GAIN GROUP

Insight drives growth

An evidenced based approach to Logistics Platform development: The role of data to guide Public and Private investment

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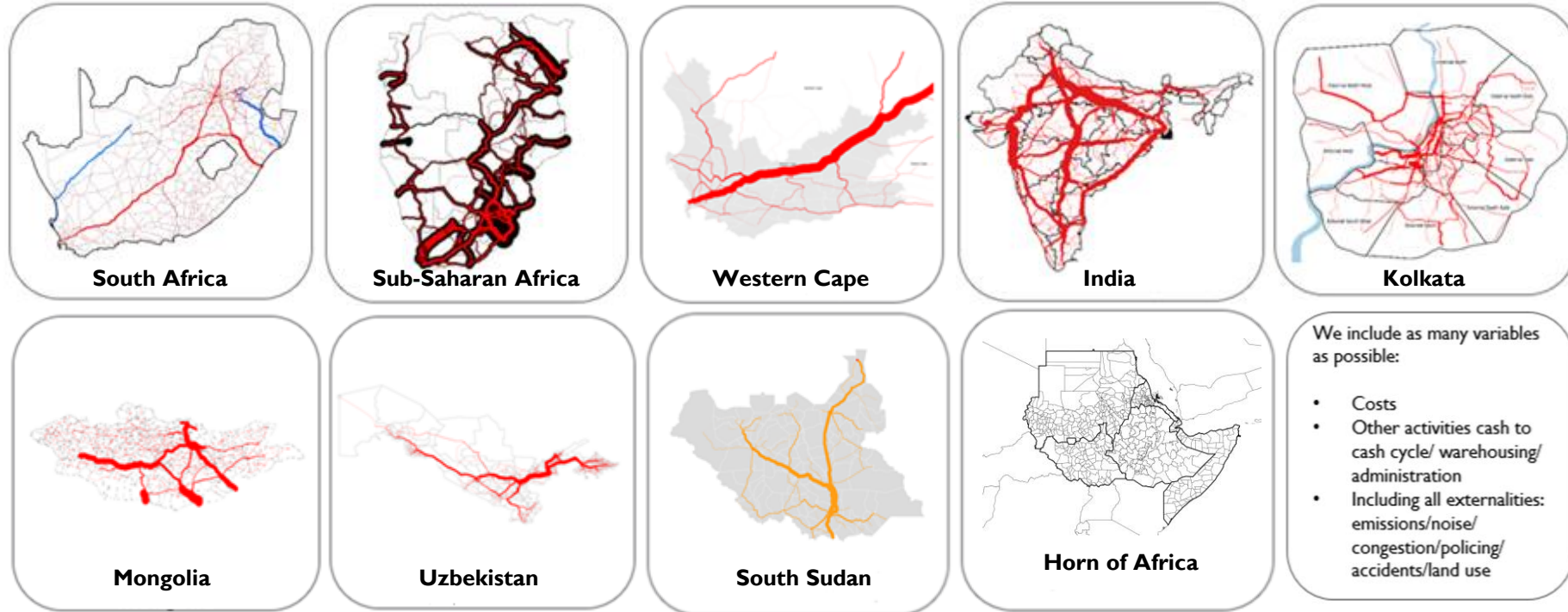Stefaan Swarts

Henk Neethling

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Logistics

- Facilitates flow:
  - Forward mostly goods
  - Reverse mostly funds
  - Both directions always intelligence
    - Efficient connections of the supply and demand signal

- Intelligence is used to:
  - Calculate the lowest cost of ownership
  - Organize all the flow production factors efficiently

Logistics on national scales have similar needs. Value chain/corridor based platforms should provide the same utility:
But intelligence is usually lacking

We've used this approach all over the world: Develop flow based intelligence

South Africa

Sub-Saharan Africa

Western Cape

India

Kolkata

Mongolia

Uzbekistan

South Sudan

Horn of Africa

We include as many variables as possible:

- Costs
- Other activities cash to cash cycle/ warehousing/ administration
- Including all externalities: emissions/noise/ congestion/policing/ accidents/land use

And in the developing world huge intelligence deficits were visible

Information availability

- In emerging economies, where flow intelligence is needed the most information is scarce and difficult to develop.
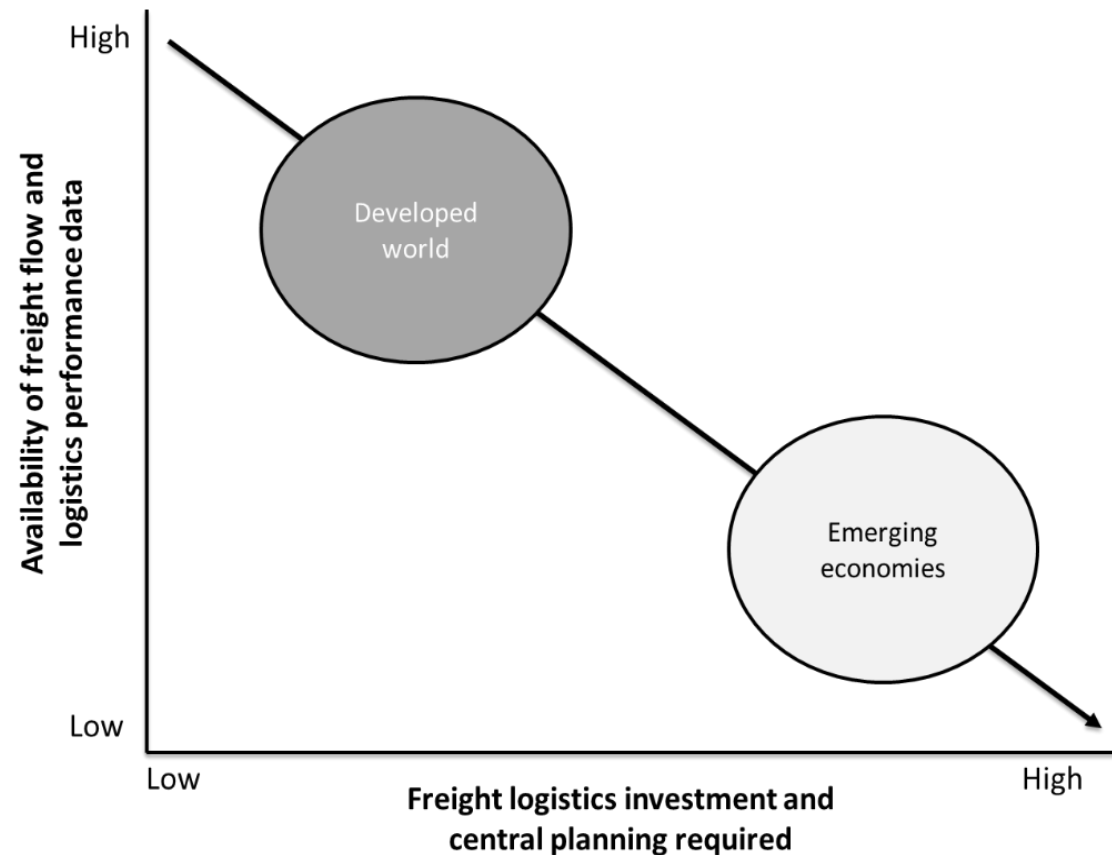
Evidenced based platform development: Case studies

- Domestic intermodal in South Africa
- The landlock challenges of Uzbekistan
- Connectivity and Freight Villages in India
- Sustainable herding in Mongolia
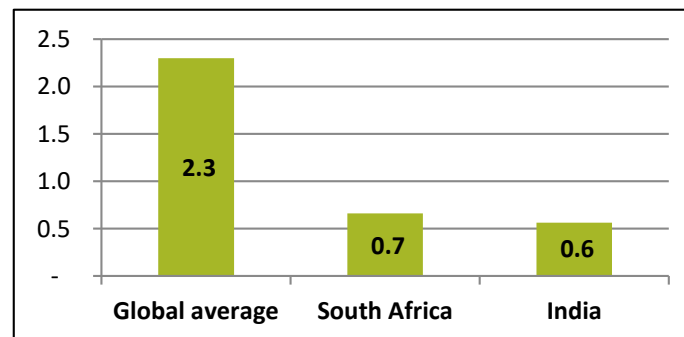- Regional value chains in the Horn of Africa

South Africa is spatially challenged, with long dense transport distances and a relatively small GDP

Today

Forecast for 2050
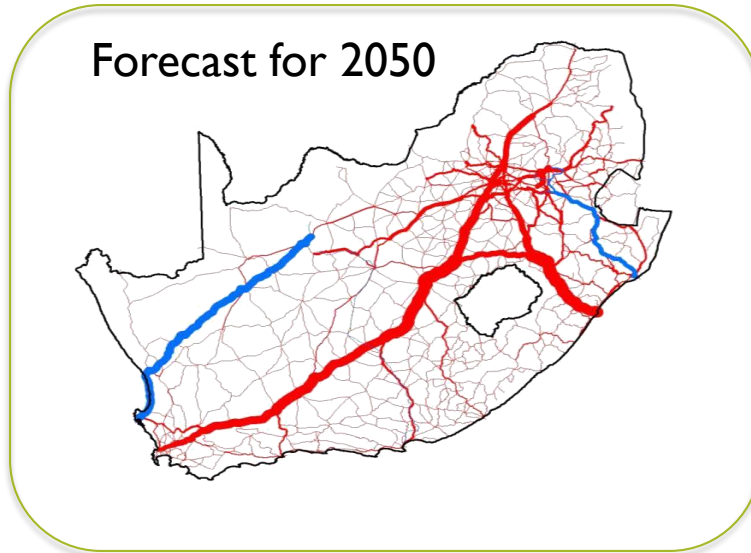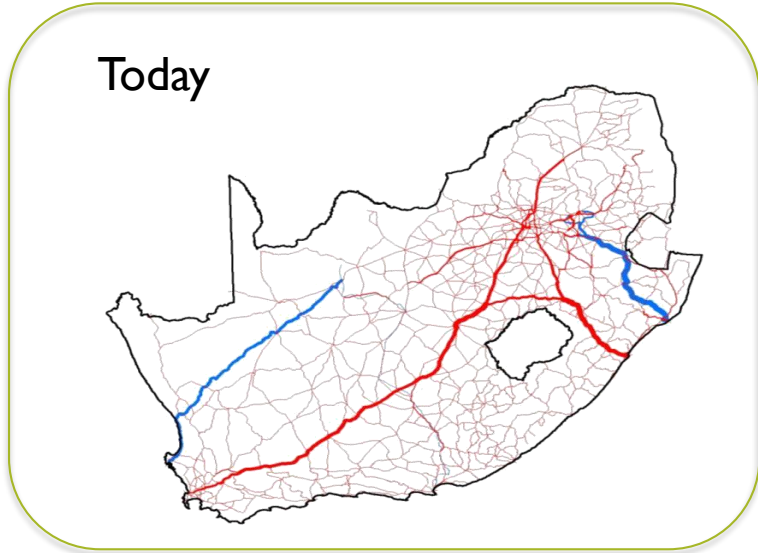
Rail gap

	Road	Rail
Current	164	149
Optimal split	134	179
10 year target	167	200

Tonne-km productivity

2.5	
2.0	2.3
1.5	
1.0	
0.5	0.7 0.6
-	Global average South Africa India

- GDP
  - South Africa $0.35 trillion
  - Europe $19.70 trillion
  - France/Germany $6.26 trillion

After careful segmentation we identified the "missing" railway?
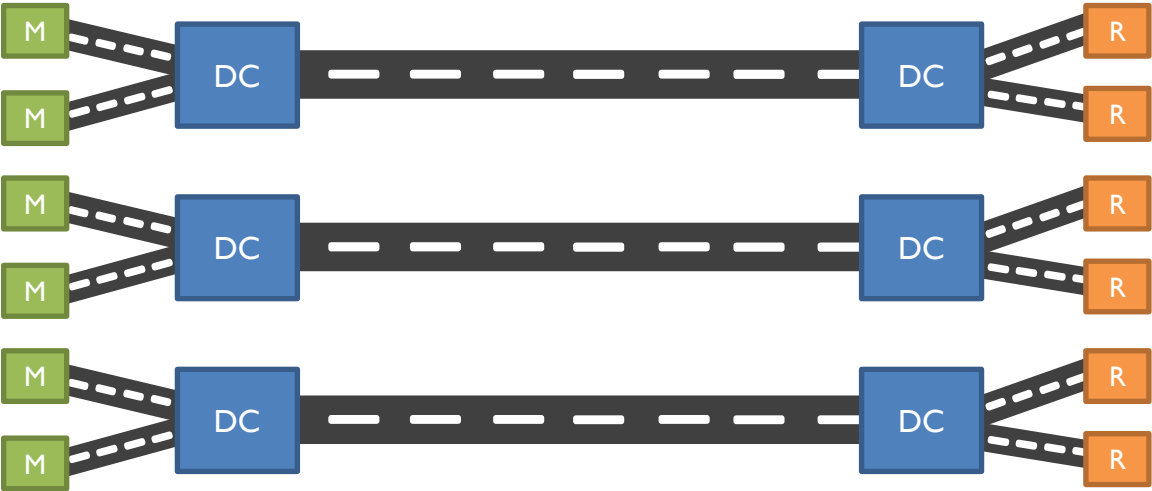
Palletized cargo
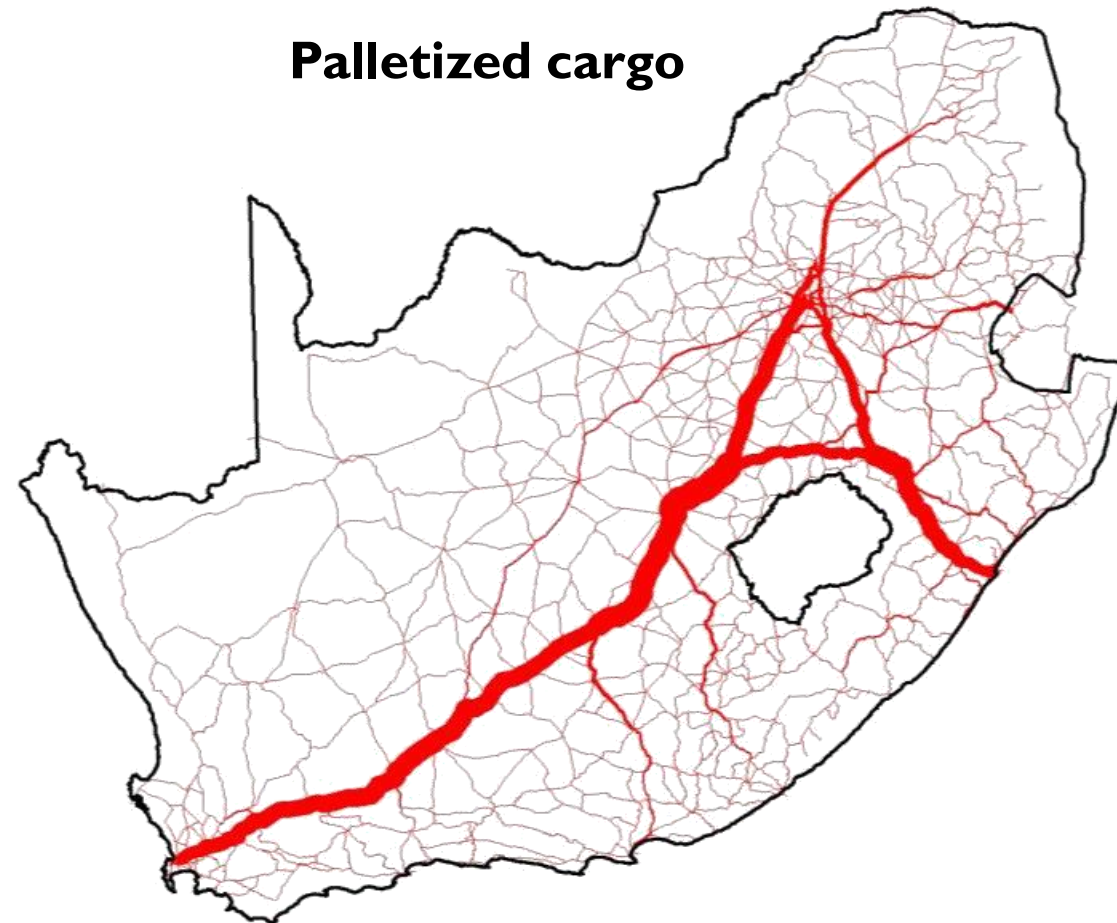
We compared it to the significant domestic intermodal opportunity in the USA

