A policy-driven framework for identifying and ranking strategic transport and urban corridors

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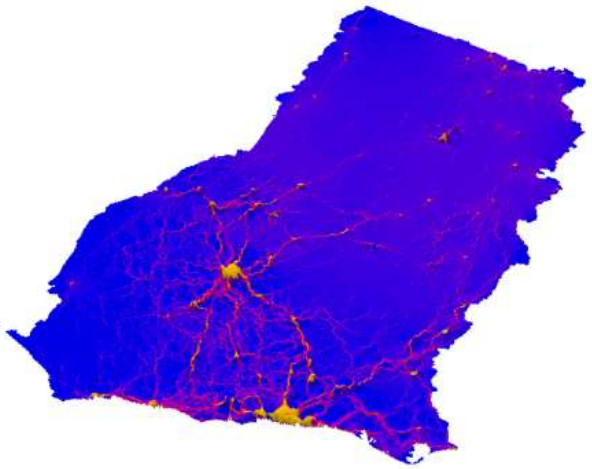
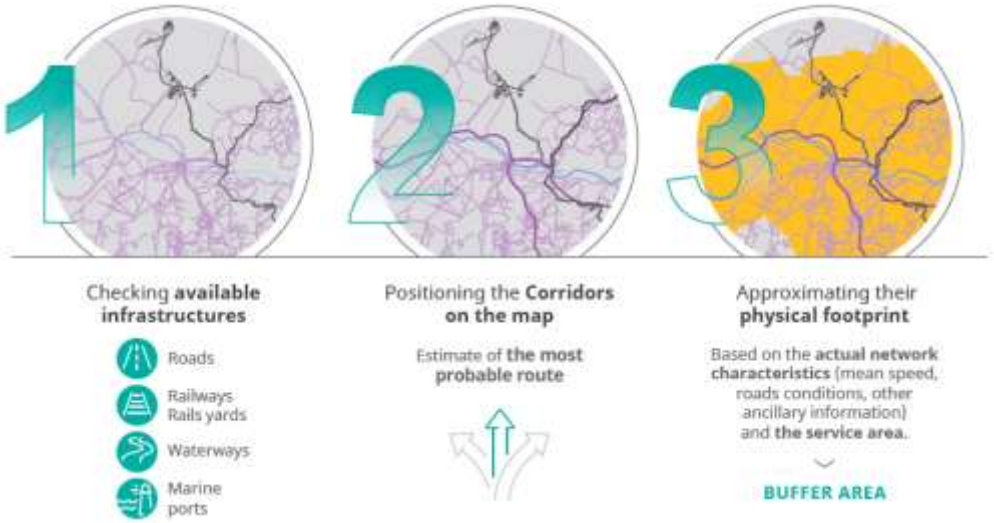
- ✓ Towards a comprehensive **Strategy** with **Africa** (2020)
- ✓ The **Global Gateway** (2021)
  - Concentrating EU investments in a limited number of Strategic Corridors;
  - Higher development impact, making a difference in the quality of the infrastructure delivered by the EU;

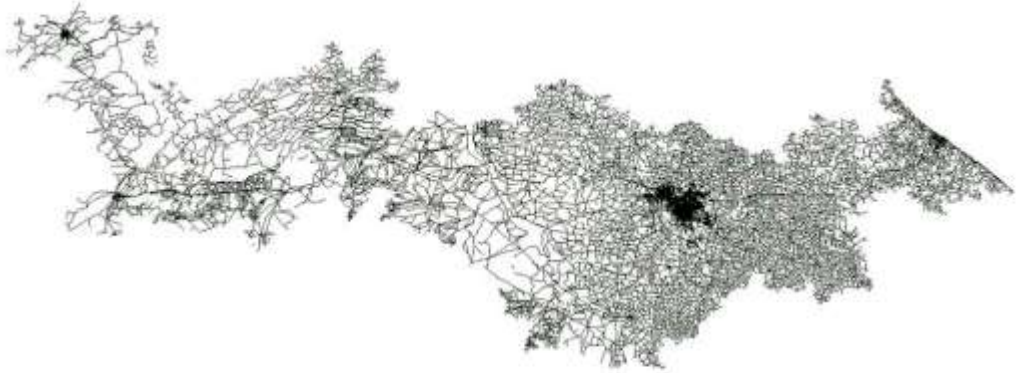
- ✓ Facilitate **intra-African** and **Africa-Europe trade;**
- ✓ Improve sustainable, smart, efficient, and safe **mobility and connectivity** between both continents;
- ✓ Develop **value chains in Africa** that can benefit industries in both Africa and Europe.

