AUDA-NEPAD
AFRICAN UNION DEVELOPMENT AGENCY

2001 - 2026 25th ANNIVERSARY

NORTHERN CORRIDOR PAPER AGRO-LOGISTICS INVESTMENTS

2026

Unlocking climate-resilient agrologistics and cold chain investments along the Northern Corridor

40 years ecdpm

Eco Origins Office Park, Block F, 349 Witch-Hazel Avenue, Highveld,
Centurion, Pretoria 0157, South Africa

Tel: +27 11 256 3600
Email: oceo@auda-nepad.org
Web: www.nepad.org
X: @NEPAD_Agency

#TheAfricaWeWant
January 2026

Acknowledgements:

This publication was prepared by AUDA-NEPAD in partnership with ECDPM.

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The authors would like to thank Bas Hetterscheid, Irene Koomen and Joost Snels of Wageningen University & Research; Janet Naggujja, Sophie t'Serstevens and Olivia Lamenya of the Kühne Foundation; and Mathews Wanjala of TradeMark Africa for their technical input and constructive feedback. We are also grateful to Bruce Byiers and Karim Karaki of ECDPM for their review and guidance, and to the public and private sector stakeholders interviewed in Kenya and Uganda for sharing their experience and insights. The views expressed in this briefing note are those of the authors and do not necessarily represent those of ECDPM or any other institution. Any errors or omissions remain the responsibility of the authors.

Recommended citation:

African Union Development Agency-NEPAD and ECDPM 2026, Unlocking climate-resilient agrologistics and cold chain investments along the Northern Corridor, Midrand, South Africa.

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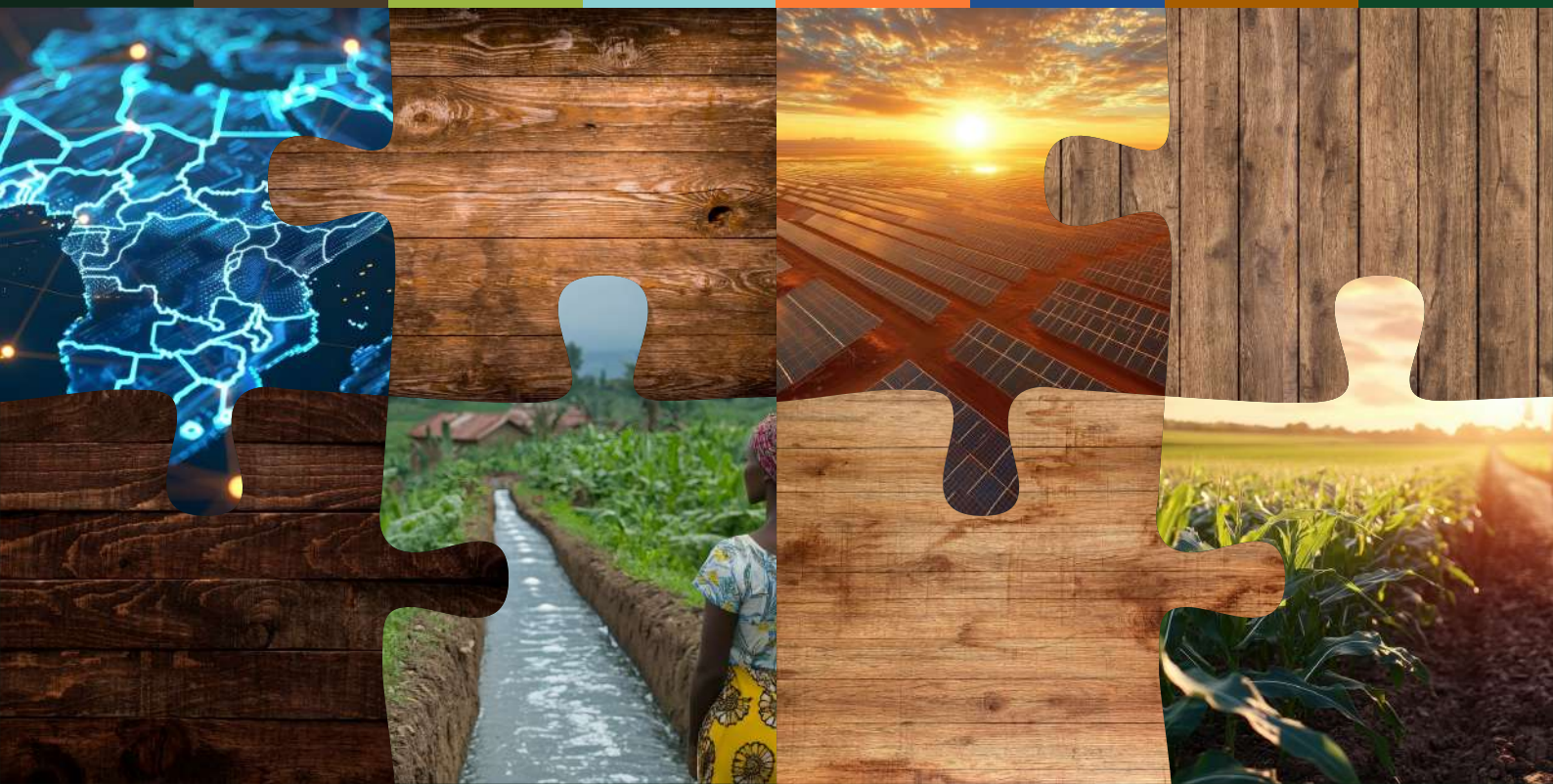
Abbreviations

Abbreviation	Full term
AfCFTA	African Continental Free Trade Area
Afreximbank	African Export-Import Bank
AGRI3	AGRI3 Fund (Rabobank/FMO blended-finance facility)
ARCH	ARCH Emerging Markets Partners (ARCH Cold Chain Solutions East Africa Fund)
AUDA-NEPAD	African Union Development Agency–New Partnership for Africa's Development
CAADP	Comprehensive Africa Agriculture Development Programme
DFI	Development Finance Institution
DRC	Democratic Republic of the Congo
EAC	East African Community
ECDPM	European Centre for Development Policy Management
EIB	European Investment Bank
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
FMO	Dutch Entrepreneurial Development Bank (Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden)
GRID	Green and Digital Trade Corridors
JRC	Joint Research Centre (European Commission)
KNBS	Kenya National Bureau of Statistics
NAP	National Adaptation Plan
NCTTCA	Northern Corridor Transit and Transport Coordination Authority
NDC	Nationally Determined Contribution
OSBP	One-Stop Border Post
PACEID	Presidential Advisory Committee on Exports and Industrial Development (Uganda)
PHL	Post-Harvest Loss
RAIP	Regional Agriculture Investment Plan
SGR	Standard Gauge Railway
SITA	Sustainable Investments in Trade and Agriculture (project)
SME	Small and Medium-sized Enterprise
SPS	Sanitary and phytosanitary standards
UK	United Kingdom
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

AGROLOGISTICS & COLD CHAIN

INTRODUCTION

“Strong systems move food, value and opportunity”



This paper is part of the African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD) and European Centre for Development Policy Management (ECDPM) initiative on scaling investments in key African food corridors for food security and climate resilience. Focusing on agrologistics and cold chain development along the Northern Corridor, it examines the main constraints to viable investment, identifies priority investment opportunities and proposes policy, financing and coordination actions to support their implementation. The analysis builds on extensive stakeholder consultations, a multi-stakeholder dialogue convened in Nairobi, and follow-up policy and investment mapping.