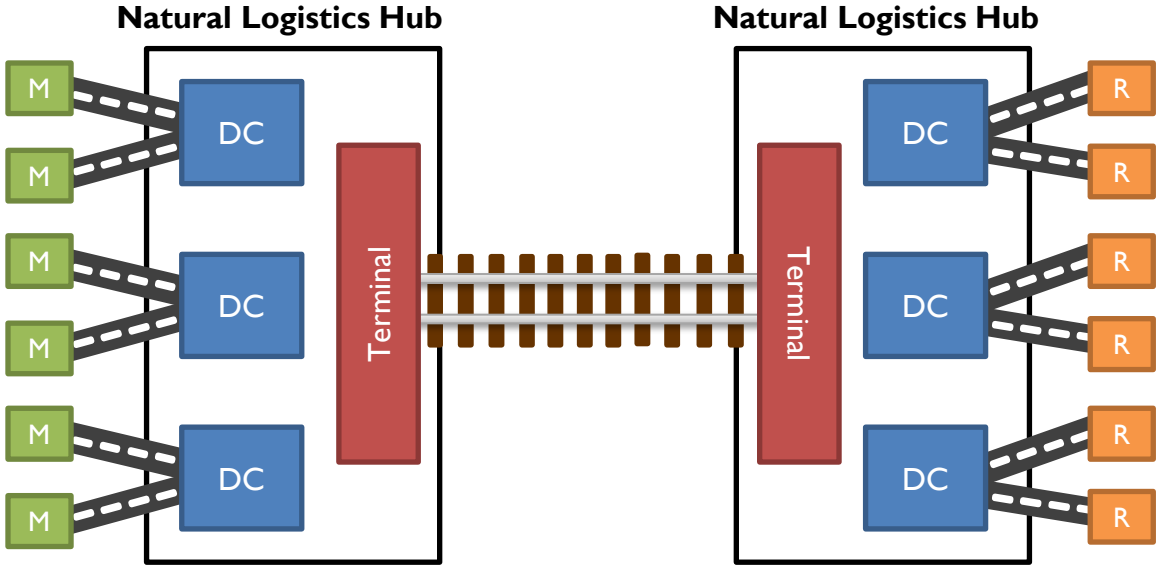ISO Containers   GDP (constant 2010 US$)   Domestic Containers

8
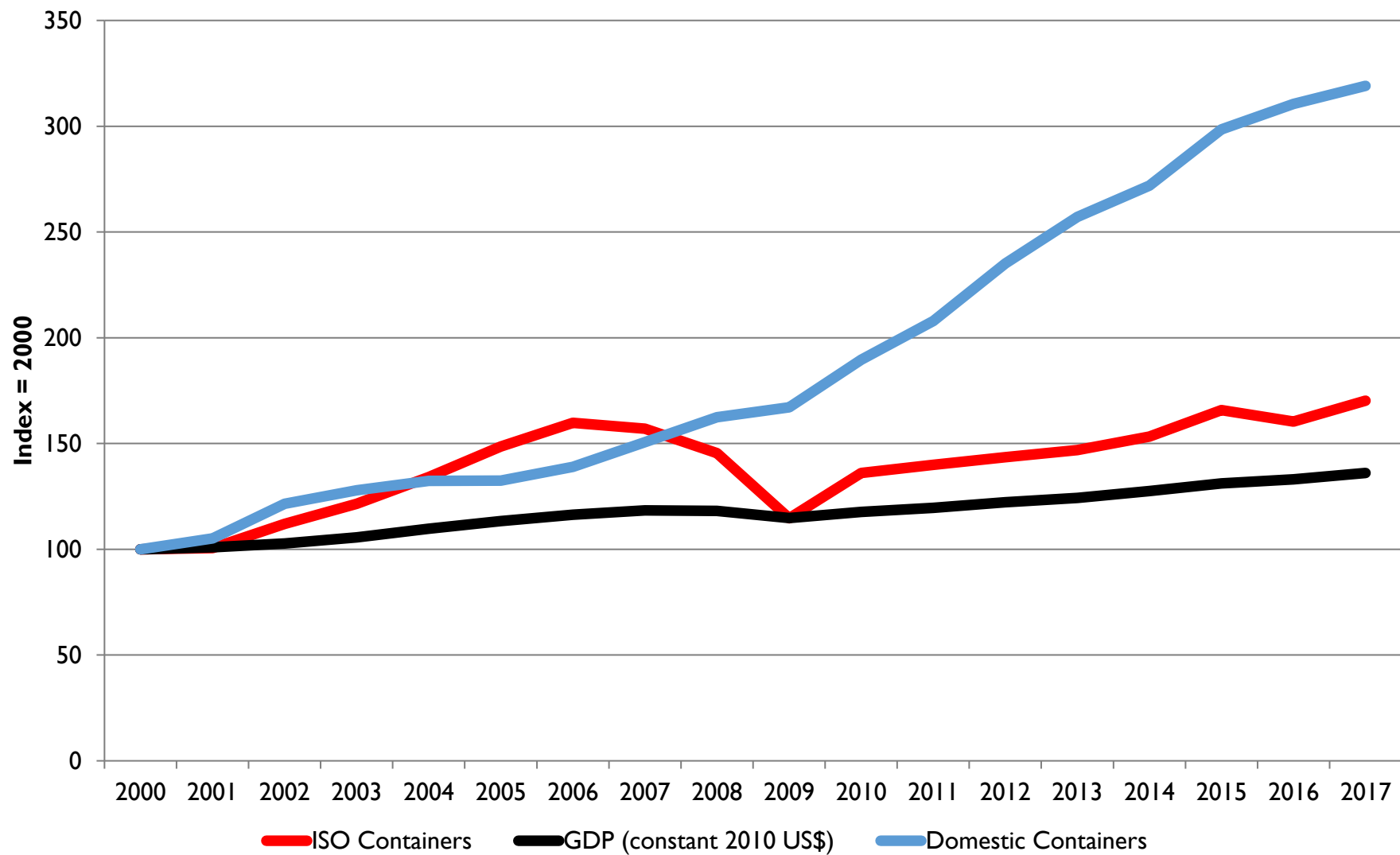
The typical FMCG long distance supply chain requires domestic intermodal

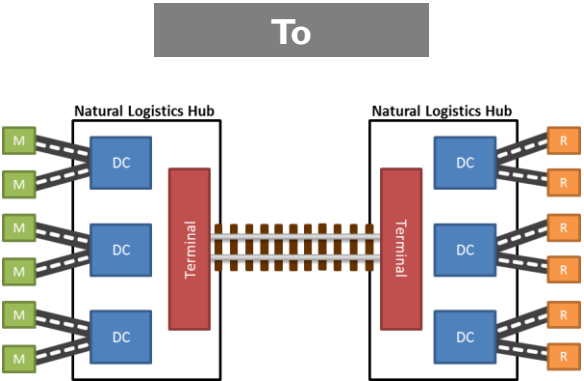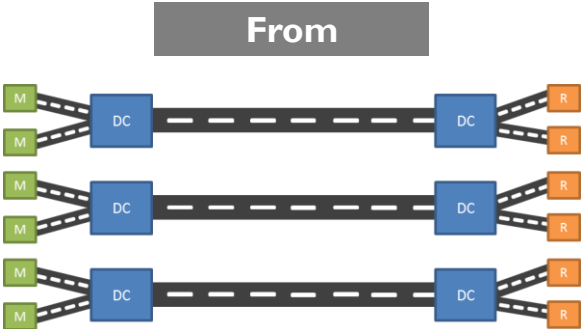M   = Manufacturing
DC = Distribution Centre
R   = Retailer

Leading to the most important opportunity for the economy and the railway

We have in fact no choice – 30 year N3 truck volume scenario

Significant savings

From

To

Natural Logistics Hub

	Volumes and Savings		
	South Africa	Corridors	2 corridors only
Tonnes (million)	50	30	20
Tonne-km (billions)	30	16	13

Requirements to make it work

- Investment:
  - Business case is solid
  - Public sector funds not available
  - Public sector provides permanent way
  - Private operators and funding

- Requires
  - Regulation
  - Intelligence

- Platform
  - Master planning
  - Access arrangements

Severely suboptimal without flow intelligence

Developing world case studies

- Domestic intermodal in South Africa
- The landlock challenges of Uzbekistan
- Connectivity and Freight Villages in India
- Sustainable herding in Mongolia
- Regional value chains in the Horn of Africa

We've identified all 195 million tonnes of freight flows in Uzbekistan

Tonnes
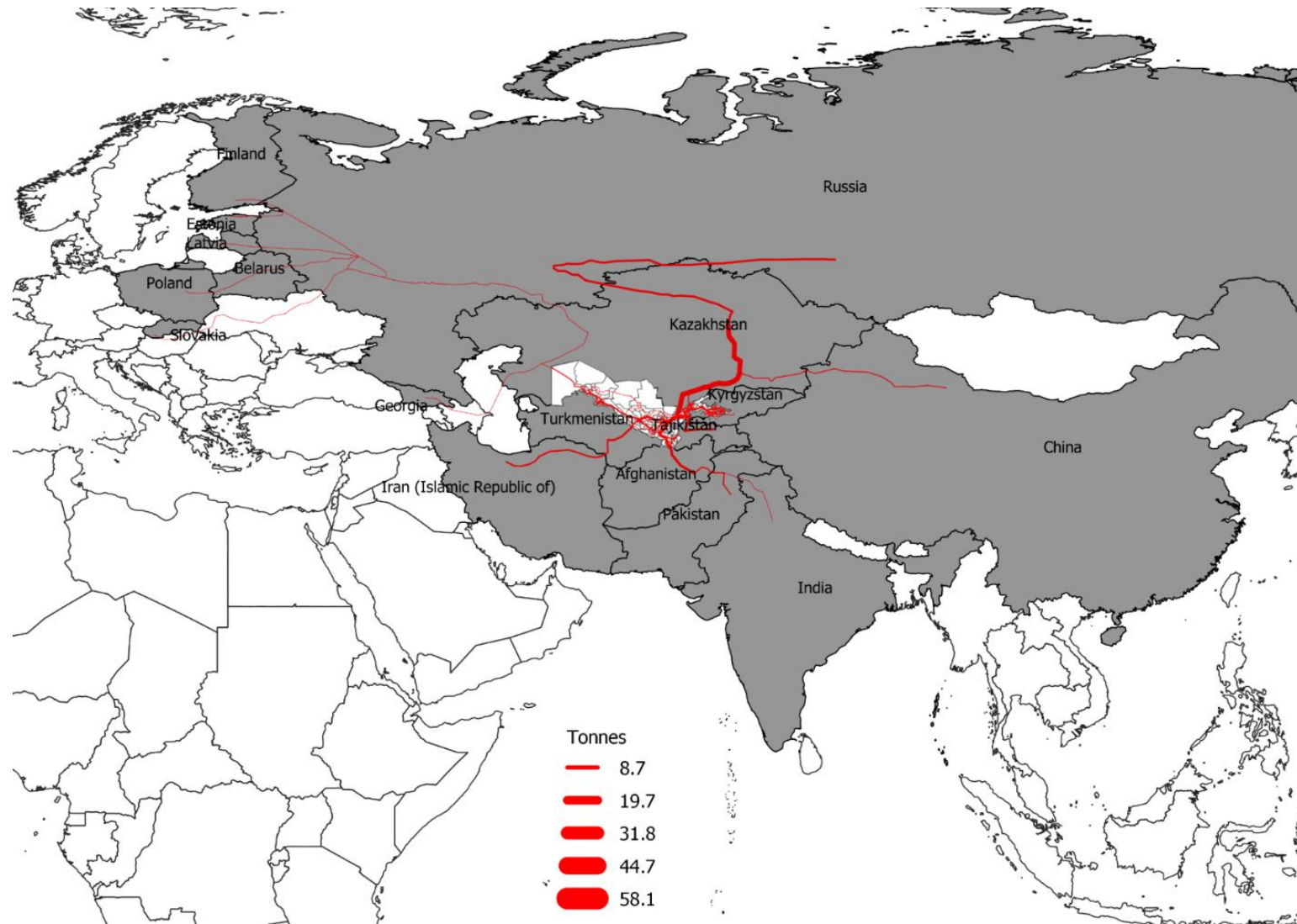- 8.7
- 19.7
- 31.8
- 44.7
- 58.1

15

Being at the cross roads of Central Asia there is also high volumes of transit freight
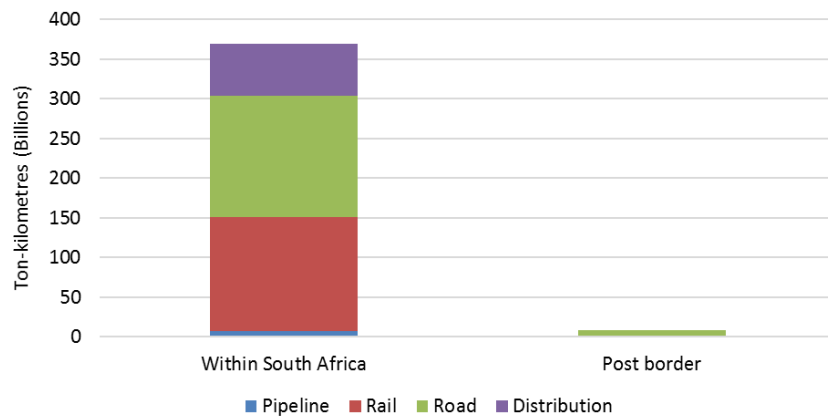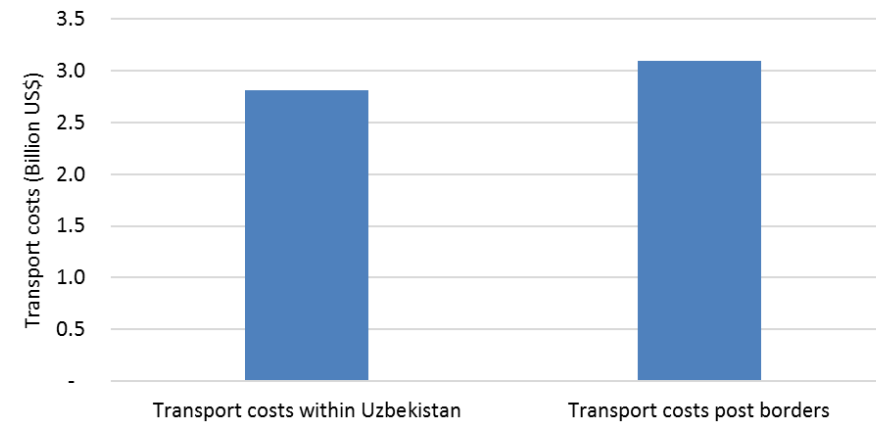

