preferential market stability (R18, S12, S16, S20, S35), transit lead time (S19, S23), and upfront capital efficiency per station (R09, R10, S06). Scores are analytical comparisons, not physical factory measurements.

The comparative profile in **Exhibit 5**, p. 32 establishes the analytical baseline for this chapter: West and Central African cotton-belt converters score highest on domestic fibre abundance but carry heavy capital intensity, whereas East and Southern African export zones maximise initial capital efficiency per sewing station while scoring lowest on domestic fibre integration and preference stability. [R05] [R10] [S02] [S12] North African near-shorers lead the continent in speed to European retail and mid-stream scale, while domestic-localisation economies build durable market stability when tariff enforcement and retailer offtake compacts hold. [S16] [S17] [S22] [S23] Because **Exhibit 5**, p. 32 normalises structural indicators onto an ordinal five-point scale, it illustrates relative strategic trade-offs across corridors rather than predicting the financial performance of an individual plant. [R06] [S02]

COMPARATIVE TAXONOMY BOUNDARY AND SCORING RULES

GFT classifies the twelve focal economies using four observable structural boundaries:

- **Upstream fibre boundary:** measured by national seed-cotton and ginned-lint output (tonnes per year), smallholder ginning organisation, and third-party verification coverage under standards such as Cotton made in Africa (CmiA). [R01] [R03] [S02] [S08]
- **Midstream conversion boundary:** measured by the percentage of domestic lint spun locally versus exported raw, installed ring-spindle and open-end rotor capacity, and the presence of shared Zero Liquid Discharge (ZLD) effluent treatment for wet dyeing and finishing. [R06] [S04] [S06] [S15]
- **Market and trade-regime boundary:** measured by the governing tariff and origin framework, distinguishing single-transformation unilateral waivers under the African Growth and Opportunity Act (AGOA) from double-transformation Economic Partnership Agreements (EPAs), Qualifying Industrial Zones (QIZ), and regional customs unions such as the 40 percent ECCAS-CEMAC Common External Tariff (CET) and South Africa's 45 percent WTO bound clothing tariff. [R18] [S11] [S16] [S19] [S32] [S35]
- **Macroeconomic and factor-cost boundary:** measured by exchange-rate regime (euro-pegged CFA franc versus floating currencies), industrial electricity tariffs and outage exposure, and statutory versus prevailing formal factory wages. [R14] [R15] [R32] [S19] [S32]

2.1

Archetype 1: West and Central African cotton-belt SEZ converters build co-located spinning and wet processing around smallholder lint

West and Central African cotton economies possess the continent's deepest agricultural foundation for textile industrialisation, anchored in rain-fed, hand-picked smallholder cultivation across the CFA franc zone. [R03] [R05] [S02] Total cotton output across the CFA franc zone reached 2.3 million tonnes in the 2024/25 season, even after an 11.5 percent seasonal contraction. [R05] Within West Africa, the Cotton-4 (C-4) countries of Benin, Burkina Faso, Chad and Mali (joined by Cote d'Ivoire in the WTO Cotton Partnership and C-4+ framework) account for roughly 3 percent of global cotton production and around 8 percent of world cotton lint trade. [S02] [S38] [S0202] Benin rose from fourth place in Africa in 2016 to first place in 2021 with a peak harvest of 728,000 tonnes of raw cotton. [S05] In Central Africa, Cameroon harvested 330,000 tonnes of seed cotton in 2022, 314,455 tonnes in 2023 and about 340,000 tonnes in 2024, with 2025 projections exceeding 350,000 tonnes. [R01] [R02] Northern Cameroon's parastatal ginning company, SODECOTON, supports more than 220,000 smallholder producers, operates nine ginning plants and two oil mills, and injects roughly US$100 million a year into rural communities. [R03] [R04]

Despite this organised agronomic base, the historical pathology of the first archetype is an acute conversion deficit. [R06] [S02] Across the C-4 economies, domestic mills historically absorbed an average of only 2 percent of raw cotton production, shipping

98 percent as baled lint mainly to Asian spinners. [S01] [S02] In Benin and Burkina Faso, raw cotton generated 69 percent and 47 percent of agricultural export earnings in 2020 while contributing minimal domestic manufacturing value added prior to recent industrial-park commissioning. [S02] Cameroon faces the same gap: about 95 percent of its cotton fibre is exported raw and only about 5 percent is processed locally, prompting the National Development Strategy 2020-2030 (SND30) to set a 50 per-cent local-processing target by 2030. [R06] [R07] [S30] At the World Trade Organization (WTO), C-4 and least-developed producers have noted that exporting unprocessed lint while facing infrastructure and technology constraints in local transformation and cotton by-products (such as edible oil and animal-feed cake) leaves rural incomes exposed to global commodity swings. [S01] [S38] [S0201]

2.2 CO-LOCATED SPECIAL ECONOMIC ZONES IN BENIN AND TOGO COMPRESS THE MIDSTREAM INFRASTRUCTURE BARRIER

To break out of raw-lint dependence, first-archetype states have shifted from isol-ated parastatal mills to co-located public-private special economic zones built around guaranteed lint supply and shared utilities. [S03] [S04] [S14] [S15] In Benin, the Glo-Djigbe Industrial Zone (GDIZ), a public-private partnership between the Republic of Benin and ARISE Integrated Industrial Platforms (ARISE IIP), spans 1,640 hectares 45 kilometres from Cotonou Port across three phases (400 hectares in Phase I, 600 hectares in Phase II and 640 hectares in Phase III). [S03] GDIZ Phase I plans to trans-form 40,000 tonnes of Beninese lint cotton annually across three vertically integrated factories covering spinning, weaving, knitting, dyeing and garmenting. [S04] Its anchor home-textile complex, Benin Textile S.A. (BTEX), occupies 16.5 hectares and oper-ates 48,768 ring spindles and 2,000 open-end rotors producing 17,500 tonnes of yarn a year in counts Ne 12s to Ne 40s, sized to produce 9,100 tonnes of towels (16 million pieces), over 13.5 million metres of sheeting fabric (3.6 million bedlinen sets), 2.1 million bottom-weight sets and 2.1 million shirts annually using CmiA-certified lint. [S04]

In Togo, the Plateforme Industrielle d'Adetikope (PIA), launched in 2021 on 400 hec-tares 15 kilometres north of Lome Port, links lint from the Nouvelle Societe Cotonniere du Togo (NSCT) to a Textile Park, a 12,500-container yard, a Garment Training Centre, and a conduit-fed Common Effluent Treatment Plant (CETP) with Zero Liquid Discharge (ZLD) recycling. [S14] [S15] Across GDIZ and PIA, ARISE IIP initiated five ver-tically integrated, traceable knit-apparel and home-textile units targeting roughly 100 million pieces per annum. [S06] By combining single-window customs, tax relief (100 percent corporate, customs and VAT exemptions on exports at GDIZ, and five-year corporate tax relief plus a 2 percent payroll tax at PIA), and park training academies that have trained over 12,000 Beninese and 2,000 Togolese youths, these zones overcome the utility and skills barriers that stalled standalone mills. [S03] [S06] [S14] [S15]

2.3 CENTRAL AFRICAN MEGAPROJECTS ILLUSTRATE THE CAPITAL-INTENSITY AND UTILISATION RISK OF ALL-AT-ONCE INTEGRATION

In Central Africa, Cameroon's response to the 95/5 processing gap has focused on restructuring legacy public assets and announcing integrated industrial poles. [R06] [R08] [R09] Cotonniere Industrielle du Cameroun (CICAM), the historic state-backed incumbent, saw its domestic market share fall from about 85 percent three decades ago to about 5 percent today. [R11] A July 2023 operational report recorded low

capacity utilisation across CICAM's plants: 33.7 percent at Garoua, 48.9 percent at CICAM 1, and 10.83 percent at CICAM 2, costing roughly CFAF 2 billion in 2020 alone and prompting restructuring estimates of CFAF 30.7 billion to CFAF 48.2 billion (with one relaunch plan cited at CFAF 70.2 billion). [R12] [R13] Alongside a planned SODECOTON-CICAM merger by 2030, Panafritex and Arise partnered with SODECOTON, CNPS and Marlo on 12 November 2025 to announce Camtext SA, a US$300 million (180 billion XAF) integrated project. [R08] [R09] Camtext SA targets 12,000 tonnes of annual cotton processing and about 12,000 jobs at Dibamba and 3,000 at Garoua, but faces an estimated return on investment near 11 years and reaches optimal capacity only around 2033. [R10] Attempting full vertical integration at once locks up hundreds of millions of dollars for a decade before downstream brand demand or sewing-line utilisation is proven. [R09] [R10] [R12]

2.4

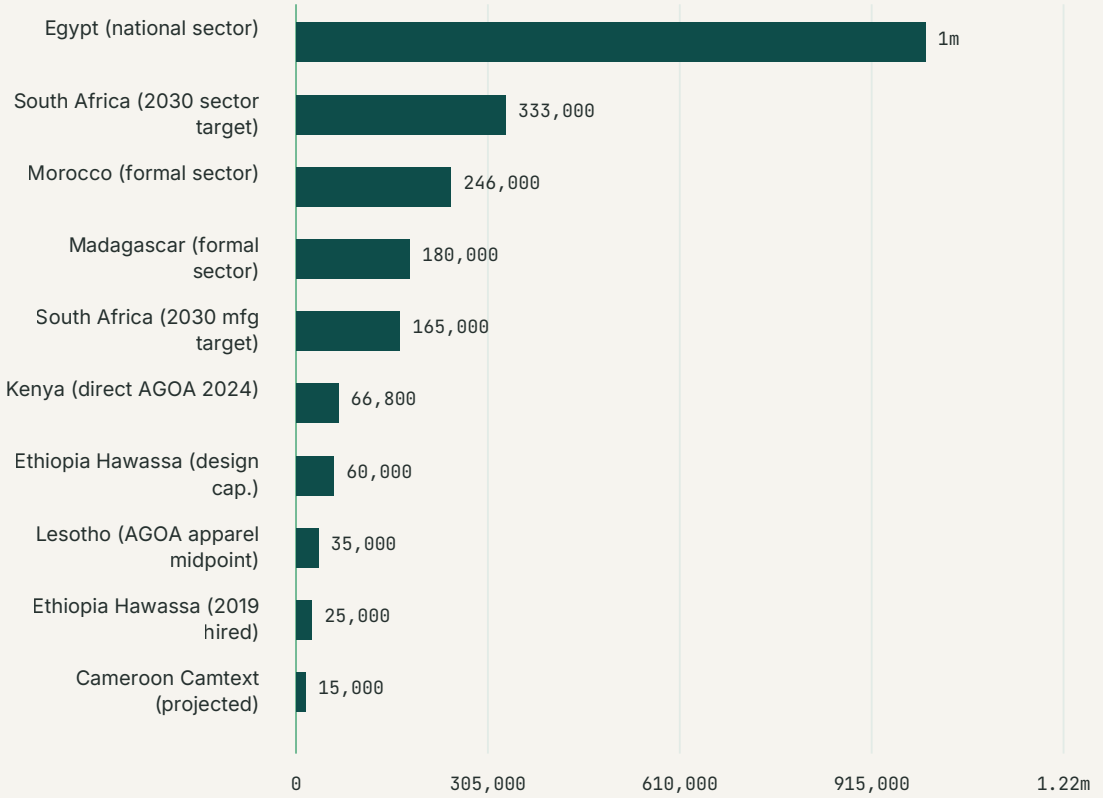
Archetype 2: East, Southern and Indian Ocean preference-driven CMT hubs scale rapid employment on imported fabric but remain exposed to eligibility shocks

The second continental archetype reverses the West African sequence: export-processing hubs in Ethiopia, Kenya, Lesotho, Madagascar and Mauritius scaled garment assembly by sewing imported third-country yarns and fabrics for duty-free export to the United States and Europe. [S07] [S11] [S12] [S24] [S26] The legal engine of this strategy is the AGOA "Special Rule" for lesser-developed beneficiary countries (defined by a 1998 per capita GNP below US$1,500), granting duty-free and quota-free US market access for apparel assembled in eligible Sub-Saharan countries from fabric originating anywhere in the world. [S11] [S27] UNCTAD trade research confirms that single-transformation origin rules under AGOA stimulated rapid LDC apparel exports compared with strict double-transformation regimes, because factories could immediately import competitively priced Asian fabrics. [S11] [S27]

As shown in **Exhibit 6**, p. 36, this export-processing strategy generated substantial formal employment across East, Southern and Indian Ocean corridors, alongside the larger workforces of North and Southern Africa. [R10] [S07] [S12] [S17] [S22] [S23] [S24] [S25]

EXHIBIT 06 / WORKERS (HEADCOUNT)

Direct textile and apparel employment ranges from 1 million in Egypt and 246,000 in Morocco to 66,800 in Kenya and 15,000 projected at Camtext



SOURCED [R10] [S07] [S12] [S17] [S22] [S23] [S24] [S25] Reported sector or project headcounts from source registers: Egypt national sector (S22); South Africa R-CTFL 2030 sector target of 333,000 and manufacturing target of 165,000 (S17); Morocco formal sector (S23); Madagascar formal sector (S25); Kenya direct AGOA apparel jobs in 2024 (S24); Ethiopia Hawassa design capacity of 60,000 and early-2019 hired count of 25,000 (S07); Lesotho apparel midpoint of 30,000 to 40,000 (S12); Camtext SA projected Dibamba (12,000) and Garoua (3,000) jobs (R10).

The employment distribution in **Exhibit 6**, p. 36 shows both the scale and the boundary differences of African garment workforces. [S07] [S12] [S22] [S24] In Kenya, AGOA apparel exports reached an estimated US$470 million in 2024, supporting about 66,800 direct Export Processing Zone (EPZ) jobs, 75 percent of them held by women, and nearly 800,000 wider livelihoods. [S24] In Lesotho, roughly one-third of national exports are tied to AGOA apparel, employing 30,000 to 40,000 workers, primarily women. [S12] In Madagascar, textiles and clothing provide 19.35 percent of GDP, 7 percent of foreign direct investment, and about 180,000 formal jobs around Antananarivo and Antsirabe. [S25] [S26] In Ethiopia, Hawassa Industrial Park (HIP) hired about 25,000 workers across 52 sheds by early 2019 against a double-shift design capacity of 60,000 workers and a US$1 billion export target anchored by PVH. [S07] Because denominators in **Exhibit 6**, p. 36 differ across sources (national formal totals in Egypt, Morocco and Madagascar; AGOA-linked workforces in Kenya and Lesotho; 2030 Master Plan targets in South Africa; and single-project capacities in Ethiopia and Cameroon), the chart compares institutional scale rather than identical statistical series. [R10] [S07] [S12] [S17] [S22] [S23] [S24] [S25]

2.5 SINGLE-TRANSFORMATION ASSEMBLY SEVERS BACKWARD LINKAGES AND CREATES SEVERE POLITICAL-ELIGIBILITY EXPOSURE

Beneath its rapid job creation, the second archetype suffers from two structural weaknesses: thin domestic value retention and exposure to unilateral preference withdrawal. [R18] [S12] [S20] [S26] Because the AGOA Special Rule permits duty-free export of garments sewn from third-country cloth, EPZ factories import Asian yarn and fabric rather than buying from local spinners. [S11] [S24] [S27] Even in Madagascar, which ranks first among Sub-Saharan exporters to the EU and second to the US under AGOA, factories imported US$104.6 million of cotton fabrics and US$23.4 million of yarns in 2024 against just US$2.6 million of fabric exports. [S26] Host economies capture only cut-make-trim wages and local utilities, leaving 70 to 80 percent of landed value with foreign mills and brands (an illustrative range reflecting standard CMT cost splits). [S12] [S26]

Second, underwriting ten-year factory assets on unilateral preferences exposes sponsors to political revocations and short renewal cycles. [R18] [S12] [S20] AGOA expired on 30 September 2025 before being retroactively reauthorised on 3 February 2026 under Public Law 119-75 only through 31 December 2026. [S20] Moreover, 17 of 49 Sub-Saharan countries were ineligible for AGOA in calendar year 2025, including Cameroon (terminated effective 1 January 2020) and Ethiopia (terminated in January 2022), alongside Mali and Burkina Faso. [R18] [S20] Without preferences, UNCTAD estimates that trade-weighted US tariffs on apparel-specialised LDCs more than double to 20 percent or higher, triggering buyer flight as seen in Madagascar during 2009 to 2015 and Ethiopia after 2022. [S12] [S20]

2.6 INDIAN OCEAN CO-PRODUCTION BETWEEN MAURITIUS AND MADAGASCAR DEMONSTRATES HOW REGIONAL CUMULATION HEDGES ENCLAVE RISK

Within the second archetype, the Mauritius-Madagascar corridor mitigated single-market enclave fragility through regional co-production. [S13] [S25] [S26] When the Multi-Fibre Arrangement phased out and Mauritius lacked third-country fabric eligibility before 2008, Mauritian groups automated local spinning, knitting and dyeing while shifting labour-intensive assembly to Madagascar. [S13] [S26] Pairing Mauritian fabric and design with Madagascar's 180,000-worker Zone Franche workforce under EU Economic Partnership Agreement (EPA) cumulation allowed Europe to become Madagascar's largest market ahead of the United States. [S13] [S25] [S26]

2.7

Archetype 3: North African vertically integrated near-shoring powerhouses win European and US orders on transit speed yet face midstream yarn deficits

The third African strategy operates along the Mediterranean rim, where Egypt and Morocco combine proximity to Europe with large workforces and free-trade agreements. [S19] [S22] [S23] Egyptian clusters in Alexandria, Port Said, Tenth of Ramadan City and Sadat City reach European ports in roughly 20 days versus 40 days from East Asia, while Moroccan factories in Tangier and Casablanca ship fast-fashion orders to Spain and France within five to fourteen days by truck and ferry. [S19] [S23]

2.8 EGYPT PAIRS US QUALIFYING INDUSTRIAL ZONES WITH STATE-LED MIDSTREAM MODERNISATION

Egypt operates Africa's largest textile and apparel sector, employing about 1.0 million workers and generating 3 percent of GDP, 27 percent of industrial output, and nearly 30 percent of manufactured exports. [S19] [S22] Exporters pair duty-free EU access under the Euro-Mediterranean Agreement with duty-free US access across more than 1,000 companies (80 percent in apparel) in 15 Qualifying Industrial Zones (QIZ), where 35 percent of appraised value must be added locally including a 10.5 percent Israeli and 11.7 percent Egyptian input share. [S19] [S22] Industrial utilities are priced competitively at US$0.047 per kilowatt-hour for electricity, US$0.50 per cubic metre for water, and US$5.35 per MMBTU for natural gas. [S19]

However, Egypt's extra-long-staple (ELS) Giza cotton is suited to luxury shirting and bedlinen rather than the medium-staple yarns required by QIZ denim and knitwear exporters, forcing Egypt to import roughly US$1.5 billion of yarns and fabrics annually. [S19] [S22] To close this US$1.5 billion midstream gap, Egypt launched a state-led modernisation anchored at the Misr Spinning and Weaving Complex in El-Mahalla El-Kubra, demonstrating that upstream spinning must match the yarn counts (Ne 12s to Ne 30s) demanded by export garment lines. [S04] [S22]

2.9 MOROCCO'S 93 PERCENT EUROPEAN EXPORT CONCENTRATION MAKES PRE-CONSUMER CIRCULARITY AND MIDSTREAM RE-INTEGRATION URGENT

Morocco's textile sector comprises 1,628 enterprises employing 246,000 formal workers (22 percent of the industrial workforce) and generating MAD 67.8 billion (US$7.4 billion) in revenue and MAD 45.97 billion (US$5.0 billion) in exports. [S23] Official figures studied by the International Finance Corporation (IFC) show that 93 percent of Moroccan textile exports go to the European Union. [S23] Because domestic spinning contracted while CMT expanded, Moroccan exporters rely heavily on imported fabric and face immediate exposure to the EU Ecodesign Regulation (EU 2024/1781) and 2027 Digital Product Passport mandates. [S23] [S34] A 2026 IFC-AMITH study showed that sorting and shredding pre-consumer cutting waste ("chutes") into recycled open-end yarns could mobilise US$1.9 billion in upstream investment and create 30,800 jobs in Morocco, a circular practice GFT adopts from shift one in Cameroon. [S23]

2.10

Archetype 4: Domestic-market and regional import-substitution economies use tariff walls and retailer compacts to anchor factory utilisation

The fourth archetype targets large domestic and regional consumer markets rather than unilateral western preferences. [S16] [S17] [S37] African textile demand reached about US$37.3 billion in 2025 and is projected to reach US$49.41 billion by 2030 at 4.73 percent annual growth, and US$72.7 billion by 2035 with fashion and apparel representing 48.1 percent of demand in 2024. [R24] [R25] Capturing this demand requires an enforced external tariff wall paired with domestic retail procurement compacts. [S16] [S17] [S18]

2.11 SOUTH AFRICA'S R-CTFL MASTER PLAN 2030 COMBINES A 45 PERCENT BOUND CLOTHING TARIFF WITH RETAILER LOCALISATION PLEDGES

Following tariff liberalisation in the 1990s and exclusion from the AGOA LDC fabric rule, South Africa lost 10,000 to 15,000 clothing and textile jobs annually between 2000 and 2008. [S11] [S16] The Department of Trade, Industry and Competition (the dtic) responded by raising clothing tariffs from 40 percent to the WTO bound maximum of 45 percent, funding Industrial Development Corporation (IDC) retooling grants that cut annual job losses by two-thirds between 2009 and 2019, and launching the Retail-Clothing, Textile, Footwear and Leather (R-CTFL) Master Plan 2030. [S16] South African retailers committed to lift the local CTFL share of sales to 65 percent by 2030, supporting 333,000 sector workers including 165,000 manufacturing jobs. [S17] A 2025 Localisation Support Fund (LSF) study found retailers willing to source up to 81 million additional local garments a year by 2030 (worth about R7.9 billion and 34,000 new formal jobs, led by t-shirts, denim and athleisure), provided factories upgrade industrial engineering, production management and fabric finishing. [S18]

2.12 NIGERIA'S DE-INDUSTRIALISATION WARNS THAT TARIFF POLICY FAILS WITHOUT CUSTOMS ENFORCEMENT AND RELIABLE FACTORY POWER

Nigeria illustrates the failure mode of the fourth archetype when customs borders and grid power break down. [S37] Industry assessments in 2026 report that rampant smuggling (up to US$4 billion a year), a 41.02 percent Chinese share of total imports in the second quarter of 2026, and chronic grid collapse forcing mills onto expensive diesel generators hollowed out legacy textile plants. [S37] Tariff protection works only when paired with customs valuation discipline, product segments insulated from contraband and used clothing (such as Ghana's 111,329 tonnes of used textile imports in 2022, where 30 percent of collected Kantamanto waste is landfilled), and captive solar-plus-storage power. [S16] [S28] [S33] [S37]

To consolidate the evidence across all twelve economies and four strategies, **Exhibit 7**, p. 40 compares upstream fibre bases, conversion shares, trade and currency regimes, and primary bottlenecks. [R01] [R06] [R10] [R18] [R32] [S02] [S04] [S07] [S12] [S14] [S16] [S19] [S22] [S23] [S24] [S25] [S26] [S35] [S37]

EXHIBIT 07 / COUNTRY AND CORRIDOR STRUCTURAL INDICATORS

Comparative structural matrix of twelve African cotton and apparel economies across the four archetypes

Economy & archetype	Cotton & midstream base	Trade & currency regime	Primary bottleneck
Benin (Archetype 1: SEZ converter)	728,000 t raw peak (2021); C-4 avg 2% local use; GDIZ Phase I targets 40,000 t lint & 17,500 t yarn at BTEX	XOF pegged at 655.957/EUR; ECOWAS/UEMOA; EU EBA & AGOA eligible; 100% GDIZ export tax relief	High upfront capex and multi-year ramp for integrated spinning & ZLD wet processing
Togo (Archetype 1: SEZ converter)	NSCT smallholder lint; PIA 400 ha park with ZLD CETP; part of 5-unit 100m pcs/yr Arise West Africa plan	XOF pegged at 655.957/EUR; ECOWAS/UEMOA; 5-yr PIA corporate tax holiday & 2% payroll tax	Building industrial sewing cadence from newly trained youth cohorts (2,000+ trained)
Cameroon (Archetype 1 / GFT Hybrid)	340,000 t seed cotton (2024); 95% raw export vs 5% local; CICAM 10.83-48.9% util.; Camtext 12,000 t planned	XAF pegged at 655.957/EUR; 40% ECCAS-CEMAC CET (1 Jan 2026); EU/UK EPA (0% duty); AGOA ineligible	93.3% grid outage exposure, legacy state mill debt, and 11-yr payback on US$300m megaprojects
Ethiopia & Kenya (Archetype 2: EPZ CMT)	Minimal local lint in EPZs; Hawassa 25,000 hired (2019) / 60,000 cap.; Kenya 66,800 AGOA jobs & US$470m exports	Floating ETB & KES; Ethiopia AGOA terminated 2022; Kenya AGOA Special Rule eligible through Dec 2026	Over-reliance on imported Asian fabric (<5% local in Kenya) and US preference renewal/revocation risk
Madagascar, Mauritius & Lesotho (Archetype 2)	Madagascar 180,000 jobs & US$104.6m fabric imports; Lesotho 30,000-40,000 jobs; Mauritius automated midstream	Floating MGA, MUR & ZAR-pegged LSL; Madagascar #1 SSA to EU (EPA) & #2 to US; Lesotho 1/3 exports in AGOA	Midstream fabric deficit in Madagascar & Lesotho; >20% US tariff cliff if AGOA preferences lapse
Egypt (Archetype 3: North Africa nearshore)	1.0m workers (30% mfg exports); Giza ELS cotton vs US$1.5bn yarn/fabric import gap; Mahalla state modernisation	Managed-float EGP; >1,000 QIZ firms (35% value rule, duty-free US) & Euro-Med EU access; US$0.047/kWh power	Count mismatch between domestic ELS cotton and medium-staple yarns needed by QIZ denim/knit exporters
Morocco (Archetype 3: North Africa nearshore)	246,000 workers across 1,628 firms; US$7.4bn revenue; contracted domestic spinning; US$1.9bn chute recycling opportunity	Managed MAD basket; 93% export share to EU via 5-14 day Tangier/Casablanca ferry corridors; Euro-Med FTA	Heavy reliance on imported fabric and immediate exposure to 2027 EU ESPR Digital Product Passports
South Africa & Nigeria (Archetype 4: Domestic)	South Africa targets 333,000 sector / 165,000 mfg jobs & 81m extra local garments; Nigeria legacy mills hollowed out	Floating ZAR & NGN; South Africa 45% WTO bound clothing tariff & 65% retail compact; Nigeria ECOWAS CET	South Africa needs firm-level IE & wet finishing; Nigeria hit by smuggling, 41% China import share & grid failure

SOURCED [R01] [R06] [R10] [R18] [R32] [S02] [S04] [S07] [S12] [S14] [S16] [S17] [S19] [S20] [S22] [S23] [S24] [S25] [S26] [S35] [S37] Compiled from GFT evidence register (R01-R18, R32) and verified primary sources (S02-S37). Grouping combines paired corridor peers where trade and currency regimes match so all twelve economies fit legibly on a single print table.

As **Exhibit 7**, p. 40 confirms, cotton-rich CFA-zone states enjoy verified fibre and currency stability but face long payback horizons on greenfield midstream mills, whereas East and Southern African export zones scaled jobs rapidly but remain

exposed to imported fabric and tariff cliffs. [R10] [R32] [S02] [S12] [S26] Because **Exhibit 7**, p. 40 summarises macro-corridor parameters, project sponsors must pair it with site-level utility and logistics audits before committing capital. [R12] [S18] [S32]

2.13

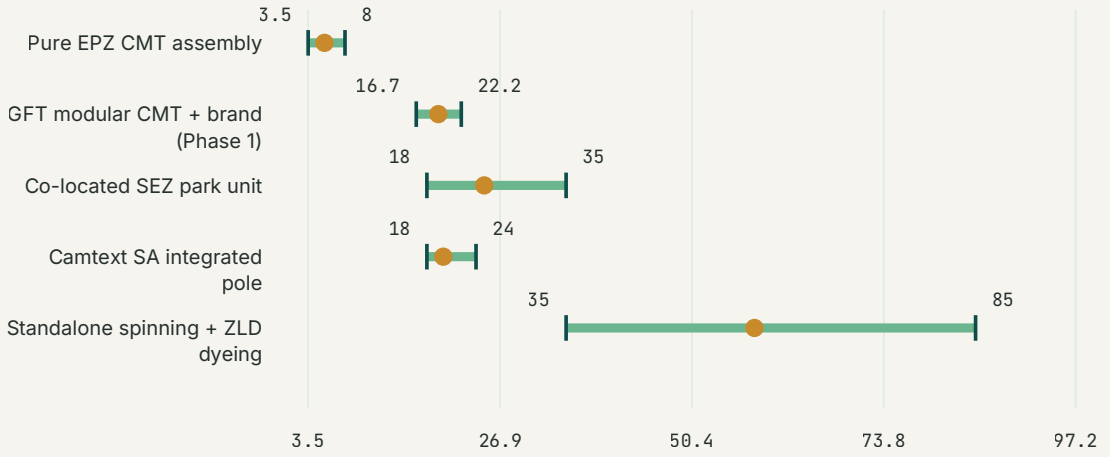
Capital intensity versus speed of cash generation separates upstream megaprojects from modular garment entry across the four strategies

For investment committees and development finance institutions, the decisive filter across the four strategies is the relationship between upfront capital intensity per worker, working-capital lockup, and payback duration. [R09] [R10] [S04] [S06] The cotton-to-garment chain comprises four distinct industrial stages whose capital-to-labour ratios diverge sharply:

1. **Stage 1 (Ginning and cottonseed oil extraction):** seasonal agro-processing in the cotton belt (such as SODECOTON's nine ginneries and two oil mills in Cameroon or NSCT in Togo), splitting seed cotton into 40 to 43 percent lint and 54 to 57 percent seed. [R03] [S02] [S14]
2. **Stage 2 (Ring and open-end rotor spinning):** continuous mechanical processing (such as BTEX's 48,768 spindles and 2,000 rotors in Benin or Misr Spinning in Egypt) requiring stable high-voltage power and climate control. [S04] [S22] [S32]
3. **Stage 3 (Weaving, knitting and wet processing):** fabric formation paired with steam boilers, reactive dyeing and Zero Liquid Discharge (ZLD) effluent plants (using 50 to 100 litres of water per kilogram before recycling). [S04] [S06] [S15]
4. **Stage 4 (Cut-make-trim garmenting, finishing and brand):** modular assembly where CNC cutting, progressive sewing lines, printing and embroidery generate early cash flow at low capital per workstation. [R28] [S06] [S18]

EXHIBIT 08 / US$ THOUSAND CAPITAL PER WORKER

Capital intensity per job and payback period rise sharply from cut-make-trim assembly to vertically integrated spinning and wet processing



DERIVED [R09] [R10] [S04] [S06] [S07] [S15] Derived capital-intensity ranges per direct worker. Camtext SA implies US$20,000 per job across 15,000 projected roles on US$300 million capex with an 11-year return horizon (R09, R10). Standalone spinning and ZLD dyeing reach US$35,000 to US$85,000 per station (illustrative range based on S04, S06, S15). GFT's modular Phase 1 CMT and brand model (~900 staff on an illustrative US$15m-US$20m capex) requires US$16,700 to US$22,200 per worker, and pure EPZ CMT sheds require US$3,500 to US$8,000 (illustrative).

The capital-intensity distribution in **Exhibit 8**, p. 42 shows why sequencing governs bankability. [R09] [R10] [S04] [S06] Renting an EPZ shell for pure CMT requires an illustrative US$3,500 to US$8,000 per operator, whereas standalone ring spinning and ZLD dyeing require an illustrative US$35,000 to US$85,000 per midstream station, and integrated poles like Camtext SA commit US$300 million (180 billion XAF) across 15,000 projected jobs (US$20,000 per job) with an 11-year return horizon and optimal capacity around 2033. [R09] [R10] [S04] [S07] [S15] Because **Exhibit 8**, p. 42 combines published project figures with illustrative engineering ranges, sponsors must verify site-specific civil, solar microgrid and machinery quotations prior to investment. [R09] [R10] [S33]

WORKED EXAMPLE: CAPITAL EFFICIENCY AND CASH-CONVERSION MATH OF MODULAR CMT ENTRY VERSUS ALL-AT-ONCE INTEGRATION

Comparing two capital-allocation paths in Cameroon using cited benchmarks and labelled illustrative assumptions demonstrates why GFT sequences downstream CMT and brand ahead of spinning (prepared for industrial research only and not investment advice):

- **Option A (All-at-once integrated megaproject, benchmarked on Camtext SA):** Committing US$300 million (180 billion XAF) across 12,000 tonnes of cotton processing and 15,000 jobs averages US$20,000 per job, reaches optimal capacity around 2033, and requires roughly 11 years to recover capital. [R09] [R10] If unmeasured losses or power cuts depress utilisation to CICAM's 10.83 to 48.9 percent range, debt service erodes equity. [R12] [S32]
- **Option B (GFT Phase 1 modular CMT and brand entry with partnered midstream):** Committing an illustrative US$15 million to US$20 million (under 7 percent of Option A) commissions an automated cutting, sewing, printing and finishing plant in Douala-Dibamba employing about 900 staff and producing an illustrative 3.0 million garments a year (roughly 750 to 1,000 tonnes of fabric at 250 to 330 grams per piece). [R10] [R14] [S32]
- **Unit revenue and turnover:** Cameroonian clothing and footwear expenditure averages US$94.70 and 8.0 pieces per person (US$11.84 retail average), while apparel e-commerce grows at 13.41 percent a year from US$20.32 million in 2023 to US$33.61 million by 2027. [R26] Shielded by the 40 percent ECCAS-CEMAC Common External Tariff effective 1 January 2026, an illustrative wholesale realization of US$6.50 to US$8.00 per garment on 3.0 million units yields US$19.5 million to US$24.0 million in annual revenue (turning over Phase 1 capital 1.0 to 1.3 times annually at maturity, an illustrative estimate) while sourcing yarn and fabric from SODECOTON-linked and regional SEZ mills. [R03] [R26] [S04] [S35]

2.14

Currency regimes and macroeconomic stability filter imported equipment risk and working-capital debt service across African corridors

Textile ventures face a structural currency split: capital machinery, reactive dyes and synthetic trims are priced in euros or United States dollars, whereas payroll, civil works and domestic sales are denominated in local currency. [R14] [R32] [S32] [S33]

2.15 THE EURO-PEGGED CFA FRANC PROVIDES A STRUCTURAL ANCHOR FOR WEST AND CENTRAL AFRICAN INDUSTRIALISERS

First-archetype economies (Benin and Togo in UEMOA using the XOF, and Cameroon in CEMAC using the XAF) share a fixed peg to the euro at 655.957 CFA francs per euro, with dollar reference rates near 590 to 610 in 2023 and 563 to 577 more recently (treated as estimates). [R32] [S06] This peg provides three advantages:

- **Zero euro exchange-rate slippage on EPA machinery and trade:** Under the Cameroon-EU Economic Partnership Agreement (entering its 60 percent tariff-reduction phase in August 2025 with zero duty on industrial machinery and raw or intermediate inputs), euro equipment financing and EU export invoices carry zero currency risk. [R32] [S32]
- **Predictable wage planning:** Cameroon's statutory minimum wage (SMIG) rose 5 percent from XAF 41,875 in 2023 to XAF 43,969 a month (about US$76) on 23 February 2024, against an average formal salary of US$359 a month and Cambodia's US$204 garment benchmark. [R14] [R15] [R17]
- **Monetary union across CEMAC:** Across CEMAC's 63.3 million consumers and US$125.9 billion GDP in 2024 (growing 3.0 percent regionally and 3.5 percent in Cameroon), regional wholesale trade settles in the same XAF behind the 40 per-cent Common External Tariff. [R32] [S35] [S36]

2.16 FLOATING CURRENCIES IN EAST, NORTH AND WEST AFRICA CAN LOWER DOLLAR WAGES BUT INFLATE CAPEX AND WORKING-CAPITAL DEBT

Non-pegged economies (Ethiopia, Kenya, Madagascar, Egypt, South Africa and Nigeria) experience exchange-rate volatility that lowers nominal dollar wages for pure exporters but inflates local-currency costs for imported machinery, dyes and foreign-currency debt service when selling domestically. [R13] [S22] [S37]

> **UNHEDGED FOREIGN-EXCHANGE AND SINGLE-MARKET PREFERENCE EXPOSURE**
>
> Sponsors must avoid two financial-structure errors: 1. **Never underwrite ten-year machinery debt on annual unilateral waivers:** AGOA's P.L. 119-75 extension expires in December 2026, and 17 Sub-Saharan states including Cameroon and Ethiopia are ineligible. [R18] [S20] 2. **Never leave dollar-priced lint or trim imports unhedged against local-currency sales:** Contract domestic lint and regional CFA-zone yarn in XAF/XOF or EUR and hold a working-capital FX buffer. [R03] [R32] [S01] [S04]

2.17

GFT's hybrid Cameroon model synthesises Archetype 1 cotton provenance with Archetype 4 regional tariff protection

Synthesising all twelve economies defines GFT's three-part Cameroon textile pro-gramme (feasibility study, performance-management system design and digital strategy, prepared 31 January 2024, sources refreshed 2026). [R01] [R06] [R12] [R27] Cameroon sits in the first archetype's cotton belt with about 340,000 tonnes of seed cotton in 2024 (projected above 350,000 tonnes in 2025) across SODECOTON's 220,000 growers, participates in Cotton made in Africa (CmiA) verification covering

nearly 40 percent of African cotton across 715,000 farming families and 700 traceable partners, and prioritises Cotton-Textile-Leather-Garment under SND30, yet lacks AGOA access. [R01] [R02] [R03] [R07] [R18] [S08] [S09] [S10] [S30] GFT combines the strongest elements of the continental archetypes:

- **Archetype 1 provenance and upstream partnerships:** GFT partners with SODECOTON, the emerging Camtext SA pole (12,000 tonnes a year at Dibamba and Garoua) and regional SEZ mills in Benin (GDIZ) and Togo (PIA) for CmiA-traceable yarn and fabric rather than duplicating US$300 million in Phase 1 midstream capex. [R03] [R09] [R10] [S04] [S08] [S15]
- **Archetype 4 tariff-shielded domestic and CEMAC demand:** Under the 40 percent ECCAS-CEMAC Common External Tariff effective 1 January 2026 across a 63.3 million consumer market (paralleling South Africa's 45 percent bound tariff), GFT anchors Phase 1 (an illustrative 3.0 million garments a year and 900 staff) on domestic traditional wear, urban ready-to-wear and e-commerce (growing 13.41 percent a year), and B2B uniforms insulated from used clothing while AfCFTA's unresolved 7.7 percent textile origin rules are finalised. [R23] [R26] [S16] [S21] [S28] [S35] [S36]
- **Archetype 3 zero-duty European machinery, circularity and Digital Product Passports:** GFT imports machinery at 0 percent duty under the Cameroon-EU/UK EPAs, segregates cutting offcuts ("chutes") for rotor-spinning valorisation following Morocco's IFC-AMITH model, and links CmiA Hard Identity Preserved lots to garment QR codes for the 2027 EU Digital Product Passport. [S10] [S23] [S32] [S34]
- **Warp and Signal shop-floor discipline:** To overcome Cameroon's 93.3 percent grid outage incidence and avoid CICAM's 10.83 to 48.9 percent utilisation trap, GFT pairs a dry-process Douala-Dibamba Phase 1 plant (backed by utility solar PV at US$0.043/kWh global benchmark LCOE and battery storage down 93 percent to US$192/kWh) with a four-week vestibule school, northern weaving links at Garoua's Gaaraadji centre, ILO Better Work female supervisor training (lifting productivity up to 22 percent across 5,850 supervisors), a six-family KPI ledger, and Day-1 edge computer-vision inspection above 90 percent accuracy at 60 metres a minute (versus 60 to 70 percent manual accuracy, in a market growing from US$523.4 million to US$6,522.1 million by 2033), while gating ML demand forecasting (cutting inventory costs 35 to 40 percent and forecast errors 20 to 50 percent) and physics-constrained generative design to later phases. [R12] [R16] [R27] [R28] [R29] [R30] [R31] [S29] [S31] [S32] [S33]

GFT NOTE: PRACTICAL SEQUENCE FOR AFRICAN COTTON-BELT SPONSORS

GFT recommends a three-step capital sequence for African cotton economies. First, enter downstream in automated cutting, sewing, finishing and regional branding anchored on B2B workwear and customs-union retail behind the 40 percent CEMAC CET (at an illustrative US$16,700 to US$22,200 capital per worker). [R26] [S35] Second, contract yarn and fabric from co-located SEZ or state-backed upstream poles (BTEX, PIA or Camtext SA) rather than financing standalone ZLD wet processing in Phase 1. [R09] [R10] [S04] [S15] Third, install six-family KPI measurement, female supervisor training and edge optical inspection from Shift One so proven line utilisation (>65 to 75 percent target OEE) finances Phase 2 and 3 backward integration. [R12] [R28] [R29] [S29]

A resilient African factory anchors its looms in regional demand, partners for midstream scale, and measures every thread from the first shift.

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03

Agronomic organisation and smallholder verification give African lint a structural provenance advantage that raw export gives away

Organised smallholders, rain-fed cultivation and independent verification can give African lint a valuable origin record, but only segregated lots, measured fibre quality and local conversion turn that record into durable value.

CHAPTER 03
DECISION TEST

Organised smallholders, rain-fed cultivation and independent verification can give African lint a valuable origin record, but only segregated lots, measured fibre quality and local conversion turn that record into durable value.

African lint's provenance advantage is organisational before it is botanical. Cotton companies already coordinate seed, inputs, collection and ginning across dispersed smallholders. Standards such as Cotton made in Africa (CmiA) add a defined assurance process at farm and ginnery level, while physical custody systems can follow verified material into yarn, fabric and finished products. [S0301] [S09] [S10] Exporting an unidentified bale sells the fibre while moving subsequent fibre-processing income and much of the usable transformation record elsewhere. It also forfeits the opportunity to manage lint and co-product netbacks within one domestic industrial system. The corrective is not a romantic claim that every African bale is cleaner or lower carbon. It is a controlled chain in which each lot retains its origin, measured quality and transformation history. Local conversion makes that chain shorter and more useful, but only when segregation, testing and commercial discipline continue after the bale leaves the gin.

3.1

Integrated ginning networks turn dispersed cultivation into an auditable production system

Cameroon's upstream base already has the unit of organisation that a provenance system needs. The inherited evidence register records more than 220,000 cotton producers supported by SODECOTON in northern Cameroon, alongside nine ginning plants and two oil mills. [R03] The ministry's sector study describes an integrated intervention covering input credit, seed-cotton marketing, ginning, fibre and seed sales, and crushing for oil and cakes. [S30] These functions matter more than the headline producer count. They create repeated points at which identity, quantity and practice can be recorded: farmer registration, input issue, village collection, weighbridge reception, gin-lot formation and bale dispatch.

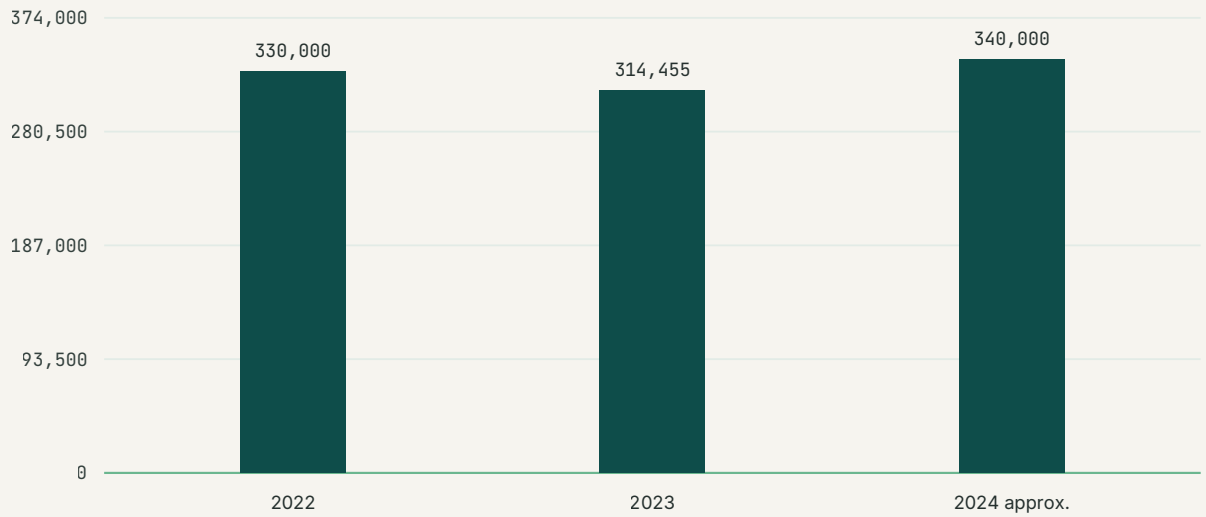
Smallholder agriculture does not become traceable by placing a digital label on a bale. A credible record begins with a managing entity that knows which farmers belong to the unit, which ginneries handle their seed cotton and which records support the annual self-assessment. CmiA's assurance manual assigns that responsibility to the managing entity and requires an up-to-date contracted-farmer list, supporting evidence and a continuous-improvement plan. [S0301] The practical advantage of an integrated cotton network is therefore a reduction in coordination cost. An auditor can test a functioning management system and select risk-based field samples rather than attempting to reconstruct thousands of unrelated transactions after export.

The production record must still preserve dates and uncertainty. Cameroon harvested 330,000 tonnes of seed cotton in 2022, 314,455 tonnes in 2023 and about 340,000 tonnes in 2024, according to the inherited register. The 2025 figure above 350,000 tonnes is a projection, not realised output. [R01] [R02] The apparent recovery therefore does not justify a straight-line supply forecast. At regional level, the inherited register records CFA-zone cotton output of 2.3 million tonnes in 2024/25, down 11.5 percent from the previous season. [R05] A local mill should read these figures as a reason for harvest-sensitive procurement and inventory planning, not as proof of uninterrupted availability.

Exhibit 9, p. 50 keeps the observed series separate from the later projection. It also exposes the limitation of a three-year national series: it cannot establish a long-term trend, farm yield or the volume of lint that meets a particular spinner's specification.

EXHIBIT 09 / TONNES OF SEED COTTON

Cameroon's approximate 2024 seed-cotton output recovered above 2022 after a contraction in 2023



SOURCED [R01] Inherited sector observations: 2022 and 2023 recorded values; 2024 is approximate. The original publication dates were not recorded in the shared register. No 2025 projection is plotted as realised output.

This organisation also creates a route for agronomic improvement to become a manufacturing signal. Extension advice on picking, storage and moisture can be connected to the lot received at the gin. Gin settings and maintenance can then be reviewed against trash, moisture and fibre damage rather than treated as isolated engineering choices. The feedback loop is valuable only if the lot identifier survives each handover and if measured exceptions return to a named operational owner. Otherwise, the network coordinates volume without preserving the evidence that distinguishes one lot from another.

3.2

Regional supply matters only when domestic conversion can buy and use the lint

The Cotton-4 countries of Benin, Burkina Faso, Chad and Mali accounted for 3 percent of world cotton production and around 8 percent of world cotton trade in FAO's 2022 assessment. FAO also estimated that about 20 percent of the population in each country earned a living from cotton, while domestic utilisation averaged only 2 percent of production. [S02] These figures describe different denominators and should not be compressed into a single development score. They do, however, show the central paradox: a large rural and trading system coexists with very limited mill use.

Benin illustrates the speed and the social weight of upstream expansion. ARISE reports record raw-cotton production of 728,000 tonnes in 2021, up from Benin's position as Africa's fourth-largest producer in 2016 to first in 2021. The same source reports more than two million people reliant on cotton farming and typical farms of about two hectares, often with rotation crops. [S05] These are supplier-published figures rather than an independent agricultural census. They nevertheless reinforce the operational point: procurement and verification must serve many small farms, not a small number of plantations.

Togo shows how primary transformation can be connected to a downstream industrial platform. PIA states that the Nouvelle Société Cotonnière du Togo performs first transformation before export, while the zone is intended to extend local raw cotton into textiles and garments. [S14] In Benin, GDIZ plans first-phase conversion of 40,000 tonnes of lint a year across three integrated factories and states that its textile park uses CmiA-certified cotton and FibreTrace traceability. [S04] Planned conversion is not realised output, but the configuration is instructive: farm supply, ginning, industrial conversion and provenance controls are designed as one system rather than assembled after a garment buyer requests evidence.

The commercial interface remains decisive. Cameroon's 2022 ministry study reported that local spinners bought domestically produced fibre at the world price, as if importing it. [S30] This is a historical diagnosis, not evidence of every current contract. It identifies the problem that an offtake agreement must solve. A domestic buyer gains little from local origin if the pricing formula charges for logistics it does not incur, while quality, delivery and volume remain uncertain.

A bankable lint or yarn agreement therefore needs more than a national-content clause. It should define the reference price, currency, quality premiums and discounts, taxes, freight boundary, payment terms, delivery windows and the treatment of rejected lots. It should state whether the supplier provides lint, yarn or both, and who owns the records required to substantiate a provenance claim. The buyer should compare the delivered cost of conforming material, not the nominal price of a bale that may generate additional cleaning, waste or spinning breaks.

> **GFT NOTE**
>
> GFT recommends treating lint or yarn offtake as a condition precedent to a Cameroonian garment investment. The negotiation should join price and delivery terms to bale-level quality data, verified-standard status, custody records and a claims-approval process. A low headline price is not acceptable compensation for missing evidence or unstable fibre performance.

3.3 A CONFORMING-LOT COST MODEL PREVENTS FALSE LOCAL SAVINGS

The procurement comparison should use the cost of lint accepted into production, not the invoice price alone. Start with the amount payable after quality adjustments. Add inbound freight, insurance, testing, handling, financing and any custody cost borne by the buyer. Then adjust for measured cleaning loss, spinning waste and the production delay caused by rejected or late lots. Subtract only those co-product credits that

contractually accrue to the same buyer. The resulting conforming-lot cost can be compared across domestic, regional and imported offers without confusing origin with efficiency.

This model changes the purpose of verification expenditure. Testing and record reconciliation are not overhead appended to a sustainability story. They reduce uncertainty about the usable input and the evidence available to the customer. A supplier that charges more per delivered tonne may still be competitive if its lots produce less waste, fewer stoppages and a complete provenance file. Conversely, a cheap offer becomes expensive when foreign matter, moisture or missing custody records force repeated intervention.

The buyer and ginner should share the measurements that drive these adjustments. A lot rejected at the spinner needs a traceable result back to the gin and collection route. A recurring contamination signature should lead to corrective action at the responsible handover, while a moisture problem should prompt review of storage and conditioning. This creates a commercial reason to improve the upstream record rather than merely requesting it for a label.

Contract review should then use actual reconciled lots. Nominal price, conforming-lot cost and evidence completeness should be assessed together. Renewal or volume allocation can follow suppliers that meet all three tests, while development support can target a specific recurring failure. Provenance thereby becomes part of supplier performance management rather than a separate reporting exercise.

3.4

Hand-picking helps only when contamination and fibre condition are measured

West and Central African cotton is commonly characterised as rain-fed and hand-picked in a WTO-hosted technical presentation on the C4+ value chain. [S0304] That description supports a potentially useful production story, but it is not a life-cycle assessment and does not establish that every lot is sustainable. Hand-picking can select mature bolls and avoid some mechanical harvesting damage. It can also introduce contamination through bags, handling, storage and transport. Origin and harvest method are therefore inputs to quality control, not substitutes for it.

The distinction between botanical lint percentage and industrial ginning outturn makes this clear. A World Bank technical reference defines ginning outturn as the lint share in seed cotton delivered to the ginnery, influenced by foreign matter and moisture before and after ginning, as well as by the underlying variety. [S0302] A high laboratory lint percentage does not guarantee the same saleable yield from a contaminated or poorly conditioned delivery. The procurement model must consequently reconcile the weight received, the lint pressed and the material lost at each stage.

Fibre quality needs an equally explicit boundary. Staple length, length uniformity, micronaire, strength, short-fibre content, neps, trash and moisture answer different production questions. A bale can have an attractive length distribution and still perform badly because of contamination or inappropriate moisture. Cameroon's ministry

study separately discusses grade, length, ginning yield and bale moisture, including the operational effects of overly dry fibre. [S30] This is the right analytical direction: judge the lot by measured behaviour, not by a national reputation.

The Egyptian comparison demonstrates why product fit outranks generic claims of superiority. USDA describes Egyptian extra-long-staple cotton at 34.9 to 39 millimetres and reports that mills spinning fine yarns above count 60 rely on Giza and US Pima long-staple varieties. [S0303] By contrast, Benin's BTEX plant is configured for Ne 12s to Ne 40s yarns serving towels, sheeting, shirts and knitted apparel. [S04] These are different engineering choices. A fine-count luxury programme and a volume towel programme should not buy against the same specification simply because both use cotton.

For a West or Central African entrant, the sensible response is a product-to-fibre matrix. Start with the yarn count, spinning system, fabric construction, dye route and end-use performance. Set acceptance ranges for the fibre properties that affect those choices. Run spinning trials on representative lots and record breaks, waste, yarn evenness and strength. Only then convert the trial into contract limits. This process allows regional upland cotton to be specified confidently for suitable products without pretending that it is interchangeable with extra-long-staple lint.

Hand-picking also creates a labour and provenance record that mechanised origin stories may lack, but the record must remain precise. A brand may substantiate farmer organisation, harvest method and verified practices when its evidence covers those claims. It may not infer a particular carbon footprint, a contamination-free bale or a universal quality premium from the same evidence. The advantage becomes credible when each claim is narrower than the control that supports it.

3.5

CmiA verifies defined practices, not a blanket environmental conclusion

CmiA gives the upstream network a recognisable assurance language. Its current standard description requires rain-fed cultivation, excludes genetically modified seed, regulates pesticide use and uses independent third parties within the assurance system. It also describes crop rotation with food crops and verification by ISO-17065-accredited organisations. [S09] These are specific, inspectable requirements. They allow a buyer to discuss how cotton was cultivated without relying solely on a supplier's narrative.

The scale is material. AbTF's annual report for 2025 states that around 715,000 small-scale farmers in ten African countries cultivated cotton under CmiA or CmiA Organic, representing 36.4 percent of African cotton production. [S08] The foundation's current homepage describes activity across nine countries, so the country count should be tied to the publication and reporting boundary rather than treated as a timeless constant. [S09] For a time-bound comparison, this chapter uses the annual report's 2025 population and share.

Exhibit 10, p. 54 summarises the scale without converting it into a carbon or income-impact estimate. Verification coverage indicates the reach of the standard. It does not demonstrate that the same share of African lint is physically segregated through every downstream transaction.

EXHIBIT 10 / REPORTED STATUS FOR 2025 AND FEBRUARY 2026

CmiA combines substantial farm-level coverage with a smaller physically traceable partner network

36.4%

African output verified

CmiA or CmiA Organic, 2025

about 715,000

Participating farmers

Small-scale farmers, 2025

10

Countries in annual report

2025 reporting boundary

about 700

Traceability partners

Across 25 countries, February 2026

SOURCED [S08] [S10] AbTF reports 2025 farm and production coverage in its annual report. The partner count is reported as of 19 February 2026 and concerns partners able to trace CmiA cotton, not all CmiA supply-chain participants.

The standard's boundary is as important as its coverage. The assurance manual places verification at field and ginnery level. Traders, spinners and garment producers sit outside that particular verification scope and are instead addressed through chain-of-custody arrangements. [S0301] A CmiA claim about cultivation therefore cannot be repurposed as certification of a garment factory's labour practices, energy use or effluent performance. Each stage needs its own evidence.

Assurance is also a process, not a one-off badge. The manual requires annual self-assessment, regular external verification and continuous improvement. Field and ginnery missions alternate within a two-year cycle, with risk-based sampling and follow-up where non-conformities are found. [S0301] This structure is well suited to

dispersed smallholders because it tests the management system as well as observed practice. It does not mean every farm is inspected every year, nor that compliance is guaranteed between visits.

That distinction should improve rather than weaken buyer confidence. The buyer can ask when the managing entity last completed each level of verification, which non-conformities were found, what corrective action was required and whether the licence remains valid. The buyer can also distinguish core requirements from improvement indicators. These questions turn a logo into an auditable procurement file.

Rain-fed cultivation deserves the same precision. Avoiding irrigation is a meaningful production characteristic and can be recorded at farm level. It does not, by itself, quantify greenhouse-gas emissions per kilogram of lint. Fertiliser production and application, soil emissions, yields, transport, gin energy and allocation between lint and co-products all influence a footprint. A comparative low-carbon claim requires a declared life-cycle method and measured or clearly sourced factors. Until then, the defensible wording is rain-fed and independently verified against the CmiA criteria, not automatically low carbon.

The same rule applies to social claims. CmiA's criteria cover management, people, planet and prosperity, while its assurance process tests evidence and improvement. [S0301] A buyer should not translate participation into an unsupported promise of a living income or uniform farmer welfare. It should report the standard's actual scope and invest in the missing measurements where the purchasing programme depends on them.

3.6

Physical custody preserves origin where accounting alone cannot

Farm verification and product provenance are separate control problems. CmiA offers Mass Balance and physical-segregation routes. Its assurance manual calls the latter Hard Identity Preserved (HIP), while current guidance renames HIP as Segregation and states that the underlying traceability and material-separation requirements remain unchanged. [S0301] [S0305] Mass Balance can support a volume-based sourcing claim when verified and conventional material enter the same accounting system. Segregation, formerly HIP, is the relevant model when the commercial promise depends on the physical cotton in the finished item being traceable to its verified origin.

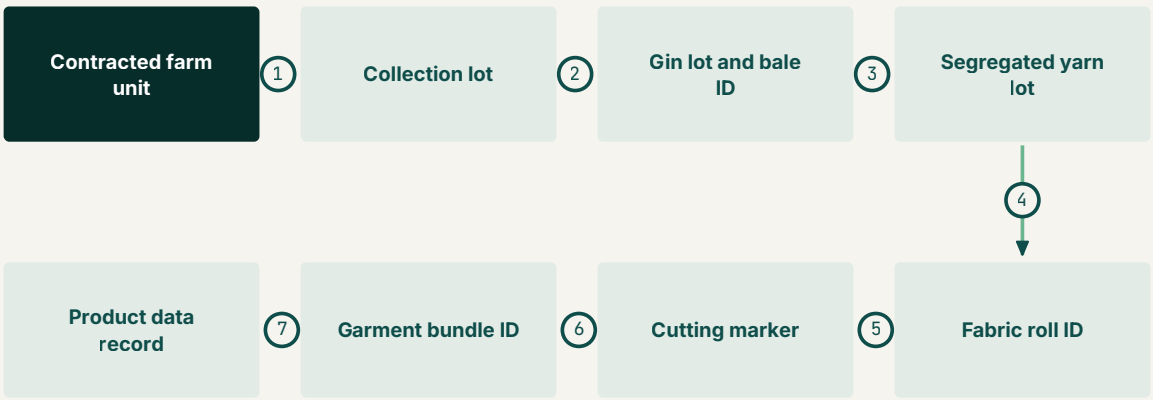
The HIP network is already international. As of 19 February 2026, AbTF reported around 700 suppliers and producers in 25 countries able to trace CmiA cotton from product to origin, more than double the previous year's figure. It also reported about 33,000 tonnes of physically traceable CmiA cotton processed into approximately 190 million textile items. [S10] These figures disprove an easy but inaccurate claim: exporting raw African lint does not necessarily destroy its provenance. A functioning HIP chain can preserve identity across borders.

What raw export gives away is the domestic capture of subsequent fibre-transformation value and operational data, alongside the opportunity to coordinate lint and co-product economics within one industrial system. It also adds organisations and conversions at which custody can fail. Local processing cannot guarantee single-origin content either. A spinner that mixes verified and unverified bales, a knitting plant that loses roll identity or a cutting room that combines incompatible lots can break the story inside the country of origin. The structural advantage is realised only when local conversion is matched by physical segregation and reconciled records.

Exhibit 11, p. 56 sets out GFT's proposed control path. The HIP components follow the bale-to-yarn-to-fabric-to-product logic described by AbTF. [S10] The garment identifier and digital product passport connection are a design extension, not a statement that every CmiA product already carries such a record. The European Commission describes a digital carrier, such as a QR code, linking a physical product to its Digital Product Passport. [S34] That carrier is useful only when the underlying lot and transformation data are complete.

EXHIBIT 11 / GFT REFERENCE CONTROL SEQUENCE

A controlled provenance chain preserves identity from contracted farm to garment record



1. Register
2. Weigh and check
3. HIP issue
4. Reconcile
5. Reserve rolls
6. Preserve lots
7. Link evidence

ILLUSTRATIVE [S0301] [S0305] [S10] [S34] Illustrative GFT architecture. AbTF supports the HIP chain, now called Segregation, from bale through textile product; the garment data carrier and factory exception controls are proposed extensions. This is not a claim of implementation at a GFT operating factory.

The operating test is conservation. Verified bales issued to spinning should reconcile with yarn produced after declared process losses. Yarn lots issued to knitting or weaving should reconcile with fabric rolls, and rolls released to cutting should reconcile with bundles and remaining stock. The reconciliation need not imply zero loss. It requires measured loss, a defined tolerance and an exception review when the physical balance fails.

Digital tools can strengthen this control but cannot repair a weak physical boundary. FibreTrace is listed within GDIZ's traceability arrangements alongside CmiA-certified sourcing, providing one example of a marker and record system inside an integrated park. [S04] A marker, transaction document or QR code should be treated as corroborating evidence within that system. None should be presented as proof when the material was never segregated in the first place.

African origin can consequently be preserved in an international HIP chain or lost in a poorly controlled domestic chain. The strategic choice is not geography alone. It is whether sponsors build the contracts, lot discipline and measurement capacity that make origin both true and commercially useful. Local conversion offers a shorter and more investable place to do that work.

3.7

Co-product economics strengthen the gin only when the whole mass balance is sold

Seed cotton is not simply lint awaiting extraction. Cameroon's ministry study reports fibre yield above 42 percent, seed yield of 53 to 54 percent, linter yield of 0.5 to 1 percent and waste of 3.0 to 3.5 percent. [S30] FAO records cottonseed processing into oil and cakes for human and animal consumption in the Cotton-4 economies. [S02] SODECOTON's two oil mills place that conversion inside the Cameroonian cotton network, while GDIZ lists animal-feed mills among the activities in its integrated zone. [R03] [S03]

This material balance changes the procurement question. A ginner sells more than a bale, and a regional industrial strategy should not value only the fibre fraction. Oil, meal, linter and other co-products can create additional domestic demand and processing records. They can also spread fixed ginning costs across more than one revenue line. Yet seed tonnage is not oil tonnage, and co-product existence is not proof of profitability. Each stream has its own recovery rate, quality specification, market price, processing cost and working-capital requirement.

