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2nd International Conference on Finance and Sustainable Business (ICFSB 2026)
Windhoek, Namibia
10 September 2026

Track 3
Category: Green Technologies

PEOPLE
PLANET
PROSPERITY
AFRICA

DIGITAL SOLUTIONS
REAL IMPACT

# An Integrated Digital Public Infrastructure Framework for Green Finance:

## Advancing Sustainable MSME Development in Africa

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**International Conference on Finance and Sustainable Business (ICFSB 2026)**
Track 3 | Category: Green Technologies

Windhoek, Namibia | 10 September 2026

Manuscript P024



INCLUSIVE ECONOMIES

CLIMATE RESILIENCE

SUSTAINABLE DEVELOPMENT



Digital Public Infrastructure | Green Finance | Financial Inclusion | MSMEs | Regional Integration

1. THE PROBLEM

# Africa's Green Finance Challenge
## Is Also an Information Challenge

INCLUSIVE FINANCE A GREENER AFRICA

### African MSMEs



**90%+**
of businesses

Majority of jobs across Africa

### Need financing for

- Renewable energy
- Climate-smart agriculture
- Sustainable production

**BUT**

### Key barriers to financing

- Limited collateral
- Weak formal credit histories
- Fragmented payment ecosystems
- Information asymmetry



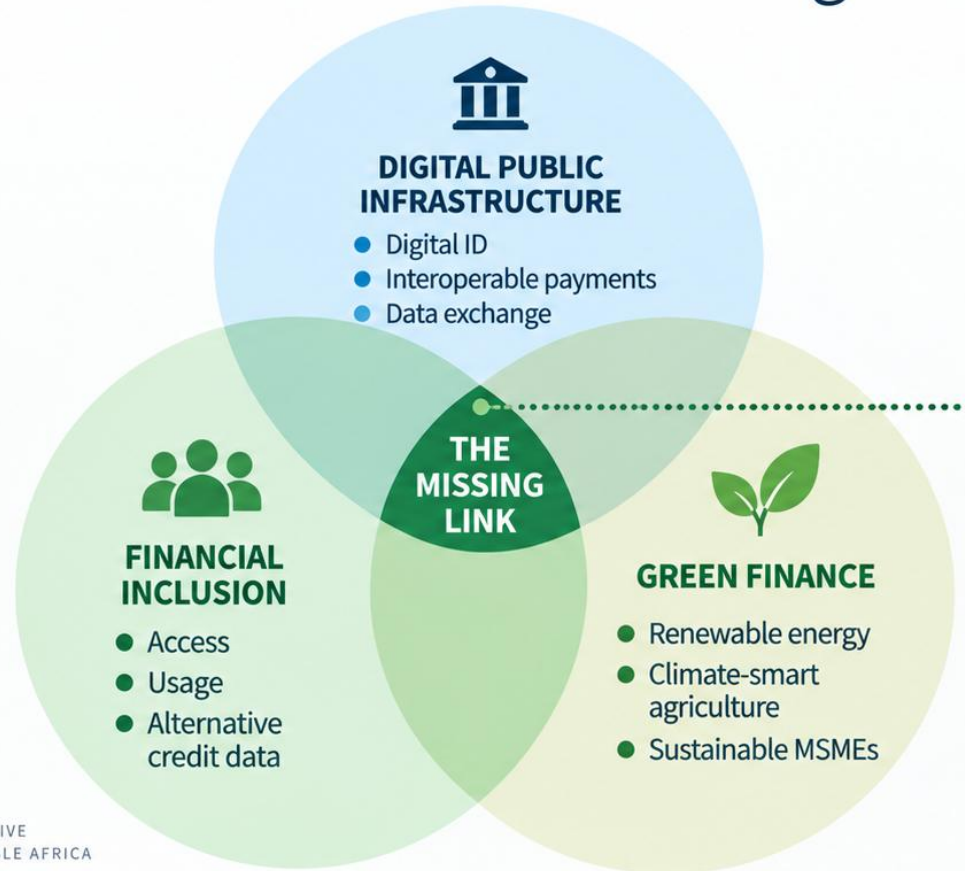
**Green Finance Gap**

Many viable MSMEs remain excluded from green finance, despite their potential to drive sustainable development.

**What if everyday digital transactions could help make these businesses financially visible?**

# **Three Literatures.** One Missing Connection.

DIGITAL
SOLUTIONS
SUSTAINABLE
AFRICA




**How can DPI generate the information and institutional conditions needed to enable green finance?**

A MORE INCLUSIVE
AND SUSTAINABLE AFRICA

PEOPLE
FINANCE
PLANET
PROSPERITY

# **Three Questions** Guide the Study

DIGITAL
INCLUSION
GREEN GROWTH
AFRICA

## RQ1

How does **Digital Public Infrastructure** contribute to alleviating green-finance access constraints for African MSMEs?

## RQ2

How can **interoperable payments** and **alternative credit data** reduce barriers to sustainable investment finance?

## RQ3

What lessons can **African DPI ecosystems** provide for inclusive and climate-resilient development?

**National DPI** → **Regional DPI** → **Sustainable Finance**

# Why Should DPI Affect Access to Finance?

DIGITAL PEOPLE INCLUSIVE AFRICA

## 1 Information Asymmetry

Akerlof (1970)




Lenders lack reliable borrower information.

