Building and Sustaining Resilient Trade Infrastructure in SIDS and LLDC's

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Presented by Ronald Jackson

Overview of Key Focus Areas

- Present key resilience challenges for SIDS and LLDCs
- Highlight priority actions for financing climate-resilient trade infrastructure
- Explain the role of risk-informed planning, standards, and early warning systems
- Provide actionable recommendations to Member States

Key Questions

Q1: What priority actions can accelerate investment and financing for resilient physical and digital trade infrastructure?

Q2: How can risk-informed planning, resilient standards, and data systems reduce vulnerability and be integrated into national development strategies?

Key insights

Financing

Adequate financing is essential for resilience. **Innovative funding mechanisms** must be developed to ensure SIDS and LLDCs obtain resources needed to strengthen their trade infrastructure.

Planning

Risk-informed planning integrates climate risks into decision-making. Strong analytical frameworks are required to assess vulnerabilities and prioritize investments that enhance resilience against climate-related disruptions.

EWS

Early Warning Systems (EWS) are crucial for disaster preparedness. **Robust data platforms** and regional cooperation will significantly improve how SIDS and LLDCs respond to emerging climate threats.

Integration

Developing strategies that embed climate resilience into national policies ensures sustainability. By integrating trade and climate action, SIDS and LLDCs can create holistic frameworks for future growth.

Context & Rationale

Understanding the challenges faced today

- **Heightened Vulnerability of SIDS and LLDCs**
  - Extreme Vulnerability to Climate & Disaster Risks – SIDS and LLDCs face severe exposure to cyclones, floods, sea-level rise, and supply chain disruptions, which directly threaten their limited trade routes, economic stability, and social well-being.
  - Limited Economic Capacity & High Dependence on Trade/Tourism – Lower income levels, narrow fiscal space, and heavy reliance on external markets and tourism greatly heighten their vulnerability, putting long-term development and resilience at significant risk.

- **Importance of Resilient Physical & Digital Infrastructure**
  - Strengthening both physical trade infrastructure (ports, corridors, logistics systems) and digital infrastructure (connectivity, data systems, digital public infrastructure) is essential to ensure continuity of trade, safeguard development gains, and maintain regional and global connectivity.

- **Alignment with International Frameworks**
  - Building resilient trade systems directly supports global commitments under the Sendai Framework for Disaster Risk Reduction, the Paris Agreement on Climate Change, and the Sustainable Development Goals (SDGs), particularly those focused on resilient infrastructure, climate action, and sustainable economic growth.

Context & Rationale

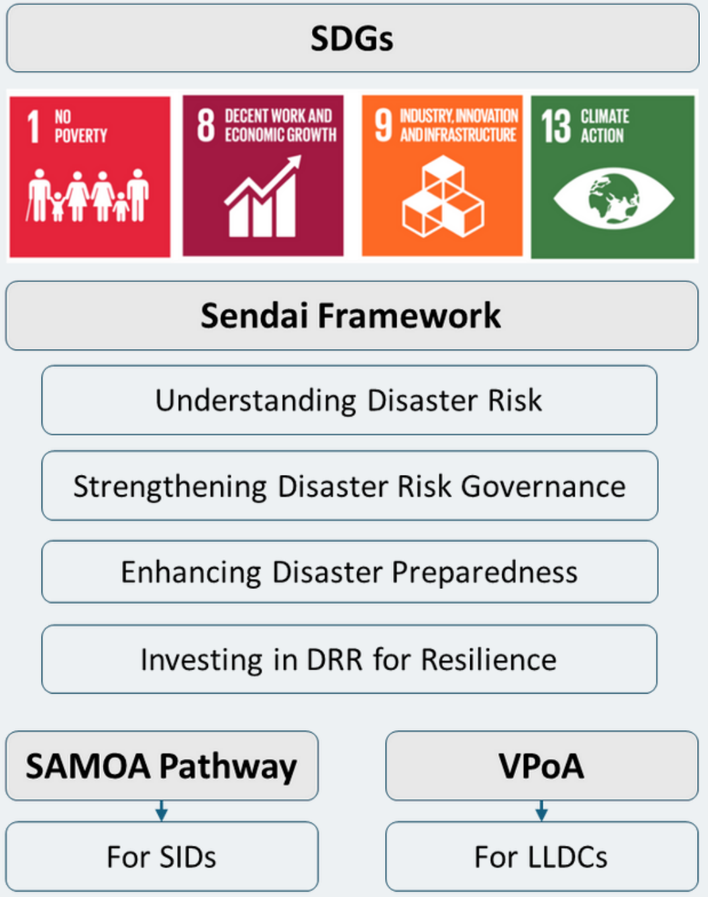
Understanding the challenges for SIDS & LLDCs