WORKED EXAMPLE: AN ILLUSTRATIVE GIN-LOT BALANCE

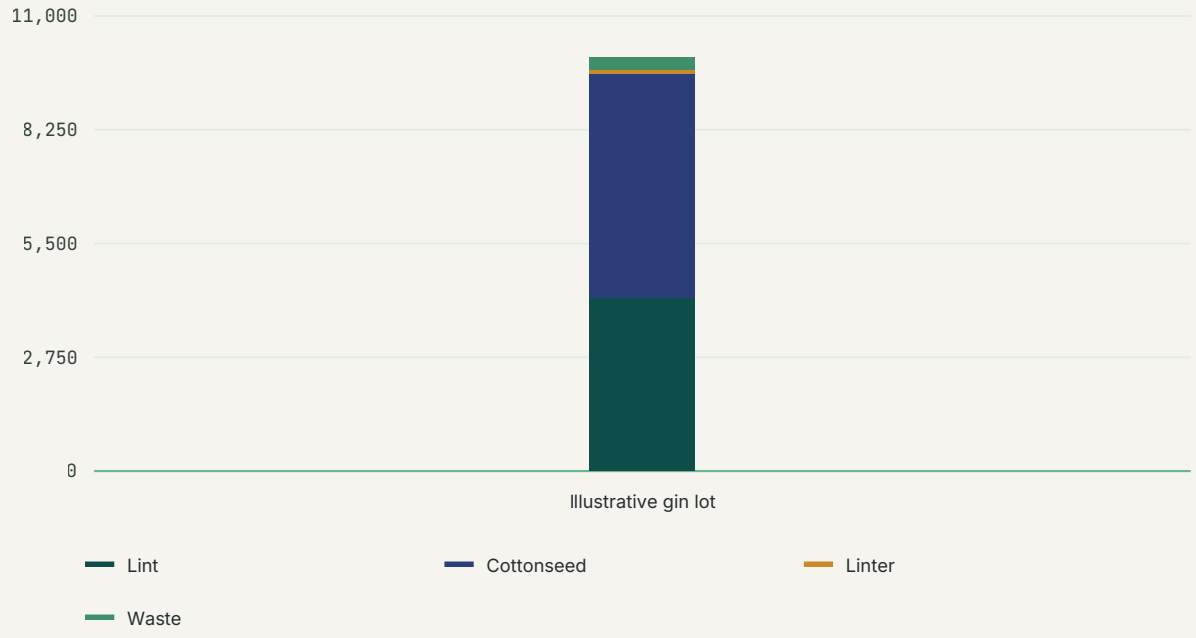
Take an illustrative delivery of 10,000 tonnes of seed cotton solely to demonstrate the method. Apply a central lint share of 42 percent, a seed share of 54 percent, a linter share of 1 percent and a waste share of 3 percent. The first and fourth values are reported point or rounded values in the ministry study; the middle two are the upper ends of its reported ranges, selected here so that the illustrative balance closes to 100 percent. [S30]

The illustrative arithmetic gives 4,200 tonnes of lint, 5,400 tonnes of cottonseed, 100 tonnes of linter and 300 tonnes of waste. The calculation is 10,000 multiplied by each respective share. It is not a forecast for any harvest or ginnery, and the 5,400 tonnes of seed must not be booked as edible oil. Actual balances require measured input, foreign matter, moisture, process losses and saleable co-product yields.

Exhibit 12, p. 58 displays the same illustrative balance. Its purpose is to prevent two common errors: treating seed cotton as though all its weight were spinnable fibre, and treating cottonseed as a valueless residue. It does not provide a revenue allocation or an environmental allocation method.

EXHIBIT 12 / TONNES OF OUTPUT

An illustrative 10,000-tonne gin lot yields lint and substantial co-product streams



DERIVED [S30] Derived illustrative central case: 10,000 t × 42% lint = 4,200 t; × 54% seed = 5,400 t; × 1% linter = 100 t; × 3% waste = 300 t. The ministry reports seed at 53 to 54%, linter at 0.5 to 1% and waste at 3.0 to 3.5%; upper values close this case to 100%. Not a measured GFT result or a forecast.

A financial model should calculate netback separately for each stream. Lint netback begins with saleable bales and their quality-adjusted price. Seed and linter netbacks begin with measured saleable yields, then deduct crushing or handling costs, quality

losses, freight and inventory costs. Waste may carry a disposal cost rather than being assigned a zero value by default. The farm-gate or gin-gate result then provides a defensible basis for discussing supplier margins and producer pricing.

Co-products also belong inside the provenance record. The same gin-lot identity that follows lint can connect seed deliveries to an oil mill or feed customer. This does not require a consumer-facing claim for every stream. It does require mass reconciliation so that co-product revenue cannot be presented as an unrelated business while the lint chain claims the full benefit of integrated processing. Shared evidence makes the economics and the origin story consistent.

Domestic co-product demand can reduce exposure to a single lint buyer, but it cannot remove commodity risk. Oil and meal prices, food-safety compliance, feed formulation and transport all affect realised value. Sponsors should therefore test actual netbacks through a full operating season before using co-products to justify a higher farm-gate price or a lower lint transfer price. The structural opportunity is diversification with measurement, not an assumed margin subsidy.

3.8

Bankable provenance joins contract terms, physical controls and claim approval

A provenance-ready venture should convert the upstream advantage into a small set of non-negotiable operating controls. The first is supplier due diligence. Confirm the managing entity, the ginneries in scope, the verification status and the exact chain-of-custody model offered. Do not infer HIP availability from CmiA participation alone. Review the evidence behind the current licence and establish who can authorise use of the mark and associated claims.

The second is a lot-acceptance protocol. At dispatch, the supplier records bale identity, gin lot, weight and verified status. At reception, the buyer checks those records against the physical delivery and samples fibre against the agreed specification. Non-conforming lots enter a documented hold, retest, discount or rejection route. Quality and provenance exceptions should share the same lot reference so that a commercial dispute does not sever the material history.

The third is conservation across conversion. Spinning, fabric formation and cutting each need opening stock, receipts, outputs, measured loss and closing stock. The tolerance should reflect process reality and be approved before production. An unexplained deficit triggers an exception review, not an accounting adjustment that silently restores the balance. This is where performance management and provenance become the same operating discipline.

The fourth is claims governance. A sourcing team may negotiate verified cotton, but a marketing team should publish only the claim supported by the chosen custody route and evidence file. Rain-fed cultivation, GMO exclusion under CmiA, HIP content and factory environmental performance are different statements. They require different support. Legal and compliance review should confirm the wording for each destination market; this chapter is industrial research, not legal or investment advice.

Exhibit 13, p. 60 summarises the minimum contract and control package. It is a GFT design template, not a claim that these terms already exist in a supplier agreement.

EXHIBIT 13 / GFT RECOMMENDED CONTROL SET

A provenance-ready offtake agreement binds commercial terms to auditable lot evidence

Control	Required evidence	Decision when evidence fails
Supplier status	Managing entity, gin scope and custody route	Hold verified claim
Fibre acceptance	Lot test against agreed product specification	Hold, retest, discount or reject
Mass conservation	Receipts, outputs, stock and measured loss	Open exception review
Price and delivery	Reference price, quality adjustments and freight boundary	Apply agreed remedy
Product claim	Approved wording linked to custody evidence	Do not publish claim
Corrective action	Owner, due date and verification record	Suspend affected supply or claim

ILLUSTRATIVE [S0301] [S0302] [S10] [S30] Illustrative contract and operating template derived from the assurance, ginning and HIP control requirements discussed in this chapter. Exact legal terms and tolerances require transaction-specific review.

Implementation should proceed through evidence gates rather than a broad brand launch. Begin with desk review and physical supplier assessment. Continue with representative bale testing and spinning trials. Then pilot the custody and reconciliation routine on bounded production lots before extending the claim to a full product range. The evidence budget should include testing, verifier coordination, staff time, record systems and exception handling. These are production costs of a credible origin proposition, not optional communications expenditure.

The performance-management system should carry a compact set of upstream indicators: share of received bales with complete identity records, lots passing first fibre inspection, custody exceptions awaiting closure, physical reconciliation variance, and claims approved against evidence. Definitions matter more than dashboard volume. Each indicator needs an owner, source record, review frequency and consequence. A missing record should remain visible as missing rather than being replaced with an assumed value.

GFT's Cameroon textile programme provides the relevant three-part design logic. Feasibility analysis sets the fibre-supply and co-product commercial case. Performance-management design connects incoming bale quality and custody exceptions to

production decisions. Digital strategy carries the lot reference from supplier record to yarn, fabric, garment and product-data carrier. These are design recommendations within the programme, not claimed operating results or certifications.

Residual risks remain visible. Shared production entries in the inherited register do not always retain original publication dates. CmiA scale figures are reported by the foundation that owns the standard. Cameroon's export-parity pricing diagnosis dates from 2022 and requires current contractual confirmation. Most importantly, no source used here supplies a comparative product carbon footprint. Those limitations do not erase the provenance advantage. They define the work needed to make it bankable.

Provenance becomes value only when the lot, the fibre and the transformation remain connected.

CHAPTER SOURCE NOTES

S0301 Aid by Trade Foundation (AbTF). 2022-12.

S09 Cotton made in Africa (CmiA). 2026-09-28.

S10 Cotton made in Africa (CmiA) / Aid by Trade Foundation. 2026-02-19.

R03 SODECOTON. Publication date unrecorded; inherited source-text check.

S30 Ministry of Small and Medium-Sized Enterprises, Social Economy and Handicrafts (MINPMEESA), Republic of Cameroon. 2022-09.

R01 Business in Cameroon. Publication date unrecorded; inherited source-text check.

R02 Fibre2Fashion; Business in Cameroon. Publication date unrecorded; inherited source-text check.

R05 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S02 Food and Agriculture Organization of the United Nations (FAO). 2022.

S05 ARISE Integrated Industrial Platforms (ARISE IIP). 2022-06-01.

S14 ARISE Integrated Industrial Platforms (ARISE IIP). 2023.

S04 SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). 2025-02-27.

S0304 World Trade Organization (WTO) / Gherzi Textil Organisation. 2025.

S0302 World Bank Group. 1995-12.

S0303 United States Department of Agriculture, Foreign Agricultural Service. 2024-04-10.

S08 Aid by Trade Foundation (AbTF) / Cotton made in Africa. 2026-08-20.

S0305 Cotton made in Africa (CmiA) / Aid by Trade Foundation. 2026-09-28.

S34 European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. 2025.

S03 ARISE Integrated Industrial Platforms (ARISE IIP). 2023.

04

REGIONAL ARCHETYPES IN PRACTICE / WEST AFRICAN SEZ MODEL

West African special economic zones in Benin and Togo prove that co-located spinning, weaving and garmenting can compress the conversion gap

Benin and Togo show how shared infrastructure can bring cotton conversion stages together. Published capacities and investment announcements establish a direction, while operating records must establish the realised result.

CHAPTER 04
DECISION TEST

Benin and Togo show how shared infrastructure can bring cotton conversion stages together. Published capacities and investment announcements establish a direction, while operating records must establish the realised result.

Co-located textile parks can shorten the distance between African lint and finished goods by bringing production stages, utilities and administrative decisions within a common operating boundary. Benin's GDIZ and Togo's PIA provide evidence of that institutional model, alongside a reported garment export and a factory inauguration. They do not yet provide, in the sources opened here, a reconciled demonstration that every announced integrated unit achieves its stated output. The transferable lesson is conditional: connect commercially matched stages through accountable shared services, then measure conversion, delivery and environmental performance before expanding. [S03] [S14] [S0402] [S0404]

4.1

Public-private zone governance aligns cotton policy with infrastructure execution

The operator describes GDIZ as a partnership between the Republic of Benin and ARISE Integrated Industrial Platforms. Its published total area is 1,640 hectares and its stated distance from Cotonou Port is 45 kilometres. ARISE also identifies PIA as a partnership with the Republic of Togo, covering 400 hectares and situated 15 kilometres north of Lomé. The latter description is a distance from the city, not a verified distance from the port gate. [S03] [S14]

The practical attraction is coordination. GFT's interpretation is that a sponsor can negotiate factory occupancy alongside utility connections and administrative interfaces rather than assembling those dependencies through unrelated transactions. That interpretation is a proposed mechanism, not a measured reduction in project duration. Public participation also creates a need to distinguish the state's policy objectives from the operator's service obligations and the manufacturer's commercial risks.

The sources disagree on GDIZ's later phase allocations. ARISE lists 400, 600 and 640 hectares; the textile-park page lists 400, 400 and 840 hectares. Both sum to the published total, but neither breakdown should silently replace the other. This chapter therefore uses the common total and treats the later phase boundaries as unresolved. The publication years attached to these inherited outline entries are register metadata; the live project pages do not visibly establish original publication dates. [S03] [S04]

PIA's operator lists a container yard with space for 12,500 containers, alongside power supply, effluent treatment and a single-window clearance system. GDIZ's operator similarly lists power, water, treatment and administrative facilities. These are operator descriptions of the service offer. Yard capacity is not annual throughput, container counts are not automatically twenty-foot equivalent units, and the existence of a clearance office does not establish a particular border-processing time. [S14] [S03]

A useful governance agreement should therefore identify the entity responsible for each service, the conditions under which that service is available and the evidence a tenant can inspect. GFT recommends attaching an agreed connection boundary and acceptance procedure to each utility contract. A manufacturer needs to know whether the operator supplies electricity at the factory incomer, merely arranges a grid connection, or undertakes another defined obligation. Similar precision is needed for treated water and wastewater reception.

The same discipline applies to exceptional events. The proposed contract should address outages, equipment damage, treatment interruptions and disputes over metering. Where the operator controls both the infrastructure and the occupancy agreement, tenants should seek a documented escalation route and access to underlying meter records. These recommendations are intended to make a shared-service arrangement inspectable; they are not claims about the contractual protections currently available at either park.

GFT recommends separating construction acceptance from service acceptance. A completed building can be inspected without proving that a connected utility sustains the required operating conditions. The commissioning record should therefore identify what was tested, the load applied, the result obtained and the party accepting responsibility. Where an essential system has not been tested under the intended combination of tenants, the project should record that limitation rather than extrapolating from an unloaded demonstration.

A further proposed control is a common change register. A new wet-processing tenant, a revised production mix or a utility modification can alter the demands placed on shared infrastructure. The operator should explain how such changes are assessed before they affect existing users. For the manufacturer, the useful question is whether its agreed service boundary remains valid after the park changes around it. That question belongs in operating governance as well as initial diligence.

The planning figures in **Exhibit 14**, p. 64 describe different boundaries. They should anchor questions about infrastructure and material flow, not serve as a ranking of investment quality.

EXHIBIT 14 / OPERATOR DESCRIPTIONS, NOT AUDITED OUTPUT

Published park areas and planned lint intake describe different boundaries

1,640 ha	400 ha	40,000 t/year
GDIZ total area	**PIA total area**	**GDIZ lint intake**
Published whole-zone footprint	Published whole-zone footprint	Phase I planned transformation

SOURCED [S03] [S04] [S14] GDIZ total area agrees across operator pages, but later phase allocations conflict. PIA area is not its textile-only area. GDIZ lint volume is a Phase I plan, not measured conversion.

The distinction matters because land does not convert cotton. GFT would assess usable serviced plots, enforceable service terms and completed acceptance tests separately from the headline footprint. A smaller occupied plot with demonstrated

utility performance may be more useful to a garment entrant than access to a larger undeveloped allocation. That is a decision principle, not a conclusion about the relative condition of these parks.

4.2

GDIZ's planned lint conversion requires matched capacities at every stage

GDIZ's textile page states a first-phase plan to transform 40,000 tonnes of lint annually across three integrated factories. For BTEX, it lists approximately 48,768 ring spindles, 2,000 rotors and annual yarn capacity of 17,500 tonnes. The BTC and STB descriptions each list approximately 7,000 tonnes of annual yarn capacity. These are published plant descriptions, not independently checked annual production accounts. [S04]

The same page describes BTEX home-textile outputs including towels and sheeting, while BTC and STB address knitted apparel. It also lists annual piece and set capacities. Those product measures are not interchangeable with lint or yarn tonnage. A towel, a bedlinen set and a shirt cannot be combined into a meaningful physical conversion rate without product weights, construction details and material-loss records. [S04]

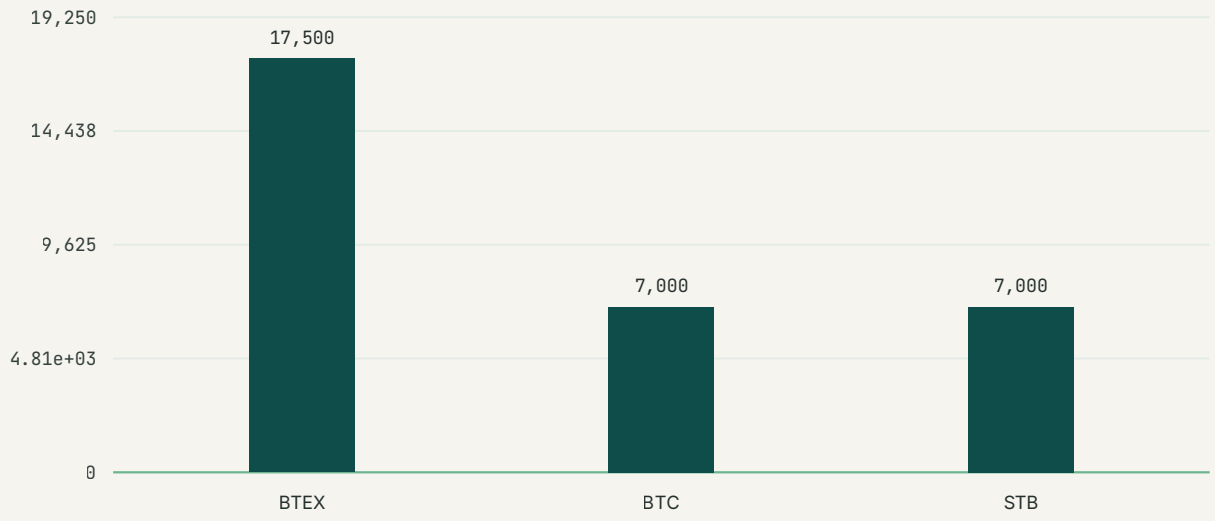
The analytical task is to balance the chain around a defined product programme. GFT recommends specifying yarn count, fabric construction, finished width, colour mix and garment specification before interpreting any machine count. The question is whether the selected equipment can support the same order book at compatible rates. A nominal surplus of spinning equipment does not compensate for an unavailable finishing route or a fabric that fails the buyer's shrinkage requirement.

A proposed acceptance file should reconcile incoming lint, opening stocks, yarn produced, recoverable waste and closing stocks. The downstream reconciliation should connect yarn lots to fabric batches and then to accepted finished goods. The sponsor should retain both physical quantities and disposition reasons. Waste sold externally, reusable offcuts, rejected fabric and goods held for rework should remain distinct categories, so an apparent yield improvement cannot simply conceal a change in classification.

The planned yarn capacities in **Exhibit 15**, p. 66 illustrate the differing scales of the named units. Their arithmetic sum is 31,500 tonnes annually, calculated as 17,500 + 7,000 + 7,000. That sum is not a verified yield from the lint-intake plan: the sources do not reconcile product mix, operating time, stocks, waste or external yarn sales across the units. [S04]

EXHIBIT 15 / TONNES OF YARN PER YEAR, PUBLISHED CAPACITY

BTEX has the largest published yarn capacity among the named GDIZ units



SOURCED [S04] BTEX 17,500; BTC 7,000; STB 7,000. Capacity descriptions are not audited realised production. Do not infer lint-to-yarn yield by dividing their sum by planned park intake.

The planned intake can also support a transparent sensitivity test. In an illustrative utilisation case, applying an assumed 60 percent operating factor to the published 40,000-tonne annual lint plan gives 24,000 tonnes; applying an assumed 80 percent gives 32,000 tonnes. The difference is 8,000 tonnes of annual intake. These are arithmetic scenarios, calculated as capacity multiplied by the assumed factor, not forecasts or reported park results. They show why delivered operating time matters alongside installed machinery. [S04]

GFT would keep those intake scenarios separate from a sales forecast. Material entering a plant may remain in work in progress or emerge as goods awaiting acceptance. The proposed financial model should link the physical stages to the timing of customer acceptance and payment rather than treating intake as immediate revenue. Where a stage is modelled from an assumption, its owner should identify the evidence needed to replace that assumption with an operating observation.

Capacity comparison should also separate technical capability from commercial availability. GFT recommends asking whether a mill will offer yarn or fabric to independent converters, under what minimum order and with which delivery commitments. An integrated factory may reserve its output for its own downstream operation. For a neighbouring garment manufacturer, a large internal mill becomes a useful supplier only when accessible specifications, order terms and quality responsibilities are agreed.

Nor should a programme equate all domestic processing with completed garment value. GFT proposes reporting lint consumed locally, fabric converted locally and finished goods accepted by buyers as separate measures. Each answers a different policy question. The first tests upstream industrial absorption; the next tests continuity into fabric; the last tests saleable output. Holding these boundaries apart prevents an intermediate transfer from being counted repeatedly as new national conversion.

4.3

The five-unit ambition is a dated investment proposition rather than an output series

A USFIA event page presents ARISE's intention to construct five integrated knit-apparel and home-textile units across Benin and Togo, targeting approximately 100 million pieces annually. Although the inherited outline dated this entry to 2024, the opened page identifies the event as 20 January 2022. This chapter records the corrected event date under a chapter-local source identifier and retains the future-tense nature of the proposition. [S0401]

That distinction is commercially material. A multi-unit ambition may demonstrate sponsor intent and help organise supplier discussions, but it cannot establish factory completion, accepted machinery, paid customer orders or cash generation. GFT recommends maintaining separate status fields for each of those milestones. A total programme target should never be relabelled as current capacity merely because a later factory ceremony or shipment has been reported.

A GDIZ release dated 14 June 2024 describes an initial export of 80,000 children's leggings for Kiabi. It also states order commitments for subsequent volumes. The release is evidence that the operator reported a concrete shipment milestone, not an independent buyer receipt, payment confirmation or proof that the garments passed through every upstream process within the zone. [S0402]

Togo's official portal supplies another useful distinction. Its 25 April 2025 report describes construction beginning for an ATMS textile unit after a foundation ceremony. Its 19 June 2025 report records the inauguration of Star Garments Togo and identifies cutting, garment assembly and finishing facilities. These reports concern different projects and different stages of development. Neither should be used as evidence that the entire proposed integrated programme is complete. [S0403] [S0404]

For an investment committee, GFT recommends an evidence ladder that begins with a dated announcement and continues through construction, equipment acceptance, repeatable production, buyer acceptance and collected sales. Each stage requires its own supporting document. The purpose is not to dismiss early progress, but to attach the right decision to it. A foundation report can justify a construction-monitoring enquiry; it cannot justify relying on that plant for an imminent fabric delivery.

Co-location can reduce an intermediate transport interface when compatible suppliers and customers transact locally. GFT would test the benefit with a product-specific route comparison that includes waiting, quality release, customs treatment and buffer stocks. It would not assume that a common fence eliminates every delay. The illustrative calculation below shows how to isolate the timing mechanism without presenting invented Benin or Togo logistics measurements.

WORKED EXAMPLE: REDUCING AN INTERMEDIATE DELIVERY CYCLE

An illustrative fabric-delivery comparison assumes an imported route takes 12 days for supplier release, 24 days for transport and port handling, and 9 days for clearance and delivery. Its total is 45 days. An illustrative local route assumes the same 12-day release plus 4 days for local transfer and receipt, totalling 16 days. The assumed reduction is 45 - 16 = 29 days. These are teaching inputs, not observed corridor times or a sourcing quotation.

For an illustrative requirement of 2 tonnes of accepted fabric daily, the cycle-stock equivalent is 2 × 45 = 90 tonnes on the imported route and 2 × 16 = 32 tonnes locally. The difference is 58 tonnes. This is a timing proxy, not guaranteed cash release: safety stock, payment terms, transit ownership and rejection rates could change the financing outcome. The assumed equal release time deliberately prevents the case from attributing a production-speed gain to geography alone.

The timing bridge in **Exhibit 16**, p. 68 makes that illustrative arithmetic visible. It establishes no observed freight saving, carbon saving or reliability improvement.

EXHIBIT 16 / ILLUSTRATIVE DAYS PER FABRIC DELIVERY CYCLE

The illustrative local route removes 29 days of intermediate delivery time



ILLUSTRATIVE Assumed imported cycle: 12 release + 24 transport/port + 9 clearance/delivery = 45 days. Local cycle: 12 release + 4 transfer/receipt = 16. Retain release time; remove 24 and 9; add 4. No measured park data.

A practical proposed test is to follow an order from specification approval through material release and receipt. Record the cause of each hold rather than only its duration. A laboratory release, a payment dispute and a missed transport departure may all appear as waiting time, yet require different remedies. The comparison becomes useful when it identifies a controllable cause and assigns responsibility for addressing it. Proximity alone supplies no such diagnosis.

GFT recommends repeating the comparison for the same material specification and delivery destination, using supplier quotations and actual event timestamps. A useful result should survive an adverse local-supply case as well as a favourable one. If the integrated supplier misses its release date, local proximity may preserve some transport advantage while failing the customer's required delivery window. Supplier performance must therefore remain part of the model.

4.4

Fiscal incentives support a factory only when its transactions qualify

ARISE's PIA page advertises corporate and business-licence tax relief during the first five years. The GDIZ page also advertises fiscal and administrative advantages. These are descriptions by the developer, not a current legal opinion on a particular tenant or transaction. GFT would require the applicable instruments and a project-specific eligibility review before including any exemption in a financing model. [S14] [S03]

The useful comparison is between cash costs under documented eligibility conditions. GFT recommends separating tax relief on factory profits, import treatment of machinery, treatment of production inputs and treatment of finished sales. An exemption associated with an authorised export operation should not be assumed to apply to an unrelated domestic transaction. Where an incentive has conditions or an expiry, the model should show the consequences of losing it.

The same boundary discipline applies to regional trade. Membership of an economic community is not itself evidence that a particular garment qualifies for preferential entry. GFT recommends identifying the destination, tariff classification, product origin rule and documentary route for the actual transaction. A zone's customs status and the origin of its output should be tested separately. The detailed trade-policy analysis belongs elsewhere in this paper; here the issue is whether the park proposition survives that examination.

The historical USFIA presentation advertises preferential market access alongside the park offer. Because the event is dated, it should be read as part of the original investment pitch, not as verification of current eligibility or tariffs. This chapter therefore makes no current entitlement claim for either US or European market access. A sponsor should obtain destination-specific confirmation when quoting an order or approving investment. [S0401]

GFT proposes comparing the parks and Cameroon's programme at the level of evidence available, as in **Exhibit 17**, p. 70. The Cameroon entry uses the inherited register's project description and expressly retains its announcement status. It does not establish an operating supply agreement with any private garment entrant. [R09]

EXHIBIT 17 / PUBLISHED DESCRIPTIONS AND EVIDENCE LIMITS

The cases offer different evidence for a supplier decision

Case	Evidence available	Still to verify
GDIZ	Integrated plant descriptions	Matched operating output
PIA	Services; garment inauguration	Local fabric availability
Camtext	Integrated project announcement	Completion and supply terms

SOURCED [S03] [S04] [S14] [S15] [S0404] [R09] Descriptive comparison, not a ranking. Cameroon uses inherited project-announcement evidence; its original source was not independently reopened. Operator facility listings do not establish contracted service performance.

A proposed downside case should retain ordinary operating costs while removing any incentive whose eligibility is unresolved. The sponsor can then see whether the factory depends on that item to remain viable. This is a diligence method, not an argument that incentives are unimportant. It also prevents attractive policy language from obscuring the more immediate questions of accepted output, delivery performance and working-capital needs.

This chapter provides industrial decision analysis, not investment, legal or tax advice. GFT recommends seeking qualified advice on the actual structure, customs movements and destination markets before making contractual commitments. The commercial model should retain the advice date and the conditions on which the adviser relied, so a later change in product mix or sales destination triggers a fresh review.

4.5

Shared treatment makes wet processing a governed service rather than a label

PIA's textile page advertises a common effluent treatment plant and zero liquid discharge, stating that wastewater is received through conduit pipelines, treated and recycled. It also identifies rainwater harvesting and approved disposal routes for treatment and factory waste. The USFIA presentation refers to common treatment using ZLD/ZDHC terminology. These are facility and positioning statements, not independently verified compliance certificates or measured discharge records. [S15] [S0401]

GFT's engineering interpretation is that shared treatment can move part of the infrastructure burden from an individual factory to a common operator. The recommendation is to make that relationship explicit in the service contract. A tenant should identify the wastewater characteristics it is permitted to send, the required pretreatment, the monitoring arrangement and the response when the receiving plant cannot accept the stream. Factory production should not depend on an undefined environmental interface.

Zero liquid discharge describes a liquid-management boundary. GFT recommends checking how the system handles concentrated salts, sludge, evaporative losses, maintenance bypasses and final residuals before making a broader environmental claim. Likewise, wastewater treatment does not by itself establish chemical-input

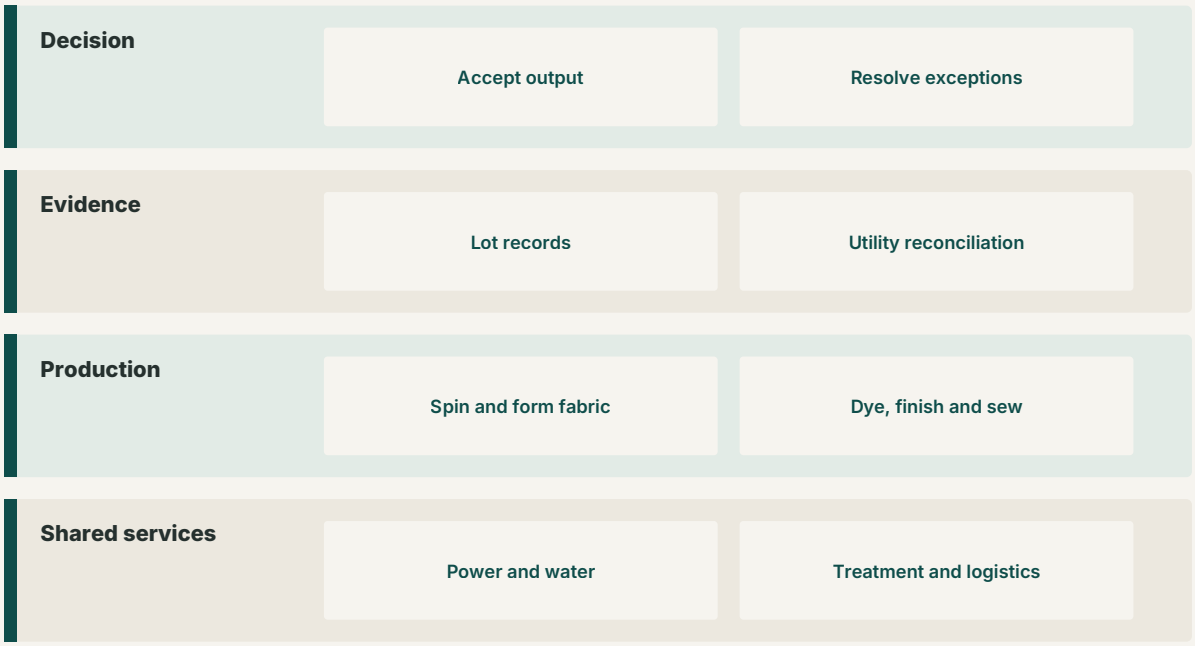
conformity. The diligence file should distinguish treatment performance, chemical management, water consumption and energy use rather than treating an environmental acronym as a substitute for evidence.

A proposed metering arrangement would record freshwater received, recycled water returned, wastewater transferred and production accepted. The operator and tenant should agree how to reconcile those quantities and investigate unexplained differences. A meter on a shared pipeline needs a defined reading method and calibration responsibility. For a material environmental claim, GFT recommends retaining the measurement period, laboratory scope and relevant production denominator alongside the reported result.

The illustrative architecture in **Exhibit 18**, p. 71 separates the production chain from the service and evidence layers. The named production stages and service categories are informed by the operator pages, but the allocation of responsibilities is GFT's proposed design. The exhibit does not claim that this governance arrangement is installed in either park. [S04] [S15]

EXHIBIT 18 / ILLUSTRATIVE RESPONSIBILITY ARCHITECTURE

A proposed park operating model joins physical conversion to service evidence



ILLUSTRATIVE [S04] [S15] GFT design informed by published process and utility categories. Layer ownership, metering and escalation are recommendations, not verified park implementation.

GFT also recommends checking the plant's response to an abnormal incoming stream. The procedure should identify who can isolate that stream, where it may be held safely and how the responsible factory is notified. Acceptance thresholds need to be consistent with the treatment operator's capabilities. An agreement to receive wastewater without a corresponding response to non-conforming loads leaves both the shared asset and compliant tenants exposed to an unresolved operating interface.

The allocation of cost deserves equal attention. GFT recommends distinguishing charges for access, reserved treatment capacity, actual flows and excess contaminant loads. A low headline water tariff can be misleading if another charge carries the fixed infrastructure burden. The procurement exercise should examine the complete service schedule, including the circumstances in which charges change and the remedies available after an interruption.

Environmental resilience also needs a production response. The proposed operating procedure should state whether the factory slows, stores an allowable stream or stops when the shared system is unavailable. Responsibilities for communication and restart approval should be agreed before commissioning. Sharing a treatment asset can reduce duplication, but GFT would treat dependence on its availability as a risk requiring a documented response rather than assuming that common ownership removes it.

4.6

On-site training needs a demonstrated route into accepted production

GDIZ's textile page identifies operating garment training centres, and PIA's textile page lists a vocational training centre and testing laboratory among its facilities. These descriptions support the presence of a training offer in the park proposition. They do not establish graduate placement rates, sustained productivity, employee retention or the absence of recruitment competition between factories. [S04] [S15]

GFT recommends organising training around tasks required by the launch product programme. Sewing, machine adjustment, inspection and line supervision should each have a defined competence check. Attendance and course completion are useful administrative records, but a production decision needs evidence that the worker can perform the assigned task safely and consistently under the intended operating conditions. The factory should retain a route for further coaching when that evidence is incomplete.

A proposed training-to-production handover would join a trainee's demonstrated operations to the tasks required on the commissioning line. The supervisor should know where the worker needs assistance and which quality issues require immediate intervention. That record need not become an intrusive personnel system. GFT recommends collecting only the information needed for safe allocation, training support and fair assessment, with clear access rules.

To assess whether a common training centre is useful, GFT would compare the factory's recruitment needs with the centre's course content and available equipment. The decision should include who pays for training time, how factory placements are arranged and how technical instructors receive feedback from production. Those are proposed diligence questions, not verified features of either centre's employment arrangements.

Training should also be separated from a claim of labour-cost advantage. A forecast built around a nominal wage requires a corresponding account of accepted output, supervision, rework, attendance and safe working conditions. GFT recommends test-

ing productivity assumptions during a controlled launch run and preserving the results by task and product. A general national wage comparison cannot establish the cost of converting a particular garment to the buyer's required standard.

Finally, the zone operator and tenants should consider how training remains viable after the initial launch. GFT proposes a shared review of recurring skill gaps and a funding arrangement tied to actual course delivery. The objective is to maintain a reliable competence pipeline without assuming that a common academy automatically prevents staff turnover. An industrial park can supply a useful institution; employers still need credible working conditions, supervision and progression.

4.7

Cameroon should adopt accountable interfaces before committing to full integration

Cameroon's inherited evidence register records approximately 5 percent of cotton fibre processed locally and 95 percent exported raw. Its original publication date is unrecorded, so it is a baseline retained from the programme, not a newly verified observation. It establishes the motivation for examining conversion strategies, but it should not be combined with seed-cotton tonnage to manufacture a current lint-processing balance. [R06]

The same register describes Camtext as an announced integrated project involving ARISE and other parties. This chapter uses that announcement only to identify a possible future upstream counterpart. It does not imply that fabric is currently available, that a delivery date is guaranteed or that GFT has any relationship with the project. The detailed Cameroon investment case belongs to the neighbouring chapter. [R09]

The practical implication of Benin and Togo is a sequence of decisions. GFT recommends starting with the intended garment and buyer specification, then establishing which yarn, fabric and finishing services can be supplied on acceptable terms. The next task is to verify those interfaces through sample acceptance and delivery evidence. Ownership of upstream machinery should remain a separate decision, justified by demand, service performance and the cost of alternatives.

> **GFT NOTE**
>
> Treat an integrated pole as a potential supplier before treating it as a reason to duplicate its assets. Request an actual fabric specification, sample approval route, delivery commitment, treatment-service boundary and exception procedure. Retain a qualified alternative supply route until repeat performance supports greater dependence. This is a proposed procurement discipline, not a representation that any named pole has agreed those terms.

A proposed supplier qualification should include an adverse case. Ask how an independent garment customer will be served when the integrated mill's own downstream factory needs the same fabric capacity. Determine whether reservations, allocations and delivery priorities are contractual or discretionary. The sponsor should under-

stand the available remedies before building its customer promise around another manufacturer's internal production schedule. Physical adjacency makes communication easier to arrange; it does not establish commercial priority.

GFT would record the alternative supply route in comparable terms, including specification, approval status, delivery boundary and minimum order. The purpose is to understand the cost of dependence and the conditions for switching. A nominal backup that has never produced an acceptable sample is an unresolved option, not qualified supply. Maintaining that distinction can make a phased conversion strategy more credible while upstream projects are still moving through construction and commissioning.

For public policy, GFT recommends publishing progress in forms that can be reconciled: commissioned stages, accepted material flows, environmental service performance and finished-goods sales. A headline processing target can remain useful, but its denominator and observation period should travel with it. Public reports should distinguish direct operating employment from projected jobs and separate occupied industrial plots from undeveloped land. That reporting would make the conversion proposition easier to assess without demanding commercially sensitive customer information.

For a private sponsor, the decision record should state which dependencies remain unresolved and what evidence would permit commitment. A supplier's announcement may justify opening a discussion; an accepted sample may justify a pilot order; repeated conforming deliveries may justify a longer agreement. GFT recommends preserving those distinctions in the project file so commercial enthusiasm cannot quietly substitute for completion of a material gate.

The conclusion is therefore narrower, and more useful, than a universal endorsement of integrated megaprojects. Benin and Togo demonstrate a way to organise cotton policy, factory investment and shared services, with dated evidence of specific industrial milestones. They support testing local conversion as a connected system. They do not establish a general profitability result or prove that every proposed park capacity is realised. [S03] [S14] [S0402] [S0403] [S0404]

Bring the stages together, then make every handover answer to evidence.

CHAPTER SOURCE NOTES

S03 ARISE Integrated Industrial Platforms (ARISE IIP). n.d..

S14 ARISE Integrated Industrial Platforms (ARISE IIP). n.d..

S0402 SIPI-Benin S.A. / Glo-Djigbé Industrial Zone (GDIZ). 2024-06-14.

S0404 Portail Officiel de la République Togolaise. 2025-06-19.

S04 SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). n.d..

S0401 United States Fashion Industry Association (USFIA). 2022-01-20.

S0403 Portail Officiel de la République Togolaise. 2025-04-25.

R09 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S15 Plateforme Industrielle d'Adetikope (PIA Togo). n.d..

R06 Cameroon Trade Hub. Publication date unrecorded; inherited source-text check.

GREEN FUTURE TECH
LIMITED / HONG KONG SAR

05

Central Africa's cotton belt faces a choice between state-led megaprojects and modular private cut-make-trim ventures

Cameroon's 95 to 5 processing gap, CICAM's operational decline and the US$300 million Camtext SA timeline create space for an agile, sustainability-branded private garment maker. [R06] [R09] [R11]

CHAPTER 05
DECISION TEST

Cameroon's 95 to 5 processing gap, CICAM's operational decline and the US$300 million Camtext SA timeline create space for an agile, sustainability-branded private garment maker. [R06] [R09] [R11]

Central Africa's cotton belt does not lack raw fibre, rural agronomic organisation, or consumer demand for cloth; it lacks capital-disciplined, measured factory capacity that can convert ginned lint into finished garments without drowning in multi-decade state overhead. [R01] [R06] [R12] Across the Economic and Monetary Community of Central Africa (CEMAC), where six member states unite 63.3 million consumers and a combined gross domestic product of US$125.9 billion as of 2024, northern Cameroon and southern Chad anchor a rain-fed cotton basin that supports hundreds of thousands of smallholder families yet exports almost all of its fibre raw. [R03] [R06] [S36] [S0503] In Cameroon, about 95 percent of cotton fibre is shipped abroad as baled lint and only about 5 percent is processed locally, while the historic state-backed textile incumbent, Cotonniere Industrielle du Cameroun (CICAM), has seen its domestic market share fall from about 85 percent three decades ago to about 5 percent today. [R06] [R11] Faced with this industrial gap, public policy has gravitated toward capital-heavy, vertically integrated megaprojects, led by the announced merger of Societe de Developpement du Coton du Cameroun (SODECOTON) and CICAM and the November 2025 unveiling of Camtext SA, a US$300 million (180 billion XAF) integrated cotton-to-textile venture targeting optimal capacity around 2033 with an estimated return on investment near 11 years. [R08] [R09] [R10] [S0501] Green Future Tech's comparative engineering diagnosis demonstrates that private sponsors in Central Africa should neither copy all-at-once state megaprojects nor view public spinning and weaving poles as rivals. Instead, the investable private strategy enters downstream in modular cut, make, trim, finishing and domestic-to-regional brand building at an illustrative scale of 3.0 million garments a year, treats emerging public-private mills at Dibamba and Garoua as upstream yarn and fabric partners, and embeds line-level performance and sustainability measurement from the first shift. [R10] [R28] [S0501]

5.1

Cameroon's 95/5 paradox: a thriving northern cotton base paired with a hollowed-out domestic mill

The structural paradox of Central African industrialisation lies in the contrast between the disciplined organisation of its northern cotton fields and the near-absence of downstream textile conversion. [R03] [R06] [S30] Within the wider CFA franc zone, which harvested 2.3 million tonnes of seed cotton in the 2024/25 campaign following an 11.5 percent weather-driven contraction, Cameroon and Chad constitute the two primary cotton-producing economies of the CEMAC customs union. [R05] [S02] [S36] In Cameroon, seed-cotton output reached 330,000 tonnes in 2022, dipped to 314,455 tonnes in 2023, and rebounded to about 340,000 tonnes in 2024, with early sector projections for 2025 pointing above 350,000 tonnes. [R01] [R02] Campaign tracking by SODECOTON subsequently recorded that while 400,000 tonnes had been forecast for the 2024/2025 season, severe flooding between August and September combined with jassid insect infestations reduced actual harvested volume to 286,000 tonnes, a shortfall of 114,000 tonnes that highlights the exposure of rain-fed agriculture to climate shocks. [S0502] Even so, SODECOTON projected a recovery to 440,000 tonnes

of seed cotton for the 2025/2026 campaign, advancing toward the National Development Strategy 2020 to 2030 (SND30) long-term agricultural goal of 600,000 tonnes a year by 2030. [S0501] [S0502]

That agricultural volume rests on a coordinated parastatal and smallholder network across Cameroon's North, Far North and Adamawa regions. [R03] [S30] Headquartered in Garoua, SODECOTON supports more than 220,000 smallholder cotton producers (with 150,000 to 200,000 farmers supervised in each campaign), operates nine ginning plants with roughly 320,000 tonnes of annual seed-cotton capacity alongside two cottonseed oil mills, and injects roughly US$100 million a year into rural communities. [R03] [R04] [S0502] Across the border in southern Chad, CotonTchad SN (CTSN), operated as an Olam Agri subsidiary out of Moundou, coordinates around 200,000 smallholder cotton producers across the Logone Occidental and Lac provinces and supports the livelihoods of roughly 3 million people out of Chad's population of 17.5 million. [S0503] Together, the Cameroonian and Chadian basins represent over 420,000 farming households cultivating hand-picked, rain-fed upland cotton within a monetary union whose currency, the Central African CFA franc (XAF), is pegged to the euro at 655.957 XAF per euro. [R03] [R32] [S0503]

Yet the moment seed cotton passes through the ginning saws in Garoua or Moundou, the Central African value chain breaks. [R03] [R06] [S02] In Cameroon, sector baseline records show that about 95 percent of ginned cotton fibre is exported raw and only about 5 percent is processed locally. [R06] In Chad, which sits alongside Benin, Burkina Faso and Mali in the Cotton-4 (C-4) coalition supplying roughly 3 percent of world cotton output and 8 percent of global lint trade, average domestic mill use across the bloc stands at just 2 percent. [S02] Exporting 95 to 98 percent of regional lint raw means that Central African economies capture only the volatile international lint price, around 890 to 900 XAF per kilogram during the 2024/2025 downturn, while forfeiting the five-to-tenfold unit value uplift across spinning, knitting, weaving, dyeing and branded apparel manufacture. [R06] [S02] [S0501]

To close this conversion deficit, the Cameroonian government designated the Cotton-Textile-Leather-Garment industry as one of nine priority emergence sectors under SND30 and set a national target to process 50 percent of domestic cotton fibre locally by 2030. [R06] [R07] [S30] However, a September 2022 sector diagnosis by the Ministry of Small and Medium-Sized Enterprises, Social Economy and Handicrafts (MINPMEESA) documented why policy targets alone have not shifted the 5 percent baseline. [R06] [S30] Downstream garment making in Cameroon remains fragmented across under-capitalised tailoring workshops and small enterprises lacking industrial pattern-grading tools, working-capital credit and domestic cloth supply. [S30] Moreover, domestic spinners historically had to buy Cameroonian lint at world export-parity prices as if importing it, penalising local transformation. [S30] Without an industrial bridge linking northern lint to urban sewing lines, Cameroon exports baled fibre through Douala Port and re-imports finished Asian fabrics, garments and second-hand clothing. [R06] [S30] [S0501]

5.2

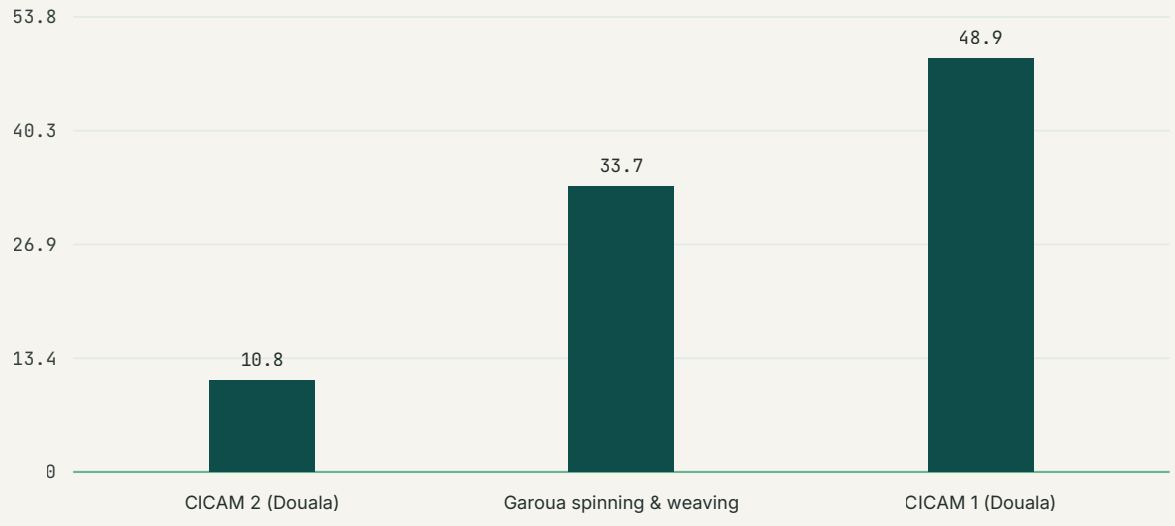
Anatomy of an incumbent decline: why CICAM fell from 85 percent to 5 percent market share

Designing a viable private garment venture in Cameroon requires understanding why the historic state-backed incumbent, CICAM, lost its market footing. [R11] [R12] [S0504] Founded in the mid-1960s, CICAM operated a two-pole system: spinning and grey-cloth (ecru) weaving in Garoua, paired with bleaching, dyeing, printing and finishing at CICAM 1 and CICAM 2 in Douala. [R12] [S0504] [S0505] Three decades ago, CICAM held about 85 percent of the domestic textile market; today its share stands near 5 percent. [R11]

The operational mechanics of that decline were quantified on 14 July 2023 when the Enterprises Upgrading Office (BMN) presented a comprehensive restructuring diagnosis carried out by Mazars for the Ministry of Industry alongside a CAEAC financial audit for the Ministry of Finance. [R12] [R13] [S0504] As shown in **Exhibit 19**, p. 79, the July 2023 report revealed severe underutilisation across CICAM's plants: 33.7 percent at the Garoua site, 48.9 percent at CICAM 1 in Douala, and only 10.83 percent at CICAM 2. [R12] [S0504] Operating high-fixed-cost spinning and wet-finishing plants at 10.83 to 48.9 percent utilisation crippled unit economics: Mazars estimated that structural underutilisation and raw-material shortages generated hidden idle-capacity costs of CFAF 2 billion in 2020 alone. [R12] [S0504]

EXHIBIT 19 / PERCENT OF INSTALLED CAPACITY

CICAM's July 2023 plant utilisation ranged from 10.83 percent to 48.9 percent, illustrating the cost of unmeasured legacy assets



SOURCED [R12] [S0504] Plant-level capacity utilisation recorded in the 14 July 2023 BMN/Mazars diagnostic audit of CICAM. Underutilisation generated hidden costs estimated at CFAF 2 billion in 2020 alone. GFT's Phase 1 greenfield gate requires at least 65 percent Overall Equipment Effectiveness (illustrative target) before expansion.

Exhibit 19, p. 79 demonstrates that low statutory wages cannot save an unmeasured factory whose machines sit idle between half and nine-tenths of the time. [R12] [R14] [S0504] Crucially, CICAM's decline was accelerated by a working-capital breakdown

with its state-controlled lint supplier. [S0504] [S0505] Under the bilateral supply memorandum between SODECOTON and CICAM, SODECOTON was authorised to suspend raw cotton deliveries to CICAM's Garoua mill whenever unpaid bills exceeded XAF 200 million. [S0505] Because obsolete machinery and unmeasured shop-floor losses made CICAM's operating cycle unprofitable, unpaid lint receivables owed to SODECOTON exceeded XAF 1.3 billion by April 2021. [S0504] [S0505] When SODECOTON suspended lint deliveries, the Garoua plant exhausted its raw stock, idling 352 workers and cutting off the supply of unbleached ecru cloth required by Douala's printing lines. [S0505] By 2026, CICAM's Garoua operations remained suspended, leaving local training centres to draw on residual yarn stocks. [S31]

Once a state mill enters this spiral of technical obsolescence and working-capital illiquidity, rehabilitation costs escalate rapidly. [R13] [S0504] Mazars estimated that restructuring CICAM under an unchanged public economic model would cost CFAF 48.2 billion (net financing requirement CFAF 40.6 billion), or CFAF 30.7 billion (net financing requirement CFAF 21.7 billion) under partial privatisation. [R13] [S0504] The companion CAEAC audit identified CFAF 9.6 billion in public tax, social and shareholder debts to be cancelled, CFAF 12.6 billion in commercial bank debt to be settled or securitised, and CFAF 26 billion in funding needs through 2025 (CFAF 19 billion for equipment maintenance and investments and CFAF 7 billion for the operating cycle), while a broader relaunch plan was cited at CFAF 70.2 billion. [R13] [S0504] What the CICAM record proves is not that textile manufacturing cannot work in Cameroon, but that coupling multi-site spinning, weaving and wet finishing without ring-fenced working capital, preventive maintenance and shift-level utilisation control turns industrial assets into fiscal liabilities. [R12] [R13] [S0504]

5.3

Public megaprojects on a long clock: Camtext SA and the SODECOTON-CICAM merger pole

To address CICAM's decline and the 2030 SND30 target of 50 percent local processing, Cameroonian authorities and institutional partners have launched two major public-private initiatives. [R07] [R08] [R09] [S0501] First, the government announced a merger of SODECOTON and CICAM to build an integrated national cotton-textile industrial pole targeted by 2030. [R08] Second, in November 2025, a consortium comprising Panafritex (the textile branch of Arise), SODECOTON, the National Social Insurance Fund (CNPS) and Marlo Properties Fincorp unveiled Camtext SA, a US$300 million (180 billion XAF) integrated cotton-to-textile project. [R09] [S0501]

Inspired by Arise's West African industrial zones in Benin (the 1,640-hectare Glo-Djigbe Industrial Zone, GDIZ) and Togo (the 400-hectare Plateforme Industrielle d'Adetikope, PIA), Camtext SA plans to process 12,000 tonnes of SODECOTON cotton lint a year, blending local cotton with synthetic fibres to optimise pricing against Asian imports. [R09] [R10] [S03] [S14] [S0501] Spatially, Camtext SA divides its footprint between two nodes: a main heavy industrial hub in the Dibamba industrial and port zone near Douala housing spinning, weaving, knitting and finishing units expected to generate 12,000 direct jobs, and a textile centre of excellence and garment factory in Garoua expected to create 3,000 direct jobs, totalling 15,000 jobs. [R10] [S0501] The roadmap targets two initial domestic segments: apparel for defence, security forces and public

service using 60 percent local cotton, and sports goods (jerseys, tracksuits, sneakers) covering at least 50 percent of domestic demand, with projected annual net profit between 3 billion and 4 billion XAF. [S0501]

Exhibit 20, p. 81 situates Camtext SA and the SODECOTON-CICAM pole along Cameroon's trade and industrial timeline from 2020 to 2033. [R07] [R08] [R09] [R10] [R12] [R14] [R18] [S35] [S0501]

EXHIBIT 20 / CALENDAR YEAR

Cameroon's cotton-to-textile industrial timeline runs from the 2020 AGOA exit through the 2026 CEMAC tariff to Camtext's 2033 optimal capacity

2,020
AGOA exit (Jan 2020)
US terminates Cameroon AGOA eligibility on human-rights grounds.

2,023
CICAM audit (Jul 2023)
BMN/Mazars report logs 10.83% to 48.9% plant utilisation and CFAF 30.7-48.2bn restructuring cost.

2,024
SMIG & CET approval (2024)
GFT programme prepared (Jan); SMIG raised to XAF 43,969 (Feb); ECCAS-CEMAC CET approved (Oct).

2,025
Camtext SA unveiled (Nov 2025)
US$300m (180bn XAF) Panafritex-SODECOTON-CNPS-Marlo venture announced for Dibamba and Garoua.

2,026
40% CET in force (Jan 2026)
ECCAS-CEMAC 40% tariff on imported fabrics and garments takes effect; Camtext prep phase slated.

2,030
SND30 50% target (2030)
National target for 50% local cotton processing and SODECOTON-CICAM industrial pole.

2,033
Camtext optimal scale (2033)
Camtext SA projected to reach full 12,000 t/yr lint capacity with ~11-year return on investment.

SOURCED [R07] [R08] [R09] [R10] [R12] [R14] [R18] [S35] [S0501] Chronological sequence of verified policy, wage, audit and megaproject milestones in Cameroon. Numeric values represent calendar years. Post-2026 milestones (2030 SND30 target and 2033 Camtext optimal capacity) are official targets and promoter projections, not realised outcomes.

Inspecting **Exhibit 20**, p. 81 highlights the strategic constraint of integrated megaprojects: time to cash flow. [R09] [R10] [S0501] While technical planning for Camtext SA was completed in November 2025, financial mobilisation of the 180 billion XAF (US$300 million) investment remained pending, with preparatory training and the Garoua garment unit slated for the first half of 2026, a four-year ramp-up, optimal capacity around 2033, and an estimated return on investment near 11 years. [R09] [R10] [S0501] Private commercial capital cannot wait until 2033 for full utilisation or 11 years for payback, particularly when sovereign budget pressures have already slowed multi-billion-franc restructuring plans at CICAM. [R10] [R13] [S0501] [S0504] Conversely, the 40 percent ECCAS-CEMAC Common External Tariff took effect on 1 January 2026, opening a seven-year commercial window between 2026 and 2033 during which an agile private garment maker can build domestic and regional market share while heavy upstream mills are still commissioning spindles and looms. [R10] [S35] [S0501]

5.4 WHY SOVEREIGN EQUITY AND PRIVATE GARMENT CAPITAL OPERATE ON DIFFERENT CLOCKS

In both Benin's GDIZ and Cameroon's Camtext SA, sovereign entities and institutional pension funds (such as Cameroon's CNPS and SODECOTON) accept decade-long payback periods because their mandate includes national trade-balance correction, rural cotton absorption and industrial employment generation across 15,000 direct positions. [R09] [R10] [S03] [S0501] A private industrial sponsor, by contrast, must turn working capital three to four times a year (illustrative benchmark) and service equipment finance out of early operating cash flow. Recognising that structural difference allows private and public capital to specialise along the value chain rather than compete for the same stage. [R09] [R10] [S04]

5.5

Why public integrated poles are upstream partners rather than rivals to a private CMT entrant

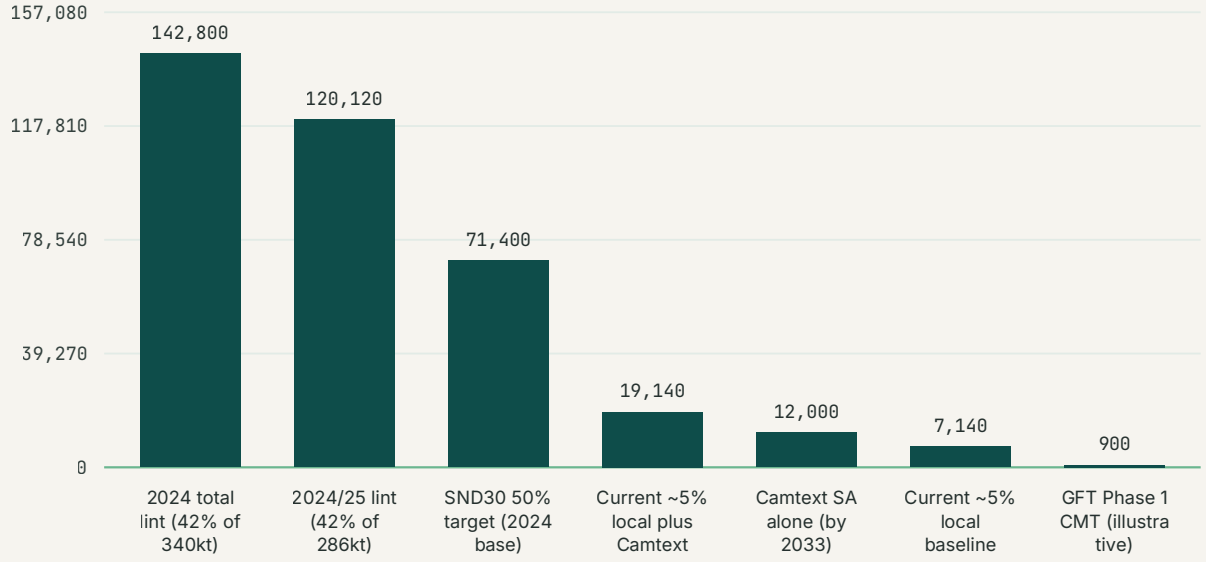
Prospective sponsors sometimes fear that state-backed poles like Camtext SA or a merged SODECOTON-CICAM will crowd out private garment entrants. [R08] [R09] [R10] Mass-balance arithmetic across Cameroon's cotton harvest proves the opposite: even when Camtext SA reaches full capacity in 2033, it will absorb less than a tenth of national lint output, and its Dibamba spinning, weaving and knitting halls will need downstream garment factories as commercial buyers. [R01] [R06] [R10] [S0501]

> **METHOD**
>
> To compare agricultural seed-cotton harvests with industrial mill capacities on a unified physical denominator, figures are converted into tonnes of ginned spinnable lint. Across CFA-zone ginneries operated by SODECOTON and C-4 cotton companies, saw ginning recovers an illustrative 40 to 43 percent spinnable lint by weight (42 percent central outturn benchmark), alongside 54 to 57 percent cottonseed for oil and meal and roughly 3 percent ginning waste. [R03] [S02] [S03] Applying a 42 percent illustrative ginning outturn ratio to Cameroon's 2024 harvest of about 340,000 tonnes of seed cotton yields roughly 142,800 tonnes of ginned lint. [R01] At the weather-reduced 2024/2025 harvest of 286,000 tonnes of seed cotton, lint output equals roughly 120,120 tonnes (illustrative at 42 percent outturn), while SODECOTON's 440,000-tonne 2025/2026 forecast corresponds to roughly 184,800 tonnes of lint. [S0502]

On the 2024 baseline of 142,800 tonnes of ginned lint (derived from 340,000 tonnes of seed cotton at an illustrative 42 percent outturn), Cameroon's current 5 percent domestic processing rate absorbs about 7,140 tonnes of lint annually, leaving roughly 135,660 tonnes exported raw. [R01] [R06] Reaching the SND30 target of 50 percent local processing requires converting roughly 71,400 tonnes of lint a year on the 2024 baseline. [R01] [R06] [R07] **Exhibit 21**, p. 83 reconciles these volumes against Camtext SA's 12,000-tonne capacity and Green Future Tech's illustrative Phase 1 requirement. [R01] [R06] [R07] [R10] [S0501] [S0502]

EXHIBIT 21 / TONNES OF GINNED LINT PER YEAR

Even at full 12,000-tonne capacity in 2033, Camtext SA absorbs less than a tenth of Cameroon's ginned lint, leaving a wide gap to the 50 percent target



DERIVED [R01] [R06] [R07] [R10] [S02] [S0501] [S0502] Derived mass-balance comparison in tonnes of ginned lint. Inputs: 2024 Cameroon seed cotton of 340,000 t (R01) converted at a 42% CFA-zone ginning outturn ratio (R03, S02) = 142,800 t total lint; 2024/25 weather-reduced harvest of 286,000 t seed cotton (S0502) = 120,120 t lint; SND30 50% local processing target on 2024 baseline (R07) = 71,400 t; current ~5% local processing (R06) = 7,140 t; Camtext SA planned capacity by 2033 (R10, S0501) = 12,000 t; GFT Phase 1 modular CMT uptake (illustrative 3.0m garments at 250-300 g lint equivalent) = 900 t.