The Northern Corridor connects the Port of Mombasa in Kenya to the hinterland countries of Uganda, Rwanda, Burundi, South Sudan and the Democratic Republic of the Congo (see Figure 1). It links key members of the East African Community (EAC) customs union and has long served as a backbone for both regional trade and extra-regional imports and exports.

Today, the corridor stands at the intersection of several structural transitions: rising food-import dependence and vulnerability to climate shocks; slow agricultural-productivity growth and high post-harvest losses; and political commitments to regional trade facilitation and infrastructure upgrading.

Figure 1: The Northern Corridor in East Africa

Source: Joint Research Centre 2022.

In this context, climate-smart agrologistics and cold chain development can help reduce post-harvest losses, improve market access for farmers and SMEs, and expand intra-regional trade in nutritious and climate-resilient food.

Section 1

CLIMATE-SMART AGROLOGISTICS & COLD CHAIN DEVELOPMENT

“Vision for climate-smart agrologistics and cold chain development along the Northern Corridor”

This note sets out a vision and investment case for climate-smart agrologistics and cold chain development along the Northern Corridor in East Africa. It examines current constraints, emerging opportunities and priority actions required to unlock inclusive regional trade, reduce food losses and strengthen food security and safety across the wider region of East and Central Africa.

In this vision, the Northern Corridor would function as a **regional logistics backbone** for food movement, enabling more reliable and climate-smart transport and cold-chain services between production areas, domestic markets and regional trade routes.

Our vision: a multimodal Northern Corridor that integrates climate-smart agrologistics and cold chains from farms to cities and export gateways, reducing food losses, improving food safety and quality, strengthening regional food security, enabling competitive regional and export-oriented agri-food trade and supporting inclusive green growth for East and Central Africa.

Policy readiness, strategic alignment and early investment signals

The policy and institutional landscape across the Northern Corridor and the East African Community is increasingly aligned with the development of a climate-smart, multimodal cold-chain logistics backbone, with early pilots and investment initiatives signalling growing readiness for scale.

The Northern Corridor and Transport Coordination Authority (NCTTCA) has long advocated for public-private partnerships in member states to stimulate investments and encourage development in the region. Kenya, in particular, has made great strides in rehabilitating, upgrading and developing infrastructure along the Northern Corridor and at the Port of Mombasa in order to facilitate regional and international trade. The 2025 **first refrigerated rail trial, transporting flowers via the standard gauge railway (SGR),** demonstrated the technical and operational potential for intermodal cold-chain transport from inland consolidation centres to the Port of Mombasa for export (Logistics Update Africa 2025).

The Northern Corridor's own strategies (NCTTCA 2022–2026; Green Freight Strategy 2030) underline the need for: efficient, sustainable logistics; a modal shift from road to rail; reduced dwell times and border delays; and the integration of environmental and social sustainability. These are the same pre-conditions needed for a functional cold-chain logistics backbone.

At the regional level, **food security, post-harvest loss (PHL) reduction and cold chain expansion are already recognised as strategic priorities**. The EAC recognises PHL as a major concern and signals strategic intent to expand storage, packhouses and cold chains in its fruits and vegetables strategy and PHL action plans. Effective cold chains in the EAC would sharply cut perishable food losses, commonly reported to be 30% in cereals, 50% in roots and tubers and 70% in fruits and vegetables (EAC 2022). They could also raise farmer incomes, expand intra-regional trade and exports in perishable goods and reduce emissions from food waste.

Horticulture, livestock, dairy and fish are key urban market commodities along the Northern Corridor (Northern Corridor Transit Observatory Report 2024), while selected horticulture products (flowers, vegetables, avocado) function as significant export commodities, primarily to the European Union (EU), United Kingdom (UK) and Gulf markets. **Cold-chain infrastructure is strategically important for import substitution and the competitiveness of regional trade against low-cost imports.** Across value chains, temperature is essential for maintaining quality, meeting food safety and export standards, and accessing higher-value markets. Cold-chain gaps are repeatedly cited as a cause of rejected consignments and lost export potential. For example, Kenya's fresh horticultural exports dropped by 14.1% in 2024 due to compliance issues (KNBS, 2025).

Cold chain weakness also has climate implications: food lost or wasted generates upstream greenhouse gas emissions and recent analyses show that improved cold-chain infrastructure can reduce overall emissions by lowering spoilage and by shifting toward solar or clean-refrigeration solutions (FAO and UNEP 2022).

Regional policy frameworks led by the EAC provide an increasingly supportive **basis for cold chain expansion across the corridor:**

- The **Post-Harvest Loss Management Strategy and Action Plan for the Fruits and Vegetables Value Chain** (2023) explicitly focuses on measures to reduce post-harvest losses, including collection centres, sorting, packhouses, cold storages and refrigeration tanks

- The **Regional Agriculture Investment Plan** (RAIP) 2017–2025 lists post-harvest management, storage and agro-processing among sectoral priorities. These priorities are also consistent with the strategic objective five of Building Resilient Agrifood Systems in the **Comprehensive Africa Agriculture Development Programme (CAADP) Strategy and Action Plan 2026-2035** [1]

- The EAC Secretariat has repeatedly flagged cold storage and packhouses as measures to halve post-harvest losses across the region

However, despite this strong regional intent, national policy prioritisation enabling or supporting cold chain development remains uneven across corridor countries, and is **often driven by climate, energy and refrigerant-phase-down commitments under the Montreal Protocol/Kigali Amendment to the Kyoto Protocol, rather than by agricultural, food or trade policy.** As a result, clean cooling objectives tend to advance faster than integrated agricultural cold chain development.

Kenya's National Cooling Action Plan highlights policy interventions that support the transition of the cooling sector away from high global warming potential refrigerants and increase value chain actors' access to agricultural cold-chain solutions.

Export-oriented horticulture is the primary driver for cold-chain infrastructure. In Kenya, the largest cold storage capacity is located near airports, especially Jomo Kenyatta International Airport, because export markets require strict temperature management. Compliance with international food safety standards (EU, Gulf markets) pushes growers and exporters to adopt cooling systems. A study by the Dutch Ministry of Agriculture also examines the potential to shift suitable bulk horticultural exports, including avocados and flowers, from air- to sea freight through the Port of Mombasa, reducing transport costs and emissions while maintaining cold chain integrity.

Domestic markets are informal and traditional, with no differentiation between cooled and non-cooled products, while regional markets sit between this informal system and a fully formal export market. However, regional trade creates incipient, not systemic, demand for cooling, as price sensitivity (affordability) is often the main driver. Farmers therefore have **little incentive to pay for cooling** and the costs are too high for smallholders. [2]

The Rwanda National Cooling Strategy stresses the upscaling of cold-chain and off-grid cooling infrastructure to support productive sectors and emphasises energy efficiency as a main instrument to make cooling more affordable for more people. While other countries have not formally adopted national cooling plans, **cooling-related objectives are beginning to emerge through broader climate and energy policy frameworks.** Uganda has committed to improving the energy efficiency of its refrigeration and air-conditioning sector through its updated Nationally Determined Contribution (NDC) 2022 under the Paris Agreement. The Democratic Republic of Congo's (DRC) efforts to address climate change and energy use are currently focused within its broader National Adaptation Plan (NAP) and other strategic climate documents.