Tonnes
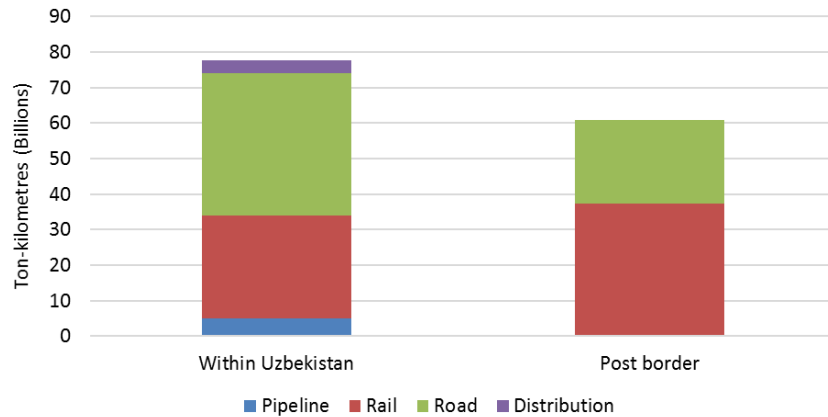— 8.7
— 19.7
— 31.8
— 44.7
— 58.1
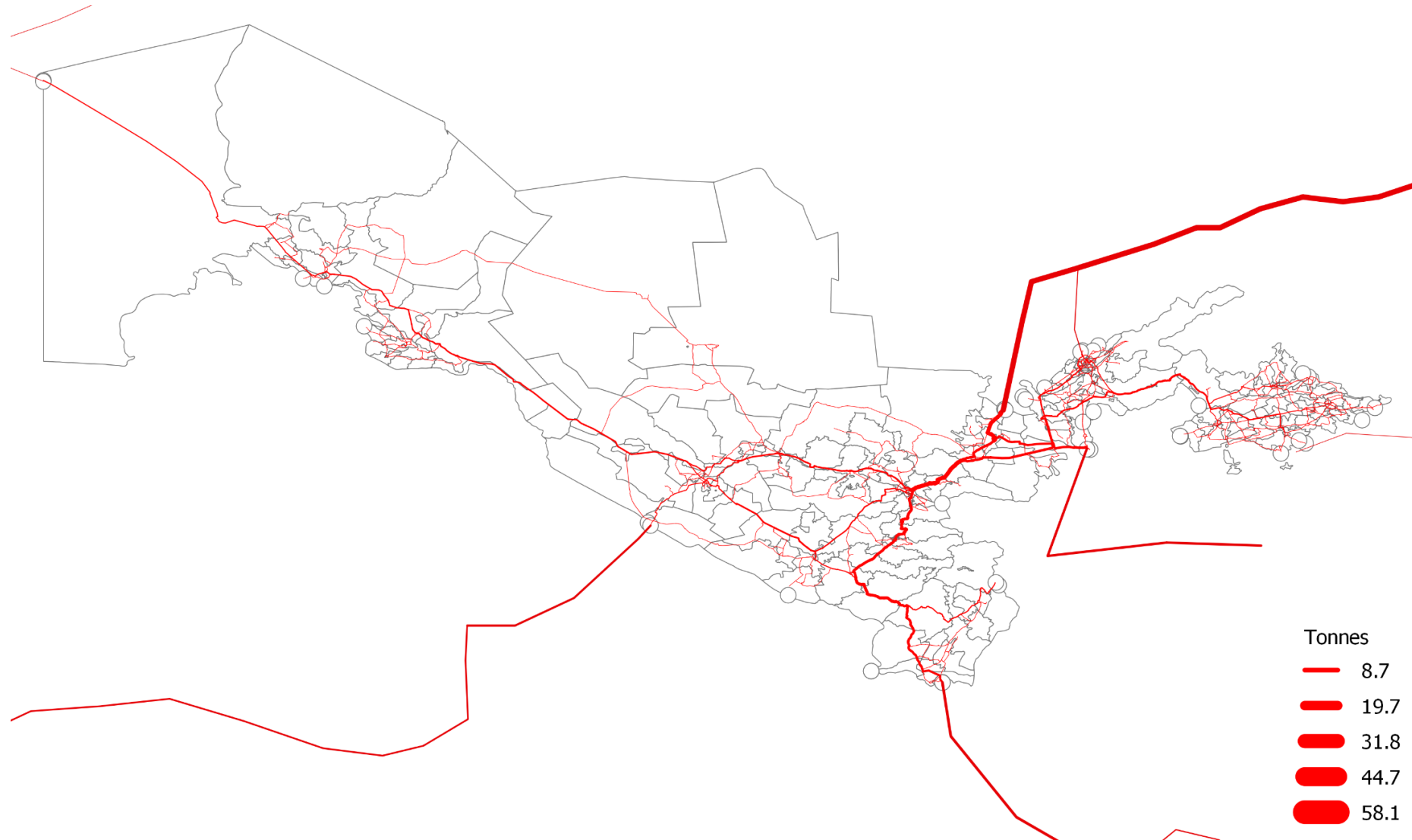
And long distances/high volume cross border freight routes

Making Uzbekistan dependant on logistics outside of the country

- Maritime nations benefit from a highly organized global marine system
- That organisation is tenuous for international land freight
- It is a problem in Central Asia
- It is a relative bigger problem for Uzbekistan

Land borders are highly inefficient and carbon intensive with high levels of waste.

A logistics "facilitator" role could be Uzbekistan's best opportunity

- Much like the Netherlands, but for inland flows

- A core connector in the BRI space

- Will require a complicated set of arrangements/agreements

- And different types of actors

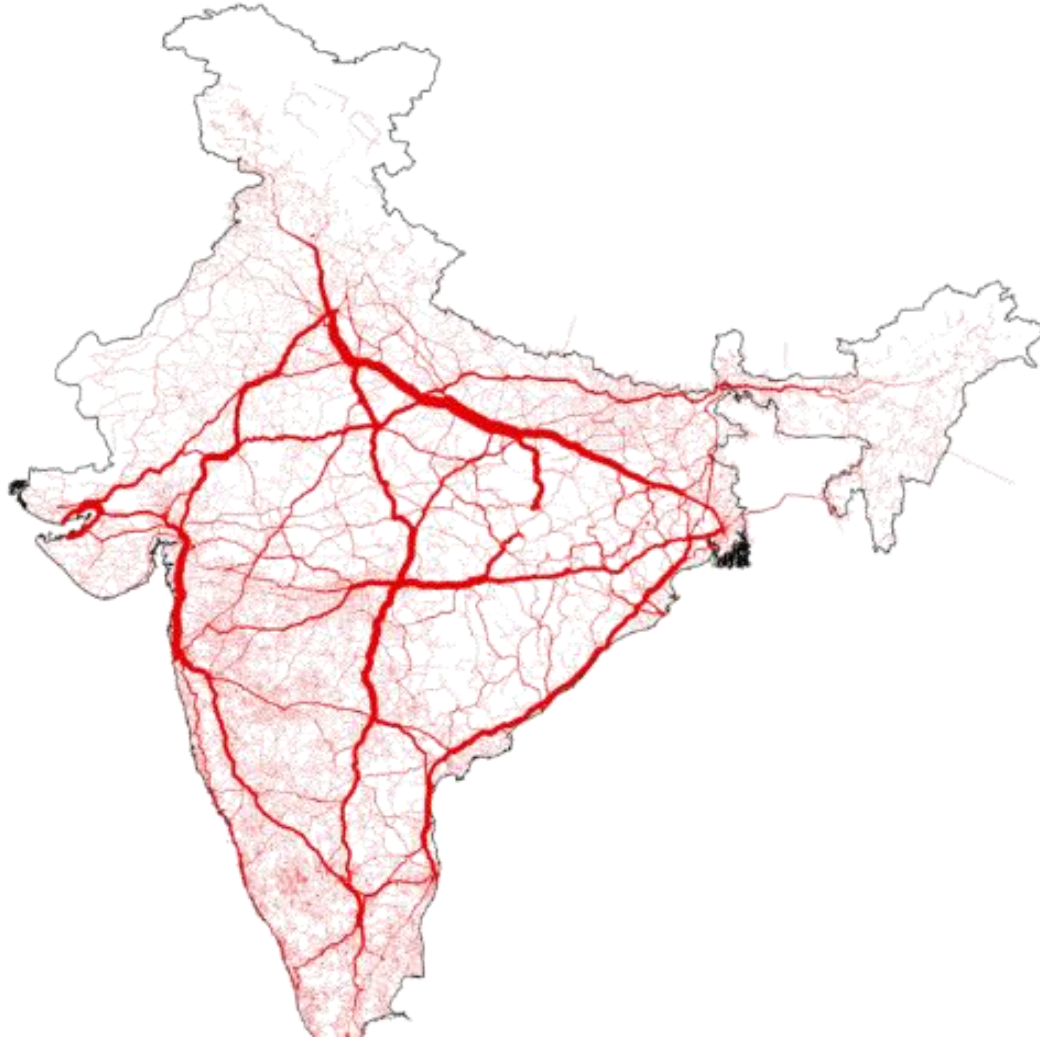Could only be facilitated by deep real time flow intelligence.

Developing world case studies

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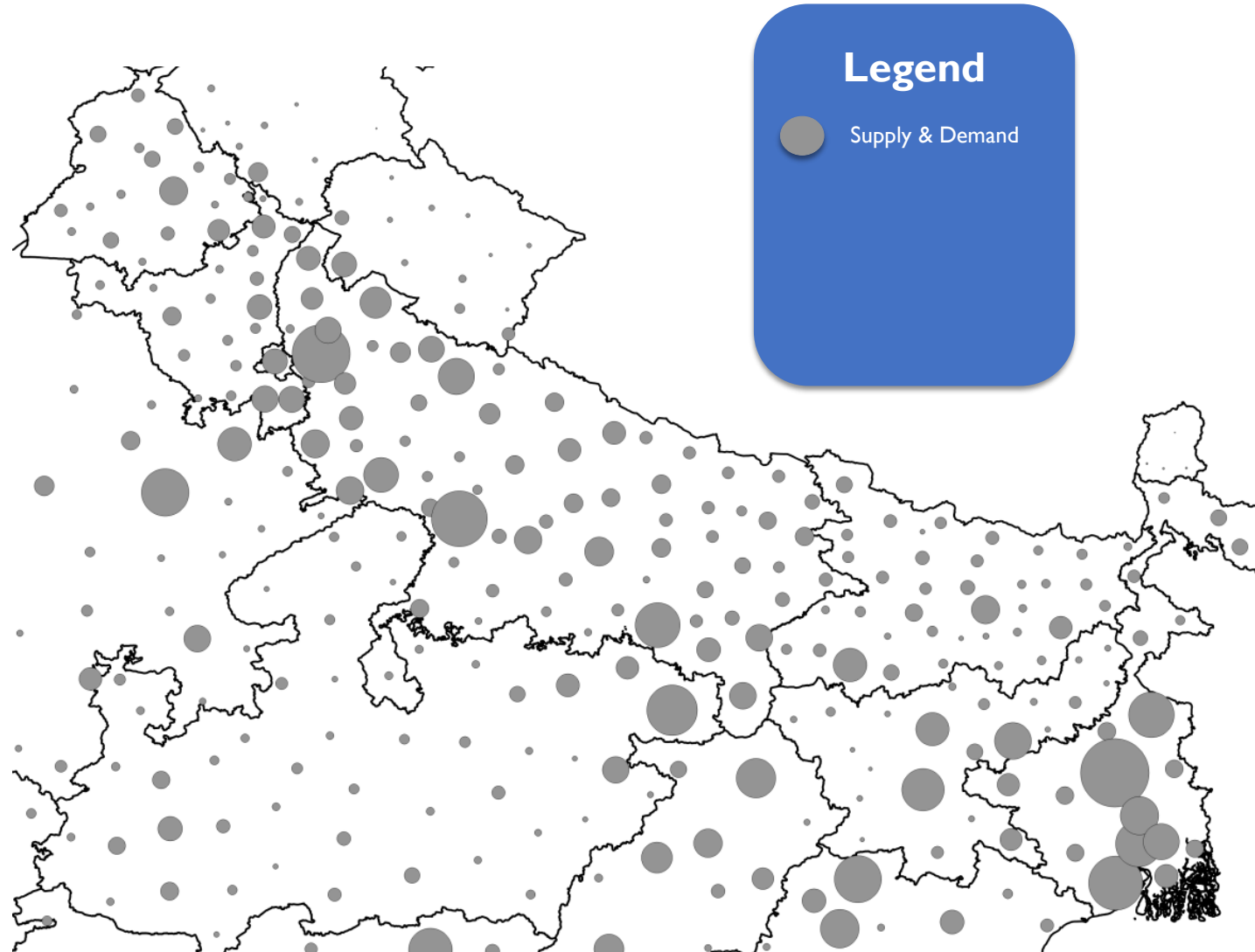
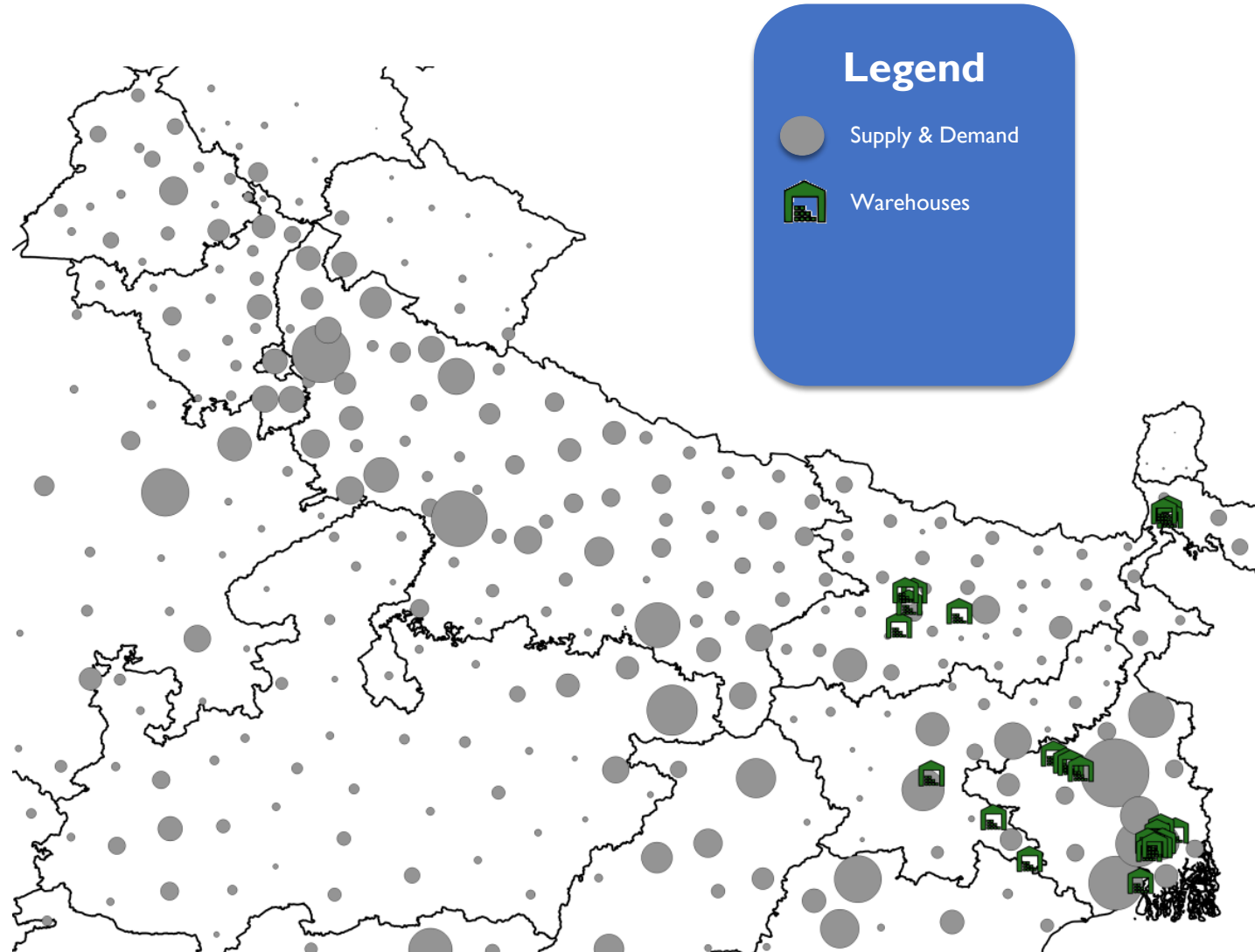# We've identified all freight flows in India