As **Exhibit 21**, p. 83 shows, combining Camtext SA's 12,000 tonnes with the 7,140-tonne baseline brings domestic lint use to 19,140 tonnes a year, or about 13.4 percent of 2024 lint supply (derived from [R01] [R06] [R10]). That still leaves a gap of more than 52,000 tonnes of lint a year to meet the 50 percent SND30 goal. [R01] [R06] [R07] [R10] Moreover, **Exhibit 21**, p. 83 cannot establish that Camtext SA will sew all 12,000 tonnes into retail garments itself: just as Arise IIP's West African zones at GDIZ Benin (40,000 tonnes Phase I lint conversion, with BTEX operating 48,768 ring spindles and 2,000 rotors for 17,500 tonnes of yarn) and PIA Togo rely on multiple downstream garment tenants sharing Zero Liquid Discharge (ZLD) effluent utilities to reach 100 million pieces a year, Dibamba's spinning, weaving, knitting and dyeing units are natural upstream suppliers and toll-finishing partners for private Cameroonian CMT factories. [R10] [S03] [S04] [S06] [S15] [S0501]

5.6

The GFT modular alternative: 3.0 million garments a year in cut, make, trim, finishing and own brand

Green Future Tech's Cameroon textile programme (feasibility study, performance-management system design and digital strategy prepared 31 January 2024, sources refreshed 2026) sizes its private greenfield entry at an illustrative nameplate capacity of 3.0 million garments a year, employing about 900 workers at full ramp (both estimates). Phase 1 (Months 7 to 24, estimated US$15 million to US$20 million capital

expenditure) focuses strictly on computer-aided cutting, sewing, trimming, garment finishing and domestic-to-regional brand marketing, consuming an estimated 750 to 900 tonnes of fabric annually (assuming an illustrative 250 to 300 grams per garment including cutting loss). Rather than building standalone spinning frames or dyehouses upfront, Phase 1 sources verified African cotton fabrics from regional CFA-zone mills (GDIZ and PIA initially, adding Camtext SA Dibamba and restructured SODECOTON-CICAM lines as they commission) and imports zero-duty European machinery under the Cameroon-EU Economic Partnership Agreement. [R08] [R09] [S04] [S15] [S32] Selective knitting/finishing (1,000 to 2,000 tonnes a year, estimate) and partnered spinning are gated into Phases 2 and 3 once garment cash flow and utilisation thresholds are achieved.

WORKED EXAMPLE

Comparing Camtext SA against GFT's illustrative 3.0 million garment a year CMT-and-brand plant illustrates why modular entry compresses capital risk while magnifying the importance of line utilisation:

1. **Capital commitment and payback clock:** Camtext SA requires US$300 million (180 billion XAF) to process 12,000 tonnes of cotton and create 15,000 jobs across Dibamba (12,000) and Garoua (3,000), equating to a derived US$20,000 per job and US$25,000 per annual tonne of lint, with projected net earnings of 3 billion to 4 billion XAF a year, an 11-year return on investment, and optimal capacity around 2033. [R09] [R10] [S0501] GFT's illustrative Phase 1 CMT plant requires an estimated US$15 million to US$20 million for about 900 workers and 3.0 million garments a year (roughly US$16,667 to US$22,222 per worker), committing less than one-fifteenth of the total capital of the megaproject and commissioning within 18 to 24 months (illustrative comparison derived from [R09] [R10] [S0501]).
2. **Wage baseline versus Asian benchmarks:** Cameroon raised its statutory minimum wage (SMIG) by 5 percent from XAF 41,875 in 2023 to XAF 43,969 a month from 23 February 2024 (about US$76), while the cross-sector average salary is about US$359 a month under a 40-hour standard week (48-hour maximum, overtime at 1.2 times) in an economy that is roughly 90 percent informal. [R14] [R15] [R16] Against Cambodia's 2024 garment minimum wage of US$204 a month, an illustrative Cameroonian operator package of US$110 to US$150 a month (including social charges and bonuses above the US$76 SMIG) yields a 26 to 46 percent nominal wage advantage. [R14] [R17]
3. **Utilisation sensitivity:** Assume a 900-worker plant carries an illustrative fixed payroll and factory overhead of US$225,000 a month (US$2.70 million a year). At GFT's Phase 1 target of 3.0 million garments a year (at an illustrative 65 to 75 percent Overall Equipment Effectiveness, OEE), fixed overhead is US$0.90 per garment. At CICAM 1's 48.9 percent utilisation ([R12]), output drops to 1.96 million garments and overhead rises to US$1.38 per garment; at Garoua's 33.7 percent utilisation ([R12]), output falls to 1.35 million garments and overhead hits US$2.00 per garment; and at CICAM 2's 10.83 percent utilisation ([R12]), unit overhead reaches US$6.23 per garment, erasing the wage advantage (illustrative sensitivity calculation).

This sensitivity explains why GFT engineers production and measurement together under its **Warp and Signal** framework. [R28] [R29]

GFT NOTE

To prevent unmeasured downtime without overspending on Phase 1 software, GFT Deliverable 2 installs a 24-metric Performance-Management System (PMS) across six KPI families (Production, Quality, Delivery, Cost, People, Sustainability) tracked from Shift One in a formula-locked Excel workbook pack using strict entity IDs (`Operator_ID`, `Line_ID`, `Lot_ID`, `Defect_Code`). Deliverable 3 pairs this ledger with Day-One Tier 1A edge computer-vision inspection on fabric tables and end-of-line stations: whereas manual inspection is 60 to 70 percent accurate and misses 20 to 30 percent of defects, edge computer vision exceeds 90 percent accuracy across more than 40 defect types at line-scan speeds up to 60 metres a minute, within a fabric-defect AI market growing from US$523.4 million in 2024 to US$6,522.1 million by 2033 at 33.8 percent a year. [R28] [R29] Tier 1B machine-learning demand forecasting (which McKinsey's *The State of Fashion 2025* reports can cut inventory cost 35 to 40 percent, forecast errors 20 to 50 percent, and lost sales up to 65 percent) is gated until Month 12 once the Excel PMS ledger holds 6 to 12 months of clean order history. [R27]

5.7

Competing against the import and contraband tide on provenance, freshness and institutional reliability

Unlike East and Southern African export hubs in Kenya, Lesotho or Madagascar that rely on the United States African Growth and Opportunity Act (AGOA) third-country fabric rule, a Cameroonian venture cannot underwrite its factory on US preferences. [R18] [S11] [S12] [S24] Cameroon's AGOA eligibility was terminated effective 1 January 2020 on human-rights grounds and remained ineligible in 2025 and 2026 even as AGOA expired in September 2025 and was reauthorised only through December 2026 under Public Law 119-75. [R18] [S20] GFT therefore excludes AGOA from its base case and anchors on domestic and regional demand. [R18] [S20]

Continental textile demand reached about US$37.3 billion in 2025 and is projected to hit US$49.41 billion by 2030 at 4.73 percent a year (Mordor Intelligence) and US$72.7 billion by 2035 at 6.9 percent a year, with fashion and apparel holding 48.1 percent in 2024 (Market.us). [R24] [R25] In Cameroon, clothing and footwear expenditure stood at about US$94.70 and 8.0 pieces a person in 2024, while apparel e-commerce revenue is projected to grow at 13.41 percent a year from US$20.32 million in 2023 to US$33.61 million by 2027 as user penetration rises from 18.0 percent to 22.7 percent. [R26] Regionally, the harmonised ECCAS-CEMAC Common External Tariff (CET), approved on 18 October 2024 and effective in Cameroon on 1 January 2026, sets duty bands from 0 to 40 percent and places a 40 percent tariff wall on imported fabrics and ready-to-wear clothing across CEMAC's 63.3 million consumers and US$125.9 billion economy (where 2024 GDP grew 3.0 percent regionally, 3.5 percent in Cameroon and 3.7 percent in Chad). [S35] [S36] Meanwhile, the Cameroon-EU and Cameroon-UK Economic Partnership Agreements (reaching a 60 percent tariff reduction on third-group EU goods in August 2025, with raw materials and machinery at zero duty) lower equipment capex and grant duty-free EU and UK export access. [S32]

To avoid competing on unit price alone against contraband and used clothing, GFT sequences five market segments as shown in **Exhibit 22**, p. 86. [R18] [R23] [R26] [S32] [S34] [S35] [S36] [S0501]

EXHIBIT 22 / MARKET AND POLICY BENCHMARK

GFT's five-segment go-to-market sequence prioritises fast-turning domestic segments before regional and continental expansion

Priority tier & segment	Primary channel	Verified market or policy anchor	Margin and risk logic
Priority 1A: Traditional & occasion wear	Domestic boutiques, ateliers & direct brand	US$94.70 & 8.0 pcs/person spend in 2024 (R26); CmiA provenance (S08)	High cultural design premium; insulated from basic used-clothing price floor
Priority 1B: Urban ready-to-wear & e-commerce	Urban retail stores & mobile e-commerce	Apparel e-commerce US$20.32m (2023) to US$33.61m (2027) at 13.41%/yr (R26)	Fast cash conversion and SKU feedback loop for Month-12 ML forecasting
Priority 2A: Institutional & corporate uniforms	Direct B2B tenders (schools, utilities, security)	SND30/Camtext 60% local cotton public-procurement benchmark (S0501)	Long-run baseload line utilisation once Phase 1 First-Pass Yield >=96%
Priority 2B: CEMAC regional wholesale	Cross-border B2B distributors in 6 CEMAC states	63.3m consumers, US$125.9bn GDP (S36); 40% CET wall from 1 Jan 2026 (S35)	Zero internal CEMAC tariff plus 40% external duty shield against Asian imports
Priority 3: AfCFTA & EU/UK EPA exports	Certified export buyers (EU/UK & continental)	92.3% AfCFTA lines agreed excl. textiles (R23); EU/UK EPA + 2027 DPP (S32, S34)	Monitored expansion; requires CmiA Hard Identity Preserved lot logs for EU DPP

SOURCED [R18] [R23] [R26] [S08] [S32] [S34] [S35] [S36] [S0501] Sequenced go-to-market architecture from GFT Deliverable 1 (Cameroon Feasibility Study), matching domestic and regional demand indicators (R26, S36) with active tariff and regulatory frameworks (R18, R23, S32, S34, S35, S0501).

As **Exhibit 22**, p. 86 shows, Priority 1A (traditional and occasion wear) and Priority 1B (urban ready-to-wear and e-commerce) launch first to capture design margins and fast cash conversion. [R26] [S30] Once First-Pass Yield and On-Time In-Full delivery stabilise, Priority 2A scales B2B corporate, school and public-service uniform tenders (aligned with Cameroon's 60 percent local-cotton public apparel benchmark), while Priority 2B expands wholesale distribution across CEMAC behind the 40 percent CET wall. [S35] [S36] [S0501] Priority 3 monitors the African Continental Free Trade Area (where 92.3 percent of tariff lines are agreed but textiles remain in the unresolved 7.7 percent gap) and prepares for European exports under the 2027 EU Digital Product Passport (Regulation EU 2024/1781) by combining Cotton made in Africa (CmiA) Hard Identity Preserved traceability (covering nearly 40 percent of African cotton across 715,000 farming families and 700 supply-chain partners) with Shift-One sorting of 100 percent cotton cutting offcuts (`chutes`), modelled on the IFC-Morocco circularity roadmap (US$1.9 billion investment potential and 30,800 jobs). [R23] [S08] [S09] [S10] [S21] [S23] [S34]

5.8

The corridor-versus-north siting trade-off: Douala-Dibamba against Garoua

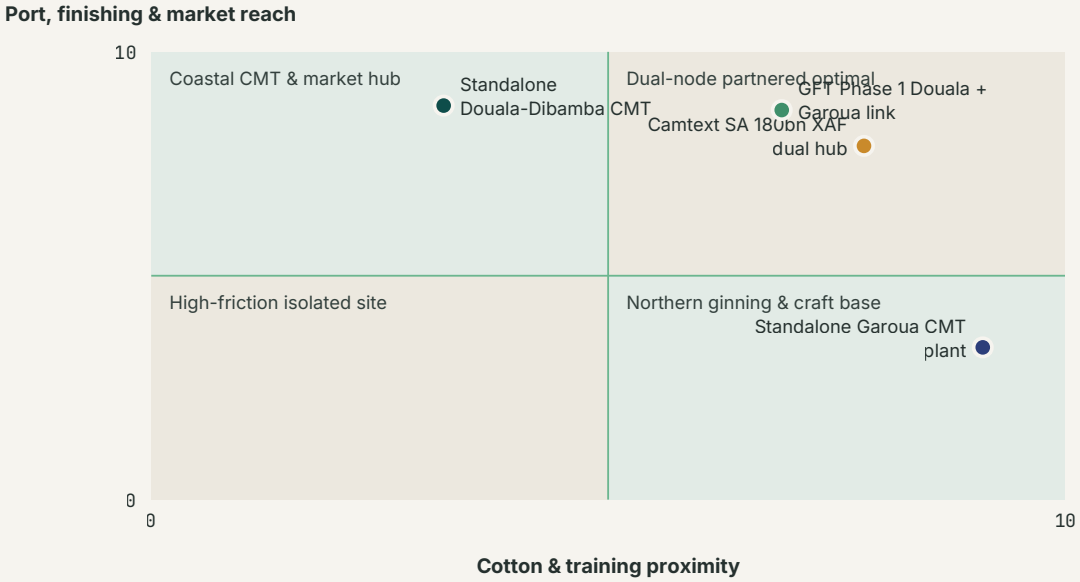
Every Cameroonian textile venture confronts the spatial trade-off between siting on the coastal Douala-Dibamba industrial corridor or in Garoua in the northern cotton belt. [R03] [R10] [S0501] Splitting a Phase 1 900-worker CMT plant across two sites separated by roughly 1,000 kilometres of road and rail (estimate) would duplicate overhead and recreate CICAM's coordination vulnerabilities. [R12] [S0504] [S0505] GFT instead evaluates both locations across seven engineering criteria before choosing a single Phase 1 plant site paired with a northern liaison node. [R03] [R10] [S31] [S32] [S33]

Garoua offers direct adjacency to SODECOTON's nine ginneries and two oil mills, Camtext SA's planned 3,000-job textile centre of excellence and garment unit, high solar irradiance, and grassroots weaving initiatives such as the Gaaraadji Training Centre in Garoua's Poumpoumre neighbourhood, which trains young women to weave local cotton thread and showcased fabrics at the 14th WTO Ministerial Conference in Yaounde. [R03] [R10] [S31] [S33] [S0501] However, because Phase 1 imports zero-duty European machinery and trims via Douala Port, partners with Dibamba's 12,000-job spinning and finishing hub, and sells primarily into coastal urban retail and CEMAC corridors, siting Phase 1 CMT in Garoua would incur roughly 2,000 kilometres of round-trip inland freight (estimate based on [R10] [R26] [S32] [S35] [S0501]).

Conversely, the Douala-Dibamba corridor offers immediate port access, proximity to Camtext SA's Dibamba fabric-finishing hub, and direct reach to Cameroon's largest urban and CEMAC markets. [R10] [R26] [S35] [S0501] Although grid outages affect 93.3 percent of surveyed Cameroonian businesses, a dry-process CMT plant in Douala-Dibamba has a modest power load that can be buffered with captive rooftop solar PV (US$691 per kilowatt installed, US$0.043 per kilowatt-hour global LCOE in 2024) and lithium iron phosphate battery storage (US$192 per kilowatt-hour after a 93 percent cost drop from US$2,571 per kilowatt-hour in 2010). [S32] [S33] **Exhibit 23**, p. 88 maps this two-dimensional siting trade-off. [R03] [R10] [S31] [S32] [S33] [S35] [S0501]

EXHIBIT 23 / COMPARATIVE SCORE (0 TO 10)

Douala-Dibamba corridor siting trades cotton-belt proximity for port access, grid density and urban market reach



DERIVED [R03] [R10] [S31] [S32] [S33] [S35] [S0501] Derived multi-criteria siting evaluation on a 0 to 10 scale from GFT Deliverable 1 (Cameroon Feasibility Study). X-axis scores proximity to SODECOTON ginneries (R03), Garoua weaving/training pipelines (S31) and northern solar resource (S33). Y-axis scores proximity to Douala Port for EPA machinery/trims (S32), Camtext Dibamba fabric finishing (R10, S0501), urban retail/B2B demand and CEMAC corridors (S35).

As **Exhibit 23**, p. 88 illustrates, a standalone Garoua CMT plant scores 9.1 on northern cotton proximity but 3.4 on port and market reach, whereas a standalone Douala-Dibamba CMT plant scores 8.8 on coastal logistics and market access but 3.2 on direct cotton-basin proximity (illustrative multi-criteria scores derived from [R03] [R10] [S31] [S32] [S35] [S0501]). Note that **Exhibit 23**, p. 88 is a structured engineering decision matrix rather than an operating measurement; binding civil, freight and utility tariffs must be confirmed during Phase 0 site due diligence.

5.9 EXECUTING THE TWO-NODE COASTAL-AND-NORTHERN OPERATING LINK

To capture the upper-right quadrant of **Exhibit 23**, p. 88 without committing US$300 million across two heavy industrial complexes ([R09]), GFT's Phase 1 architecture locates the 3.0 million garment a year CMT, edge-vision inspection and brand fulfilment plant on the Douala-Dibamba industrial corridor (adjacent to Camtext SA's 12,000-job spinning and finishing hub and Douala Port), buffered by a captive solar-plus-LFP-storage microgrid. [R10] [R29] [S32] [S33] [S0501] Simultaneously, GFT establishes a dedicated northern sourcing and artisan-weaving liaison office in Garoua that executes three operational functions from Month 1:

- **Bale-level provenance registration:** Recording CmiA-verified seed-cotton and lint lot numbers directly at SODECOTON's nine ginneries so that yarn spun at regional or Dibamba partner mills retains unbroken single-origin traceability for the 2027 European Union Digital Product Passport. [R03] [S08] [S10] [S34]

- **Technician and weaver pipeline integration:** Recruiting graduates from northern vocational initiatives, including the Gaaraadji Training Centre in Garoua's Poum-poumre neighbourhood and the planned Garoua textile centre of excellence, into GFT's four-week vestibule sewing school and ILO Better Work-modelled supervisory training track. [S29] [S31] [S0501]
- **Artisan-woven panel co-production:** Commissioning hand-woven northern cotton trim and accent panels from Garoua women's cooperatives for integration into Priority 1A traditional and occasion collections, combining industrial sewing precision in Douala with authentic northern craft value. [R26] [S31]

By uniting coastal industrial velocity with northern cotton provenance and first-shift measurement, a private Cameroonian venture can turn Central Africa's 95 to 5 processing gap into a durable, cash-generative industrial advantage. [R06] [R28]

A state megaproject measures ambition in hundreds of millions of dollars committed upfront; a resilient factory measures survival in standard minutes earned and defects caught on the first shift.

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GREEN FUTURE TECH
LIMITED / HONG KONG SAR

06

East African export zones built on third-country fabric and unilateral US preferences suffer severe shocks when eligibility is revoked

Ethiopia's Hawassa Industrial Park and Kenya's Athi River and Mombasa Export Processing Zones demonstrate both the rapid job-creation power of the AGOA Special Rule and the structural fragility of single-market assembly.

CHAPTER 06
DECISION TEST

Ethiopia's Hawassa Industrial Park and Kenya's Athi River and Mombasa Export Processing Zones demonstrate both the rapid job-creation power of the AGOA Special Rule and the structural fragility of single-market assembly.

East Africa's export-oriented garment zones prove that assembling imported Asian fabric under unilateral United States trade preferences can create tens of thousands of formal factory jobs within a few years, yet leaves host economies structurally exposed to sudden diplomatic eligibility shocks and thin domestic value retention. [S07] [S11] [S12] [S24] In Ethiopia, state-constructed industrial parks led by Hawassa Industrial Park scaled rapidly after July 2016 to employ about 25,000 workers across 52 factory sheds by early 2019 (and up to 36,000 at peak before subsequent contractions), only to suffer severe order cancellations and factory closures when the United States terminated Ethiopia's African Growth and Opportunity Act (AGOA) eligibility in January 2022. [S07] [S20] [S0601] Conversely, Kenya retained its AGOA status and exported an estimated US$470 million (KSh 60.6 billion) of apparel to the United States in 2024, supporting about 66,800 direct Export Processing Zone (EPZ) jobs, 75 percent of them held by women, and nearly 800,000 wider livelihoods. [S24] [S0603] Yet both national experiences reveal the same underlying vulnerability: when garment lines rely almost entirely on the AGOA Special Rule for third-country fabric, domestic cotton farming and spinning are bypassed, cut-make-trim (CMT) margins remain compressed, and a single foreign legislative or executive decision can render ten-year factory investments unviable overnight. [S11] [S12] [S27] For Green Future Tech (GFT) in Cameroon, which lost its own AGOA eligibility on 1 January 2020, East Africa provides empirical proof that a bankable African textile venture must never underwrite its base financial case on revocable unilateral preferences. [R18] [S20]

6.1

Ethiopia's Hawassa flagship: state-built plug-and-play sheds anchored by global brand commitments

During the decade preceding 2020, the Federal Democratic Republic of Ethiopia executed the most ambitious state-led light-manufacturing industrial park programme in Sub-Saharan Africa, positioning the textile and garment sector as a primary engine to shift the country from an agrarian economy toward lower-middle-income status by 2025. [S07] [S0602] Rather than waiting for private developers to assemble land and utilities piecemeal, the Ethiopian government established the Industrial Parks Development Corporation (IPDC) to construct specialised, export-oriented eco-industrial parks along transport corridors linking the highland interior to the port of Djibouti. [S07] The centrepiece of this strategy was Hawassa Industrial Park (HIP), inaugurated in July 2016 in Hawassa, the capital of the Southern Nations, Nationalities, and Peoples' Region (SNNPR), a lakeside city of roughly 300,000 inhabitants. [S07]

6.2 TURNKEY INFRASTRUCTURE AND GLOBAL ANCHOR-TENANT RECRUITMENT

Hawassa Industrial Park was engineered to remove the physical infrastructure bottlenecks that typically stall greenfield African manufacturing ventures. [S07] The state financed and built plug-and-play factory sheds equipped with pre-installed electrical connections fed by low-cost national hydroelectricity (priced near US$0.03 to US$0.04 per kilowatt-hour), alongside a centralised zero-liquid-discharge (ZLD) effluent treatment plant capable of recycling process wastewater from textile dyeing

and washing. [S07] [S11] To solve administrative friction, the park integrated a one-stop government service centre housing customs clearance, visa processing, tax administration, and banking inside the perimeter fence. [S07]

Crucially, Ethiopian industrial planners co-designed the park around the technical, environmental, and social compliance standards of a major international apparel buyer, PVH Corp. (owner of Calvin Klein and Tommy Hilfiger), which committed to act as anchor tenant. [S07] By guaranteeing international fire-safety norms, building structural integrity, and zero-liquid-discharge wastewater treatment, Ethiopia persuaded PVH and 18 transnational textile and garment manufacturers from Asia, Europe, and North America (including suppliers from China, India, Sri Lanka, Indonesia, Taiwan, and Hong Kong SAR) to lease all 52 factory sheds in Phase I. [S07] By early 2019, less than three years after opening, Hawassa Industrial Park had hired approximately 25,000 workers across those 52 sheds, while subsequent evaluations recorded peak employment reaching roughly 36,000 workers before external shocks intervened. [S07] [S0601] At full double-shift utilisation, the government projected that Hawassa would employ 60,000 workers (with long-term master-plan visions cited up to 90,000) and generate US$1 billion a year in clothing exports, including US$100 million annually for PVH brands. [S07] [S0601]

From an engineering standpoint, Hawassa's turnkey model lowered the capital-expenditure barrier for foreign suppliers while transferring infrastructure debt onto the sovereign balance sheet. [S07] A transnational garment maker entering Hawassa shipped containerised sewing machines, spreading tables, and cutters through Djibouti, bolted them to the floor of a leased IPDC shed, and started training operators within weeks. [S07] Because the tenant's fixed asset footprint consisted mainly of portable sewing machines rather than immovable spinning frames or dye boilers, factories remained footloose if tariff or security conditions deteriorated. [S07] [S12] [S0601]

6.3 CENTRALISED RURAL LABOUR MOBILISATION THROUGH THE HIPSTER SCHEME

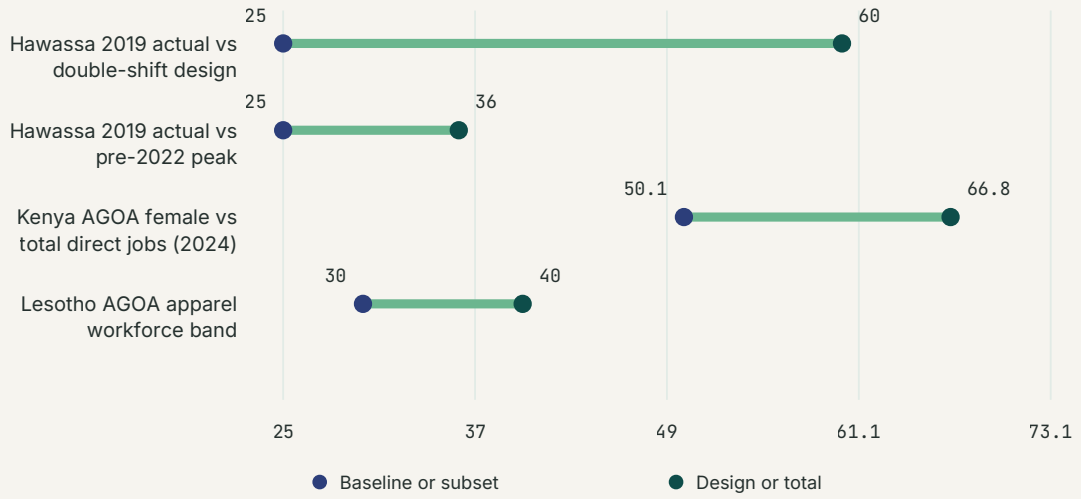
Because Hawassa was a regional city of 300,000 residents with virtually no pre-existing industrial garment workforce, staffing 52 export sheds required mobilising first-generation factory workers from surrounding rural districts across SNNPR and Oromia. [S07] To prevent gate-recruitment chaos and inter-firm poaching, the Ethiopian government, the Regional Bureau of Trade and Industry, the UK-funded Enterprise Partners programme, and the Hawassa Investors' Association established the Hawassa Industrial Park Sourcing and Training Employees in the Region (HIPSTER) scheme. [S07]

Under HIPSTER, regional woreda (district) administrations advertised park jobs across rural villages, targeting young women aged 18 to 35 with eighth-grade or tenth-grade schooling. [S07] Candidates underwent medical checks, manual dexterity assessments, and literacy verification before receiving soft-skills orientation covering industrial timekeeping, hygiene, workplace rights, and urban living, creating a rural-migrant workforce in which women accounted for 84.8 percent of production operators. [S07] As **Exhibit 24**, p. 94 illustrates, Ethiopia's mobilisation at Hawassa and

Kenya's private Export Processing Zone growth both achieved massive female employment scale, yet their trajectories diverged once Ethiopia's US preference was severed in 2022. [S07] [S20] [S24]

EXHIBIT 24 / THOUSAND DIRECT WORKERS

Ethiopia's Hawassa Industrial Park and Kenya's EPZ apparel hub diverge sharply after the 2022 AGOA eligibility split



SOURCED [S07] [S12] [S24] [S0601] Compares documented workforce milestones in thousand direct jobs: Hawassa early-2019 employment (25.0k) against double-shift design capacity (60.0k, S07); Hawassa early-2019 employment (25.0k) against pre-shock peak (36.0k, S07, S0601); Kenya AGOA female direct jobs (50.1k, 75% share) against total direct AGOA apparel jobs in 2024 (66.8k, S24); and Lesotho AGOA garment employment range (30.0k to 40.0k, S12).

While **Exhibit 24**, p. 94 highlights the speed at which turnkey sheds and buyer commitments can assemble a 25,000 to 66,800 worker base, headcount figures alone cannot establish whether the underlying business model is self-sustaining. [S07] [S24] In Ethiopia, both sovereign debt service on park bonds and tenant operating margins depended on a single external policy pillar: duty-free entry into the United States under AGOA. [S11] [S20] [S0601]

6.4

The January 2022 AGOA termination shock: why unhedged US export reliance broke the Hawassa model

The commercial logic that attracted Asian and Middle Eastern garment suppliers to Hawassa, Bole Lemi, Adama, and Mekelle industrial parks was an arbitrage equation built on three variables: low nominal base wages (initially around US$26 a month at entry), heavily subsidised hydropower electricity, and duty-free, quota-free access to the United States market under AGOA. [S07] [S11] [S20] Because the United States levies high Most-Favoured-Nation (MFN) customs duties on imported apparel, ranging from roughly 15 percent on cotton woven trousers and shirts to 28 to 32 percent on man-made fibre knitwear and activewear (estimate based on US Harmonized Tariff Schedule Chapter 61 and 62 bands and UNCTAD trade-weighted tariff ana-

lysis), AGOA's zero-duty preference provided Ethiopian sheds with a 15 to 32 percentage-point landed-cost shield over competitors in China, Bangladesh, Viet Nam, and Cambodia. [S11] [S12]

6.5 ANATOMY OF A UNILATERAL PREFERENCE REVOCATION

Under the AGOA statute enacted by the United States Congress in 2000 (Title I of the Trade and Development Act of 2000, P.L. 106-200), country eligibility is not a negotiated bilateral treaty right; it is a unilateral privilege reviewed annually by the President of the United States based on statutory political, economic, labour, and human-rights criteria. [R18] [S11] [S20] Following the outbreak of armed conflict in northern Ethiopia in November 2020 and subsequent findings by the United States government regarding gross violations of internationally recognised human rights, Washington terminated Ethiopia's designation as an AGOA beneficiary country effective 1 January 2022. [S20] [S0601] According to Congressional Research Service Report IF10149, Ethiopia remained among the 17 Sub-Saharan African countries ineligible for AGOA in calendar year 2025, alongside Cameroon (terminated effective 1 January 2020 on human-rights grounds), Mali, Burkina Faso, Guinea, Gabon, Niger, and Uganda. [R18] [S20]

The operational impact inside Ethiopia's export industrial parks was immediate and severe. [S0601] Because transnational suppliers inside Hawassa had leased sheds specifically to fulfil United States retail orders for PVH, H&M, JCPenney, and Gap using imported Asian cloth, the sudden imposition of full MFN customs duties erased the cost advantage of manufacturing in landlocked Ethiopia overnight. [S07] [S12] [S0601] Worse still, the AGOA termination coincided with post-pandemic ocean freight disruptions, Red Sea shipping security surcharges, and foreign-exchange shortages in the Ethiopian banking system. [S0601] Global brands shifted purchase orders out of Hawassa toward AGOA-eligible East African facilities in Kenya and Madagascar or back to Asian hubs. [S24] [S26] [S0601]

6.6 WHY PROMISED DOMESTIC COTTON LINKAGE FAILED TO MATERIALISE BEFORE THE SHOCK

When Ethiopia launched its industrial park strategy, policymakers anticipated that foreign garment assemblers would initially import fabric under AGOA's third-country fabric rule and progressively shift to Ethiopian-grown cotton spun and woven inside the park's integrated textile mills. [S07] In practice, backward integration lagged far behind downstream sewing capacity because domestic seed-cotton output, ginning consistency, and lint grading could not match the volume, staple uniformity, or trade-credit terms required by export spinning and weaving halls. [S07] [S0601]

Consequently, even integrated fabric mills inside Hawassa imported a large share of their lint and dyes from abroad, while CMT sheds imported finished fabric rolls from Asia via the Port of Djibouti. [S07] [S11] Hauling containerised fabric roughly 750 to 900 kilometres inland from Djibouti to Hawassa (estimate based on the Ethio-Djibouti corridor) and trucking finished cartons back added weeks to order cycle times; once the 15 to 32 percent AGOA tariff shield vanished in January 2022, that corridor penalty became uncompetitive. [S07] [S12] [S20] [S0601] Surviving sheds shed thousands of workers and lobbied to sell into the domestic market and bid on state uniform contracts. [S0601] As Professors Carlos Oya and Florian Schaefer documented in their

2024 evaluation for Better Work, employment at Hawassa, which had climbed to 36,000 by 2019 on a plan toward 90,000, declined below its starting phase levels. [S0601]

> **WARNING**
>
> **Unhedged single-market preference risk:** When an industrial park or factory is engineered exclusively to arbitrage a unilateral foreign tariff preference (such as AGOA) using imported third-country fabric, the project carries binary political risk. If the preference-granting state suspends country eligibility over diplomatic, governance, or human-rights disputes, the factory loses its entire gross margin overnight while still owing hard-currency debt service on imported machinery and long-term lease obligations. [R18] [S12] [S20]

6.7

Agrarian-to-industrial workforce friction: lessons from ILO and World Bank evaluations in Ethiopia

Even before the January 2022 AGOA suspension, Ethiopia's export zones exposed a second structural flaw in the low-wage enclave model: pricing entry factory wages below the urban subsistence floor creates crippling labour turnover and absenteeism that destroy sewing-line efficiency. [S07] [S0601] When investment promotion agencies marketed Ethiopia between 2014 and 2018, promotional materials emphasised base operator wages of roughly US$26 a month, less than a seventh of Cambodia's US$204 monthly garment minimum wage and barely a third of Cameroon's statutory minimum wage (SMIG) of XAF 43,969 (about US$76 a month as of February 2024). [R14] [R17] [S07]

6.8 THE HIDDEN COST OF SUB-SUBSISTENCE WAGES IN HAWASSA

World Bank community impact evaluations of Hawassa Industrial Park (Report 24753, February 2019) and subsequent International Labour Organization (ILO) assessments under the SIRAYE and Vision Zero Fund programmes revealed how this ultra-low nominal wage backfired on the shop floor. [S07] [S0601] [S0602] Young women recruited via HIPSTER from rural farming families in SNNPR and Oromia arrived in Hawassa with no savings and rented rooms in informal compounds lacking piped water or secure transport, while rapid urban influx drove up rents, food prices, and minibus fares beyond their monthly take-home pay. [S07] [S0601]

The industrial engineering consequence was severe workforce churn. [S07] [S0601] A new recruit from an agrarian background requires three to six months of daily practice on lockstitch or overlock machines to climb from an initial greenfield efficiency of 25 to 35 percent of Standard Allowed Minutes (SAM) toward the 65 to 75 percent efficiency required for export profitability (illustrative learning curve benchmarked on S07 and S29). In a progressive bundle line of 35 to 45 sequential workstations, overall throughput is governed by the slowest bottleneck station: when experienced operators quit over sub-subsistence pay and are replaced by beginners running at 30 percent SAM efficiency, bundles pile up behind the novices and drag Overall Equipment Effectiveness (OEE) down regardless of how low the nominal wage

appears (illustrative mechanism benchmarked on R28, S07, and S29). Prior to ILO intervention, weak union representation inside the parks left workers with few grievance channels other than wildcat strikes and courtyard stoppages. [S0601]

6.9 THE ILO SIRAYE AND VISION ZERO FUND "MODEL OF SHARED RESPONSIBILITY"

To stabilise Ethiopia's textile and garment workforce, the ILO launched the comprehensive **SIRAYE** ("One ILO") programme in 2019, pooling Better Work, SCORE, LABADMIN/OSH, and the **Vision Zero Fund (VZF)** across national, regional, and factory levels. [S0601] [S0602] The Vision Zero Fund worked inside Ethiopian garment hubs to eliminate work-related injuries and illnesses, supporting 235 factories in establishing occupational safety and health (OSH) taskforces, upgrading ventilation and ergonomics, strengthening the labour inspectorate, and reforming the Employment Injury Insurance system. [S0602]

Simultaneously, Better Work deployed its Supervisory Skills Training (SST) and Women's Leadership Development curriculum inside participating Ethiopian factories while facilitating constructive unionisation dialogues. [S29] [S0601] Globally, across more than 5,850 trained supervisors in seven garment-producing countries, Better Work's three-day interactive Supervisory Skills Training lifts sewing-line productivity by 22 percent and reduces time-to-target by 18 percent. [S29] In Ethiopia, the 2024 SOAS and King's College London evaluation found that factories participating in SIRAYE achieved stronger compliance, lower workplace conflict, and higher resilience because management kept trained operators healthy, union-represented, and at their machines. [S0601]

> **GFT NOTE**
>
> **Why GFT rejects minimum-wage arbitrage in Cameroon:** Ethiopia's Hawassa experience proves that setting factory pay at the bare statutory minimum creates a false economy of high attrition, wildcat stoppages, and perpetual 35 percent line efficiency. [S07] [S0601] In Cameroon, while the statutory minimum wage (SMIG) stands at XAF 43,969 a month (about US$76) following the 5 percent increase on 23 February 2024, the average formal-sector salary across the economy is about US$359 a month, and roughly 90 percent of the national labour force works in the informal sector. [R14] [R15] [R16] In Deliverable 1 (Feasibility Study) and Deliverable 2 (Performance-Management System), GFT budgets realistic formal factory wage bands well above the SMIG, enforces the Cameroonian Labour Code's 40-hour standard workweek (48-hour maximum with overtime paid at 1.2 times base pay), runs a four-week pre-production vestibule training school, and tracks operator attendance, turnover, training hours, and Lost-Time Injury Frequency Rate (LTIFR) weekly under the People KPI family. [R14] [R15] [R16]

6.10

Kenya's Export Processing Zone resilience: US$470 million in AGOA apparel exports and 66,800 direct jobs

While Ethiopia's state-park model faltered after its January 2022 AGOA suspension, neighbouring Kenya consolidated its position as East Africa's premier United States-facing garment exporter. [S20] [S24] Operating primarily out of Export Processing Zones (EPZs) in Athi River (near Nairobi), Mombasa, Kilifi, and Ruaraka under the oversight of the Export Processing Zones Authority (EPZA), Kenya's apparel industry has weathered global demand swings for over two decades by pairing private zone management with deep integration into United States retail supply chains. [S24] [S0603]

6.11 QUANTIFYING KENYA'S 2023 TO 2024 AGOA EXPORT REBOUND

Official data from the Kenya National Bureau of Statistics (KNBS) 2025 Economic Survey and the Ministry of Investments, Trade and Industry confirm the macroeconomic weight of Kenya's export garment cluster. [S24] [S0603] Apparel accounts for roughly 70 percent of Kenya's total exports to the United States under AGOA. [S0603] After a global inventory correction in 2023, when Kenyan AGOA apparel exports stood at KSh 50.8 billion, the sector rebounded by 19 percent in 2024 to reach KSh 60.6 billion, equivalent to an estimated US$470 million in annual export revenue. [S24] [S0603]

In employment terms, Kenya's AGOA apparel factories supported approximately 66,800 direct formal jobs in 2024, with women holding 75 percent (roughly 50,100) of all factory positions, while sustaining nearly 800,000 livelihoods nationwide across logistics, packaging, catering, and transport. [S24] Unlike Ethiopia's single-park concentration in Hawassa, Kenya's EPZ footprint spans both coastal zones around the Port of Mombasa and inland zones around Nairobi and Athi River connected by the Mombasa-Nairobi Standard Gauge Railway (SGR). [S24] [S0603] Coastal Mombasa factories enjoy zero inland rail haulage on imported Asian fabric containers, while Athi River factories draw on Greater Nairobi's deep pool of seasoned industrial sewing machinists and line supervisors trained since the early 2000s, allowing Kenyan lines to absorb orders displaced from Ethiopia after 2022. [S20] [S24] [S0601]

6.12 LEGISLATIVE RENEWAL CLIFFS AND CAPEX HESITATION

Despite Kenya's strong operational execution, its heavy concentration in the United States market exposes the sector to recurring legislative renewal cliffs in Washington. [S20] [S24] When the previous ten-year extension of AGOA (P.L. 114-27) expired on 30 September 2025, exporters faced months of tariff uncertainty until Congress passed Section 5019, Division I of the Consolidated Appropriations Act, 2026 (P.L. 119-75) on 3 February 2026, reauthorising AGOA through 31 December 2026 retroactively from September 2025, followed by legislative steps in late 2026 advancing two-year extension commitments through December 2028. [S20] [S24] [S0603] While the Kenya Private Sector Alliance (KEPSA) welcomed these extensions as a vital trade lifeline, KEPSA emphasised that short one-to-two-year preference extensions cannot underwrite long-term capital expenditure in upstream spinning, weaving, and dyeing mills requiring eight-to-twelve-year payback horizons. [R10] [S20] [S24] [S0603]

6.13

The third-country fabric trap in Kenya: high export volume paired with minimal local cotton uptake

To understand why Kenya can export US$470 million of garments a year while its domestic cotton-farming and spinning sectors remain stagnant, one must examine the statutory mechanics of the **AGOA Special Rule for Lesser-Developed Beneficiary Countries (LDBCs)**. [S11] [S24] Under standard AGOA textile rules summarized by the U.S. Department of Commerce Office of Textiles and Apparel (OTEXA), duty-free apparel entry requires yarn and fabric formed either in the United States or in eligible African beneficiary countries. [S11] However, Congress carved out the Special Rule for LDBCs, defined as Sub-Saharan African countries with a 1998 per capita gross national product below US$1,500 as measured by the World Bank (which includes almost all eligible beneficiaries except South Africa). [S11]

EXHIBIT 25 /

The AGOA Special Rule routes Asian fabric through East African EPZ sewing lines to US retail, bypassing domestic African cotton growers



1. Over 95% of EPZ fabric
2. Buyer-nominated cloth
3. Single transformation
4. Low volume and credit gap

SOURCED [S11] [S12] [S24] [S27] [S0603] Illustrates the material and customs architecture of the AGOA Special Rule for Lesser-Developed Beneficiary Countries (S11, S24, S0603) contrasted with the disconnected domestic cotton circuit documented in UNCTAD rules-of-origin studies (S12, S27).

As shown in **Exhibit 25**, p. 99, the AGOA Special Rule permits factories in Kenya, Lesotho, and Madagascar to import yarn and fabric from **anywhere in the world**, perform a single transformation (cutting and sewing inside the EPZ), and export finished

clothing to the United States duty-free. [S11] [S24] [S27] [S0603] While **Exhibit 25**, p. 99 maps the legal routing of inputs, the reason local mills fail to win EPZ orders lies in working-capital finance, fabric variety, and buyer nomination. [S11] [S21]

6.14 WHY BUYER FABRIC NOMINATION LOCKS OUT DOMESTIC GINNERIES AND SPINNERS

In global apparel supply chains serving mass-market American retailers, the brand or its buying agent exercises **fabric nomination**, negotiating bulk contracts with accredited mega-mills in China, India, or Pakistan that guarantee shade continuity across millions of yards, synthetic-blend innovations, and 60-to-90-day supplier credit. [S11] [S21] [S24] By contrast, Kenya's domestic cotton sector operates at a fraction of its potential, leaving local ginneries and spinners unable to match Asian fabric width, finish diversity, or credit terms. [S24] Consequently, less than 5 percent (under a twentieth, estimate consistent with EPZA and KNA sector reporting) of the fabric sewn inside Kenya's EPZs is spun or woven domestically. [S24] [S0603] The same pattern holds in Madagascar, where Zone Franche factories imported US$104.6 million of cotton fabrics and US$23.4 million of yarns in 2024 against just US$2.6 million in fabric exports. [S26]

6.15 EMPIRICAL FINDINGS FROM UNCTAD ON SINGLE VERSUS DOUBLE TRANSFORMATION

In its *Economic Development in Africa Report 2019: Made in Africa – Rules of Origin for Enhanced Intra-African Trade*, UNCTAD reviewed the empirical evidence (including De Melo and Portugal-Perez 2013, and De Melo and Tsikata 2015) comparing the AGOA single-transformation Special Rule against European Union Everything But Arms (EBA) and Economic Partnership Agreement (EPA) double-transformation rules. [S27] Relaxing rules of origin to single transformation triggered an immediate multi-fold surge in LDC apparel exports and female sewing employment, but UNCTAD's 2026 analysis warns that after 25 years under the third-country fabric waiver, single-transformation enclaves in Kenya and Lesotho capture only 20 to 30 percent of free-on-board (FOB) export value locally while 70 to 80 percent flows back out to foreign fabric mills and logistics providers (illustrative value-retention bridge derived from S12, S24, S27). [S12] [S27]

6.16

Margin compression and unit-value squeeze in pure CMT assembly

Operating as a pure cut-make-trim (CMT) contractor on buyer-nominated Asian fabric also places the individual factory on a razor-thin financial margin, since the foreign buyer fixes both inbound fabric pricing and outbound FOB garment pricing, leaving the factory a narrow fee to cover wages, power, logistics, and overhead. [S12] [S21]

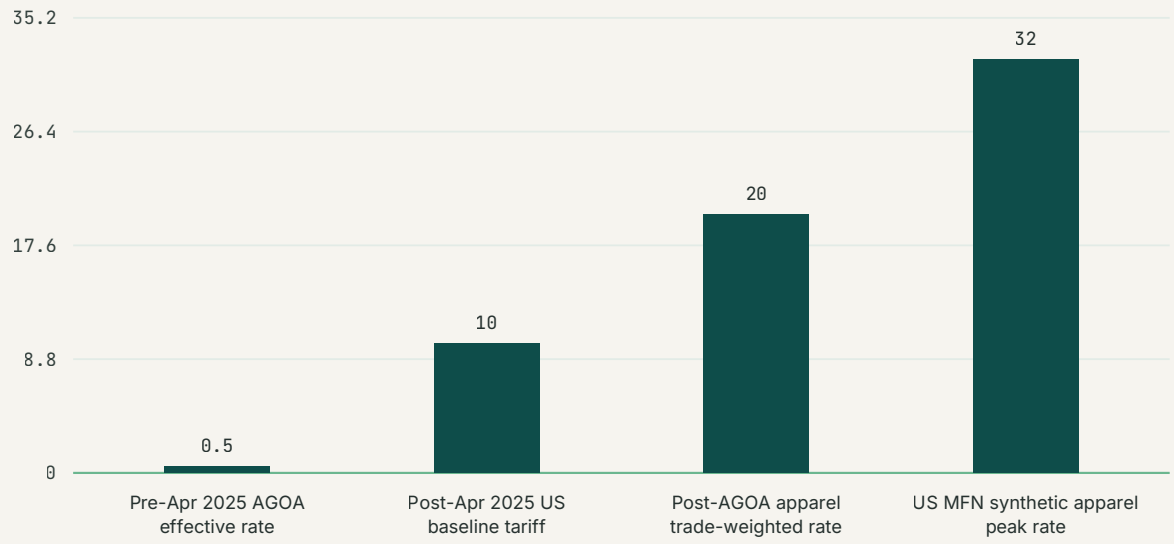
6.17 THE 2025 TO 2026 US TARIFF SHIFTS AND UNCTAD'S TARIFF-DOUBLING WARNING

In its 2026 assessment (*AGOA expiry impact on African export diversification*), UNCTAD documented that prior to April 2025, African exporters under AGOA faced an average effective U.S. tariff below 0.5 percent. [S12] Following new U.S. baseline tariffs introduced in April 2025, average duties across AGOA countries rose to roughly 10 per-

cent, and UNCTAD calculated that without AGOA preferences, trade-weighted U.S. tariffs on apparel-specialised LDCs such as Lesotho, Kenya, and Madagascar more than double to **20 percent or higher**. [S12]

EXHIBIT 26 / PERCENT TARIFF RATE

Without AGOA preferences, trade-weighted US tariffs on African apparel exporters jump to 20 percent or higher



SOURCED [S11] [S12] [S20] Compares average effective US tariff rates on AGOA beneficiaries prior to April 2025 (<0.5%, plotted at 0.5%), the post-April 2025 baseline increase (10.0%), the post-AGOA expiry trade-weighted tariff for apparel-specialised LDCs such as Lesotho and Kenya (20.0%+, S12), and the top US MFN duty band on man-made fibre apparel (32.0%, S11, S12).

As **Exhibit 26**, p. 101 demonstrates, losing duty-free status subjects African apparel shipments to a 10 to 32 percent customs wall at United States ports. [S11] [S12] While **Exhibit 26**, p. 101 records macro tariff rates, translating those rates into unit-garment cash flow explains why single-market CMT plants collapse when eligibility is revoked. [S12] [S20]

METHOD

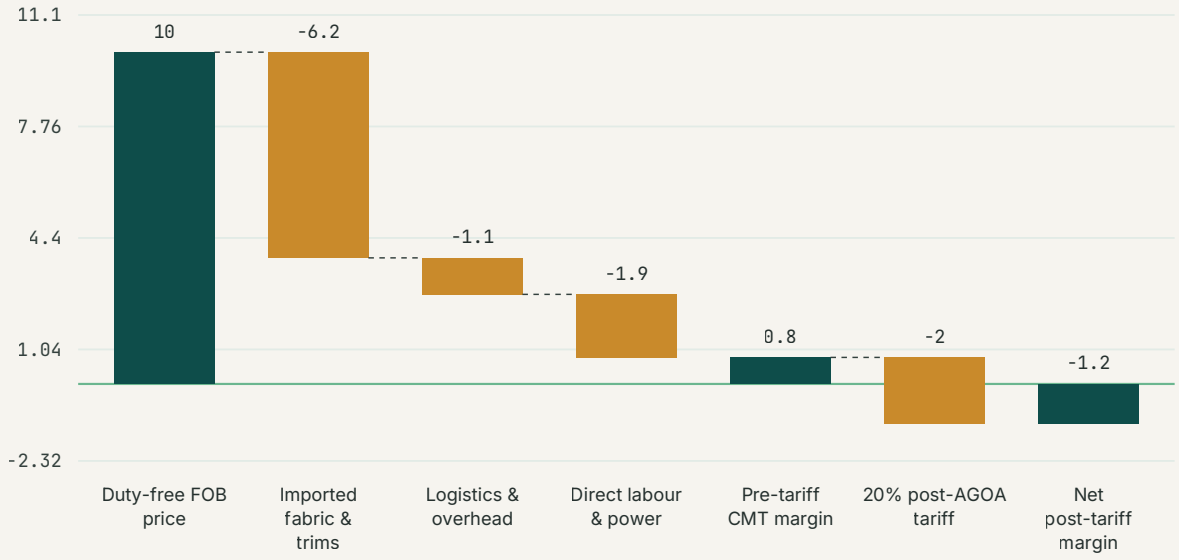
Unit-economics boundary for an East African EPZ garment exporter: GFT models the Free-On-Board (FOB) cost structure of a standard export garment shipped from an East African EPZ to a U.S. port at an illustrative benchmark price of **US$10.00 FOB per unit**: imported third-country fabric and trims represent 62 percent (US$6.20), corridor logistics and overhead represent 11 percent (US$1.10), direct factory labour and utilities represent 19 percent (US$1.90), and pre-tariff factory operating margin (EBITDA) is 8 percent (US$0.80 per unit). When a 20 percent U.S. tariff (US$2.00 per unit) is imposed upon preference revocation, the duty is levied on the **entire US$10.00 FOB value** (including the US$6.20 of Asian fabric), not merely on the US$2.70 of local conversion value. [S11] [S12] [S24]

WORKED EXAMPLE

Arithmetic of a 20 percent tariff shock on a 3.0 million piece EPZ order book: Consider an illustrative East African EPZ factory producing **3,000,000 garments a year** (matching GFT's reference scale) at **US$10.00 FOB per unit** (**US$30,000,000** annual revenue). [S12] [S24] 1. **Duty-free AGOA baseline:** Per garment, imported Asian fabric and trims cost **US$6.20**, logistics and overhead cost **US$1.10**, and direct labour and power cost **US$1.90** (total cost **US$9.20**), leaving an operating margin of **US$0.80 per unit** (8.0 percent), or **US$2,400,000 a year** (illustrative calculation). 2. **Impact of a 10 percent baseline tariff (April 2025 regime):** A 10 percent duty adds **US$1.00 per unit**. [S12] Under a 50/50 buyer-supplier discount split (**-US$0.50** FOB), unit margin falls from US$0.80 to **US$0.30** (3.16 percent), cutting annual EBITDA by **62.5 percent** to **US$900,000** (illustrative calculation). 3. **Impact of AGOA revocation or expiry (20 percent trade-weighted tariff):** A 20 percent tariff adds **US$2.00 per unit**. [R18] [S12] [S20] Even if the buyer absorbs half (US$1.00), the factory's unit margin drops to **-US$0.20** (**-US$600,000** annual loss); if forced to absorb the full **-US$2.00** duty to match Asian landed prices, the factory loses **-US$1.20 per unit** (**-US$3,600,000 a year**), forcing immediate closure. [S12]

EXHIBIT 27 / US$ PER GARMENT (ILLUSTRATIVE US$10.00 FOB)

A 20 percent US tariff shock on full FOB value wipes out the 8 percent operating margin of an imported-fabric CMT factory



DERIVED [S11] [S12] [S20] [S24] Derived from the worked example in the text using an illustrative US$10.00 FOB export garment sewn from imported Asian fabric under the AGOA Special Rule (S11, S24) and subjected to the 20% post-AGOA trade-weighted US tariff rate documented by UNCTAD (S12, S20). Shows full tariff incidence on unit operating margin.

The waterfall in **Exhibit 27**, p. 102 exposes the mathematical trap of single-transformation assembly: because U.S. customs duties apply to the full US$10.00 FOB price rather than the US$2.70 African value added, a 20 percent tariff (US$2.00) equals **74.1 percent** of the entire local conversion and margin pool (illustrative calculation). [S11] [S12] While **Exhibit 27**, p. 102 is an illustrative unit-cost bridge rather than a single firm's audit, it explains why tenant factories exited Hawassa rapidly after January 2022. [S07] [S20] [S0601]

6.18

Comparative takeaway for GFT: never build the base case on a revocable unilateral preference

Surveying the continental map of AGOA eligibility in 2025 and 2026 in Congressional Research Service Report IF10149 and GFT's evidence register shows that 17 of 49 Sub-Saharan African countries sit outside the AGOA preference system, while AfCFTA textile rules of origin remain unresolved. [R18] [R23] [S11] [S20] [S21]

EXHIBIT 28 /

AGOA eligibility, fabric rules and strategic market anchors across major African cotton and apparel economies (2025 to 2026)

Economy	2025 to 2026 AGOA status	Third-country fabric waiver	Primary market anchor & workforce scale
Cameroon	Ineligible (terminated 1 Jan 2020, human rights)	No (ineligible)	Domestic & CEMAC bloc under 40% CET (2026); 340,000 t seed cotton
Ethiopia	Ineligible (terminated 1 Jan 2022, human rights)	No (ineligible)	Hawassa 25,000 to 36,000 peak workers; forced pivot to domestic market
Kenya	Eligible (renewed via P.L. 119-75)	Yes (LDBC Special Rule)	US$470m US AGOA exports (70% of US trade); 66,800 direct EPZ jobs
Lesotho	Eligible (renewed via P.L. 119-75)	Yes (LDBC Special Rule)	US AGOA accounts for ~1/3 of national exports; 30,000 to 40,000 jobs
Madagascar	Eligible (suspended 2009 to 2015, restored)	Yes (LDBC Special Rule)	Dual EU EPA (#1 in SSA) & US AGOA (#2 in SSA); 180,000 formal jobs
Benin & Togo	Eligible (Mali & Burkina Faso ineligible)	Yes (paired with local lint)	Integrated SEZs (GDIZ 40,000 t lint, PIA) targeting EU EBA, US & ECOWAS
South Africa	Eligible (subject to congressional review)	No (excluded by GNP rule)	Domestic R-CTFL Master Plan 2030 (65% local retail share, 333,000 jobs)

SOURCED [R18] [S04] [S07] [S11] [S12] [S14] [S17] [S20] [S24] [S26] [S35] Compiled from CRS Report IF10149 (S20), OTEXA AGOA summary (S11), UNCTAD (S12), KNA (S24), Trade.gov Madagascar (S26), GDIZ/PIA disclosures (S04, S14), South Africa dtic/InvestSA (S17), CNCC Cameroon CET notice (S35) and GFT evidence R18.

6.19 WHY CAMEROON'S 2020 AGOA EXIT MIRRORS ETHIOPIA'S 2022 SHOCK

As **Exhibit 28**, p. 103 shows, Cameroon's AGOA beneficiary status was terminated effective 1 January 2020 over human-rights concerns, and Cameroon remained ineligible in 2025 and under the February 2026 P.L. 119-75 reauthorisation alongside Ethiopia, Mali, and Burkina Faso. [R18] [S02] [S20] Even Rwanda saw its duty-free apparel benefits suspended in July 2018 after raising tariffs on imported used clothing (*mitumba*). [S20] While **Exhibit 28**, p. 103 records legal status as of 2025 to

2026 rather than predicting future diplomacy, it establishes an ironclad capital-budgeting rule: **unilateral foreign trade preferences are policy variables, not bankable commercial assets.** [R18] [S20]

6.20 HOW EAST AFRICA'S LESSONS SHAPE GFT'S CAMEROON FEASIBILITY, PMS, AND DIGITAL ARCHITECTURE

Synthesising the empirical record of Ethiopia's Hawassa Industrial Park and Kenya's Export Processing Zones directly validates five core design decisions across Green Future Tech's three-part Cameroon textile programme (prepared 31 January 2024, sources refreshed 2026): [R18] [S07] [S24]

1. **Zero AGOA reliance in the base financial case (Deliverable 1, Feasibility Study):** Because Cameroon has been ineligible for AGOA since 1 January 2020, GFT excludes United States duty-free access completely from its base-case financial plan. [R18] [S20] Instead, GFT anchors Phase 1 capacity (an illustrative nameplate of 3.0 million garments a year and roughly 900 workers, both estimates) on domestic Cameroonian demand (where consumer spending stood at about US$94.70 and 8.0 pieces per person in 2024, alongside apparel e-commerce rising at 13.41 percent a year from US$20.32 million in 2023 to US$33.61 million by 2027) and the six-nation CEMAC regional market of 63.3 million consumers and US$125.9 billion GDP protected by a 40 percent Common External Tariff effective 1 January 2026. [R26] [S35] [S36]
2. **Treat bilateral EU and UK Economic Partnership Agreements as the export bridge:** Cameroon's ratified Economic Partnership Agreements with the European Union (2014) and United Kingdom (2021) grant duty-free export access alongside zero customs duty on imported European industrial machinery. [S32] Partnering with SODECOTON (supporting over 220,000 growers with about 340,000 tonnes of seed cotton in 2024 and over 350,000 tonnes projected in 2025) and the US$300 million Camtext SA pole at Dibamba and Garoua satisfies double-transformation origin rules for European and future AfCFTA exports. [R01] [R02] [R03] [R09] [R10] [R23] [S21] [S32]
3. **Avoid the third-country fabric trap without taking on US$300 million in Day-1 mill debt:** Rather than relying permanently on imported Asian cloth like Kenyan EPZs or carrying unmeasured multi-plant state overhead like CICAM (whose market share fell from 85 percent to 5 percent with July 2023 plant utilisation between 10.83 and 48.9 percent), GFT enters in Phase 1 at a capital-disciplined CMT, finishing, and brand scale paired with upstream domestic yarn and fabric partnerships. [R03] [R09] [R10] [R11] [R12] [S24]
4. **Institutionalise living formal wages, vestibule training, and female supervisor promotion (Deliverable 2, Performance-Management System):** Learning from Hawassa's attrition crisis and ILO SIRAYE / Better Work evaluations, GFT budgets competitive formal wages above the XAF 43,969 SMIG, runs a four-week vestibule dexterity school, and applies the Better Work Supervisory Skills Training model (+22 percent productivity lift) while tracking weekly People KPIs. [R14] [R15] [S07] [S29] [S0601]
5. **Deploy Day-One shop-floor measurement and Edge Vision QC to protect conversion margins (Deliverable 3, Digital and AI Strategy):** To prevent manual inspection leakage (only 60 to 70 percent accurate) and inventory waste, GFT

installs its 24-metric Excel KPI ledger and Tier 1A edge computer-vision inspection (>90 percent accuracy across 40+ defect types at 60 metres a minute) from Shift One, gating Tier 1B machine-learning demand forecasting (-20 to 50 percent forecast error, -35 to 40 percent inventory cost) to Month 12. [R27] [R28] [R29] Readers can test these trade-offs in GFT's **Market-Access Route Mapper** (`market-access`) and **Garment Unit-Economics Simulator** (`unit-economics`), and in Chapter 09 and White Paper 08 (*Access Is a Policy, Not a Market*). [R18] [S20]

This comparative analysis is prepared by Green Future Tech Limited for industrial research and planning purposes only and does not constitute investment, legal, customs, or tax advice.

A tariff preference granted by a foreign legislature is a weather forecast, not a foundation: build the factory on domestic fibre, regional treaty walls, and measured shop-floor efficiency, so that any external preference is a windfall rather than a lifeline.