## 2 Financial Intermediation

Diamond (1984)




- Screening
- Monitoring
- Better allocation of capital

Better information can improve screening and monitoring.

## 3 TOE Framework

Tornatzky & Fleischer (1990)

Technology alone is insufficient.

**Technology** (e.g. DPI) + **Organizations** (e.g. FIs, MSMEs, public sector) + **Enabling Environment** (e.g. regulation, policy, governance)

**DPI potentially changes the information environment within which financial intermediation occurs.**

5. CONCEPTUAL FRAMEWORK

# The Integrated DPI–Green Finance Framework

## From Digital Infrastructure to Sustainable Development

PEOPLE
DIGITAL
SUSTAINABLE
AFRICA




DIGITAL SOLUTIONS
REAL IMPACT
A GREENER AFRICA

**DIGITAL PUBLIC INFRASTRUCTURE**
Digital ID • Instant Payments • Data Exchange
→ Enables secure, interoperable and trusted digital transactions

↓

**FINANCIAL INCLUSION**
Access • Usage • Interoperability • Trust
→ Brings more people and businesses into the formal digital economy

↓

**ALTERNATIVE CREDIT DATA**
Transaction Histories • Cash Flows • Digital Footprints
→ Generates rich and credible financial information

↓

**REDUCED INFORMATION ASYMMETRY**
Better Credit Assessment • Lower Risk • Credit Access
→ Helps financial institutions better understand and serve MSMEs

↓

**GREEN FINANCE**
Green Loans • Climate Finance • ESG Finance
→ Provides financing for green and climate-resilient investments

↓

**SUSTAINABLE DEVELOPMENT**
MSMEs • Climate Resilience • SDGs • Green Growth
→ More inclusive, resilient and prosperous Africa

### Proposed mechanism

DPI
↓
Data
↓
Information
↓
Finance
↓
Sustainable Investment

FINANCING
PEOPLE
POWERING
A GREENER TOMORROW

INCLUSION | INNOVATION | SUSTAINABILITY | OPPORTUNITY

# Testing the Framework Across Seven African Digital Ecosystems

A qualitative exploratory multiple-case study

DATA
PEOPLE
OPPORTUNITIES
A GREENER AFRICA




Seven African digital ecosystems

## Research Design

Qualitative exploratory multiple-case study

## Cases (7 ecosystems)

- Kenya
- Nigeria
- Ghana
- Rwanda
- South Africa
- Egypt
- GIMACPAY / CEMAC
  (Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon)

## Evidence Sources

- Peer-reviewed literature
- Institutional & policy reports
- Central banks & payment authorities
- International organisations (World Bank, AfDB, UNDP, etc.)

## Analysis

Thematic Analysis → Cross-Case Comparison → Pattern Matching

Evidence period
**2018 – 2025**

Literature search conducted
**March – June 2026**

# Different Ecosystems. A Converging Pattern.

Seven African experiences, one common pathway toward green finance.

DIGITAL
INNOVATION
INCLUSIVE
AFRICA

## Kenya



Digital payments
→ **PAYGo solar**

Expanding access to clean energy

## Nigeria




Instant payments + ID
→ **solar finance**

Unlocking finance for renewable energy

## Ghana



Payments + agricultural data
→ **climate-smart agriculture**

Supporting smallholder farmers

## Rwanda



Digital ID + government platforms
→ **climate-resilient agriculture**

Building inclusive rural ecosystems

## South Africa



Digital banking data
→ **ESG-oriented SME finance**

Combining digital data with sustainability criteria

## Egypt



Payments + e-KYC
→ **sustainable SME lending**

Expanding digital financial inclusion

## GIMACPAY / CEMAC



Regional interoperability
→ **emerging potential**

Laying the foundation for regional green MSME finance

**The technology differs. The enabling mechanism converges.**

# Four Building Blocks Connect DPI and Green Finance

From digital infrastructure to sustainable investment

INCLUSIVE
DIGITAL
SUSTAINABLE
AFRICA

## 01 DIGITAL IDENTITY

Trust & verification



- Verifies individuals and businesses
- Builds trust in the ecosystem
- Enables KYC and formal access

**TRUSTED USERS AND BUSINESSES**

## 02 INTEROPERABLE PAYMENTS

Participation & transactions




- Connects people, businesses and financial institutions
- Enables real-time, low-cost transactions
- Generates digital transaction histories

**MORE PARTICIPATION AND TRANSACTIONS**

## 03 ALTERNATIVE CREDIT DATA

Financial visibility



- Uses transaction histories, cash flows and digital footprints
- Provides a more complete view of MSMEs
- Supports better risk assessment

**BETTER INFORMATION FOR LENDING**

## 04 GREEN FINANCE MODELS

Sustainable investment



- Green loans and climate finance
- Supports climate-smart MSMEs and sustainable projects
- Mobilizes private and public capital for a greener economy

**SUSTAINABLE INVESTMENT AND GREEN GROWTH**

**Governance** determines whether these building blocks translate into outcomes.

Regulation | Standards & Interoperability | Institutional Capacity | Consumer Protection | Data Governance