- 7 million unique flows

- To and from 638 districts (with ports and borders separate also)
  - 31 commodities
  - 3 modes
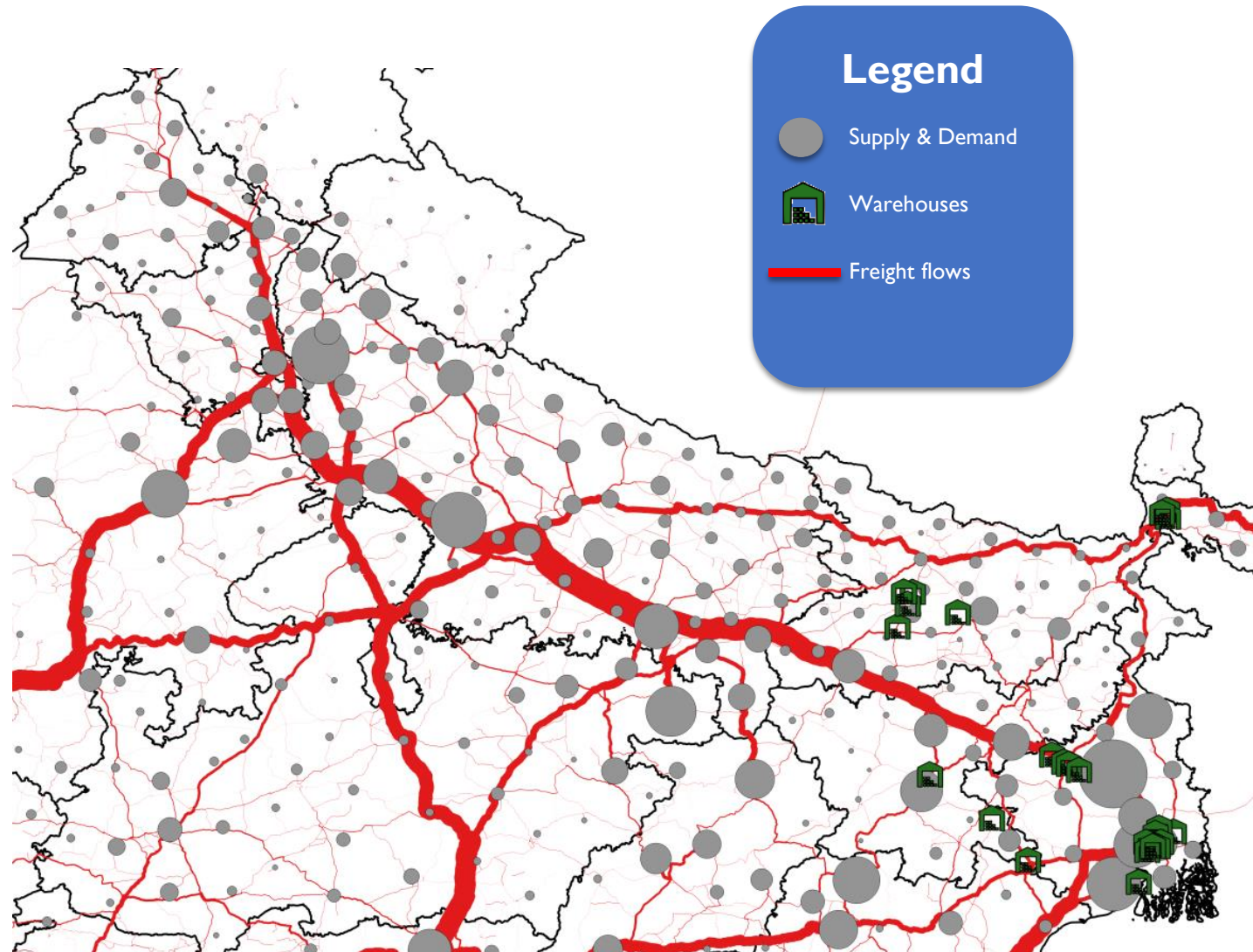 - ExIm and domestic

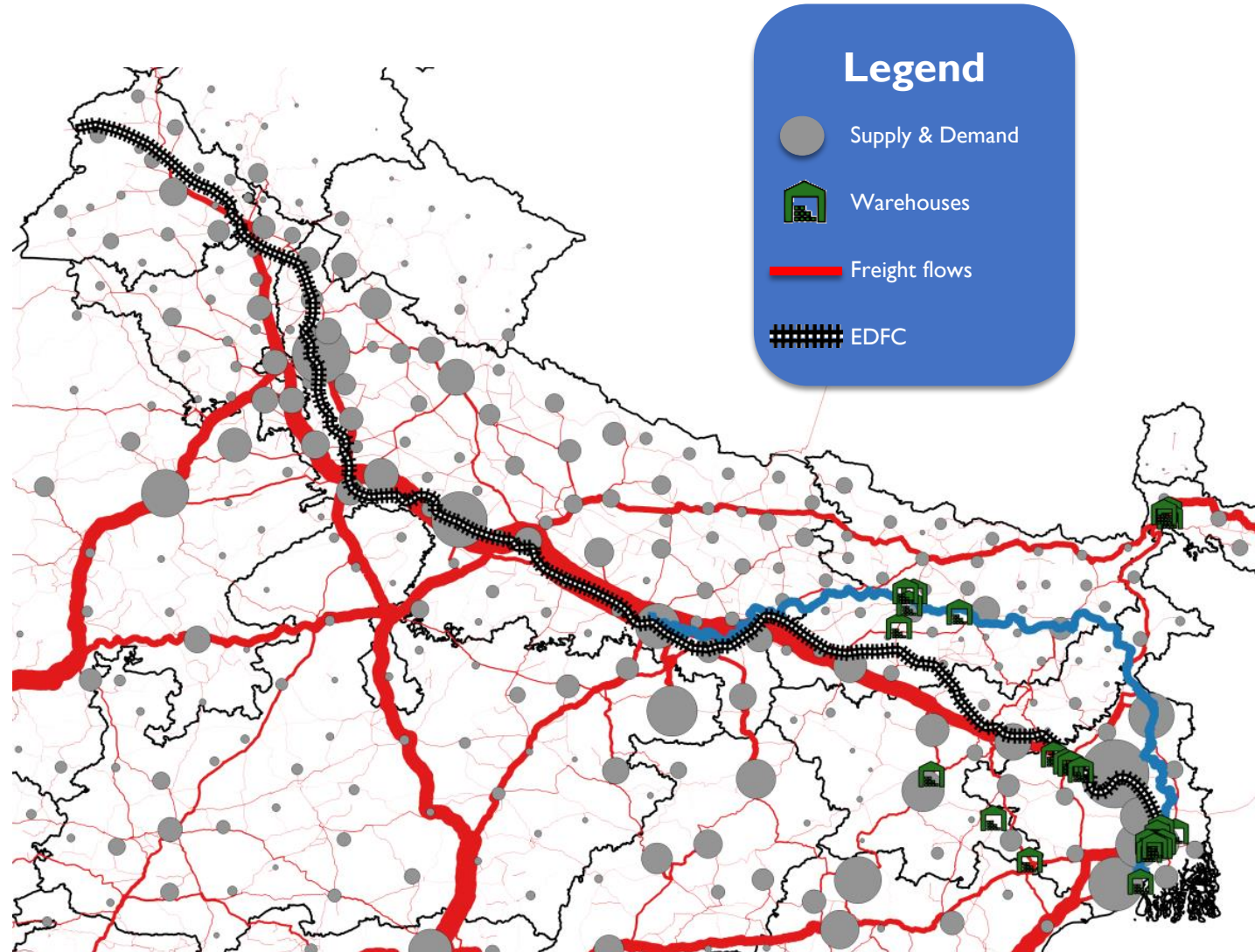# And then focused on the Eastern Corridor