Moreover, the NCTTCA2022-2026 Strategic Plan identifies persistent bottlenecks relevant to agrologistics, including poor infrastructure conditions, high transit and border-crossing times, non-tariff barriers, weak modal integration, limited attention to sustainability and inclusion, and institutional and monitoring capacity gaps.

Existing and planned cold chain investments across East Africa signal growing interest from donors, development finance institutions (DFIs) and private investors. These include the planned $100-million ARCH Cold Chain Solutions East Africa Fund, which aims to develop eight large cold-chain operations in the region, alongside other DFI-supported projects (see Table 1 in Annex for a non-exhaustive list of existing initiatives). However, most investments remain concentrated in higher-margin export chains and urban clusters, leaving many smallholders and domestic markets underserved.

Section 2

STATE OF PLAY OF AGROLOGISTICS AND COLD CHAIN

“State of agrologistics and cold chain logistics in the Northern corridor”

The Northern Corridor's agrologistics and cold-storage system faces major deficiencies at farm, transport, border, and market levels. Limited first-mile infrastructure, poor rural roads, high logistics and energy costs and fragmented value chains make it difficult to maintain produce quality beyond the farm gate. High capital costs, import duties and an unfavourable business environment also constrain investment in cold-chain assets. Uneven application of tariff and non-tariff measures; institutional fragmentation and limited technical capacity further slow cross-border trade, increasing costs and spoilage and limiting farmers' access to higher-value regional and global markets.

A key infrastructure gap is **the near absence of pre-cooling and cold rooms near farms.** Existing cold storage is concentrated in a small number of central hubs, leaving many rural production zones disconnected from temperature-controlled logistics (Becker et al, 2025). Coordination between road, rail and maritime transport also remains weak, while the limited availability and improper use of refrigerated transport [3] lead to early breaks in the cold chain (Green Freight Strategy 2030).

Cold-chain investments alone are unlikely to substantially reduce PHL or improve trade outcomes without parallel improvements in basic post-harvest handling and aggregation at the farm level. Across multiple value chains, deficiencies in drying, grading, sorting and on-farm storage, alongside a lack of post-harvest handling knowledge at farmer level, lead to quality deterioration before products reach cold storage or transport. A shortage of reliable agrologistics service providers, particularly refrigerated transport operators, further raises costs, limits competition and encourages reliance on ad hoc solutions such as ice-based transport, increasing spoilage risks and reinforcing fragmentation.

Energy is a further constraint. Cold chains require reliable electricity, yet rural energy access is limited, expensive and unreliable. High energy costs make operating cold rooms and pre-coolers financially unsustainable. Even where grid power is available, cold-chain operations face significant operational risks due to power outages, forcing firms to rely on costly diesel-based backup systems, especially in aquaculture and food processing, where short interruptions can cause food safety issues and substantial losses. While solar-powered cold storage is emerging as a solution for small-scale or first-mile applications, solar systems alone are not yet sufficient for large-scale, continuous cold-chain operations, reinforcing reliance on hybrid or diesel-based energy solutions. Power interruptions and system unreliability can lead to food loss and waste, quality degradation and spoilage, while making it harder for operators to recover investment costs. These conditions tend to favour larger firms able to finance backup systems and discourage smaller logistics providers from entering the market.

Several stakeholders referred to past cold-storage investments that were technically sound but commercially underused. Wageningen University & Research similarly finds that cold-chain investments often fail when market demand, crop–market combinations, competing technologies and business models are insufficiently assessed *ex ante*. Cooling is a means to extend time-to-market, not an end product in itself, and its viability depends on alignment with market structure, energy conditions and value-chain organisation (Wageningen University & Research 2023). Investments that ignore these conditions risk becoming underused **white elephants**.

On a **financial level**, existing finance is promising but still insufficient relative to corridor-wide needs. Cold-chain projects are seen as high-risk, requiring collateral and offering limited profitability, restricting access to long-term loans. Informal market actors rely on short-term loans unsuitable for capital investments. Moreover, financing instruments are often narrowly focused on standalone cold storage, while viable agrologistics investments require bundled solutions across aggregation, handling and transport, leaving many funds underutilised.

On a **policy and governance level**, cold-chain and agrologistics priorities remain dispersed across agriculture, trade, health, energy and transport mandates and are not yet operationalised through a coherent corridor-level approach. While harmonised SPS and temperature-control standards exist at EAC level, their implementation and enforcement vary significantly across countries, making SPS a constraint on cross-border perishables trade and a key area for operational reform. Export markets impose stringent SPS requirements [4], making **food quality and safety compliance the primary driver of cold-chain adoption along the corridor.** Within regional markets, enforcement is uneven and often politicised, particularly along the Uganda–Kenya route, creating uncertainty that constrains trade and weakens incentives for systematic investment in temperature-controlled logistics. Along Uganda's borders with eastern DRC and South Sudan, informal trade dominates perishable flows. Although it facilitates market access where SPS enforcement is weak, it also reduces incentives to invest in cold-chain services, traceability and quality upgrading, limiting scale and preparedness for future compliance requirements.

Border procedures remain a critical bottleneck for perishable trade along the Northern Corridor. Despite the establishment of one-stop border posts (OSBPs) at crossings such as Malaba and Busia (Kenya), perishable goods are typically subject to the same inspection and clearance processes as non-perishables, with no systematic fast-tracking for time-sensitive cargo. Limited access to SPS and quality-testing facilities near borders, repeated phytosanitary checks, inconsistent interpretation of standards and low awareness among traders (particularly small-scale and informal actors) frequently result in delays, rejected consignments or informal negotiation of procedures.

Political economy landscape

Agrologistics and cold chains' development along the Northern Corridor is shaped by a combination of **asymmetric national capacities, divergent political priorities and unequal economic and bargaining power** among member states, which together create an uneven landscape for investment, standard-setting, and cross-border coordination.

Kenya's structural dominance in the corridor, rooted in its port leadership, Nairobi's logistics ecosystem and its export-oriented horticulture sector, positions it as the primary locus of innovation, regulatory advancement and cold-chain investment. Kenya's adoption or enforcement of higher food-safety, SPS, and traceability standards, combined with its stronger institutional capacity and closer integration with global markets, attracts private sector actors willing to invest in pre-cooling, packhouses, refrigerated transport and port-linked cold infrastructure. However, this leadership also carries the risk of skewed benefits, with value disproportionately accruing to Kenya's exporters and large agribusinesses, while smallholders and inland states struggle to participate in higher-value perishable trade (Mathieson 2016).

In contrast, **Uganda and Rwanda represent emerging but differentiated opportunities** for agrologistics upgrading, reflecting varying levels of readiness with respect to infrastructure, institutional alignment and market integration. Uganda's agricultural potential positions it well for future agrologistics and cold-chain development, yet challenges in standards enforcement, logistical reliability and last-mile infrastructure continue to limit competitiveness. Uganda also functions as a surplus-producing hinterland along the Northern Corridor, supplying maize, dairy, fish and horticulture to Kenya, eastern DRC and South Sudan. However, weak aggregation, long transit times and inconsistent standards enforcement mean this surplus is often absorbed into Kenyan supply chains, sometimes rebranded for export, while Uganda captures limited value, reinforcing trade imbalances and contributing to empty return trips along the corridor. Rwanda's strong political commitment to regional integration and its governance model create a conducive regulatory environment, but the small domestic market, limited production scale and high transport costs constrain its ability to anchor major cold chain investments. These intra-regional disparities highlight how uneven state capacities, divergent bureaucratic mandates and domestic political priorities often override the collective incentives of regional integration, resulting in inconsistent implementation of transport, SPS and trade facilitation commitments that are essential for functioning perishable corridors (Byiers et al 2023; European Centre for Development Policy Management, unpublished).