# From National DPI to Regional DPI

Scaling digital infrastructure for greater inclusion and sustainable development

CONNECTED
PEOPLE
STRONGER
AFRICA

## NATIONAL DPI

**One jurisdiction**



- **Digital ID** — Identify and verify
- **Payments** — Enable transactions
- **Data** — Generate digital records
- **Financial services** — Deliver inclusive finance

**Domestic inclusion**
More people and businesses in the formal economy

FROM NATIONAL TO REGIONAL

Interoperability beyond borders for greater impact

## REGIONAL DPI — RDPI

**Multiple jurisdictions**




- **Interoperable payments** — Seamless cross-border transactions
- **Shared standards** — Common technical and regulatory frameworks
- **Regional governance** — Coordination among central banks, regulators and stakeholders
- **Cross-border data possibilities** — Enable regional data use and innovation

**Regional Financial Integration**
Larger markets and more opportunities

**Cross-Border MSME Finance**
Access to finance across the region

**Potential Regional Green Finance**
Support sustainable and climate-resilient growth

## Regional Digital Public Infrastructure (RDPI)

A multi-country-governed interoperable digital ecosystem.

*Shared infrastructure.*
*Greater opportunities.*
*A greener Africa.*

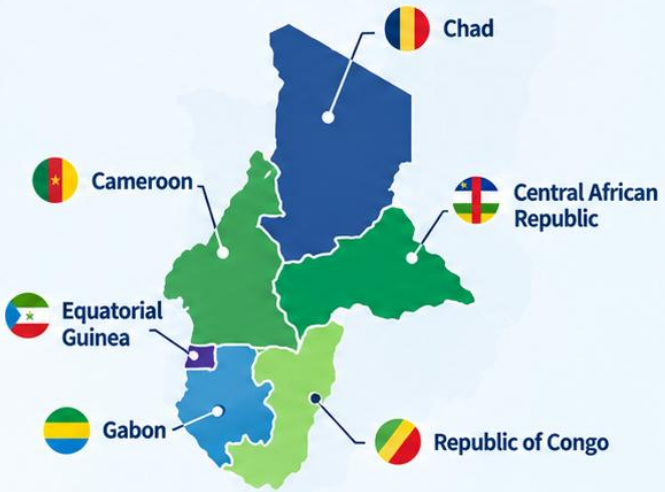
# GIMACPAY: An Emerging RDPI Case

A regional interoperable payment infrastructure for inclusive and sustainable growth

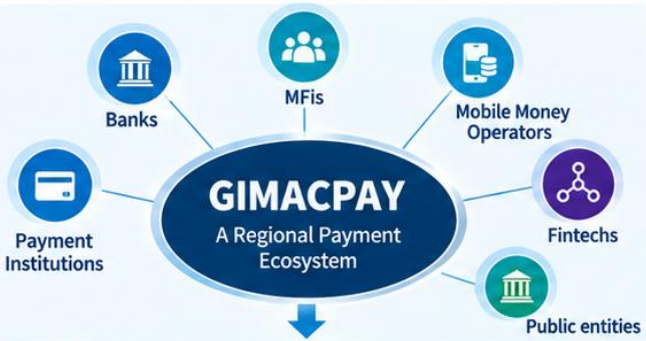
PEOPLE
PAYMENTS
OPPORTUNITIES
A GREENER
CENTRAL AFRICA

## Six Countries. A Shared Vision.

**CEMAC:** Toward a more integrated and inclusive digital economy




**CEMAC**
People | Integration | Shared Prosperity




**Regional interoperable payments**
Instant • Secure • Across six countries

**Cross-border transaction records**
Richer and more comprehensive data

**Potential alternative credit data**
Transaction histories • Cash flows • Digital footprints

**Future Sustainable MSME Finance**
Green loans • Climate finance • Inclusive growth

A diverse ecosystem of public and private actors across the CEMAC region

Enables seamless cross-border payments and regional connectivity

Generates valuable transaction data across six countries

Creates the foundation for alternative credit data and new financing models

Supports the potential for sustainable and climate-resilient MSMEs

**Important note**
The study does not claim that GIMACPAY currently delivers green-finance outcomes. Its role is examined as an emerging enabling infrastructure whose green-finance potential requires empirical testing.

# Four Contributions

New insights for a more inclusive and sustainable Africa

PEOPLE
PLANET
PROSPERITY
AFRICA

DIGITAL
SOLUTIONS
REAL IMPACT

## 01 CONCEPTUAL



Proposes an **Integrated DPI–Green Finance Framework**

Links DPI, financial inclusion, alternative credit data, green finance and sustainable development.

**A new conceptual lens for inclusive and climate-aligned development.**

## 02 THEORETICAL



Positions **alternative credit data and reduced information asymmetry** as the mechanism linking DPI with financing

Integrates Information Asymmetry (Akerlof, 1970), Financial Intermediation (Diamond, 1984) and the TOE Framework (Tornatzky & Fleischer, 1990).

**A stronger theoretical foundation for understanding how DPI enables finance.**

## 03 EMPIRICAL



Compares **six national African ecosystems + one regional ecosystem**

Kenya, Nigeria, Ghana, Rwanda, South Africa, Egypt and GIMACPAY/CEMAC.