Legend

Supply & Demand

Eastern Corridor

Eastern Corridor

Legend
- Supply & Demand
- Warehouses
- Freight flows

Eastern Corridor

Legend
- Supply & Demand
- Warehouses
- Freight flows
- EDFC

The problem is the gap between Dankuni and the city centre and port

Legend

Supply & Demand

Warehouses

—— Freight flows
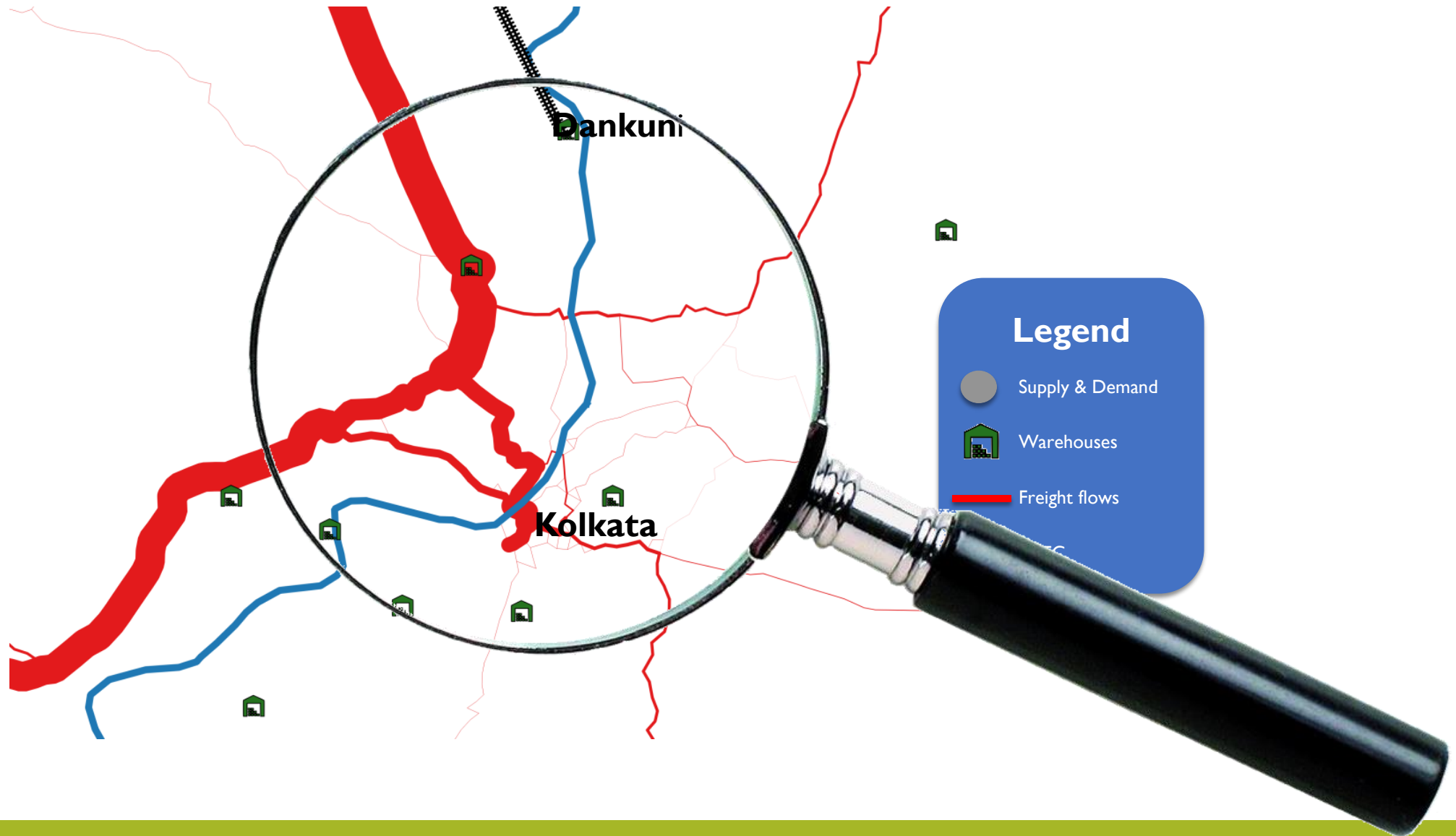
Combined extended gate/domestic intermodal terminal proposal
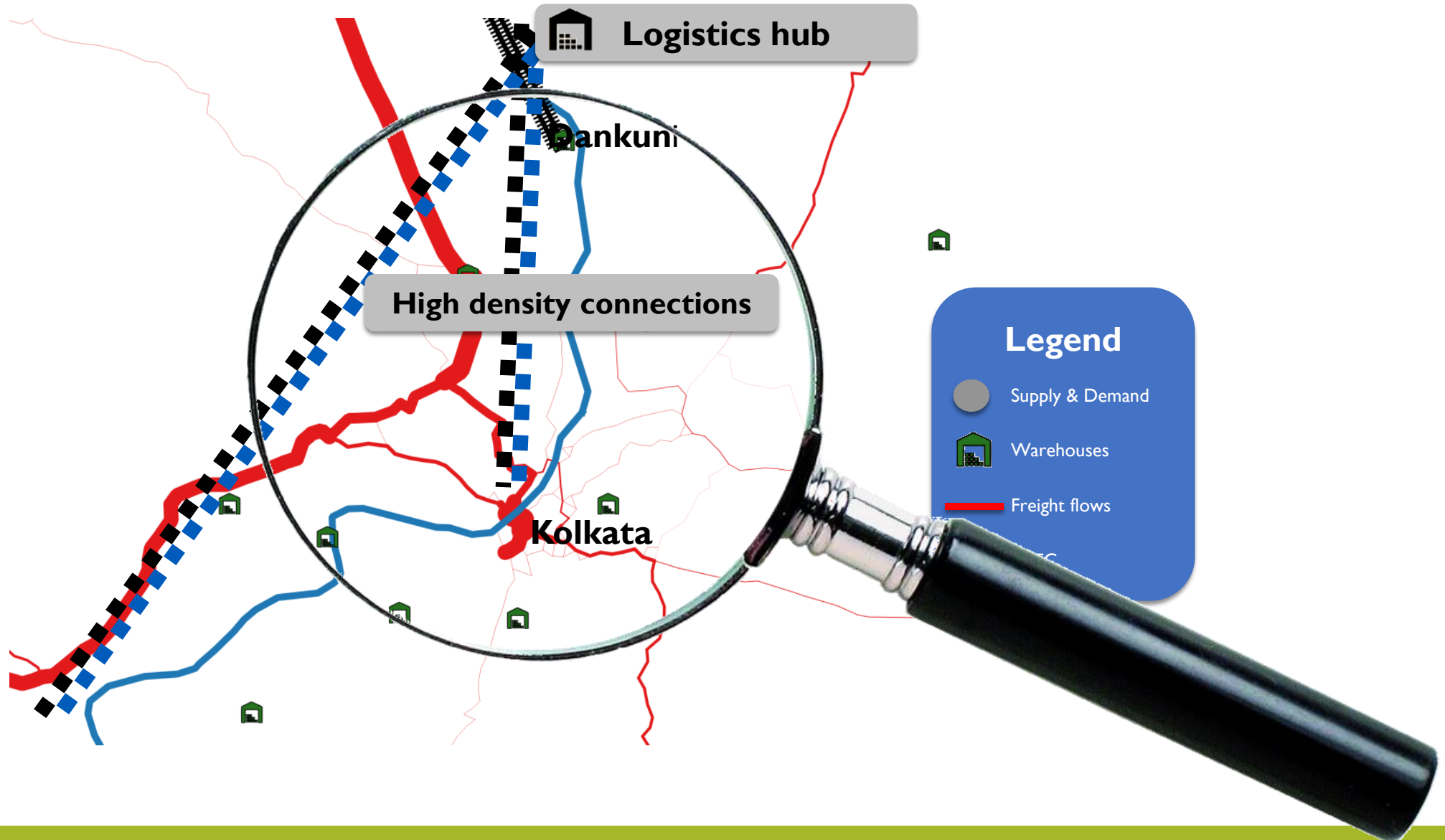
Eastern Corridor savings potential*
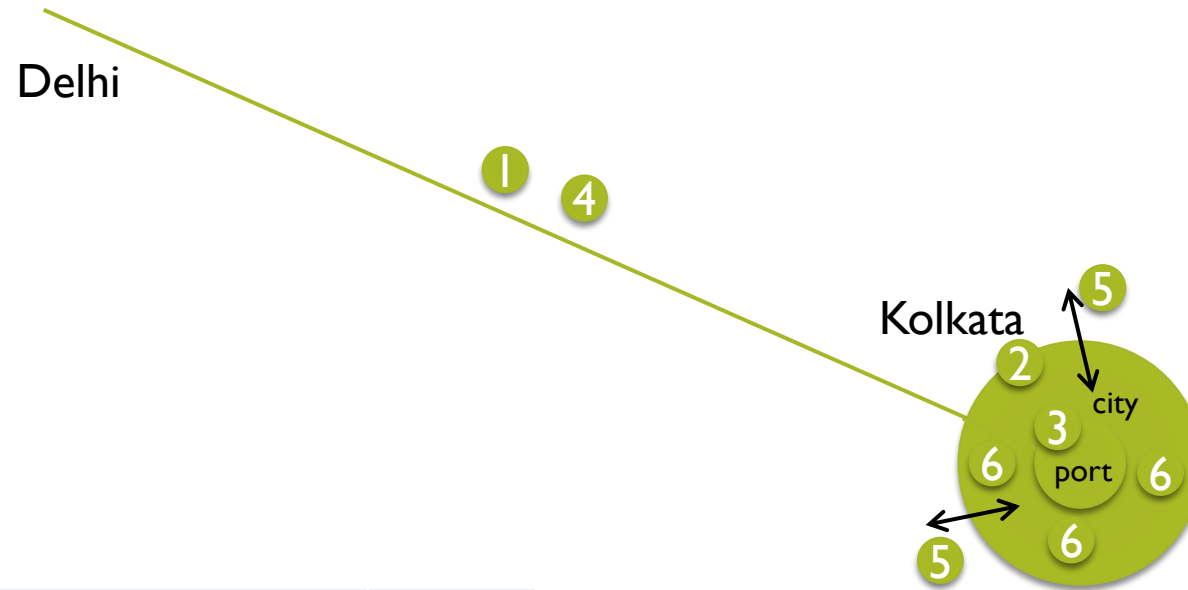
Delhi

Kolkata

city

port

*These results are best estimates based on current data available. With further data these estimates will be improved.

Eastern Corridor savings potential of $3 billion

US$ Millions

The dedicated corridor can save US$1.1 billion for freight that origins and destins on the corridor

The real potential is the additional US$1.9 billion that can be save with a well designed logistics hub and port connectivity and city logistics

38%

5%
24%
19%
1%
13%

Dedicated freight corridor

Logistics hub and dedicated link

Only 38% of DFC potential will be achieved with current design
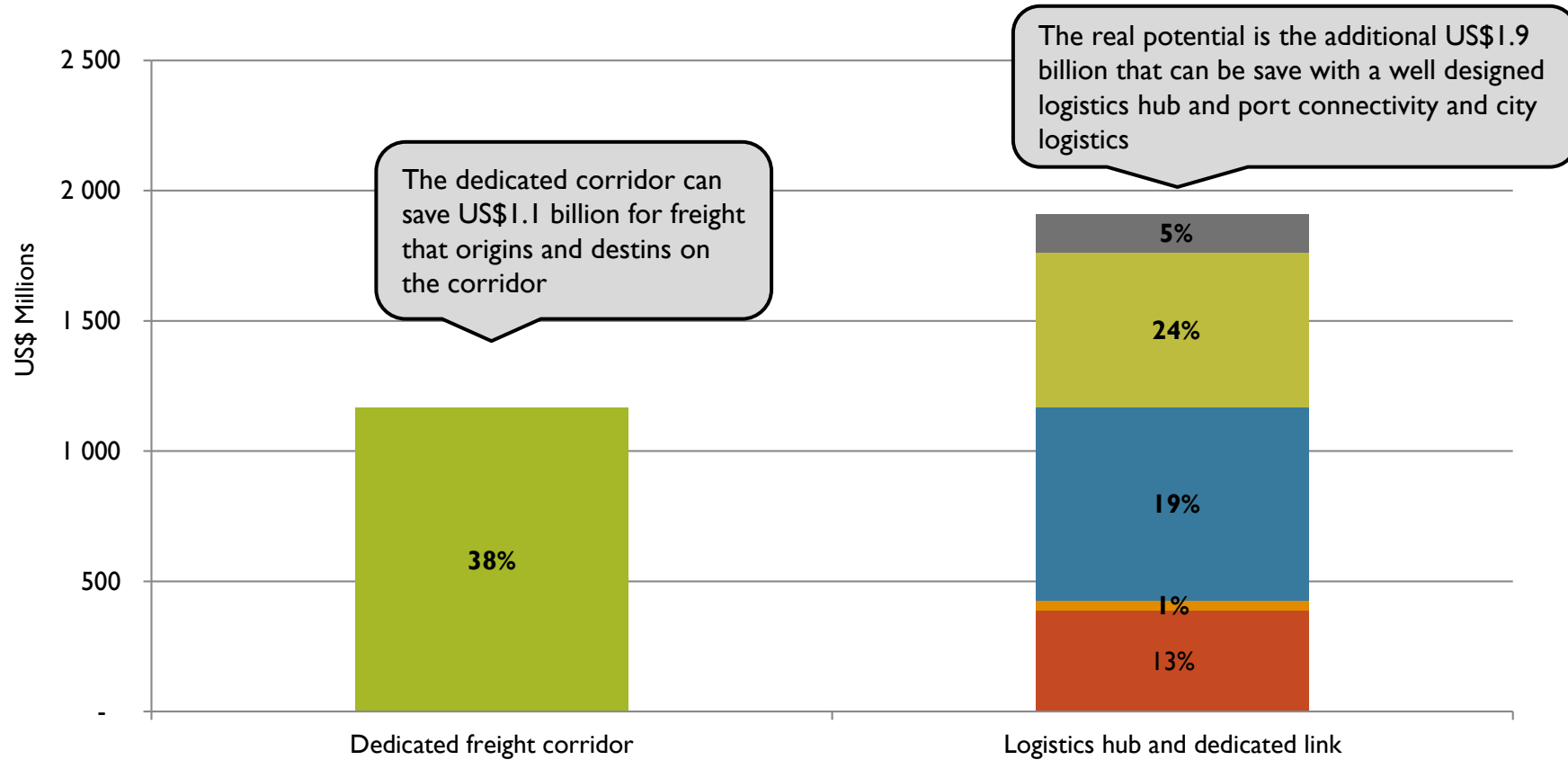
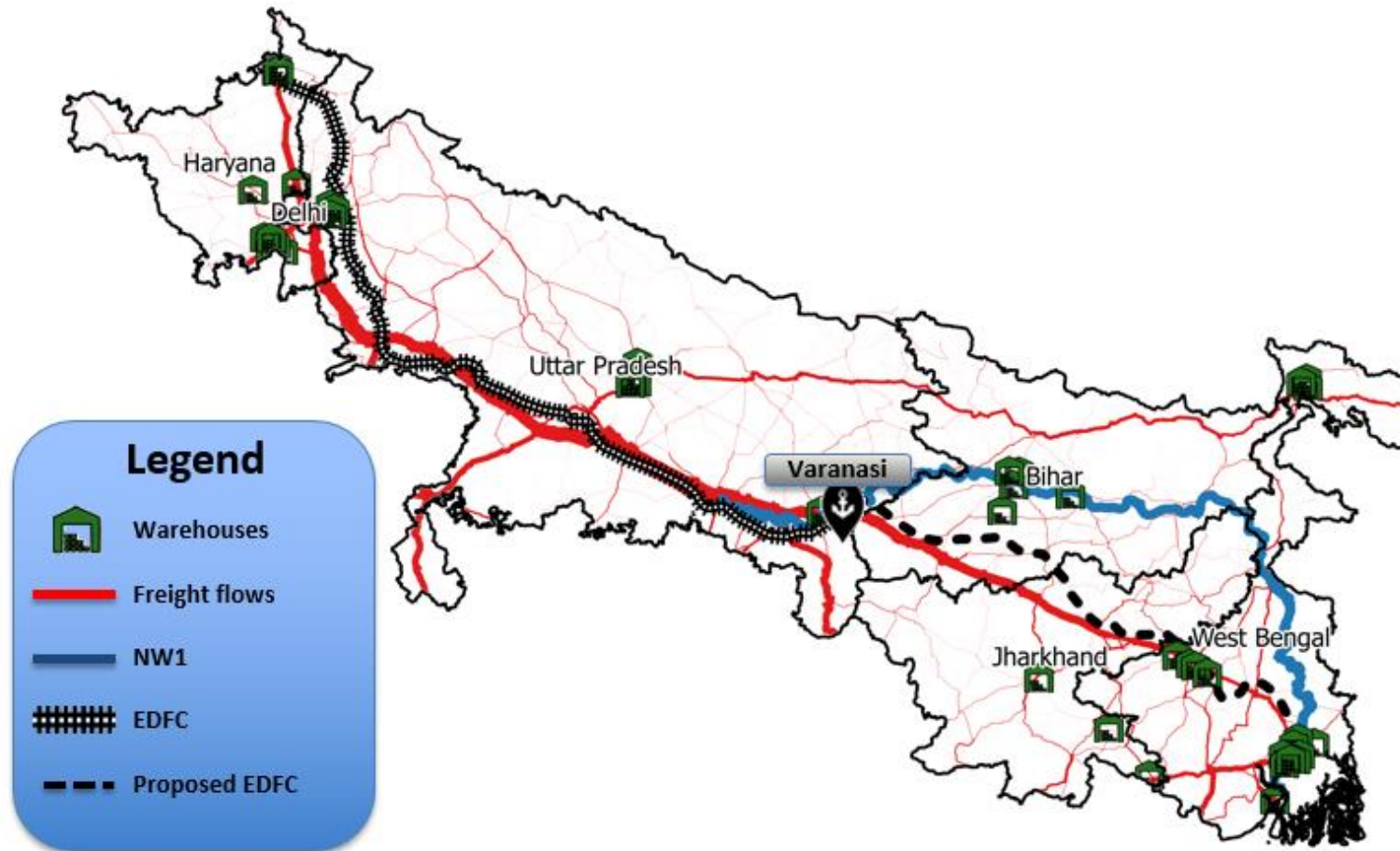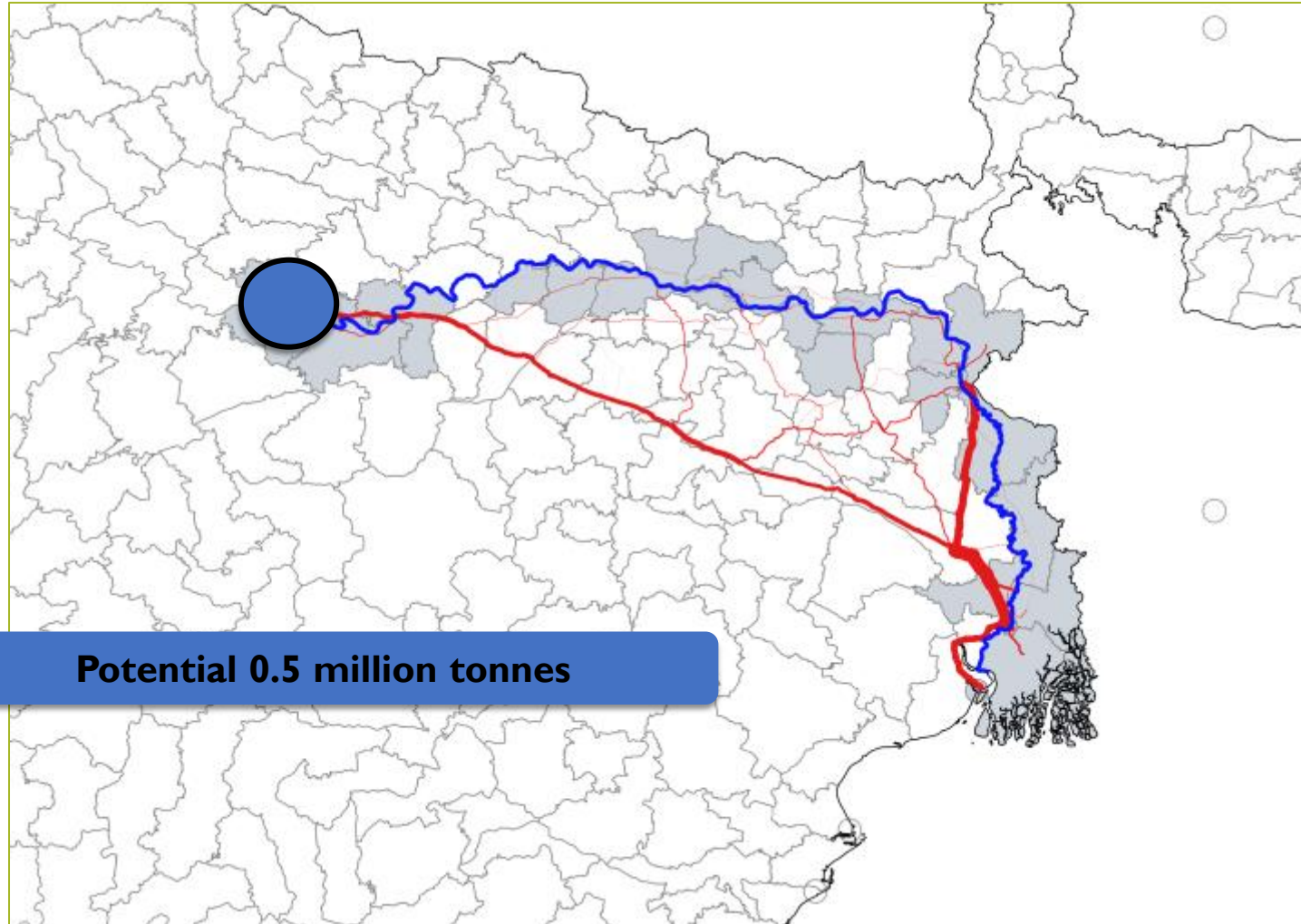*These results are best estimates based on current data available. With further data these estimates will be improved.