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GREEN FUTURE TECH
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07

Indian Ocean and Southern African clusters survive preference erosion only when they pair skilled assembly with regional fabric or retailer commitments

Madagascar and Mauritius hedge US exposure through European Economic Partnership Agreements and regional yarn integration, while South Africa's R-CTFL Master Plan 2030 anchors factories on domestic retail chains. [S13] [S17] [S26]

CHAPTER 07
DECISION TEST

Madagascar and Mauritius hedge US exposure through European Economic Partnership Agreements and regional yarn integration, while South Africa's R-CTFL Master Plan 2030 anchors factories on domestic retail chains. [S13] [S17] [S26]

Indian Ocean and Southern African textile clusters prove that garment assembly survives unilateral trade preference shocks only when factories pair skilled sewing lines with multi-market rules of origin, regional yarn and fabric co-production, or domestic retail procurement compacts. [S12] [S13] [S17] [S26] Across Madagascar, Mauritius, Lesotho and South Africa, four decades of industrial divergence define the boundary between durable value chains and fragile export enclaves. [S12] [S16] [S25] Where Lesotho built a single-market monoculture sewing imported Asian cloth for United States mass retailers under the African Growth and Opportunity Act (AGOA) Special Rule, softer American demand and tariff volatility cut factory employment from 45,261 in March 2021 to 30,991 by December 2024 and forced a defensive pivot toward South Africa. [S11] [S12] [S0701] Conversely, when Madagascar suffered a five-year AGOA suspension from 2009 to 2015, its Zone Franche enterprises survived by shifting into higher value-added woven shirts, knitwear and children's wear for the European Union under an Economic Partnership Agreement (EPA) and by integrating into a cross-border co-production network with capital-intensive Mauritian spinners, knitters and dyers. [S12] [S13] [S25] [S26] Further south, South Africa's Retail-Clothing, Textile, Footwear and Leather (R-CTFL) Master Plan 2030 demonstrates that combining a 45 percent World Trade Organization (WTO) bound clothing tariff with structured retail commitments for 81 million additional local garments a year reverses industrial decline, provided factories close internal gaps in line balancing, production management and wet finishing. [S16] [S17] [S18] For Green Future Tech's (GFT) Cameroon textile programme, this southern quad offers a clear operational blueprint: anchor base-load factory utilisation on domestic and regional demand behind the 40 percent Economic and Monetary Community of Central Africa (CEMAC) Common External Tariff (CET), use zero-duty European Union EPA access for machinery and export diversification, and install line-level measurement from the first shift. [R18] [S32] [S35]

7.1

Madagascar's Zone Franche: 180,000 formal jobs and 19.35 percent of GDP built on dual EU-US market access

Madagascar occupies a distinct structural position in Sub-Saharan African apparel manufacturing because its export zones balance European Union and United States demand rather than relying on a single unilateral trade preference. [S25] [S26] According to the International Labour Organization (ILO), the textile and clothing sector generates 19.35 percent of Madagascar's gross domestic product, attracts 7 percent of national foreign direct investment, and provides about 180,000 formal jobs. [S25] By April 2025, following post-pandemic recovery and orders shifting from Asia, the wider textile and apparel industry remained the country's largest formal employer outside agriculture, sustaining over 400,000 direct and indirect jobs, half of which operate in Export Processing Zones (locally termed Zones Franches) around Antananarivo and Antsirabe. [S26] [S0702] As of 2023, United States International Trade Administration assessments ranked Madagascar first among all Sub-Saharan African countries in textile and apparel exports to the European Union and second in apparel exports to the United States under AGOA. [S26]

7.2 THE 2009 TO 2015 AGOA SUSPENSION FORCED AN OPERATIONAL PIVOT FROM BASIC VOLUME TO COMPLEX EUROPEAN ORDERS

This dual-market balance emerged from an acute policy shock. [S12] [S25] Following a political crisis in 2009, the United States suspended Madagascar's AGOA eligibility, removing duty-free entry to the American market for five years until reinstatement in 2014 and effective trade restoration by 2015. [S12] Enclave factories configured solely for long-run, low-margin basic knit t-shirts and five-pocket denim for American mass merchandisers either closed or consolidated. [S12] [S25] Surviving Zone Franche firms executed a commercial and technical pivot toward European Union buyers, led by France and Germany, alongside the United Kingdom and South Africa, using duty-free access under the Eastern and Southern Africa (ESA) Interim Economic Partnership Agreement. [S25] [S26] [S0702]

Serving European specialty retailers required a more flexible factory operating system than standard American cut-make-trim (CMT) volume lines. [S25] [S0702] Whereas United States mass retail programmes specify multi-container runs of basic styles at thin CMT margins, European buyers demand smaller batch sizes, frequent style changeovers, intricate smocking and embroidery on children's wear, fine-gauge flat-knitted sweaters, and tailored woven shirts. [S25] [S26] [S0702] Malagasy operators and pattern technicians built specialised dexterity in multi-operation construction, allowing factories in Antananarivo and Antsirabe to retain European accounts after AGOA returned. [S25] [S26] [S0702] When American buyers resumed sourcing after 2015, Madagascar re-entered the United States market as a dual-hemisphere exporter rather than a single-buyer enclave, regaining second place among Sub-Saharan African AGOA suppliers by 2023 while keeping the European Union as its primary anchor. [S12] [S25] [S26]

7.3 HIGHLAND INDUSTRIAL CLUSTERING IN ANTANANARIVO AND ANTSIRABE CONCENTRATES SKILLS BUT STRAINS TRANSPORT CORRIDORS

Spatial clustering in the central highlands supports Madagascar's operator productivity while exposing its transport bottlenecks. [S25] [S26] Antananarivo offers the largest urban labour pool, banking services, customs administration and air-freight connectivity, while Antsirabe, roughly 170 kilometres south along National Route 7, hosts historic cotton-spinning, weaving and knitwear complexes alongside deep vocational sewing traditions. [S25] [S26] Highland elevations between 1,200 and 1,500 metres moderate factory floor temperatures compared with coastal tropics, reducing operator heat fatigue across eight-hour shifts. [S25] However, every container of imported cloth and exported apparel must travel between the central highlands and the eastern Indian Ocean port of Toamasina along National Route 2, a mountain corridor exposed to cyclone damage and freight delays. [S25] [S26] Malagasy Zone Franche factories must therefore offset inland haulage costs through higher sewing-line efficiency, low rework rates and duty-free preference margins in Europe and the United States. [S25] [S26]

7.4

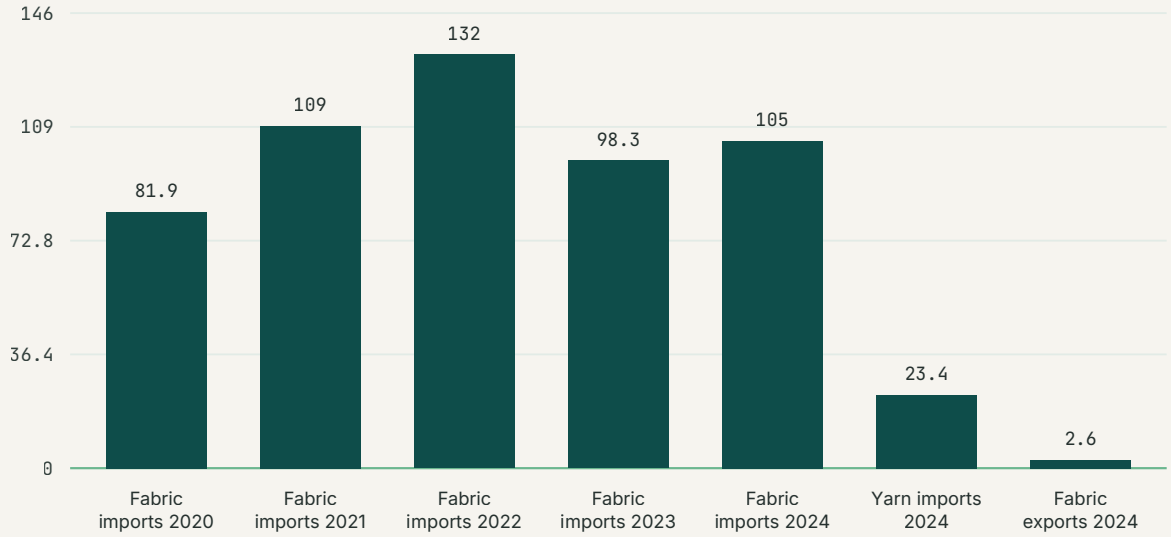
Madagascar's midstream dependency: US$104.6 million in fabric imports shows the limits of assembly-only growth

Despite its skilled assembly workforce and historic cotton-growing base in the south-west and northwest, Madagascar's garment sector suffers a severe midstream conversion gap. [S25] [S26] Madagascar Customs statistics compiled by the International Trade Administration for Harmonized Tariff Schedule (HTS) headings 5208 to 5212 show that national imports of woven cotton fabrics rose from US$81.85 million in 2020 and US$109.36 million in 2021 to a peak of US$132.28 million in 2022, before settling at US$98.33 million in 2023 and US$104.60 million in 2024. [S26] Across that same five-year period, Madagascar's cotton fabric exports remained minimal: US$0.81 million in 2020, US$1.31 million in 2021, US$3.59 million in 2022, US$4.66 million in 2023 and US$2.63 million in 2024. [S26] Yarn trade shows the same deficit: in 2024, Madagascar imported US$23.39 million of yarns (after US$12.14 million in 2020, US$18.33 million in 2021 and US$26.03 million in 2022) while exporting only US$2,000 of yarn. [S26]

The customs series in **Exhibit 29**, p. 110 demonstrates why assembly scale alone does not automatically catalyse domestic spinning and weaving. [S26] While integrated pioneers such as Cotona and the Socota Group in Antsirabe maintain domestic cotton weaving, dyeing and finishing for European shirting accounts, most Zone Franche capacity relies on fabric and yarn imported from China, India, Pakistan and Mauritius. [S25] [S26] [S0702]

EXHIBIT 29 / US$ MILLIONS

Madagascar's Zone Franche imports over US$104 million of cotton fabric annually while exporting US$2.6 million, showing the midstream gap



SOURCED [S26] Madagascar Customs data reported by the U.S. International Trade Administration (2025-08-04) for cotton fabrics (HTS 5208 to 5212) from 2020 to 2024, alongside 2024 cotton fabric exports (US$2.63m) and 2024 yarn imports (US$23.39m). Original values reported in thousands of USD and rounded to one decimal place.

7.5 WHY IMPORTED INTERMEDIATE CLOTH CAPS DOMESTIC VALUE RETENTION AND WORKING-CAPITAL VELOCITY

As **Exhibit 29**, p. 110 confirms, importing US$104.6 million of cotton fabric and US$23.4 million of yarn in 2024 against US$2.6 million in fabric exports means roughly US$128 million of intermediate cotton inputs came from offshore mills before Malagasy sewing lines began cutting. [S26] Furthermore, **Exhibit 29**, p. 110 covers only HTS Chapter 52 cotton categories and does not capture synthetic or woollen yarns and fabrics imported for knitwear and activewear. [S26] Reliance on imported cloth imposes two structural penalties. [S12] [S26] First, domestic value retention is capped at assembly wages, utilities, inland transport and local overhead, typically 20 to 30 percent of the free-on-board (FOB) garment price (illustrative CMT share), while 50 to 65 percent of garment value leaks to foreign spinners, weavers and dye-houses. [S12] [S26] Second, ocean freight across the Indian Ocean locks working capital into a 90-to-150-day cash conversion cycle (illustrative transit and buffer window), preventing standalone CMT contractors from matching the five-to-fourteen-day fast-fashion turnaround of Moroccan exporters. [S23] [S26]

7.6 TRIPARTITE GOVERNANCE UNDER BETTER WORK MADAGASCAR ADDRESSES SUPERVISORY AND COMPLIANCE BOTTLENECKS

ILO and Better Work studies also highlight human-capital and compliance gaps inside Madagascar's factory tier. [S25] [S0702] Although Malagasy operators are skilled in intricate sewing, factories face shortages of industrial engineers, textile technicians and trained line supervisors, alongside fragile public infrastructure and social-compliance gaps in lower-tier subcontractors. [S25] [S0702] Because European Union buyers in France and Germany enforce strict supply-chain due diligence, labour violations in subcontracting sheds threaten export orders across the cluster. [S25] [S0702]

To address this, the ILO and International Finance Corporation (IFC) launched Better Work Madagascar in 2021 as a tripartite pilot that concluded its initial phase in 2025 across 30 factories and 11 brands and retailers. [S25] [S0702] Working simultaneously at enterprise, sectoral and institutional levels with government, employers and unions, the programme targeted supervisory capability: on 5 April 2023, Better Work launched a leadership and supervisory skills programme for 25 female managers and supervisors across five partner factories, alongside advisory work with the Socota Group. [S0702] Across more than 5,850 supervisors trained globally by Better Work, structured instruction in line balancing, time management and workplace communication lifts productivity and reduces rework. [S29] [S0702]

7.7

Mauritius: upgrading from basic CMT to capital-intensive textiles, design and Indian Ocean co-production

Mauritius demonstrates how an island economy upgrades out of low-wage CMT assembly when trade rules shift and local wages rise. [S13] [S0703] With a 2024 population of 1,259,509, GDP of US$14.95 billion and GDP per capita of US$11,872, Mauritius operates at an upper-middle-income wage level far above continental African statutory minimums. [R14] [S0703] Ranked first among 47 Sub-Saharan African countries and 15th globally in the 2025 Index of Economic Freedom, Mauritius gener-

ated 13.4 percent of its 2024 GDP from financial and business services and 12.8 percent from manufacturing, shipping US$235 million in goods exports to the United States in 2024. [S0703]

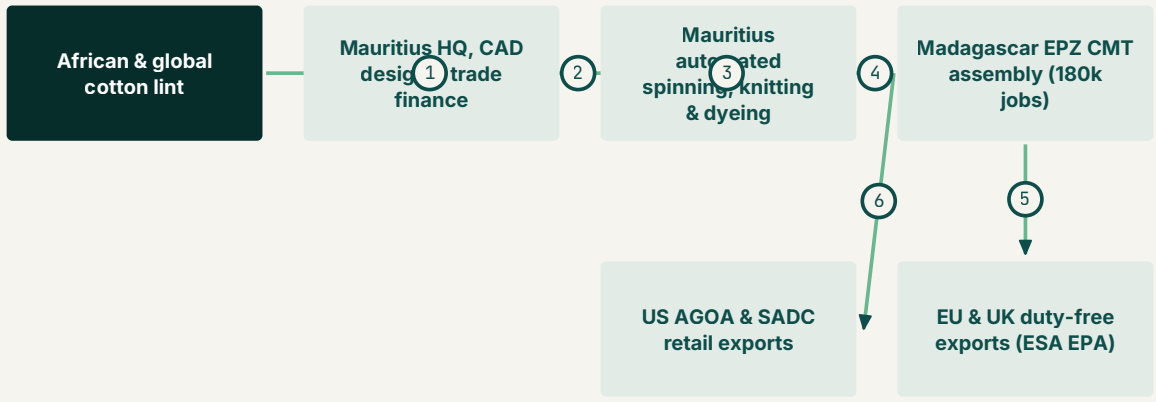
7.8 HOW THE 2005 MFA PHASE-OUT AND INITIAL THIRD-COUNTRY FABRIC EXCLUSION FORCED MAURITIAN AUTOMATION

Mauritius's upgrading was forced by a dual trade shock between 2000 and 2008. [S13] When AGOA was enacted in 2000, Mauritius's higher per-capita income initially excluded it from the Special Rule for lesser-developed countries, barring duty-free United States entry on garments sewn from Asian third-country fabric. [S11] [S13] Simultaneously, the termination of WTO Multi-Fibre Arrangement (MFA) quotas on 1 January 2005 exposed Mauritian factories to unquotaed Asian competition. [S13]

Before H.R. 7222 granted Mauritius third-country fabric eligibility in 2008, Mauritian textile groups (such as CIEL Textile, Compagnie Mauricienne de Textile and Ferney Spinning Mills) executed two structural moves. [S13] [S26] Domestically, they automated ring and rotor spinning, circular and flat-bed knitting, computerised dyeing and 3D CAD design to serve fast-turnaround orders. [S13] [S0703] Regionally, they shifted labour-intensive sewing and linking into sister plants in Madagascar, building an integrated Indian Ocean co-production corridor. [S13] [S25] [S26]

EXHIBIT 30 /

The Mauritius-Madagascar co-production corridor pairs capital-intensive island spinning and design with Malagasy Zone Franche garment assembly



1. Baled lint
2. Tech packs & dye specs
3. Order routing & QA
4. Sea-freighted yarn & fabric
5. Double transformation
6. Duty-free apparel

SOURCED [S13] [S25] [S26] [S0703] Cross-border regional value-chain architecture across the Indian Ocean corridor derived from Mauritius Trade Easy (S13), ILO Madagascar (S25), U.S. Trade.gov Madagascar and Mauritius guides (S26, S0703). Mauritian headquarters and automated mills supply yarn, knitted/dyed fabric and merchandising to Antananarivo and Antsirabe EPZ assembly plants for duty-free export.

7.9 MECHANICS OF REGIONAL CUMULATION ACROSS THE INDIAN OCEAN CORRIDOR

As shown in **Exhibit 30**, p. 112, corporate treasury, merchandising, automated yarn spinning and reactive fabric dyeing remain in Mauritius, supported by Port Louis logistics and a banking sector representing 13.4 percent of GDP. [S13] [S0703] Dyed fabric rolls and yarns ship on short sea-freight hops to Toamasina and by road to Antananarivo and Antsirabe Zone Franche plants, where 180,000 formal workers perform cutting, sewing and finishing. [S25] [S26]

Crucially, **Exhibit 30**, p. 112 shows how regional cumulation under the EU-ESA Economic Partnership Agreement, Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) protocols secures double-transformation origin status. [S13] [S26] [S27] Fabric knitted or woven in Mauritius (Stage 1) and sewn into garments in Madagascar (Stage 2) qualifies for duty-free entry into the European Union, the United Kingdom and SADC, as well as the United States under AGOA. [S11] [S13] [S26] [S27] However, **Exhibit 30**, p. 112 does not capture the inter-plant coordination discipline required: without shared lot tracking, automated cutting-marker synchronization and dyehouse shade control, customs or shipping delays between Port Louis and Antananarivo can idle sewing lines. [S26] [S0702]

7.10

Lesotho's monoculture vulnerability: one-third of national exports tied to US apparel preferences

In contrast to the Mauritius-Madagascar corridor, Lesotho illustrates the extreme vulnerability of a single-market CMT enclave. [S12] [S0701] According to UN Trade and Development (UNCTAD), roughly one-third of Lesotho's total national exports are tied to AGOA, overwhelmingly in the apparel sector, which employs 30,000 to 40,000 workers, primarily women. [S12] Manufacturing is Lesotho's largest formal private employer and second-largest employer after the government, making Lesotho the second-largest Sub-Saharan African AGOA exporter to the United States by value and third by volume, reaching US$237.3 million in 2024. [S0701]

7.11 HOW THE AGOA SPECIAL RULE CREATED A HIGH-VOLUME ENCLAVE WITH MINIMAL DOMESTIC TEXTILE LINKAGES

Lesotho's factories in Maseru and Maputsoe were built largely by East Asian transnational producers to assemble denim jeans and knit activewear for American mass retailers using imported Asian cloth under the AGOA Special Rule. [S11] [S12] [S27] [S0701] Aside from one local denim mill in Maseru, backward linkages are minimal: in 2019, Southern Africa imported US$1.5 million in knit fabrics externally while Lesotho alone imported US$96 million of knit fabrics because the country possessed zero domestic knit-fabric mill capacity, prompting the Lesotho National Development Corporation (LNDC) to actively seek foreign investors for a domestic knit mill and upstream accessories manufacturing in zippers, buttons and thread. [S0701] Lesotho also lacks industrial washing facilities, forcing local factories to truck sewn garments across the border to South African laundries and dyehouses for enzyme washing and wet finishing, which inflates unit logistics costs and extends delivery lead times. [S0701] Because foreign parent companies manage buyer relationships, fabric

sourcing, product design and trade finance offshore, Lesotho's domestic economy captures primarily sewing wages, factory rent and local utility payments. [S12] [S27] [S0701]

7.12 EMPLOYMENT VOLATILITY FROM 45,261 TO 30,991 WORKERS AND THE FORCED PIVOT TO SOUTH AFRICAN RETAIL

When an enclave captures only single-transformation CMT fees on one external market, demand or tariff shocks hit employment immediately. [S12] [S0701] International Trade Administration records show Lesotho's manufacturing employment fell from 43,542 in February 2020 to 30,741 in April 2020, rebounded to 45,261 in March 2021, and then dropped by 31.5 percent (derived from (45,261 - 30,991) / 45,261) to 30,991 by December 2024 as United States demand contracted. [S0701] Although Congress reauthorised AGOA retroactively from 30 September 2025 through 31 December 2026 under Public Law 119-75, UNCTAD notes that post-April 2025 United States tariff hikes raised baseline duties on AGOA exporters from under 0.5 percent to 10 percent across several lines, and warns that without preferences, trade-weighted tariffs on Lesotho's exports would more than double to 20 percent or above. [S12] [S20]

In response, Lesotho factories pivoted into the Southern African Customs Union (SACU) and the 277-million-consumer SADC market: by 2025, South Africa absorbed 30 percent of Lesotho's apparel export volume behind SACU's 45 percent external clothing tariff. [S16] [S0701] Simultaneously, unions, brands, human-rights groups and employers signed the binding Lesotho Agreement with government inspectorate enforcement and toll-free reporting lines to curb gender-based violence (GBV) in factories. [S0701]

7.13

South Africa's de-industrialisation lesson and the forty-five percent WTO bound tariff floor

South Africa represents Africa's primary test case for domestic-market apparel industrialisation and retail localisation. [S16] [S17] [S18] Data from the Department of Trade, Industry and Competition (the dtic) trace three distinct policy phases: rapid trade liberalisation and job losses from 2000 to 2008, defensive tariff restoration and Industrial Development Corporation (IDC) retooling from 2009 to 2019, and the demand-led R-CTFL Master Plan 2030 from 2020 onward. [S16] [S17]

7.14 HOW RAPID TARIFF CUTS AND CUSTOMS UNDER-INVOICING DESTROYED 10,000 TO 15,000 JOBS A YEAR (2000 TO 2008)

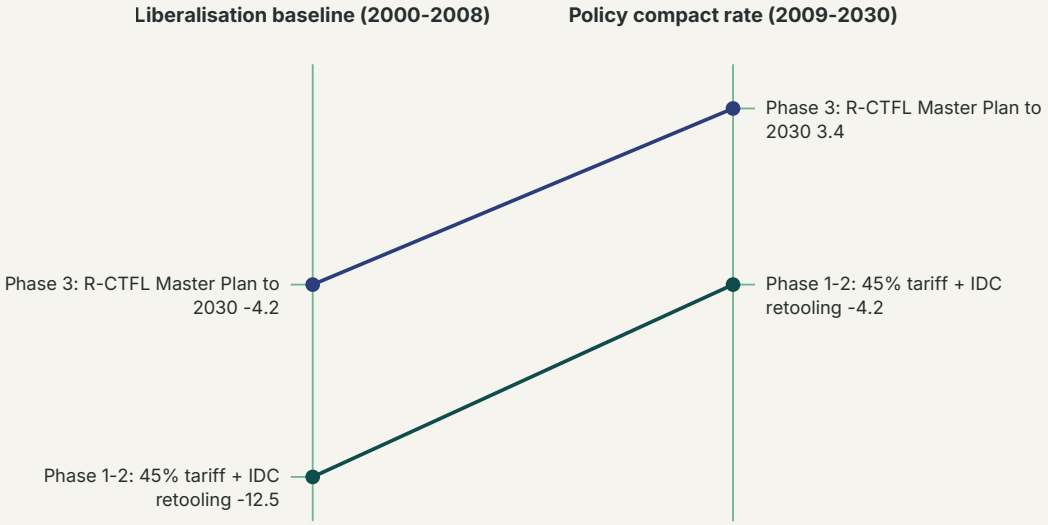
After 1994, South Africa cut clothing and textile tariffs faster than required by WTO schedules, coinciding with China's 2001 WTO accession. [S16] Hit by low-cost Asian imports, an appreciating rand and widespread customs under-invoicing, South Africa's clothing and textile industry shed 10,000 to 15,000 formal manufacturing jobs annually between 2000 and 2008 as domestic retail chains shifted orders off-shore. [S16] [S18]

7.15 HOW THE WTO BOUND TARIFF CEILING AND IDC COMPETITIVENESS GRANTS ARRESTED THE DECLINE (2009 TO 2019)

To halt de-industrialisation, the government intervened in two steps prior to the Master Plan. [S16] In Phase 1, South Africa raised clothing tariffs from 40 percent to the WTO bound maximum of 45 percent while rebating duties on unavailable fabrics and yarns. [S16] In Phase 2, the dtic and IDC deployed the Clothing and Textiles Competitiveness Programme (CTCP) to co-finance plant automation, lean clusters and skills upgrading. [S16] Together, the 45 percent bound tariff and IDC retooling grants cut the annual rate of job loss by two-thirds between 2009 and 2019. [S16]

EXHIBIT 31 / THOUSAND FORMAL MANUFACTURING JOBS/YEAR

South Africa's tariff and IDC competitiveness interventions cut annual clothing job losses by two-thirds before the Master Plan pivot to growth



DERIVED [S16] [S17] [S18] Derived from the dtic presentation to the Portfolio Committee on Trade and Industry (S16) and the LSF garment localisation study (S18). During 2000 to 2008 liberalisation, the sector lost 10,000 to 15,000 jobs/year (midpoint -12.5k/yr); during 2009 to 2019 tariff + IDC retooling, the annual loss rate was cut by two-thirds (to ~-4.2k/yr); under the 2020 to 2030 R-CTFL Master Plan, the 81m garment localisation opportunity projects +34,000 formal jobs over the decade (~+3.4k/yr).

The slope comparison in **Exhibit 31**, p. 115 tracks annualised employment change across the three regimes: from minus 12.5 thousand jobs a year during 2000 to 2008 liberalisation, to minus 4.2 thousand a year during 2009 to 2019 stabilisation, toward a projected gain of 34,000 formal jobs (plus 3.4 thousand a year) under the 2030 localisation compact. [S16] [S18] What **Exhibit 31**, p. 115 cannot guarantee is automatic order capture, which requires factory-level engineering upgrades and border enforcement. [S16] [S18] Under the Revised 2024 Clothing, Textiles, Footwear and Leather Growth Programme (CTFLGP), the dtic and IDC fund four windows: Programme A (Competitiveness Improvement), Programme B (Expansionary Working Capital), Programme C (Start-up Funding) and Programme D (Cluster Funding). [S16]

7.16

The South African R-CTFL Master Plan 2030: retailer demand commitments for eighty-one million additional local garments

Signed in November 2019, South Africa's R-CTFL Master Plan 2030 binds national retailers (including Mr Price, The Foschini Group and Ackermans), manufacturers, labour and government into a monitored social compact. [S16] [S17] Retailers committed to raise the local share of CTFL sales to 65 percent by 2030, supporting 333,000 total sector workers including 165,000 direct CTFL manufacturing jobs. [S17]

EXHIBIT 32 / REPORTED MASTER PLAN AND LSF FEASIBILITY BENCHMARKS

South Africa's R-CTFL Master Plan 2030 quantifies the employment and output prize of domestic retail localisation

65%

Target local retail share

Share of South African CTFL retail sales committed to local sourcing by 2030 (S17)

333,000

Total sector employment target

Including 165,000 direct CTFL manufacturing jobs supported under the Master Plan (S17)

81m units/yr

Additional local garment demand

Retailer willingness to source locally by 2030 identified by the LSF feasibility study (S18)

R7.9bn/yr

Additional manufacturing output

Annual factory gate revenue from the 81m garment localisation opportunity (S18)

34,000

New formal garment jobs

Direct formal manufacturing jobs generated by capturing the 81m unit opportunity (S18)

45%

WTO bound clothing tariff

Applied customs duty ceiling protecting domestic garment makers against imports (S16)

SOURCED [S16] [S17] [S18] Compiled from the dtic R-CTFL Master Plan presentation (S16), InvestSA / the dtic progress report (S17), and the Localisation Support Fund (LSF) Feasibility of Garment Localisation study (S18). Targets are policy and industry compact commitments through 2030, not GFT operating results.

7.17 INSIDE THE LSF FEASIBILITY STUDY: WHERE THE GARMENT LOCALISATION OPPORTUNITY SITS BY PRODUCT CATEGORY

As summarised in **Exhibit 32**, p. 116, a comprehensive Localisation Support Fund (LSF) feasibility study across major retail groups and nearly 200 manufacturers found that retailers are willing to source up to 81 million additional garments a year locally by 2030, worth about R7.9 billion in annual output (a 20 percent increase in local sourcing) and up to 34,000 new formal manufacturing jobs. [S18] Notice what **Exhibit 32**, p. 116 cannot guarantee on its own: these figures represent conditional commercial demand identified by surveyed retail buying teams rather than unconditional procurement subsidies. [S18] Roughly half of the 81 million garment prize sits in three high-velocity categories: knitted cotton and cotton-blend t-shirts, woven denim bottoms, and knitted athleisure (fleece hoodies, joggers and activewear), alongside women's woven fashion dresses and blouses, tailored outerwear, and men's woven shirts. [S18] Retailers prioritise these categories for domestic localisation in KwaZulu-Natal and the Western Cape because 21-to-42-day domestic quick-response replenishment (illustrative lead time) beats 120-to-180-day Asian import cycles, reducing seasonal markdowns and stockouts while relying on standardised circular-knit and twill fabrics in the Ne 16s to Ne 30s yarn-count range. [R27] [S04] [S18]

7.18 THE FIRM-LEVEL BOTTLENECKS BLOCKING LOCALISATION: INDUSTRIAL ENGINEERING, MIDDLE MANAGEMENT AND WET FINISHING

However, the LSF study demonstrated that tariff protection and retail willingness alone do not automatically fill domestic sewing lines: capturing those 81 million units requires closing three firm-level supply bottlenecks across South African factories. [S16] [S18] First, many small and medium-sized CMT plants lack dedicated industrial engineering departments and formal Standard Allowed Minute (SAM) work-measurement systems, resulting in unbalanced sewing lines, operator waiting time, work-in-progress accumulation and inflated unit conversion costs. [S18] Second, factories face a persistent shortage of middle-tier production managers and trained line supervisors capable of sustaining high First-Pass Yield (FPY) and On-Time In-Full (OTIF) delivery schedules required by national retail distribution centres. [S18] [S29] Third, in denim and woven casualwear, the domestic supply chain lacks sufficient modern fabric-washing, dyeing and special-finishing capacity, mirroring the exact wet-finishing bottleneck documented in neighbouring Lesotho. [S18] [S0701] Where skills training, industrial engineering and retailer commitments align, even rural factories thrive: in Keates Drift in Msinga, KwaZulu-Natal, where 3,000 families were affected by an earlier shoe factory closure, the Msinga Clothing Factory partnered with the Health and Welfare Sector Education and Training Authority (HWSETA) under the R-CTFL Value Chain Master Plan to train and employ 100 rural women sewing garments directly for The Foschini Group, Mr Price and Ackermans. [S17]

EXHIBIT 33 / CLUSTER STRUCTURAL INDICATORS

Comparative structure of Indian Ocean and Southern African textile clusters against the Cameroon CEMAC baseline

Economy / Cluster	Sector employment & GDP role	Primary market & tariff regime	Midstream yarn & fabric linkage	Core vulnerability & strategic response
Madagascar (Zone Franche)	180,000 formal jobs; >400,000 total jobs; 19.35% of GDP (S25, S26)	1st in SSA to EU (EPA); 2nd in SSA to US (AGOA) (S26)	Imported US$104.6m cotton fabric & US$23.4m yarn in 2024 vs US$2.6m fabric exports (S26)	Survived 2009-2015 AGOA exit via EU EPA diversification & Mauritius co-production (S12, S26)
Mauritius (Island Hub)	Manufacturing 12.8% of US$14.95bn GDP; GDP/capita US$11,872 (S0703)	EU/UK ESA EPA, US AGOA (US$235m goods exports in 2024), SADC/COMESA (S13, S0703)	Automated local spinning, knitting & dyeing exported to Malagasy sister plants (S13, S26)	High island wages offset by capital automation & cross-border CMT in Madagascar (S13, S26)
Lesotho (Maseru / Maputsoe)	30,000 to 40,000 workers (30,991 Dec 2024, down from 45,261 Mar 2021) (S12, S0701)	~1/3 of national exports tied to US AGOA (US$237.3m in 2024); 30% volume now to SA (S12, S0701)	Imported US$96m knit fabric (2019); lacks knit mill & local washing facilities (S0701)	Acute US tariff/demand exposure (>20% tariff without AGOA); pivoting to SACU/SA retail (S12, S0701)
South Africa (R-CTFL 2030)	Target 333,000 total CTFL jobs (165,000 manufacturing); +34,000 LSF jobs (S17, S18)	Domestic retail compact (65% local share by 2030) + 45% WTO bound clothing tariff (S16, S17)	Local spinning/weaving recovering via CTFLGP Windows A-D; wet-finishing gap remains (S16, S18)	Customs under-invoicing & firm IE/management gaps addressed by LSF & IDC grants (S16, S18)
Cameroon (GFT Benchmark)	340,000 t seed cotton (R01); 95% raw export vs 5% local processing (R06)	40% ECCAS-CEMAC CET (1 Jan 2026, S35) + EU/UK EPA (0% duty, S32); AGOA ineligible (R18)	Legacy CICAM at 10.83-48.9% utilisation (R12); US$300m Camtext SA pole by 2033 (R09, R10)	Modular 3.0m garment CMT/brand entry (estimate) + partnered midstream + Day-1 PMS (R10, R28)

SOURCED [R01] [R06] [R18] [S11] [S12] [S13] [S16] [S17] [S18] [S25] [S26] [S32] [S35] [S0701] [S0703] Compiled from official trade, labour and industrial policy sources opened for this chapter alongside GFT's Cameroon evidence register. Employment and trade figures reflect the latest reported year in each cited source (2023 to 2026).

7.19

Strategic synthesis from the south: combine tariff protection with firm-level industrial engineering

Comparing the five clusters in **Exhibit 33**, p. 118 yields a clear strategic synthesis for Cameroon and the CFA franc zone, while showing that macro indicators alone cannot establish unit-level cost competitiveness without a shop-floor financial bridge. [R06] [S12] [S16] [S26] [S35]

7.20 WHY CAMEROON'S CEMAC COMMON EXTERNAL TARIFF AND EU EPA MIRROR THE STRONGEST FEATURES OF SOUTH AFRICA AND MADAGASCAR

First, Cameroon's January 2020 AGOA termination and Lesotho's 31.5 percent employment drop prove that unilateral United States preferences cannot anchor ten-year factory debt; instead, Cameroon's duty-free EU and UK Economic Partnership Agreements (which also allow zero-duty European machinery imports) replicate Madagascar's successful European diversification route. [R18] [S12] [S26] [S32] [S0701] Second, the harmonised ECCAS-CEMAC Common External Tariff effective 1 January 2026 levies a 40 percent top duty on imported fabrics and ready-to-wear garments across CEMAC's 63.3 million consumers and US$125.9 billion GDP, playing the exact price-umbrella role of South Africa's 45 percent bound clothing tariff. [S16] [S35] [S36] Third, rather than importing US$104.6 million of foreign cloth like Madagascar or duplicating US$300 million in upstream capex, GFT replicates the Mauritius-Madagascar co-production logic domestically by partnering with SODECOTON (220,000 growers, 340,000 tonnes of seed cotton in 2024) and the emerging 12,000-tonne Camtext SA pole at Dibamba and Garoua (or UEMOA mills at GDIZ Benin) while focusing private capital on a modular 3.0 million garment-a-year (estimate) CMT, finishing and brand plant. [R01] [R03] [R09] [R10] [S04] [S13] [S26]

METHOD

Boundary and arithmetic of the regional tariff-and-efficiency unit cost bridge

To test when a regional African factory beats landed Asian imports, GFT models unit wholesale cost in US dollars for a 250-gram combed-cotton t-shirt (rated at 8.0 Standard Allowed Minutes, requiring 0.28 kilograms of fabric at an illustrative 12 percent marker loss) across four inputs: [S16] [S18] [S35] 1. **Material cost (M):** partnered regional cotton fabric and zero-duty EPA trims versus imported cloth. [S26] [S32] 2. **Direct labour (L / E):** monthly payroll divided by 10,400 monthly minutes (40-hour week), multiplied by 8.0 SAM and divided by line efficiency (E). [R14] [R16] [S18] 3. **Overhead and logistics (O):** captive solar-plus-grid power, rework scrap, depreciation and freight. [S26] [S32] 4. **Tariff multiplier ($1 + \tau$):** the 40 percent CEMAC CET ($\tau = 0.40$) or 45 percent SACU tariff ($\tau = 0.45$) on extra-regional CIF garment imports versus $\tau = 0.00$ for intra-bloc production. [S16] [S35]

WORKED EXAMPLE

Comparing enclave CMT assembly, unmeasured legacy local production, and GFT's measured regional localisation (illustrative 250-gram cotton t-shirt cost bridge) [S16] [S35]

Compare three illustrative supply routes into a Douala (40 percent CET) or Johannesburg (45 percent SACU tariff) retail distribution centre using cited wage, utilisation and tariff baselines: [R12] [R14] [S16] [S18] [S35]

- **Benchmark 1: Landed Asian import across the tariff wall (illustrative CIF baseline).** An Asian exporter produces the 250-gram t-shirt at an illustrative US$2.20 FOB (US$1.35 fabric/trims, US$0.45 conversion/overhead, US$0.40 margin) plus US$0.20 sea freight, giving a US$2.40 CIF price. Under the 40 percent CEMAC CET, customs duty adds $\text{US\$2.40} \times 0.40 = \text{US\$0.96}$ plus US$0.14 port clearance, setting the formal landed benchmark at **US$3.50 per garment** (or **US$3.62** under South Africa's 45 percent tariff where duty is US$1.08). [S16] [S35]
- **Benchmark 2: Unmeasured African plant at low utilisation and efficiency (illustrative legacy trap).** A domestic plant buys regional fabric and trims at an illustrative US$1.65. With Cameroon's statutory minimum wage (SMIG) at XAF 43,969 a month (about US$76) and loaded operator payroll averaging an illustrative US$160 a month (US$0.0154 per available minute), unmeasured lines operating at an illustrative 30 percent SAM efficiency (reflecting CICAM's 10.83 to 48.9 percent utilisation range) and 82 percent First-Pass Yield require $8.0 / 0.30 = 26.7$ paid minutes (US$0.41 labour), while downtime and 18 percent rework inflate overhead to US$1.55 plus US$0.25 margin, totalling **US$3.86 per garment** and losing to the US$3.50 tariff-paid import by US$0.36. [R12] [R14] [R16] [S18] [S35]
- **Benchmark 3: GFT measured modular factory with partnered fabric and supervisor training (illustrative target case).** Applying the LSF and Better Work lessons in GFT's 3.0 million garment Cameroon model, partnered fabric and zero-duty EPA trims cost an illustrative US$1.58, while vestibule training, female supervisor line balancing and Tier 1A Edge Computer Vision inspection (above 90 percent defect detection accuracy) lift SAM efficiency to an illustrative 65 percent ($8.0 / 0.65 = 12.3$ minutes, US$0.19 labour) and First-Pass Yield to 97 percent, cutting overhead to US$0.78 plus US$0.40 margin for a delivered price of **US$2.95 per garment**, beating tariff-paid Asian imports by **US$0.55 to US$0.67 per unit** (15.7 to 18.5 percent lower) while retaining over 85 percent of value regionally. [R10] [R28] [R29] [S16] [S18] [S29] [S32] [S35]

7.21 OPERATIONALISING THE SOUTHERN LESSONS IN GFT'S CAMEROON PERFORMANCE-MANAGEMENT SYSTEM

This cost bridge explains why South Africa's LSF study concluded that tariff protection and retailer pledges convert into competitive local garments only when factories upgrade firm-level industrial engineering and production management. [S16] [S18] GFT's Cameroon Performance-Management System (Deliverable 2) and Digital Strategy (Deliverable 3) embed four controls from Shift One: [R27] [R28] [R29] [S18]

1. **Daily SAM line balancing:** tracking OEE, SAM efficiency, plan attainment and throughput at every 15-minute shift huddle in a formula-locked Excel workbook. [R28]

2. **Edge computer-vision quality gates:** replacing 60 to 70 percent accurate manual inspection with camera-based inspection above 90 percent accuracy across more than 40 defect types at up to 60 metres a minute to protect retail On-Time In-Full (OTIF) delivery. [R28] [R29]
3. **Female supervisory pipelines:** replicating Better Work's 5,850-supervisor training curriculum and Antananarivo female leadership cohorts while enforcing Lesotho-style anti-harassment safeguards. [R16] [S29] [S0701] [S0702]
4. **Partnered wet finishing and Month-12 ML forecasting:** partnering with Camtext SA or UEMOA ZLD parks for dyed cloth while gating Tier 1B machine-learning demand forecasting to Month 12 to cut forecast errors by 20 to 50 percent and inventory costs by 35 to 40 percent. [R09] [R10] [R27] [S06] [S18]

GFT NOTE

Practical recommendation for African garment sponsors and industrial ministries

Never underwrite a ten-year garment factory on single-transformation assembly of imported Asian cloth for a revocable unilateral preference. [R18] [S12] [S20] Anchor base-load utilisation on domestic and regional retail basics (t-shirts, polo shirts, workwear, institutional uniforms and denim) behind the 40 percent CEMAC CET or 45 percent SACU bound tariff, pair European Union EPA exports with regional yarn and fabric co-production (matching the Mauritius-Madagascar corridor), and enforce SAM line balancing, female supervisor training and edge vision quality control from Shift One. [R28] [R29] [S13] [S16] [S18] [S26] [S29] [S32] [S35]

Preference waivers rent temporary assembly jobs; regional cloth, retail compacts and measured lines build permanent industry.

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GREEN FUTURE TECH
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08

North African near-shoring hubs capture speed-to-market premiums but must close midstream spinning and circularity gaps to keep European buyers

Egypt and Morocco employ over 1.24 million textile and apparel workers and ship within days to Europe and the United States, yet still import billions of dollars of yarn and fabric annually because domestic spinning and textile recycling lag garment assembly. [S19] [S22] [S23] [S0801]

CHAPTER 08
DECISION TEST

Egypt and Morocco employ over 1.24 million textile and apparel workers and ship within days to Europe and the United States, yet still import billions of dollars of yarn and fabric annually because domestic spinning and textile recycling lag garment assembly. [S19] [S22] [S23] [S0801]

North Africa's Mediterranean apparel clusters prove that geographic proximity and preferential trade access secure fast-fashion order velocity, but cannot prevent severe working-capital leakage when domestic spinning, fabric finishing and fibre recycling lag behind downstream sewing capacity. [S19] [S22] [S23] Across Egypt and Morocco, more than 1.24 million formal textile and garment workers produce billions of dollars in export apparel for European and United States retail chains, shipping replenishment orders in days rather than the five-to-six-week ocean voyages required from East and South Asia. [S22] [S23] Yet both North African leaders confront an acute midstream bottleneck that threatens their margin structure and regulatory compliance. [S22] [S23] Egypt cultivates prestigious extra-long-staple Giza cotton and employs roughly 1 million workers across its textile complex, but imports over US$4.5 billion in textiles and intermediates annually because legacy public-sector spinning mills were historically unequipped to supply the medium-staple carded and combed yarns required by export denim and knitwear lines. [S22] [S0801] [S0803] Morocco employs 246,000 workers and directs 93 percent of its textile exports to the European Union, yet imports nearly all of its yarn and fabric under temporary customs admission while discarding thousands of tonnes of clean cutting-room cotton offcuts that now must be recycled domestically to satisfy the European Union Ecodesign for Sustainable Products Regulation (Regulation (EU) 2024/1781) and the 2027 Digital Product Passport mandate. [S23] [S34] For Green Future Tech (GFT) and industrial sponsors across Sub-Saharan Africa, the operational lesson from Archetype 3 is decisive: downstream cut-make-trim (CMT) reactivity wins the initial buyer contract, but long-term value capture requires aligning domestic yarn counts with target garment categories and segregating pre-consumer cutting waste from the first shift. [R06] [R10] [S22] [S23]

8.1

Egypt's dual export engine combines US Qualifying Industrial Zones with Mediterranean near-shoring

Egypt operates the largest industrial textile and apparel workforce on the African continent, employing approximately 1 million workers and generating almost 30 percent of the nation's total manufactured exports. [S22] According to investment diagnostics compiled by the General Authority for Investment and Free Zones (GAFI) in October 2024, the textile and garment sector is the second-largest manufacturing industry in Egypt after food processing, contributing 3 percent of national gross domestic product (GDP) and 27 percent of total industrial output. [S0801] Within the broader industrial base, 25 percent of manufacturing activity focuses on textile production, distributed across home textiles at 12 percent, cotton spinning at 8 percent, and other textile sub-sectors at 5 percent. [S0801] Unlike Sub-Saharan enclaves that rely on a single unilateral preference regime, Egyptian exporters straddle two major hard-currency trade corridors simultaneously: duty-free access to the European Union under the Euro-Mediterranean Association Agreement, and duty-free, quota-free entry into the United States under the Qualifying Industrial Zones (QIZ) protocol. [S19] [S22] [S0801]

8.2 SIX QUALIFYING INDUSTRIAL ZONES ENFORCE A STRICT REGIONAL VALUE THRESHOLD FOR DUTY-FREE US ENTRY

Established in 2004 and overseen jointly with the United States International Trade Administration, the Egyptian QIZ protocol grants duty-free entry into the United States for goods co-produced by registered factories inside designated Egyptian industrial zones and Israeli input suppliers. [S19] To qualify at United States customs ports, an exported garment must be manufactured inside one of six designated QIZ regions: Greater Cairo, Alexandria, the Suez Canal zone (including Port Said and Ismailia), the Central Delta, Beni Suef, or Al Minya. [S19] Crucially, the protocol enforces a statutory regional value-content floor rather than a simple single-transformation cutting rule. [S19] The sum of the cost or value of materials produced in the qualifying zones plus the direct costs of processing operations must equal at least 35 percent of the appraised value of the finished garment upon entry into the United States. [S19] Within that 35 percent minimum threshold, at least 11.7 percent of material value must originate in an Egyptian QIZ, at least 10.5 percent of material cost must originate from Israel, and the remaining 12.8 percent may be fulfilled from any combination of Egyptian QIZ, Israeli, or United States inputs. [S19]

As of September 2025, more than 1,000 Egyptian companies were registered across over 20 individual industrial zones within the QIZ framework, with approximately 80 percent of participating enterprises producing ready-made apparel and accessories such as denim trousers, woven shirts, knitted t-shirts, pullovers, underwear, bedsheets and terry towels. [S19] [S22] Because United States Most Favoured Nation (MFN) tariffs on cotton and man-made fibre apparel typically range from 12 percent to 32 percent, the QIZ duty exemption provides Egyptian exporters with a permanent landed-cost advantage over non-preferential Asian competitors, without the recurring congressional expiration cliff that affects the African Growth and Opportunity Act (AGOA). [S12] [S19] [S22] At the same time, Egypt's position at the mouth of the Suez Canal with more than 15 commercial ports allows vessels sailing from Alexandria or Port Said to reach European ports in roughly 6 to 20 days, compared with 35 to 45 days from East Asia. [S22] [S0801]

8.3 PUBLIC UPSTREAM OWNERSHIP AND PRIVATE GARMENT ASSEMBLY SPLIT THE EGYPTIAN INDUSTRIAL STRUCTURE

Beneath this dual export success lies a sharp institutional division between upstream fibre conversion and downstream garment making. [S0801] Between 2014 and 2021, approximately 6,740 companies were incorporated in the Egyptian textile sector with an issued capital reaching EGP 10.5 billion, spanning 10 customs chapters and 575 distinct tariff items. [S0801] GAFI structural data show that the Egyptian public sector historically dominated capital-intensive upstream and midstream operations, accounting for 50 percent of national spinning capacity, 60 percent of knitting capacity, and 60 percent of woven textile production, whereas private enterprises own 90 percent of the ready-made garment industry. [S0801]

This split explains why Egypt's private garment exporters expanded much faster than its domestic yarn and fabric supply. [S22] [S0801] When private QIZ and Euro-Med apparel makers scaled up in Alexandria, Tenth of Ramadan City, Sadat City (which hosts a 3 million square metre textile zone) and Port Said to serve buyers such as Gap, Marks and Spencer, and Pierre Cardin, state-owned mills suffered from decades of deferred maintenance and outdated ring frames. [S22] [S0801] [S0803] To compare the

structural foundations of North Africa's two near-shoring leaders before examining their midstream bottlenecks, **Exhibit 34**, p. 126 compiles verified industrial, trade and factor-cost metrics for Egypt and Morocco.

EXHIBIT 34 / REPORTED NATIONAL METRICS

North African near-shoring benchmark compares industrial scale, factor costs and midstream balance in Egypt and Morocco

Structural indicator	Egypt near-shoring cluster	Morocco near-shoring cluster	Primary operational implication
Direct workforce	About 1,000,000 workers	246,000 formal workers (63% women)	Largest formal industrial workforce pools in North Africa
Active enterprises	6,740 incorporated (2014 to 2021); 1,000+ in QIZ	1,680 enterprises producing 1 billion items/year	Private SMEs dominate CMT; state or foreign firms hold midstream
Share of GDP and industry	3% of GDP; 27% of industrial output	7.6% of industrial revenue (MAD 67.8bn / US$7.4bn)	Core macroeconomic pillar and foreign-exchange earner
Export share and value	Almost 30% of manufactured exports; US$5,477m (2022)	11.4% of merchandise exports; 93% shipped to EU	Egypt balances US (QIZ) and EU; Morocco is 93% EU-concentrated
Trade preference rules	US QIZ (35% value, 10.5% Israeli) and EU Euro-Med	EU-Morocco Association Agreement and US FTA	Requires origin compliance and regional fabric cumulation
Midstream import gap	US$4,538m to US$5,597m textile imports (2022)	Nearly all CMT fabric imported under ATPA customs	High working-capital leakage to China, Turkiye and India
Flagship midstream response	US$1.1bn to US$1.5bn state upgrade (182,784 spindles at Mahalla)	IFC-AMITH chute circularity (US$1.9bn potential, 30,800 jobs)	Egypt builds public virgin spinning; Morocco builds waste recycling
Wage and energy baseline	EGP 7,000/mo min wage (~US$138); gas US$6.75/MMBtu	Informal collectors MAD 500 to 1,000/mo; formal industrial grid	FX float in Egypt lowers dollar labour but raises imported input cost

SOURCED [S19] [S22] [S23] [S0801] [S0802] [S0805] Compiled from US ITA (S19), Textile Excellence (S22), IFC-AMITH 2026 report (S23), GAFI Egypt 2024 sector study (S0801), PCIAW Mahalla update (S0802) and Egypt 2026 industrial tariff guide (S0805).

As **Exhibit 34**, p. 126 demonstrates, Egypt and Morocco operate at an industrial scale unmatched by West or Central African cotton economies, yet neither country has achieved self-sufficiency in midstream yarn and fabric supply. [S22] [S23] [S0801] While the table establishes macro-level employment, trade value and policy rules across both economies, it cannot by itself reveal the fibre-physics mismatch inside individual spinning mills or the customs accounting rules that trap cutting-room waste. [S23] [S0803]

8.4

The Egyptian cotton paradox pairs extra-long-staple heritage with multi-billion-dollar yarn and fabric imports

Egypt exhibits a striking raw-material paradox that directly instructs Sub-Saharan cotton-producing nations. [S22] [S0803] For over a century, the Nile Delta has cultivated world-renowned long-staple and extra-long-staple (ELS) Gossypium barbadense varieties under the Giza pedigree, yet Egypt exports most of its raw harvest while importing billions of dollars of yarns and fabrics to feed its garment plants. [S22] [S0801] [S0803]

8.5 FINE-COUNT GIZA LINT CANNOT ECONOMICALLY FEED VOLUME DENIM AND MEDIUM-COUNT KNIT LINES

The root cause of Egypt's midstream import dependency is an agronomic and engineering mismatch between staple length and garment specification. [S22] [S0803] Long-staple and extra-long-staple cotton accounts for no more than 3 percent of global cotton consumption, whereas 97 percent of the international apparel market relies on short-staple and medium-staple upland cotton. [S0803] Extra-long-staple Giza fibres are engineered to be combed and ring-spun into fine and superfine yarn counts such as Ne 76 to Ne 100 compact yarns for luxury dress shirting and sateen bedlinen. [S0802] [S0803]

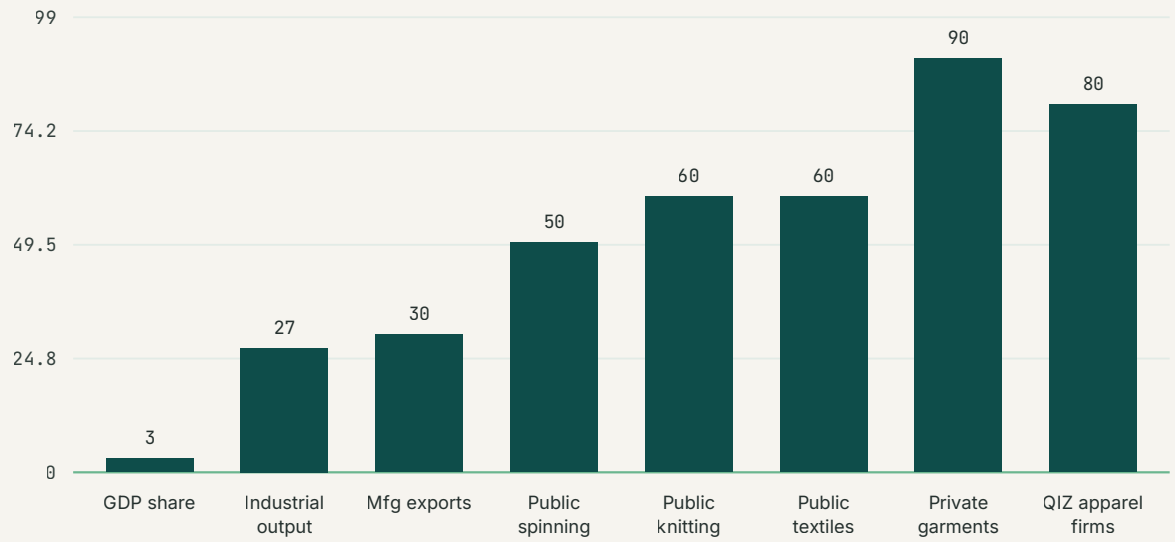
By contrast, the 800-plus apparel factories inside Egypt's QIZs predominantly manufacture volume denim jeans, twill trousers, jersey t-shirts, fleece pullovers and underwear. [S19] [S22] These garments require coarse-to-medium yarn counts between Ne 6s and Ne 30s spun from medium-staple upland lint or polyester-cotton blends. [S04] [S22] [S0803] Spinning expensive Giza lint into coarse Ne 10s denim or Ne 24s t-shirt yarn prices the garment out of mass-market retail brackets. [S0803] Because Egypt historically restricted upland cultivation in the Nile Delta and lacked modern short-staple rotors and ring frames, the country exported raw Giza lint (about 86,000 tonnes out of 117,000 tonnes produced in 2021) while garment makers imported medium-staple yarns and fabrics. [S22] [S0801] [S0803]

8.6 SHORT-STAPLE SPINDLE EXPANSION AND TRADE BALANCES EXPOSE THE INTERMEDIATE BOTTLENECK

GAFI and World Bank trade data quantify this two-way flow. [S0801] In 2022, Egypt ranked 31st globally among 164 textile exporters with US$5,477 million in exports (over 12 percent of national merchandise exports), led by the United States (US$1,918 million), Turkiye (US$623 million), Germany (US$308 million), Italy (US$304 million) and the United Arab Emirates (US$221 million), with other markets taking US$2,104 million. [S0801] In the same year, Egypt ranked 45th globally as a textile importer, bringing in US$4,538 million to US$5,597 million in textile inputs from 139 countries (including about US$1.5 billion in core midstream yarns and fabrics for export garment makers), led by China (US$2,267 million), Turkiye (US$557 million), India (US$397 million), Indonesia (US$136 million) and Sudan (US$120 million). [S22] [S0801] Although the sector posted a US$939 million trade surplus in 2022, importing over four-fifths of export value in foreign textiles diluted local value capture. [S0801] **Exhibit 35**, p. 128 illustrates the structural breakdown of Egypt's textile economy across output and public-versus-private ownership shares.

EXHIBIT 35 / PERCENT SHARE OF CATEGORY

Egypt's textile complex generates 30 percent of manufactured exports while public mills hold 50 to 60 percent of midstream capacity



SOURCED [S22] [S0801] Sourced from GAFI Egypt October 2024 sector study (S0801) and QIZ export share reported in Textile Excellence (S22). Ownership shares reflect public-sector share in spinning (50%), knitting (60%) and weaving/textiles (60%) versus private-sector share in ready-made garments (90%).

The distribution shown in **Exhibit 35**, p. 128 highlights the institutional tension in Egypt's textile industry: while private entrepreneurs control 90 percent of garment assembly and 80 percent of the 1,000-plus QIZ exporters focus on apparel, half of national spinning and 60 percent of knitting and weaving remained in public-sector enterprises. [S22] [S0801] While these shares explain why garment capacity outran local fabric supply, they do not show the capital required to modernise legacy state mills. [S22] [S0802]

8.7

State-backed midstream modernisation at El-Mahalla El-Kubra targets the imported intermediate deficit

To close its yarn and fabric deficit and eliminate public-sector losses that reached EGP 2.7 billion in 2018, the Egyptian government launched a national modernisation programme through the Holding Company for Cotton, Spinning, Weaving and Garments, budgeted at EGP 25 billion (US$1.1 billion to US$1.5 billion across exchange-rate tranches). [S22] [S0803] [S0804]

8.8 CONSOLIDATING LEGACY STATE ENTERPRISES INTO INTEGRATED COMPLEXES ANCHORS ON A MEGA-SPINDLE FACILITY

Avoiding the fragmentation that trapped Cameroon's Cotonniere Industrielle du Cameroun (CICAM) between 10.83 percent and 48.9 percent capacity utilisation [R12], Egypt merged 32 state-affiliated companies into 10 enterprises and designated three integrated complexes at El-Mahalla El-Kubra, Kafr El-Dawar and Helwan,

alongside Misr Shebin El-Kom. [S22] [S0803] At Misr Spinning and Weaving in El-Mahalla El-Kubra (a 2.5 million square metre complex 120 kilometres north of Cairo supporting 14,000 jobs), Phase 1 completed by July 2026 with Spinning Mill No. 1: a 62,000 square metre hall housing 182,784 spindles producing 30 tonnes of fine Ne 100 yarn per day, alongside Mill No. 4 with 71,000 to 73,000 spindles producing 9 tonnes per day of Ne 76 compact yarn. [S0802] [S0804] Simultaneously, private and joint-venture investors expanded short-staple spinning: even as global short-staple spindle shipments fell 40 percent in 2024 to 5.92 million units, ITMF data ranked Egypt among the top global buyers alongside China, India, Turkiye, Bangladesh and Indonesia. [S22]

8.9 EXCHANGE-RATE FLOATATION AND REGULATED ENERGY TARIFFS RESHAPE FACTORY CONVERSION ECONOMICS

Egypt's experience also shows how currency floatation alters factory economics. [R32] [S0805] Following the 6 March 2024 float, the US dollar rose from EGP 30.96 to EGP 49.60, reaching EGP 50.83 in August 2026 and passing EGP 55.33 on 22 October 2026, with September 2026 urban inflation at 13.9 percent and central bank lending rates at 20 percent. [S0805] When Egypt raised the private-sector minimum wage from EGP 6,000 to EGP 7,000 per month on 1 March 2025 (with a part-time floor of EGP 28 per hour), EGP 7,000 equalled about US$138 per month at August 2026 rates, while Decree 1306 of 2026 set industrial natural gas from 3 May 2026 at US$6.75 per MMBtu for textiles (below US$7.75 for steel and petrochemicals and US$14.00 for cement, following earlier benchmarks near US$0.047 per kilowatt-hour for electricity and US$5.35 per MMBtu for gas). [S19] [S0805] Yet currency depreciation inflates hard-currency machinery and lint imports, whereas Benin, Togo and Cameroon enjoy a CFA franc pegged at 655.957 per euro. [R32] [S06] [S0805]

8.10

Morocco's fast-fashion reactivity model anchors a quarter-million workers on European retail corridors

At the western gateway of the Mediterranean, Morocco exemplifies ultra-fast reactivity integrated into European retail logistics. [S23] According to the 2026 report *Closing the Loop: Scaling Circularity in Morocco's Textile Industry* by the International Finance Corporation (IFC) and the Moroccan Association of Textile and Apparel Industries (AMITH), Morocco's sector comprises 1,680 companies employing 246,000 formal workers who produce 1 billion items annually. [S23]

8.11 ROLL-ON ROLL-OFF FERRY CORRIDORS FROM TANGIER COMPRESS REPLENISHMENT CYCLES TO DAYS

Separated from Spain by 14 kilometres across the Strait of Gibraltar, factories in Tangier-Tetouan-Al Hoceima, Casablanca-Settat and Fes-Meknes ship garments by roll-on/roll-off truck-and-ferry from Tanger Med port into Spanish distribution centres in 48 to 72 hours, enabling five-to-fourteen-day fast-fashion turnaround. [S23] In 2024, the sector generated MAD 67.8 billion (about US$7.4 billion) in revenue, representing 7.6 percent of national industrial revenue and 11.4 percent of

merchandise exports. [S23] In 2025, 97 percent of Moroccan textile exports went to Europe and 93 percent entered the European Union, led by Spain and followed by France at 18 percent. [S23]

8.12 FEMALE WORKFORCE PARTICIPATION AND REGIONAL CLUSTER SPECIALISATION SUSTAIN HIGH-VELOCITY OUTPUT

With 246,000 formal employees, textiles provide 23.7 percent of all industrial jobs in Morocco, ranking second only to automotive manufacturing. [S23] Around 63 percent of textile employees are women, the highest female share of any industrial sector in Morocco, mirroring female participation across Kenya (75 percent of 66,800 AGOA jobs), Togo's PIA (60 to 65 percent), and Lesotho (30,000 to 40,000 workers). [S12] [S23]

8.13

Morocco's upstream contraction exposes fast-fashion exporters to imported fabric and EU Ecodesign mandates

Over the past two decades, as European buyers shifted to nominated fabrics for rapid seasonal turns, Morocco's domestic spinning and weaving base contracted, leaving its 1,680 garment makers dependent on imported yarn and cloth. [S23]

8.14 TEMPORARY ADMISSION CUSTOMS REGIMES AND LAW 28.00 INADVERTENTLY PENALISED DOMESTIC WASTE RECOVERY

Moroccan CMT exporters import nearly all fabric duty-free under the *Admission Temporaire pour Perfectionnement Actif* (ATPA) inward-processing regime. [S23] However, the IFC's 2023 to 2026 diagnostic showed that ATPA rules and general waste Law 28.00 (which lacks textile recycling targets or Extended Producer Responsibility rules) treated pre-consumer cutting offcuts (*chute*) as having zero value and no domestic legal owner. [S23] Unable to transfer bonded title or ship waste to Europe, factories sent most *chute* to landfill or cement kilns at around US$50 per tonne. [S23]

8.15 FRENCH ENVIRONMENTAL SCORING AND THE 2027 EU DIGITAL PRODUCT PASSPORT FORCE PRODUCT-LEVEL DISCLOSURE

With 93 percent of exports entering the EU and 18 percent going to France, Moroccan suppliers face the EU Ecodesign for Sustainable Products Regulation (Regulation (EU) 2024/1781), its 2027 Digital Product Passport (DPP), harmonised EU EPR rules, and France's AGEC environmental scoring labels. [S23] [S34] Retaining European buyers now requires verifiable recycled content and product-level lifecycle data. [S23] [S34]

8.16

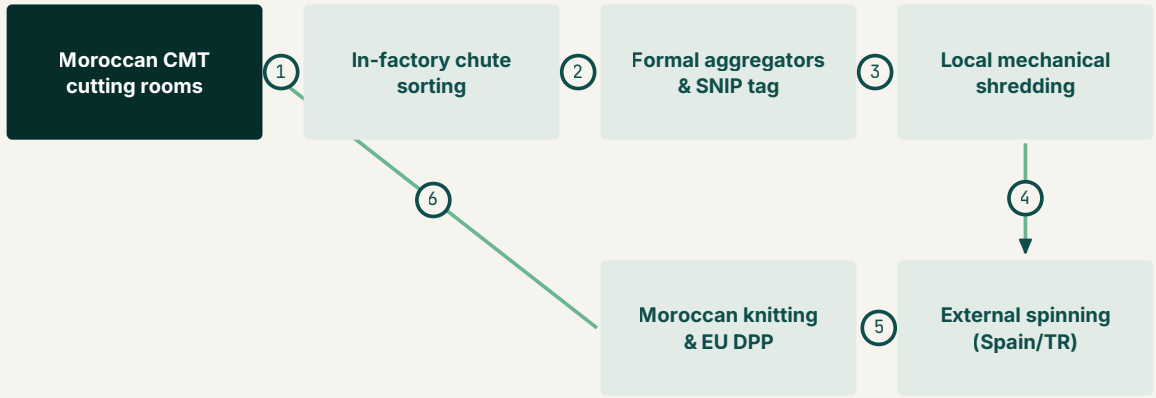
The IFC and AMITH Textile Circularity Exchange turns pre-consumer cutting waste into an upstream investment opportunity

Launched in September 2023 by the IFC with AMITH, Moroccan ministries and customs authorities across eight workshops through 2026, the Textile Circularity Exchange set a vision to recycle 100 percent of post-industrial cotton *chute* in Morocco by 2027. [S23] The World Bank Group's March 2026 *Morocco Country Private*

Sector Diagnostic (CPSD 2.0) concludes that scaling textile circularity could attract US$1.9 billion in private investment and create 30,800 jobs. [S23] [S0806] **Exhibit 36**, p. 131 maps this circularity loop and the external spinning detour uncovered during pilot trials.