Regional coordination challenges are further compounded by **fragmented incentive structures**. National interests continue to shape corridor governance;. Also, border agencies, transport regulators and quality-control authorities operate under varying accountability systems, leading to persistent non-tariff barriers, lengthy inspections, inconsistent SPS controls and limited interoperability of data systems. These political and institutional frictions erode the continuity required for a functional cold chain and deter private investment. Meanwhile, the differing pace of regulatory reform across Uganda and Rwanda slows collective progress toward a harmonised perishables logistics framework (Joint Research Centre 2022).

Recent analysis of agricultural logistics in East Africa also highlights **the political economy of infrastructure investment and energy governance** (Maersk 2025). High electricity costs, unreliable power supply and the limited coordination of rural energy planning make cold chain operations particularly expensive in inland and rural areas. Political priorities also influence the pace of investment in digital systems, such as cargo tracking, temperature monitoring and integrated border management, which play a growing role in perishable goods' competitiveness, but require stable public-sector investment and regulatory alignment.

These dynamics help explain why **the Northern Corridor has developed islands of cold-chain sophistication,** primarily concentrated around Mombasa's port, Nairobi and Naivasha, and export-oriented horticultural and dairy value chains, while **the wider system remains fragmented and underdeveloped for domestic and regional agri-food flows.** The political economy of the corridor privileges investments with clear export returns and strong private-sector champions, but offers weaker incentives for rural first-mile infrastructure, smallholder-oriented pre-cooling or cross-border interoperability. As long as political incentives remain asymmetric and institutional capacities uneven, the corridor is likely to continue functioning as a partial cold-chain ecosystem, with Kenya capturing most of the gains. Deliberate regional cooperation and shared standards will shift the balance toward a more inclusive, integrated and resilient agrologistics system.

Section 3

INVESTMENT OPPORTUNITIES

“Investment opportunities along the Northern Corridor”

This section identifies **priority clusters of investment opportunities** along the Northern Corridor that could unlock more efficient, inclusive and resilient agri-food trade. The analysis is structured around clusters of complementary investments that address recurring bottlenecks identified mainly through consultations in Uganda and Kenya and during the Nairobi dialogue, although similar needs arise at other corridor nodes. They represent priority areas for coordinated public, private and development finance rather than a ranked pipeline of individual projects or locations.

The Northen Corridor as an Integrated Agrologistics System

Farm to market - four complimentary clusters, not isolated assets

Where losses and breaks occur today

Near-absence of first-mile cooling

Weak modal co-ordination, border delays for perishables

Farm / production → **First-mile aggregation** → **Inland transport** → **Border crossing** → **Export / regional mkt**

Cluster 1 - First-mile

Pre-cooling, packhouses
Solar dryers, grading/sorting
Aggregation centres

Cluster 2 - Border node

Cold storage, reefer plugs
bulking, light processing
Hubs near OSBPs

Cluster 3 - Perishable cold-chain logistics & specialised services

Refridgerated trucking - reefer fleet upgrades - containerised & multimodal road-rail-lake-sea - shared services.

Cluster 4 - Enabling infrastructure & systems (foundation layer)

SPS labs & inspection - certification - digital traceability - electronic SPS docs
Cargo tracking & corridor monitoring - the connective tisssue across the whole journey

Why first-mile matters - Post-harvest loss

Cereals 30% - roots & tubers 50% - fruits & verg 70%

Geography anchor:
Mombasa - UG - RW - BI - S.SUDAN - e.DRC

Table 1: Clusters of investment opportunities along the Northern Corridor

CLUSTER	CORE FUNCTION	INVESTMENT FOCUS
1. First-mile aggregation and handling	Improve produce quality before it enters formal logistics chains	Aggregation centres; cooperative or village-level infrastructure; pre-cooling facilities; packhouses; drying, grading, sorting and storage close to production zones.
2. Border and corridor nodes	Adapt border-adjacent and inland hubs to agri-food, SPS and perishables requirements	Cold storage at border crossings; reefer plugs; bulking and consolidation areas; light processing and packaging; hubs near OSBPs and inland nodes.
3. Logistics services	Expand specialised services for temperature-sensitive and consolidated trade flows	Refrigerated trucking; reefer fleet upgrades; containerised cold-chain services; transport consolidation or “piggybacking” for small traders; shared logistics services; multimodal road–rail–lake–sea links.
4. Enabling systems	Support efficient cross-border trade through verification, digital and monitoring systems	SPS labs/inspection infrastructure; mobile testing; certification services; inspector training; trader awareness; digital traceability; electronic SPS documentation; interoperable customs/SPS platforms; cargo tracking and corridor monitoring.

Taken together, these clusters suggest the need for **integrated agrologistics systems along the corridor rather than isolated assets**, linking aggregation and handling infrastructure with storage, transport, enabling systems and viable operating arrangements. The emerging Caála Agrologistics Platform along the Lobito Corridor provides one illustration of how several of these functions may be brought together within a corridor-based logistics platform.

Cluster 1 – First-mile aggregation, pre-cooling and farm-proximate handling

One of the most persistent bottlenecks in corridor performance lies at the first mile, close to production areas. Significant volumes of food never enter formal value chains due to poor post-harvest handling, lack of aggregation and the absence of basic cooling or drying infrastructure.

In Uganda, this challenge affects perishables (dairy, fish, horticulture) and semi-perishables (maize, beans, coffee). Cold storage alone is insufficient: investments are needed in basic handling infrastructure such as aggregation centres, pre-cooling units, packhouses, solar dryers, grading and sorting equipment and simple storage facilities located near farms or producer groups. Equally important are farmer-facing interventions that address basic production and post-harvest gaps, such as sub-optimal harvesting timing, inadequate grading and sorting, and poor handling practices – supported by training, standard operating procedures (SOPs) and basic quality protocols to ensure that produce enters the chain at the right quality for cooling, drying or aggregation to be effective. These combined interventions would reduce losses, improve quality and enable compliance with SPS requirements further down the corridor.

Comparable needs exist along other Northern Corridor hinterlands, including western Kenya and southern Rwanda, where smallholders dominate supply and aggregation remains fragmented. In Kenya, cold chains are largely confined to export value chains, while domestic and regional trade largely relies on night transport and rapid turnover, with losses often treated as a normal cost of trade.

The viability of first-mile investments depends both on **commodity characteristics** and alignment with **market structure**. Bananas and some staples can be transported green and aggregated without cooling for regional markets, whereas leafy vegetables, dairy, fish and fresh horticulture require rapid pre-cooling and continuous temperature control. Less temperature-sensitive commodities, such as grains, also face significant first-mile losses from moisture, pests and delayed aggregation where storage and handling systems are weak.

At the same time, while urban demand for perishable foods is growing, driven by urbanisation, income growth; seasonality gaps and persistent nutritional deficits, demand for highly sophisticated, capital-intensive cold chain systems remains uneven. In several corridor markets, price sensitivity and fragmented retail structures limit the uptake of fully integrated, export-style cold-chain services. This partly explains why some technically sound facilities are present but commercially underused.