DG INTPA & JRC: **C**orridors and **U**rban **S**ystems in **A**frica (**CUSA**): 2020-

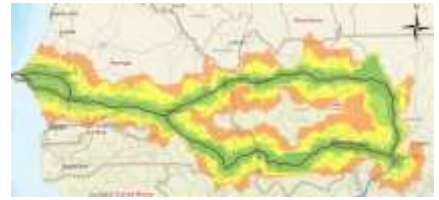
GHSL built-up as surfaces + **GHSL population** as nodes + **Circuit** Algorithm = **Least Cost Paths**







Identified **links** as destinations+ fishnet **points** as origins+ **Cost OD** Algorithm = **Service Areas**



Corridor identification

CUSA-1: Scenarios & ranking

Different priorities and strategies analysed under different scenarios.

DEFINITION OF SCENARIOS and assignment of indicators

Human development & peace and security | Green Deal | Sustainable growth and jobs | Strengthening the EU positions

UTILITY FUNCTIONS

Minimise or **maximise**
each indicator

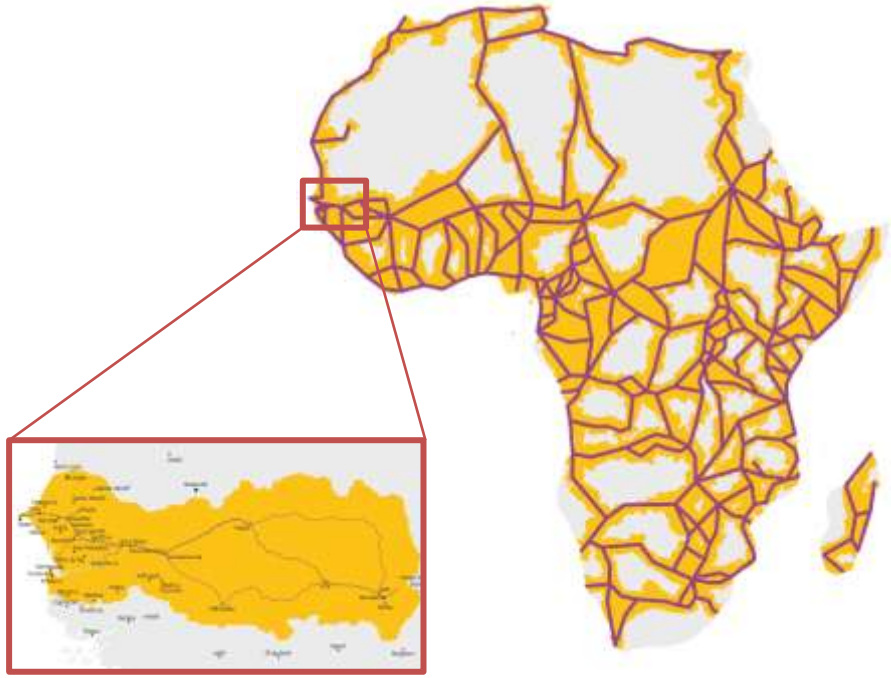
WEIGHTING

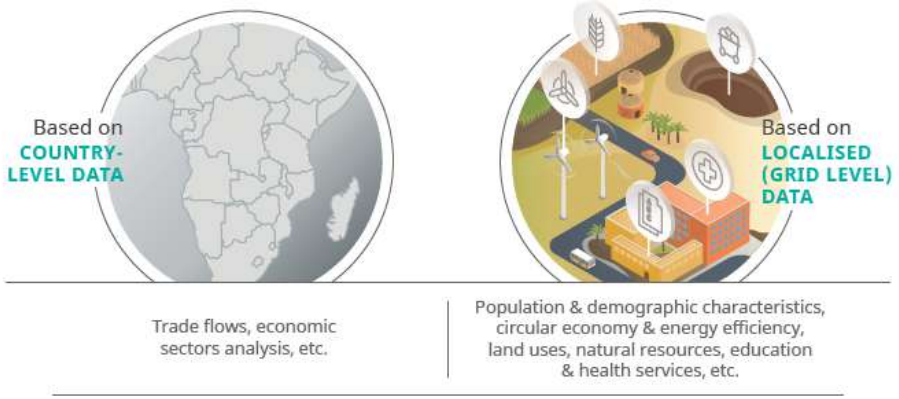
The **weight of indicators** changes according to the importance of criteria, which can be defined in two ways.