Varanasi is centrally located on the National Waterway 1 that is currently being developed and halfway of the dedicated rail freight corridor
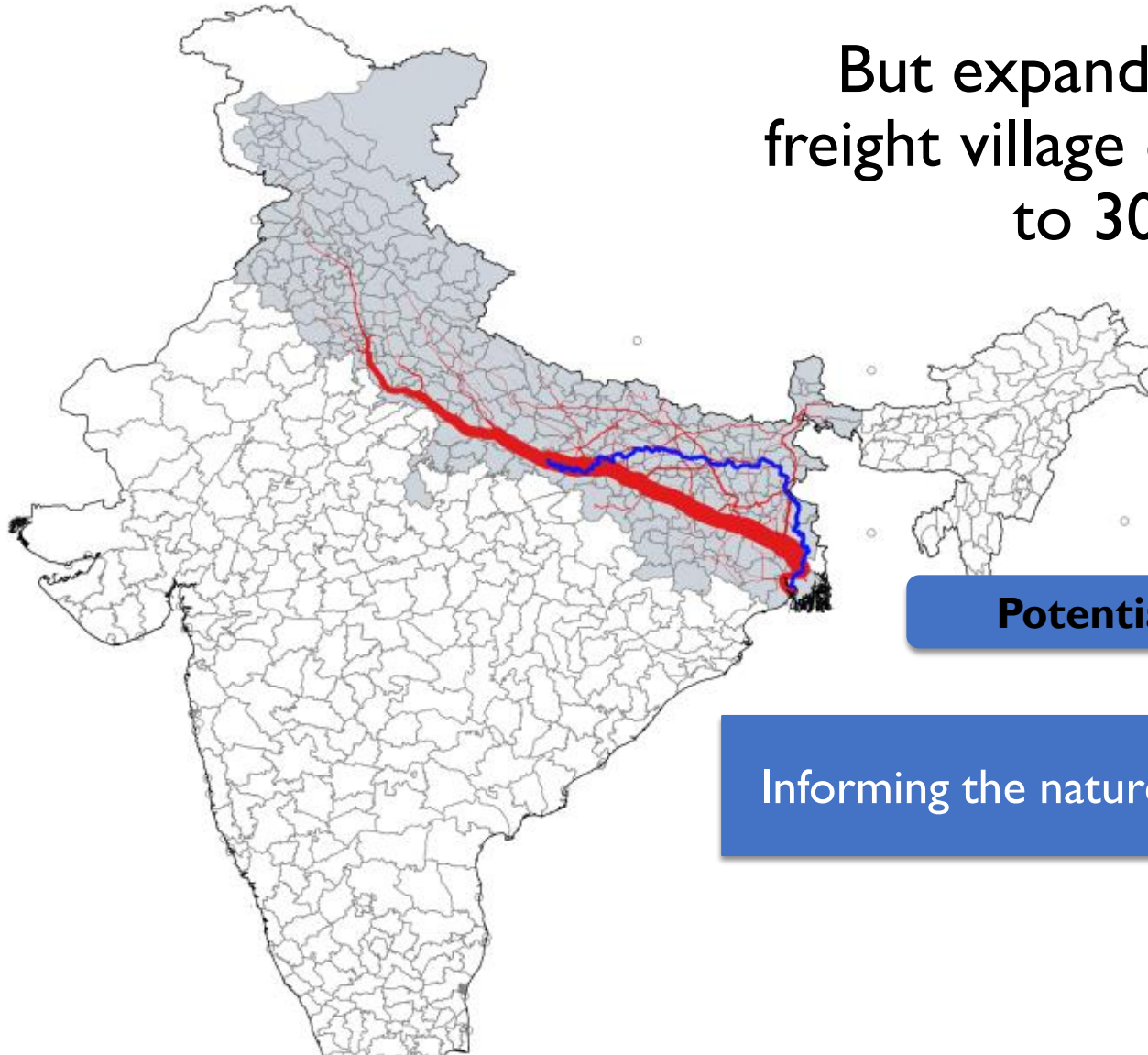
We've identified waterway potential along NWI

Potential 0.5 million tonnes

But expanded thinking towards a freight village can extend the potential to 30 million tonnes

Potential 30 million tonnes

Informing the nature of the changed design approach

The freight village concept is relatively new in the developing world.
It decreases freight demand for the same relative output.

Various actors will have to cooperate

- Kolkata Port Trust

- Waterway authority

- Shipping, railway, highway and commerce ministries

- Logistics service providers

- Industry

The opportunity identified by intelligence, which is also the only way to facilitate it

Developing world case studies

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- Sustainable herding in Mongolia
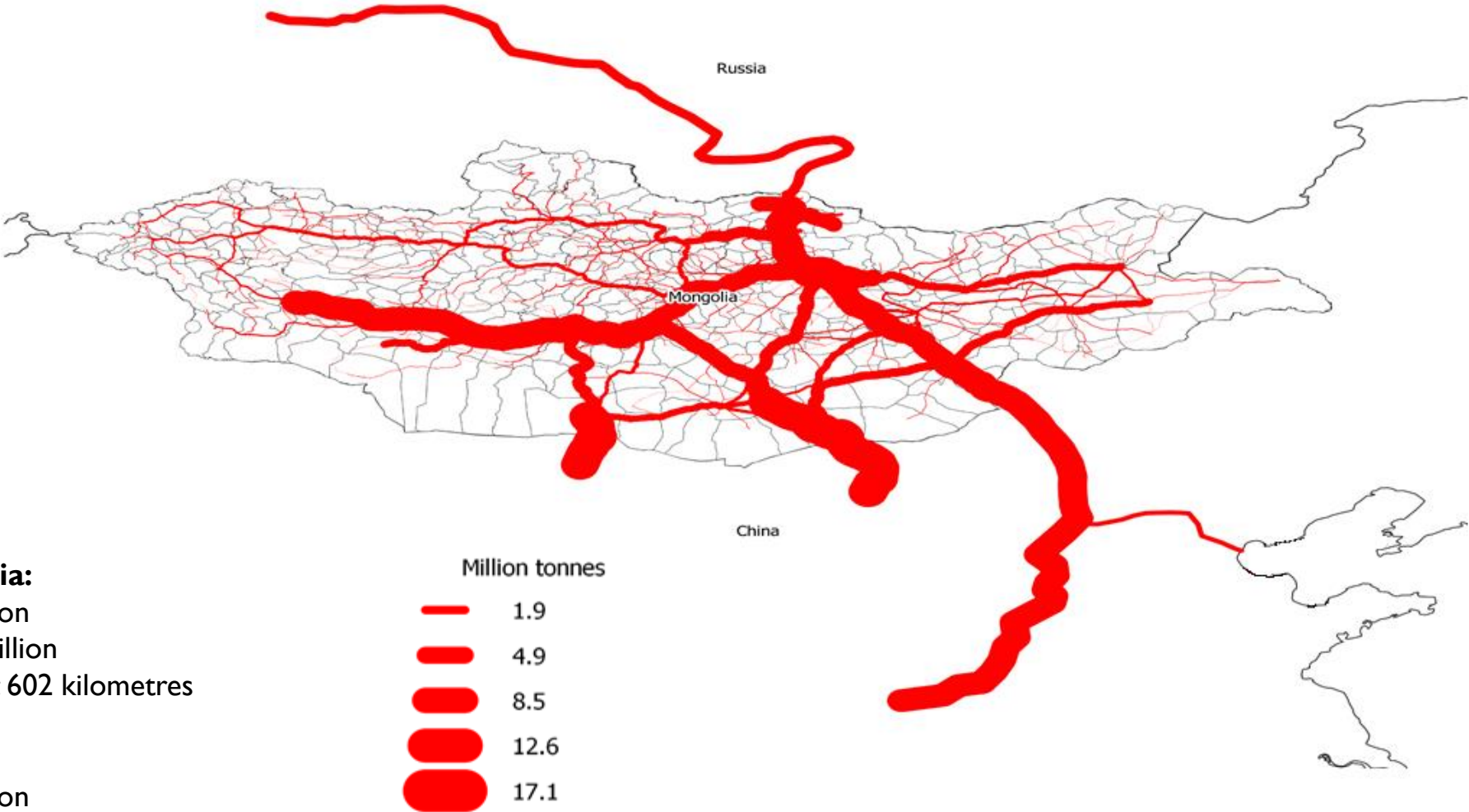
- Regional value chains in the Horn of Africa

Transport distances are vast
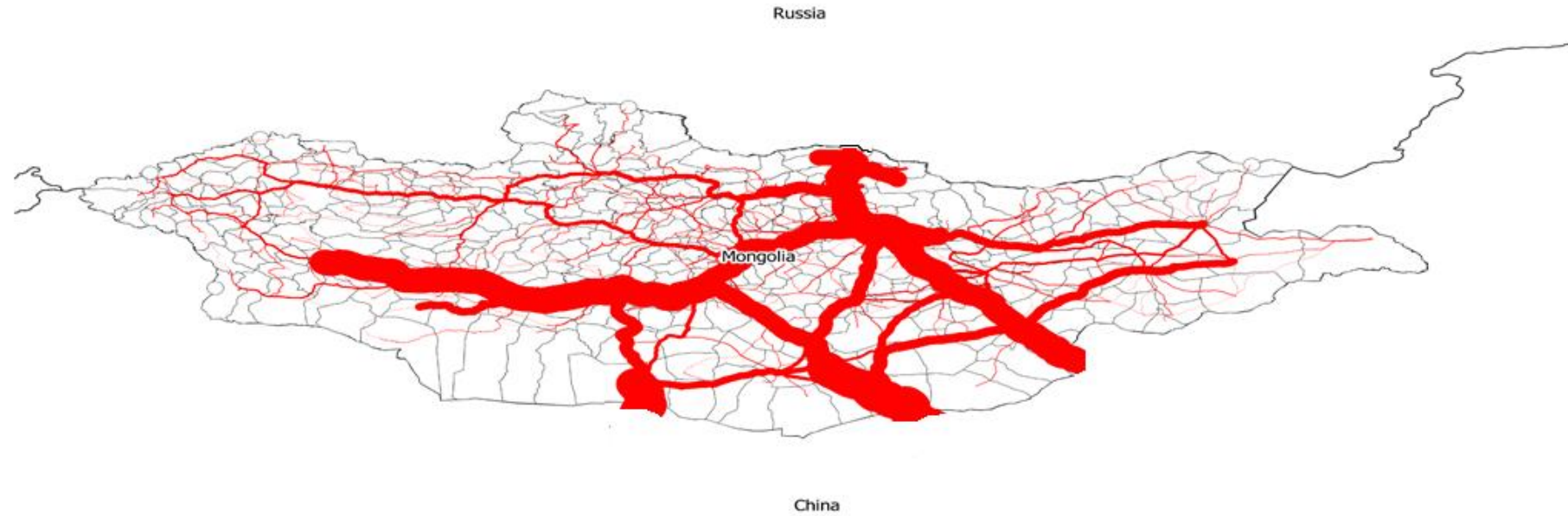
Within Mongolia:
Tonnes: 67.4 million
Tonne-km: 40.6 billion
Average distance: 602 kilometres

Million tonnes
1.9
4.9
8.5
12.6
17.1

Mongolia is also highly dependant on freight flows outside of its borders

Within Mongolia:
Tonnes: 67.4 million
Tonne-km: 40.6 billion
Average distance: 602 kilometres

Post Border:
Tonnes: 45.7 million
Tonne-km: 17.9 billion

Million tonnes

— 1.9

— 4.9

— 8.5

— 12.6

— 17.1

We used our freight flow, spatial and economic data to look at 7 options to improve conditions

✓Investments with dual objective of highest possible GDP and

improved logistics cost as % of GDP ratio

Sector	Industry	National Log cost as % GDP, will change from 24.7% to:	% GDP growth
Primary	Coal export	21.9 %	13.8 %
	Iron ore export	24.1 %	3.5 %
Secondary	Meat optimization	19.7 %	26.5 %
	Other animal products	22.9 %	10.5 %
	DRI	20.1 %	31.0 %
Tertiary	Tourism	24.6 %	0.4 %
	Transit traffic	24.1 %	2.9 %

Targeted investments in meat and iron beneficiation infrastructure have highest potential to accelerate growth and reduce logistics costs.