EXHIBIT 36 /

Morocco's IFC and AMITH pre-consumer textile circularity loop converts cutting-room offcuts into EU-compliant recycled yarn



1. 425+ t pilot chute
2. US$400/t sorted
3. Baled by fibre
4. Recycled fibre
5. 80/20 blended yarn
6. Closed-loop jersey

SOURCED [S23] [S34] [S0806] Operational workflow documented in the 2023 to 2026 IFC-AMITH Textile Circularity Exchange pilot and GreenStory LCA (S23, S0806), showing the cross-border Spain and Turkiye spinning detour caused by Morocco's domestic spinning gap.

8.17 PILOT TRIALS ON SEGREGATED OFFCUTS PROVE COMMERCIAL QUALITY AND AN EIGHTFOLD PRICE UPLIFT

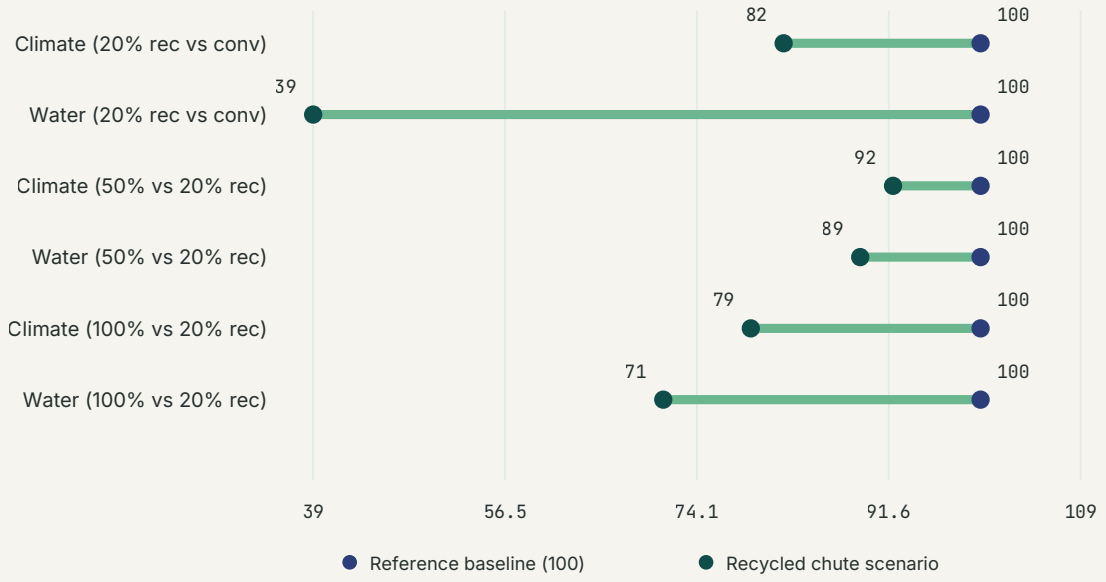
As **Exhibit 36**, p. 131 illustrates, non-profit partner Accelerating Circularity tested two traceable supply chains in Tangier across 100 percent white/greige cotton, 100 per-cent coloured cotton, and polyester blends using a factory Sorting Manual. [S23] Parti-cipating firms valorised over 425 metric tonnes (427 tonnes in final tallies) of *chute* during the pilot and committed a further 2,400 metric tonnes beyond the project, beating the 1,200-tonne target. [S23] [S0806] Segregating and digitally tagging *chute* (via CTR Solutions' Wastex-powered SNIP platform) lifted offcut value from US$50 per tonne (cement fuel) to US$400 per tonne. [S23] Yet because Morocco lacked recycled-fibre spinning mills, fibre shredded at Reciclados in Morocco had to be shipped to Spain and Turkiye for spinning before returning to Hallotex in Morocco for knitting and finishing. [S23] While **Exhibit 36**, p. 131 shows this physical routing, the Exchange's Life Cycle Assessment quantifies the environmental dividend. [S23]

8.18 CRADLE-TO-GATE LIFE-CYCLE ASSESSMENTS SHOW RECYCLED COTTON SLASHES WATER AND CARBON FOOTPRINTS

In October 2025, GreenStory completed a cradle-to-gate Life Cycle Assessment (LCA) for 1 kilogram of finished 80 percent organic / 20 percent recycled Moroccan single-jersey fabric against 100 percent organic and 100 percent conventional cotton fabrics made in Spain. [S23] While Moroccan wet processing (35 percent) and organic cotton farming (32 percent) drove water use, circular collection, sorting and shredding each contributed under 5 percent to any impact category. [S23] Using 20 percent recycled *chute* cut climate impact by 18 percent and water consumption by 61 percent against conventional cotton in Spain; relative to the 80/20 baseline, 50 percent recycled content cut carbon by a further 8 percent, fossil fuel by 6 percent and water by 11 percent (beating 100 percent Spanish organic cotton), while 100 percent recycled content cut carbon by 21 percent, fossil resource use by 17 percent and water by 29 percent. [S23] [S0806] **Exhibit 37**, p. 132 presents these LCA comparisons.

EXHIBIT 37 / RELATIVE IMPACT INDEX (VIRGIN BASELINE = 100)

Incorporating mechanically recycled cutting waste in Morocco cuts water and climate impacts against virgin cotton baselines



SOURCED [S23] [S0806] Derived from the October 2025 GreenStory / IFC-AMITH cradle-to-gate Life Cycle Assessment for 1 kg of finished single-jersey cotton fabric (S23, pp. 13, 34-36; S0806). For the 20% recycled vs conventional comparison, 100 represents 100% conventional cotton (climate -18% to 82; water -61% to 39). For the 50% and 100% recycled tiers, 100 represents the 80/20 baseline (climate -8% to 92 and -21% to 79; water -11% to 89 and -29% to 71).

As **Exhibit 37**, p. 132 confirms, mechanical recycling delivers verified Scope 3 reductions, though full gains require onshoring rotor spinning to eliminate cross-border yarn transport. [S23]

8.19 FORMALISING INFORMAL WASTE COLLECTORS REQUIRES AGGREGATORS AND ORDER-LINKED WORKING CAPITAL

An October 2025 Tangier collector survey found that over 80 percent of waste collectors operate informally in rented garages earning MAD 500 to MAD 1,000 monthly, yet up to 75 percent could formalise within five years with legal recognition and industrial-zone depots alongside formal leaders like SERP Recyclage Maroc (300

workers) and FEDERCC (20 member firms). [S23] The IFC and Morocco's interministerial committee recommended reclassifying *chute* as a by-product under Law 28.00 and ATPA, phasing in mandatory four-year factory sorting, introducing order-linked bank financing for aggregators, and using Green Invest to subsidise SME GRS, OEKO-TEX and BSCI certifications. [S23]

> **WARNING**
>
> Even when technical recycling trials succeed, commercial and customs friction can stall circular uptake. In the IFC-AMITH Morocco pilot, seven international apparel brands initially committed to participate, but several withdrew or failed to place commercial orders for recycled-content fabric once the material was produced, leaving suppliers holding speculative stock. [S23] Furthermore, under customs inward-processing regimes such as Morocco's ATPA, cutting waste from duty-exempt imported fabric cannot be sold legally inside the host country unless customs regulations explicitly permit title transfer or by-product reclassification. [S23] Industrial sponsors must therefore lock in binding buyer offtake specifications (colour, fibre blend and target yarn count) and verify customs waste-accounting rules before investing in mechanical shredding or open-end rotor equipment. [S23]

8.20

Strategic lessons for Sub-Saharan entrants show why assembly-only clusters hit a midstream value wall

Comparing Egypt and Morocco against Sub-Saharan hubs completes Part II of this paper. [R06] [S04] [S22] [S23] Both North African leaders prove that assembly-only growth leaks billions in intermediate imports unless paired with aligned domestic yarn spinning and cutting-room waste capture. [S22] [S23] [S34]

8.21 ALIGNING LOCAL LINT STAPLE PROFILES WITH TARGET GARMENT YARN COUNTS AVOIDS THE EGYPTIAN MISMATCH

Unlike Egypt (where extra-long-staple Giza cotton was too fine for volume QIZ denim and knits, forcing US$1.5 billion to US$4.5 billion in intermediate imports [S22] [S0801] [S0803]), Cameroon's 340,000 tonnes of annual seed cotton harvested by SODECOTON's 220,000 smallholders inside the 2.3 million tonne CFA-zone belt consists of rain-fed medium-to-long staple upland lint. [R01] [R03] [R05] [S04] This upland fibre spins directly into Ne 12s to Ne 40s ring and rotor yarns, the exact counts produced at Benin's BTEX mill (48,768 ring spindles, 2,000 rotors, 17,500 tonnes of yarn a year) and targeted by Cameroon's US$300 million Camtext SA pole (12,000 tonnes a year at Dibamba and Garoua) for t-shirts, uniforms, workwear and sheeting across CEMAC. [R09] [R10] [S04] [S35] [S36] Structuring yarn and fabric partnerships with SODECOTON and Camtext SA insulates private CMT entrants from the fabric import trap seen in Madagascar (US$104.6 million in 2024) and Morocco. [R03] [R10] [S23] [S26]

METHOD

To prevent both midstream origin disqualifications and unmeasured cutting-room waste, GFT's Performance-Management System (Deliverable 2) enforces two strict material-balance equations at the factory gate and on the cutting floor: [R28] [S23]

1. **Preferential Value-Addition and Origin Ratio**: For any export lot targeting a value-content threshold (such as Egypt's 35 percent QIZ rule) or double-transformation rule (such as the Cameroon-EU Economic Partnership Agreement), the lot ledger records verified domestic and regional input cost (C_{dom}) plus direct factory conversion cost (C_{conv}) divided by ex-works appraised value (V_{EXW}), confirming $(C_{\text{dom}} + C_{\text{conv}}) / V_{\text{EXW}}$ and stage-by-stage yarn-to-fabric origin before cutting begins. [S19] [S32]
2. **Cutting-Marker Utilisation and Segregated Chute Balance**: Every cutting marker m logs total input fabric roll weight ($W_{\text{in},m}$ in kilograms), net cut garment panel weight ($W_{\text{panel},m}$), and residual offcut weight ($W_{\text{chute},m}$), enforcing conservation of mass $W_{\text{in},m} = W_{\text{panel},m} + W_{\text{chute},m}$. [R28] [S23] Marker utilisation is tracked daily as $\eta_{\text{marker}} = W_{\text{panel},m} / W_{\text{in},m}$, while segregated circular recovery is tracked under the Sustainability KPI family as the percentage of $W_{\text{chute},m}$ sorted into uncontaminated colour-and-fibre bins (100 percent white/greige cotton, 100 percent single-colour cotton, or poly-cotton blends) ready for mechanical rotor recycling. [R28] [S23]

8.22 DAY-ONE CUTTING-ROOM OFFCUT SEGREGATION CAPTURES CIRCULAR FEEDSTOCK WITHOUT WAITING FOR A NATIONAL LAW

Whereas retrofitting *chute* sorting across 1,680 Moroccan factories required a three-year multi-stakeholder intervention [S23], a greenfield African factory can embed zero-contamination sorting from Shift One at minimal cost. [R28] [S23] In GFT's Cameroon design, every cutting table uses wheeled, colour-coded, QR-tagged bins linked to the active fabric roll's SODECOTON and Cotton made in Africa Hard Identity Preserved bale certificate, feeding clean cotton offcuts into partnered rotor spinning and the garment's EU Digital Product Passport. [R03] [R10] [S08] [S10] [S23] [S34]

WORKED EXAMPLE

Quantifying cutting-room chute valorisation and recycled rotor-yarn blending in an illustrative 3.0 million garment a year plant

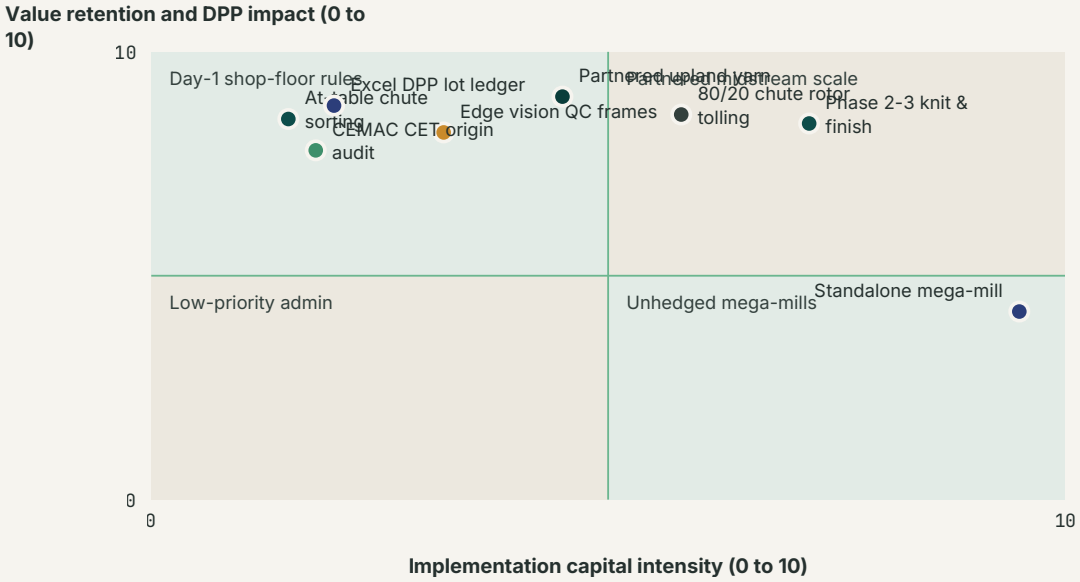
Consider GFT's illustrative Phase 1 greenfield garment venture in the Douala-Dibamba corridor, sized at a nameplate capacity of 3.0 million garments a year employing approximately 900 workers (both planning estimates from GFT's Cameroon feasibility model). Assume an illustrative product mix averaging 250 grams of finished cotton fabric per garment across t-shirts, polo shirts and light workwear shirts, requiring a net cut-panel mass of $3,000,000 \times 0.25\text{ kg} = 750,000\text{ kg}$ (750 metric tonnes) of finished fabric per year.

1. **Cutting-room mass balance**: Operating computer-aided marker nesting at an illustrative first-year cutting-marker utilisation rate of $\eta_{\text{marker}} = 83.33\text{ percent}$ requires an annual input fabric purchase of $750\text{ tonnes} / 0.8333 = 900\text{ metric tonnes}$ of cotton cloth. The remaining 16.67 percent ($900 - 750 = 150\text{ metric tonnes}$ a year) exits the cutting tables as pre-consumer post-industrial cotton offcuts (*chute* estimate).
2. **Revenue uplift from at-source sorting**: Using the empirical price benchmarks documented in the 2026 IFC-AMITH Morocco study [S23], if those 150 tonnes of annual cutting offcuts are swept together unsorted and sold as low-grade fuel for cement kilns at US$50 per tonne, the factory recovers only $150 \times \text{US\$50} = \text{US\$7,500}$ a year (illustrative arithmetic from cited IFC price). Conversely, when cutting-table operators segregate 90 percent of that stream (135 tonnes) at source into clean, colour-sorted, QR-tagged 100 percent cotton bales valued at the IFC circular benchmark of US$400 per tonne [S23] (with the remaining 15 tonnes of mixed trim waste sold at US$50 per tonne), annual by-product value rises to $(135 \times \text{US\$400}) + (15 \times \text{US\$50}) = \text{US\$54,000} + \text{US\$750} = \text{US\$54,750}$ a year (about XAF 33.4 million at an illustrative US$1 = 610 XAF rate, derived from the 655.957 XAF/EUR peg [R32]), a net cash-flow gain of US$47,250 a year that pays for cutting-room bins and barcode labels in weeks.
3. **Midstream yarn substitution and LCA water/carbon dividend**: In Phase 2 and Phase 3, delivering those 135 tonnes of clean, CmiA-traceable cotton offcuts to a partnered mechanical shredding and open-end rotor spinning line at an illustrative 92 percent mechanical fibre recovery yields $135 \times 0.92 = 124.2\text{ tonnes}$ of recycled cotton fibre. Blended at 20 percent recycled content with 80 percent virgin SODECOTON/CmiA cotton (matching the exact 80/20 blend validated in the IFC-AMITH GreenStory LCA [S23]), those 124.2 tonnes of internal offcuts anchor $124.2 / 0.20 = 621\text{ tonnes}$ of 80/20 circular yarn, sufficient to supply more than two-thirds of the factory's 900-tonne annual fabric requirement while delivering the LCA-verified 18 percent carbon reduction and 61 percent water reduction relative to conventional cotton. [S23] [S0806] This worked calculation is an illustrative planning case demonstrating GFT's engineering method, not a historical operating result.

To synthesise how GFT translates the empirical lessons of both Egypt and Morocco into concrete design rules across Phases 1, 2 and 3 of its Cameroon textile programme, **Exhibit 38**, p. 136 maps North African structural bottlenecks against GFT's operational controls on two defined dimensions: implementation capital intensity (x-axis) and value-retention and compliance impact (y-axis). [R10] [R28] [S22] [S23]

EXHIBIT 38 / DERIVED ENGINEERING SCORE (0 TO 10 SCALE)

GFT applies North Africa's midstream alignment and cutting-waste segregation lessons to its phased Cameroon programme



DERIVED [R06] [R10] [R28] [S22] [S23] [S35] Derived analytical positioning scoring GFT's Cameroon programme interventions from 0 (lowest) to 10 (highest) on implementation capital intensity (x-axis) and value-retention/compliance impact (y-axis), drawing on Egypt's ELS/midstream lessons (S22), Morocco's chute circularity benchmarks (S23), Camtext SA partnering (R10) and GFT Deliverable 2/3 controls (R28).

As **Exhibit 38**, p. 136 illustrates, the highest-return interventions sit in the upper-left and upper-middle zones: day-one cutting-table *chute* segregation, relational Excel lot tracking for Digital Product Passports, Edge Computer Vision defect inspection (above 90 percent accuracy at up to 60 metres a minute [R29]), and partnered medium-staple yarn and 80/20 rotor-spinning tolling with upstream poles such as Camtext SA. [R10] [R28] [S23] While the matrix provides a structured decision framework for sequencing capital across Phases 1 to 3, the plotted coordinates are derived analytical scores rather than measured factory outputs and must be validated against site-specific engineering quotes before each capital tranche is released.

GFT NOTE

Practical recommendation for African garment sponsors and industrial zone authorities: Never treat cutting-room fabric offcuts as sweeping waste or defer midstream yarn alignment until after export buyers audit the plant. [S22] [S23] First, match target garment constructions (t-shirts, polo shirts, workwear twills, sheeting) to local medium-staple upland cotton counts (Ne 12s to Ne 40s) and lock in domestic or regional yarn supply agreements so the factory avoids Egypt's US$1.5 billion intermediate import trap. [S04] [S22] Second, install colour- and composition-segregated *chute* bins with lot-linked QR traveller tickets at every cutting table from Day 1, and ensure national industrial zone customs rules classify segregated offcuts as a tradeable industrial by-product rather than bonded waste. [R28] [S23] Doing so converts a US$50 per tonne disposal burden into a US$400 per tonne circular raw material and prepares every exported garment for the 2027 European Union Digital Product Passport. [S23] [S34]

With the comparative analysis of all four regional archetypes across West, Central, East, Southern and North Africa now complete, Part III of this white paper turns in Chapter 09 to the cross-cutting determinants of bankability across every African corridor: tariff schedules, preferential rules of origin, and border enforcement. [R23] [S20] [S21] [S35]

Proximity buys a garment cluster its first order, but only measured midstream fibre conversion and segregated cutting-room circularity let it keep the margin.

CHAPTER SOURCE NOTES

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S23 International Finance Corporation (IFC), World Bank Group. 2026.

S0801 General Authority for Investment and Free Zones (GAFI), Arab Republic of Egypt. 2024-10.

S0803 Amwal Al Ghad English. 2019-07-08.

S34 European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. 2025.

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R10 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S12 UN Trade and Development (UNCTAD). 2026.

S0802 Professional Clothing Industry Association Worldwide (PCIAW). 2026-08-31.

S0805 Salihoglu Sourcing. 2026-10-27.

S04 SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). 2024.

S0804 The New Arab. 2025-01-07.

R12 Business in Cameroon. Publication date unrecorded; inherited source-text check.

R32 Wise; XE. Publication date unrecorded; inherited source-text check.

S06 United States Fashion Industry Association (USFIA). 2024.

S0806 Global Textile Times. 2026-06-12.

R01 Business in Cameroon. Publication date unrecorded; inherited source-text check.

R03 SODECOTON. Publication date unrecorded; inherited source-text check.

R05 Ecofin Agency. Publication date unrecorded; inherited source-text check.

R09 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S35 Cameroon National Shippers' Council (CNCC). 2026-01.

S36 World Bank Group. 2025-06.

S26 International Trade Administration, U.S. Department of Commerce. 2025-08-04.

R28 DataIntelo. Publication date unrecorded; inherited source-text check.

S32 Business in Cameroon. 2025-08-08.

S08 Aid by Trade Foundation (AbTF) / Cotton made in Africa. 2026-08-20.

S10 Cotton made in Africa (CmiA) / Aid by Trade Foundation. 2026-02-19.

R29 MDPI; industry inspection literature. Publication date unrecorded; inherited source-text check.

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S21 Trade and Industrial Policy Strategies (TIPS). 2024.

GREEN FUTURE TECH

LIMITED / HONG KONG SAR

09

Trade policy and rules of origin decide which business model is bankable before a single machine is ordered

In African textiles and apparel, tariff schedules, origin rules and used-clothing border enforcement outweigh nominal wage gaps; bankable projects anchor on regional customs unions and bilateral Economic Partnership Agreements rather than fragile unilateral waivers.

CHAPTER 09
DECISION TEST

In African textiles and apparel, tariff schedules, origin rules and used-clothing border enforcement outweigh nominal wage gaps; bankable projects anchor on regional customs unions and bilateral Economic Partnership Agreements rather than fragile unilateral waivers.

Trade policy and rules of origin determine whether an African textile or garment venture is bankable before a single ring frame, circular knitting machine or industrial sewing line is ordered. [S12] [S20] Across the continent, customs duty bands, preferential origin transformations and border enforcement against second-hand clothing and unrecorded imports shift landed unit economics by 20 to 45 percent, swamping the narrower cost differences produced by nominal statutory wages. [R14] [S12] [S16] [S35] Factory sponsors who underwrite ten-year machinery debt on unilateral, short-dated foreign trade preferences such as the United States African Growth and Opportunity Act (AGOA) and its single-transformation third-country fabric rule expose their balance sheets to sudden political revocation and legislative renewal cliffs. [R18] [S11] [S20] Conversely, structuring a manufacturing venture inside a protected regional customs union, specifically the 2026 Economic Community of Central African States (ECCAS) and Economic and Monetary Community of Central Africa (CEMAC) Common External Tariff (CET) with its 40 percent top duty on imported fabrics and ready-to-wear garments, paired with zero-duty European machinery imports and permanent duty-free export access under the Cameroon-European Union and Cameroon-United Kingdom Economic Partnership Agreements (EPAs), establishes a durable gross-margin buffer that does not depend on external political waivers. [S32] [S35] [S0902]

In Green Future Tech's three-part Cameroon textile programme, prepared on 31 January 2024 with sources refreshed in 2026, customs architecture and origin engineering act as primary design constraints alongside shop-floor productivity and utility reliability. [R18] [S32] [S35] Because Cameroon exports roughly 95 percent of its ginned cotton fibre raw and processes only about 5 percent domestically despite a national target to reach 50 percent local processing by 2030, every investment proposal must reconcile upstream fibre availability with downstream market protection. [R06] [R07] [S30] This chapter evaluates the seven trade-policy mechanisms that govern revenue stability across African textile corridors: the structural fragility of AGOA preferences, the industrial divergence between single-transformation and double-transformation origin rules, the landed-cost shield created by the 1 January 2026 ECCAS-CEMAC Common External Tariff, the capital-equipment and market-access arbitrage inside Cameroon's EU and UK Economic Partnership Agreements, the unresolved 7.7 percent tariff-line impasse in the African Continental Free Trade Area (AfCFTA), border leakage from used-clothing inflows and smuggling, and the B2B product-mix architecture that insulates local factory utilisation from day one. [R18] [R23] [S20] [S28] [S32] [S35] [S37]

9.1

AGOA's structural fragility makes short-dated unilateral US preferences non-bankable for ten-year capex

Unilateral trade preference programmes cannot support long-term industrial debt when their legislative horizon is shorter than the depreciation schedule of a textile mill. [S12] [S20] Enacted by the United States Congress in 2000 and extended by Public Law 114-27 in 2015, the African Growth and Opportunity Act expired on 30 September 2025 after twenty-five years as the primary framework for Sub-Saharan African apparel exports to the United States. [S20] Between 1 October 2025 and 2 February

2026, African apparel shipments entering United States ports faced standard Most-Favoured-Nation (MFN) duties before Congress enacted Section 5019, Division I of the Consolidated Appropriations Act, 2026 (Public Law 119-75) on 3 February 2026. [S20] That statute reauthorised AGOA and its third-country fabric rule only through 31 December 2026, while retroactively refunding duties collected since September 2025. [S20]

9.2 LEGISLATIVE RENEWAL CLIFFS AND POLITICAL REVOCATIONS DISRUPT LONG-TERM CAPEX

Operating a garment enterprise under short legislative extensions creates an intractable mismatch between buyer sourcing calendars and industrial capital expenditure. [S20] [S24] Global apparel brands place fabric commitments six to nine months ahead of retail delivery, meaning that a statutory expiry on 31 December 2026 forces sourcing directors to contingency-plan alternative Asian orders early in the calendar year. [S12] [S20] Industry bodies such as the Kenya Private Sector Alliance (KEPSA) note that short renewal cycles deter factory owners from committing to upstream spinning, weaving and wet-processing investments that require seven to twelve years of uninterrupted cash flow to amortise. [R10] [S24]

Beyond legislative cliffs, AGOA country eligibility is subject to annual review by the Office of the United States Trade Representative (USTR) against political, human-rights, labour and market-access criteria. [R18] [S20] [S0901] As of the 2025 and 2026 cycles, 17 of the 49 designated Sub-Saharan African countries were ineligible for AGOA benefits. [S20] Cameroon's eligibility was terminated effective 1 January 2020 over human-rights concerns, and Cameroon remained ineligible through 2025 and 2026. [R18] [S20] Ethiopia, which built Hawassa Industrial Park to employ 60,000 workers on double shifts (reaching 25,000 workers across 52 sheds in early 2019) and target US$1 billion in clothing exports, lost its AGOA eligibility effective 1 January 2022. [S07] [S20] Mali, Burkina Faso, Guinea, Niger, Gabon, Uganda and the Central African Republic were also removed between 2020 and 2025. [S20] Earlier, Madagascar suffered a five-year AGOA suspension from 2009 to 2015 ([S12]), and Rwanda had its AGOA apparel benefits suspended on 30 July 2018 during the East African used-clothing dispute, affecting US$1.5 million in garment exports (3 percent of Rwanda's US exports in 2017). [S0901]

9.3 CAPITAL-AMORTISATION HORIZONS REQUIRE CONTRACTUAL TRADE REGIMES

The financial consequence of this volatility is clear when examining equipment payback periods across African textile projects. [R09] [R10] In Cameroon, the Camtext SA integrated cotton-to-textile project announced on 12 November 2025 by Panafritex and Arise with SODECOTON, CNPS and Marlo commits US$300 million (180 billion XAF) to process 12,000 tonnes of cotton annually and create about 12,000 jobs at Dibamba and 3,000 at Garoua, with an estimated return on investment near 11 years and optimal capacity around 2033. [R09] [R10] Even a modular private downstream cut-make-trim (CMT) plant sized at an illustrative 3.0 million garments a year requires five to seven years of stable utilisation to recover machinery and captive solar-plus-storage investment. To establish a rigorous project baseline, **Exhibit 39**, p. 142 compares the six principal trade regimes governing African textiles and apparel in 2026.

EXHIBIT 39 / CUSTOMS AND ORIGIN PARAMETERS

Comparative matrix of trade regimes governing African textiles and apparel in 2026

Trade regime	Legal horizon	Origin rule	Key tariff rate	Cameroon status
US AGOA (P.L. 119-75)	To 31 Dec 2026	Single transformation (LDBC)	0% (15-32% MFN)	Ineligible since 1 Jan 2020
ECCAS-CEMAC CET	Permanent (1 Jan 2026)	Regional CEMAC origin	40% top garment band	In force (63.3m consumers)
Cameroon-EU / UK EPAs	Permanent (since 2014)	Double transformation	0% export / 0% capex	In force (textiles protected)
Egypt-US QIZ Protocol	Permanent bilateral	35% value (10.5% Israel)	0% US entry	Not applicable (Egypt only)
South Africa R-CTFL	Master Plan to 2030	Domestic retail compact	45% WTO bound duty	External benchmark (SACU)
AfCFTA (HS 50-63)	Treaty in force	Contested (1 vs 2 stage)	In 7.7% unresolved gap	Ratified (textiles pending)

SOURCED [R18] [R23] [S11] [S16] [S19] [S20] [S21] [S32] [S35] [S0902] Compiled from official legislative, customs and institutional records as of 2026. AGOA reauthorised through 31 Dec 2026 under P.L. 119-75 (S20). ECCAS-CEMAC CET effective 1 Jan 2026 in Cameroon (S35).

As **Exhibit 39**, p. 142 shows, the regimes divide sharply between discretionary unilateral waivers and binding treaty or customs-union schedules. [S20] [S35] [S0902] While the table establishes the statutory parameters of each framework, it cannot by itself guarantee margin capture; actual realisation depends on customs valuation discipline and on whether the manufacturer's bill of materials satisfies the required origin transformation gate. [S21] [S27] [S35]

9.4

Third-country fabric waivers versus double transformation dictate whether midstream mills get built

Preferential rules of origin directly determine whether an African economy builds upstream spinning and fabric mills or remains locked in low-margin garment assembly on imported Asian cloth. [S11] [S21] [S27] Global apparel trade agreements use four main origin architectures: single transformation (cutting and sewing imported fabric into a garment), double transformation (forming fabric from yarn and making up the garment, or spinning yarn and forming fabric within qualifying territories), triple transformation ("yarn forward"), and appraised value-content rules. [S11] [S19] [S21] [S27]

9.5 HOW THE AGOA SPECIAL RULE BUILT CMT EMPLOYMENT ENCLAVES DISCONNECTED FROM AFRICAN LINT

Under AGOA's "Special Rule" for Lesser Developed Beneficiary Countries (LDBCs) with a 1998 per capita gross national product below US$1,500 as measured by the World Bank, eligible African countries enjoy duty-free and quota-free US market access for apparel assembled from fabric originating anywhere in the world. [S11] Only

non-LDBCs such as South Africa were excluded from the outset, while Mauritius gained eligibility for the third-country fabric provision in 2008. [S11] [S13] Econometric studies cited by UN Trade and Development (UNCTAD), including De Melo and Portugal-Perez (2013) and De Melo and Tsikata (2015), confirmed that AGOA's single-transformation rule stimulated much faster LDC apparel export growth than the European Union's pre-2011 Everything But Arms (EBA) double-transformation regime. [S27] In Kenya, Export Processing Zone (EPZ) plants exported an estimated US$470 million of apparel to the US under AGOA in 2024, supporting about 66,800 direct jobs (75 percent women) and nearly 800,000 wider livelihoods. [S24] In Lesotho, roughly one-third of total national exports are tied to AGOA apparel, employing 30,000 to 40,000 workers. [S12] In Madagascar, where textiles and clothing generate 19.35 percent of GDP, 7 percent of foreign direct investment and 180,000 formal jobs, exporters ranked second in Sub-Saharan Africa to the US under AGOA and first to the EU as of 2023. [S25] [S26]

Yet single transformation discouraged backward integration into African cotton. [S12] [S26] Because foreign buyers nominate Asian fabrics with short lead times and export credit, EPZ assemblers rarely source local lint. [S11] [S24] In 2024, Madagascar imported US$104.6 million of cotton fabrics and US$23.4 million of yarns while exporting only US$2.6 million of fabric. [S26] Across West and Central Africa, the Cotton-4 countries (Benin, Burkina Faso, Chad and Mali) supply roughly 8 percent of global cotton trade (3 percent of world output) but process only 2 percent of their lint domestically ([S02]), while Cameroon exports 95 percent of its lint raw ([R06]). When tariff shocks hit, pure CMT enclaves have no domestic fabric buffer: UNCTAD notes that after April 2025 US tariff measures raised average duties on AGOA exporters from under 0.5 percent to 10 percent, full preference loss would more than double trade-weighted US tariffs to 20 percent or higher for apparel-specialised LDCs like Lesotho, Kenya and Madagascar, undermining competitiveness against integrated Asian mills in Bangladesh and Viet Nam. [S01] [S12]

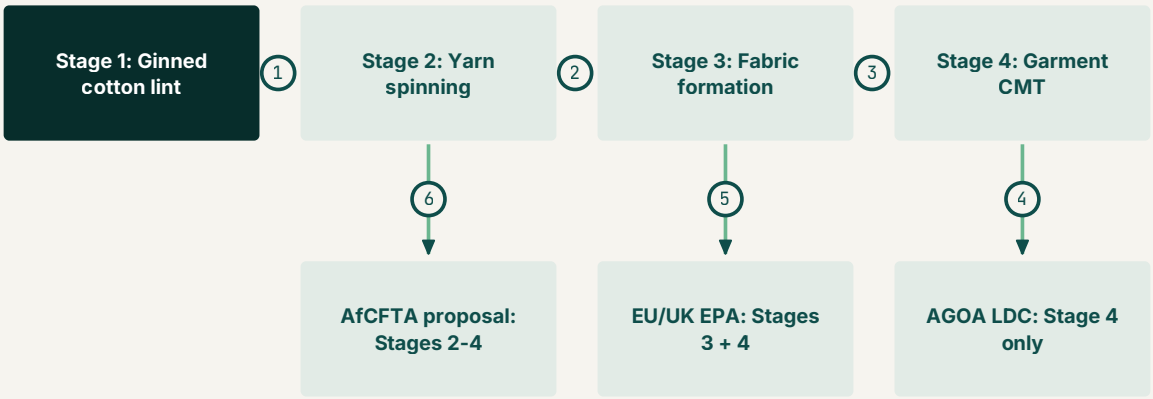
9.6 DOUBLE TRANSFORMATION AND VALUE-CONTENT RULES IN EU EPAS AND NORTH AFRICA

European Union Economic Partnership Agreements and Council Regulation (EU) 2016/1076 require double transformation: non-originating fibres must be spun and woven/knitted, or imported yarn must be woven/knitted into fabric and made up into garments within qualifying territories. [S21] [S27] [S0902] This requirement compelled Indian Ocean and North African exporters serving Europe, including the Mauritius-Madagascar co-production corridor and Morocco's 246,000-worker cluster (which sends 93 percent of its US$7.4 billion textile output to the EU), to maintain regional fabric or cumulation linkages. [S13] [S23] [S26] Similarly, Egypt's Qualifying Industrial Zone (QIZ) protocol grants over 1,000 firms (within a sector employing 1 million workers and providing nearly 30 percent of manufactured exports) duty-free US entry if 35 percent of appraised value is added in QIZ plants (including 11.7 percent Egyptian and 10.5 percent Israeli inputs). [S19] [S22] Even so, Egyptian exporters import US$1.5 billion of medium-staple yarns and fabrics annually because domestic spinning focused on fine Giza cotton, prompting state midstream modernisation at El-Mahalla El-Kubra. [S19] [S22]

To make these origin gates operational for project planners, **Exhibit 40**, p. 144 maps the four cotton-to-garment stages against AGOA, EU/UK EPA and AfCFTA qualification rules.

EXHIBIT 40 / VALUE-CHAIN QUALIFICATION STAGES

Single transformation versus double transformation across African and European preferential rules of origin



1. Ring or rotor spinning
2. Looms or circular knits
3. Spreading, cutting, sewing
4. Imported Asian fabric allowed
5. Qualifying fabric + CMT
6. African yarn + fabric + CMT

SOURCED [S11] [S20] [S21] [S27] [S32] [S0902] Compares physical manufacturing stages required inside the preference zone or cumulation partners under the AGOA LDC Special Rule (S11, S20), EU/UK EPA double transformation (S27, S32, S0902), and AfCFTA Chapter 50-63 negotiations (S21).

The sequence in **Exhibit 40**, p. 144 establishes why GFT designs its Cameroon supply chain for progressive midstream integration. [S21] [S27] A factory restricted to Stage 4 CMT on Asian cloth cannot clear the EU/UK EPA double-transformation gate (Stages 3 + 4) or an AfCFTA yarn-forward rule (Stages 2-4). [S21] [S0902] By anchoring Phase 1 in domestic and CEMAC sales while partnering with Camtext SA ([R09]) and West African zones such as Benin's GDIZ (1,640 hectares, transforming 40,000 tonnes of lint in Phase I across three integrated plants including BTEX's 48,768 spindles and 2,000 rotors) and Togo's PIA (400 hectares, five integrated units targeting 100 million pieces annually across the Arise parks) ([S03], [S04], [S06], [S14]), a producer crosses both double-transformation and yarn-forward thresholds. What **Exhibit 40**, p. 144 cannot capture is the working-capital cost of holding regional yarn and fabric inventories, which must be managed through staged cash-flow gates.

9.7

The 2026 ECCAS-CEMAC Common External Tariff creates a 40 percent gross-margin shield for Central African producers

On 1 January 2026, Central Africa enacted a structural customs reform that fundamentally improves the unit economics of regional garment manufacturing. [S35] Approved by the Council of Ministers in Bata on 18 October 2024, the harmonised ECCAS-CEMAC Common External Tariff (CET) officially entered into force in Cameroon on 1 January 2026 under the 2026 Finance Law, unifying external customs duties across the six CEMAC states and the wider eleven-member ECCAS bloc. [S35] [S36]

9.8 THE FOUR-BAND TARIFF ARCHITECTURE AND THE CONVERSION DUTY SPREAD

As documented by the Cameroon National Shippers' Council (CNCC), the 2026 ECCAS-CEMAC CET classifies external imports into four ad valorem duty bands according to processing depth: [S35]

- **Band 1 (0 percent duty):** Essential social goods and priority basic necessities. [S35]
- **Band 2 (5 percent to 10 percent duty):** Raw materials, primary agricultural inputs and unliberalised industrial capital equipment. [S35]
- **Band 3 (20 percent duty):** Intermediate goods and semi-finished components requiring further regional processing. [S35]
- **Band 4 (30 percent to 40 percent duty):** Finished consumer goods, applying the top **40 percent customs tariff** directly to imported fabrics and ready-to-wear clothing. [S35]

This cascading schedule creates a 20 to 35 percentage-point duty differential between imported finished garments (40 percent) and production inputs (5 to 20 percent, or 0 percent on domestic lint and EU EPA machinery). [R01] [S32] [S35] [S0903] In a country that harvested 314,455 tonnes of seed cotton in 2023 and about 340,000 tonnes in 2024 (with 2025 projections above 350,000 tonnes across SODECOTON's 220,000 growers and nine ginneries), converting local fibre behind a 40 percent external tariff wall reverses decades of import disadvantage. [R01] [R02] [R03] [S35]

9.9 MACRO-REGIONAL DEMAND SCALE AND THE SOUTH AFRICAN LOCALISATION PARALLEL

The market sheltered by the 2026 CET is substantial. [S35] [S36] According to the World Bank's June 2025 CEMAC Economic Barometer, the six CEMAC states (Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea and Gabon) encompass 63.3 million consumers and a combined GDP of US$125.9 billion in 2024, with regional growth at 3.0 percent (3.5 percent in Cameroon and 3.7 percent in Chad) and a single euro-pegged currency at 655.957 XAF per EUR. [R32] [S36] In Cameroon, clothing and footwear expenditure stood at about US$94.70 and 8.0 pieces per person in 2024, while apparel e-commerce revenue is projected to rise from US$20.32 million in 2023 to US$33.61 million by 2027 at 13.41 percent annually. [R26]

South Africa's Retail-Clothing, Textile, Footwear and Leather (R-CTFL) Master Plan 2030 illustrates how a comparable tariff floor anchors domestic manufacturing. [S16] [S17] [S18] After losing 10,000 to 15,000 jobs annually between 2000 and 2008, South Africa raised clothing tariffs from 40 percent to the WTO bound rate of 45 percent and introduced Industrial Development Corporation (IDC) retooling grants, cutting the rate of job loss by two-thirds. [S16] Under the R-CTFL Master Plan, retailers committed to raise local procurement to 65 percent of sales by 2030, supporting 333,000 sector workers (165,000 in manufacturing). [S17] A 2025 Localisation Support Fund (LSF) study confirmed retailer willingness to source up to 81 million additional garments locally a year by 2030, worth R7.9 billion and 34,000 formal jobs, provided factories close industrial-engineering and finishing gaps. [S18]

METHOD

To quantify the landed-cost shield created by the 1 January 2026 ECCAS-CEMAC Common External Tariff ([S35]) and the Cameroon-EU EPA ([S32], [S0903]), GFT models a unit-cost bridge at the Port of Douala boundary comparing an imported Asian corporate polo shirt (250 grams combed cotton pique) with local Douala assembly.

- **System boundary:** CIF Port of Douala warehouse gate before standard 19.25 percent domestic VAT, which applies equally to duty-paid imports and local sales (illustrative boundary).
- **Cited policy inputs:** 40 percent ECCAS-CEMAC CET rate on imported ready-to-wear apparel ([S35]); 0 percent customs duty on EU EPA Group 1 and Group 2 machinery ([S32], [S0903]); 10 percent Band 2 duty on non-EU trims ([S35]); fixed euro peg of 655.957 XAF per EUR ([R32]).
- **Illustrative commercial inputs:** Asian FOB export price of US$4.50 per shirt; ocean freight and insurance of US$0.50 per unit (CIF Douala US$5.00); port clearance of US$0.35 per unit; local Douala production cost built up from partnered regional fabric, zero-duty EU equipment depreciation and calibrated Cameroonian line labour.

WORKED EXAMPLE

Consider an institutional buyer in Douala procuring 10,000 cotton workwear polo shirts in 2026 under the ECCAS-CEMAC CET ([S35]).

1. **Imported Asian garment landed cost (illustrative benchmark using cited 40 percent CET):**
2. Free on Board (FOB) Asian port price: **US$4.50** per garment (illustrative).
3. Ocean freight, insurance and terminal handling: **+US$0.50**, giving a CIF Douala customs value of **US$5.00** per garment (illustrative).
4. ECCAS-CEMAC Band 4 Common External Tariff at 40 percent of CIF ([S35]): `0.40 * US$5.00` = **+US$2.00** per garment.
5. Customs brokerage, port levies and inland drayage: **+US$0.35** per garment (illustrative).
6. **Total duty-paid landed import cost:** `US$4.50 + US$0.50 + US$2.00 + US$0.35` = **US$7.35** per garment (about **XAF 4,410** at an illustrative 600 XAF/US$ rate derived from 655.957 XAF/EUR, [R32]).

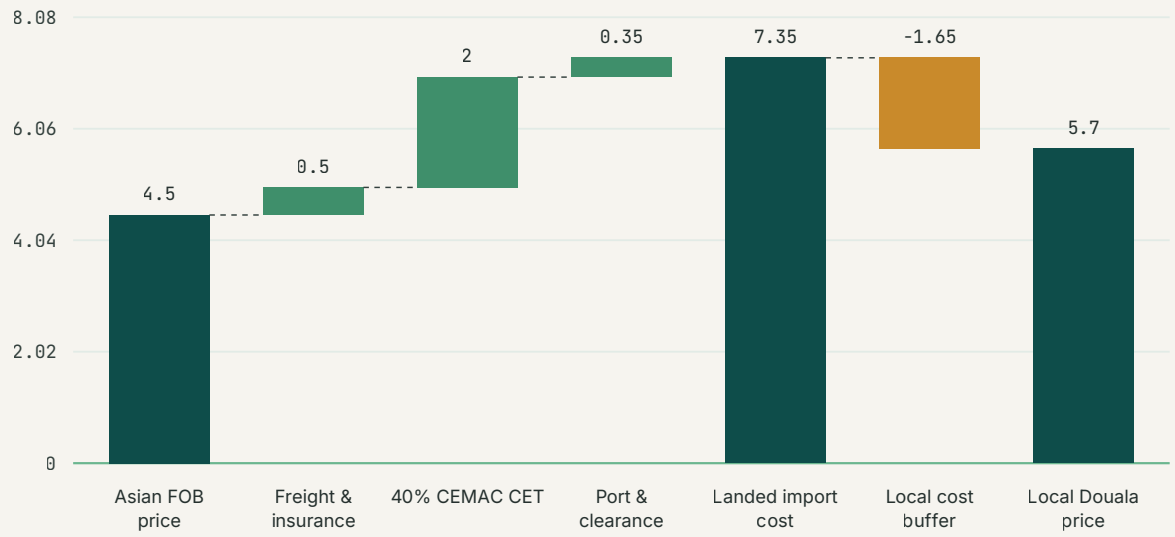
1. **GFT local Douala ex-factory cost (illustrative Phase 1 calculation):**
2. Domestic/regional cotton pique fabric (0.28 kg gross per shirt, 0 percent customs duty): **US$2.60** per garment (illustrative).
3. Trims, collar rib, thread and packaging (partially imported at 10 percent Band 2 duty, [S35]): **US$0.55** per garment (illustrative).
4. Direct and supervisory labour (15 Standard Allowed Minutes at 65 percent efficiency, salaried well above the XAF 43,969 statutory SMIG toward the US$359 national formal average, [R14], [R15]): **US$1.15** per garment (illustrative).
5. Captive solar-plus-storage power ([S33]), zero-duty EU EPA equipment depreciation ([S32], [S0903]), quality assurance and overhead: **US$0.85** per garment (illustrative).
6. Target factory operating margin (9.6 percent on cost): **+US$0.55** per garment (illustrative).
7. **Total local Douala ex-factory selling price:** `US$2.60 + US$0.55 + US$1.15 + US$0.85 + US$0.55` = **US$5.70** per garment (about **XAF 3,420**, illustrative).

1. **Net competitive buffer:** Local Douala manufacturing delivers the shirt at **US$5.70** against **US$7.35** for the duty-paid import, creating a **US$1.65 per garment (22.4 percent) landed-cost buffer** while earning a positive factory operating margin. This worked example is an illustrative analytical case and not a commercial forecast.

To visualise this cost reconciliation, **Exhibit 41**, p. 148 charts the waterfall from the US$4.50 Asian FOB benchmark to the US$7.35 duty-paid import cost and down to the illustrative US$5.70 local Douala ex-factory price. [S35]

EXHIBIT 41 / US DOLLARS PER GARMENT (ILLUSTRATIVE BENCHMARK)

The 2026 ECCAS-CEMAC 40 percent Common External Tariff creates a decisive landed-cost buffer for Douala garment assembly



DERIVED [R32] [S32] [S35] Derived landed-cost bridge applying the 40% ECCAS-CEMAC CET effective 1 Jan 2026 (S35) and 0% EU EPA machinery duty (S32) to an illustrative US$4.50 FOB imported cotton polo shirt ($5.00 CIF Douala) versus local Douala manufacturing ($5.70 ex-factory).

As **Exhibit 41**, p. 148 demonstrates, the US$2.00 per unit tariff levied by the 40 per-cent CET more than offsets the initial productivity gap between a greenfield Central African plant and an Asian exporter. [S35] What the waterfall cannot guarantee is full customs valuation compliance at the port; if an importer under-invoices the CIF value, the realised tariff shrinks, which is why customs valuation enforcement and B2B buyer selection are essential companions to tariff policy. [S16] [S35] [S37]

9.10

Cameroon's EU and UK Economic Partnership Agreements grant zero-duty machinery imports and duty-free export access

Complementing the CEMAC Common External Tariff, Cameroon's bilateral Economic Partnership Agreements with the European Union (ratified July 2014, provisionally applied since 4 August 2014) and the United Kingdom (effective July 2021) provide permanent duty-free export access to Europe alongside zero-duty import of European industrial machinery. [S32] [S0902] [S0903] Within Central Africa, Cameroon is the sole country implementing the EU EPA, accounting for roughly 26 percent of the EUR 17.9 billion in 2024 EU-Central Africa goods trade. [S0902] While upper-middle-income CEMAC neighbours Gabon and Equatorial Guinea graduated out of EU GSP and EBA preferences in 2014 and 2021 respectively, Cameroon's duty-free, quota-free access to the 27-nation EU and the UK is locked in permanently by treaty. [S0902]

9.11 ASYMMETRIC IMPORT LIBERALISATION LOWERS CAPEX WHILE EXCLUDING USED CLOTHES AND TEXTILES

On the import side, Cameroon phases out customs duties on 80 percent of EU and UK goods over 15 years across three product groups while permanently excluding 20 percent of sensitive domestic categories: [S32] [S0902] [S0903]

1. **Group 1 (raw materials, essential inputs and capital goods):** Dismantling began on 4 August 2016 at 25 percent a year and reached **100 percent duty exemption (0 percent tariff)** on 4 August 2019, covering chemicals, computers and laboratory testing equipment. [S32] [S0903]
2. **Group 2 (industrial equipment and production inputs):** Dismantling began on 4 August 2017 at 15 percent a year and reached **100 percent duty exemption (0 percent tariff)** on 4 August 2023, covering industrial machinery, generators, electric rotary converters and commercial goods vehicles. [S0903]
3. **Group 3 (high-tax-yield sensitive goods):** Tariffs fell by 10 percent annually to reach a 60 percent cut in August 2025 (10th phase) and a **70 percent discount** on 4 August 2026 (11th phase), with full exemption scheduled for 2030. [S32] [S0903]
4. **Permanently excluded products (20 percent of lines):** As recorded in the European Commission's Access2Markets schedule, **used clothes and textiles** remain **entirely excluded from tariff liberalisation**. [S0902]

This asymmetric schedule gives a Cameroonian textile venture a major capital-cost advantage. [S32] [S0903] European spinning frames, knitting machines, automated cutters, sewing machines, optical inspection cameras and backup generators enter Douala at **0 percent customs duty** under Group 1 and Group 2 (part of roughly CFAF 103 billion in cumulative 10-year EPA duty savings across the economy, even as total customs receipts exceeded CFAF 1 trillion in 2023). [S0903] Simultaneously, because used clothes and textiles sit on the 20 percent exclusion list, European exporters receive zero tariff concessions on competing apparel or second-hand clothing, leaving the 40 percent CEMAC CET wall intact. [S35] [S0902] On the export side, originating Cameroonian garments shipped with a Movement Certificate EUR.1 (valid 10 months) benefit from a 15 percent ex-works tolerance and diagonal/full cumulation with ACP partners. [S0902]

9.12

The AfCFTA textile rules-of-origin impasse leaves clothing inside the unresolved 7.7 percent tariff gap

Although 54 African Union member states have signed the African Continental Free Trade Area (AfCFTA) and agreed rules of origin covering 92.3 percent of tariff lines, **textiles and clothing (HS Chapters 50 to 63)** and vehicles remain inside the **unre-**

solved 7.7 percent gap. [R23] [S21] As Trade and Industrial Policy Strategies (TIPS) Policy Brief 4/2024 and UNCTAD document, continental negotiations are deadlocked between two coalitions: [S21] [S27]

- **Cotton-growing and integrated states (double transformation):** Led by South Africa, Egypt, Nigeria and West/Central African cotton producers (Benin, Togo, Cameroon and the C-4+ WTO-Afreximbank Cotton Partnership bloc), this coalition insists on two-stage "yarn-forward" origin rules so that AfCFTA does not become a duty-free transhipment conduit for Asian fabrics stitched in coastal enclaves. [S02] [S16] [S21] [S27] [S38]
- **CMT assembly hubs (single transformation):** Led by EPZ exporters such as Kenya and Lesotho that rely on imported third-country cloth, this group seeks single-transformation rules or multi-year transition waivers. [S11] [S21] [S24]

For a venture sponsor in Cameroon, this impasse dictates two planning rules. [R23] [S21] First, Phase 1 financial projections must not rely on extra-regional AfCFTA tariff preferences; regional revenue should be anchored strictly inside the six-nation, 63.3 million consumer CEMAC customs union where duty-free circulation is already active behind the 40 percent CET. [S35] [S36] Second, by sourcing yarn and fabric from domestic SODECOTON/Camtext operations ([R03], [R09]) or UEMOA parks ([S04], [S14]), GFT's garments satisfy double-transformation origin automatically the day AfCFTA Chapter 50 to 63 rules take effect. [R23] [S21]

9.13

Second-hand clothing inflows and porous borders require product-mix insulation and customs discipline

Statutory tariff protection fails when business plans ignore two border leakages that depress mass-market prices across Sub-Saharan Africa: imported post-consumer used clothing (*fripperie*, *obroni wawu* or *mitumba*) and unrecorded cross-border textile smuggling. [S28] [S30] [S37]

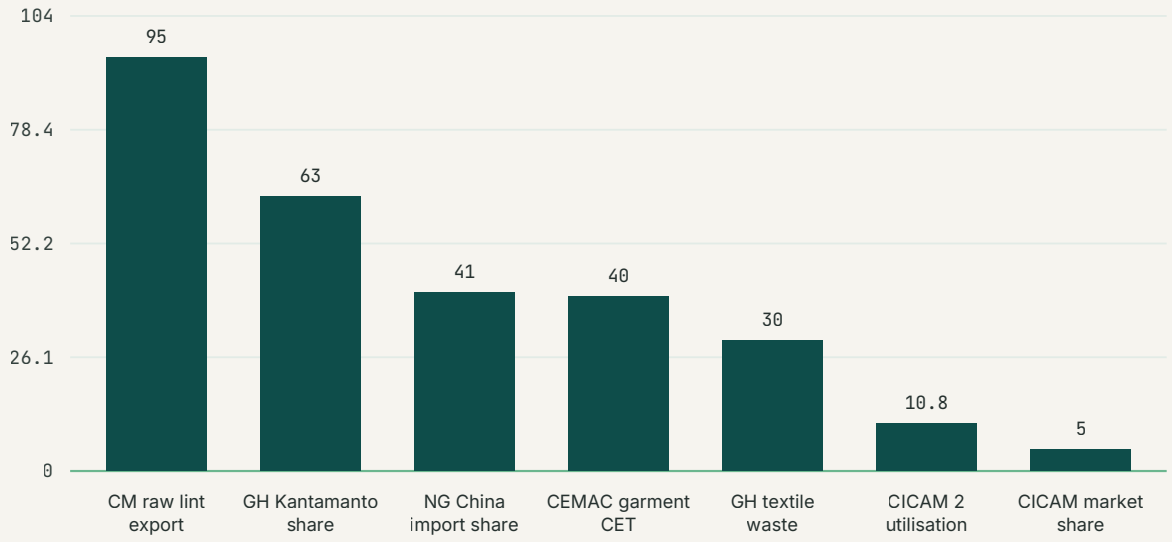
9.14 USED-CLOTHING WASTE IN GHANA AND SMUGGLING PRESSURE IN NIGERIA AND CAMEROON

In Ghana, used textile imports reached **111,329 tonnes** worth **US$164 million** in 2021 to 2022, with **63 percent** routed through Accra's Kantamanto Market. [S28] The Ellen MacArthur Foundation reports that **30 percent** of textile waste collected at Kantamanto by Accra Waste Management Services is landfilled, and **30 to 40 percent** of imported bale volume leaves the market as waste, prompting Extended Producer Responsibility (EPR) policy design. [S28] In Nigeria, up to **US$4 billion** in annual textile smuggling and cheap imports (with China supplying **41.02 percent** of total Nigerian imports in Q2 2026) weakened local mills alongside high off-grid power costs. [S37] In Cameroon, state incumbent CICAM saw its domestic market share fall from **85 percent** three decades ago to **5 percent** today ([R11]), with July 2023 plant utilisation at **33.7 percent** in Garoua, **48.9 percent** at CICAM 1 and **10.83 percent** at CICAM 2 (costing CFAF 2 billion in 2020 underutilisation and requiring CFAF 30.7 to 70.2 billion in estimated restructuring, [R12], [R13]), squeezed by contraband fabric and second-hand imports ([S30]).

When East African Community states attempted to ban used-clothing imports in 2016, US used-clothing exporters petitioned USTR, forcing Kenya, Tanzania and Uganda to back down while Rwanda's AGOA apparel benefits were suspended on 30 July 2018. [S24] [S0901] Cameroon avoids this vulnerability because its base case excludes AGOA ([R18]) and its EU EPA permanently excludes used clothes and textiles from liberalisation ([S0902]). To compare these structural rates, **Exhibit 42**, p. 151 sets seven sourced benchmarks side by side.

EXHIBIT 42 / PERCENT OF RESPECTIVE SECTOR DENOMINATOR

Import penetration, used-clothing waste and underutilisation highlight why tariff walls require B2B product insulation



SOURCED [R06] [R11] [R12] [S28] [S35] [S37] Each bar reports a sourced percentage against its stated sector denominator: Cameroon raw lint export share (R06), Ghana used-clothing routing to Kantamanto and landfilled waste share (S28), Nigeria Q2 2026 Chinese share of total imports (S37), CEMAC top garment CET rate (S35), and CICAM 2 utilisation and domestic market share (R11, R12).

The benchmarks in **Exhibit 42**, p. 151 confirm that a 40 percent statutory tariff band (CEMAC garment CET) coexists with severe historical import and waste pressures across the region. [R11] [R12] [S28] [S35] [S37] Because each bar is measured against its own sector denominator, the exhibit compares structural incidence rates rather than parts of a single sum. The operational conclusion is clear: a formal African garment factory must target segments where used-clothing bales and informal contraband cannot compete. [S28] [S30]

9.15

GFT's trade-resilient revenue portfolio anchors on CEMAC B2B workwear and local retail before export

In Deliverable 1 (Cameroon Feasibility Study), Green Future Tech sizes Phase 1 at an illustrative nameplate capacity of 3.0 million garments a year (~900 workers at full ramp), deliberately anchored in B2B institutional contracts and branded domestic/CEMAC categories that second-hand bales cannot substitute. [R26] [S28] [S30] [S35]

9.16 WHY B2B INSTITUTIONAL UNIFORMS AND BRANDED MULTI-PACKS ARE IMMUNE TO SECOND-HAND BALES

A 55-kilogram bale of used clothing contains assorted single-piece garments of mixed sizes and worn condition. [S28] It cannot fulfil corporate, industrial or public-sector uniform contracts that require five institutional specifications: (1) graded size continuity (Small to 3XL) across thousands of identical pieces with multi-year reorder repeatability ([S18], [S30]); (2) continuous dye-lot shade matching and industrial logo embroidery or printing ([R29], [S18]); (3) verified fabric weight, seam strength and shrinkage testing logged on end-of-line quality records ([R28], [R29], [S34]); (4) formal VAT invoicing and tax compliance required by corporate and parastatal buyers ([R09], [R16], [S30]); and (5) authentic Cameroonian cultural freshness in occasion and ready-to-wear lines, including northern *leppi* and *godje* woven heritage trims ([R26], [S30], [S31]).

9.17 GFT'S FIVE-TIER MARKET-ACCESS SEQUENCE FROM DOUALA TO THE EUROPEAN UNION

Combining product-mix insulation with the tariff regimes in **Exhibit 39**, p. 142, GFT sequences commercial expansion across five tiers: [R18] [R23] [R26] [S32] [S35] [S0902]

- **Priority 1 (Domestic traditional wear, urban ready-to-wear and e-commerce):** Serving Cameroon's US$94.70 per capita clothing market and an apparel e-commerce channel growing at 13.41 percent annually from US$20.32 million in 2023 to US$33.61 million by 2027, alongside northern artisanal weaving partnerships. [R26] [S30] [S31]
- **Priority 2A (Domestic B2B uniforms and corporate workwear):** Direct tenders for industrial coveralls, corporate polo shirts, school uniforms and hospital/hotel linens once First-Pass Yield passes GFT's 96 percent illustrative quality gate. [R28] [R29]
- **Priority 2B (CEMAC regional customs union):** Duty-free distribution across the 63.3 million consumer, US$125.9 billion GDP CEMAC bloc behind the 40 percent CET effective 1 January 2026. [R32] [S35] [S36]
- **Priority 3A (Duty-free EU and UK EPA exports):** Double-transformation garments made from CmiA-verified SODECOTON/Camtext or regional yarn and fabric ([R03], [R10], [S08], [S09], [S32], [S0902]), carrying lot-level Digital Product Passports under Regulation (EU) 2024/1781 ([S10], [S34]).
- **Priority 3B (AfCFTA monitored expansion):** Entry into ECOWAS, EAC and SADC once Chapter 50 to 63 rules of origin conclude ([R23], [S21]), with zero reliance on AGOA in the base financial case ([R18], [S20]).