SIDS – Small Island Developing States

- Extreme Climate Exposure: Highly vulnerable to cyclones, storm surges, floods, and sea-level rise, disrupting ports, coastal roads, and supply chains.
- "Build–Neglect–Rebuild" Cycle: Pacific SIDS need 3.1% of GDP annually for maintenance, but funding gaps cause premature asset failure.
- Severe Transport Damage: In Fiji's Tropical Cyclone Winston, 61% of total damages were in the transport sector—highlighting fragile infrastructure and inadequate engineering standards.
- High Dependence on Tourism & Trade: Narrow economic base and limited fiscal space heighten vulnerability to climate shocks.
- Limited Climate Finance Access: Receive only 0.2% of global climate finance, far below adaptation needs.

LLDCs – Landlocked Developing Countries

- High Trade & Transport Vulnerability: Remoteness and complex transit arrangements make LLDCs extremely sensitive to border closures and climate-related disruptions.
- Very High Transport Costs: 30–60% higher than global averages due to long corridors, multi-country transit, and outdated infrastructure.
- Massive Infrastructure Funding Gap: Face a $500 billion infrastructure financing gap, limiting ability to climate-proof corridors and logistics systems.
- Limited Diversification: Economies depend heavily on a few trade routes; disruptions quickly escalate into national crises.



Key Challenges

Climate Exposure

SIDS and LLDCs are **highly vulnerable** to climate impacts, including extreme weather events such as storms and floods, which disrupt local economies and trade activities significantly.

Debt Constraints

Many SIDS and LLDCs face significant **debt burdens** that limit their capacity to invest in resilient infrastructure and financing necessary for adapting to climate-related challenges effectively.

Weak Data Systems

The lack of robust data systems hinders effective **risk assessment**, making it difficult for policymakers to implement informed strategies that address vulnerabilities in trade and infrastructure.

Infrastructure Gaps

Inadequate and aging infrastructure exposes SIDS and LLDCs to further risks, compromising trade efficiency and **resilience** against climate change impacts that can disrupt essential services.

Limited Access to Innovative Financing

Access to global financial instruments, insurance, or climate funds is often restricted. This prevents SIDS and LLDCs from scaling up resilience initiatives or investing in long-term infrastructure improvements.

Technological Gaps

Lack of digital infrastructure and technology adoption restricts monitoring, early warning systems, and smart logistics solutions that could enhance trade resilience.

Trade Dependency & Economic Fragility

Many SIDS and LLDCs rely heavily on a few export commodities or trade partners, making their economies more sensitive to shocks and global market fluctuations.

Institutional & Governance Weaknesses

Limited technical expertise, coordination challenges, and fragmented governance structures slow down the planning and implementation of resilience strategies.

Priority Actions

Climate Finance

Accessing climate finance is crucial for SIDS & LLDCs. It enables these regions to implement necessary infrastructure projects and mitigate the impact of climate change on their economies.

Physical Investment

Investing in both **physical and digital infrastructure** is essential for enhancing resilience. This dual approach helps ensure that critical systems are robust and can withstand climate-related disruptions.

Bankable Projects

Developing **bankable project pipelines** ensures that investment opportunities attract funding. This involves creating clear project proposals that demonstrate financial viability and sustainability for potential investors.

Resilience Finance

Resilience-sensitive public finance incorporates climate risks into budgeting and planning processes. This strategy allows governments to prioritize funding that supports sustainable development and infrastructure resilience.

Blended Finance

Blended finance combines public and private funding to maximize investment in resilient infrastructure. This approach helps leverage additional capital while reducing risks for private sector investors.

Risk-Informed Planning

Climate Risk Screening

Implementing **climate risk screening** enables decision-makers to assess vulnerabilities and prioritize risk mitigation strategies for infrastructure projects in SIDS and LLDCs effectively.

Geographic Risk Avoidance

Geographic risk avoidance strategies help identify regions prone to climate hazards, allowing for smarter planning and resource allocation to minimize exposure and enhance resilience.