**Provides cross-country evidence of how DPI supports access to green finance.**

## 04 REGIONAL



Introduces **Regional Digital Public Infrastructure (RDPI)** as an extension of national DPI

Shows how interoperability, shared standards and regional governance can unlock cross-border finance and green opportunities.

**A practical pathway for regional integration and sustainable development.**

**DPI should be understood not only as transaction infrastructure, but as enabling infrastructure for economic and sustainable development.**

# What Would It Take to Move from DPI to Green Finance?

Turning evidence into policy, practice and impact.

INCLUSIVE
RESILIENT
PROSPEROUS
AFRICA



## GOVERNMENTS & REGULATORS

Enable, regulate and create the right conditions

- **Interoperability**
  Enable open and interoperable systems
- **Digital identity**
  Universal, trusted and inclusive digital ID
- **Data governance**
  Responsible, secure and ethical data use
- **Consumer protection**
  Build trust and safeguard users
- **Cybersecurity**
  Strengthen resilience and risk management
- **Regional harmonization**
  Align regulations and standards across countries

**A TRUSTED AND ENABLING POLICY ENVIRONMENT**

## FINANCIAL INSTITUTIONS

Innovate, lend and scale inclusive green finance

- **Alternative credit assessment**
  Use transaction data and digital footprints
- **Digital cash-flow analysis**
  Leverage real-time payment data
- **Green MSME products**
  Develop tailored financial products for climate-friendly businesses
- **Responsible data use**
  Adopt fair, transparent and ethical lending practices

**MORE ACCESS TO FINANCE FOR SUSTAINABLE MSMEs**

## REGIONAL INSTITUTIONS

Coordinate, integrate and scale across borders

- **Cross-border standards**
  Develop common technical and regulatory standards
- **Regional interoperability**
  Connect payment systems and data across countries
- **AfCFTA integration**
  Align with the African Continental Free Trade Area agenda
- **Regional sustainable finance**
  Mobilize capital for green and climate-resilient development

**A MORE INTEGRATED, RESILIENT AND SUSTAINABLE AFRICA**

## Infrastructure + Data + Governance + Finance

Technology alone is insufficient.

13. CONCLUSION

# From Digital Transactions to Sustainable Investment

Turning digital participation into real opportunities for a greener and more inclusive Africa.

PEOPLE
PLANET
PROSPERITY
AFRICA

DIGITAL
SOLUTIONS
REAL IMPACT

**PAYMENTS**
create
Digital transactions and participation

**DATA**
which can improve
Transaction records, cash flows and digital footprints

**INFORMATION**
which can enable
Better credit assessment, lower risk and greater financial visibility

**FINANCE**
which can support
Green loans, climate finance and innovative financial products for MSMEs

**SUSTAINABLE INVESTMENT**
Climate-resilient MSMEs, green growth and sustainable development

**Africa's next DPI frontier may not simply be connecting people to digital services, but connecting digital participation to productive and sustainable economic opportunity.**