> **GFT NOTE**
>
> In GFT's performance-management design (Deliverable 2), trade compliance is captured at the receiving dock from Shift One. Every yarn cone and fabric roll logged into the Year 1 Excel system of record carries its 8-digit Harmonised System code, its supplier origin and CmiA Hard Identity Preserved lot ID ([S08], [S10]), and its transformation qualification status (CEMAC origin, EU/UK EPA double-transformation eligible, or Band 2/3 import, [S35], [S0902]). Linking cutting-room traveller tickets to these lot IDs generates audit-ready documentation for CEMAC circulation certificates, EU Movement Certificates EUR.1 ([S0902]) and 2027 EU Digital Product Passports ([S34]) without separate administrative overhead.

WARNING

Tariff schedules and trade preferences are subject to legislative revision and customs reclassification. As the Cameroon National Shippers' Council notes ([S35]), EPA duty exemptions and 2026 ECCAS-CEMAC CET bands depend strictly on accurate Harmonised System classification and do not exempt imports from VAT or port fees. Because annex references R19 to R22 were absent from the inherited 2024 study register, AGOA Public Law 119-75 ([S20]) and the 1 January 2026 ECCAS-CEMAC CET ([S35]) were re-sourced from primary records for this edition. Sponsors must obtain binding customs rulings from the Directorate General of Customs (douanes.cm) before ordering machinery. This chapter is for industrial research only and does not constitute legal, customs, tax or investment advice.

Securing a 40 percent regional tariff shield ([S35]) and zero-duty EU machinery imports ([S32], [S0903]) establishes the external margin envelope, but tariff protection cannot save a factory whose sewing lines stall at low efficiency ([R12], [S18]). Chapter 10 therefore moves inside the factory to examine how unit labour costs, Standard Allowed Minutes and female supervisory training pipelines convert trade-policy protection into shop-floor profitability. [R14] [R15] [S29]

A tariff wall buys a factory time to learn, but only measured origin and shop-floor discipline turn a protected border into a permanent industry.

CHAPTER SOURCE NOTES

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S20 Congressional Research Service (CRS). 2026-02-17.

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R18 Congressional Research Service IF10149; AGOA (Wikipedia). Publication date unrecorded; inherited source-text check.

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S06 United States Fashion Industry Association (USFIA). 2024.
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R03 SODECOTON. Publication date unrecorded; inherited source-text check.
R32 Wise; XE. Publication date unrecorded; inherited source-text check.
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R15 wage.is. Publication date unrecorded; inherited source-text check.
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S38 World Trade Organization (WTO). 2025.
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R12 Business in Cameroon. Publication date unrecorded; inherited source-text check.
R13 Business in Cameroon; MMI News. Publication date unrecorded; inherited source-text check.
R29 MDPI; industry inspection literature. Publication date unrecorded; inherited source-text check.
R28 DataIntelo. Publication date unrecorded; inherited source-text check.
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GREEN FUTURE TECH

LIMITED / HONG KONG SAR

10

Low nominal African wages do not translate into low unit labour cost without a funded supervisor and technician pipeline

A low monthly wage becomes a low cost per garment only when standard minutes, saleable output and supervisory capability are engineered together. GFT therefore treats operator and technician training as production capital, not overhead.

CHAPTER 10
DECISION TEST

A low monthly wage becomes a low cost per garment only when standard minutes, saleable output and supervisory capability are engineered together. GFT therefore treats operator and technician training as production capital, not overhead.

The answer is to cost accepted output, not job titles. A sewing operator's monthly pay is only the numerator of one input. The denominator is the number of garments that pass quality inspection within the paid time available. Recruitment, vestibule training, line balancing, mechanical attendance and supervisory judgement determine that denominator. A factory that funds these capabilities can pay a higher wage and still record the lower unit labour cost. A factory that treats training as discretionary overhead can destroy its apparent wage advantage before the first order ships.

This distinction changes the investment decision. The skills budget belongs inside the production ramp, alongside machines, spare parts and working capital. It needs a named owner, a cohort plan and measured release gates. It also needs honest benchmarks. Statutory minima, economy-wide salary indicators and actual factory offers are not interchangeable. Nor are trainee numbers, productivity results and employment projections. This chapter separates those categories, then sets out an operator-to-supervisor and technician pipeline for GFT's Cameroon textile programme.

10.1

Wage benchmarks only matter when their denominators match

Cameroon's inherited evidence register records a statutory minimum wage of XAF 43,969 a month from 23 February 2024, approximately US$76 at the source's conversion. The same register records an earlier XAF 41,875 minimum in 2023 and describes the increase as 5 percent. These are statutory floors, not observations of what a competent sewing operator, mechanic or line leader costs to recruit and retain. [R14]

The inherited cross-sector salary indicator for Cameroon is about US$359 a month. Its scope is average salary across sectors, and its original publication date is not recorded in the register. It is therefore a useful warning against budgeting every factory role at the statutory floor, but it is not a prevailing garment wage, a current offer or a Cameroon manufacturing average. [R15]

Cambodia provides a second necessary correction. The inherited register identifies US$204 a month as the garment-sector minimum for 2024, not the average wage paid by garment factories. Comparing that figure with Cameroon's cross-sector US$359 indicator would mix sector, definition and date. The defensible comparison is between each statutory or sector floor and the actual all-in pay required for a defined role at the proposed site. [R17]

An investor should build the wage bill from a role-by-role pay architecture. Start with the legal minimum that applies to the worker and classification. Add the recruiting premium for dexterity, experience and reliability. Add shift, transport, meal or attendance elements where the factory chooses or is required to provide them. Then add the employer charges and paid non-production time verified for the Cameroonian case. Supervisors, quality staff, maintenance technicians, trainers and planners need separate bands because their output cannot be inferred from operator headcount.

The comparison in **Exhibit 43**, p. 157 preserves the different meanings of the published figures. It deliberately includes a workforce scale observation from Hawassa to show why headcount cannot sit in the same ranking as monthly pay. The World Bank reported about 25,000 workers hired across 52 factory sheds by early 2019. That figure describes recruitment at that time, not wages, retention or present employment. [S07]

EXHIBIT 43 / REPORTED MONTHLY PAY UNLESS OTHERWISE STATED

Published labour figures answer different questions and cannot be treated as one wage ranking

Benchmark	Reported value	Scope and period	Correct model use
Cameroon statutory minimum	XAF 43,969; about US$76	National floor from 23 February 2024	Legal floor, not total employment cost
Cameroon salary indicator	About US$359	Cross-sector average; source date not recorded	Pay escalation check, not garment wage
Cambodia garment minimum	US$204	Sector minimum for 2024	Sector floor, not average factory pay
Cameroon working time	40 hours standard; 48 maximum	Inherited Labour Code summary	Paid-time boundary, subject to legal review
Hawassa recruitment scale	About 25,000 workers in 52 sheds	Hiring by early 2019	Onboarding scale, not wage or retention

SOURCED [R14] [R15] [R16] [R17] [S07] Inherited R14 to R17 entries are source-text records, not fresh current validation. The R15 original publication date is not recorded. US dollar conversions are approximate source values. Hawassa headcount is an early 2019 hiring observation, not a wage or retention measure.

The table prevents two common modelling errors. The first is using a national minimum as the expected pay of every employee. The second is importing an Asian sector minimum as if it were the full labour cost of an operating line. Neither shortcut measures what the proposed African factory will pay for accepted garments. A sourcing comparison should request actual offers, paid hours, overtime rules, allowances, employer charges and output by operation, all for the same period.

GFT's practical baseline is therefore a range, not a single wage cell. The lower bound tests compliance and recruitment feasibility. The central case uses role-specific pay needed to stabilise the intended workforce. The stress case adds higher supervision coverage, slower ramp and absence cover. The statutory minimum remains visible as a compliance reference, while the cost model runs on the pay architecture that the plant can actually recruit against. [R14]

10.2

Unit labour cost follows earned minutes and accepted pieces

For this chapter, GFT defines direct unit labour cost as paid direct-labour cost divided by first-pass accepted garments. Standard Allowed Minutes, or SAM, is the engineered time content of a garment at the defined method and quality standard. Line effi-

ciency is earned standard minutes divided by attended operator minutes. The calculation must use the same operators, operations, shift and quality boundary in both quantities. Changing the garment mix without changing SAM invalidates the comparison.

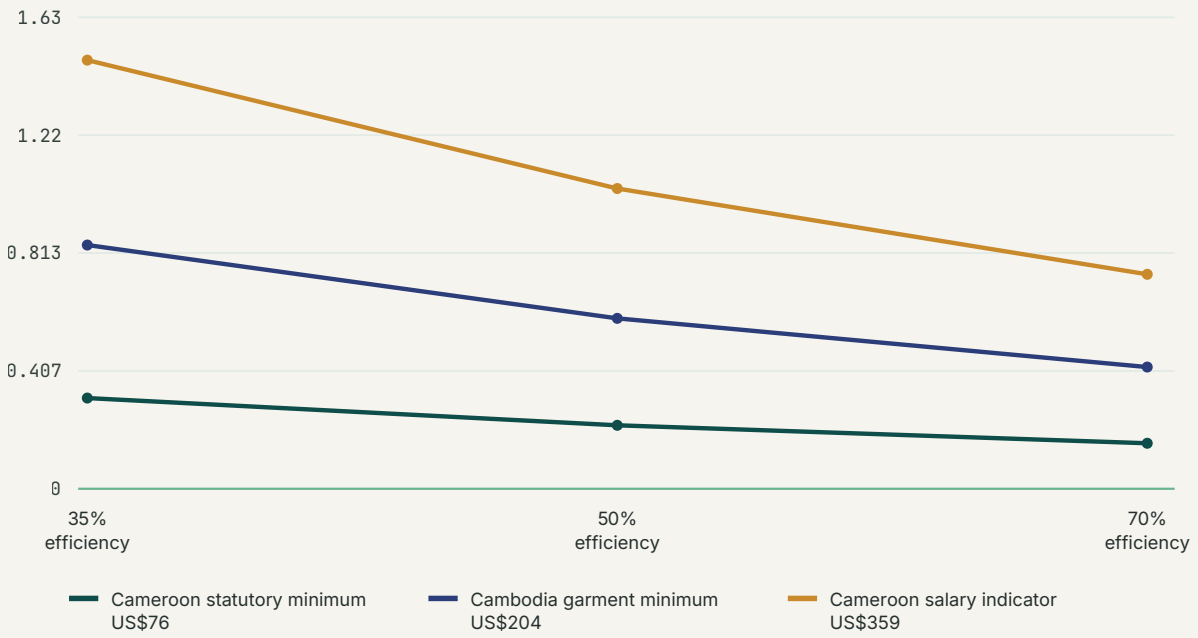
The paid-time denominator begins with the legal working-time boundary, not with an assumed round month. Cameroon's inherited Labour Code summary states a standard 40-hour non-agricultural week, a 48-hour maximum and overtime at 1.2 times the base rate. Using the standard week solely for arithmetic gives 40 hours times 52 weeks divided by 12 months, or 173.33 paid hours a month before leave, absence and other non-available time. That equals 10,400 minutes. These are derived planning minutes, not a promise of productive attendance. [R16]

A garment's paid direct minutes per accepted piece can then be approximated as SAM divided by line efficiency, with a further adjustment for quality. If first-pass yield enters the denominator, the analyst must state what happens to failed pieces. Rework does not usually require a complete second garment assembly. It should be timed by operation and added separately once data exist. A simple first-pass divisor is suitable for screening only when its conservative assumption is visible.

The derived curves in **Exhibit 44**, p. 159 isolate efficiency by holding quality, allowances and indirect labour constant. They use an illustrative 15 SAM garment and the three cited monthly wage figures. Efficiency scenarios of 35, 50 and 70 percent are planning cases, not measured GFT lines and not claimed national averages. The monthly cost figures retain their original source scopes, so the curves demonstrate sensitivity rather than a like-for-like country league table. [R14] [R15] [R17]

EXHIBIT 44 / US DOLLARS PER GARMENT, DERIVED SCREENING CASE

Efficiency changes direct labour cost per garment even when monthly pay stays fixed



DERIVED [R14] [R15] [R16] [R17] Derived as monthly wage / 10,400 paid minutes x 15 illustrative SAM / efficiency. Paid minutes use the inherited 40-hour standard week: 40 × 52 / 12 × 60. Wage inputs are about US$76 Cameroon statutory minimum, US$204 Cambodia garment minimum and US$359 Cameroon cross-sector salary indicator. The 15 SAM and efficiency points are illustrative. First-pass yield, overtime, allowances, employer charges, indirect labour and absence are excluded. Values rounded to three decimals.

At the illustrative 35 percent efficiency point, the derived direct cost for a 15 SAM garment is about US$0.313 at the Cameroon statutory minimum and US$0.841 at the Cambodian sector minimum. At 70 percent efficiency, the corresponding values fall to about US$0.157 and US$0.420. The halving of cost when efficiency doubles is arithmetic, not a forecast. It excludes quality failures and every employment cost beyond the cited monthly figure. [R14] [R16] [R17]

The higher Cameroon cross-sector indicator produces a derived US$1.479 per garment at 35 percent efficiency and US$0.740 at 70 percent. This is not evidence that Cameroonian garment workers earn that amount. It shows why using an economy-wide salary indicator for direct factory labour would dominate the model and why scope control matters as much as efficiency. The proper operating model replaces every benchmark with measured role pay and measured line output. [R15] [R16]

Efficiency is not a moral attribute of the workforce. It is the result of method engineering, balanced work allocation, machine condition, bundle flow, fabric behaviour, operator learning and the speed of supervisory response. South Africa's localisation study identifies production management and industrial engineering as firm-level constraints alongside commercial and upstream gaps. That finding supports treating technical capability as part of competitiveness, not assuming that a low-wage labour pool will organise itself into an efficient line. [S18]

WORKED EXAMPLE: QUALITY CAN REVERSE THE APPARENT WAGE ADVANTAGE

An illustrative new line pays US$100 per operator month, works on the same 15 SAM garment, achieves 35 percent efficiency and records 85 percent first-pass yield. For screening only, assume every failed first pass consumes one complete additional SAM-equivalent pass. Paid minutes per first-pass accepted garment are 15 / (0.35 x 0.85) = 50.42. Using 10,400 paid minutes a month, direct labour cost is US$100 / 10,400 × 50.42 = US$0.485 per accepted garment.

An illustrative mature line pays US$250 per operator month, achieves 70 percent efficiency and records 97 percent first-pass yield under the same assumptions. Its paid minutes are 15 / (0.70 × 0.97) = 22.09 per accepted garment. Direct labour cost is US$250 / 10,400 × 22.09 = US$0.531. The line with the higher monthly wage therefore has the higher unit cost in this particular case, by about 9.5 percent, despite much better productivity.

The result is conditional, not a general rule. At an illustrative US$175 monthly wage, the mature line's cost falls to about US$0.372 per accepted garment. Holding the other inputs constant, the break-even mature wage is about US$228, calculated as US$100 × 50.42 / 22.09. Actual rework minutes, different garment SAM, paid leave, absence and indirect labour must replace these screening assumptions before an investment decision.

GFT NOTE

Fund the ramp as a production work package. Ring-fence vestibule instruction, trainer time, trainee pay, supervisor development, mechanic understudies and the materials consumed in practice. Release each cohort against observed dexterity, safety, method compliance and first-pass quality, not attendance alone. The financial model should carry slower and faster learning cases until the factory has enough shift records to replace them.

10.3

Labour governance belongs inside the capacity calculation

The inherited Cameroon working-time summary sets a 40-hour standard non-agricultural week, a 48-hour maximum including overtime, and a minimum 1.2-times overtime multiplier. Those figures affect both capacity and cost. A line plan that quietly relies on the maximum week to meet its base output target has no compliant headroom for late fabric, machine stoppages or a seasonal order peak. Overtime also changes the wage numerator, so it cannot be used to repair an efficiency shortfall for free. [R16]

The same inherited entry reports that about 90 percent of employment is informal. This economy-wide observation does not establish the ability, discipline or prior experience of any individual recruit. It does mean that a formal factory should not assume every entrant has already worked with clocked attendance, standardised handoffs, machine guards, recorded defects or a production target governed by standard minutes. Recruitment and induction must test and teach the actual requirements of the role. [R16]

A vestibule school creates a safe boundary between learning and revenue production. The first module covers attendance, conduct, ergonomics, guarding and escalation. The next covers material identification, bundle handling and the operation sequence. Only then does the trainee practise machine control, method repetition and self-inspection. The instructor records each attempt against the same skill matrix used on the live line. A trainee who cannot yet meet the gate receives targeted practice rather than being placed in a bottleneck operation to conceal a staffing gap.

Attendance and turnover must enter the denominator explicitly. Paid operator minutes are not the same as attended minutes, and attended minutes are not all available for standard work. Meetings, approved training, machine waits, fabric shortages and changeovers need separate codes. Combining them into one low-efficiency percentage tells management nothing about the next action. The line leader should explain controllable losses, while planning, maintenance and human resources own the losses within their respective boundaries.

Working-time compliance also needs production-level verification. The payroll register, access record and line attendance sheet should reconcile for the same person and shift. Any difference requires investigation before efficiency or overtime is calculated. This is an industrial-control recommendation, not a statement that a particular Cameroonian factory is non-compliant. Local counsel and payroll specialists should verify the current legal classifications, contributions and overtime application, because this chapter provides industrial research rather than legal or tax advice.

The purpose of this discipline is not surveillance for its own sake. It is to give the operator a stable method, the supervisor a reliable picture of available capacity and the sponsor a unit cost that can be audited. A factory that pays correctly but records time loosely can still make poor decisions. It may add overtime when the true loss is mechanical, or add operators when the true loss is an unbalanced operation sequence.

10.4

Supervisory training has measured value, but not a universal multiplier

Better Work provides unusually relevant evidence because its Supervisory Skills Training addresses the person who converts an engineered method into hourly line performance. Its September 2016 account states that more than 5,850 supervisors across seven garment-manufacturing countries had taken the interactive three-day course during the preceding two years. The curriculum included listening, communication, time management, work allocation, worker rights and supervisor responsibilities. [S29]

The same Better Work page reports a Tufts University independent assessment finding that productivity increased by 22 percent when female supervisors took the training. This is a measured programme finding, not a guaranteed uplift for every factory, country or cohort. It does not specify that an untrained Cameroonian greenfield line will gain the same amount. The defensible use is to justify a supervised pilot with a baseline, a comparison where feasible and a predefined measurement window. [S29]

The operational mechanism is credible without exaggerating the effect size. A trained line leader can allocate work against actual operator skill, detect a growing queue before the whole line slows, and communicate a method correction without turning a defect into a personal dispute. Better Work's described curriculum directly covers work allocation, communication and time management. Those are production controls, not generic management enrichment. [S29]

The evidence in **Exhibit 45**, p. 162 also imposes an evidence hierarchy. The Better Work productivity figure is an evaluation result. GDIZ's equipment count is a capacity statement from the park operator. PIA's recruitment figure describes an ongoing campaign for people to be trained before deployment. Gaaraadji's retention figure describes a small group at an artisanal centre. None of the last three is a measured garment-line productivity effect. [S04] [S15] [S31]

EXHIBIT 45 / REPORTED PROGRAMME OBSERVATIONS AND PLANS

Training evidence becomes useful only when outcomes, enrolment and plans stay distinct

+22%

Productivity after female supervisor training

Tufts assessment reported by Better Work; not a guaranteed transfer

5,850+

Supervisors trained

Seven garment countries over two years reported in 2016

350

Sewing machines per GDIZ GTC

Two operating centres; equipment capacity, not a graduate total

1,000

PIA recruitment campaign

Togolese youths to be trained before deployment; ongoing when published

10 of 20

Gaaraadji retained group

Small artisanal centre cohort, not a factory-line result

SOURCED [S29] [S04] [S15] [S31] The 22 percent figure is a Tufts assessment reported by Better Work in September 2016. GDIZ reports sewing machines per operating centre without stating completions or productivity. PIA reports an ongoing recruitment campaign, not graduates. Gaaraadji reports a small retained group, not industrial productivity. These entries are not additive.

A GFT supervisory programme should therefore borrow the curriculum logic while setting its own local proof standard. Candidates need technical command of the operation sequence before they receive people-management responsibility. Promo-

tion should open a visible route for high-performing operators, including women, into line leadership. Selection must remain tied to demonstrated skill, safety, reliability and communication, with an appeal route and documented decisions.

The evaluation begins before training. Record efficiency, first-pass yield, rework minutes, absence, turnover and unresolved stoppages by line for a stable baseline period. Keep garment mix and staffing visible because a change in either can imitate a training effect. After instruction, track the same measures through comparable orders. The review should ask which supervisory behaviours changed and whether the production record confirms their value.

A productivity gain is only one benefit to test. Better work allocation can reduce starvation at downstream stations. Clearer communication can surface a safety or quality problem earlier. Documented promotion can make capability visible beyond one expatriate instructor or one experienced operator. These are proposed causal pathways for local verification, not claimed GFT results. The factory should report only what its own records later establish.

10.5

Park academies reduce duplicated recruitment, but factories still own certification

GDIZ shows the value of placing initial skills infrastructure beside production. The park's textile page reports two operating Garment Training Centres, each equipped with 350 sewing machines. It describes their purpose as base-building and skilled-manpower ramp-up for people newly adopting an industrial working environment. The equipment count is not a graduate total, and the page does not provide a common productivity outcome across trainees. [S04]

PIA presents a similar institutional approach at a different stage. Its textile-park page states that two Garment Training Centres are being implemented with co-financing from the Togolese State. At publication, a recruitment campaign was ongoing to hire and train 1,000 Togolese youths before deployment in textile plants. The published curriculum spans garment manufacturing, quality, productivity measures, line balancing, cost control and line management. This is a planned training pathway, not evidence that all recruits had completed it. [S15]

The shared-academy model solves a coordination problem. Individual tenants recruiting independently from the same inexperienced labour pool can repeat screening, dilute instructor time and bid against one another for the few people already trained. A common centre can standardise safety, basic machine handling and assessment before placement. It can also give the zone operator a forward view of cohort supply against factory commissioning. The benefit is organisational, not a claim that a central certificate makes every operator interchangeable.

Factory-specific certification remains necessary. A shared academy cannot know every tenant's machine settings, garment construction, quality tolerance, bundle size or takt. The receiving line must verify the operation sequence and material behaviour

used in its own orders. A trainee who passes generic lockstitch exercises still needs method instruction for the actual seam, folder, needle, thread and fabric combination. The handover should therefore be a skills record, not just a certificate of attendance.

Hawassa adds a recruitment lesson rather than a training-effect estimate. The World Bank document describes a centralised government-led system integrating recruitment, registration, grading and soft-skills training for future workers, with women aged 18 to 35 expected to form most of the workforce at full capacity. It also sets out a community impact evaluation using randomly assigned communities and repeated household surveys. That design distinguishes a recruitment intervention from the later measurement of its effects. [S07]

For a Cameroonian programme, these cases suggest a split contract. A shared or partnered academy can handle outreach, baseline screening, safety and core dexterity. The factory must fund role-specific vestibule completion, supervised placement and skill verification. The zone or public partner can report applicants, enrolment and completions. The factory must report time to independent operation, first-pass quality, retention and line efficiency. Combining those figures into one training number would hide who is accountable for the result.

Funding should follow the same boundary. Shared funding is suitable for common facilities and basic instruction where several employers benefit. The individual sponsor should budget trainee pay during factory-specific modules, instructor time, practice garments, machine capacity and assessment. Cohort size should be tied to the line commissioning schedule and expected attrition, with an explicit reserve rather than an assumption that every trainee arrives, passes and stays.

10.6

Northern artisanal skills can feed the pipeline without being mistaken for industrial readiness

Garoua's Gaaraadji Training Centre offers a different entry point. The opened report describes young people learning to weave, dye and embroider with cotton thread from northern Cameroon. It states that 10 young people were retained from an initial group of 20 trainees. These are small-scale observations from one centre, not a regional employment rate or an industrial sewing-line result. [S31]

The centre's significance lies in skill formation and local material knowledge. Weaving requires repeated attention to thread tension, sequence and fault detection. Dyeing and embroidery add process discipline and an understanding of appearance standards. The report also describes weaving instruction, local cotton thread and the centre's ambition to provide vocational courses. Those elements can support a recruitment bridge where candidates are assessed on their actual dexterity and learning rather than on formal factory history. [S31]

The transfer to industrial work is not automatic. Hand-loom weaving does not prove lockstitch control, and craft embroidery does not prove that a candidate can hold a standard method at line takt. Likewise, an experienced machinist may not understand

the material and design choices behind a traditional woven product. The appropriate response is a skills map. Record which capabilities transfer directly, which need conversion training and which require entirely new instruction.

A northern partnership could therefore serve two distinct purposes. The first is recruitment and pre-assessment for industrial roles, with transport, accommodation and safeguarding considered before any relocation. The second is a product-development relationship for limited runs where artisanal cloth remains identifiable and is cut and finished under controlled specifications. Neither purpose requires pretending that a small centre already supplies industrial technicians or volume garment output.

Quality control should respect both production systems. Artisanal variation may be part of a product's intended character, while industrial workwear requires repeatable dimensions and seam performance. The design team must decide which variations are acceptable before setting inspection rules. Fabric width, shade, weight and construction need receiving records so that cutting and sewing methods can be adjusted deliberately. A heritage claim does not remove the need for incoming inspection.

The social case also needs measured boundaries. The Gaaraadji report provides individual accounts and a retained cohort, but it does not establish net income effects across a region or prove scalability. GFT should report the number recruited, training completion, retention, pay and safety outcomes only after they are observed. This keeps inclusion credible and prevents a small community initiative from being used as an unsupported industrial-impact claim. [S31]

> **METHOD**
>
> Use one skills passport across every entry route. Record the candidate's demonstrated operations, machine types, materials, safety modules, assessment dates and instructor sign-off. Keep self-reported experience separate from observed assessment. When a person changes line or role, update the same record rather than creating a new training spreadsheet. The passport becomes the link between recruitment, pay progression and the line's available skill coverage.

10.7

GFT should staff capability before staffing the organisation chart

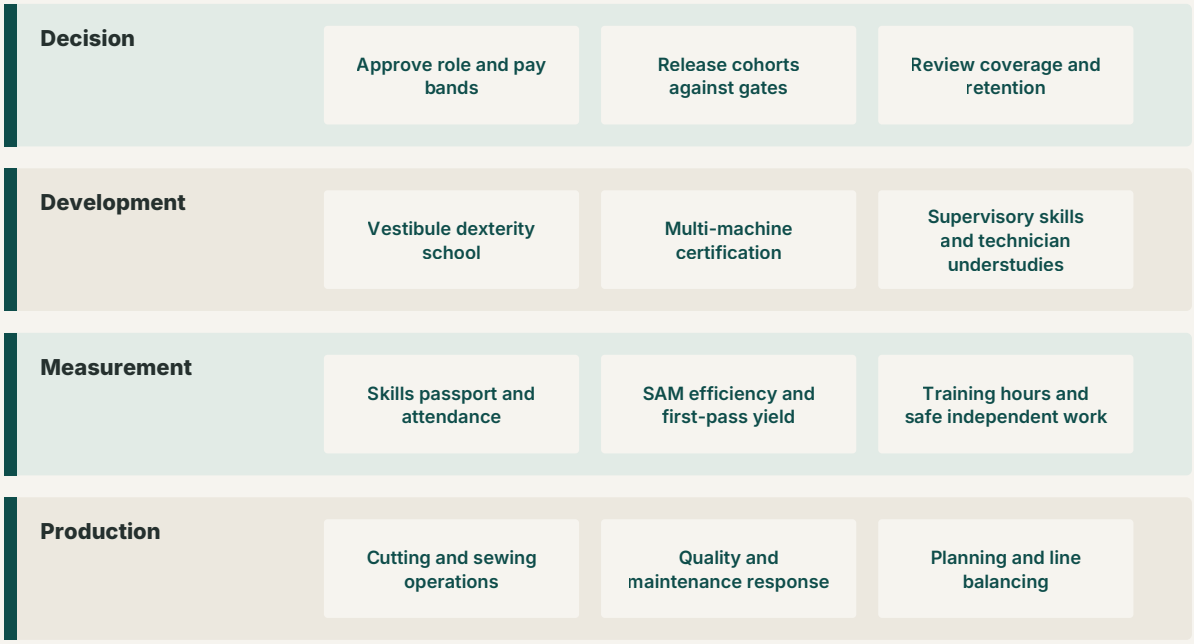
The GFT Cameroon blueprint uses an illustrative full-ramp organisation of about 900 employees across production, quality, maintenance, planning and administration. This is a programme estimate, not a statement of current GFT headcount or an operating factory result. The staffing model should be built from required work and skill coverage, then reconciled to that estimate. It should not begin by distributing a predetermined headcount across departments.

The architecture in **Exhibit 46**, p. 166 connects four layers. Production creates the demand for skills. Measurement shows where capability is missing. Development converts operators and technicians into broader coverage. Decision-makers control appointment, pay progression and the release of further recruitment. Better Work

informs the supervisory component, the park cases inform pre-employment preparation, and South Africa's findings reinforce the place of production management and industrial engineering. [S04] [S15] [S18] [S29]

EXHIBIT 46 / ILLUSTRATIVE GFT PROGRAMME DESIGN

A gated skills architecture connects production demand to verified capability



ILLUSTRATIVE [S04] [S15] [S18] [S29] Illustrative architecture for the Cameroon programme's estimated full-ramp organisation of about 900 employees. It is not a current GFT organisation, an implemented academy or a measured productivity result. Training content is informed by the cited programmes; all release gates require local verification.

The first development stage is safe, independent execution of one operation. The trainee must follow the defined method, inspect the result and stop or escalate when conditions change. Speed comes after repeatability. The second stage adds machines or operations so the line can cover absence and changeovers without losing balance. The third prepares selected operators for work allocation, hourly loss review, coaching and quality response. A separate technical route develops mechanics, electricians and industrial engineers rather than forcing every high-performing operator into people management.

Technician coverage needs the same deliberate pipeline as supervision. Each critical machine family should have a maintenance skill map, an approved intervention boundary and a named understudy path. A visiting or expatriate master technician, where the sponsor chooses to use one, should leave behind documented settings, fault trees, spare-parts logic and assessed local competence. The objective is not dependence on a particular individual. It is safe restoration of production with learning retained inside the factory.

Industrial engineering closes the loop between skill and method. The engineer verifies SAM, operation sequence, workstation layout and balance before blaming the operator for a shortfall. When garment mix changes, the engineer revises the standard and

the line leader reallocates work. Maintenance then confirms that machine condition supports the method. This division prevents three different functions from issuing conflicting instructions to the same operator.

The weekly People review should use a small set of reconciled measures: attendance, regretted and total turnover, training hours by completed module, assessed skill coverage, SAM efficiency, first-pass yield and safety events. Each measure needs a person-level or line-level denominator and an owner. Training hours alone measure exposure, not competence. Efficiency without skill coverage can hide a line that depends on one person. Turnover without role and tenure detail cannot show whether the vestibule school or the pay band is failing.

Release gates should govern the ramp. A new line starts when its leader, critical operations and maintenance cover are certified, not merely when its machines are installed. Additional recruitment follows the order book and the observed learning rate. Pay progression follows assessed capability and sustained performance. These controls make training visible in the unit-cost model while avoiding the assumption that a course automatically creates output.

The sponsor should test the organisation against absence, attrition and product change before committing the full ramp. A slower-learning case keeps instructors and cover operators in place for longer. A higher-attrition case increases recruitment and vestibule throughput without silently assuming constant efficiency. A product-mix case adds industrial-engineering time and retraining. These are illustrative planning stresses, not predictions about Cameroonian workers.

GFT's recommendation is therefore direct. Treat the supervisor and technician pipeline as a condition of production readiness. Fund it before the live line needs it, measure its output at the same boundary as garment cost, and scale only when skill coverage and accepted output confirm that the system works. The wage bill then becomes a managed investment in capability rather than an apparent saving waiting to be reversed by rework, delay and turnover.

The cheapest wage is not the cheapest garment: capability turns paid minutes into accepted work.

CHAPTER SOURCE NOTES

R14 WageIndicator. Publication date unrecorded; inherited source-text check.

R15 wage.is. Publication date unrecorded; inherited source-text check.

R17 just-style. Publication date unrecorded; inherited source-text check.

S07 World Bank Group. 2019-02.

R16 WageIndicator. Publication date unrecorded; inherited source-text check.

S18 Localisation Support Fund (LSF), South Africa. 2025.

S29 Better Work (International Labour Organization and International Finance Corporation). 2016-09-26.

S04 SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). 2024.

S15 Plateforme Industrielle d'Adetikope (PIA Togo). 2023-04-07.

S31 bird story agency. 2026-09-02.

GREEN FUTURE TECH

LIMITED / HONG KONG SAR

11

Grid unreliability, captive solar-plus-storage economics and wet-processing water intensity dictate corridor versus cotton-belt factory siting

Factory siting is a utility decision before it is a geography decision: dry garment assembly favours the Douala–Dibamba corridor, while northern solar and cotton proximity cannot compensate for unproven power, water, effluent and logistics conditions.

CHAPTER 11
DECISION TEST

Factory siting is a utility decision before it is a geography decision: dry garment assembly favours the Douala-Dibamba corridor, while northern solar and cotton proximity cannot compensate for unproven power, water, effluent and logistics conditions.

The siting answer depends on the process boundary. For the dry, modular cut-make-trim entry proposed in Green Future Tech's Cameroon textile programme, Douala-Dibamba is the stronger starting point because imported machinery, trims and spare parts, finished-garment distribution and port-dependent partners all converge there. Douala handled 95 percent of Cameroon's port traffic in the WTO's 2023 review, although its location 50 kilometres upstream on the Wouri requires continuing dredging and limits vessel size. [S1113] The northern cotton belt offers a different advantage: Global Solar Atlas screening data give Garoua 1,673.2 kWh/kWp of modelled annual photovoltaic output against 1,349.7 kWh/kWp in Douala, a 24.0 percent resource premium calculated from the two point estimates. [S1114] [S1115] That premium does not outweigh an unmeasured grid connection, a long inbound and outbound logistics chain, or an unproven water and effluent route.

A wet-processing project would face a different decision. IFC benchmarks put water use at 50 to 100 litres/kg for woven fabric finishing and 70 to 120 litres/kg for knitted fabric finishing, with substantial thermal-energy requirements. [S1106] A standalone dyehouse therefore needs firm water, heat, chemical control, effluent treatment and sludge disposal before its cotton-belt location can be called efficient. Shared treatment can spread these duties across tenants, but Hawassa's experience shows that high water recovery does not remove operating cost or management burdens. [S1107] [S1108]

The recommended sequence is consequently precise. Start with dry and low-water garment operations in the coastal corridor, meter every utility from the first shift, and buy finished fabric from partners until utilisation and cash flow are proven. Size solar and storage against measured critical loads and outage records rather than a national average. Reassess northern spinning, knitting or wet processing only when site-specific power, water, transport and treatment contracts clear defined investment gates. This is a conditional engineering recommendation, not evidence of an operating GFT factory or a guarantee of project returns.

11.1

The energy penalty strikes continuous midstream processes before dry assembly

The World Bank Enterprise Survey for Cameroon 2024 recorded electrical outages at 93.3 percent of 615 interviewed formal, private, non-agricultural firms. [S1101] This is an incidence measure across a representative business sample, not a textile-specific outage probability and not a statement that 93.3 percent of production time is unavailable. The correct project response is to measure the candidate feeder: event timestamps, duration, voltage and frequency deviations, restart time, affected machines and lost contribution. A national survey establishes the need for that diligence; it cannot replace it.

The production consequence varies sharply by process. A sewing line can usually stop, make safe and restart with limited material loss, although bundle control, electronic settings and completion times still suffer. Spinning is less forgiving because interrupted drafting and winding create end breaks, waste and restart labour. Weaving and knitting can lose machine time and introduce fabric faults at the stop and restart

boundary. A pressurised dyeing cycle couples electricity to pumps, controls and heat: an interruption can disturb liquor circulation and process timing, leaving a batch that requires reworking or disposal. These are engineering failure modes to test in the equipment specification, not measured losses at a GFT site.

The financial bridge must include more than the generator fuel bill. The complete outage cost is idle direct labour, lost contribution on delayed orders, overtime needed for recovery, material waste, quality claims, additional maintenance, expedited freight and working capital held in unfinished batches. Continuous processes carry more of the material and restart components. Dry assembly carries more of the labour and delivery components. Treating every stoppage as permanently lost sales would overstate the damage because some output can be recovered; treating it as a harmless pause would understate the costs that never appear on the utility invoice.

Nachtigal improves Cameroon's generation position but does not settle a Douala factory's supply quality. All seven units of the 420 MW plant entered commercial operation by 5 May 2025, raising national installed capacity by nearly 30 percent. [S1102] The World Bank's March 2026 completion report also states that dispatch remained constrained by incomplete transmission and distribution reinforcements serving major Douala industrial loads. It records an effective early-generation cost of about 67 XAF/kWh in 2025 against an appraisal estimate of 40 XAF/kWh, while thermal generation was estimated at nearly 149 XAF/kWh. These system costs are not retail tariffs. [S1102]

> **METHOD**
>
> Use a common outage ledger at each candidate site. Record the feeder and transformer, event start and end, voltage and frequency envelope, machines affected, material at risk, restart duration, diesel consumed and orders delayed. Separate a supply interruption from an internal electrical fault. After each event, assign the cause and the recoverable and non-recoverable costs. The output is a site loss distribution, not a single national downtime assumption. This ledger becomes the load-shedding and storage-sizing input for the microgrid design.

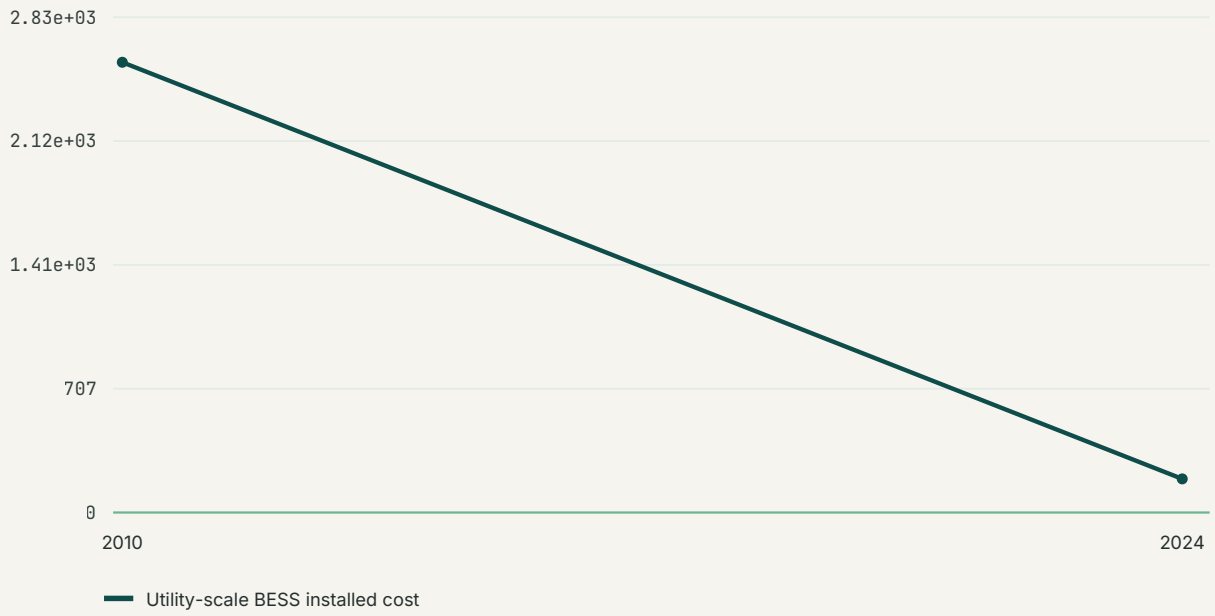
11.2

Falling solar and battery costs justify appraisal, not an automatic investment case

IRENA reports a global weighted-average utility-scale solar PV levelised cost of electricity of US$0.043/kWh for projects commissioned in 2024. It also reports a fall in global utility-scale battery energy storage installed cost from US$2,571/kWh in 2010 to US$192/kWh in 2024, a 93 percent reduction. [S1103] **Exhibit 47**, p. 171 retains the two reported battery endpoints without inventing a year-by-year series.

EXHIBIT 47 / 2024 US DOLLARS PER KWH OF BATTERY CAPACITY

Utility-scale battery installed cost fell 93 percent between 2010 and 2024



SOURCED [S1103] Two IRENA global weighted-average endpoints, not an interpolated annual series and not a quotation for a Cameroonian factory microgrid.

The cost decline changes what deserves a feasibility study. It does not make the global figures a delivered rooftop or factory-microgrid price. IRENA's African utility-scale solar averages are higher than the global headline, including total installed cost of US$1,093/kW and levelised electricity cost of US$0.074/kWh in 2024. Its methodology excludes network expenditure beyond the plant busbar, and hybrid-system cost evidence remains limited. [S1103] Roof reinforcement, imported controls, grid-forming inverters, protection, fire separation, design, taxes, financing, spare parts and battery augmentation must therefore enter a Cameroonian project model explicitly.

A sensible factory architecture has four operating modes. Solar serves daytime loads first. The grid supplies energy when it is economical and available. The battery covers defined short interruptions and power-quality events while carrying only critical loads. A generator remains available for long-duration emergencies where its fuel and maintenance costs are justified by the avoided loss. This is not a promise to eliminate diesel. It is a dispatch hierarchy that makes each asset perform a defined task.

WORKED EXAMPLE

Take an illustrative critical load of 250 kW that must ride through a four-hour interruption. Required alternating-current energy is `250 kW * 4 h = 1,000 kWh`. If the design permits 90 percent depth of discharge, assumes 90 percent discharge efficiency and retains a 10 percent capacity reserve, required battery nameplate is `1,000 / (0.90 * 0.90 * 0.90) = 1,372 kWh`. An illustrative 1.5 MWh battery satisfies that energy requirement, subject to power, thermal and protection checks. At IRENA's global utility-scale benchmark of US$192/kWh, its screening cost is `1,500 * US$192 = US$288,000`, not a supplier quotation. [S1103]

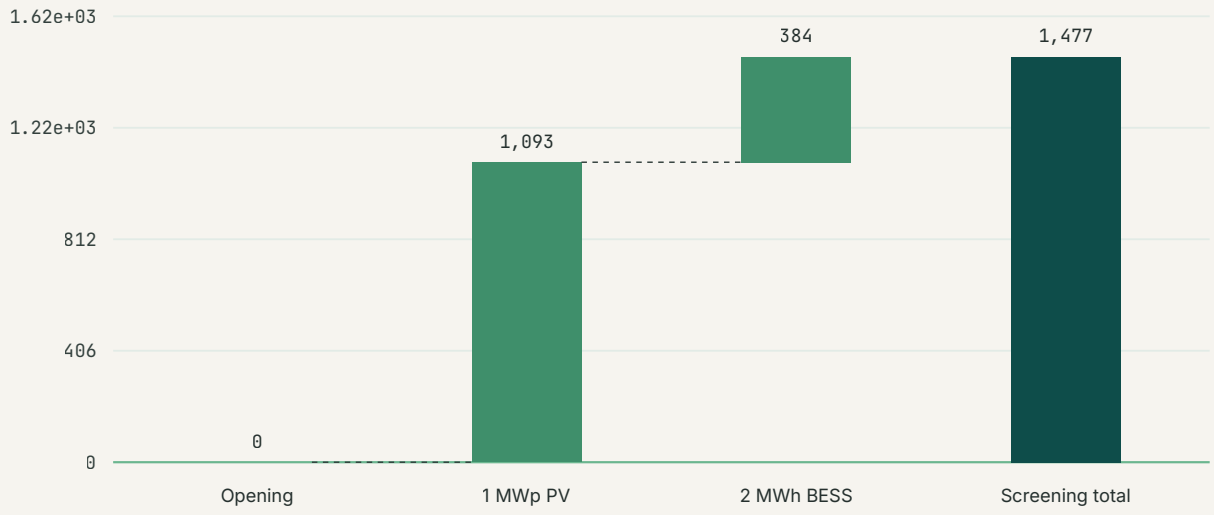
For a broader illustrative envelope, pair 1 MWp of PV with 2 MWh of storage. Using IRENA's African utility-scale PV installed-cost average of US$1,093/kW and global utility-scale battery average gives `1,000 * US$1,093 + 2,000 * US$192 = US$1.477 million`. This mixes two different benchmark scopes deliberately labelled as a screening case. It excludes the factory-specific costs listed above. [S1103]

Resilience still needs a value test. At an illustrative 12 percent capital charge and ten-year recovery period, the capital recovery factor is approximately 0.177. The battery's annualised screening capital is `US$288,000 * 0.177 = US$50,976` before operating and replacement costs. If it protects 25,000 kWh a year, the annualised capital alone is about `US$50,976 / 25,000 = US$2.04` per protected kWh. The example shows why load shedding, actual outage data and the value of avoided interruption matter more than a headline battery price.

Exhibit 48, p. 172 shows the capital arithmetic in the worked example. It is a decision aid, not a forecast or an investment recommendation.

EXHIBIT 48 / THOUSAND 2024 US DOLLARS

Benchmark inputs give a US$1.477 million screening envelope, not a microgrid quotation



DERIVED [S1103] Derived illustrative case: 1,000 kW PV *USD 1,093/kW African utility-scale average + 2,000 kWh BESS* USD 192/kWh global utility-scale average = USD 1.477 million. Excludes roof, interconnection, controls, financing, tax, augmentation and factory-specific EPC costs.

11.3

A continental tariff league table conceals the factory bill

Industrial electricity prices are not directly comparable when they omit voltage level, subscribed capacity, load factor, time of use, taxes and reliability. A garment factory with a fluctuating daytime load does not buy the same product as a continuous dye-house, and a dedicated industrial feeder does not offer the same service as a shared urban connection. The useful comparison is annual cost at the meter for an identical load profile, including fixed charges and the expected cost of interruptions.

Cameroon's regulated medium-voltage schedule makes this boundary visible. ARSEL's December 2022 decision sets both a monthly fixed charge per subscribed kW and an energy charge per kWh, with rates varying by customer band, monthly hours of use and peak or off-peak consumption. [S1104] For the illustrative 0.5 to 1 MW band above 400 monthly hours, the 2023 schedule shows 55 XAF/kWh off peak and 95 XAF/kWh at peak, plus 5,500 XAF/kW a month. Applying the decision's successive 5 percent adjustments for 2024, 2025 and 2026 gives 63.67 XAF/kWh off peak, 109.99 XAF/kWh at peak and 6,366.94 XAF/kW a month, before taxes and any later reclassification. This is GFT arithmetic from the regulated schedule, not a bespoke ENEO offer. [S1104]

ARSEL's separate 2026 revenue decision projects an average collected price of 85.23 XAF/kWh and a calculated average tariff of 96.31 XAF/kWh across medium- and low-voltage customers. [S1105] These system averages must not be substituted for the factory's band and time-of-use calculation. Nor should they be converted into US dollars and placed beside IRENA's US$0.043/kWh global solar LCOE without matching the price year, exchange rate, taxes and plant boundary. [S1103] [S1105] One number is a regulated customer-billing average; the other is a generation cost for utility-scale projects.

The same discipline applies to comparisons with Ethiopia, Egypt, Benin or Togo. A published hydro or industrial tariff can be a useful screening input, but it does not evidence the connection offer available to a proposed textile plant. Sponsors should request a written medium-voltage quotation at each shortlisted site and model the same hourly year. The model should include subscribed demand, energy by tariff period, power-factor penalties where applicable, taxes, planned escalation and the outage ledger. A park substation or embedded solar array can improve the infrastructure proposition, but its existence alone does not prove tenant power quality.

For Douala-Dibamba, Nachtigal's additional renewable generation is a positive system condition, while the documented transmission constraints make a connection study essential. [S1102] For Garoua, the appraisal must address the northern interconnected system on its own terms rather than assuming that a southern hydropower addition has the same local effect. The investment question is not which region has the most attractive national average. It is which connection delivers compliant power to the proposed machines at an acceptable total annual cost.

11.4 CAPACITY AND ENERGY CHARGES REWARD DIFFERENT OPERATING CHOICES

An illustrative monthly load calculation shows why a single average tariff misleads. Assume a factory subscribes to 800 kW and uses 320,000 kWh, split 70 percent off peak and 30 percent at peak. Applying the derived 2026 rates above gives `224,000 * 63.67 + 96,000 * 109.99 = XAF 24,821,120` for energy. The fixed charge is `800 * 6,366.94 = XAF 5,093,552`, producing a total of XAF 29,914,672 before taxes. The effective blended cost is about 93.48 XAF/kWh, not the off-peak rate and not ARSEL's system average. [S1104] [S1105]

This boundary changes the solar business case. Daytime PV can reduce imported energy when factory demand absorbs it, but it does not automatically reduce subscribed capacity or peak-period consumption. Battery dispatch can address a peak only when the connection agreement, metering and protection scheme recognise that operation. The financial model should simulate each interval, then apply the correct fixed and variable charges. Annual energy multiplied by one tariff cannot provide that answer.

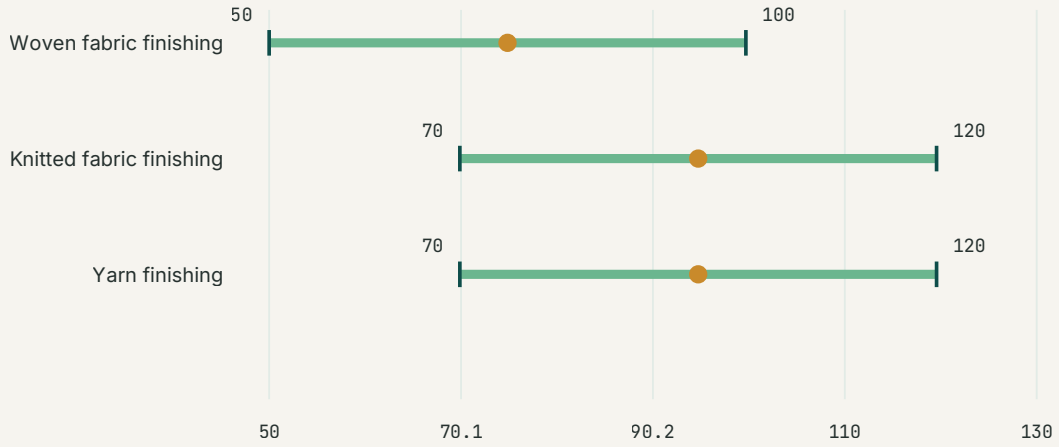
11.5

Wet processing changes the site question from electricity to water, heat and effluent

Wet processing introduces three coupled utility demands that dry garment assembly does not carry at the same scale: clean process water, thermal energy and a lawful route for effluent and residues. IFC's comparative benchmarks report 50 to 100 litres/kg for woven fabric finishing and 70 to 120 litres/kg for knitted fabric finishing. Corresponding thermal-energy benchmarks are 30 to 70 MJ/kg for woven finishing and 10 to 60 MJ/kg for knitted finishing. Yarn finishing has a 70 to 120 litres/kg benchmark, while yarn dyeing and rinsing have different process-specific ranges. [S1106] **Exhibit 49**, p. 175 preserves these distinctions rather than applying one water number to every textile route.

EXHIBIT 49 / LITRES PER KILOGRAM OF MATERIAL PROCESSED

Fabric construction and process route change the freshwater benchmark



SOURCED [S1106] IFC comparative industry benchmarks from a limited set of installations. Midpoints are arithmetic display points, not observed means or GFT targets. Yarn dyeing and rinsing are not combined into these categories.

At an illustrative throughput of 10 tonnes/day, those benchmarks imply 500 to 1,000 m³/day for woven finishing and 700 to 1,200 m³/day for knitted finishing before any recycling credit. The calculation is simply daily material throughput multiplied by the cited lower and upper intensities. [S1106] A feasibility study must then distinguish gross water entering the plant, water incorporated or evaporated, water returned to process, treated discharge and residues. Reporting only the municipal or borehole abstraction figure would hide whether a recycling system is actually reducing freshwater demand.

Effluent is not a generic dirty-water stream. The IFC guideline describes alkaline textile wastewater with high organic loads; dyeing effluent commonly has COD above 5,000 mg/l, and reactive-dye salt concentrations may range from 2,000 to 3,000 ppm. Dye streams can also be hot, coloured and metal-bearing. [S1106] Equalisation, source segregation and appropriate treatment are therefore process-design decisions. Combining a concentrated dye stream with every low-load rinse can increase the volume requiring advanced treatment and obscure the source of non-compliance.

A water and mass balance should start at each machine, not at the site fence. Meter clean water by preparation, dyeing, rinsing, washing, cooling and domestic use. Measure temperature and flow at relevant discharge branches, and sample pH, COD, colour, salinity and other parameters required by the environmental assessment. Reconcile daily water input with product, evaporation, reuse, stored water, discharge and sludge moisture. A missing residual is a measurement warning, not permission to assume zero discharge.

11.6 SHARED TREATMENT CAN SPREAD INFRASTRUCTURE DUTIES, BUT RECOVERY IS NOT FREE

Hawassa provides the clearest institutional warning against treating zero liquid discharge as a slogan. The World Bank reports that its shared ZLD facility recycled 90 percent of wastewater for tenant reuse, with industrial effluent treatment capacity of

8,000 m³/day and domestic wastewater capacity of 3,000 m³/day. [S1107] In the same review, ZLD operating cost was US$3.40/m³ while investors were charged US$0.80/m³. The Bank also identifies high energy use, sludge-management gaps and operational challenges. [S1107]

A later World Bank study reports that Hawassa's estimated operating cost of US$1.01/m³ had risen to US$4.12/m³ by 2023 because of chemical and spare-parts costs. [S1108] The two reports use different observation points, so they should not be collapsed into one tariff series. Together they show that a high recovery rate can coexist with subsidy, rising input costs and unresolved residues. A project model needs a full tariff and operating-cost bridge, not just a recovery percentage.

The practical lesson for Cameroon is to separate three propositions. A common effluent treatment plant centralises treatment. ZLD is a treatment and recovery approach that aims to avoid liquid discharge. ZDHC is a chemicals-management programme, not a type of treatment plant. A zone can offer shared treatment with ZDHC-aligned chemical controls without proving that every tenant achieves a particular recycling rate.

Phase 1 should therefore avoid standalone heavy dyeing. Partner-finished fabric keeps water, steam and effluent outside the initial factory boundary, although it does not remove the sponsor's duty to assess supplier performance. [S1106] [S1107] Any later wet-processing phase should pass four gates before land or machines are committed: a firm water allocation, a heat and fuel balance, a permitted treatment and discharge or reuse route, and an operating contract that prices chemicals, energy, membranes, sludge and replacement parts. Shared infrastructure becomes attractive when those obligations are explicit and the utilisation base is credible, not when a site brochure uses the letters ZLD.

11.7

Corridor economics favour coastal assembly while solar resource favours the north

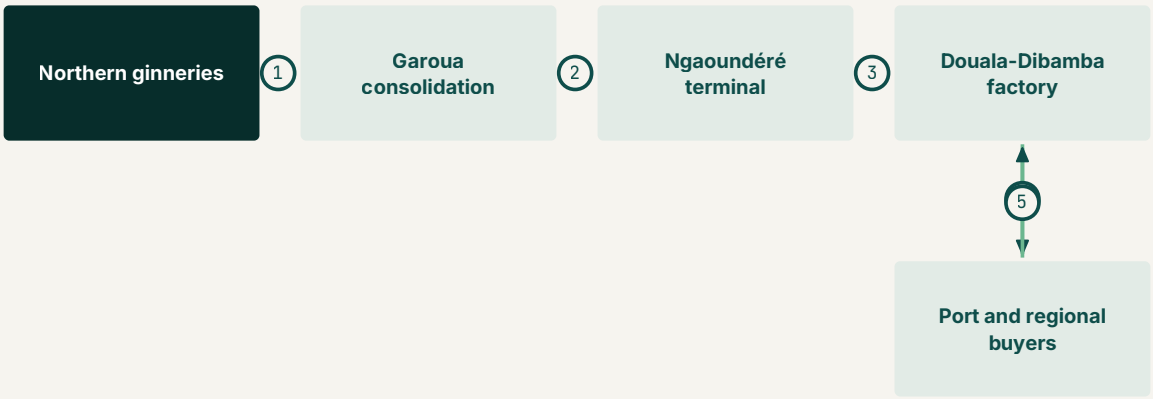
The cotton belt and the garment market do not sit at the same point on Cameroon's logistics map. SODECOTON's inherited company profile records more than 220,000 producers and nine ginning plants in northern Cameroon. [R03] A World Bank agricultural value-chain study describes baled lint travelling around 1,200 km to Douala after ginning. [S1110] That historical route observation establishes the order of magnitude, but a current investment model should price each origin, mode, terminal leg and return load rather than reuse an old national average.

The intermodal arithmetic is more informative. The World Bank records 913 km of railway between Douala and Ngaoundéré, while the African Development Bank identifies the Ngaoundéré-Garoua road section as 246 km. [S1111] [S1112] Their sum is 1,159 km before local access and terminal legs. This derived route distance is not a claim that all cotton moves by the same itinerary. It shows why a coastal Phase 1 plant should consolidate fabric or yarn deliveries and why a northern plant should not treat imported equipment, trims and finished-garment backhaul as costless.

Exhibit 50, p. 177 maps the physical decision boundary. The port's national and regional role strengthens the coastal case, but its dredging constraint belongs in the same model. [S1113]

EXHIBIT 50 / ROUTE AND LOGISTICS FUNCTIONS

The northern fibre base and coastal factory market meet through a long intermodal corridor



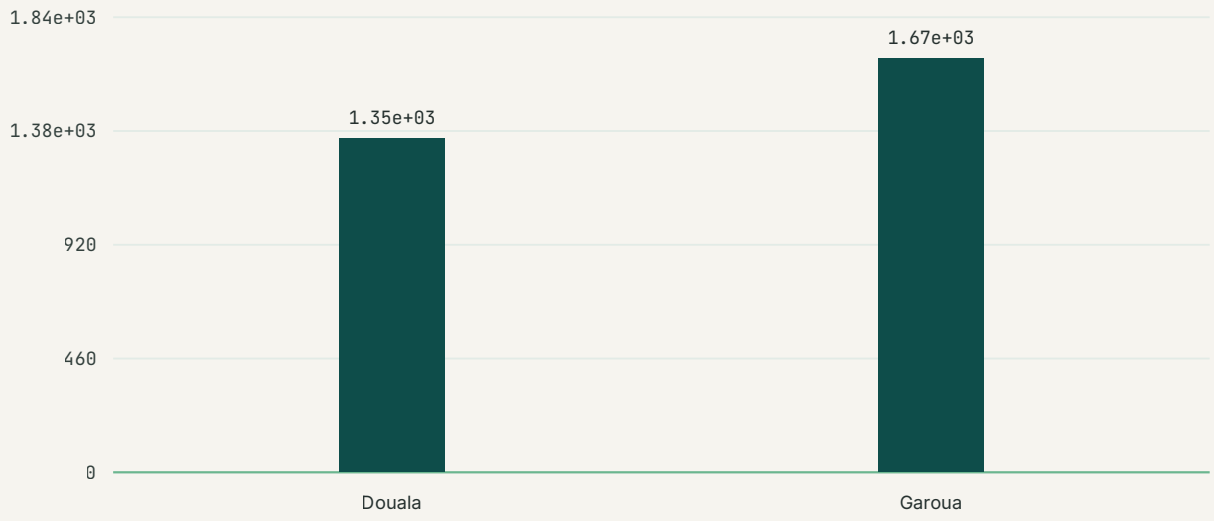
1. Baled lint
2. 246 km road section
3. 913 km rail section
4. Machinery, trims and garments
5. Inbound equipment

SOURCED [R03] [S1110] [S1111] [S1112] [S1113] The 913 km rail section and 246 km road section sum to 1,159 km before terminal and access legs. The approximately 1,200 km lint observation is historical and route-specific. Distances do not prove delivered cost or transit reliability.

Solar pulls the other way. At the city-centre screening coordinates, annual modelled PV output is 1,349.7 kWh/kWp in Douala and 1,673.2 kWh/kWp in Garoua, while global horizontal irradiation is 1,682.8 and 2,126.8 kWh/m² respectively. [S1114] [S1115] **Exhibit 51**, p. 178 compares the PV outputs. Garoua's advantage is `(1,673.1959 / 1,349.6925 - 1) * 100 = 23.97 percent`, rounded to 24.0 percent. The Atlas describes its data as a preliminary assessment tool and warns that local microclimate can deviate from the global database. [S1116]

EXHIBIT 51 / MODELLED KWH PER KWP PER YEAR

Garoua offers 24 percent more modelled annual PV output than Douala



SOURCED [S1114] [S1115] [S1116] Global Solar Atlas long-term-average city-centre screening values for optimally tilted crystalline-silicon PV. These are not measured factory-roof yields and exclude site shading, roof orientation, curtailment and detailed temperature losses.

The result should be used as an energy-yield input, not a siting verdict. For an illustrative 1 MWp array, the point estimates correspond to 1.350 GWh/year in Douala and 1.673 GWh/year in Garoua before project-specific curtailment. The difference of about 323.5 MWh/year can be monetised only after the self-consumption profile, displaced tariff, export rules and downtime are known. [S1114] [S1115] IFC's Cameroon diagnostic independently identifies northern irradiation as an opportunity to displace thermal generation and complement hydropower. [S1117]

The conditional siting rule now follows. Choose Douala-Dibamba for dry assembly when buyer access, port logistics and partner fabric supply dominate, provided the connection study and outage ledger are acceptable. Consider Garoua for upstream operations when cotton adjacency and higher solar yield produce a measured delivered-cost advantage, and when water, heat, labour and outbound logistics are contracted. Do not locate a wet plant in either place until its complete water and effluent system is financeable and permitted. A weighted score can support that decision, but it cannot substitute for the underlying utility and transport contracts.

11.8 A GATED SCORECARD PREVENTS THE SAME ADVANTAGE BEING COUNTED TWICE

The site review should begin with evidence gates rather than weights. The power gate requires the connection offer, load-flow study and measured outage record. The solar gate requires a roof survey, shading analysis and hourly yield model. The water gate requires source reliability, quality, allocation and seasonal stress. The effluent gate requires a permitted route, treatment responsibility and full lifecycle tariff. The logistics gate requires origin-specific freight, terminal, inventory and backhaul quotations. The social and permitting gate requires land, environmental and community review appropriate to the project.