We used our freight flow, spatial and economic data to look at 7 options to improve conditions

✓Investments with dual objective of highest possible GDP and improved logistics cost as % of GDP ratio

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Targeted investments in meat and iron beneficiation infrastructure have highest potential to accelerate growth and reduce logistics costs.

Status quo of the meat industry

The total number of livestock is estimated at **70 969 315** thousand by 2019

4 214 818

4 753 192

472 379

32 267 265

29 261 661

Total number of livestock 1970 – 2019

Source : National Statistical Office

22 574.7 24 313.5 22 942.1 23 771.4 23 570.3 22 644 24 674.9 25 694.1 31 292.3 30 227.5 26 075.3 28 028 34 802.9 40 263.8 43 288.5 32 729.5 36 335.8 40 920.9 45 144.3 51 982.6 55 979.8 61 549.2 66 219 70 969.3

Number of livestock

Missing Value
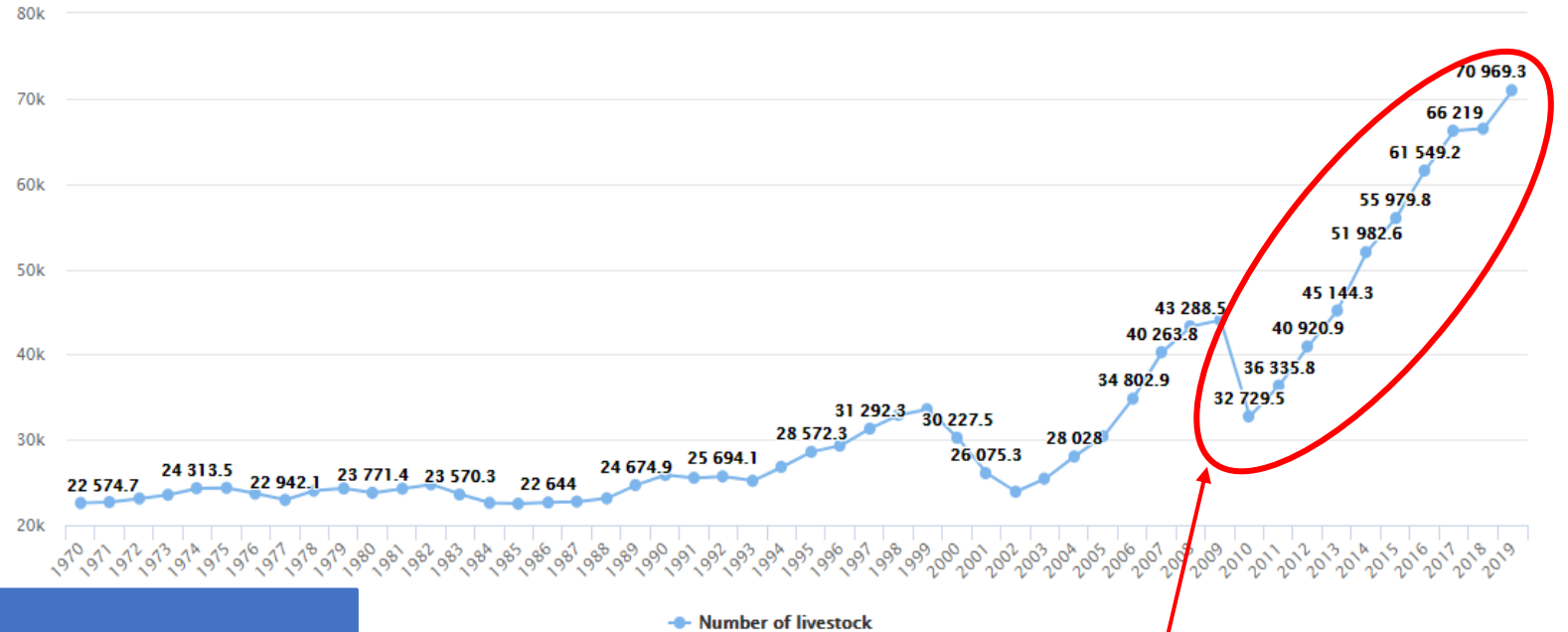
Multiple reasons:
1. Underdeveloped animal health and breeding systems
2. Lack of proper management of pastureland
3. Competition and lack of certification and branding
4. Inadequate regulations and formal market mechanisms
5. Poor transport connectivity and logistics system
6. Trading and marketing platform (supply & demand mismatch)
7. Private sector investment climate

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# Potential to achieve the $1 billion national target (Vision 2030 goal)

- **Increase in processed meat export:**
  - 250 000 tonnes
  - $858 million value

- **The increase is possible due to:**
  - Animal health and services
  - Better facilities to yield more meat per animal
  - Lower wastage and loss
  - Increased value-added services
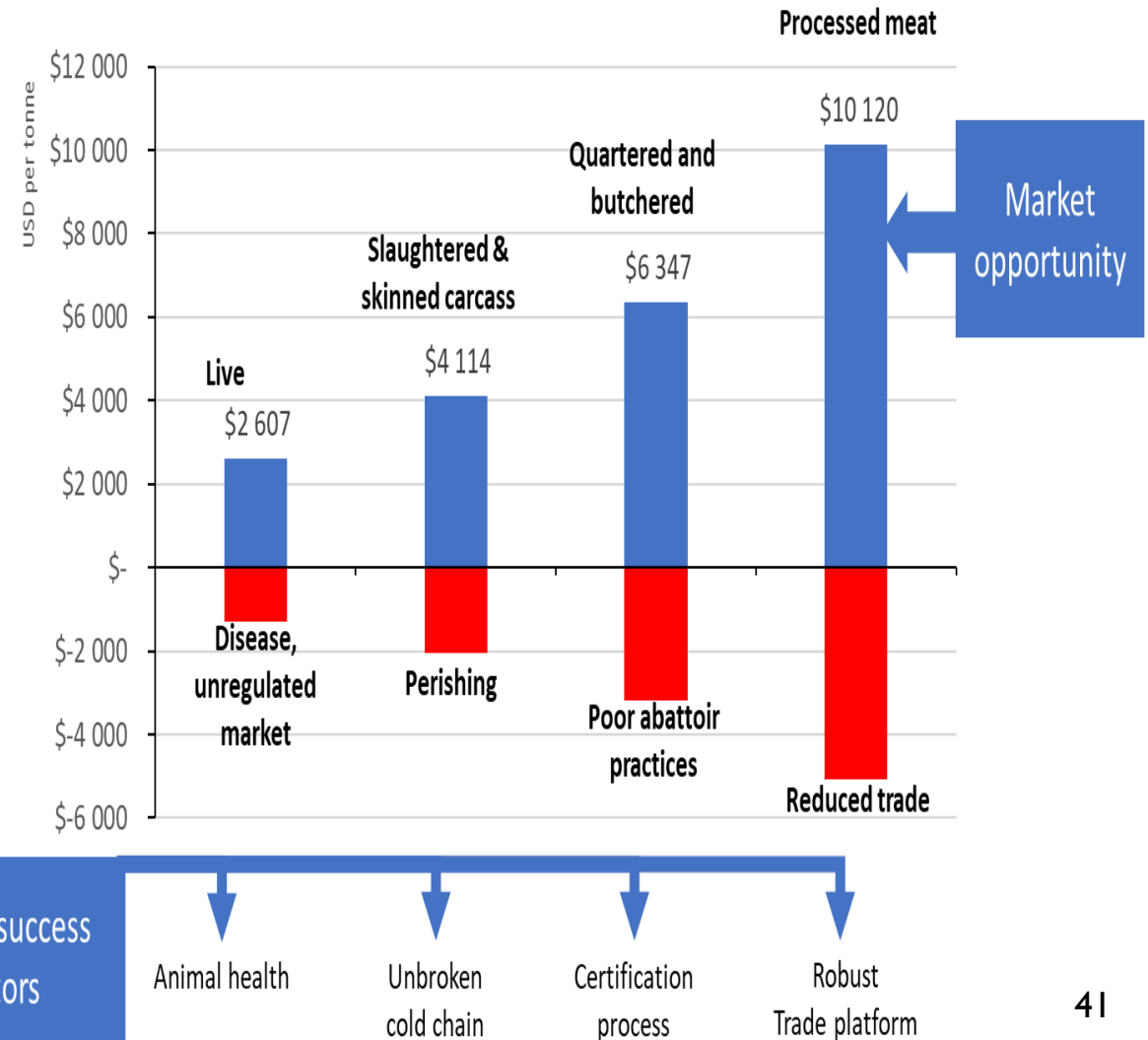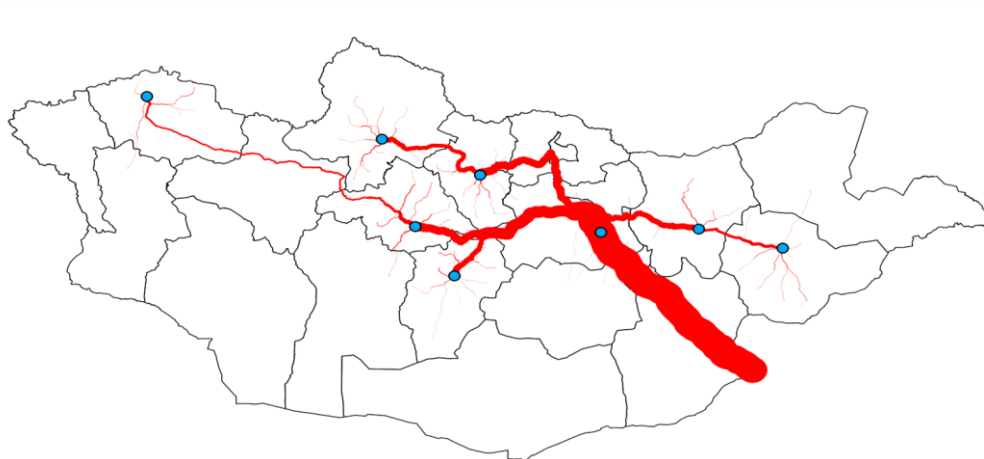 - Access to markets for premium traded meat.

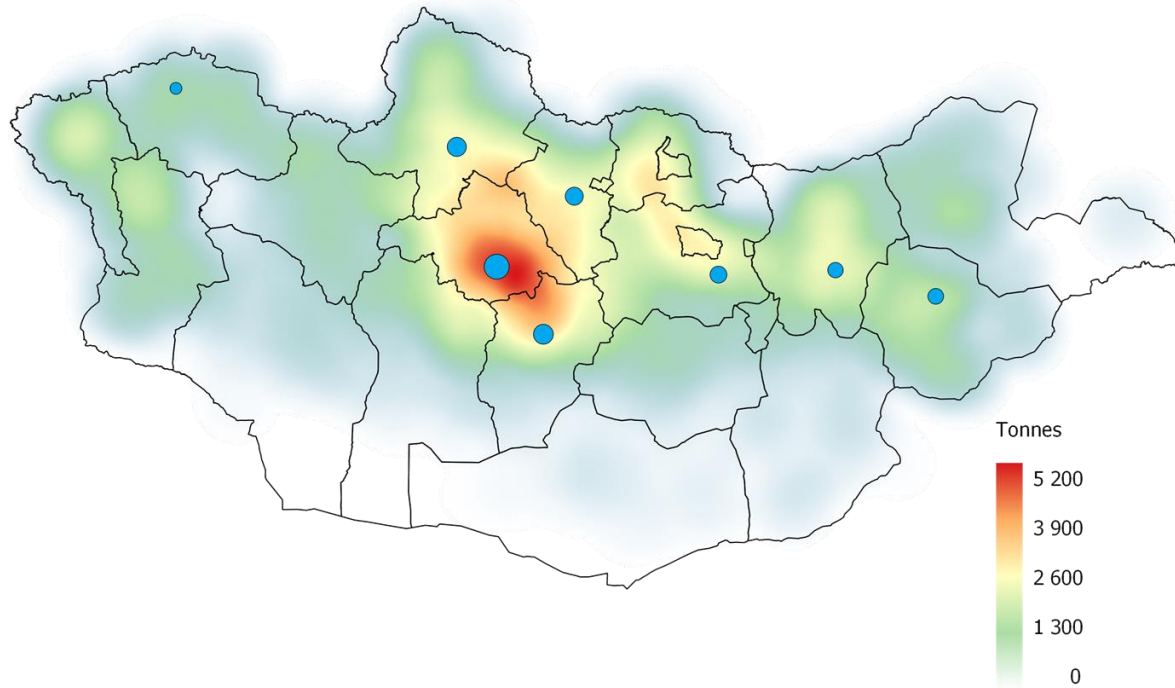# Supply chain densification of the meat value chain unlocks missing value

