Cost of Structural Inefficiency in the West African Cocoa Value Chain (EUR)

Estimated per-tonne value lost, stranded, or uncaptured due to systemic failures

Reference Parameters

Normalised FOB Export Price (EUR/tonne)	€3,400	Source: $4,000 USD × 0.85 EUR/USD (Feb 2026 rate). JPM structural forecast ~€5,100
Ghana 2025/26 Farm-Gate Price (EUR/tonne	€4,284	Source: Ghana PPRC Aug 2025: $5,040 × 0.85 = €4,284 (70% of FOB)
Avg. West African Yield (kg/ha)	450	Source: ICCO, FAO, industry consensus
USD/EUR Exchange Rate	0.85	Source: Mid-market rate, 6 February 2026 (~0.848, rounded to 0.85)

#	Structural Inefficiency	Low Estimate (EUR/tonne)	Mid Estimate (EUR/tonne)	High Estimate (EUR/tonne)	Basis of Estimate / Key Assumptions
1	Fragmented Production & Yield Gap	€425	€595	€808	Fixed costs (land, labour, tree maintenance) spread over ~450 kg/ha vs achievable 900 kg/ha. Effective doubling of per-tonne production cost. Includes: excess labour cost per tonne (~$300-500), underinvestment in inputs due to lack of credit (~$100-200), and ageing tree productivity loss (~$100-250).
1a	→ Off-Season Stranded Value	€128	€234	€340	Estimated 15-25% of annual pod production goes unharvested in conventional chain due to seasonal buying operations. At $4,000/tonne, 20% stranded volume = ~$800/tonne of pods left on tree; allocated across total annual output = $150-400/tonne. COOKO's year-round model directly captures this value.
2	Opaque Market Intermediation	€170	€276	€382	Pisteur margin: 3-5% of farm-gate value (~$100-200). Traitant/LBC margin: 2-4% (~$80-160). Informal deductions (moisture, transport, quality discounts): 3-8% (~$120-320). Information asymmetry preventing quality premiums reaching farmer: ~$50-100. Total intermediary extraction between farm-gate and FOB.
3	Post-Harvest Quality & Physical Losses	€425	€680	€935	Quality downgrade from poor fermentation (bulk/substandard vs Grade I): $200-400/tonne in lost premium. Physical losses from spoilage, contamination, moisture re-absorption: 5-10% of volume ($200-400/tonne). Flavour deficiency preventing fine-flavour premium: $100-300/tonne vs Latin American origins. Based on studies estimating 20-30% total value loss from poor

3a	→ Seasonal Infrastructure Underutilisation	€85	€170	€255	Conventional fermentation centres operate 6-8 months/year. Fixed infrastructure costs (facilities, equipment, staff overhead) amortised over seasonal throughput vs 12-month operation. Estimated idle capacity cost of $100-300/tonne. COOKO's year-round model eliminates this.
4	Extractive Pricing Mechanisms	€170	€298	€425	LID erosion: $400/tonne premium offset by ~$150-200 reduction in country differentials (~$150-200 net loss). Hedging asymmetry: origin countries bear full downside risk, lack sophisticated risk management ($100-150). Delayed payment / implicit financing cost to farmer: $50-100. Cash leakage from informal transactions: $50-100.
5	Regulatory & Institutional Overhead	€128	€234	€340	Marketing board overhead funded from cocoa revenue: $80-150/tonne (COCOBOD institutional costs). EUDR compliance costs for non-prepared actors (mapping, traceability systems, data management, audits): $50-150/tonne. Regulatory fragmentation / producer country arbitrage cost: $50-100/tonne.
6	Value Addition Deficit (Unrealised)	€1,275	€1,912	€2,550	Raw beans FOB: ~$4,000/tonne. Semi-processed products (liquor, butter, powder): $5,500-7,000/tonne equivalent. Finished chocolate at origin: $15,000-25,000/tonne in bean-equivalent terms. Minimum foregone value from exporting raw vs semi-processed: $1,500-3,000/tonne. Note: This represents structural opportunity cost, not a realisable short-term saving.
	TOTAL ESTIMATED STRUCTURAL INEFFICIENCY	€2,806	€4,399	€6,035	Sum of all six inefficiency categories including sub-items
	As % of Normalised FOB Price	82.5%	129.4%	177.5%	

METHODOLOGY NOTES

1. All estimates are indicative ranges based on industry research, institutional reports (ICCO, FAO, World Bank, Cocoa Barometer), and expert analysis.
2. Estimates use a normalised FOB price of €3,400/tonne (≈$4,000) as a stable reference. At current spot prices (~€3,400-5,100 (≈$4,000-6,000)), absolute dollar values scale proportionally
3. Categories 1-5 represent costs currently borne by the system (value destroyed or extracted). Category 6 represents unrealised opportunity cost.
4. Sub-items (1a, 3a) are components of their parent categories, shown separately to highlight COOKO-specific interventions. They are included in the parent total.
5. Ghana 2025/26 farm-gate price of $5,040/tonne (70% of FOB) represents a significant improvement from prior seasons ($1,837-3,100). Structural analysis uses long-run norms.
6. Fine-flavour / specialty cocoa premiums typically command 3-10x commodity prices (source: Cocoa Runners, ICCO fine-flavour classification). Controlled fermentation is the primary drive
7. EUDR compliance costs are estimated at $50-150/tonne for non-prepared actors; actors with pre-existing digital traceability (like COOKO) face near-zero marginal compliance cost.