Only after those gates are documented should the sponsor score cost, resilience, implementation time and strategic fit. Solar yield and grid reliability must remain separate criteria because one does not prove the other. Cotton proximity and corridor distance must not be counted as two independent advantages when they describe the same freight flow. Port access and buyer proximity also need distinct denominators: one measures freight, the other commercial lead time. This structure prevents a high-level score from hiding a failed physical constraint.

The final comparison should preserve veto conditions. A site with the lowest weighted cost remains unsuitable if its water allocation is contested, its effluent route is unapproved, or its connection cannot carry the proposed machines. Conversely, a higher-cost site may be preferable when its utility contracts reduce restart losses, inventory or delivery risk. The decision record should show which evidence changed the ranking and which assumptions remain unresolved at financial close.

11.9

Environmental standards require evidence, not a green-finance label

IFC Performance Standard 3 requires technically and financially feasible, cost-effective improvements in energy and water efficiency. For potentially significant water users, it requires measures that avoid or reduce consumption so the project does not create significant adverse impacts on others. It also requires pollution avoidance where feasible and control of the intensity and mass flow of releases. [S1109] The textile EHS guideline adds site-specific application, comparative resource benchmarks and monitoring expectations. [S1106]

These requirements belong in the initial alternatives analysis. Roof structure, inverter location, fire compartments, water abstraction, chemical storage, ventilation, effluent routing and residue disposal are cheaper to coordinate before the process layout is frozen. Early design can also document avoided impacts through dry processing, reduced liquor ratios, counter-current washing, heat recovery and low-water printing where the product specification permits. [S1106]

Solar PV, batteries and rainwater harvesting do not automatically qualify a factory for concessional finance. Each lender applies its own taxonomy, credit assessment and environmental and social requirements. The sponsor's stronger proposition is an auditable design: metered baseline, named technology alternatives, lifecycle cost, expected resource savings, residual risks and a monitoring plan. This is useful evidence for appraisal, not a funding guarantee or an unearned environmental claim.

11.10

GFT's dry-process entry makes utility measurement a production input

GFT's illustrative Phase 1 utility architecture follows the capital-sequence decision: cutting, sewing, trimming, finishing and selected decoration in Douala-Dibamba, using partner-finished fabric rather than an internal dyehouse. Dry does not mean impact-free. Cutting and sewing still require electricity, compressed air where specified,

ventilation, lighting and domestic water. Printing and washing operations can create chemical or wastewater duties depending on the method. Each decoration process therefore needs its own bill of materials and environmental review rather than a blanket low-water label.

Exhibit 52, p. 180 summarises why the utility design must follow the production stage. The water and thermal figures are IFC comparative benchmarks, while the outage consequences and phase mapping are GFT engineering interpretations to be validated with equipment suppliers. [S1106]

EXHIBIT 52 / PROCESS BENCHMARKS AND DESIGN IMPLICATIONS

Utility intensity and interruption risk rise as the chain moves into wet processing

Production stage	Freshwater benchmark	Thermal benchmark	Interruption consequence	GFT phase treatment
Ginning	Not assigned	Not assigned	Mechanical stop and restart	Upstream partner
Spinning	Not assigned	Not assigned	End breaks and waste	Upstream partner
Weaving or knitting	Not assigned	Not assigned	Machine stop and fabric faults	Partner first
Woven finishing	50-100 L/kg	30-70 MJ/kg	Batch, pump and heat risk	Defer heavy wet scope
Knitted finishing	70-120 L/kg	10-60 MJ/kg	Batch, pump and heat risk	Defer heavy wet scope
Cut-make-trim	No universal benchmark	No universal benchmark	Idle labour and delayed output	Coastal Phase 1

DERIVED [S1101] [S1106] Water and thermal ranges are IFC comparative benchmarks, not GFT performance. Outage consequences are engineering design interpretations, not observed factory losses. Blank benchmark cells mean that this table does not assign a universal value.

The electrical single-line diagram should identify every source and every critical load. Meter the grid incomer, PV inverter, battery charge and discharge, generator output and synchronisation point separately. Sub-meter cutting, sewing, compressors, HVAC, lighting and information systems. Record power factor, voltage events and harmonic or protection alarms where the equipment permits. This allows the team to distinguish energy cost, self-generation, battery losses and unserved energy instead of calling all consumption renewable.

The water design uses the same discipline even without a dyehouse. Separate process, cleaning, cooling and domestic lines where they exist. Fit meters at the main and at each significant branch. Keep chemical inventories and Safety Data Sheets tied to the storage and use points. Any future effluent stream receives a flow record, sampling point and assigned owner. Cotton offcuts, general waste, chemical containers and treatment residues require separate mass records and disposal evidence.

GFT NOTE

Install the utility data model before production starts. Give every meter, feeder, tank, machine centre and sampling point a stable identifier linked to the factory layout. At each shift close, production and maintenance reconcile kilowatt-hours, water, fuel, runtime, output and downtime causes. The daily review addresses exceptions; the weekly review approves corrective work; the monthly review updates the microgrid dispatch and water-efficiency business cases. The Sustainability KPI family should report both absolute consumption and intensity per accepted garment, with the denominator defined. A fall in intensity caused by overproduction against orders is not an environmental improvement.

The measurement system also protects the investment case. PV output can be compared with the Atlas screening expectation after temperature, shading and curtailment are considered. Battery state of charge, throughput and unavailable capacity can be compared with the ride-through specification. Grid events can be matched to the outage ledger and actual material loss. Water recovery claims can be reconciled to abstraction, reuse and discharge. Each claim therefore has a physical numerator, a production denominator and an accountable owner.

WARNING

The solar values in this chapter are modelled screening data, the capital figures are global or continental benchmarks, and the factory cases are explicitly illustrative. They are not supplier quotations, measured GFT results or proof that a project is financeable. Before commitment, the sponsor needs site power-quality records, a written grid offer, structural roof assessment, hourly load modelling, water availability and receiving-environment assessment, environmental and social studies, logistics quotations and equipment-specific efficiency data. Tariffs, permits and lender requirements also need professional confirmation. This chapter is industrial research, not investment, legal, tax or environmental-compliance advice.

The next design step is to carry these utility records into product-level evidence. Lot-level energy and water data can support the traceability and Digital Product Passport architecture examined in the next chapter, but only when the underlying meters and allocation rules are stable. The factory should first learn to trust its measurements, then decide which product claims those measurements can support.

Choose the site whose utilities can carry the process, and measure the utilities before trusting the site.

CHAPTER SOURCE NOTES

S1113 World Trade Organization. 2023-08-16.

S1114 World Bank Group and Solargis, Global Solar Atlas. 2026-04-01.

S1115 World Bank Group and Solargis, Global Solar Atlas. 2026-04-01.

S1106 World Bank Group and International Finance Corporation. 2007-04-30.

S1107 World Bank. 2022-11-14.

S1108 World Bank. 2024-09.

S1101 World Bank Enterprise Surveys. 2025.

S1102 World Bank. 2026-03-26.

S1103 International Renewable Energy Agency (IRENA). 2025-07.

S1104 Agence de Régulation du Secteur de l'Electricité (ARSEL), Republic of Cameroon. 2022-12-12.

S1105 Agence de Régulation du Secteur de l'Electricité (ARSEL), Republic of Cameroon. 2025-12-19.

R03 SODECOTON. Publication date unrecorded; inherited source-text check.

S1110 World Bank. 2008-06-30.

S1111 World Bank. 2004.

S1112 African Development Bank Group. 2025-03-24.

S1116 World Bank and Energy Sector Management Assistance Program, prepared by Solargis. 2019-11-29.

S1117 International Finance Corporation and World Bank. 2022-12.

S1109 International Finance Corporation. 2012-01-01.

GREEN FUTURE TECH

LIMITED / HONG KONG SAR

12

European digital product passports and supply-chain due diligence turn farm-to-garment traceability from a marketing story into a market-access gate

European product, labour and due-diligence rules reward suppliers that can prove each material transformation. CmiA offers a useful origin baseline, but an African garment becomes inspectable only when bale, yarn, fabric, production and claims records reconcile.

CHAPTER 12
DECISION TEST

European product, labour and due-diligence rules reward suppliers that can prove each material transformation. CmiA offers a useful origin baseline, but an African garment becomes inspectable only when bale, yarn, fabric, production and claims records reconcile.

Farm-to-garment traceability becomes commercially valuable when it can answer a buyer's evidence request without reconstruction. The answer is not a larger sustainability narrative. It is a controlled chain of lot identifiers, physical transformations, source documents and measured outcomes. African cotton can then support product compliance, buyer due diligence and precise origin claims from the same record. A certificate at the farm gate helps, but it cannot carry that burden alone.

The regulatory conclusion needs equal precision. The European Union has established the Digital Product Passport framework and prioritised textiles, but it has not set a blanket requirement for every garment to carry a passport from the start of 2027. The Commission currently plans the textile delegated act for the fourth quarter of 2027, describes that timing as indicative and leaves the exact data requirements and subsequent implementation measures to that act and its supporting specifications. [S1203] GFT therefore recommends building the evidence spine now while treating the final payload, granularity and application date as controlled regulatory variables.

12.1

Delegated acts, not a blanket 2027 slogan, define the European gate

Regulation (EU) 2024/1781 establishes the Ecodesign for Sustainable Products Regulation. It creates product-specific performance and information requirements through delegated acts rather than imposing one finished textile rule immediately. Article 9 makes a passport necessary only in accordance with the applicable delegated acts. It also requires passport data to be accurate, complete and current. [S1201] This distinction matters for an investment committee. The legal direction is clear, but the final textile data dictionary is still being prepared.

The first working plan adopted on 16 April 2025 places textiles and apparel among the priority final products and gives 2027 as the indicative adoption year. It also states that product-specific delegated acts will specify the information collected and made available in the passport. [S1202] The Commission's textile page narrows the current planning point to the fourth quarter of 2027 and repeats that the timeline may evolve. [S1203] Adoption is not the same as application. The framework regulation normally gives economic operators at least eighteen months from a delegated act's entry into force before its requirements apply, except in specified justified cases. [S1201] A prudent programme therefore plans against enacted transition text, not against a trade headline.

The passport is nevertheless a market-access instrument rather than a voluntary product page. Once the relevant acts and systems apply, manufacturers and importers have defined responsibilities, and customs can check the unique registration identifier against registry data before releasing a covered product for free circulation. The regulation also requires a persistent product identifier linked through a data carrier, with open, interoperable and machine-readable data as appropriate. [S1201] A QR code is only the carrier. The legal and operational asset is the maintained record behind it.

Other European duties have separate triggers and should not be collapsed into the passport. Since 19 July 2026, the prohibition on destroying unsold apparel, clothing accessories and footwear has applied to large enterprises, with medium-sized enterprises following in 2030 and micro and small enterprises outside that prohibition. [S1201] The forced-labour regulation applies from 14 December 2027 and covers products made with forced labour at any production, harvest or processing stage, including imported products and online offers targeting EU end users. [S1205] These instruments make different evidence requests. A passport cannot certify away a labour investigation, and a social audit cannot substitute for missing product data.

Corporate due diligence has its own scope. Following the 2026 amendments, the principal thresholds rise to 5,000 employees and EUR 1.5 billion of turnover, rather than placing every small African supplier directly inside the Corporate Sustainability Due Diligence Directive. [S1204] Smaller suppliers can still receive requests through their chains of activities. Their response should be proportionate, contractually clear and capable of showing actual controls. The OECD sector guidance supports that wider risk process, but it is voluntary and does not itself create legal obligations. [S1210]

The chronology in **Exhibit 53**, p. 185 separates enacted dates from planned work. This is the compliance calendar GFT would put under change control.

EXHIBIT 53 / CALENDAR YEAR, MONTH FRACTIONS USED ONLY FOR SPACING

Textile evidence duties arrive through separate legal instruments, not one 2027 deadline



SOURCED [S1201] [S1202] [S1203] [S1204] [S1205] [S1206] The Q4 2027 textile delegated act is planned and indicative, not a fixed garment application date. CSDDD application shown for 26 July 2029 follows the amended timetable. EPR schemes are due by 17 April 2028. Exact textile DPP fields and transition remain subject to delegated and implementing acts.

Two implications follow. First, regulatory readiness must be versioned by instrument, product, operator role and date. Second, the underlying evidence should be useful before any passport obligation starts. The same lot record improves receiving inspection, supplier claims, production reconciliation and customer service even if the European timetable moves.

12.2

CmiA supplies a verified origin baseline, not an automatic compliance certificate

Cotton made in Africa gives an African supplier a documented starting point. The Aid by Trade Foundation reports that, in 2025, about 715,000 small-scale farmers in ten African countries produced under CmiA or CmiA Organic, representing 36.4 percent of African cotton production. It separately reports more than 2,800 partners processing cotton under its various standards across 50 textile production markets. [S08] These figures describe the standard owner's ecosystem. They do not show that every African bale, every Cameroonian bale or every garment sold with a sustainability reference is verified.

The physical traceability network is narrower and should not be confused with the wider processing network. In February 2026, AbTF reported around 700 suppliers and producers in 25 countries able to trace CmiA cotton from product back to origin, more than double the previous year's figure. [S10] The dated figures in **Exhibit 54**, p. 187 retain this distinction between total production verification and the physically traceable partner network.

EXHIBIT 54 / REPORTED SHARE, FARMERS, PARTNERS AND COUNTRIES

CmiA provides scale, while the physically traceable HIP network has a narrower reported boundary

36.4%

African output verified

CmiA and CmiA Organic, 2025

715,000

Small-scale farmers

Approximate, ten countries, 2025

700

Physically traceable partners

Approximate, reported February 2026

25

Countries in that network

Suppliers and producers, February 2026

SOURCED [S08] [S10] The 36.4 percent and farmer figures describe CmiA and CmiA Organic in 2025. The 700 partners in 25 countries describe the physically traceable network reported in February 2026. These are different denominators and must not be combined into one coverage ratio.

CmiA's value is specific. Its standard covers cotton cultivation and ginning, while its chain-of-custody models provide different ways to carry a claim through later organisations. The standard owner states that CmiA cotton is rainfed, excludes genetically modified seed and uses independent third parties within its assurance system. [S09] That is useful evidence for origin and farm practice. It is not proof of chemical compliance at a dyehouse, labour conditions on every garment line, or the footprint of a finished shirt.

A buyer must therefore qualify the exact organisation, site, material and claim. AbTF's membership guidelines place a duty on the purchasing entity to check that the selling entity is registered, and they require organisations producing, treating, trading or sourcing CmiA-claimed products to maintain the relevant membership. [S1208] A certificate screenshot without scope, validity and transaction linkage is weak procurement evidence.

GFT NOTE

GFT recommends a supplier-evidence matrix before the first fabric order. Record the legal seller, processing site, chain-of-custody model, registration scope, certificate validity, incoming lot identifier and transaction document reference. Reconcile those fields at every receipt. Do not describe a garment as physically traceable until every transformation from verified bale to packed lot has a matching record.

The practical distinction is between an eligible input and an eligible product story. Cameroon can offer the first through its cotton organisation and CmiA participation. The second must be manufactured through controlled procurement and production. GFT's role is to specify that control system, not to claim that a future factory or supplier has already attained it.

12.3

Physical segregation and volume reconciliation answer different questions

The two CmiA chain-of-custody models support different statements. Under Hard Identity Preserved, the cotton share of a claimed yarn, fabric or garment must contain only CmiA cotton from nominated traders, and claimed materials must be segregated through the supply chain. Under Mass Balance, verified cotton may be blended or substituted, while the tracking system reconciles purchased and claimed volumes. [S1208] Mass Balance is a volume-control mechanism, not proof that verified fibre is physically present in a particular garment.

This is not a reason to dismiss Mass Balance. It can support demand for verified cotton where physical segregation would be costly or impractical. It is a reason to control language. A Mass Balance claim may support a statement about verified purchasing and volume reconciliation within the scheme's rules. It cannot support the stronger statement that a particular shirt contains identifiable Cameroonian cotton. HIP is the appropriate CmiA route when that stronger physical-origin statement is required.

HIP also demands operating discipline rather than a software label. The guidelines permit physical or temporal segregation, require clear marking and call for bale or lot identifiers on accompanying production, sales and transport records. Site-level assurance reviews documentation, records and physical controls. [S1208] Temporal segregation is especially relevant to a small factory. A dedicated line is not always necessary, but a documented production run, line clearance, status label and reconciliation are necessary.

The comparison in **Exhibit 55**, p. 189 converts those requirements into procurement and communication decisions.

EXHIBIT 55 / CUSTODY CONTROL COMPARISON

HIP supports physical-origin claims, while Mass Balance verifies volumes rather than garment content

Control question	Hard Identity Preserved	Mass Balance
Physical content	Cotton share must be CmiA from nominated traders	Verified cotton may be blended or substituted
Segregation	Required at every supply-chain stage	Not required after registered spinning purchase
Core evidence	Lot identity, segregation and transaction records	Purchase and claimed-volume reconciliation
Assurance emphasis	Site controls, documentation and physical traceability	Tracking-system balance and transaction validity
Strong single-origin statement	Possible when all lot links and claim rules hold	Not supported as a physical content claim

SOURCED [S1208] [S10] Interpretation follows CmiA Membership Guidelines version 1, October 2025, and the AbTF Transparency Standard description reported in February 2026. Buyer and legal teams should confirm current scheme rules before approving a claim.

A garment factory must preserve identity through many-to-one and one-to-many transformations. Several bales can feed a yarn lot. Several yarn lots can feed a fabric batch. One fabric roll can serve several cutting markers, and one marker can create bundles for several sewing lines. The ledger therefore needs parent and child relationships, not a single copied certificate number. Each event should record input identifiers, output identifiers, site, timestamp, quantity, unit, operator role and source document.

The same structure must handle losses and exceptions. Cutting offcuts, rejected panels, rework, returned garments and subcontracted operations all change either quantity or custody. A manual adjustment should require a reason code and a second role's approval. A missing predecessor should block a physical-origin claim until resolved, even when the commercial invoice is valid. This is where a traceability system becomes an operating control rather than a reporting layer.

Physical markers can strengthen that control, but they do not replace it. A tracer attached to fibre may help test whether material is present, while a transaction ledger explains who transformed it and under which claim. Conversely, a digital token without a controlled material stream can be copied far more easily than the physical lot it purports to describe. GFT's design principle is to make independent evidence types agree: material observation, document, quantity and responsible actor.

12.4 SUPPLY CONTRACTS MUST MAKE THE EVIDENCE DELIVERABLE ENFORCEABLE

The purchase contract should define the evidence schedule as carefully as the fabric specification. Each order should identify the chain-of-custody model, expected registration scope, required transaction documents, lot-level quantity data and any restrictions on substitution or subcontracting. The supplier should know before production which records must arrive with the material and which discrepancy will place

the receipt on hold. AbTF's own guidance makes registration and claim-specific documentation an operating requirement, so these fields should be procurement obligations rather than optional requests after shipment. [S1208]

Change control needs a named trigger. A different dyehouse, a new subcontracted sewing site or a replacement yarn lot can break the approved custody route even when the fabric looks identical. The supplier should notify that change before execution and supply the new site's evidence for review. The receiving team should then compare the actual delivery note, lot labels and transaction record against the approved route. A commercial acceptance of substitute material should not automatically become approval for the same origin claim.

Remedies should distinguish commercial and communications decisions. A buyer may accept a late document as an administrative delay, reject the material, or accept the material while withdrawing the physical-origin statement. Those are different actions with different consequences. The contract should preserve the right to correct the public record if later evidence contradicts an earlier claim, including instructions for labels, product pages and customer notifications.

Finally, retention and access must survive staff changes. The factory should be able to retrieve the complete evidence pack for a historical lot after the merchandiser has left and the supplier has changed account managers. Independent assurance works best when both parties know the sampling method, response window and acceptable source artefacts in advance. This turns due diligence from an annual questionnaire into a repeatable control, consistent with the OECD's emphasis on tracking effectiveness rather than treating assessment as a one-off exercise. [S1210]

12.5

Rain-fed provenance helps only when the footprint boundary stays visible

CmiA states that its cotton is entirely rainfed with zero groundwater extraction. It reports more than 2,100 litres of water saved per kilogram and up to 13 percent fewer greenhouse-gas emissions than conventional cotton, citing its 2021 lifecycle assessment for both comparisons. [S09] These are relevant fibre-level findings from the standard owner. They are not a finished-garment footprint, a guarantee for every lot or a comparison that a manufacturer can transfer automatically to its own product.

The boundary explains the limitation. A farm and ginnery assessment does not include every later choice of spinning technology, dye recipe, thermal energy, factory electricity, cutting efficiency, packaging, transport, garment use or end-of-life treatment. A verified agricultural input can therefore sit inside a product with a very different total profile. The proper claim identifies which stages were assessed, in which year, with which method and against which comparator.

GFT recommends three tiers of environmental evidence. Tier A is direct measurement at the processing site, such as a meter reading tied to a production interval. Tier B is supplier-specific evidence whose method and allocation have been reviewed. Tier C is a published secondary factor used only when the better evidence is unavailable.

The passport or buyer file should carry the tier, source, period and allocation rule beside each value. A lower tier is not necessarily useless, but presenting it as measured factory performance would be misleading.

Allocation deserves the same scrutiny as measurement. A factory submeter may serve several lines and several customer lots. The energy assigned to a lot can be based on recorded machine time, standard minutes or another stated driver, but the choice can change the result. The calculation should show the meter total, the allocation driver, the lot share and any unallocated remainder. Reconciliation to the meter total prevents a collection of plausible product footprints from exceeding actual consumption.

Wet processing needs particular care because the garment factory may not control it directly. The purchase specification should require the dyehouse or finisher to identify the batch, recipe family, water and energy method, effluent destination and relevant test reports. If those data are unavailable, the record should say so. An estimated dyehouse footprint with a named method is more credible than a false zero inserted to complete a passport field.

The resulting rule is simple. Preserve the agricultural advantage as a sourced farm attribute, then build the manufacturing footprint from measured or explicitly estimated downstream evidence. Never convert rainfed cultivation into an unbounded low-carbon or low-water garment slogan.

12.6

Evidence governance prevents provenance from becoming greenwashing

European consumer-protection rules now make the wording of a claim a controlled output. The relevant amendments have applied since 27 September 2026. The Commission states that environmental claims and sustainability labels in business-to-consumer communications must comply from that date, including for existing products. [S1207] Generic claims, future-performance claims and claims based on offsetting have different tests. The communications team therefore needs legal review and evidence at the point of publication, not a library of interchangeable green phrases.

A claim register should hold the exact wording, product and lot scope, lifecycle boundary, evidence references, calculation method, approval role, publication channel and review date. It should also hold the prohibited interpretation. For example, a team may be authorised to say that a lot uses physically traceable CmiA cotton, but not to imply that every product in the brand is traceable. A target to reduce future emissions should not be presented as an achieved reduction.

The distinction between CmiA and CmiA Organic is equally important. CmiA Organic requires both the CmiA criteria and certification under an approved organic standard, while the HIP model is mandatory for CmiA Organic. [S1208] A supplier cannot infer organic status from ordinary CmiA verification, rainfed cultivation or the absence of genetically modified seed. Each term has a separate evidence burden.

Traceability also does not complete due diligence. The OECD garment and footwear guidance describes an ongoing process of embedding responsible conduct, identifying harm, preventing or mitigating it, tracking effectiveness, communicating and supporting remediation. It expressly warns against a tick-the-box approach. [S1210] A lot ledger can show where material went. It cannot, by itself, show whether recruitment fees, excessive hours, harassment or unsafe work occurred at each site.

The operating response must therefore include worker and supplier channels. Complaints should have an owner, a protection rule, a remediation path and a closure test. Corrective actions should identify the cause and verify effectiveness rather than merely recording training attendance. Where a buyer identifies a severe risk, evidence requests should focus on that risk and the affected sites. Indiscriminate data collection can burden small suppliers while leaving the actual harm untouched.

> **WARNING**
>
> A certified input, a QR carrier and a social audit address different failure modes. None should be marketed as universal proof. The unresolved item belongs in an exceptions register with an owner and a deadline, not in a footnote that the sales team never sees.

For GFT, the communications rule follows directly: state what has been measured, what has been verified by another party, what remains an estimate and what is still a target. This is especially important for a programme in formation. No future plant, certification, supplier audit or impact result should be described as already achieved.

12.7

A lean event ledger can serve the passport without pretending to be an ERP

A greenfield factory does not need to buy a monolithic enterprise system before it can preserve evidence. It needs a disciplined data model, controlled forms and clear ownership. A structured workbook and small relational database can suffice for an initial lot ledger when they enforce unique identifiers, validation, access rights, backups and change logs. The weakness is not the spreadsheet itself. The weakness is an untracked file that permits overwritten lot histories and unlabelled estimates.

GFT proposes the architecture in **Exhibit 56**, p. 193. It separates physical custody, transformation events, source evidence, passport publication and user decisions. Each layer has a distinct control owner, so a communications editor cannot silently alter a receiving weight or an energy allocation.

EXHIBIT 56 / GFT PROPOSED CONTROL LAYERS

A five-layer evidence architecture keeps physical custody separate from publication and access



ILLUSTRATIVE [S1201] [S1203] [S1208] Illustrative GFT system design for a future African garment operation. It is not an implemented GFT result or a declaration of legal conformity. Final DPP payload, registry, access and retention rules must be mapped to the applicable delegated acts and technical specifications.

The identifier register comes first. It defines the legal entity, facility, supplier, bale, yarn lot, fabric batch, cutting marker, bundle, production order, carton and product identifiers. The passport's eventual model, batch or item granularity must follow the delegated act, but the internal ledger can already preserve finer relationships. [S1201] Stable identifiers should never be recycled after a year-end reset or a change of commercial customer.

The event register comes second. Receiving, ginning, spinning, fabric formation, wet processing, cutting, sewing, finishing, packing, shipping and return events use the same minimum fields: event type, site, timestamp, input lot, output lot, quantity, unit, evidence reference and responsible role. Offline capture can be synchronised later, but the original device timestamp and subsequent correction history must remain visible. Connectivity is an implementation constraint, not a reason to invent continuity.

The evidence register comes third. It stores the actual certificate, scope, validity, test report, supplier declaration, transaction document and claim approval. A metadata field saying "certified" is not enough. The reviewer must be able to open the source artefact and see why it applies to the lot. Expired evidence remains in the historical record but cannot support a new claim without review.

The measurement register carries quality and resource data. Fabric inspection, first-pass quality, offcut weight, meter readings and allocation calculations link to the same production event. Where a value is calculated, the record stores its inputs and formula. Where it is estimated, it stores the basis and confidence limitation. This makes the future passport reproducible rather than merely readable.

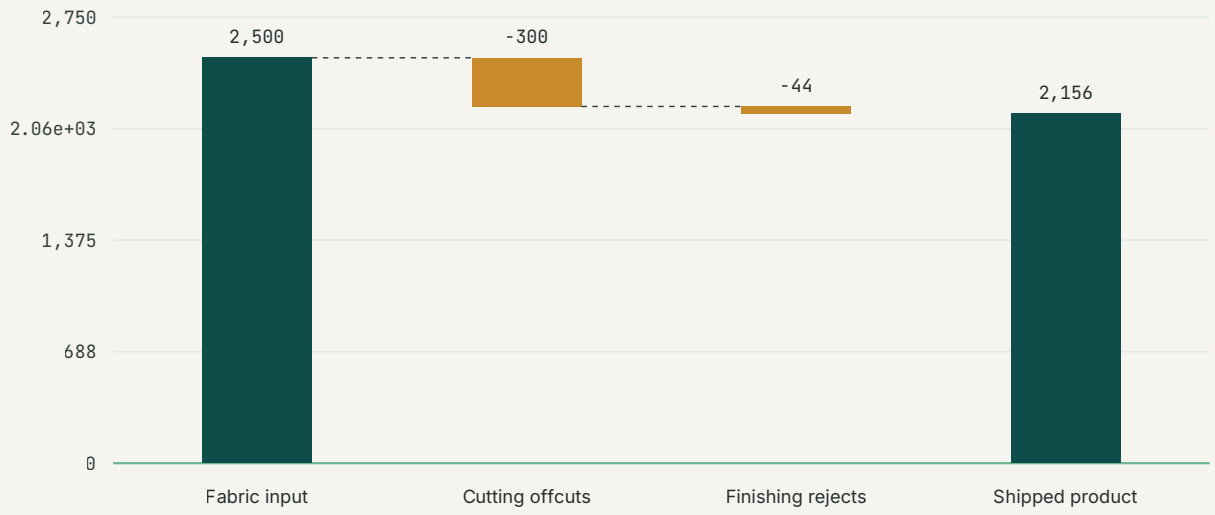
Access is deliberately uneven. A consumer may need composition, care and origin information. A buyer may also need transaction documents and audit summaries. An authority may need conformity records, while a recycler needs material and disassembly information. The Commission's textile page says access will include online sales and a product data carrier, with exact information and technical specifications still to be defined. [S1203] Role-based views avoid publishing worker identities, sensitive costing or a supplier's confidential process data merely because transparency is required elsewhere.

> **WORKED EXAMPLE: A LOT MUST RECONCILE BEFORE IT CAN CARRY A CLAIM**
>
> An illustrative cutting and sewing order starts with 2,500 kg of traceable fabric and plans 10,000 shirts at 0.22 kg of fabric per shipped shirt. Cutting produces 300 kg of offcuts. Finishing rejects 200 shirts, representing 44 kg at the same unit mass, and 9,800 shirts ship. The illustrative mass balance is 2,500 kg input minus 300 kg offcut minus 44 kg rejected product, giving 2,156 kg shipped. That equals 9,800 multiplied by 0.22 kg. Offcuts are 12 percent of fabric input and finishing rejects are 2 percent of planned pieces. These assumptions demonstrate the control method and are not a forecast or an observed GFT result.

Exhibit 57, p. 195 shows why the arithmetic matters. A batch that cannot explain its quantities should not publish an unqualified physical-origin statement, even if every incoming document is genuine.

EXHIBIT 57 / KILOGRAMS OF FABRIC EQUIVALENT

The illustrative shirt lot closes only when shipped product, offcuts and rejects reconcile to fabric input



ILLUSTRATIVE Illustrative arithmetic: 2,500 kg input minus 300 kg cutting offcuts minus 44 kg finishing rejects equals 2,156 kg shipped. The example assumes 10,000 planned shirts, 9,800 shipped shirts and 0.22 kg per shipped or rejected shirt. It is not a GFT operating result or a yield benchmark.

The passport record for that illustrative lot can now state the shipped quantity, fabric equivalent, offcut destination and reject disposition, with links to the cutting and finishing events. It still cannot prove farm origin unless the upstream identifiers resolve. It cannot state emissions without metered or estimated energy evidence. And it cannot declare conformity with a future textile delegated act whose final requirements are not yet published. Those limitations are features of an honest system.

Implementation should proceed through a thin pilot. Select one fabric supplier, one product family and one shipment route. Reconcile every lot from receipt to packed garment, test an offline shift, simulate a certificate expiry and ask an independent reviewer to reconstruct the batch. Only after that reconstruction succeeds should the factory scale the template across suppliers and product families.

12.8 RECONCILIATION TESTS SHOULD CHALLENGE THE LEDGER BEFORE BUYERS DO

A useful pilot ends with deliberate failure tests. The reviewer should attempt to register output greater than available input, reuse a child-lot identifier, receive material against an expired scope and mix two lots without recording the new parent. The system should reject or visibly flag each case. A successful test is not the absence of exceptions. It is proof that exceptions cannot pass silently into a published claim.

Quantity controls need both local and cumulative checks. At each event, inputs should reconcile to outputs plus recorded losses within an approved measurement tolerance. Across the order, the sum of child quantities should not exceed the parent quantity without an explained return or adjustment. The tolerance should reflect scale calibration and process knowledge, not a broad allowance chosen to make discrepancies disappear. Any manual balancing entry should display its author, reason and approval.

Temporal segregation requires a different test. The reviewer should inspect the prior and following production runs, clearance record, line status and residual material handling. A timestamp alone cannot prove that the previous fibre was removed. Photographs or checklists may support the clearance, but the responsible supervisor and the quantity remaining still matter. The objective is to show that the claimed production window was physically controlled.

The final test follows evidence into language. The reviewer selects the strongest statement planned for the product page and asks which lot records prove every part of it. If the wording covers a whole collection while the evidence covers one order, the claim is too broad. If the record supports rainfed cultivation but not factory emissions, the environmental statement is too broad. This last gate joins data assurance to editorial control and prevents a correct ledger from producing an incorrect advertisement.

12.9

Disclosure should follow verified operating gates, not a promotional calendar

A twelve-month programme is useful only if each communication follows evidence. The calendar should never force a claim. GFT therefore recommends an initial year of gated releases: establish governance and the claim register, qualify suppliers, complete a traceability pilot, stabilise production records, commission an independent evidence review, and publish a measured impact report only when the records reconcile. This is an illustrative sequence for GFT's Cameroon textile programme, not a report of completed activity.

Exhibit 58, p. 197 turns the outline's communications calendar into hold points. Each gate identifies what can be said and what must stop publication.

EXHIBIT 58 / ILLUSTRATIVE MONTHS AND RELEASE CONDITIONS

External disclosure advances only when the underlying evidence gate closes

Planning window	Evidence gate	Permitted external statement	Hold condition
Months 1 to 2	Owners, methods and claim register approved	System design and sourcing policy	Unassigned evidence owner
Months 3 to 4	Supplier scopes and transactions verified	Named input verification within scope	Expired or mismatched evidence
Months 5 to 6	Pilot lot reconstructed independently	Traceable pilot with stated boundary	Broken parent and child lot links
Months 7 to 9	Production and resource records reconcile	Measured operating KPIs with methods	Unexplained quantity or meter variance
Months 10 to 11	Evidence review and corrective actions closed	Verified claims within reviewer scope	Open material non-conformity
Month 12	Annual ledger, grievances and remediation reconciled	Measured impact report with limitations	Any unresolved material exception

ILLUSTRATIVE [S1210] Illustrative GFT governance sequence, not completed activity or a commitment to publish on a fixed date. The OECD guidance supplies the wider due-diligence principle. Months are planning windows; a failed gate pauses the associated external claim rather than the underlying corrective work.

The measured impact report should be a reconciliation package rather than a glossy assertion. It should show opening and closing lot balances, supplier scopes, production quality, resource methods, waste destinations, workforce measures, complaints and remediation. Targets belong beside actuals with clear labels. Estimates belong beside measured values with their basis. Material exceptions belong in the report, not in an excluded annex.

The buyer evidence room can use the same structure at shorter intervals. A sourcing lead receives supplier scopes and transaction documents. A technical lead receives test reports and process specifications. A sustainability lead receives methods and calculations. This reuse reduces contradictory answers across teams and makes the public claim a controlled extract from the operational record.

The final control is independent challenge. A reviewer who did not build the ledger should select a shipment and trace it backwards to the upstream evidence, then select an input lot and trace it forwards to all affected shipments. The two directions

test different failure modes: unsupported product claims and unallocated verified inputs. Findings should enter the same corrective-action process as production defects.

This chapter is industrial research, not legal advice. Product scope, operator responsibility, claim wording and transition dates should be confirmed against the applicable EU acts, Member State measures and buyer contracts before an export decision. The engineering task remains stable even when those rules change: preserve the physical lot, reconcile every transformation and publish only what the evidence can carry.

A passport is only as strong as the lot record behind it.

CHAPTER SOURCE NOTES

S1203 European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. 2026-07-20.

S1201 European Union, EUR-Lex. 2024-06-28.

S1202 European Commission. 2025-04-16.

S1205 European Union, EUR-Lex. 2025-10-16.

S1204 European Union, EUR-Lex. 2026-02-26.

S1210 Organisation for Economic Co-operation and Development (OECD). 2018.

S1206 European Union, EUR-Lex. 2025-09-26.

S08 Aid by Trade Foundation (AbTF) / Cotton made in Africa. 2026-08-20.

S10 Cotton made in Africa (CmiA) / Aid by Trade Foundation. 2026-02-19.

S09 Cotton made in Africa (CmiA). 2026-09-28.

S1208 Aid by Trade Foundation (AbTF) / Cotton made in Africa. 2025-10.

S1207 European Commission. 2026-09-27.

GREEN FUTURE TECH

LIMITED / HONG KONG SAR

13

A sequenced performance-management and edge-first AI stack lets a greenfield African factory match Asian conversion efficiency without legacy data

A greenfield plant has no operating history, so GFT's proposed stack builds a six-family KPI ledger and validates edge inspection from the first shift, then admits forecasting and generative design only when their data and physical-validation gates are passed.

CHAPTER 13
DECISION TEST

A greenfield plant has no operating history, so GFT's proposed stack builds a six-family KPI ledger and validates edge inspection from the first shift, then admits forecasting and generative design only when their data and physical-validation gates are passed.

A greenfield African garment factory should not buy artificial intelligence as a substitute for an operating system. It should build the operating system first, capture trustworthy production events from the first shift, and add algorithms only where each has a defined decision, a measurable denominator and a safe failure mode. GFT's answer is a sequenced stack: a formula-locked performance-management workbook establishes the system of record; edge computer vision supports inspection without waiting for sales history; demand forecasting starts only after order data passes a maturity test; and generative design remains behind engineering and physical-sample gates. This sequence gives a new factory a credible route towards Asian conversion efficiency without pretending that it already possesses legacy data or proven operating results.

The distinction matters because the technologies do not share the same data dependency. A forecasting model learns from the factory's own orders, shipments, stockouts and returns. A pre-trained inspection model can instead begin with external visual examples, provided the factory validates it on local fabric, lighting, cameras and defect definitions. Published reviews report manual inspection success around 60 to 70 percent and automated methods above 90 percent, but those figures are research benchmarks rather than guaranteed performance in a new African plant. [R29] [S1302] Likewise, McKinsey reports substantial forecasting gains across supply-chain cases, not an entitlement to the same gain in every garment business. [S1301] GFT therefore treats each external result as a hypothesis to retest at line level.

Matching an Asian benchmark is consequently a measurement protocol, not a marketing statement. The comparison must use the same garment operation, standard allowed minute basis, size mix, shift calendar, quality rule and inspection boundary. A factory can claim parity only after a sustained, reconciled period shows comparable earned minutes per attended minute, first-pass yield and delivery performance. Until then, the stack described here is GFT's proposed design for its Cameroon textile programme, not an account of an operating GFT factory or a realised efficiency result.

13.1

Artificial intelligence fails when the shop floor has no trustworthy denominators

The greenfield cold-start problem is not simply an absence of rows in a database. It is an absence of shared meaning. A sewing-line output total is ambiguous if one shift counts pieces leaving the final operation while another counts pieces passing final inspection. Downtime is unusable if operators mix planned changeovers with breakdowns. A defect record has little analytical value when the same hole is described as fabric damage, a cutting fault and a sewing reject. Models trained on such records inherit the inconsistency and conceal it behind numerical confidence.

The first design task is therefore a data contract. Every event needs a timestamp, Line ID, Operator ID where appropriate, Lot ID, style and size identifier, operation code, quantity, unit and source device or document. Every quantity also needs a status: observed, corrected, estimated or rejected. The data dictionary must state whether output means sewn, inspected, repaired or packed, and whether efficiency uses

attended time, available time or paid time. These decisions are managerial and engineering choices. They should be approved before software configuration, because a later change in definition can invalidate an entire time series.

13.2 SIMPLE BASELINES REMAIN NECESSARY WHEN ORDER HISTORY IS THIN

A new plant begins without its own reorder patterns, style-level seasonality or reliable stockout history. McKinsey's review of data-light forecasting does not prescribe one universal waiting period. It recommends choosing model complexity to suit the sample, smoothing genuinely anomalous periods, preparing scenarios for uncertainty and adding external data only where relevant. [S1301] That evidence supports a more disciplined response than either premature machine learning or a blanket refusal to forecast. During early operation, planners should use visible baseline methods: contracted order books, customer-confirmed delivery windows, moving averages, simple seasonal assumptions and explicit scenarios. Each assumption must remain editable by the responsible planner.

External data cannot repair a weak internal boundary. Weather may help a maintenance forecast, and a customer's point-of-sale feed may help a replenishment forecast, but neither reveals what a factory failed to ship because its own line stopped. Orders, shipments and true demand must remain separate fields. A stockout is a censored observation of demand, not proof that demand equalled dispatched quantity. Preserving these distinctions from the first order prevents a later forecasting team from learning the wrong target.

13.3 EDGE-FIRST COMPUTING PROTECTS THE DECISION FROM THE CONNECTION

The architecture also has a physical constraint. Inspection and line intervention cannot wait for a remote service to respond. NIST identifies decentralised applications, management and analytics as a response to cloud environments constrained by scale, heterogeneity and latency. [S1303] In GFT's proposed design, inference runs beside the inspection frame or quality table. The edge device retains the model, recent event buffer and local rules. It writes a compact result to the factory ledger when connectivity permits. Production continues if the external network fails.

Edge-first does not mean isolated or uncontrolled. Devices need authenticated administration, signed model versions, restricted ports, backed-up configurations and a tested manual fallback. The vision system should recommend a disposition, not actuate a cutter, sewing machine or safety device. A quality technician retains authority over acceptance and rework. This separation limits the consequence of a false classification and keeps functional safety outside the AI design. NIST's voluntary AI Risk Management Framework similarly places trustworthiness across design, development, use and evaluation rather than treating deployment as the end of control. [S1307]

Exhibit 59, p. 202 sets out the proposed responsibility boundaries. It is an architecture to implement and test, not evidence that the layers already operate together.

EXHIBIT 59 / SYSTEM RESPONSIBILITY

The proposed stack separates production events, local inference, governed learning and management decisions



ILLUSTRATIVE [R27] [R29] [S1301] [S1303] [S1307] Illustrative GFT architecture for a greenfield factory. Local inference and manual fallback protect operations from connectivity loss. Forecasting and generative design remain gated. This is not a claim of implemented GFT infrastructure.

The exhibit's important feature is not the number of layers. It is the direction of authority. Production generates events; the signal layer validates them; control determines what may happen; learning offers recommendations within that mandate; and named managers remain accountable for action. Data can move upwards for later analysis, but an unvalidated model never acquires direct authority over machinery.

> **GFT NOTE**
>
> Fund the data contract, inspection lighting, edge-device maintenance and supervisor routine before funding a forecasting platform. GFT's practical recommendation is to approve one page per KPI containing its formula, boundary, owner, source fields, correction rule and escalation action. If that page cannot be completed, the metric is not ready for automation.

13.4

Six KPI families turn daily production into a governed operating record

GFT's proposed scorecard contains 24 core measures across six families. The count is less important than the chain from a physical event to a management decision. Production shows whether assets and labour create earned output. Quality shows whether that output is acceptable without repair. Delivery tests the promise to the customer. Cost converts physical losses into financial consequences. People records the capability and safety conditions behind performance. Sustainability applies the same denominator discipline to energy, water and waste. Cameroon's working-time rules and the programme's inspection evidence inform the operating context, but the formulas and thresholds below are proposed GFT controls rather than external industry standards. [R16] [R28] [R29]

Every measure needs one formula and one accountable owner. Overall Equipment Effectiveness (OEE) multiplies availability, performance and quality for a defined asset and period; it must not be presented as sewing-line labour efficiency. Standard Allowed Minute (SAM) efficiency divides earned standard minutes by attended direct-labour minutes. First-Pass Yield (FPY) counts units accepted without rework divided by units entering inspection. Defects per Hundred Units (DHU) counts defects rather than defective garments, so one garment can contribute more than one defect. On-Time In-Full (OTIF) is binary at order-line level unless the customer contract specifies another rule.

Exhibit 60, p. 204 compresses the scorecard into its operating contract. The formulas should sit beside the source fields in the workbook so that a reviewer can reproduce every reported result.

EXHIBIT 60 / PROPOSED KPI DEFINITIONS

Six KPI families assign every proposed measure a formula, owner and decision cadence

Family	Core measures and governing formula	Accountable owner	Review
Production	OEE = A x P x Q; SAM efficiency = earned SAM / attended minutes; plan attainment = actual / plan; throughput = accepted units / period	Production manager	Shift and day
Quality	FPY = first-pass accepted / inspected; DHU = 100 x defects / inspected; rework share; supplier fault share	Quality manager	Shift and week
Delivery	OTIF = complete on-time order lines / due lines; order cycle = dispatch minus receipt; production-to-ship lag; supplier OTIF	Planning lead	Day and week
Cost	Cost / earned SAM; marker = pattern / marker area; trim cost variance	Finance and IE leads	Week and month
People	Attendance; turnover; training hours / worker; LTIFR = injuries x exposure factor / hours worked	HR and safety leads	Week and month
Sustainability	kWh / accepted garment; water litres / kg where applicable; segregated waste share; landfill intensity; renewable share	Utilities and EHS leads	Day and month

ILLUSTRATIVE [R16] [R28] [R29] GFT scorecard design. The 24 measures and their operating definitions are proposed controls, not measured factory results or universal thresholds. R16 informs working-time context; R28 and R29 inform the quality-measurement context.

Thresholds should trigger investigation rather than automatic punishment. A red FPY result sends the quality lead to the defect Pareto and the affected lot. A low marker-utilisation result sends industrial engineering to the marker, width and size-assortment records. A high SAM efficiency accompanied by rising DHU is not a success; it may indicate that inspection has weakened or that operators are passing defects downstream. The daily review must therefore read production, quality and delivery together.

13.5 A WORKED EXAMPLE SHOWS WHY EARNED MINUTES MATTER MORE THAN BUSY TIME

WORKED EXAMPLE

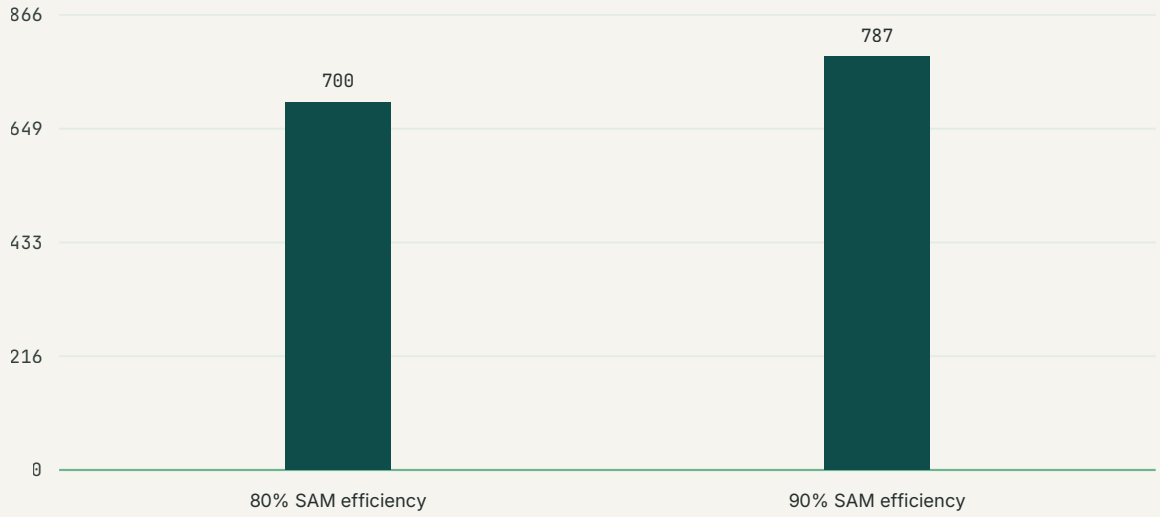
An illustrative sewing line has 25 operators, a 480-minute shift, 60 minutes of planned non-production time and a garment standard of 12 SAM. Attended direct-labour minutes are `25 x (480 - 60) = 10,500`. If the line produces 700 garments accepted without rework, earned minutes are `700 x 12 = 8,400`, so SAM efficiency is `8,400 / 10,500 = 80 percent`. These are constructed inputs for method demonstration, not an observed factory result.

Under the illustrative assumption that attended minutes, garment SAM and quality remain unchanged, 90 percent SAM efficiency would produce `floor(10,500 x 0.90 / 12) = 787` accepted garments. The gain is 87 garments, or `87 / 700 = 12.4 percent`. The calculation deliberately excludes extra breaks, absenteeism, style changes and quality deterioration, so it is not a ramp forecast.

Exhibit 61, `p. 205` displays only that arithmetic. Its value is to make the denominator visible, not to establish an Asian benchmark or a GFT target.

EXHIBIT 61 / ACCEPTED GARMENTS PER SHIFT

The illustrative line converts the same attended minutes into more accepted output at higher SAM efficiency



ILLUSTRATIVE Constructed case: 25 operators x (480 - 60) minutes = 10,500 attended minutes; 12 SAM per garment. At 80% efficiency: 700 garments. At 90%: floor(10,500 × 0.90 / 12) = 787 garments. No quality or downtime change is modelled.

The same logic applies to automation. A device can increase accepted output only if it improves a binding loss without creating another. Faster inspection has little value when the line already waits for fabric, and a small FPY improvement can matter more than a large speed increase when rework consumes scarce operator minutes. The workbook lets managers locate that constraint before they approve capital.

13.6

A fixed management cadence makes the workbook a system of record

Metrics do not govern a factory because they exist in a file. They govern it when the same people review the same reconciled values at a fixed time and leave with an owner and deadline. GFT's illustrative management rhythm starts with a 15-minute shift huddle at each cutting and sewing line. The team reviews the previous shift's plan attainment, FPY, top defect, downtime cause and safety exception. It agrees no more than a few actions, each with a named owner. A weekly cross-functional review then examines recurring losses, supplier faults, corrective and preventive actions (CAPA), delivery risk and training needs.

The monthly Sales and Operations Planning (S&OP) meeting serves a different purpose. It does not rerun the daily defect review. It reconciles the demand plan, confirmed orders, capacity, material arrivals, inventory, cash implications and workforce plan. Executives sign off one feasible operating plan and record the assumptions that would change it. Daily huddles protect flow; weekly reviews remove repeated causes; monthly S&OP resolves trade-offs between sales and capacity. Mixing those agendas weakens all three.

13.7 FORMULA LOCKING AND MASTER DATA MAKE EXCEL A CONTROLLED EARLY-PHASE LEDGER

For the early operating phase, GFT proposes a formula-locked Excel workbook pack as the principal system of record. This is a controlled application, not a spreadsheet emailed between personal computers. A restricted master copy sits on managed storage with role-based editing, scheduled backup, version history and a documented restore test. Input cells accept only defined types and ranges. Formula cells remain locked. A change log records who altered a master definition, when, why and with whose approval.

The relational structure matters more than the visual dashboard. Separate tables hold operators, lines, styles, operations, customers, suppliers, lots and defect codes. Transaction tables refer to those stable identifiers rather than retyping names. A Line ID must not change when a supervisor changes, and a defect code must retain its meaning across shifts. QR travellers can reduce manual transcription by carrying Lot ID and bundle identity from cutting to sewing and inspection. Manual entries still require reason codes for corrections; deleting a rejected record would destroy the audit trail.

Daily controls should reject duplicate event IDs, impossible timestamps, negative quantities, unknown defect codes and output that exceeds available input without an explained adjustment. Reconciliation then ties accepted production to inspection and packing, ties fabric issued to cut panels plus recorded waste, and ties attended minutes to approved shift records. Exceptions enter a clearance queue rather than being silently corrected. These checks provide the training data quality that later machine learning will require.

Excel is a sequencing choice, not a permanent architecture. The factory should migrate when concurrent users, transaction volume, customer interfaces or control requirements exceed the workbook's tested limits. Migration becomes safer when

tables already have stable keys, documented formulas and complete histories. Conversely, buying a manufacturing execution system before those decisions are settled merely automates ambiguity. The phase gate is operational readiness, not embarrassment at using a workbook.

> **WARNING**
>
> A workbook can become a single point of failure if version control, backup restoration or access administration is weak. Before launch, the programme must prove that a clean restore reproduces the prior day's signed results and that a disconnected line can still record production on its controlled fallback form.

13.8

Edge vision can start early, but only local validation earns production use

Computer vision occupies a different position from demand forecasting because its initial training data need not come from the new factory's order book. A supplier can provide a pre-trained model, cameras and an edge inference device. The factory still cannot accept the supplier's accuracy claim as its own operating result. Fabric construction, colour, surface texture, illumination, camera distance, line speed and defect taxonomy all alter what the model sees. Local validation is therefore part of commissioning, not a later improvement.

The external case for investigation is credible. The inherited inspection literature reports manual defect-detection accuracy of 60 to 70 percent, automated performance above 90 percent, coverage of more than 40 defect types and line-scan inspection speeds up to 60 metres a minute. [R28] [R29] A 2025 review of YOLO-based fabric inspection likewise reports automated success above 90 percent against 60 to 70 percent for human inspection. [S1302] These statements do not prove that one system achieves every figure on one fabric, nor do they establish a garment factory's FPY. Detection success, classification accuracy, defect recall and first-pass yield measure different things.

Exhibit 62, p. 208 keeps those external benchmarks visible while stating their limits.

EXHIBIT 62 / REPORTED LITERATURE BENCHMARK

Published inspection benchmarks justify a local pilot, not an assumed factory result

60-70%	**>90%**
Manual inspection	**Automated inspection**
Reported detection accuracy range	Reported success or accuracy benchmark
Up to 60 m/min	**40+ types**
Line-scan speed	**Defect coverage**
Inherited literature maximum	Inherited literature breadth

SOURCED [R28] [R29] [S1302] Values summarise separate inspection-literature findings. They are not a specification for one machine, not measured at a GFT factory, and not equivalent to FPY. Speed and defect-class coverage must be validated for the selected fabric and inspection boundary.

13.9 A SHADOW-MODE TRIAL MUST MEASURE ERRORS BY DEFECT CLASS

Commissioning should begin in shadow mode. The camera records its proposed classification while trained inspectors continue the existing inspection and disposition. The trial set must include the actual fabric families, colours, finishes and defect types expected in production, with hard cases retained rather than removed. Quality staff label the reference result independently, and disagreements enter adjudication. A randomly selected mixture dominated by good fabric can make overall accuracy look reassuring while hiding poor detection of the faults that matter.

The release review should therefore examine a confusion matrix by defect class, including false accepts, false rejects and unclassified items. False accepts allow defects downstream; false rejects consume inspection time and may waste good fabric. Their costs are not equal across products. A small shade variation may be critical on a uniform contract but acceptable on a different product only if the customer specification permits it. The quality manager must set release thresholds against those consequences, record them in the model card and keep a manual inspection route available.

The validated model can then support, rather than replace, disposition. Each event should contain Lot ID, roll or bundle ID, timestamp, image reference, model version, predicted class, confidence score where meaningful, operator decision and final disposition. Images need a retention policy based on quality investigation and customer requirements, while cameras should be framed on material rather than workers. Periodic challenge samples and routine cleaning, focus and lighting checks detect drift. A model update returns the system to shadow mode until the affected classes pass again.

13.10 EDGE ECONOMICS DEPEND ON AVOIDED LOSS, NOT CAMERA COUNT

The investment case starts with the cost of the current defect escape and false-reject path. Industrial engineering should trace where defects are first created, where they are detected and how many attended minutes, fabric units and delivery delays occur between those points. Inspection at the correct earlier boundary can prevent a faulty panel from consuming sewing and finishing time. It cannot repair the process cause by itself. The resulting CAPA must return to the supplier, spreading table, needle, operator method or machine setting responsible for the recurrence.

This is why GFT places vision in Tier 1A for early deployment but does not call it autonomous quality management. [R28] [R29] The measurable benefits are fewer defect escapes, less avoidable rework, faster containment and better-coded quality data. A supplier demonstration establishes technical possibility. Only a reconciled before-and-after trial on the factory's own products establishes operating value.

13.11

Demand forecasting waits for a usable order history, not a calendar announcement

GFT classifies machine-learning demand forecasting as strategically important but activates it only after the underlying records pass a maturity gate. The outline's proposed observation window of 6 to 12 months is an illustrative planning rule, not a statistical law. A stable repeat uniform style may support a simple model earlier than a seasonal fashion range. A full annual cycle may still be inadequate for a new customer with no reorder history. Eligibility must be assessed by stock-keeping unit and customer segment rather than switched on for the whole factory on one date.

The evidence supports both ambition and restraint. The inherited fashion-AI register records potential inventory-cost reductions of 35 to 40 percent and forecast-error reductions of 20 to 50 percent across broader use cases. [R27] McKinsey's supply-chain-specific article reports forecast-error reductions of 20 to 50 percent, lost-sales and product-unavailability reductions up to 65 percent, warehousing-cost reductions of 5 to 10 percent and administration-cost reductions of 25 to 40 percent. [S1301] These sources cover different decisions and denominators. Their ranges must not be combined, transferred directly into a greenfield investment case or described as GFT outcomes.

13.12 A FORECASTING CHAMPION MUST BEAT A VISIBLE BASELINE OUT OF SAMPLE

The first candidate model competes against the current planning method, not against an imaginary perfect forecast. For each eligible style and customer, the team freezes a time-ordered training period and a later test period. It compares the candidate with a naive repeat, moving average or current planner baseline using weighted absolute percentage error where volumes permit, mean absolute error and forecast bias. The review examines error at the actual decision level, such as weekly fabric requirement or monthly style-colour demand, rather than celebrating an aggregate that hides product-level failure.

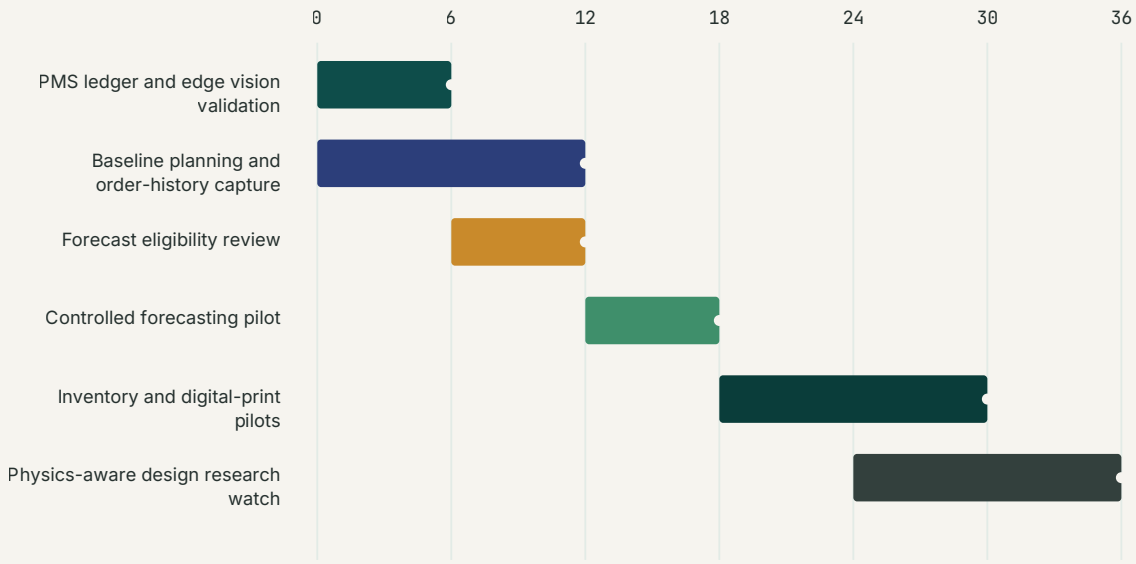
Data acceptance comes before model acceptance. Required fields include order receipt, requested and confirmed delivery dates, cancellations, shipments, returns, stockouts, price changes and customer promotions where applicable. The team must identify periods when capacity constrained sales and distinguish them from weak demand. A forecast that learns from shipments alone may reproduce past production constraints. S&OP must also approve overrides and record their reasons so that subsequent review can determine whether the model or the human adjustment added value.

Deployment begins as decision support. The model proposes a range and the planner accepts, changes or rejects it with a reason code. Procurement and capacity commitments remain inside the signed S&OP process. Drift monitoring tracks errors by segment and triggers reversion to the baseline when performance deteriorates. The business case recognises value only after reconciled changes in inventory, service and planning effort, with no double counting between those effects.

Exhibit 63, p. 211 summarises the proposed sequence. Dates are observation windows, not automatic permission to deploy.

EXHIBIT 63 / MONTHS FROM FIRST COMMERCIAL SHIFT

AI deployment follows demonstrated data maturity rather than the purchase calendar



ILLUSTRATIVE [R27] [R29] [R30] [R31] [S1301] [S1306] Illustrative sequencing model. Every phase requires its data, validation and owner gates. The 6 to 12 month forecasting eligibility window is a GFT planning rule, not a statistical minimum established by the cited sources. Tier 3 remains research watch.

The roadmap makes two forms of progress compatible. The factory can use externally trained vision immediately after local validation while its own commercial history accumulates. At the same time, simple forecasting and scenario planning remain active until a more complex candidate proves superior. Delay is therefore not inactivity; it is the period in which the factory creates the evidence required for safe automation.

13.13

Selective pilots begin only after stable flow makes inventory and printing decisions legible

Multi-echelon inventory optimisation is useful only when the factory can distinguish protective stock from concealed instability. Imported trims, regional fabric, work in progress and finished uniforms have different lead times, demand patterns and consequences of shortage. The illustrative Tier 2 pilot therefore starts with a small set of items whose demand, supplier lead time, minimum order quantity and service requirement are complete. It compares current reorder rules with a candidate policy at each stocking point. Stable OEE and FPY are prerequisites because unpredictable rework and stoppage otherwise enter the model as false demand variability.

The pilot must preserve physical and financial reconciliation. System stock should agree with a controlled count; open purchase orders need confirmed rather than hoped-for dates; and fabric reserved for one contract must not be treated as available to another. Candidate rules are tested on a historical period and then in a bounded live trial. Service, inventory value, expiry or obsolescence, emergency freight and planner

workload are assessed together. An algorithm that reduces average stock by creating shortages on a critical trim has failed even if its aggregate working-capital score improves.

Short-run digital textile printing follows the same evidence discipline. It can place logos, badges and capsule designs close to dispatch without engraving a new screen for every design, while the appropriate ink and fabric process still requires testing. FESPA cites an industry estimate that digital textile printing can save as much as 95 percent of industrial water and reduce energy consumption by 75 percent against analogue alternatives. [S1304] GFT treats these as trade-literature upper claims, not base-case savings. The factory must meter water and energy across pre-treatment, printing, curing, washing and cleaning for its own process boundary.

A printing pilot should therefore compare total accepted output, changeover time, colour fastness, hand feel, chemical compliance, ink consumption, curing energy, water, rejects and unit contribution. On-demand customisation may reduce finished-stock risk, but it does not remove the need for quality and effluent controls. Scale follows a passed customer specification and a reconciled unit-economics result, not the promise printed in an equipment brochure.