Investments must therefore be calibrated to market maturity: rather than replicating export-oriented, IT-heavy cold-chain models, corridor strategies should prioritise context-appropriate aggregation, handling and basic temperature management solutions that reduce losses and stabilise supply at reasonable cost.

Cluster 2 – Border-adjacent logistics hubs and export ecosystem facilities

While OSBPs have reduced clearance times, they are often not designed to handle agri-food trade requirements. Across the corridor, borders lack the cold storage, laboratories, bulking areas and processing space needed to manage perishables and SPS compliance.

Uganda illustrates this clearly. Border Export Zones (e.g. Busia, Malaba, Elegu, Katuna) are being planned or partially developed to host markets with common-user facilities, such as cold rooms, warehouses, light processing, packaging, and inspection services. The Presidential Advisory Committee on Exports and Industrial Development (PACEID) has promoted targeted export infrastructure and compliance initiatives, including the development of regional agrologistics hubs linked to high-production areas (such as Gulu and Entebbe), specifically targeting strategic commodity clusters in central Uganda (for matooke and other fresh produce), Western Uganda (for dairy and horticulture) and northern/eastern Uganda (for grains and oilseeds).

These initiatives aim to strengthen standards compliance and connect smallholder farmers more effectively to regional markets. However, financing gaps remain and coordination between infrastructure provision, service operators and regulators is weak. Experience from northern Uganda illustrates the risks of misalignment: horticulture trade towards DRC and South Sudan is significant, yet planned logistics facilities in Gulu were not originally designed or equipped for horticultural cold-chain requirements. This highlights the importance of commodity-informed planning when designing border-adjacent logistics hubs.

Similar opportunities exist at Kenyan border nodes and inland hubs (including Naivasha and Kisumu), where logistics infrastructure exists but is not tailored to agri-food flows or regional trade. Border-adjacent logistics hubs and export ecosystems in Kenya are necessary but insufficient for corridor performance, because they concentrate cold-chain and compliance functions downstream, while first-mile and mid-mile gaps persist across commodities. Properly designed hubs could reduce informal trade losses, de-risk formal exports and support women traders and SMEs operating at borders.

The locations cited are illustrative – the prioritisation and design of specific investments would require validation against commodity flows, SPS requirements, existing infrastructure and operator demand.

Cluster 3: perishable cold-chain logistics and specialised services

For highly perishable commodities, such as fish, dairy and horticulture, cold-chain logistics remain a binding constraint. Specialised agro-logistics operators are scarce and many existing providers lack the technical capacity to manage temperature-sensitive cargo, documentation and certification requirements. In Uganda, this results in high logistics costs, rejected consignments and reliance on informal trade routes. Private operators (e.g. fish and dairy processors) often internalise logistics or produce ice and storage themselves, an inefficient solution that limits scaling. Comparable challenges exist elsewhere along the corridor, despite stronger logistics ecosystems in Kenya.

In Kenya, specialised perishable cold-chain logistics services exist and function well for export markets, but remain narrow, exclusive and downstream-focused, leaving first-mile, domestic and regional perishables largely outside the cold chain and preventing corridor-wide service integration. In export-oriented chains, food-safety and certification requirements increasingly shape the business case for professional cold-chain logistics. Where processors and buyers demand demonstrated temperature control and traceability, compliance becomes a practical driver of demand for reliable refrigerated transport and handling. Across domestic and regional markets, however, this commercial pull remains uneven because enforcement is weaker and many perishable flows remain informal. Specialised refrigerated logistics therefore represent a growing investment opportunity, but demand is not yet systemic.

Beyond road-based refrigerated services, stakeholders also highlighted the need for more reliable containerised and **multimodal cold-chain solutions** to reduce costs and improve predictability for higher-volume flows. Interest in modal diversification across road, rail, lake and sea is growing in particular for horticulture exports, where some operators are exploring a gradual **shift from air-to-sea freight**. However, this requires reliable end-to-end cold chains, containerised solutions and predictable volumes – conditions that are not yet consistently met. While not immediately viable across all value chains, such a transition has the potential to reduce logistics costs and emissions over the medium term, particularly for export-oriented horticulture and processed products.

Beyond physical assets, **specialised services** can sometimes unlock greater functionality than additional capital-intensive assets. Examples include shared-user cold rooms with clear operating rules, leasing models for refrigerated equipment that lower upfront costs for SMEs and targeted reefer fleet upgrades only where predictable volumes justify them. These operational solutions help extend cold chain functionality even where full end-to-end integration is not yet viable.

Cluster 4 – Enabling infrastructure and systems: SPS, traceability and corridor data systems

Cold rooms, packhouses and logistics hubs will only function as corridor assets if they are supported by **reliable inspection, verification and data systems**. For the Northern Corridor, this includes two main investment areas: SPS and quality infrastructure; and digital systems for trade facilitation, traceability and corridor monitoring.

A first investment area is SPS and quality infrastructure. Limited laboratory coverage, insufficient inspection equipment, under-trained inspectors and weak trader awareness increase delays, uncertainty and compliance costs. Investments in border-adjacent laboratories, mobile testing units, inspection equipment, certification services, inspector training and trader-facing awareness tools can help reduce repetitive checks and improve the reliability of SPS compliance systems. These investments are particularly relevant at OSBPs, logistics hubs and aggregation points serving high-volume or higher-risk value chains.

A second investment area is **digital trade facilitation, traceability and corridor monitoring**. Digital systems can support pre-arrival processing, electronic SPS certification, cargo tracking, data exchange between agencies and better coordination between customs, SPS authorities, logistics operators and traders. Ongoing work by aid-for-trade organisation TradeMark Africa, through programmes such as SITA and GRID points to the growing importance of integrated customs systems, digital public infrastructure, cargo-tracking tools and “smart border” approaches that allow data to move ahead of goods. These systems can support priority-clearance models for perishable goods, reduce unnecessary stopping and inspection and improve predictability for compliant traders. At the first-mile level, simpler **digital aggregation tools** can also help track volumes, quality, collection schedules and buyer linkages, improving visibility for logistics operators, buyers and financiers.

Section 4

THREE PILLARS OF ACTION

“Three practical levers to enable viable agrologistics and cold chain investment along the corridor”

BBuilding on the diagnostic in Section 2 and the investment opportunities outlined in Section 3, this section identifies what needs to change in how policy, finance and coordination are approached along the Northern Corridor. It sets out **three practical levers to enable viable agrologistics and cold chain investment along the corridor:**

(i) a more coherent policy and regulatory environment,
(ii) better-aligned finance and investment mechanisms, and
(iii) delivery-oriented multi-stakeholder coordination. Together, these pillars translate corridor-level ambitions into actionable conditions for public and private actors.

A. Policy and regulatory levers

Cold chain and agrologistics investments along the Northern Corridor are constrained less by the absence of policies than by **weak implementation and limited coordination** across transport, trade, agriculture, SPS and energy systems. As a result, infrastructure development, SPS enforcement and border procedures are not designed around the operational realities of perishable goods, undermining both private investment and regional food security outcomes. The actions below therefore focus on practical improvements within existing mandates and policy frameworks.

Action 1: operationalise agrologistics within NCTTCA's existing mandate

Several corridor countries have developed national aggregation centres, industrial parks and agrologistics initiatives (e.g. Kenya's County Aggregation and Industrial Parks and PACEID's aggregation hubs under development in Uganda). But these initiatives are not systematically connected to cross-border infrastructure planning and trade facilitation processes. Better integration could improve their commercial viability and make regional agrologistics investments more attractive to both public and private investors.