Machine-based
defined by algorithm

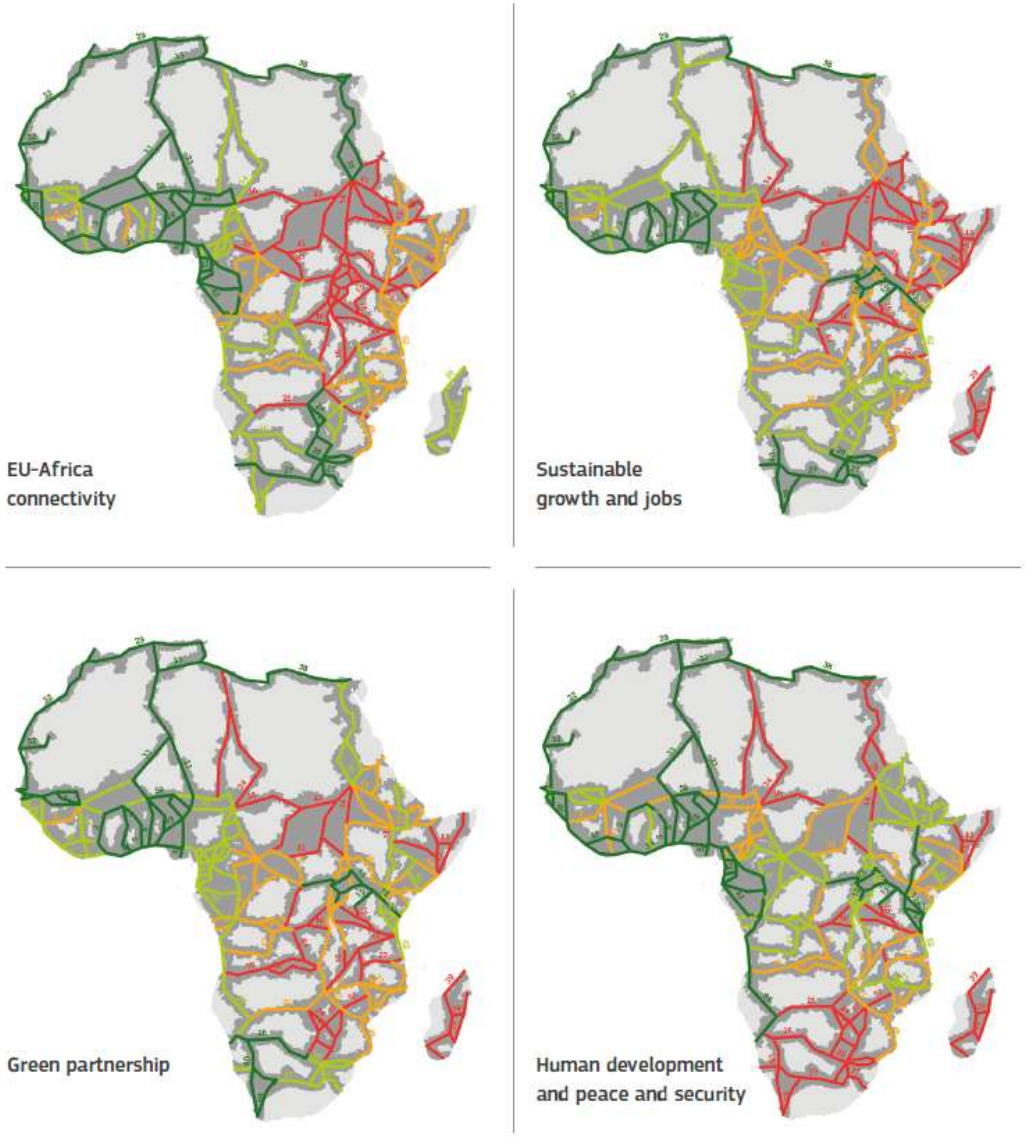
User-defined
stakeholders needs

Scenario / Indicator	Sustainable growth and jobs		Green partnership		Human development and peace and security		EU-Africa connectivity	
	Utility	*Weight*	*Utility*	*Weight*	*Utility*	*Weight*	*Utility*	*Weight*
Trade index	max	0.031	max	0.031	max	0.031	max	0.129
Mineral resources	max	0.032	min	0.032	min	0.032	max	0.0645
Agricultural land (projected)	max	0.031	max	0.031	max	0.031	-	0
	max	0.031	max					129



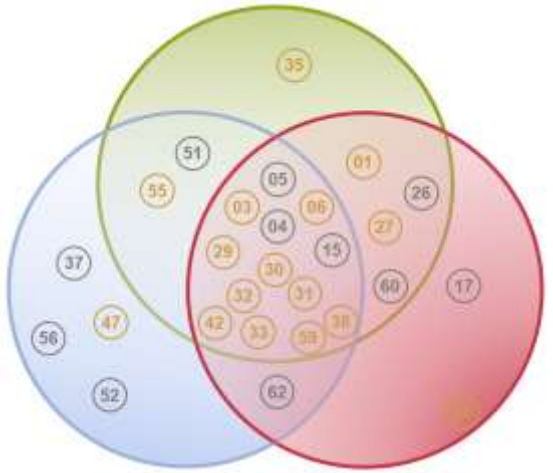


Corridor ranking (quantitative) and shorlisting approach (qualitative)