**National DPI**
Stronger digital foundations within countries

**Regional DPI**
Interoperability and integration across borders

**Inclusive Green Growth**
More opportunities, greener and more resilient Africa



INCLUSIVE FINANCE | DIGITAL INNOVATION | SUSTAINABLE DEVELOPMENT

A GREENER, MORE PROSPEROUS AFRICA

PEOPLE
PLANET
PROSPERITY
AFRICA

DIGITAL SOLUTIONS
REAL IMPACT

INCLUSIVE
RESILIENT
SUSTAINABLE
AFRICA

# Thank You

## Questions & Discussion

**Exode Clesol Jocla Nawamonadio**
GIMAC | Cameroon

**An Integrated Digital Public Infrastructure Framework for Green Finance**



DIGITAL INFRASTRUCTURE FOR A **GREENER** AND MORE **PROSPEROUS** AFRICA

Digital Public Infrastructure | Green Finance | MSMEs | RDPI

CONNECTING PEOPLE
ENABLING OPPORTUNITIES
BUILDING A GREENER AFRICA

TOGETHER FOR
SUSTAINABLE DEVELOPMENT

# ANNEXES

BACKUP 1

# Comparative Case Matrix: National and Regional Experiences

## Key features, mechanisms and contributions to green finance

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AFRICA

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REAL IMPACT

| Country / Ecosystem | Digital Identity | Interoperable Payments | Alternative Credit Data | Green Finance Model | Financial Inclusion | Governance | Key Contribution / What It Shows |
|---|---|---|---|---|---|---|---|
| **Kenya** | National digital ID (Huduma Namba) | M-Pesa and interoperable rails | Mobile money transaction histories | **PAYGo solar** (home solar systems) | Expanded access for rural and low-income households | Enabling regulation and sandbox approaches | Shows how digital payments can scale climate solutions (PAYGo). |
| **Nigeria** | National ID (NIN) | Instant payments (NIBSS, NIP) | Transaction + ID + utility data | **Solar finance** (integrated with digital lending) | Greater access for MSMEs and underserved segments | Progressive digital finance policies and open banking initiatives | Demonstrates how payments and digital ID can enable sustainable SME finance. |
| **Ghana** | National ID (Ghana Card) | Interoperable mobile money (MoMo) | Payments + agricultural data (e.g., farmer data) | **Climate-smart agricultura finance** (input loans, agri-fintech) | Improved access for smallholder farmers and rural MSMEs | Supportive policy for digital finance and agricultural innovation | Illustrates the use of payment and non-financial data (agri data) for green finance in agriculture. |
| **Rwanda** | National digital ID (Irembo ID) | Interoperable payments (RSwitch) | Government and payment platform data | **Climate-resilient agriculture** (e.g., climate insurance, resilient inputs) | Increased access for rural communities and women | Strong government platforms and data governance framework | Shows how digital ID and government platforms can enable climate-resilient agriculture finance. |
| **South Africa** | Digital ID and e-KYC (Home Affairs) | Real-time payments (PayShap) | Digital banking data (transaction and cash-flow data) | **ESG-oriented SME finance** (green loans, sustainability-linked products) | Broader access for formal and informal MSMEs | Mature regulatory environment and ESG frameworks | Highlights the use of digital banking data for green and sustainable SME finance. |
| **Egypt** | National ID (e-KYC) | Instant payments (meeza) | Payments + e-KYC data | **Sustainable SME lending** (green and climate-aligned loans) | Expanded access for MSMEs and youth | Regulatory support for digital payments and green finance | Demonstrates how payments and e-KYC can enable sustainable SME lending. |
| **GIMACPAY / CEMAC** (Regional) | National ID systems (across CEMAC countries) | Regional interoperable payments (GIMACPAY) | Cross-border transaction records (potential) | **Emerging potential** (e.g., green MSME finance, regional value chains) | Potential to expand financial inclusion across six countries | Regional governance (BEAC, COBAC) and harmonization efforts | Illustrates the potential of Regional DPI (RDPI) to enable cross-border green finance and regional integration. |

**Different ecosystems. A converging pattern:** Digital identity, interoperable payments and alternative credit data can enable **green finance**, when supported by inclusive governance and supportive policies.

Source: Author's compilation based on case studies (pp. 13–14).

# Figure 2. Research Methodology and Analytical Approach

From literature identification to cross-case findings



01

### IDENTIFICATION

Define scope and research questions

- Define research objectives and questions
- Identify key themes (DPI, green finance, MSMEs, Africa)
- Set inclusion and exclusion criteria

**Research protocol**



02

### DATABASE SEARCH

Search academic and grey literature

- Databases: Scopus, Web of Science, Google Scholar, JSTOR, Springer, ScienceDirect
- Grey literature: World Bank, AfDB, CGAP, UN, OECD, G20, central banks, policy reports
- Use defined keywords and search strings

**1,248 records identified**



03

### SCREENING

Remove duplicates and screen titles/ abstracts

- Remove duplicates
- Screen titles and abstracts
- Exclude irrelevant records

**842 records after screening**



04

### ELIGIBILITY

Assess full texts against criteria

- Review full-text articles and reports
- Apply inclusion/ exclusion criteria
- Assess relevance to DPI, financial inclusion, green finance and MSMEs in Africa

**312 full texts assessed**



05

### SELECTED DOCUMENTS

Final sample for analysis

- Select high-quality and most relevant studies
- Include diverse geographies and institutional sources
- Ensure balance of academic and practitioner literature

**187 documents included**



06

### THEMATIC CODING

Code and organize evidence

- Develop codebook based on research framework
- Conduct open and axial coding
- Identify key themes and sub-themes using thematic analysis

**Coded dataset**



07

### CROSS-CASE COMPARISON

Compare across countries and cases

- Analyse patterns within each country case
- Compare key dimensions across cases (e.g. policy, DPI components, finance models, outcomes)
- Identify similarities and differences

**Cross-case comparative matrix**



08

### PATTERN MATCHING

Identify and validate emerging patterns

- Match empirical findings with theoretical propositions (e.g. information asymmetry, DPI frameworks)
- Identify recurring patterns and explanations
- Validate patterns across multiple cases

**Validated patterns**



09

### FINDINGS

Synthesize insights and draw conclusions

- Answer research questions
- Derive key findings
- Identify policy implications
- Highlight contributions to knowledge

**Findings and conclusions**

A systematic and transparent approach to generate **robust evidence** for policy and practice.

Note: Numbers are illustrative and based on the final sample used in this study (pp. 9–10).

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AFRICA

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REAL IMPACT

# Current Limitations and Future Research Agenda

## Building a stronger evidence base for DPI and green finance in Africa

### Current Limitations

Key constraints of this study

**Secondary qualitative evidence**
Findings are based on existing literature, policy documents and publicly available sources.

**No causal inference**
The study does not establish causal relationships between DPI and green finance outcomes.

**Seven selected ecosystems**
Analysis is limited to six national case studies and one regional ecosystem, which may not capture all African contexts.

**No quantitative measurement of green-finance impact**
The study does not quantify the actual impact of DPI on green-finance volumes or environmental outcomes.

**GIMACPAY green-finance pathway remains prospective**
GIMACPAY is examined as an emerging enabling infrastructure whose green-finance potential requires empirical testing.