13.14

Generative design remains behind pattern physics and a sewn-sample gate

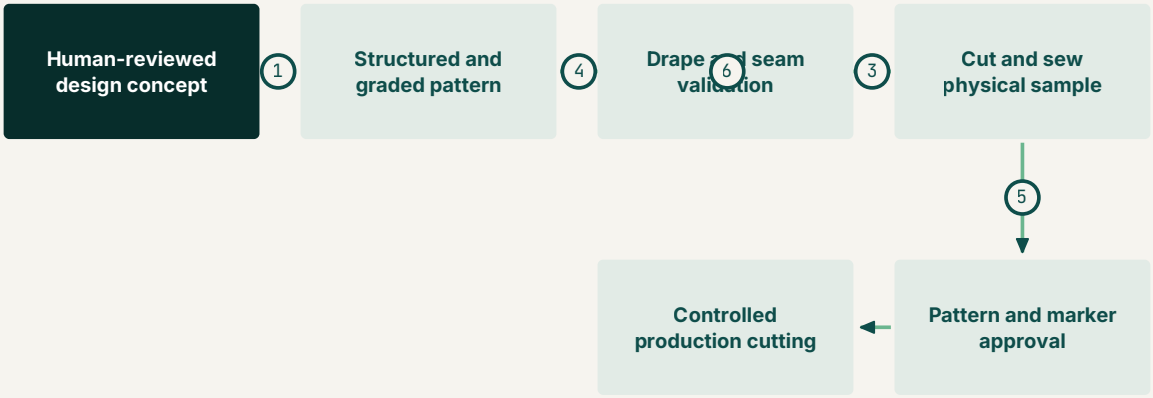
Generative design has a different maturity profile from inspection and forecasting. The inherited research register places recent apparel image generation mainly across style, silhouette, colour and pattern ideation. [R30] A comparative study of large language models found that all tested models struggled with complex fabric constructions and intricate designs from images. [S1305] These are reasons to use generated images as concepts for human review, not as cutting instructions. Visual plausibility does not establish seam length compatibility, grain direction, seam allowance, size grading, fabric drape or needle feasibility.

Research is moving towards structured representations that connect CAD, physics simulation and sustainability assessment. The Textile IR proposal explicitly combines manufacturing-valid CAD with drape and stress validation, but its authors also state that integration of the separately validated components awaits implementation. [S1306] GFT accordingly keeps this field in Tier 3 research watch. The relevant question is not whether a system can produce an attractive garment image. It is whether a pattern engineer can reproduce, edit, grade, simulate, cut and sew the output under controlled material conditions.

Exhibit 64, p. 213 shows the minimum proposed route. A failed simulation or sample returns the design to structured pattern development; neither route bypasses human approval.

EXHIBIT 64 / ENGINEERING VALIDATION SEQUENCE

Generated garment concepts cannot reach cutting without structured pattern, simulation and physical-sample gates



1. Engineer, do not auto-export
3. Pass virtual checks
4. Correct failed geometry
5. Pass physical checks
6. Correct failed sample

ILLUSTRATIVE [R30] [R31] [S1305] [S1306] Illustrative GFT control sequence informed by design research. Textile IR integration remains unimplemented in the cited proposal. Physical construction and pattern-engineer approval remain mandatory; no direct image-to-cutter route is permitted.

A serious research trial would measure more than image quality. Pattern engineers would score editability and construction correctness; the laboratory would verify material parameters; and the sample room would record sewing defects, dimensions and fit against the approved specification. The team would retain failed cases and model versions so that progress can be audited. Until those tests demonstrate repeatable value on the factory's own products, generative design belongs in a bounded research budget, not in the critical path of customer delivery.

13.15

Conversion parity becomes a comparative audit, not a software promise

The proposed stack can close information delays, but it cannot guarantee conversion-efficiency parity with an Asian factory. Proof requires a like-for-like comparison across a sustained operating period. Industrial engineering must align the style operation breakdown and SAM, then normalise attended time, shift calendars, size mix, fabric behaviour and customer quality rules. Reports should show distributions and exceptions, not only averages that conceal a difficult product group.

The comparison should read SAM efficiency beside FPY, DHU, OTIF, conversion cost and energy per accepted garment. Higher output achieved by accepting weaker quality or late delivery is not parity. Financial comparisons also need a stated currency and price date, while external benchmarks need their original denominator and period. Where those conditions are unavailable, GFT should report an internal trend and withhold the cross-country claim.

This is the practical role of Warp and Signal. Production creates the garment; measurement creates the evidence that improves the next one. The workbook preserves that evidence, edge inference shortens selected inspection decisions, and later models earn authority through out-of-sample performance. The sequence gives a greenfield factory a disciplined way to learn from its own operation without waiting for a legacy system or pretending that purchased intelligence is inherited competence.

Let each algorithm earn its place from a measured decision, and let no decision outrun the evidence on the factory floor.

CHAPTER SOURCE NOTES

R29 MDPI; industry inspection literature. Publication date unrecorded; inherited source-text check.

S1302 MDPI, Sensors. 2025-04-03.

S1301 McKinsey & Company. 2022-02-15.

S1303 National Institute of Standards and Technology (NIST). 2018-03-14.

S1307 National Institute of Standards and Technology (NIST). 2023-01-26.

R27 McKinsey, The State of Fashion 2025. Publication date unrecorded; inherited source-text check.

R16 WageIndicator. Publication date unrecorded; inherited source-text check.

R28 DataIntelo. Publication date unrecorded; inherited source-text check.

R30 Design Journal (Taylor and Francis). Publication date unrecorded; inherited source-text check.

R31 arXiv 2509.04705. Publication date unrecorded; inherited source-text check.

S1306 arXiv. 2026-01-06.

S1304 FESPA. 2021-06-28.

S1305 arXiv. 2025-09-04.

GREEN FUTURE TECH
LIMITED / HONG KONG SAR

14

GFT recommends a four-phase continental blueprint anchored on domestic and regional demand, partnered midstream capacity and day-one shop-floor measurement

Capturing more of Africa's cotton-to-garment value requires a gated roadmap in which domestic and regional cash flows, partnered midstream mills and audited shop-floor indicators govern each capital tranche.

CHAPTER 14
DECISION TEST

Capturing more of Africa's cotton-to-garment value requires a gated roadmap in which domestic and regional cash flows, partnered midstream mills and audited shop-floor indicators govern each capital tranche.

GFT recommends a four-phase programme that earns the right to integrate. It begins with domestic and regional orders, enters through modular garment operations, buys or tolls midstream capacity with partners, and treats measurement as production infrastructure. The sequence is the strategy. Each tranche is released only after demand, operating and compliance evidence clears a predefined gate. This is a continental blueprint tested against Cameroon's conditions, not a report of a commissioned GFT factory or a promise of investment returns.

The recommendation rejects two false shortcuts. Raw-lint export avoids industrial complexity but leaves subsequent conversion value elsewhere. Assembly on imported fabric can create employment quickly, yet it does not by itself create a regional fibre-to-fabric system. The alternative is not immediate vertical integration. It is a governed sequence in which customers pull production, partners supply capital-intensive intermediates, and the factory records enough evidence to make the next investment decision falsifiable.

14.1

Ten empirical rules convert comparison into an investment discipline

The country cases in this paper differ in resources, market access and industrial history. Their common lesson is not that one institutional form should be copied everywhere. It is that value retention depends on the connections between demand, conversion capacity, workforce capability and evidence. The following ten rules turn that lesson into decision criteria.

14.2 VALUE-CHAIN AND MARKET RULES PUT ORDERS BEFORE ASSETS

Rule 1: retain value through conversion, not through ownership of every machine. Cameroon exports about 95 percent of its cotton fibre raw and processes about 5 percent locally in the inherited sector baseline. The national ambition to raise local processing does not prove that every sponsor should build a complete chain. It proves that more conversion must occur within the region, whether inside one firm or across contractually connected specialists. [R06] [R07]

Rule 2: do not mistake garment assembly for a complete value chain. AGOA's third-country fabric provision permits qualifying apparel to use yarns and fabrics sourced outside the preference area. That mechanism can support employment and exports, but it also allows the sewing location to remain disconnected from local fibre and cloth. Industrial appraisal must therefore map the origin of inputs and the location of each transformation, rather than counting only the final sewing operation. [S20]

Rule 3: treat unilateral preferences as upside, never as the base case. AGOA was reauthorised only through December 2026, and country eligibility is reviewed separately. Cameroon was ineligible for calendar year 2025 in the CRS account, consistent with the inherited record of its earlier termination. A factory may benefit from a future preference, but its debt service, base utilisation and cash runway must remain viable without that benefit. [R18] [S20]

Rule 4: anchor utilisation in identifiable demand. South African retailers indicated willingness to source up to 81 million additional garments a year locally by 2030 in a study that also stressed productivity, industrial engineering and upstream capability. The transferable lesson is the demand compact, not the volume. A sponsor needs named customer segments, order schedules, product specifications and replenishment terms before it can interpret nameplate capacity as saleable output. [S18]

The Central African version of that compact should combine institutional workwear, uniforms, repeat-order basics and selected retail products. Cameroon applies a maximum 40 percent Common External Tariff rate to cotton and polyester fabrics and ready-to-wear clothing, which changes relative landed cost but does not guarantee local quality or delivery. Demand contracts must therefore be earned on service and specification, with the tariff treated as a boundary condition rather than a substitute for competitiveness. [S35]

14.3 MIDSTREAM AND FACTOR-INPUT RULES SHARE FIXED COSTS AND BUILD CAPABILITY

Rule 5: place capital-intensive utilities at the shared-system level. GDIZ presents a vertically integrated park spanning spinning through garmenting and reports a first-phase plan for three integrated factories. PIA describes central effluent treatment and recycled wastewater alongside ready-made sheds and training facilities. These are operator statements, not independent performance audits, but they show the relevant design principle: environmental and utility infrastructure should be financed, metered and governed as shared production capacity where throughput justifies it. [S04] [S15]

Rule 6: fund operator and supervisor capability before adding lines. Better Work reports that its supervisory skills programme improved communication, work allocation and time management, and cites an independent assessment in which productivity increased by 22 percent when female supervisors took the training. That result is context-specific, not a promised uplift for a new Cameroonian line. It nevertheless demonstrates why recruitment, vestibule training, supervisory coaching and safe working conditions belong in the commissioning critical path. [S29]

Rule 7: separate legacy rehabilitation from new-venture discipline. CICAM's inherited July 2023 utilisation observations ranged from 10.83 percent at CICAM 2 to 48.9 percent at CICAM 1. Such assets may still have a role as suppliers or tolling partners, but their liabilities, maintenance backlog and working-capital history must not be silently absorbed into a greenfield venture. Any partnership needs a ring-fenced contract, verified input quality and explicit remedies for non-delivery. [R12]

14.4 EVIDENCE AND CAPITAL RULES MAKE EXPANSION CONDITIONAL

Rule 8: preserve provenance through physical lots and digital records. In 2025, around 715,000 small-scale farmers in ten African countries cultivated cotton under CmiA or CmiA Organic according to the standard owner. Its separate transparency network reports around 700 suppliers and producers in 25 countries able to trace CmiA cotton back to origin. A factory can build on that infrastructure only if its own receiving, cutting and packing records preserve the relevant lot identity. [S08] [S10]

Rule 9: establish the denominator before deploying machine learning. Forecasting and inspection systems depend on consistent orders, timestamps, defect definitions and production counts. The inherited evidence reports substantial potential improve-

ments from AI-enabled forecasting and computer vision, but these are not automatic results for a data-light start-up. The first digital asset is therefore a disciplined transaction ledger with stable identifiers and accountable human review. [R27] [R28] [R29]

Rule 10: release capital against evidence rather than optimism. Camtext SA is reported as a US$300 million integrated project with an estimated return horizon near 11 years and optimal capacity around 2033. Those figures describe that project, not a benchmark every venture should imitate. The appropriate response is to make downstream demand visible first, partner for midstream processes, and preserve the option to stop or redesign each later tranche. [R09] [R10]

The blueprint is continental in method, not uniform in asset choice. A cotton-producing economy with limited conversion should begin by connecting verified fibre, regional fabric supply and reachable customers. An established assembly hub should instead test how much of its imported fabric exposure can be replaced by approved regional supply without disrupting delivery. A near-shoring exporter should protect its speed advantage while closing traceability and recycling gaps. A domestic-market producer should convert retailer or institutional commitments into stable line loading. The evidence changes, but the sequence of demand, partnership, measurement and gated capital remains constant. [R06] [S18] [S20] [S23]

This distinction prevents a false choice between exporting and self-sufficiency. Regional trade is part of the design. One country may supply lint, another yarn or fabric, and a third specialised garment production, provided that origin, ownership, quality and transport records remain explicit. The appropriate unit of analysis is therefore the bankable corridor, not the flag on the final carton. Public support should be judged by the additional regional conversion and dependable employment it enables, not by the number of processes photographed inside one perimeter. [S04] [S15]

For every setting, the sponsor should maintain one decision pack that follows the programme through each gate. It contains the customer pipeline, supplier contracts, mass balance, engineering basis, workforce plan, cash forecast, risk register and measurement ledger. Each revision records what changed, who approved it and which assumption now requires testing. This single record prevents commercial, technical and financial teams from presenting incompatible versions of the same expansion.

14.5

Ministries should make regional demand and clean conversion usable

14.6 CUSTOMS ADMINISTRATION MUST DEFEND THE PRICE UMBRELLA WITHOUT PROTECTING INEFFICIENCY

The Common External Tariff creates a meaningful difference between imported finished garments and many production inputs, but the statutory rate is only the starting point. Ministries should prioritise valuation checks, product classification, origin verification and coordinated border enforcement. They should publish clearance exceptions and audit outcomes in a form that compliant manufacturers can understand. A tariff that is inconsistently applied rewards avoidance and penalises the firm that pays its full legal costs. [S35]

Industrial and trade ministries should also review the tariff against realised factory performance. If local producers miss specification, delivery or traceability requirements, protection merely transfers money from consumers to inefficient capacity. South Africa's localisation study is instructive because it joins retailer demand to firm-level industrial engineering and upstream finishing, rather than presenting procurement or tariffs as sufficient on their own. [S18]

14.7 COTTON ALLOCATION SHOULD BE TRANSPARENT, BANKABLE AND FAIR TO GROWERS

A domestic lint or yarn allocation mechanism should give regional converters predictable access without imposing an opaque discount on the cotton producer. GFT recommends a published reference period, quality adjustments, transport treatment, allocation rules and payment security. Contracts should distinguish seed cotton, lint and yarn, and should state who carries inventory and price risk between ginning and fabric delivery. The objective is a bankable supply schedule, not an administered transfer of margin away from smallholders or the ginner. [R03]

Public policy can reduce friction by supporting lot testing, warehouse receipts and enforceable supply contracts. It should not require a garment entrant to buy every bale before customer demand is proven. Benin's integrated park model shows the value of proximity between cotton and conversion, while its planned capacities remain operator statements that must be separated from realised supply. [S04]

14.8 ORIGIN AND ENERGY RULES SHOULD REWARD REAL TRANSFORMATION

AfCFTA textile and clothing rules remain unresolved in the inherited evidence. Ministries should work towards rules that recognise African-grown cotton and regional transformation, with workable cumulation and documented verification. Sponsors should not receive public support on the assumption that a future continental preference will rescue their economics. The planning case must function under existing regional arrangements, with any later AfCFTA benefit assessed only after the relevant rule and tariff schedule are operative. [R23]

Energy permitting should follow the same evidence standard. IRENA reports that utility-scale battery storage costs fell by 93 percent between 2010 and 2024 to US$192 per kilowatt-hour, while its global utility-scale solar benchmarks are not site-specific quotations for Cameroon. Ministries can accelerate safe rooftop solar, metering and storage approvals, but sponsors must still model local irradiation, roof strength, interconnection, financing and maintenance. [S33]

14.9

SEZ operators and DFIs should finance shared constraints and staged proof

Private garment firms should not each be forced to reproduce a power substation, effluent plant, testing laboratory and training school before they can operate. Zone operators should provide these as metered services where scale permits, publish service-level obligations and allocate charges transparently. PIA's description of central effluent treatment and ready-made sheds illustrates the intended division of labour. GDIZ's spinning-to-garment scope illustrates how midstream and downstream activities can coexist without every tenant owning the full chain. [S04] [S15]

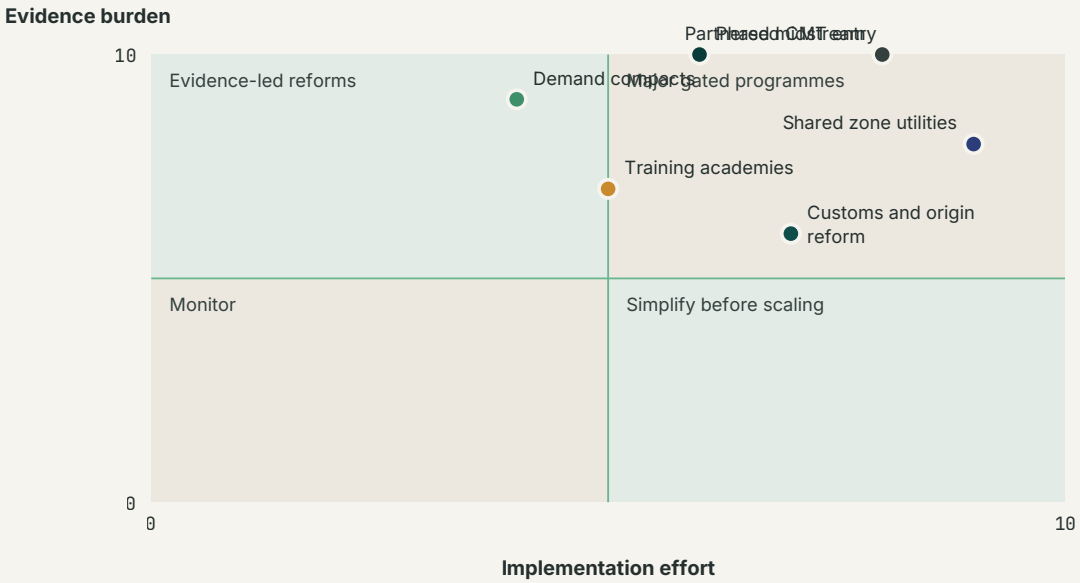
Training finance should arrive before production finance. Zone academies should teach machine handling, quality inspection, maintenance, production recording and supervisor behaviour against the actual commissioning schedule. Better Work's evidence supports structured supervisory development, but a local academy must measure its own completion, retention and line-performance outcomes rather than importing the reported 22 percent productivity result as an assumption. [S29]

Development finance institutions should tie facilities to decision gates. Long-term debt can fund justified shared utilities and equipment, while revolving facilities cover the timing difference between material purchases, production, delivery and customer payment. The lender's information pack should include order cover, supplier performance, inventory ageing, operating cash flow and the same shop-floor denominators used by management. This allows working capital to expand with verified orders rather than with optimistic nameplate capacity.

The stakeholder action matrix at **Exhibit 65**, p. 220 converts these recommendations into an illustrative prioritisation device. It compares the effort required to implement each action with the evidence burden that should accompany it. The scores are ordinal judgements, not measured country ratings or a substitute for a feasibility study.

EXHIBIT 65 / ILLUSTRATIVE ORDINAL SCORE FROM 0 TO 10

Demand compacts and phased entry carry the highest evidence burden



ILLUSTRATIVE [S04] [S15] [S18] [S35] Illustrative GFT scoring. Implementation effort combines coordination, capital and execution difficulty. Evidence burden reflects the proof needed before scale or disclosure. Scores are not observations, rankings of countries or measured GFT results.

The matrix gives demand compacts and phased entry the highest evidence burden because both can fail quietly. An unsigned customer pipeline looks like demand until production begins, while unused equipment looks like capacity until line data reveal otherwise. Shared utilities require heavy execution but their purpose is clearer: deliver a metered service to contracted users. In every case, the funding memorandum should identify the decision that the next evidence pack will support.

GFT NOTE

Finance the next decision, not the whole imagined chain. GFT recommends that each debt or equity tranche identify its commissioning scope, customer evidence, operating gates, data owner and stop conditions before funds are released. Shared infrastructure should have its own utilisation and service-quality ledger.

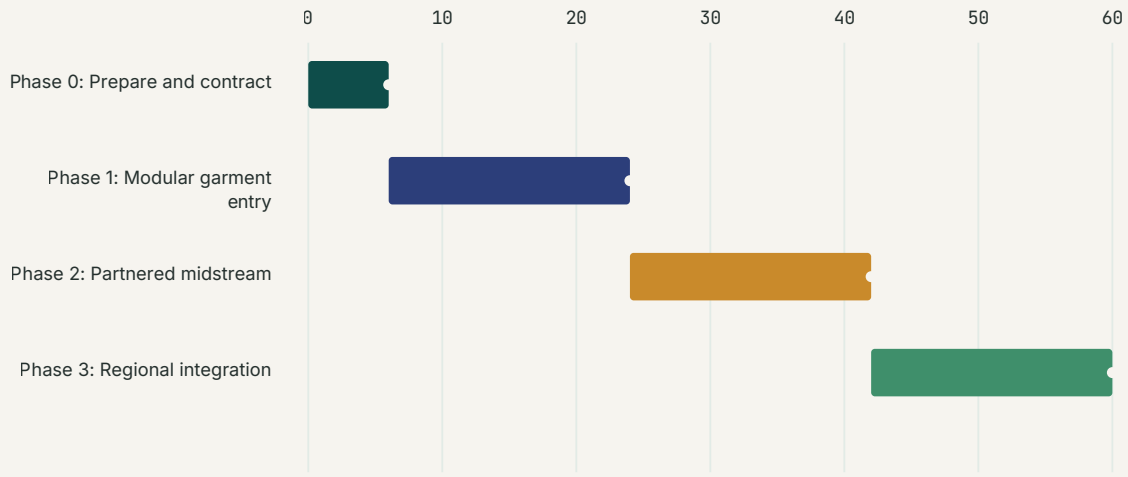
14.10

Four phases gate capital on demand, operations and compliance

The proposed roadmap at **Exhibit 66**, p. 221 starts the clock at programme approval, not at financial close or first shipment. Its dates are planning windows. They are not commitments, and later phases do not activate automatically. A gate review can accelerate, delay, redesign or stop the programme. The purpose is to preserve capital while the evidence is weak and to expand only when customers and operations justify it.

EXHIBIT 66 / MONTHS FROM PROGRAMME APPROVAL

Four gated phases move from preparation to regional scale



ILLUSTRATIVE [R09] [R10] [S23] [S33] Illustrative GFT programme design, not a commitment, construction schedule or achieved milestone. The four tasks correspond to Phase 0, Phase 1, Phase 2 and Phase 3. Progression depends on demand, financing, technical, operating and compliance gates described in the text.

The six-month preparation window is deliberately separate from commercial ramp-up. It creates the conditions under which a sewing line can become a reliable business rather than an installed asset. It also gives lenders and public partners a defined checkpoint before major production capital is committed.

14.11 PHASE 0 SECURES ORDERS, SUPPLY, PEOPLE AND THE MEASUREMENT BASELINE

During an illustrative Months 1 to 6 preparation phase, the sponsor should secure a Douala-Dibamba site subject to technical due diligence, negotiate customer offtake, and agree fabric supply and quality protocols with upstream partners. Customer doc-

uments should specify product, size curve, colour, packaging, delivery window, inspection method, payment terms and remedies. Non-binding expressions of interest must not be counted as firm order cover. Fabric agreements should identify composition, lot certificates, shade tolerance, shrinkage, defect classification and the responsibility for rejected rolls.

The same phase should commission a vestibule training line, appoint line owners, test maintenance routines and configure the performance-management ledger. Edge inspection equipment should be evaluated against the factory's actual fabric and defect set before acceptance. For imported equipment, the team should classify each item and verify its applicable tariff and origin treatment rather than assuming that every machine is duty-free. The EU-Cameroon EPA provides duty-free and quota-free access for Cameroonian exports to the EU, but export access still requires proof of origin and compliance with product-specific rules. [S1402]

14.12 PHASE 1 PROVES MODULAR GARMENT ECONOMICS BEFORE MIDSTREAM EXPANSION

The illustrative Phase 1 window runs from Months 7 to 24. It limits the production scope to cutting, sewing, trimming, finishing, printing, embroidery and selected partner-supported operations. The reference design uses an estimated US$15 million to US$20 million capital envelope, about 900 roles at full ramp and estimated nameplate capacity of 3.0 million garments a year. These are planning assumptions to be tested through detailed engineering and customer discovery, not a GFT operating result or an offer of finance.

Sales should prioritise domestic institutional and repeat-order segments, then regional customers whose specifications and payment terms are understood. Cameroon's 40 percent maximum tariff on relevant imported fabrics and ready-to-wear clothing supports the relative economics of local conversion, but it cannot compensate for late delivery or inconsistent sizing. Commercial gate evidence should therefore include signed orders, realised contribution margin, customer acceptance and payment collection, not only revenue. [S35]

GFT proposes illustrative operating gates of at least 65 percent OEE, at least 96 percent first-pass yield and at least 95 percent on-time-in-full delivery, alongside positive operating EBITDA over two consecutive quarters, before Phase 2 capital is released. The sponsor must define planned downtime, product mix and the line population in advance. Averaging a strong line with a failing line is not acceptable. The gate review should examine each commercial line, the order book and cash conversion, with independent reconciliation to production and finance records.

14.13 PHASE 2 ADDS PARTNERED FABRIC CAPACITY ONLY AFTER THE GATES CLEAR

The illustrative Phase 2 window runs from Months 25 to 42 with an estimated additional capital envelope of US$20 million to US$25 million. Its purpose is to reduce midstream dependence, not to recreate every upstream process inside the garment company. The reference option evaluates 1,000 to 2,000 tonnes a year of fabric knitting or weaving through owned modules, a joint venture or tolling arrangements. That volume is an illustrative design range and must be reconciled with actual garment consumption, yarn counts, fabric widths, finishing capacity and customer approvals.

Demand forecasting can enter controlled operation only after enough clean order history exists and a back-test beats the current planning method. Inventory optimisation should follow the same rule. Digital printing and offcut recycling should be assessed on measured water, energy, ink, yield and offtake evidence. Morocco's circularity pilots showed technical feasibility for cotton, but also showed that buyer commitments can weaken when recycled material becomes available. Phase 2 therefore requires a customer for the output as well as a process for the input. [S23]

14.14 PHASE 3 INTEGRATES REGIONALLY WITHOUT MAKING EXPORTS A DEPENDENCY

The illustrative Phase 3 window runs from Months 43 to 60 with an estimated additional US$25 million to US$30 million. It evaluates partnered spinning, deeper regional distribution and export products whose origin, quality and traceability records are complete. European market access should be developed only against the relevant product rule and documentary process. AfCFTA opportunities remain outside the base case until the applicable textile rule and tariff treatment are usable. [R23] [S1402]

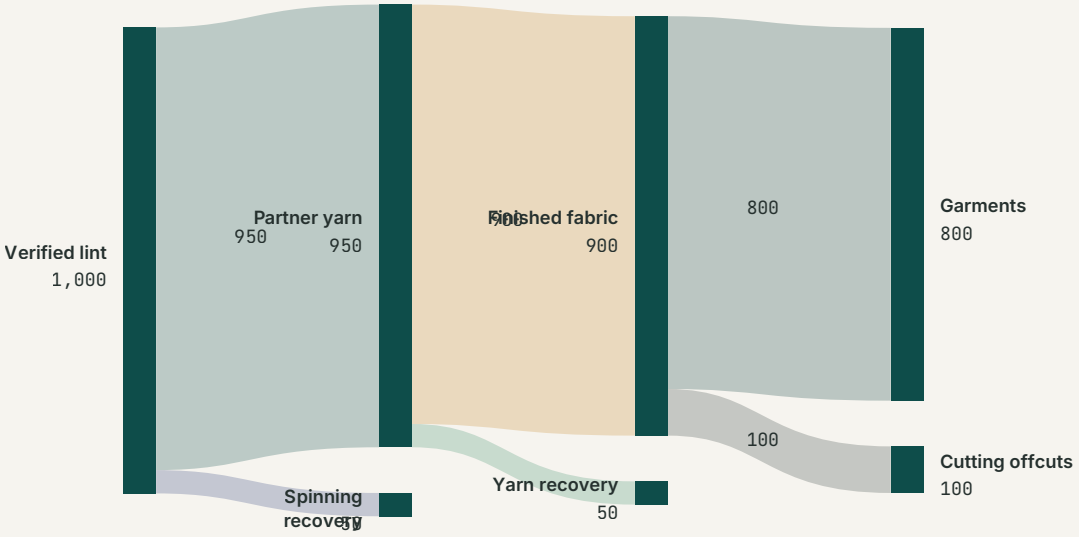
At this stage, the Digital Product Passport work should be treated as structured product-information readiness, not as a claim that a single date or data template applies to every garment. The European Commission describes a QR code as a possible carrier linking a physical product to its record. GFT's practical response is to preserve lot identity and evidence now, then map the applicable delegated requirements when they are confirmed. [S34]

> **WORKED EXAMPLE: THE CAPITAL ENVELOPE REMAINS CONDITIONAL**
>
> The illustrative Phase 1 to Phase 3 capital bands sum to US$60 million to US$75 million. The lower bound is US$15 million plus US$20 million plus US$25 million. The upper bound is US$20 million plus US$25 million plus US$30 million. This arithmetic excludes the preparation phase, working capital, financing costs, taxes, contingency and any site-specific utility premium. Only the Phase 1 envelope is considered for initial commitment. The remaining US$45 million to US$55 million stays uncommitted until the relevant gates clear. These figures are estimates for decision design, not a budget, valuation or solicitation for investment.

The material design must be just as explicit as the capital design. **Exhibit 67**, p. 224 shows an illustrative cotton-containing batch at Phase 3, including spinning recovery, yarn recovery and cutting offcuts. It demonstrates the measurement boundary rather than forecasting conversion yields.

EXHIBIT 67 / KG, ILLUSTRATIVE BATCH

A measured Phase 3 batch accounts for products and every recovery stream



ILLUSTRATIVE [S10] [S15] [S23] Illustrative mass balance, not a factory yield claim. Assumed inputs and flows: 1,000 kg lint becomes 950 kg partner yarn and 50 kg spinning recovery; 950 kg yarn becomes 900 kg fabric and 50 kg yarn recovery; 900 kg fabric becomes 800 kg garments and 100 kg cutting offcuts. Recovery and offcut destinations require separate commercial and technical validation.

The exhibit conserves mass at each internal node, but it does not establish that the assumed yields are achievable or that every recovery stream has a buyer. The operating system must weigh each stream, record its composition and link it to the originating lot. Illustrative Phase 3 circularity is credible only when those records reconcile and a partner accepts the material under a verified specification.

14.15

Early-warning indicators turn the risk register into a control system

A risk register is useful only when each exposure has a signal, an owner and a predetermined response. **Exhibit 68**, p. 225 links the principal risks to the performance-management system. It deliberately avoids a single composite risk score, which would hide different time horizons and decision rights.

EXHIBIT 68 / RISK-CONTROL REGISTER

Twelve risks require explicit signals and predetermined responses

Risk	Early-warning signal	Decision response
Grid interruption	Outage minutes and kilowatt-hours by line	Isolate critical loads and resize solar plus storage
Demand shortfall	Order cover, contribution and customer acceptance	Slow the tranche and revise the product mix
Greenfield inefficiency	SAM efficiency, first-pass yield and rework	Coach lines and repeat vestibule training
Material supply failure	Lot cover, supplier OTIF and incoming faults	Activate approved dual sourcing and buffers
Preference change	Eligibility, expiry and buyer routing	Keep preferences outside the base case
Border leakage	Price gaps and valuation exceptions	Tighten enforcement and differentiate products
Midstream overrun	Committed cost and gate variance	Use tolling, redesign or stop expansion
Effluent non-compliance	Water, effluent and chemical exceptions	Use permitted shared treatment and stop discharge

DERIVED [R05] [R18] [R27] [S1401] [S20] [S23] [S29] [S33] [S34] [S35] Derived GFT synthesis of cited evidence and the proposed operating design. No numeric risk score or probability is calculated. Thresholds must be set from the approved baseline, customer contracts, engineering design and applicable law.

EXHIBIT 69 / RISK-CONTROL REGISTER

Twelve risks require explicit signals and predetermined responses, continued

Risk	Early-warning signal	Decision response
Working-capital strain	Inventory ageing and overdue receivables	Align revolving finance to collected orders
Traceability break	Lots with missing identity or certificates	Quarantine lots and suspend product claims
AI cold-start failure	Missing data and unstable back-tests	Suspend the model and restore manual control
People and safety failure	Turnover, attendance and injury signals	Correct conditions and verify preventive action

DERIVED [R05] [R18] [R27] [S1401] [S20] [S23] [S29] [S33] [S34] [S35] Derived GFT synthesis of cited evidence and the proposed operating design. No numeric risk score or probability is calculated. Thresholds must be set from the approved baseline, customer contracts, engineering design and applicable law.

Power risk requires engineering and commercial responses. Business in Cameroon reports that the World Bank's 2024 Enterprise Survey found 93.3 percent of Cameroonian businesses experienced outages, with an average of 10.4 interruptions in a typical month. That is a survey result across businesses, not a predicted outage

rate for the proposed factory. The design response is to meter interruptions, protect sensitive loads and size solar plus storage from measured demand. IRENA's US$192 per kilowatt-hour global battery cost benchmark informs the review but does not replace a local turnkey quotation. [S1401] [S33]

Labour risk appears first as unstable output and quality, not simply as turnover. Weekly line efficiency, first-pass yield, attendance and rework should trigger coaching before management adds machines or overtime. Better Work's reported 22 percent productivity increase after female supervisor training supports investment in supervision, but the local control group and baseline will determine whether the intervention works in this setting. [S29]

Supply and trade risks need separate treatment. CFA-zone cotton output declined by 11.5 percent in 2024/25 in the inherited evidence, which supports supplier diversification and inventory rules rather than an assumption of uninterrupted local availability. AGOA's limited reauthorisation and Cameroon's ineligibility reinforce the decision to keep United States preferences outside base revenue. The corresponding signals are lot cover, supplier delivery, order destination and the legal status used in each sales contract. [R05] [R18] [S20]

The register cannot eliminate uncertainty. It makes deviations visible early enough to protect cash, workers and customers. Every threshold should name the person authorised to stop a line, quarantine a lot, defer capital or change the sales plan. Without that decision right, an alert is only another report.

14.16

The Day-One Measurement Ledger makes every later claim auditable

GFT's Cameroon textile programme combines feasibility, performance-management design and digital strategy. This chapter converts those workstreams into a proposed control record; it does not present a commissioned plant or a historic operating result. The distinction matters because a roadmap becomes promotional when targets silently turn into achievements.

From the first commercial shift, each garment bundle, fabric roll, sewing line and utility meter should carry a stable identifier. The illustrative ledger contains 24 core indicators across Production, Quality, Delivery, Cost, People and Sustainability. This is a planning choice, not a claim that an operating GFT system already produces those measures. Each indicator needs a formula, unit, denominator, source record, line owner, reporting frequency and decision consequence.

The ledger should reconcile physical and financial records. Cut panels must reconcile to fabric issued and offcuts weighed. Good garments must reconcile to packing and dispatch. Rework must remain visible rather than disappearing into final output. Utility readings must map to the same production interval as garment counts. CmiA or other certificates should be linked to the exact lots they cover, with no broader environmental claim than the evidence permits. [S08] [S10]

Daily line reviews should address exceptions while the shift can still act. Weekly operations reviews should assign corrective action and verify closure. Monthly sales and operations planning should reconcile demand, inventory, capacity and cash. Machine-learning tools should enter only after these records pass completeness and back-test checks. The inherited AI evidence provides reasons to investigate forecasting and inspection, not reasons to bypass accountable operating control. [R27] [R29]

At the illustrative Month 12 reporting point in commercial operations, the sponsor should publish a measured impact report only after reconciling the ledger to finance, customer, workforce and environmental records. Proposed disclosures include order fulfilment, first-pass yield, resource intensity, training, safety and segregated offcuts, each with its denominator and boundary. Any external assurance should be named accurately. Until then, the report remains a proposed future output, not an audited GFT result.

This discipline also protects workers and buyers. Production pressure must not override safety, quality holds or the right to stop an unsafe process. Traceability must not expose personal worker data or confidential customer terms. A usable ledger collects what a named decision requires, restricts access by role and preserves an audit trail when a record is corrected.

14.17

Companion tools support testing, while the notice preserves the decision boundary

The paper is designed to be read alongside the Cotton Value-Flow Explorer, Market-Access Route Mapper, OEE and Sewing-Line Simulator, Solar + Grid Hybrid Sizer, DPP Payload Builder and AI Readiness & Tier Planner identified in the outline. Their role is to expose assumptions, boundaries and sensitivities. A tool output remains conditional on its inputs and method note; it does not turn an illustrative roadmap into a supplier quotation, customer commitment or financing approval.

For this illustrative roadmap, the supporting paper family provides the detailed analysis behind the synthesis: WP01 on the local-processing gap, WP06 on the Digital Product Passport, WP07 on siting, WP08 on market access, WP15 on utilisation, WP16 on the six-family scorecard and WP17 on computer vision. Readers should use those treatments to inspect individual mechanisms, then return to this chapter to test the sequence between them.

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financial instrument. Project decisions require site-specific technical, commercial, legal, tax, environmental and financial due diligence by appropriately qualified advisers.

The continental blueprint is therefore a control sequence rather than a single project design. Domestic and regional demand creates the reason to produce. Partners supply the midstream depth that a new entrant should not duplicate prematurely. Measurement shows whether the system works. Capital follows only when all three support the next decision.

Build demand before capacity, partnership before duplication, and evidence before the next tranche.

CHAPTER SOURCE NOTES

R06 Cameroon Trade Hub. Publication date unrecorded; inherited source-text check.

R07 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S20 Congressional Research Service (CRS). 2026-02-17.

R18 Congressional Research Service IF10149; AGOA (Wikipedia). Publication date unrecorded; inherited source-text check.

S18 Localisation Support Fund (LSF), South Africa. n.d..

S35 Cameroon National Shippers' Council (CNCC). 2026-01.

S04 SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). n.d..

S15 Plateforme Industrielle d'Adetikope (PIA Togo). n.d..

S29 Better Work (International Labour Organization and International Finance Corporation). 2016-09-26.

R12 Business in Cameroon. Publication date unrecorded; inherited source-text check.

S08 Aid by Trade Foundation (AbTF) / Cotton made in Africa. 2026-08-20.

S10 Cotton made in Africa (CmiA) / Aid by Trade Foundation. 2026-02-19.

R27 McKinsey, The State of Fashion 2025. Publication date unrecorded; inherited source-text check.

R28 DataIntelo. Publication date unrecorded; inherited source-text check.

R29 MDPI; industry inspection literature. Publication date unrecorded; inherited source-text check.

R09 Ecofin Agency. Publication date unrecorded; inherited source-text check.

R10 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S23 International Finance Corporation (IFC), World Bank Group. 2026.

R03 SODECOTON. Publication date unrecorded; inherited source-text check.

R23 MacMap; AfCFTA. Publication date unrecorded; inherited source-text check.

S33 International Renewable Energy Agency (IRENA). 2025.

S1402 European Commission, Directorate-General for Trade. 2026-10-14.

S34 European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. n.d..

R05 Ecofin Agency. Publication date unrecorded; inherited source-text check.

S1401 Business in Cameroon. 2026-10-29.

Provenance travels with the claim.

Available inherited records and all chapter-local source records are graded below. Identical source identities are consolidated without losing citation aliases. Missing annex references are excluded. Unrecorded dates are disclosed rather than invented.

R01 Inherited evidence R01 GRADE C

Business in Cameroon. Publication date unrecorded. businessincameroon.com

Cameroon seed-cotton production 2022-2024: 330,000 t (2022), 314,455 t (2023), about 340,000 t (2024).

Inherited source-text check; original source not independently re-opened for this edition.

R02 Inherited evidence R02 GRADE C

Fibre2Fashion; Business in Cameroon. Publication date unrecorded. fibre2fashion.com; businessincameroon.com

2025 seed-cotton projection above 350,000 t.

Inherited source-text check; original source not independently re-opened for this edition.

R03 Inherited evidence R03 GRADE C

SODECOTON. Publication date unrecorded. sodecoton.cm

Company profile: more than 220,000 cotton producers supported in northern Cameroon; nine ginning plants; two oil mills.

Inherited source-text check; original source not independently re-opened for this edition.

R04 Inherited evidence R04 GRADE C

Financial Fortune Media. Publication date unrecorded. financialfortunemedia.com

SODECOTON injects roughly US$100 million a year into rural communities.

Inherited source-text check; original source not independently re-opened for this edition.

R05 Inherited evidence R05 GRADE C

Ecofin Agency. Publication date unrecorded. ecofinagency.com

CFA-zone cotton output 2.3 million t in 2024/25, down 11.5 percent.

Inherited source-text check; original source not independently re-opened for this edition.

R06 Inherited evidence R06 GRADE C

Cameroon Trade Hub. Publication date unrecorded. cameroontradehub.cm

About 95 percent of cotton fibre exported raw against 5 percent processed locally; industrialisation target of 50 percent local processing.

Inherited source-text check; original source not independently re-opened for this edition.

R07 Inherited evidence R07 GRADE C

Ecofin Agency. Publication date unrecorded. ecofinagency.com

SND30 restates the 50 percent local-processing target by 2030.

Inherited source-text check; original source not independently re-opened for this edition.

R08 Inherited evidence R08 GRADE C

Business in Cameroon. Publication date unrecorded. businessincameroon.com

Announced SODECOTON and CICAM merger to create a cotton-textile industrial pole targeted by 2030.

Inherited source-text check; original source not independently re-opened for this edition.

R09 Inherited evidence R09 GRADE C

Ecofin Agency. Publication date unrecorded. ecofinagency.com

Camtext SA integrated cotton-to-textile project, US$300 million (180 billion XAF); Panafritex and Arise with SODECOTON, CNPS and Marlo; 12 November 2025.

Inherited source-text check; original source not independently re-opened for this edition.

R10 Inherited evidence R10 GRADE C

Ecofin Agency. Publication date unrecorded. ecofinagency.com

Camtext SA: 12,000 t a year processed; about 12,000 jobs at the Dibamba hub and 3,000 at Garoua; return on investment near 11 years; optimal capacity around 2033.

Inherited source-text check; original source not independently re-opened for this edition.

R11 Inherited evidence R11 GRADE C

Business in Cameroon; MMI News. Publication date unrecorded. businessincameroon.com; mimimefoinfos.com

CICAM market share from about 85 percent three decades ago to about 5 percent today.

Inherited source-text check; original source not independently re-opened for this edition.

R12 Inherited evidence R12 GRADE C

Business in Cameroon. Publication date unrecorded. businessincameroon.com

CICAM capacity utilisation, July 2023 report: Garoua 33.7 percent, CICAM 1 48.9 percent, CICAM 2 10.83 percent; underutilisation cost about CFAF 2 billion in 2020.

Inherited source-text check; original source not independently re-opened for this edition.

R13 Inherited evidence R13 GRADE C

Business in Cameroon; MMI News. Publication date unrecorded. businessincameroon.com; mimimefoinfos.com

CICAM restructuring cost estimate CFAF 30.7 to 48.2 billion; one relaunch plan cited at 70.2 billion.

Inherited source-text check; original source not independently re-opened for this edition.

R14 Inherited evidence R14 GRADE C

WageIndicator. Publication date unrecorded. wageindicator.org

Cameroon minimum wage (SMIG) XAF 41,875 a month in 2023, raised to XAF 43,969 a month from 23 February 2024, about US$76, a rise of 5 percent.

Inherited source-text check; original source not independently re-opened for this edition.

R15 Inherited evidence R15 GRADE C

wage.is. Publication date unrecorded. wage.is/cameroon

Average salary across sectors in Cameroon about US$359 a month.

Inherited source-text check; original source not independently re-opened for this edition.

R16 Inherited evidence R16 GRADE C

WageIndicator. Publication date unrecorded. wageindicator.org

Informal share of employment about 90 percent; standard 40-hour week, 48-hour maximum, overtime at 1.2 times.

Inherited source-text check; original source not independently re-opened for this edition.

R17 Inherited evidence R17 GRADE C

just-style. Publication date unrecorded. just-style.com

Cambodia garment-sector minimum wage US$204 a month for 2024 (labour-cost benchmark).

Inherited source-text check; original source not independently re-opened for this edition.

R18 Inherited evidence R18 GRADE B

Congressional Research Service IF10149; AGOA (Wikipedia). Publication date unrecorded. congress.gov; en.wikipedia.org

AGOA: Cameroon terminated effective 1 January 2020 for gross human-rights violations; remained ineligible; listed ineligible for calendar year 2025.

Inherited source-text check; original source not independently re-opened for this edition.

R23 Inherited evidence R23 GRADE C

MacMap; AfCFTA. Publication date unrecorded. macmap.org

Textiles and clothing among unresolved AfCFTA tariff-line categories; 92.3 percent of lines agreed excluding vehicles, textiles and clothing.

Inherited source-text check; original source not independently re-opened for this edition.

R24 Inherited evidence R24 GRADE C

Mordor Intelligence. Publication date unrecorded. mordorintelligence.com

Africa textile market about US$37.3 billion in 2025, projected US$49.41 billion by 2030 at 4.73 percent a year.

Inherited source-text check; original source not independently re-opened for this edition.

R25 Inherited evidence R25 GRADE C

Market.us. Publication date unrecorded. market.us

Africa textile market to about US$72.7 billion by 2035 at 6.9 percent a year; fashion and apparel 48.1 percent of the market in 2024.

Inherited source-text check; original source not independently re-opened for this edition.

R26 Inherited evidence R26 GRADE C

Statista. Publication date unrecorded. statista.com

Cameroon clothing and footwear spend about US$94.70 a person in 2024 and about 8.0 pieces a person; apparel eCommerce revenue US$20.32 million (2023) to US$33.61 million (2027) at 13.41 percent a year; user penetration 18.0 percent (2023) to 22.7 percent (2027).

Inherited source-text check; original source not independently re-opened for this edition.

R27 Inherited evidence R27 GRADE B

McKinsey, The State of Fashion 2025. Publication date unrecorded. mckinsey.com

AI at scale in fashion: inventory cost down 35 to 40 percent; forecast accuracy up 20 to 30 percent; revenue per customer up 15 to 25 percent; forecast errors cut 20 to 50 percent; lost sales down up to 65 percent; 75 percent of executives prioritising; sector operating-profit potential US$150 to 275 billion over three to five years.

Inherited source-text check; original source not independently re-opened for this edition.

R28 Inherited evidence R28 GRADE C

DataIntelo. Publication date unrecorded. dataintelo.com

Fabric-defect-detection AI market US$523.4 million (2024) to US$6,522.1 million (2033) at 33.8 percent a year; Asia-Pacific about 46 percent in 2024.

Inherited source-text check; original source not independently re-opened for this edition.

R29 Inherited evidence R29 GRADE C

MDPI; industry inspection literature. Publication date unrecorded. mdpi.com

Manual defect inspection 60 to 70 percent accurate, missing 20 to 30 percent of defects; computer vision above 90 percent across more than 40 defect types; line-scan inspection up to 60 metres a minute.

Inherited source-text check; original source not independently re-opened for this edition.

R30 Inherited evidence R30 GRADE C

Design Journal (Taylor and Francis). Publication date unrecorded. tandfonline.com

Generative AI in apparel 2023-2024 mainly design-side image generation (Midjourney, Stable Diffusion) across style, silhouette, colour and pattern.

Inherited source-text check; original source not independently re-opened for this edition.

R31 Inherited evidence R31 GRADE C

arXiv 2509.04705. Publication date unrecorded. arxiv.org/abs/2509.04705

By 2025-2026 the field moved to multi-model garment-design pipelines (fabric construction, shade, weave, silhouette) and physics-constrained generation coupling neural generation with simulation validation.

Inherited source-text check; original source not independently re-opened for this edition.

R32 Inherited evidence R32 GRADE C

Wise; XE. Publication date unrecorded. wise.com; xe.com

CFA franc to US dollar reference rates; franc pegged to the euro at 655.957. The GFT study's method note places the franc near 590 to 610 per US dollar across the 2023 study window and near 563 to 577 more recently, and treats currency conversions as estimates.

Inherited source-text check; original source not independently re-opened for this edition.

c01-S01 OECD-FAO Agricultural Outlook 2024-2033: Chapter 10 Cotton GRADE A

OECD and Food and Agriculture Organization of the United Nations (FAO). 2024. https://openknowledge.fao.org/server/api/core/bitstreams/8f255c15-3119-4a3a-9671-b398ccb9dd4b/content

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c01-S02 The Cotton-4 (C-4) countries in the context of the global cotton market: Situation and short- and medium-term outlook GRADE A

Food and Agriculture Organization of the United Nations (FAO). 2022. https://openknowledge.fao.org/server/api/core/bitstreams/162a57a2-a754-4139-a1bf-ad89f39c9346/content

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c01-S11 The Textile and Apparel Provisions of AGOA (OTEXA Summary) GRADE A

International Trade Administration, U.S. Department of Commerce. 2019-04-04. https://www.trade.gov/sites/default/files/2023-06/OTEXA%20website%20summary%20of%20AGOA%20provisions%2004_04_2019.pdf

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c01-S12 AGOA expiry impact on African export diversification GRADE B

UN Trade and Development (UNCTAD). 2025-10-01. https://unctad.org/news/agoa-expiry-impact-african-export-diversification

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c01-S26 Madagascar Country Commercial Guide: Textiles and Apparel GRADE A

International Trade Administration, U.S. Department of Commerce. 2025-08-04. https://www.trade.gov/country-commercial-guides/madagascar-textiles-and-apparel

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c01-S28 Pushing the Boundaries of EPR Policy for Textiles: EPR for textiles in Ghana GRADE B

Ellen MacArthur Foundation. 2024-09-25. https://www.ellenmacarthurfoundation.org/epr-for-textiles-in-ghana

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c01-S30 Final Report: Structuring SMESEHs in the Cotton-Textile-Leather-Garment Sector GRADE A

Ministry of Small and Medium-Sized Enterprises, Social Economy and Handicrafts (MINPMEESA), Republic of Cameroon. 2022-09. https://www.minpmeesa.cm/site/inhoud/uploads/2022/10/ETUDE-COTON-TEXTILE-TRADUCTION-1-1.pdf

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c01-S35 The ECCAS Common External Tariff now applicable in Cameroon GRADE A

Cameroon National Shippers' Council (CNCC). 2026-01. https://www.cncc.cm/en/article/the-eccas-common-external-tariff-now-applicable-in-cameroon-1031

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c01-S36 CEMAC Economic Barometer: June 2025 (Vol. 8) GRADE A

World Bank Group. 2025-06. https://documents1.worldbank.org/curated/en/099646306172529192/pdf/IDU-1b8948e5-2c2d-42f9-b392-6a694f5d009f.pdf

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c02-S01 Same source record as c01-S01.

c02-S02 Same source record as c01-S02.

c02-S03 Glo-Djigbe Industrial Zone (GDIZ) - Benin Africa GRADE C

ARISE Integrated Industrial Platforms (ARISE IIP). 2023. https://www.ariseiip.com/project/gdiz/

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c02-S04 Textile Park - GDIZ Benin GRADE C

SIPI-Benin S.A. / Glo-Djigbe Industrial Zone (GDIZ). 2024. https://gdiz-benin.com/textile-park/

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Accessed 2026-10-30. Quote retained in the machine-readable source record.

c02-S05 Benin Textile and Cotton Industry GRADE C

ARISE Integrated Industrial Platforms (ARISE IIP). 2023. https://www.ariseiip.com/homepage/major-industries-in-benin/benin-textile-and-cotton-industry/

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c02-S06 Apparel Sourcing and Investment Opportunities at Arise Textile Parks in West Africa GRADE B

United States Fashion Industry Association (USFIA). 2024. https://www.usfashionindustry.com/index.php?option=com_civicrm&task=civicrm/event/info&Itemid=1040&reset=1&id=385

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c09-S11 Same source record as c01-S11.

c09-S12 Same source record as c02-S12.

c09-S13 Same source record as c02-S13.

c09-S14 Same source record as c02-S14.

c09-S16 Same source record as c02-S16.

c09-S17 Same source record as c02-S17.

c09-S18 Same source record as c02-S18.

c09-S19 Same source record as c02-S19.

c09-S20 Same source record as c02-S20.

c09-S21 Same source record as c02-S21.

c09-S22 Same source record as c02-S22.

c09-S23 Same source record as c02-S23.

c09-S24 Same source record as c02-S24.

c09-S25 Same source record as c02-S25.

c09-S26 Same source record as c01-S26.

c09-S27 Same source record as c02-S27.

c09-S28 Same source record as c01-S28.

c09-S29 Same source record as c02-S29.

c09-S30 Same source record as c01-S30.

c09-S31 Same source record as c02-S31.

c09-S32 Same source record as c02-S32.

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Stable definitions make comparisons useful.

AfCFTA

African Continental Free Trade Area, the continental trade agreement uniting 54 signatory African Union member states across a 1.4 billion person market, under which textile and apparel rules of origin remain under negotiation (R23, S21).

AGOA

African Growth and Opportunity Act, a non-reciprocal United States trade preference programme enacted in 2000 and reauthorised through December 2026 under Public Law 119-75 (R18, S20).

Andon

A visual and audible shop-floor control signal allowing a sewing or cutting operator to flag a defect cluster or machine stoppage immediately for supervisor intervention.

BESS

Battery Energy Storage System, electrochemical storage paired with captive solar photovoltaics to stabilise factory power quality and bridge grid outages (S33).

BTEX

Benin Textile S.A., the vertically integrated home-textile and fabric plant in Benin's Glo-Djigbe Industrial Zone equipped with 48,768 ring spindles and 2,000 open-end rotors (S04).

Camtext SA

A US$300 million (180 billion XAF) integrated cotton-to-textile venture in Cameroon backed by Panafritex, Arise, SODECOTON, CNPS and Marlo, targeting 12,000 tonnes of cotton processing a year at Dibamba and Garoua (R09, R10).

CAPA

Corrective and Preventive Action, a structured root-cause engineering log that assigns a single owner and verification date to recurring shop-floor defects or downtime events.

CEMAC

Economic and Monetary Community of Central Africa, comprising Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea and Gabon, with a 2024 population of 63.3 million and GDP of US$125.9 billion (S36).

CET

Common External Tariff, the harmonised ECCAS-CEMAC customs tariff schedule approved in October 2024 and effective in Cameroon on 1 January 2026 with duty bands from 0 to 40 percent (S35).

CETP

Central Effluent Treatment Plant, shared industrial wastewater treatment infrastructure in textile parks designed to recycle process water and prevent dye pollution (S15).

Chute

Pre-consumer post-industrial cutting-room fabric waste generated during garment marker cutting, targeted for mechanical fibre-to-fibre recycling in North African clusters (S23).

CICAM

Cotonniere Industrielle du Cameroun, Cameroon's historic state-backed textile manufacturer whose domestic market share fell from about 85 percent three decades ago to about 5 percent (R11, R12).

CmiA

Cotton made in Africa, an Aid by Trade Foundation sustainability standard verifying nearly 40 percent of African cotton across 715,000 smallholder farming families in nine countries (S08, S09).

CMT

Cut, Make and Trim, the downstream garment manufacturing stage comprising fabric spreading, cutting, sewing assembly, pressing and packaging.

Cotton-4 (C-4)

The West and Central African cotton coalition comprising Benin, Burkina Faso, Chad and Mali, extended to C-4+ with Cote d'Ivoire, accounting for roughly 8 percent of global lint trade (S02, S38).

Cotlook A Index

The benchmark international price index representing the offering price of middling-grade raw cotton lint delivered to Far Eastern ports (S01).

CTFLGP

Clothing, Textiles, Footwear and Leather Growth Programme, South Africa's industrial incentive scheme administered by the Industrial Development Corporation for the dtic (S16).

Double Transformation

A preferential rule of origin requiring two sequential manufacturing stages, typically yarn spinning plus fabric weaving or knitting, or fabric formation plus garment making, inside the trade bloc (S21, S27).

DPP

Digital Product Passport, a mandatory digital record under European Union Regulation (EU) 2024/1781 storing product provenance, material composition and environmental performance (S34).

EPA

Economic Partnership Agreement, bilateral or regional trade frameworks between the European Union or United Kingdom and African states governing reciprocal tariff dismantling and export access (S26, S32).

EPR

Extended Producer Responsibility, a policy mechanism requiring apparel producers and importers to fund the collection, sorting and recycling of post-consumer textile waste (S28).

EPZ

Export Processing Zone, a customs-controlled industrial enclave offering duty-free input imports and tax incentives for export-oriented manufacturers, called Zone Franche in Madagascar (S24, S26).

ESPR

Ecodesign for Sustainable Products Regulation, Regulation (EU) 2024/1781 establishing sustainability, durability and digital passport rules for products placed on the EU market (S34).

First-Pass Yield (FPY)

The percentage of garments coming off a sewing line that pass final quality inspection on the first presentation without rework or rejection.

GDIZ

Glo-Djigbe Industrial Zone, a 1,640-hectare public-private industrial park 45 km from Cotonou Port in Benin hosting integrated spinning, weaving, knitting and garmenting factories (S03, S04).

Ginning Outturn Ratio

The mass fraction of spinnable cotton lint recovered from raw harvested seed cotton during mechanical ginning.

Greige Fabric

Unbleached, undyed woven or knitted cloth discharged directly from looms or circular knitting machines prior to wet processing and finishing (S23).

HIP

Hard Identity Preserved, a physical chain-of-custody tracking system used by Cotton made in Africa to segregate verified lint from ginnery to finished garment without mixing (S08, S10).

LCOE

Levelised Cost of Electricity, the discounted lifetime cost per kilowatt-hour of electricity generated by a power asset such as utility or captive solar photovoltaics (S33).

Line-Scan Camera

An optical sensor array capturing continuous row-by-row images of moving fabric webs at speeds up to 60 metres a minute for automated computer-vision defect detection (R29).

OEE

Overall Equipment Effectiveness, the composite factory productivity metric calculated as the product of machine availability, operating performance speed, and first-pass quality rate.

OTIF

On-Time In-Full, the delivery reliability measure tracking the share of customer or institutional apparel orders dispatched in complete quantities by the agreed date.

PIA

Plateforme Industrielle d'Adetikope, a 400-hectare integrated industrial zone located 15 km north of Lome, Togo, developed by the Republic of Togo and ARISE IIP (S14, S15).

QIZ

Qualifying Industrial Zone, designated Egyptian manufacturing zones whose exports enter the United States duty-free when meeting a 35 percent regional value-content rule including 10.5 percent Israeli inputs (S19, S22).

R-CTFL Master Plan 2030

South Africa's Retail-Clothing, Textile, Footwear and Leather social compact aligning major retailers, manufacturers, labour and government to reach 65 percent local retail sales share by 2030 (S16, S17).

Single Transformation

A rule of origin permitting duty-free export of apparel cut and sewn locally from fabric imported from third countries outside the preference zone (S11, S27).

SMIG

Salaire Minimum Interprofessionnel Garanti, the statutory national minimum wage in Cameroon, raised by 5 percent to XAF 43,969 a month in February 2024 (R14).

SND30

Strategie Nationale de Developpement 2020-2030, Cameroon's ten-year national development strategy targeting 50 percent domestic processing of national cotton fibre by 2030 (R07, S30).

SODECOTON

Societe de Developpement du Coton du Cameroun, the northern Cameroonian cotton enterprise supporting over 220,000 smallholder growers across nine ginneries and two oil mills (R03, R04).

Third-Country Fabric Rule

The AGOA Special Rule allowing lesser-developed beneficiary African countries to import yarn and fabric from any global source while retaining duty-free U.S. apparel access (S11, S24).

XAF

Central African CFA franc, the currency of the six CEMAC states, pegged to the euro at a fixed parity of 655.957 XAF per EUR (R32).

ZLD

Zero Liquid Discharge, an industrial wastewater engineering process that recovers and reuses virtually all factory effluent, leaving no liquid pollution discharge (S06, S15).

Follow the terms back to their context.

Page references point to occurrences in chapter prose. When a term does not occur in a chapter, its glossary definition is indexed.

AfCFTA 45 103 104 140 144 149 150 152 219 223

AGOA 20 21 33 35 36 37 39 44 45 85 92 94 95 96 98 99 100 102 103 104 108 109 112 113 114 119 125 130 140 141 142 143 144 151 152 153 216 226

Andon 255

BESS 255

BTEX 34 41 46 53 65 83 133 144

Camtext SA 25 35 42 43 45 46 77 80 81 82 83 84 87 88 104 119 121 133 136 141 144 218

CAPA 206 209

CEMAC 22 33 43 44 45 46 77 81 85 86 87 104 108 119 120 121 133 140 144 145 146 147 148 149 150 151 152 153

CET 33 46 85 86 108 119 120 121 140 145 146 147 148 149 150 152 153

CETP 34

Chute 130 131 132 133 134 135 136 137

CICAM 26 34 43 45 77 79 80 81 82 84 87 104 120 128 150 217

CmiA 33 34 44 45 49 51 53 54 55 56 57 59 61 86 88 135 152 186 187 188 190 191 217 226

CMT 31 37 38 42 43 83 84 87 88 92 95 100 101 104 109 111 113 114 117 119 120 124 130 133 141 143 144 150

Cotlook A Index 256

Cotton-4 (C-4) 256

CTFLGP 115

Double Transformation 142 143 150

DPP 130 227

EPA 37 44 100 108 119 120 121 144 145 146 147 148 149 151 152 153 222

EPR 130 150

EPZ 36 37 42 92 98 99 101 102 143 150

ESPR 256

First-Pass Yield (FPY) 256

GDIZ 34 45 51 57 63 65 67 69 72 80 82 83 84 119 144 162 163 217 219

Ginning Outturn Ratio 19 82

Greige Fabric 257

HIP 36 55 56 57 59 92 188 191

LCOE 45 87 173

Line-Scan Camera 257

OEE 46 84 96 120 203 211 222 227

OTIF 117 121 203 214

PIA 34 45 46 51 63 69 70 72 80 83 84 130 144 162 163 217 219

QIZ 33 38 124 125 128 133 134 143

R-CTFL Master Plan 2030 114 116

Single Transformation 99 100 142 143 150

SMIG 44 84 96 97 104 120 147

SND30 34 45 78 80 82 83

SODECOTON 33 35 41 43 44 45 49 57 77 78 80 81 82 84 87 88 104 119 133 134 135 141 145 150 152 176

Third-Country Fabric Rule 85 95 140 141

XAF 35 42 43 44 77 78 80 81 84 96 97 104 120 135 141 145 146 147 156 170 173 174

ZLD 33 34 41 42 46 70 83 92 121 175 176

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