Challenges

- Very high
- High
- Medium
- Low



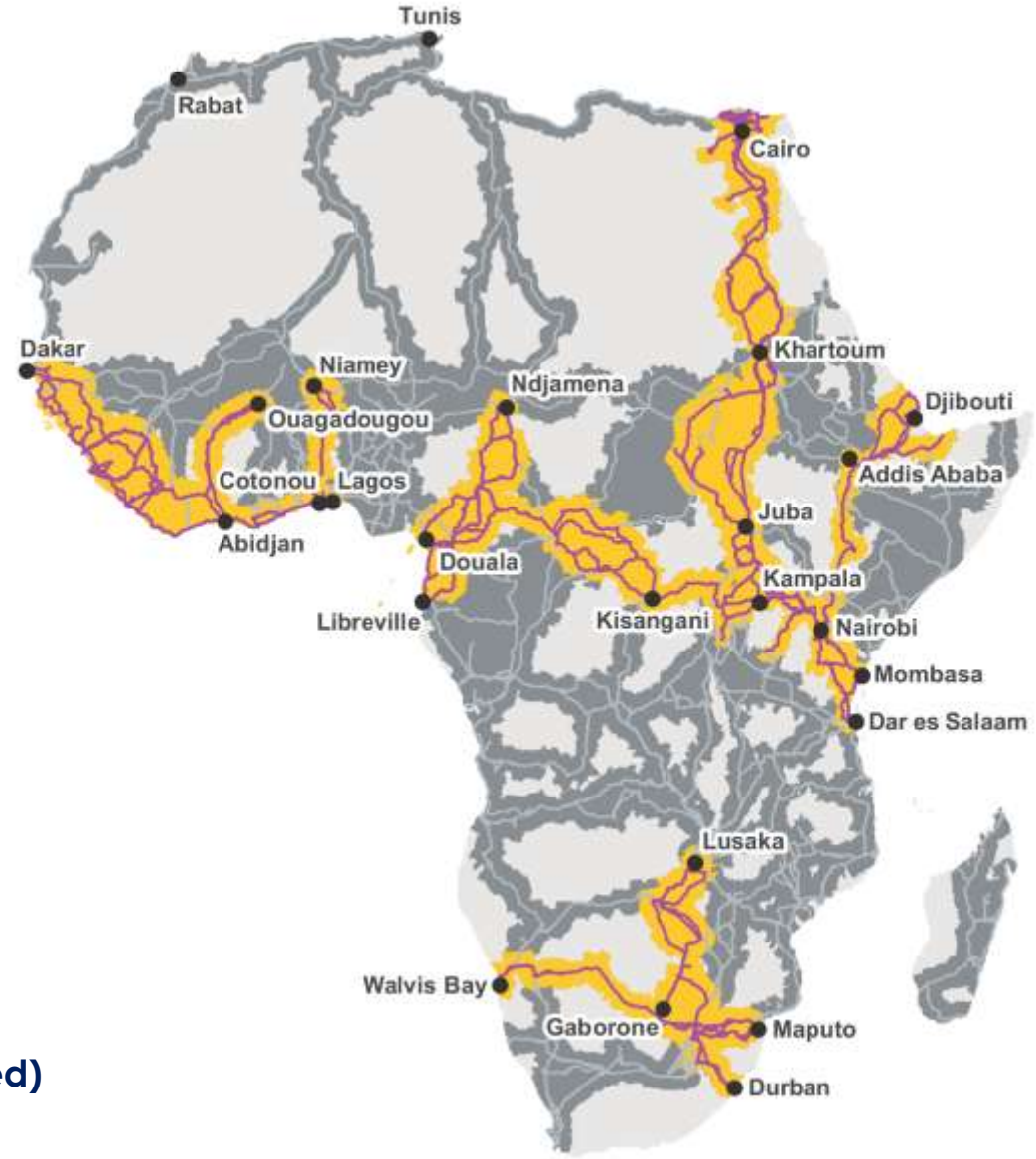
Phase 1 QUANTITATIVE ANALYSIS

Long list ▸ Middle list
of strategic corridors

Phase 2 QUALITATIVE ANALYSIS

Middle list ▸ Short list
of strategic corridors

- **52** Countries analysed
- **55** Corridors assessed and documented
- **4** Policy-oriented scenarios
- **32** Thematic Indicators
- **140+** indicators/layers database
- **250+** feedbacks from DGs, EU Dels, MS, IFI
- **11** Shortlisted Corridors (EU-Africa Summit, February 2022)