FROM INSIGHTS to STRONGER EVIDENCE

### Future Testing

Key areas for further research

**Mixed methods**
Combine qualitative and quantitative approaches, including surveys, interviews and case studies.

**Transaction-level analysis**
Use granular payment and financial transaction data to assess real impacts.

**Credit-risk outcomes**
Analyze how DPI-generated data can improve credit assessment and reduce information asymmetry.

**Green MSME financing volumes**
Measure actual financing volumes, product uptake and environmental outcomes for MSMEs.

**Cross-REC comparison**
Expand the analysis to other regional economic communities (e.g., ECOWAS, EAC, SADC) to test generalizability.

**AI / Open Finance / CBDCs / interoperable identity**
Explore the role of emerging technologies and policy innovations in strengthening DPI–green finance linkages.

Addressing these limitations through rigorous empirical research can provide **stronger evidence** on how DPI can unlock green finance and support **sustainable development** in Africa.

BACKUP 4 | CAUSAL MECHANISM

# DPI Enables Green Finance — It Does Not Automatically Cause It

## From digital infrastructure to sustainable investment: an enabling pathway

### 1 Digital Public Infrastructure
- Digital identity (e-KYC, verification)
- Interoperable payments (instant, inclusive)
- Trusted data exchange (standards, APIs)

Builds the foundation for secure, inclusive and interoperable digital ecosystems

### 2 Digital Participation
- More individuals and MSMEs in the digital economy
- Active and regular use of digital financial services)
- Broader merchant and business digitization

Expands access, usage and inclusion

### 3 Transaction & Identity Data
- Payment histories
- Cash-flow patterns
- Merchant activity
- Verified identity information
- Digital footprints (utilities, bills, etc.)

Generates granular, real-time and verifiable economic data

### 4 Alternative Credit Information
- MSME revenue and cash-flow trends
- Business stability and repayment behaviour
- Broader data points beyond traditional collateral

Transforms economic activity into financial visibility

### 5 Reduced Information Asymmetry
- Better understanding of MSME risk profile
- Lower uncertainty for lenders
- Improved screening and monitoring

Supports more accurate and inclusive credit assessment

### 6 Access to Finance
- Increased approval rates
- Potentially lower cost of finance
- More tailored financial products for MSMEs

Expands financing opportunities

### 7 Green Eligibility & Product Design
- Green taxonomy and eligibility criteria
- Green financial products (e.g. PAYGo, climate-smart loans)
- Monitoring and impact measurement

Ensures that finance supports environmentally sustainable activities

### 8 Green Finance
- Investment in renewable energy
- Climate-smart agriculture
- Energy-efficient equipment
- Green MSME growth

Supports climate resilience, green growth and sustainable development

**DPI → Green Finance is conditional, not automatic.**

Digital infrastructure creates the conditions for inclusion and data generation, but green finance requires appropriate governance, green eligibility criteria and dedicated financial products.

### Key Enabling Conditions
- Data governance and privacy
- Consumer protection
- Regulatory frameworks
- Institutional coordination
- Green finance instruments

DPI is an **enabler of green finance** when combined with strong governance, responsible data use and clear environmental objectives.

BACKUP 5 | NOVELTY & CONTRIBUTION

# Where Is the Novelty?

## This study connects previously fragmented literatures and extends the discussion to a regional scale

### Existing literature Digital Public Infrastructure

- Digital identity
- Interoperable payments
- Data exchange
- Trusted digital services

Well established evidence that DPI can facilitate financial inclusion.

### Existing literature Financial Inclusion & Alternative Credit Data

- Access, usage and inclusion
- Alternative credit data (transaction data, digital footprints)
- MSME financing constraints

Growing evidence that digital transactions can generate alternative credit information.

### Existing literature Green Finance

- Renewable energy finance
- Climate-smart agriculture
- Sustainable MSME finance
- Green taxonomy and impact measurement

Expanding evidence on green finance, but limited integration with DPI and alternation data.

### This study: An integrated framework

Connecting DPI, inclusion, alternative credit data and green finance




A theoretically grounded and empirically informed pathway from digital infrastructure to sustainable development.

## Key Contributions

**1 Conceptual Contribution**

Proposes an integrated DPI–Green Finance Framework connecting digital infrastructure to sustainable investment.

**2 Theoretical Contribution**

Identifies information asymmetry and alternative credit data as the transmission mechanism between digital participation and green finance.

**3 Empirical Contribution**

Brings together evidence from six national African ecosystems and one regional ecosystem within a common comparative framework.

**4 Regional Contribution**

Introduces Regional Digital Public Infrastructure (RDPI) as an extension of conventional nationally bounded approaches to DPI.

"The novelty lies not in one element, but in the **integration**, the **mechanism** and the **regional perspective**."

BACKUP 6 | GREEN FINANCE VS ORDINARY DIGITAL FINANCE

# When Does Digital Finance Become Green Finance?

Digital finance improves access. Green finance directs capital to environmentally sustainable activities.

## Digital Finance (Broader Concept)

Uses digital infrastructure to expand access to financial services

**Digital Payments** (transactions) → **Data Generation** (transaction records) → **Credit Assessment** (alternative data) → **Access to Finance** (loans, credit, working capital)

**Key Outcome**
Greater financial inclusion, more efficient financial services, and increased access to finance.

Green finance builds on digital finance but adds environmental objectives, criteria and impact measurement.