Resilient Infrastructure Codes

Establishing **resilient infrastructure codes** ensures that all new constructions are designed to withstand climate impacts, reducing the likelihood of future damage and promoting public safety.

NDC & NAP Alignment

Aligning projects with **Nationally Determined Contributions (NDCs)** and National Adaptation Plans (NAPs) fosters consistency in climate action efforts, ensuring that infrastructure development supports national climate goals.

Cross-Sectoral Integration

Integrating climate risk considerations across sectors—such as energy, transport, water, and trade logistics—ensures holistic planning. This prevents isolated interventions and enhances systemic resilience

Data-Driven Decision Making

Leveraging robust data, GIS mapping, and predictive analytics enables informed planning and prioritization. Data-driven approaches improve accuracy in risk assessments, investment decisions, and monitoring of infrastructure performance over time.

Strengthening Early Warning Systems

MHEWS

Multi-Hazard Early Warning Systems (MHEWS) enhance preparedness by providing timely alerts, enabling communities to respond effectively and minimize disaster impacts on trade and infrastructure.

Data Platforms

Robust data platforms facilitate the collection, storage, and dissemination of critical information, empowering stakeholders to make informed decisions and improve resilience against climate-related disruptions.

Regional & Cross-Border Data Sharing

Encouraging regional collaboration ensures that early warning information is shared across borders, enhancing preparedness for hazards that affect multiple countries. This fosters joint response strategies, resource pooling, and coordinated evacuation or mitigation measures.

Real-Time Analytics & Forecasting

Advanced analytics and predictive modeling process incoming data in real-time to provide actionable insights. Real-time forecasting helps anticipate disruptions to trade corridors, ports, and supply chains, allowing authorities to take preemptive measures.

Community-Based Warning Systems

Integrating local knowledge and community networks into EWS strengthens responsiveness at the grassroots level. Community-based systems ensure that early warnings reach vulnerable populations quickly and in understandable formats.

Training & Capacity Building

Building technical and operational capacity among local authorities, emergency services, and trade stakeholders ensures that early warning information is effectively interpreted and acted upon.

Digital Transformation

Digital Infrastructure

Developing robust digital public infrastructure is essential for enhancing trade resilience, enabling effective communication, and ensuring efficient delivery of services. Investments in broadband, cloud systems, and interoperable platforms improve operational continuity in vulnerable regions, particularly in SIDS and LLDCs.

Cybersecurity

Strengthening cybersecurity measures protects sensitive trade and economic data and maintains the integrity of digital systems. This is critical to foster confidence among governments, private sector actors, and international partners, especially as digital trade and e-governance expand.

Knowledge Economy & Services Sector

Investing in the knowledge economy and digital services—such as fintech, e-commerce, remote education, and professional services—diversifies economic activity. These sectors are less exposed to physical disruptions, can generate high-value employment, and strengthen overall economic resilience.

Risk Mapping & Data Analytics

Developing digital risk mapping and analytics tools enables visualization of potential climate or operational threats. Policymakers and stakeholders can use these insights to prioritize resources, improve disaster preparedness, and optimize infrastructure planning.

E-Logistics & Supply Chain Digitization

Implementing e-logistics solutions streamlines supply chains, improves real-time tracking of goods, and enhances overall efficiency. This reduces vulnerabilities associated with disruptions to physical infrastructure and allows for faster, more resilient trade operations.

Digital Governance & e-Government

Implementing digital governance platforms improves transparency, facilitates regulatory compliance, and enhances coordination between government agencies and private sector actors. Digital tools can streamline permits, trade documentation, and customs processes.

Integration into National Development Strategies

Align with National Climate & Development Frameworks

Ensure resilience actions are fully integrated into NDCs, NAPs, national development plans, and sectoral strategies to create a unified national direction.

Strengthen Institutional Integration

Adopt risk-informed budgeting, climate-sensitive public investment systems, and cross-government policy coherence to embed resilience in planning and finance cycles.

Build Long-Term Capacity

Invest in sustained capacity building for government officials, local institutions, and communities to apply risk analytics, manage resilient infrastructure, and support informed decision-making.

Establish Monitoring, Evaluation & Reporting Systems

Develop indicators and performance metrics to track resilience outcomes. Integrate monitoring and evaluation into national strategies to assess progress, identify gaps, and inform adaptive planning.