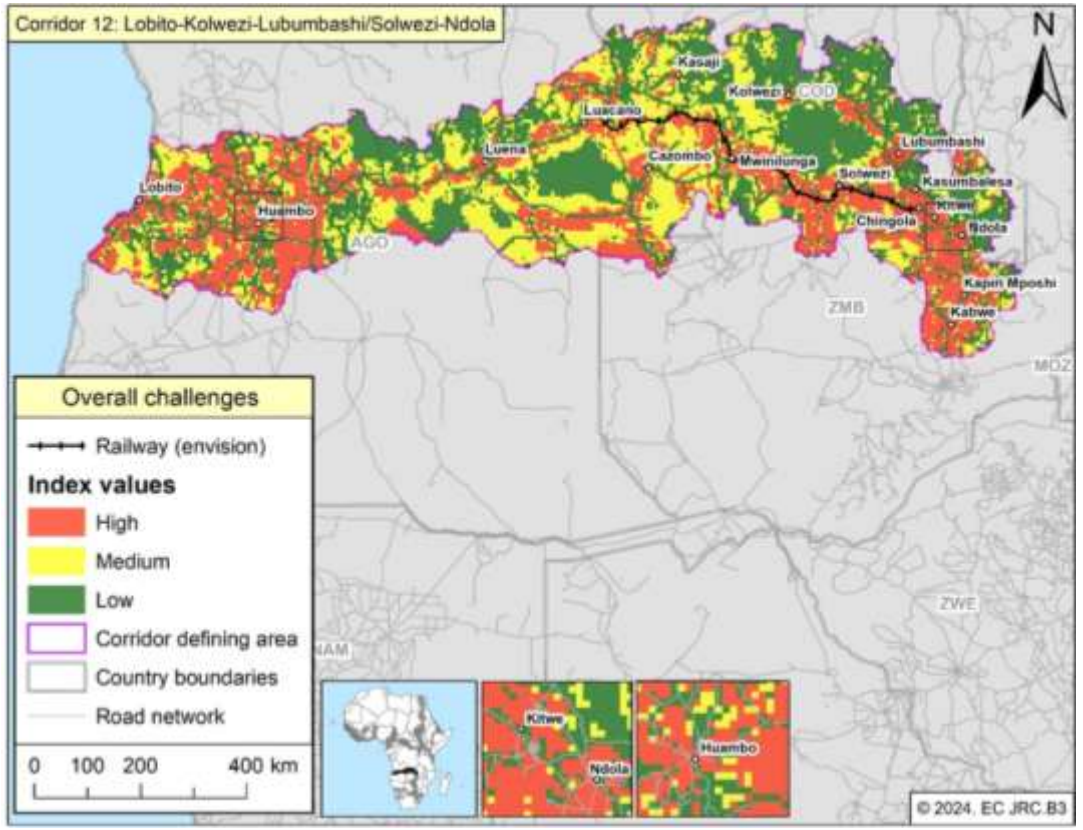
Northern Africa excluded (other EU tools, bilateral borders blocked)

No specific project recommendations

Geo-localised vulnerabilities / opportunities (5x5 km) for each of the 11 shortlisted corridors, aiming to:

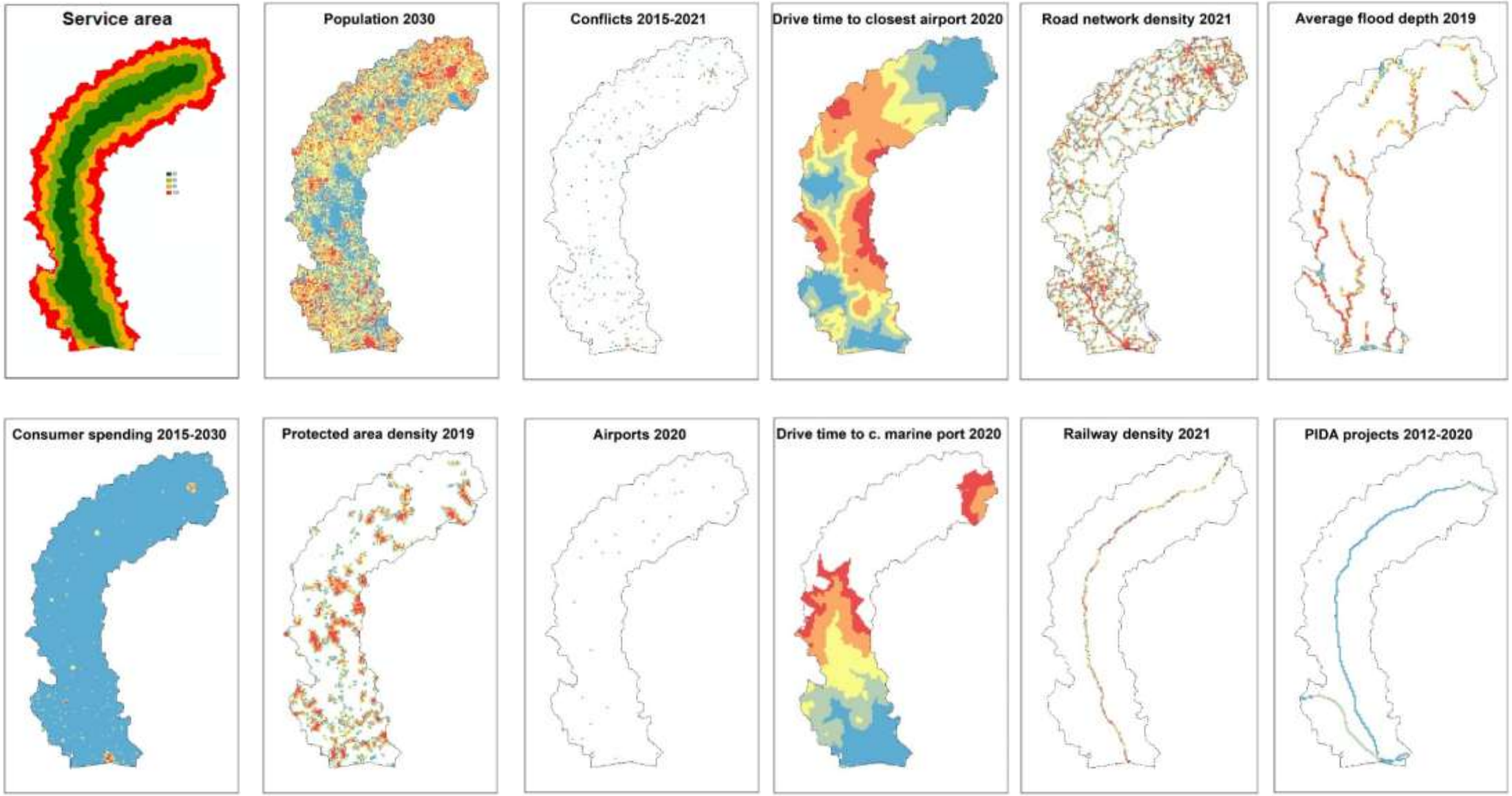
1. **Reduce carbon footprint** and protect **biodiversity**
2. **Digitalise** the corridor
3. **Improve accessibility**: access to **public services**, linking **rural road networks**, improve the **urban mobility** and **connectivity** in and between cities
4. **Unlock productive areas**, **support value chains'** development (mining, agriculture, industry, …).