## Green Finance (A Targeted Application)

Uses digital finance and additional green criteria to support environmentally sustainable investment

**Digital Payments** (transactions) → **Data Generation** (transaction and sector data) → **Credit Assessment** (alternative data) → **Green Eligibility & Taxonomy** (sector, activity, environmental criteria) → **Green Finance** (green loans, blended finance, impact investment)

**Key Outcome**
Increased financing for climate-friendly and environmentally sustainable activities, contributing to climate resilience and green growth.

## Examples of Green Finance Enabled by Digital Infrastructure

- **PAYGo solar** — Clean energy for households and SMEs
- **Climate-smart agriculture** — Inputs, equipment and value chains
- **Clean mobility** — Electric vehicles and transport solutions
- **Energy-efficient equipment** — Productive use for MSMEs
- **Green buildings and infrastructure** — Sustainable construction and facilities

## Key Messages

1. Digital finance improves credit access; green finance adds an environmental objective.
2. Payment and transaction data can support credit assessment but do not automatically indicate that an activity is green.
3. Green finance requires a taxonomy, eligibility criteria and impact measurement.
4. Better credit assessment identifies bankability; green criteria identify sustainability.
5. DPI enables the foundation, but green finance depends on intentional product design, regulation and governance.

BACKUP 7 | ALTERNATIVE CREDIT DATA

# How Does Alternative Credit Data Reduce Information Asymmetry?

## From digital footprints to better credit decisions for MSMEs

### Traditional Credit Assessment

Relies on formal, often unavailable information for many MSMEs

- Collateral
- Audited financial statements
- Formal credit history
- Registered business records
- Tax records

Many African MSMEs lack these requirements, leading to exclusion or higher perceived risk.

### Alternative Credit Data from Digital Ecosystems

Generated through everyday digital activity

- Digital payment transactions (wallet, bank, merchant)
- Cash-flow patterns
- Merchant and sales activity
- Utility payments (electricity, water, telecoms)
- Mobile money and agent activity
- Digital business records (e-invoicing, e-commerce)
- Geolocation and business footprint
- Platform and ecosystem data (fintechs, MFIs, MMOs)

### Reducing Information Asymmetry

Richer and more timely information on MSME economic behaviour

- Greater visibility of revenue and cash flows
- More accurate risk profiling
- Verification of business activity
- Improved screening and monitoring
- Potential to build transaction-based credit scores

From opaque businesses to data-informed decisions.

### Improved Credit Assessment

Better information allows financial institutions to:

- Assess creditworthiness more accurately
- Price risk more fairly
- Design tailored MSME financial products
- Expand access to finance
- Use data-driven, responsible lending models

From perceived risk to productive opportunities.

### Enabling Green MSME Finance

When improved credit assessment is combined with green criteria

- Apply green taxonomy and eligibility criteria
- Identify climate-positive business activities
- Design green financial products (e.g. renewable energy, climate-smart agriculture, energy efficiency)
- Monitor environmental impact
- Support scaling of green MSMEs

From financial inclusion to climate-resilient and sustainable economic growth.

### Key Takeaway

"Alternative credit data complements — not necessarily replaces — traditional credit assessment."

### Important Considerations

- ✓ Data quality and representativeness
- ✓ Privacy, consent and data protection
- ✓ Algorithmic bias and fair lending
- ✓ Regulatory and consumer protection frameworks

### Relevance for Africa

- ✓ Large MSME sector with limited formal credit histories
- ✓ Rapid growth in digital payments and mobile money
- ✓ Opportunity to unlock green investment at scale
- ✓ Requires trusted governance and responsible data use

BACKUP 8 | RDPI VS CROSS-BORDER PAYMENT INFRASTRUCTURE

# What Makes Regional Digital Public Infrastructure (RDPI) Different?

Beyond cross-border payments: a broader, multi-layer infrastructure for inclusive and sustainable development

## Cross-Border Payment Infrastructure (Narrower Scope)

- **Payments** — Cross-border transactions
- **Clearing & settlement** — Transaction routing and netting
- **Financial messaging** — Technical connectivity (e.g. ISO 20022)
- **Foreign exchange and liquidity** — Settlement between participants
- **Operational efficiency** — Faster, cheaper cross-border payments

**Focus: moving money across borders**
Essential, but only one component of a broader digital ecosystem.



**Payments can be one foundational layer of RDPI, but RDPI is broader than payments.**

RDPI integrates multiple DPI building blocks across countries to enable people, businesses and governments to transact, access services and invest together.