The NCTTCA already has the authority to address agrologistics under its broad coordination mandate, covering socioeconomic development, trade facilitation and transport infrastructure. The challenge is to translate that mandate into a **dedicated agrologistics and cold-chain workstream**, anchored within the NCTTCA Secretariat and relevant technical committees, in coordination with EAC structures, with agreed investment priorities and measurable corridor-level results. This workstream could integrate national aggregation and logistics initiatives into corridor master planning and regional trade-facilitation systems and coordinate member states, development partners and private-sector actors around priority investments. It could also facilitate knowledge exchange between member states on aggregation systems and first-mile logistics models.

Practical steps could include introducing a standing agri-food and perishable-trade agenda item in corridor meetings, incorporating agrologistics into the next master plan cycle and adding a small set of agri-food and perishables indicators to corridor performance reporting.

The NCTTCA's role would remain one of coordination, convening and monitoring. Implementation would remain primarily the responsibility of member states and specialised national agencies, with the EAC supporting alignment on regional agriculture, trade and SPS priorities. This division of responsibilities would strengthen delivery within existing mandates and complement, rather than replace, national policies and institutions.

Action 2: make borders perishable-aware

Border procedures remain **largely blind to the time sensitivity of perishable goods.** Despite the establishment of OSBPs, time-sensitive food and agricultural consignments typically pass through the same queues, inspections and clearance processes as other freight. At major crossings such as Busia and Malaba, clearance can take several hours and increase during seasonal peaks and when the border is congested. For perishable products, this unpredictability raises spoilage risks and logistics costs and weakens the viability of investments in aggregation, pre-cooling and refrigerated transport.

Trade Catalyst Africa, a financing facility, and TradeMark Africa, working with the NCTTCA and national authorities, have undertaken feasibility and validation work on potential green-lane mechanisms for perishable trade, with Malaba and Busia identified as possible pilot locations. Moving to piloting and implementation will require the identification of financing opportunities and agreement on institutional and operational responsibilities and procedures.

Precedence should be given to measures such as **priority treatment** for eligible time-sensitive consignments with **pre-arrival processing**, electronic submission of SPS documentation via single window systems, risk-based inspections, trusted-trader arrangements, coordinated or joint inspections, traffic segmentation and smart scheduling. Customs, SPS and cargo-tracking systems should allow documentation and risk information to move ahead of the consignment. TradeMark Africa's support to the development of the SPS Information Sharing Platform, together with SITA and GRID programmes, could help connect electronic SPS certification, customs systems and cargo-visibility platforms across borders. Where justified by traffic volumes and site constraints, procedural and digital priority treatment could be complemented by dedicated lanes or holding areas and targeted upgrades to inspection and testing facilities.

By reducing avoidable delays, spoilage and unnecessary vehicle idling, these measures would improve reliability for traders and logistics operators, strengthen the commercial viability of cold chain investments and generate climate-related co-benefits.

Action 3: improve SPS coordination and mutual recognition

Corridor countries already operate within regional SPS and trade-facilitation frameworks, but inconsistent implementation, repeated testing and weak coordination between customs and inspection authorities continue to create uncertainty for traders and logistics operators. Products considered compliant in one country may still face additional checks, documentation requirements or delays in another. This reduces predictability and weakens incentives to invest in traceability, temperature-controlled logistics and quality upgrading.

The priority is therefore not to develop additional standards, but to **improve the consistent and coordinated application of existing requirements.** Practical measures include operationalising equivalence and mutual-recognition mechanisms; reducing repetitive testing and administrative duplication; strengthening joint or coordinated inspections at OSBPs and improving the communication of SPS requirements to traders and SMEs. Digital verification systems can support these measures, but must be accompanied by clear inter-agency arrangements and consistent procedures across borders.

Implementation could initially focus on products and trade routes where repeated testing, inconsistent requirements and delays create the greatest costs. At the same time, more consistent enforcement should be introduced in ways that reflect market and aggregation realities. Where abrupt rules tighten risks excluding small-scale or informal traders, implementation should be phased and accompanied by clear guidance, capacity support and gradual pathways towards compliance.

Action 4: align energy, transport and agriculture planning around agrologistics needs

The commercial viability of cold storage, aggregation facilities and refrigerated transport depends on affordable and dependable energy, first-mile access and effective transport connections between production areas, logistics facilities and markets. Power outages, high energy costs and weak transport links substantially increase operating costs, particularly in inland and rural areas.

Energy, transport and agricultural planning should therefore **coordinate and sequence investments in power, cooling, storage and transport connectivity around priority agrologistics nodes,** rather than developing these assets separately. National cooling action plans, agricultural investment plans, energy-access programmes and the Northern Corridor Green Freight Strategy 2030 provide existing frameworks through which these shared priorities can be integrated.

B. Blended finance and investment solutions

Despite growing interest from development finance institutions, donors and private investors, agrologistics and cold-chain investments along the Northern Corridor remain constrained by limited access to suitable long-term finance, and by the misalignment of financing instruments and approaches with the operational realities and financing needs of agrifood system actors. Existing facilities are often too narrowly designed or disconnected from the realities of agri-food value chains. Addressing these constraints requires changes in how finance is structured, deployed and combined with project-development support.

Action 1: broaden financing beyond siloed cold chain assets

Current financing instruments frequently focus on standalone assets –such as solar-powered cold rooms or single-crop interventions – while viable agrologistics business models require **bundled investments** across aggregation, handling, transport, storage, SPS and digital systems as well as market access. Financing should be geared towards supporting integrated agrologistics systems and phased investments along the corridor, rather than isolated technologies or infrastructure projects. In many value chains, cold-chain assets are most viable when bundled with broader on-farm upgrades — for example, milk cooling often goes hand in hand with investments in barns, milking equipment, feed storage, and herd improvement.

This shift can be operationalised by integrating agri-logistics and climate-resilience objectives into corridor infrastructure planning, including under initiatives such as the EU's Global Gateway and related Team Europe frameworks. Rather than imposing additional rigid conditionalities, this would mean using grants, technical assistance and blended finance to ensure that major transport investments are accompanied by complementary investments in cold-chain logistics, digital customs and SPS systems, and market-facing infrastructure. The EU–Netherlands Global Gateway flagship GRID initiative along the Northern Corridor illustrates this ecosystem approach. It seeks to connect road and port infrastructure and promote a gradual shift from air- to sea freight with cold-chain logistics and digital customs services, while combining donor support, project-development expertise, private-sector involvement and donor finance institution (DFI) investment. Such an approach can reduce risk and help ensure that corridor infrastructure generates food-system and resilience outcomes rather than supporting isolated assets.

Alongside debt and blended finance, growth-stage logistics providers and privately operated infrastructure may also require patient equity or quasi-equity, particularly where seasonal or early-stage cash flows cannot support additional borrowing.

Action 2: pair finance with technical assistance and pipeline development

Across corridor countries, financial institutions identified the limited availability of bankable projects as a major constraint. Blended finance facilities should therefore be systematically paired with **technical assistance for project preparation**, feasibility studies and investment readiness. [5] Targeted support to improve the capacity of investment officers to appraise agrologistics and cold-chain projects – through structured training and deal preparation – would significantly reduce perceived risk and improve capital deployment.