Secure Sustainable Financing

Align national strategies with innovative financing mechanisms, climate funds, and public-private partnerships to ensure adequate and sustainable funding for resilience initiatives.

Community Participation & Localized Planning

Incorporate local knowledge and community priorities into national strategies to enhance relevance, ownership, and effectiveness of resilience-building measures.

Case Studies & Good Practices

Project / Context	Key Innovation & Best Practices	Impact & Results
Port of Bridgetown (Barbados)	Climate-Resilient Engineering: Use of "plus sign" boulders for breakwater reinforcement; physical separation of cruise/cargo flows for redundancy.	Secured supply chain against storm surges; improved port operational efficiency.
Pacific Climate Resilient Transport (PCRTP)	Lifecycle Management: Introduced geocell technology; established asset management systems to break the "Build-Neglect-Rebuild" cycle.	Provided all-weather roads for 380k+ people; established regional climate-resilient construction standards.
Khorgos Gateway (Kazakhstan)	Dry Port Revolution: Giant gantry cranes enable rapid gauge change (1435/1520mm); 24/7 smart customs clearance.	Reduced train processing time to 55 mins; established "Middle Corridor" advantage (faster than sea, cheaper than air).
Ethiopia-Djibouti Railway	Green Electrified Corridor: Replaced diesel trucks with hydro-powered electric rail; regional integration planning.	Cut transit time from 3 days to 12 hours; significantly reduced carbon emissions and logistics costs.
ASYCUDA World System	Digital Trade Facilitation: Implemented automated customs data systems for single-window and paperless clearance.	Significantly increased customs revenue and reduced border dwell times (high ROI of soft infrastructure).
Mangroves as Green Infrastructure – Colombia	Community-led mangrove stewardship using nature-based solutions for coastal protection, biodiversity restoration, and blue-carbon conservation; integration of traditional knowledge with scientific monitoring.	Strengthened coastal resilience against storms and erosion, expanded carbon-rich mangrove cover, improved local livelihoods through sustainable value chains, and demonstrated a scalable climate- and nature-positive adaptation model.

Key Recommendations

Scale & Mobilize Resilient Infrastructure Finance

Member States should increase investments in climate-resilient trade infrastructure by leveraging climate finance, blended finance, PPPs, and private sector participation. Innovative financing mechanisms can help overcome debt constraints and ensure long-term sustainability.

Strengthen Digital Transformation of Trade Systems

Accelerate adoption of digital customs, e-logistics, interoperable data systems, and cybersecurity-ready digital public infrastructure to enhance trade continuity, efficiency, and transparency, especially during climate disruptions.

Institutionalize Resilience Standards & Risk-Informed Planning

Develop and enforce robust resilience standards, climate-smart building codes, and benchmarking systems. Embed risk analytics, climate screening, and resilience criteria into national planning, public investment systems, and infrastructure appraisal processes.

Expand & Modernize Early Warning and Risk Information Systems

Invest in advanced Multi-Hazard Early Warning Systems (MHEWS), real-time analytics, regional data sharing, and community-centred communication channels to ensure timely alerts and minimize trade disruptions caused by climate shocks.

Leverage Regional Cooperation & IGOs for Collective Resilience

Empowered Regional IGOs can coordinate cross-border solutions, harmonize standards, diversify trade routes, and enable knowledge exchange—helping SIDS & LLDCs jointly address systemic vulnerabilities and pool limited resources.

Integrate Nature-Based Solutions into Trade Infrastructure

Promote mangrove restoration, coral protection, watershed management, and other nature-based solutions to protect ports, coastal supply chains, and transport corridors—while delivering co-benefits for carbon sequestration, biodiversity, and community livelihoods.

Call to Action

This is our collective responsibility.

Now is the moment to act. Climate impacts are accelerating, but so are opportunities for innovation, climate finance, and transformative partnerships. Delayed action will increase costs and deepen vulnerabilities.

Essential Partnerships

To effectively build resilience, strong and coordinated partnerships are needed. Governments must lead with clear policies and investment frameworks; communities must be empowered as frontline actors; and the private sector must play a central role in innovation, financing, and technology adoption. Collaboration across these groups will ensure sustainable development pathways, enhanced adaptive capacity, and resilient trade systems for generations to come.

Contact Information

Get in Touch with Us

Phone

Email

Website