Strengthen the overall **transport** and **trade** corridor **efficiency!**



Simplified, easy-to-understand traffic light categorization

CUSA-2: Sub-corridor characterisation



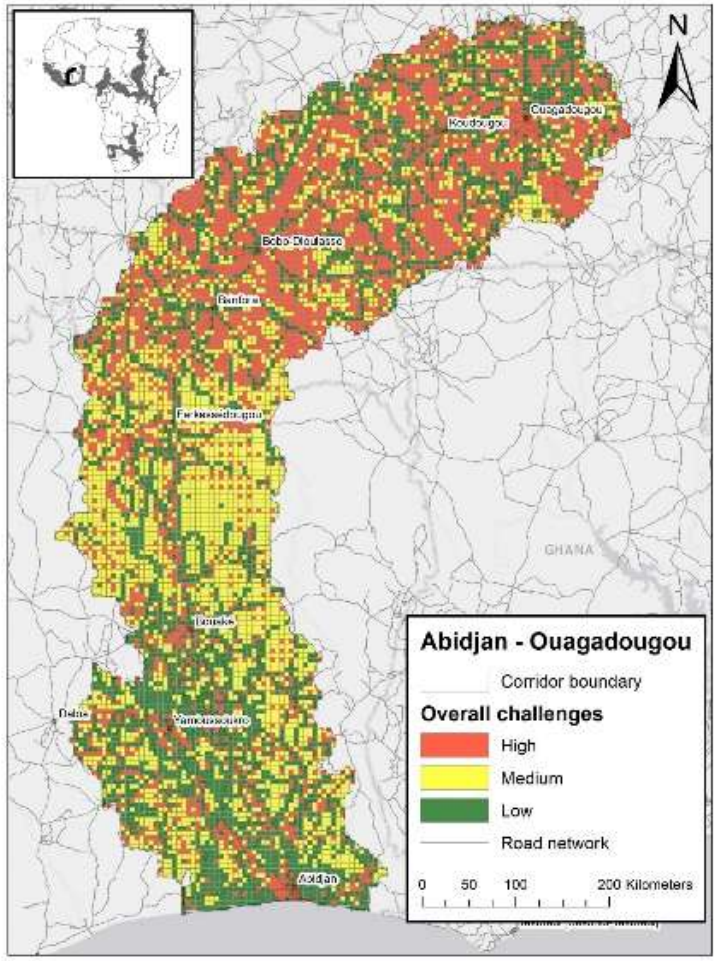
Quantile maps (5 classes). Values: Red – High, Blue – Low.