Existing guarantees and concessional instruments often fail to translate into increased lending due to commercial banks' conservative risk models. Experience shows that to be effective, guarantees (or credit lines) should be accompanied by technical assistance focusing on **capacity building at two levels:**

1) credit risk management systems, where overly conservative, short-term or ill-fitting approaches undermine investments in agriculture and climate-related projects, and

2) market analysis and business development, to develop financial products in line with businesses' needs in these sectors. In addition, guarantees can also come with lending criteria, earmarking a share of portfolio towards dedicated sectors and/or themes (e.g. gender and youth) – yet, such conditions should be carefully crafted to make the financing offer attractive in view of the competition. More broadly, financial instruments and project-preparation support should be coordinated with wider corridor infrastructure investments and the agrologistics planning process proposed under Section 4A, Action 1 of the AUDA-NEPAD agrologistics framework This would help connect finance to viable market opportunities and reduce the risk of supporting isolated assets.

Action 3: use national development banks as anchors for corridor-aligned investments

National development banks can play a catalytic role in early-stage agrologistics investments. Institutions such as the Uganda Development Bank, and its counterparts in Kenya and Rwanda, combine long-term finance with project preparation and risk-sharing instruments, positioning them as effective anchors for corridor-aligned investment programmes. Leveraging these banks alongside regional and European financing instruments can help crowd in private capital, while grounding investments in local market realities.

A recurring constraint, however, is the limited institutional expertise in assessing agri-food and agrologistics projects. Dedicated technical support may therefore be needed to strengthen project appraisal and enable development banks to perform this anchoring role effectively. In some countries, specialised agricultural banks may be better positioned to support such investments because of their deeper familiarity with farming systems; aligning their instruments with corridor priorities could further strengthen early-stage finance.

Trade-finance and export-credit guarantees could also help reduce risks associated with volatile but strategically important regional markets, such as eastern DRC and South Sudan. In this context, regional trade-finance institutions such as the African Export-Import Bank (Afreximbank) could complement longer-term infrastructure and investment capital, including through co-financing and risk-sharing partnerships with European DFIs.

C. Multi-stakeholder coordination and delivery platforms

Agrologistics development along the Northern Corridor is characterised by a dense landscape of actors, initiatives, and pilot projects, but no single mechanism is responsible for translating dialogue into delivery. Fragmented mandates across transport, agriculture, trade, energy, and standards, combined with weak alignment of donor programmes and limited inclusion of farmers, women and traders, undermine scale, coherence, and investment impact.

Action 1: assign clear delivery functions at corridor level

Rather than creating additional dialogue platforms, stakeholders emphasised the need to clarify **who is responsible for the delivery** of specific agrologistics functions at corridor level. Priority functions include coordinating public infrastructure investments with private logistics needs, supporting investment pipeline development, monitoring implementation of agreed reforms (e.g. border procedures for perishables) and tracking corridor performance for agri-food trade. Without such delivery-oriented functions and an explicit link to financing and policy processes, coordination platforms risk remaining consultative rather than transformative.

Action 2: align donor and partner programmes around the corridor logic

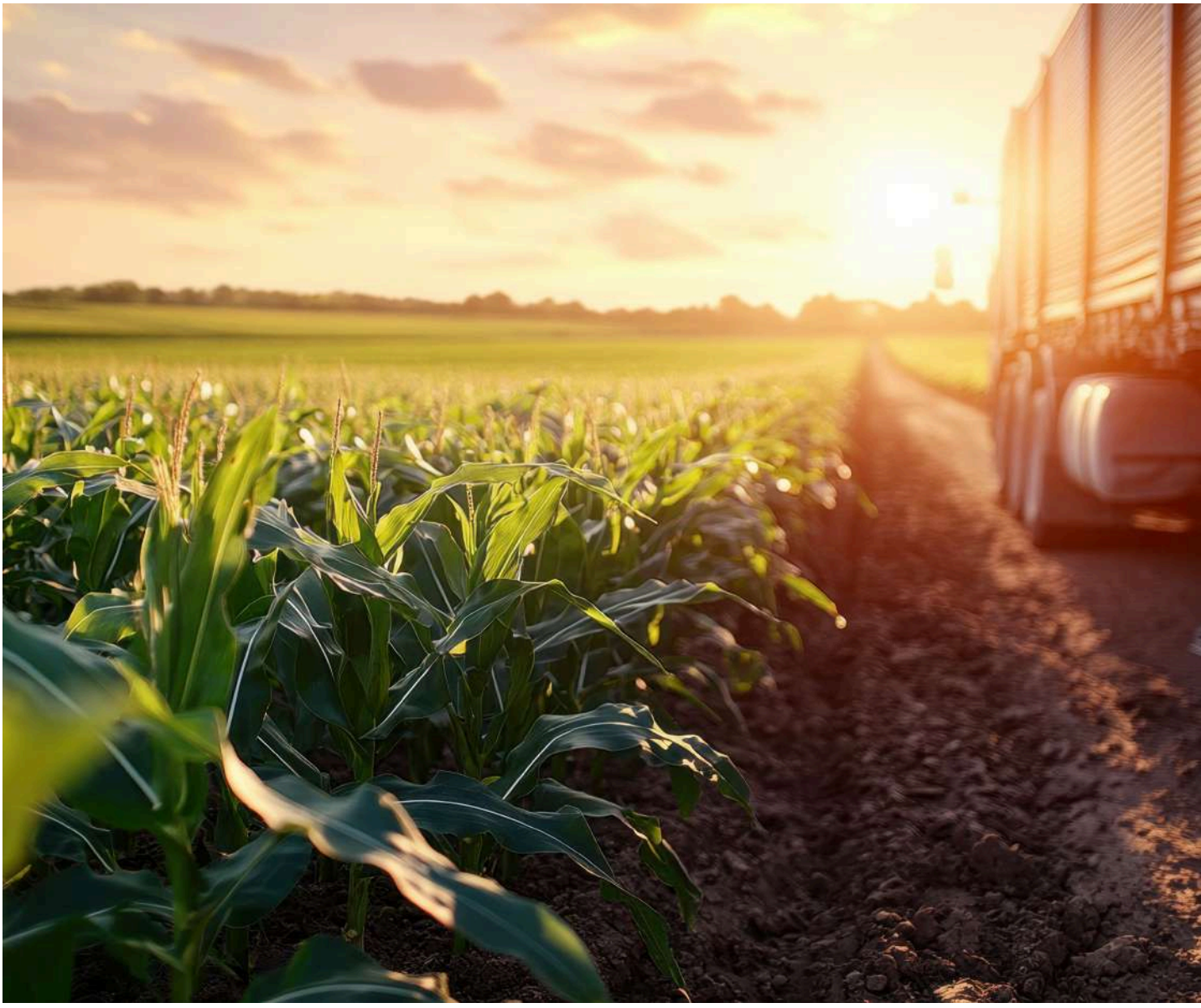
Donor and partner initiatives in agrologistics, cold chains, SPS and green freight often operate in parallel, with limited alignment across countries and value chains. Using the Northern Corridor as an organising framework would help reduce duplication, sequence reforms, aggregate impact and ensure accountability for results. This requires clearer interfaces between corridor institutions, national authorities and implementing partners, as well as shared priorities for investment, technical assistance and policy reform.

The EU's Global Gateway strategy, delivered through a Team Europe approach (including the emerging Mombasa–Kisangani Strategic Corridor platform), could provide **a framework to align European and African partners around corridor-level agrologistics priorities.** Collaboration between EU institutions, DFIs and TradeMark Africa on cold storage and the shift of suitable horticultural exports from air to sea illustrates how infrastructure, technical assistance and finance could be combined within a coordinated corridor investment package.

