

Pipeline Transportation & Security in Nigeria

A Global Comparison

Chartered Institute of Logistics & Transport (CILT) | Niger-Delta Pipeline Operations

TRANSPORT

SECURITY

INFRASTRUCTURE

MAINTENANCE

INNOVATION

Presentation Agenda

01

Nigeria's Pipeline Landscape

Overview, extent & strategic importance

02

Global Pipeline Systems Compared

USA, Russia, Canada, Saudi Arabia, Nigeria

03

Security Threats & Challenges

Vandalism, oil theft, sabotage in the Niger-Delta

04

International Security Models

Best practices from around the world

05

Role of Logistics & Transport (CILT)

Standards, frameworks & professional practice

06

Recommendations & Way Forward

Actionable strategies for Nigeria

01 | Nigeria's Pipeline Landscape

~5,120

Km of Pipelines

NNPC network

2.0M+

Barrels/day

Crude capacity

9

Major Terminals

Across Niger-Delta

70%

Revenue from Oil

Federal earnings

Infrastructure Overview

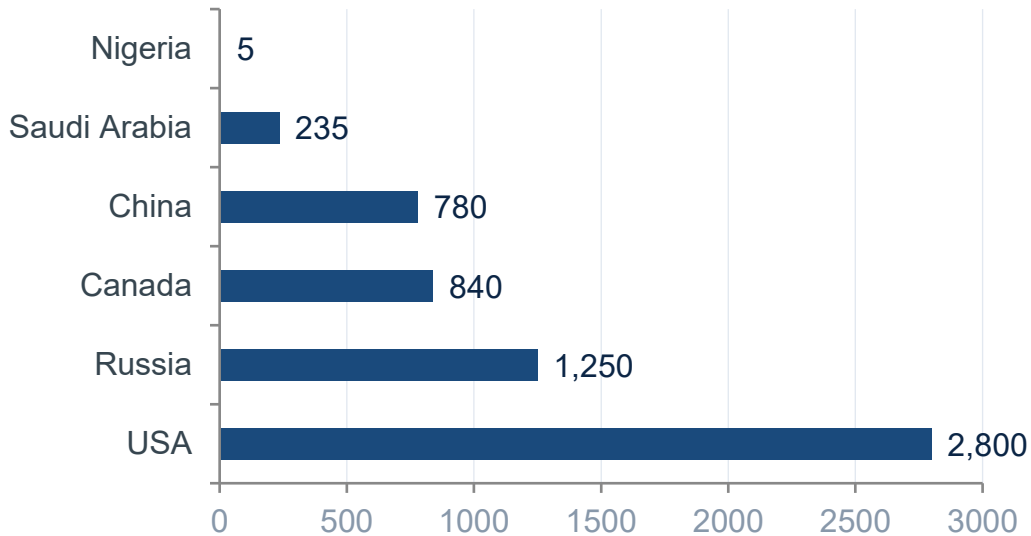
- Nigeria holds Africa's largest proven oil reserves (37 billion barrels)
- The Trans Niger Pipeline (TNP) and Bonny Export Terminal are critical national arteries
- NNPC operates ~5,120 km of pipelines for crude oil, refined products & gas
- The Niger-Delta region is the epicenter — home to Bayelsa, Rivers & Delta States

Strategic Significance

- Key pipelines: Escravos-Lagos, Warri-Kaduna, Port Harcourt-Aba systems
- Gas pipelines support NLNG and domestic power generation
- Offshore pipelines connect deepwater fields to onshore terminals

02 | Global Pipeline Systems Compared

Pipeline Network Length (000 km)



Country	Focus	Key Strength	Lesson for NG
us USA	Refined products	SCADA & real-time monitoring	Tech investment
RU Russia	Gas export (Gazprom)	State-managed security	Centralised control
CA Canada	Oil sands crude	Environmental compliance	Regulatory rigor
SA Saudi Arabia	Crude export	Integrated Aramco model	Vertically integrated ops
NG Nigeria	Crude & gas	Vast reserves	Security & maintenance gap

💡 Key Insight: Nigeria's pipeline network is comparatively small yet carries enormous national economic weight. Bridging the technology and security gap is critical to matching global standards — a core agenda for CILT members in logistics and transport.