Conversion of policy objective into decision matrix

Indicator	Utility function	Machine based weight
Presence of infrastructure	MAX	0.324
Fixed broadband speed	MIN	0.327
Transport performance	MAX	0.051
Accessible population in 1.5 h	MAX	0.298

Ranking methods:

- **S**imple **A**dditive **W**eighting (**SAW**)
- **T**echnique for **O**rder of **P**reference by **S**imilarity to **I**deal **S**olution (TOPSIS)



Red – do not fit objectives at all - challenges

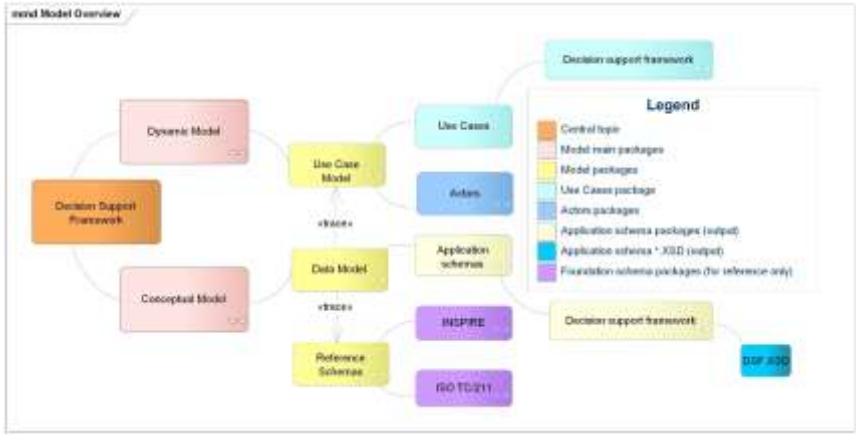
Green – fit objectives better - opportunities

Serves – traceability, transparency, replicability!

CUSA framework in UML:

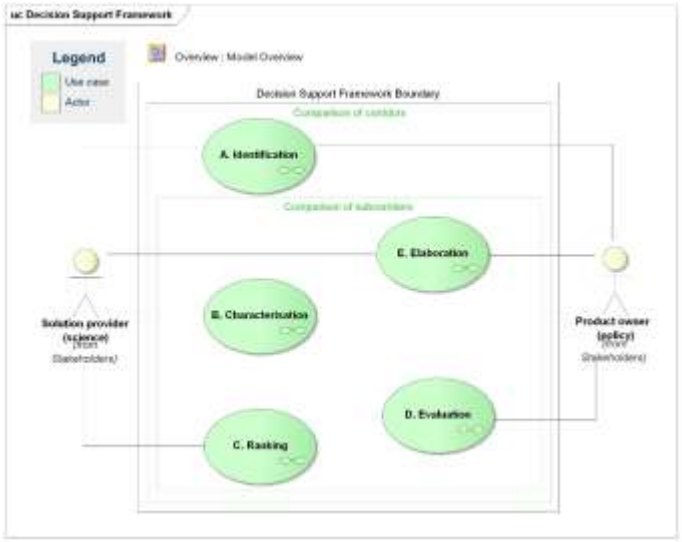
- Overview model (model structure)
- Use cases (core business cases)
- Activities (decomposition of use cases)
- Classes (placeholders in GML/ DB engineering)

Overview diagram



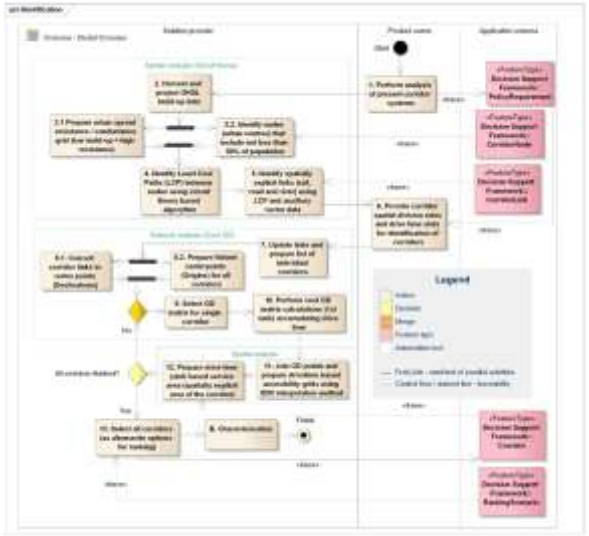
Use case diagrams

Traceability

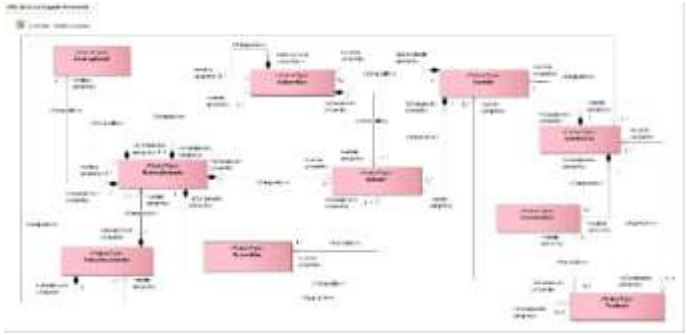


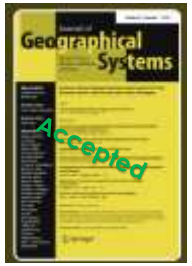
Activity diagrams

Traceability



Class diagrams (ISO TC211 compliant)