## Regional Digital Public Infrastructure (RDPI) (Broader Scope)

- **Interoperable payments** — Cross-border and domestic, real-time and inclusive
- **Digital identity interoperability** — Trusted identity across countries
- **Trusted data exchange** — Secure, consent-based data sharing (public and private)
- **Digital public services** — eKYC, e-government, trade, customs, taxation
- **Common standards and governance** — Regional rules, technical standards and institutional coordination
- **Consumer protection and cybersecurity** — Trust, safety and resilience
- **Enabling environment for innovation** — Fintechs, MFIs, MSMEs and regional value chains

**Focus: enabling people, businesses and governments to access digital services, finance and opportunities across borders, safely and inclusively.**

## Why RDPI Matters for Green Finance?

- Larger markets for green MSMEs
- Cross-border supply chains
- Greater access to climate finance
- Regional resilience to climate shocks

## Illustrative Example: GIMACPAY (CEMAC)

- ✓ Connects 6 Central African countries
- ✓ Interoperable payment infrastructure across banks, MFIs, MMOs and fintechs
- ✓ Potential foundation for broader RDPI layers (identity, data exchange, digital services)
- ✓ Can support regional MSME financing, trade and green investment (prospective)

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BACKUP 9 | GOVERNANCE, RISKS AND SAFEGUARDS

# DPI Can Enable Green Finance — But Also Create New Risks

## From opportunity to responsible implementation

### Key Opportunities

- **Greater financial inclusion** — More MSMEs and underserved groups access financial services
- **Efficiency and lower costs** — Faster, cheaper and more seamless transactions
- **Green investment at scale** — Financing for climate-smart MSMEs and green technologies
- **Interoperability** — Connections across institutions, sectors and borders
- **Data-driven innovation** — New products and services for sustainable development

**DPI creates the conditions for more inclusive, efficient and sustainable financial ecosystems.**

### Key Risks and Challenges

- **Data privacy and misuse** — Risk of unauthorized access and secondary use of data
- **Cybersecurity threats** — Systemic risks and increased attack surface
- **Algorithmic bias** — Risk of discrimination and exclusion in data-driven lending
- **Digital exclusion** — Vulnerable groups may be left behind (e.g. women, rural MSMEs)
- **Consumer protection** — New for clear recourse and dispute resolution mechanisms
- **Market concentration** — Risk of dominance by a few players

**The same data and technology that can enable green finance can also create new risks if not properly governed.**

### Key Safeguards and Enablers

- **Robust data governance** — Clear rules on data collection, use, sharing and consent
- **Privacy and cybersecurity** — Technical and institutional safeguards to protect users
- **Regulatory frameworks** — Proportionate and adaptive regulation across countries
- **Inclusive design** — Ensure accessibility for women, rural MSMEs and vulnerable groups
- **Consumer protection mechanisms** — Transparent recourse and dispute resolution systems
- **Institutional coordination** — Collaboration across central banks, governments and private sector

**Trusted DPI requires infrastructure, governance and safeguards.**

### A Responsible Path to Green Finance




**Green Finance**
Climate-resilient MSMEs
Sustainable growth
Inclusive economies

### Key Takeaway

DPI is not inherently inclusive or green. Its development and use must be guided by **strong governance, consumer protection** and **responsible data practices** to ensure it delivers sustainable and equitable outcomes.

BACKUP 10 | FROM CONCEPT TO EMPIRICAL TESTING

# How Can This Framework Be Empirically Tested?

## A roadmap for future research to validate the DPI–Green Finance pathway

### 1 Research Model and Hypotheses

**Proposed relationships to be tested empirically**

- **DPI / Interoperability** (digital payments, ID, data exchange) → H1
- ↓
- **Digital Participation** (account usage, transaction activity) → H2
- ↓
- **Alternative Credit Data** (transaction data, digital footprints) → H3
- ↓
- **MSME Credit Assessment** (credit access, terms, risk pricing) → H4
- ↓
- **Green Finance** (green loans, climate investments) → H5

**Governance, regulation** and consumer protection moderate these relationships.

### 2 Key Hypotheses / Propositions

| | |
|---|---|
| H1 | Greater payment interoperability increases digital transaction visibility for MSMEs. |
| H2 | Higher digital participation generates richer alternative credit data. |
| H3 | Richer alternative credit data improves MSME credit assessment (higher approval rates, better terms). |
| H4 | Improved credit assessment, combined with green eligibility criteria, increases green financing for MSMEs. |
| H5 | Strong governance and consumer protection positively moderate these relationships. |

### 4 Potential Variables

| | |
|---|---|
| **Independent variables** | DPI adoption, interoperability, digital ID usage |
| **Mediating variables** | Digital participation, alternative credit data availability |
| **Dependent variables** | Loan approval, loan amount, green financing volume |
| **Moderating variables** | Governance quality, regulatory environment, consumer protection |
| **Control variables** | MSME size, sector, country, economic conditions |

### 3 Possible Data Sources

- **Transaction-level data** (banks, MFIs, MMOs, payment switch)
- **Loan performance data** (approval rates, loan size, interest rates, default rates)
- **MSME surveys** (financial behaviour, use of digital services, green investments)
- **Key informant interviews** (FSPs, regulators, fintechs, green finance institutions)
- **Green finance datasets** (taxonomy, eligible activities, environmental impact)
- **Secondary data** (World Bank, AfDB, national statistics, regulatory reports)

### 5 Next Steps – A Research Agenda

1. Develop measurable indicators and data collection plan
2. Conduct quantitative and/or mixed-methods analysis
3. Test the proposed hypotheses across multiple countries
4. Compare national and regional ecosystems (e.g., GIMACPAY)
5. Generate policy and practical recommendations