03 | Security Threats & Challenges in Nigeria

Pipeline Vandalism

Over 5,000 reported incidents annually. Illegal bunkering and crude oil theft cost Nigeria \$3–\$15 billion/year in lost revenue.

5,000+
Incidents/yr

Illegal Bunkering

Organised criminal networks tap pipelines to siphon crude, with boats transporting stolen oil to illicit refineries.

\$15B
Lost/year

Sabotage & Militancy

Armed groups have used explosive devices on pipelines, particularly Forcados, Bonny, and Trans Forcados pipeline systems.

40%
Downtime risk

Infrastructure Decay

Aging pipelines (some over 50 years old) with inadequate maintenance budgets lead to corrosion, leaks and ruptures.

50+
Years old (avg)

Community Conflict

Host community grievances over environmental degradation and lack of development fuel pipeline attacks in the Niger-Delta.

Niger-Delta
Epicenter

Data & Monitoring Gaps

Limited deployment of SCADA systems and real-time leak detection compared to international counterparts.

<30%
Monitored

04 | International Security Models — Best Practices

US United States

TSA Pipeline Security Division

- Mandatory SCADA cybersecurity standards
- Real-time leak detection (Smart Pig technology)
- No-fly zones over critical pipelines
- Emergency response drills (annual)

SA Saudi Arabia

Saudi Aramco Security Model

- Integrated military-corporate security
- AI-based surveillance across 17,000 km
- Community benefit programs near pipelines
- Redundant pipeline routes for continuity

CA Canada

CER (Canada Energy Regulator)

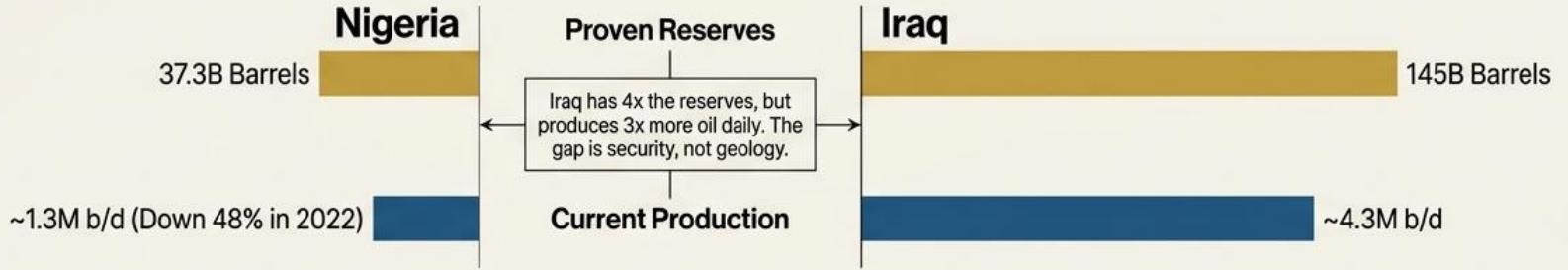
- Legislated Indigenous community engagement
- Mandatory environmental monitoring
- Drone surveillance & aerial inspection
- Publicly disclosed incident reporting

RU Russia

Transneft Security Framework

- State-funded military pipeline guard units
- Centralized control rooms (24/7 ops)
- Strict access control zones
- Rapid-response pipeline repair brigades

The Production Paradox



The Diagnostic Matrix

Nigeria		Iraq
~80–90% govt revenue		~90%+ govt revenue
Community militancy & bunkering		Post-war terrorism & ISIS
Environmental/Marginalization		War/Infrastructure neglect
Shell divesting onshore assets		BP/Majors returning

The Haemorrhage

The Cost of Insecurity

Nigeria lost **\$29 Billion** to oil theft over 10 years—nearly equaling its \$31 Billion total national budget expenditures for the same period. Between **5%** and **20%** of production is stolen daily.