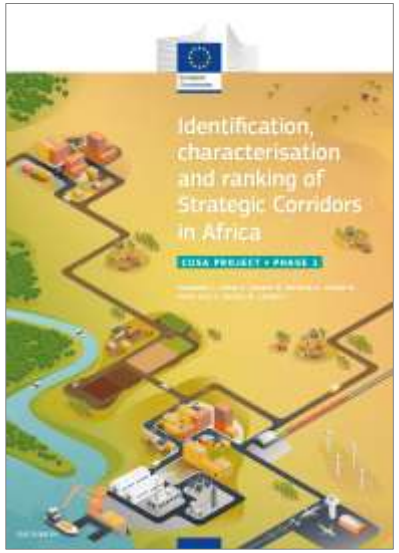


Kučas A., Tóth K., Sulis P., Proietti P., Kompil M., Maistrali A., Oliete Josa S., Georgelin L., Kavalov B. 2026. A novel transport and urban corridor identification, characterisation and ranking framework for identification of investment priorities. Journal of Geographical Systems DOI: https://doi.org/10.1007/s10109-026-00491-w

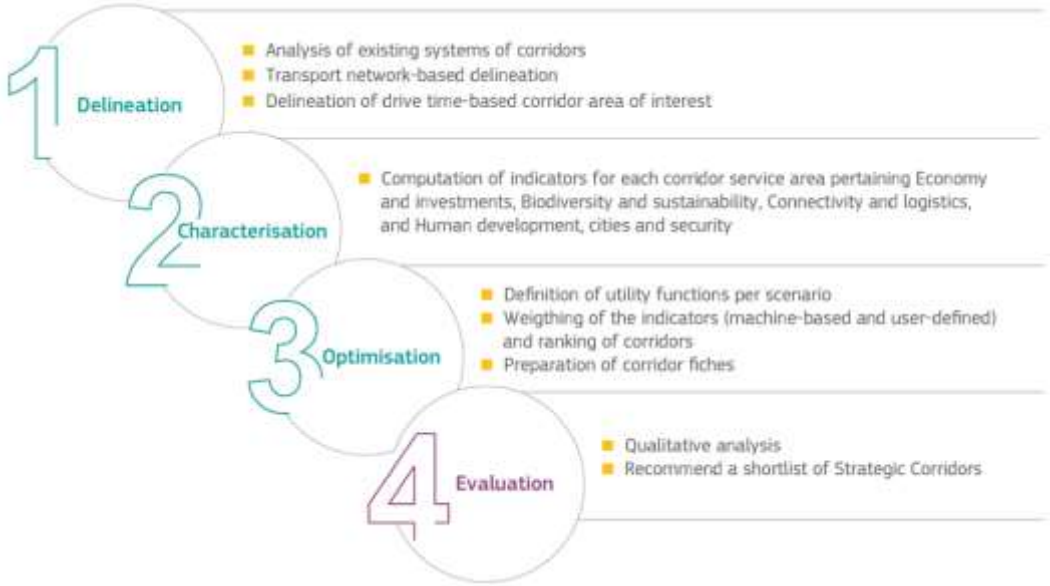
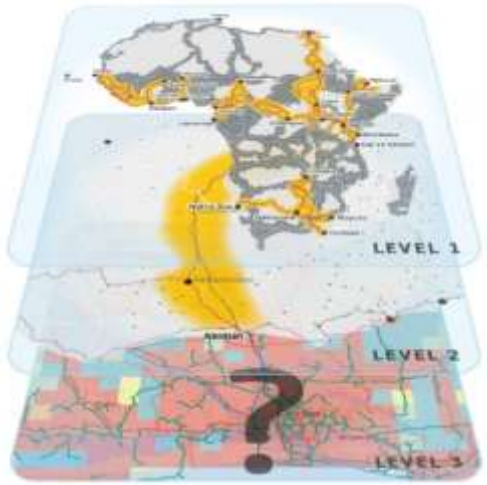
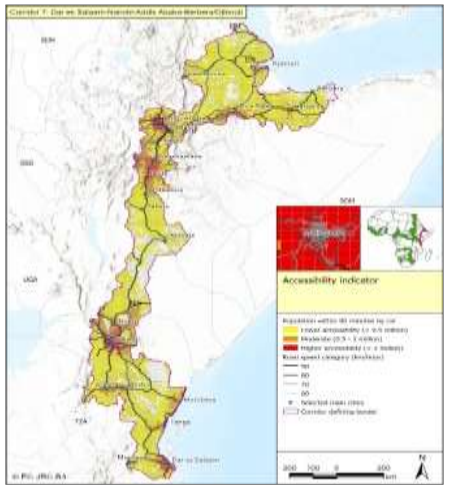
CUSA framework:

- Global data
- Recursive
- Scalable
- Transferable
- Transparent

CUSA I – continental analyses and corridor identification and shortlisting



CUSA framework



CUSA II – corridor and sub-corridor analyses