Action 3: include traders, farmers, processors and women

Informal cross-border trade, often led by women, remains central to perishable food flows along several corridor segments. Coordination mechanisms designed exclusively around formal exporters and large logistics operators risk reinforcing dual systems. **Trader and producer representation, gender-sensitive participation and gradual formalisation pathways** are therefore necessary to ensure that corridor reforms reflect the realities of small-scale and informal actors while supporting greater scale and compliance.

Ultimately, strengthening agrologistics along the Northern Corridor will depend less on creating new coordination structures than on **building a delivery coalition** capable of aligning policy, finance and implementation across borders. The NCTTCA can provide the corridor-level backbone for transport governance, performance monitoring and public–private dialogue, while the EAC Secretariat anchors regional SPS, trade and agricultural policy coordination. National ministries and agencies remain responsible for implementation, including agriculture, trade, transport, energy, standards and export promotion functions. Development partners, DFIs, national development banks and technical organisations can support project preparation, financing alignment and delivery facilitation. The key challenge is therefore to connect these roles around concrete agrologistics priorities, with structured participation from logistics operators, cold chain users, farmer organisations, cooperatives, traders, processors and SMEs, so that corridor-level reforms reflect operational realities and translate into investable pipelines.



Section 5

CONCLUSION

“Three practical levers to enable viable agrologistics and cold chain investment along the corridor”

Transforming the Northern Corridor from a traditional transit route into a climate-smart, integrated agrologistics backbone is a strategic priority for regional food security, trade and resilience across East and Central Africa.

The region faces high post-harvest losses, rising food import dependence and intensifying climate vulnerability. Addressing these challenges and realising the corridor's potential to support inclusive regional trade and stronger food security requires moving beyond fragmented infrastructure investments towards integrated agrologistics systems.
The evidence indicates that standalone cold storage interventions risk becoming commercially non-viable or underutilised white elephants when they are disconnected from upstream handling systems, commodity and market conditions and viable operating models. More effective investment will require bundled solutions that connect first-mile aggregation and handling with cooling and storage, border and inland logistics nodes, specialised transport, and enabling SPS and digital systems.

Operationalising this vision requires coordinated action across three pillars: policy and regulation, finance, and multi-stakeholder delivery. First, the NCTTCA should operationalise agrologistics within its existing coordination mandate through a dedicated workstream linked to corridor planning, performance monitoring and regional trade-facilitation processes. This should be accompanied by perishable-aware border procedures, greater consistency and mutual recognition in SPS implementation, and better coordination of energy, transport and agricultural planning around priority agrologistics needs.

Second, financing should move beyond isolated technologies and assets towards integrated investment packages. Development finance institutions, national development banks and other financing actors can help crowd in private capital by combining appropriate long-term finance and risk-sharing instruments with technical assistance, project preparation and investment-pipeline development.

Finally, stronger delivery will depend less on creating new platforms than on assigning clear functions and connecting existing institutions, national authorities, development partners and private actors around agreed priorities. Structured participation by logistics operators, farmers, cooperatives, processors, traders, SMEs and women engaged in informal cross-border trade will be essential to ensure that corridor reforms reflect operational realities and produce inclusive outcomes.

The central challenge is therefore to move from isolated initiatives and pockets of cold-chain capacity towards a more connected, commercially viable and inclusive agrologistics system. Achieving this will require sustained regional cooperation, clearer institutional responsibilities and investment decisions grounded in market and value-chain realities.

Section 6

ANNEX

“Agrologistics and cold chain development along the Northern Corridor”

Table 1: selected initiatives relevant to agrologistics and cold chain development along the Northern Corridor

Initiative	Description	Geography
UNCDF & UNDP Climate resilient solar cold room programme	Private-sector-oriented programme supporting investment in solar-powered cold rooms and related technical assistance.	Kenya
ARCH Cold Chain Solutions East Africa Fund / EIB-supported investments	Investment platform financing energy-efficient cold-storage and logistics infrastructure, including selected investments in Kenya and Uganda.	East-Africa
World Bank cold-chain diagnostics and programmes	Diagnostic and investment work linked to programmes, including the National Agricultural Value Chain Development Project and the Food Systems Resilience Programme, which may support cold-chain and post-harvest infrastructure.	Kenya
Ministry of Agriculture and Livestock Development: County Aggregation and Industrial Parks	Government initiative developing aggregation and industrial facilities intended to strengthen storage, value addition and market access at county level.	Kenya
EU–Netherlands Global Gateway project on GRI	Initiative supporting trade facilitation and infrastructure for agrologistics and cold-chain development along the Northern Corridor.	Kenya and East Africa
EU Delegation Nairobi initiatives	Relevant initiatives include the EU–Netherlands–TradeMark Africa consolidation-centre initiative along the Nairobi–Kampala–Kigali route, bilateral first-mile programmes, Agriculture Financing Initiative – AgriFI, the Investment Climate Facility and the Business Environment and Export Enhancement Programme.	Kenya
Kühne Foundation first-mile programme	Programme supporting first-mile aggregation and supply-chain resilience in Kenya's avocado value chain.	Kenya
Entebbe Airport cold-chain infrastructure	Government investment in airport-linked cold-chain infrastructure serving temperature-sensitive and export-oriented products.	Uganda
Dutch Ministry of Foreign Affairs (SITA project) & AGRI3 (Rabobank/FMO – the Dutch Entrepreneurial Development Bank) projects	Work supporting the transition of suitable East African horticultural exports from air-to-sea freight through improved cold-chain, consolidation and financing arrangements.	East Africa (with focus on Northern Corridor)

Source: adapted from Kuehne Climate Center and Wageningen University & Research with authors' elaboration.

Section 7

FOOTNOTES

“Agrologistics and cold chain development along the Northern Corridor”

[1] "Expand the use of renewable energy in agriculture including solar-powered irrigation systems and the use of biogas and other renewable energy sources for post-harvest processing, storage, and cooking, reducing greenhouse gas emissions and deforestation."

[2] In value chains such as potatoes, demand for cold rooms is extremely low most of the year, as farmers are paid almost the same price regardless of quality (WUR, unpublished).

[3] Refrigerated trucks and containers are also referred to as "reefer" units in logistics terminology. This shorthand is used later in the text when referring to fleets, equipment, and port-linked infrastructure.

[4] In some business-to-business contexts, compliance with recognised standards such as ISO 31512:2024 on cold chain logistics services may be requested.

[5] Examples of investment pipelines and business models are available in existing analytical work (e.g. recent Bid-book assessing 24 companies in East Africa, by Wageningen University & Research) and can be used to inform future corridor-level investment preparation.

Acknowledgements

The authors would like to thank Bas Hetterscheid, Irene Koomen and Joost Snels of Wageningen University & Research; Janet Naggujja, Sophie t'Serstevens and Olivia Lamenya of the Kühne Foundation; and Mathews Wanjala of TradeMark Africa for their technical input and constructive feedback. We are also grateful to Bruce Byiers and Karim Karaki of ECDPM for their review and guidance, and to the public and private sector stakeholders interviewed in Kenya and Uganda for sharing their experience and insights. The views expressed in this briefing note are those of the authors and do not necessarily represent those of ECDPM or any other institution. Any errors or omissions remain the responsibility of the authors.

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