Security Architecture Stack

Dedicated Protection Force

Iraq Status
14,000 specialized Energy Police guards.

Nigeria Gap
Piecemeal military/police and improvised community arrangements.

Real-Time Drone Surveillance

Iraq Status
50+ drones feeding real-time data to a Baghdad command center.

Nigeria Gap
Reliance on a largely unsuccessful 30-year-old manual foot-patrol model.

Digital Pipeline Management (SCADA)

Network-wide leak detection, pressure monitoring, remote isolation.

Relies on delayed manual incident reporting.

Infrastructure Diversification

\$1.26B invested in Sealine 3; building redundant routes to Syria and Jordan.

Struggling to maintain existing legacy pipelines.

Capital Reinvestment

Upgrading Basra terminal (handles 70% of exports); securing major BP deals.

Foreign operators actively divesting onshore assets.

Nascent Steps

The Petroleum Industry Act (PIA) and Host Community Development Trusts are shifting the dynamic from confrontation to collaboration, proving community integration works.

05 | The Role of CILT & Logistics Professionals

Pipeline transport is a logistics challenge as much as an engineering one.

Supply Chain Integration

CILT members ensure pipeline output connects seamlessly with storage, refining, and distribution — reducing dwell time and transit losses.

Capacity Building

CILT certifications (CMILT, FCILT) build the professional competence of pipeline operations personnel in logistics standards and ethics.

Risk & Security Standards

CILT frameworks support risk assessment, business continuity planning, and security protocol development for pipeline corridors.

Policy Advocacy

CILT engages regulators (DPR, NUPRC, Ministry of Petroleum) to align pipeline policy with international transport standards.

Innovation & Technology

Promoting adoption of IoT sensors, SCADA, GIS mapping and smart leak detection across the Nigerian pipeline system.

Environmental Responsibility

CILT champions sustainable logistics, ensuring pipeline operations minimize ecological damage — critical in the Niger-Delta.

Field Reality | Pipeline Operations in the Niger-Delta

CONSTRUCTION	⚠ CHALLENGE Difficult swamp terrain, community resistance, right-of-way disputes	✓ SOLUTION Trenchless technology, community engagement MOUs, modular prefab pipe
SECURITY	⚠ CHALLENGE Vandalism, militant attacks, illegal connections, surveillance gaps	✓ SOLUTION Armed patrol, CCTV, drone surveillance, leak detection sensors
MAINTENANCE	⚠ CHALLENGE Aging infrastructure, corrosion, limited skilled workforce, budget cuts	✓ SOLUTION Pigging operations, cathodic protection, CILT-certified technicians
LOGISTICS	⚠ CHALLENGE Coordination of crude evacuation, product scheduling, port interface	✓ SOLUTION SCADA integration, digital twinning, supply chain coordination teams

06 | Recommendations & Way Forward

1

Deploy Smart Monitoring Technology

SHORT-TERM

Mandate SCADA systems and IoT-based leak detectors across all NNPC pipeline segments, modelled on US TSA standards.

5

Establish Rapid Response Units

SHORT-TERM

Create dedicated pipeline emergency response teams (modelled on Russia's Transneft brigades) in each geo-political zone.

3

Community Ownership Model

MEDIUM-TERM

Adopt Canada's Indigenous engagement approach — establish formal host community investment agreements to reduce sabotage incentives.

4

Professionalise Pipeline Workforce

ONGOING

Partner with CILT Nigeria to certify pipeline logistics personnel — from construction engineers to security coordinators.

2

Legislate Pipeline Security Framework

MEDIUM-TERM

Enact a dedicated Pipeline Security Act assigning roles to the military, NSCDC, and private security firms with clear accountability.

6

Digitise Asset Management

LONG-TERM

Adopt GIS-based pipeline asset management and digital twin modelling to predict failures before they occur.

Thank You

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Nigeria's pipeline future depends on bridging the security, technology, and governance gap.
CILT professionals are uniquely positioned to drive this transformation.
Together, with global best practices and local commitment, we can build a pipeline network that truly serves Nigeria.

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Questions & Open Discussion Welcome