Current flows of meat
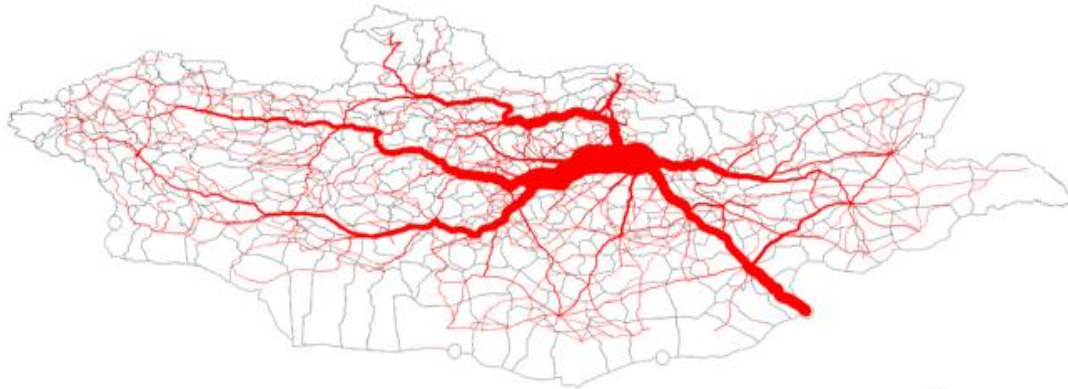
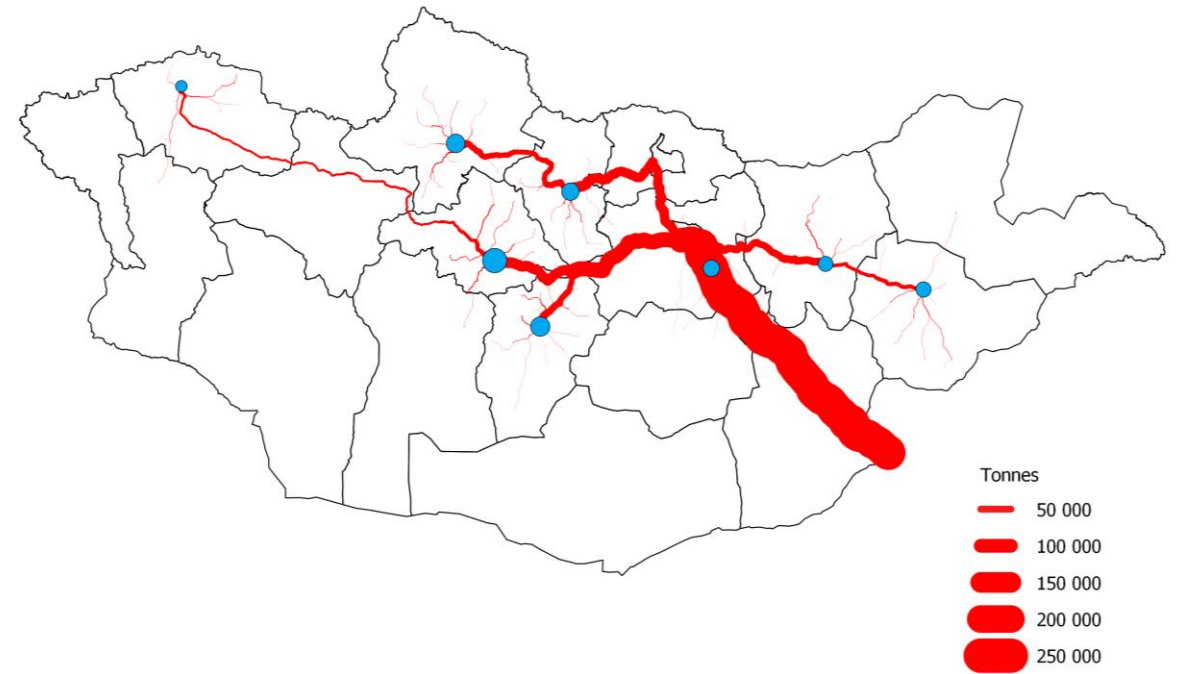Consolidated and clustered flow of meat

Placement of hubs to efficiently unlock value and provide dependable supply
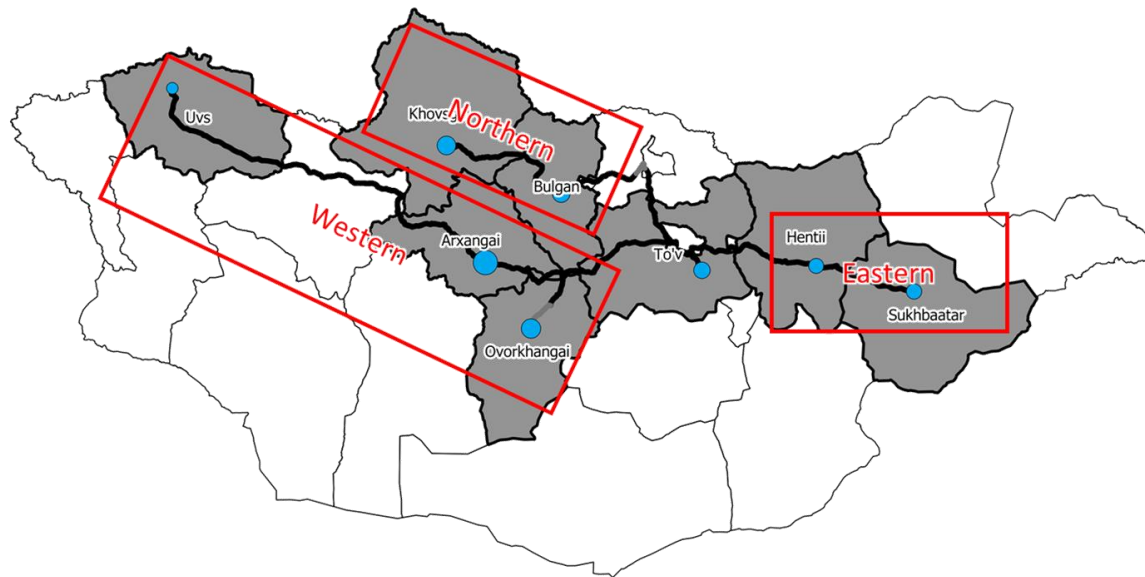

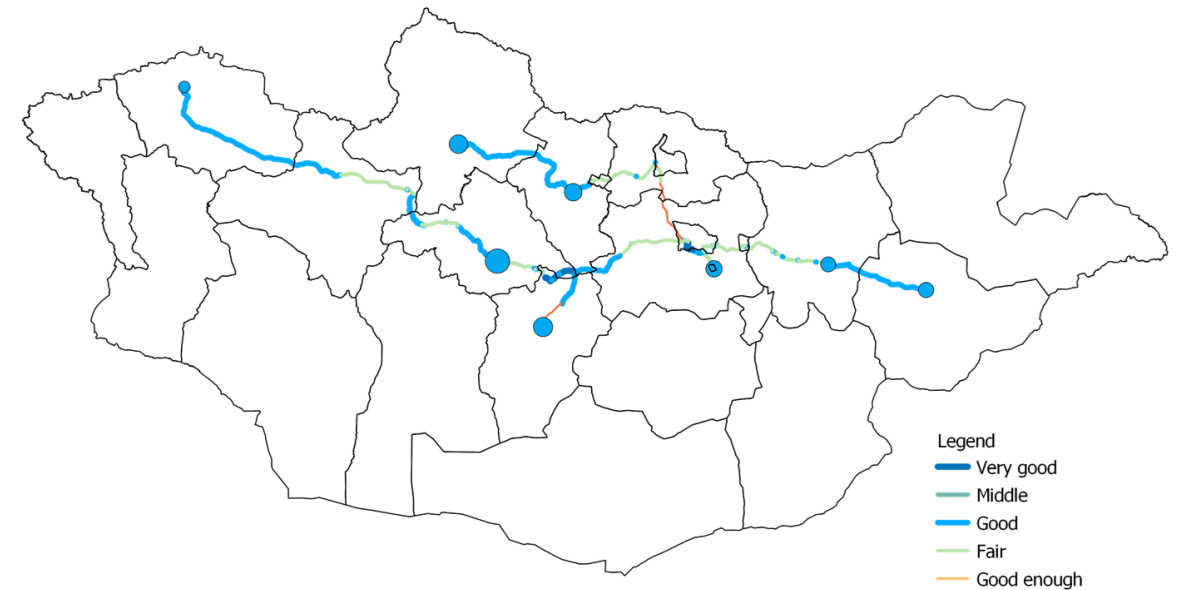Potential meat supply

Potential flow of 250 000 tons of meat

Investment should aim to establish hubs and upgrade the connecting road sections in a bad condition and maintain sections in good to very good condition

Road infrastructure

Road infrastructure condition

Massive growth, cost savings and emissions relative to output can be achieved.

The most important, however, is significant higher yield from the national herd, reducing manure induced carbon release per tonne of meat produced.

# Full project focus is the creation of a meat trading platform

- "UB1" meat will certify
  - Unbroken cold chain
  - Sustainable herding
  - Real free range

- But it will require
  - Stable trading platform
  - Stitches all the elements together

Developing world case studies

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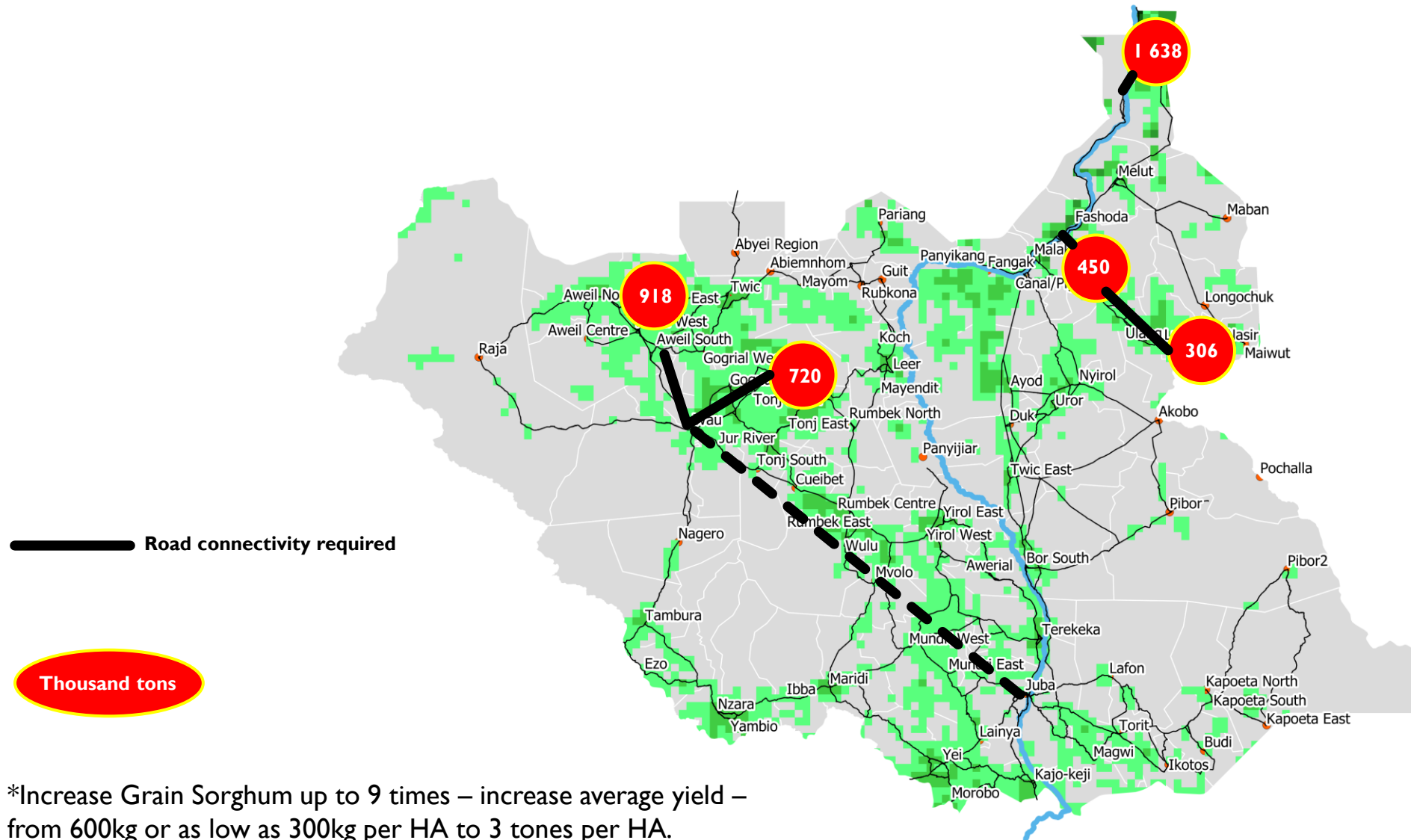- Regional value chains in the Horn of Africa

Roads that could unlock agriculture potential
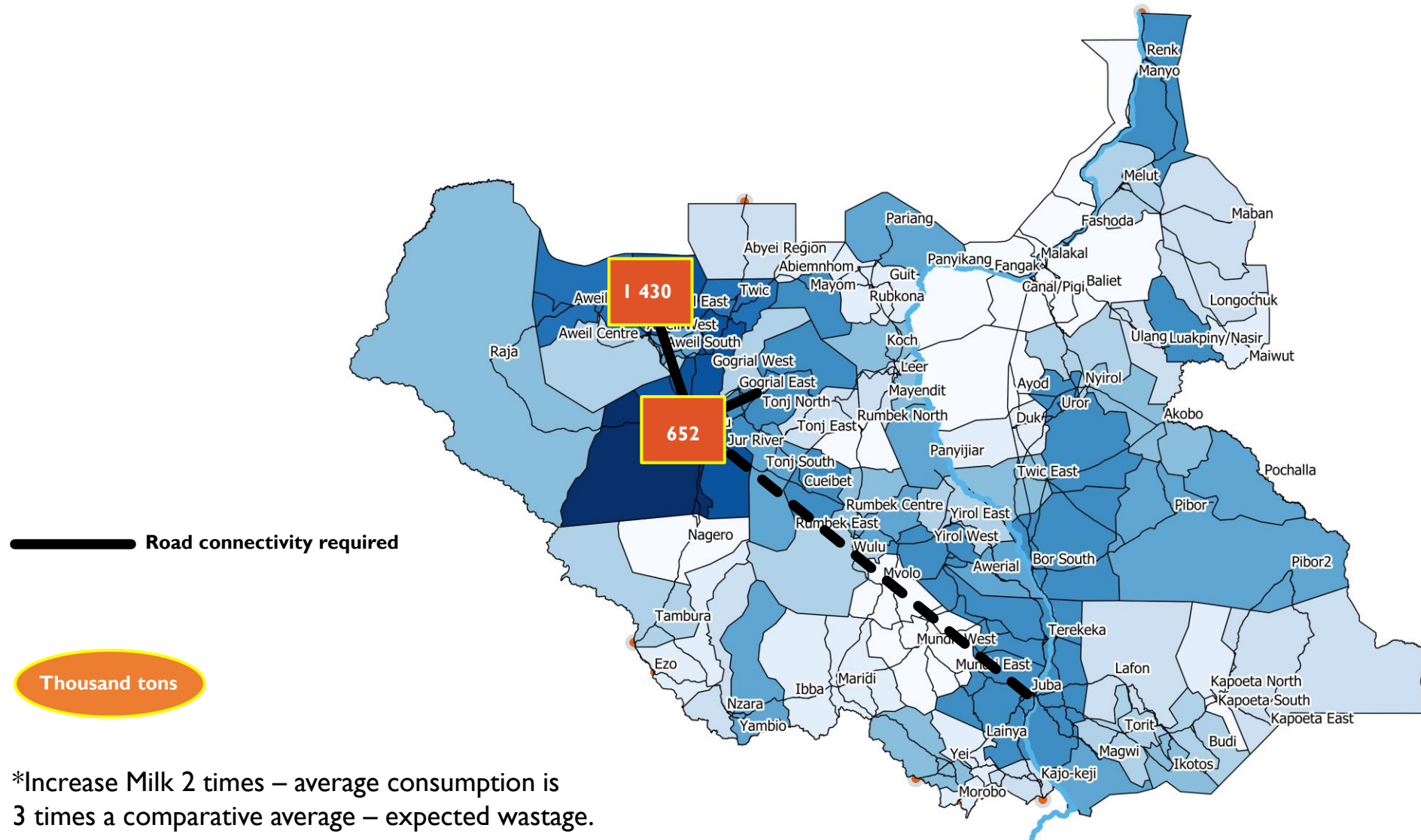
Supply

Demand
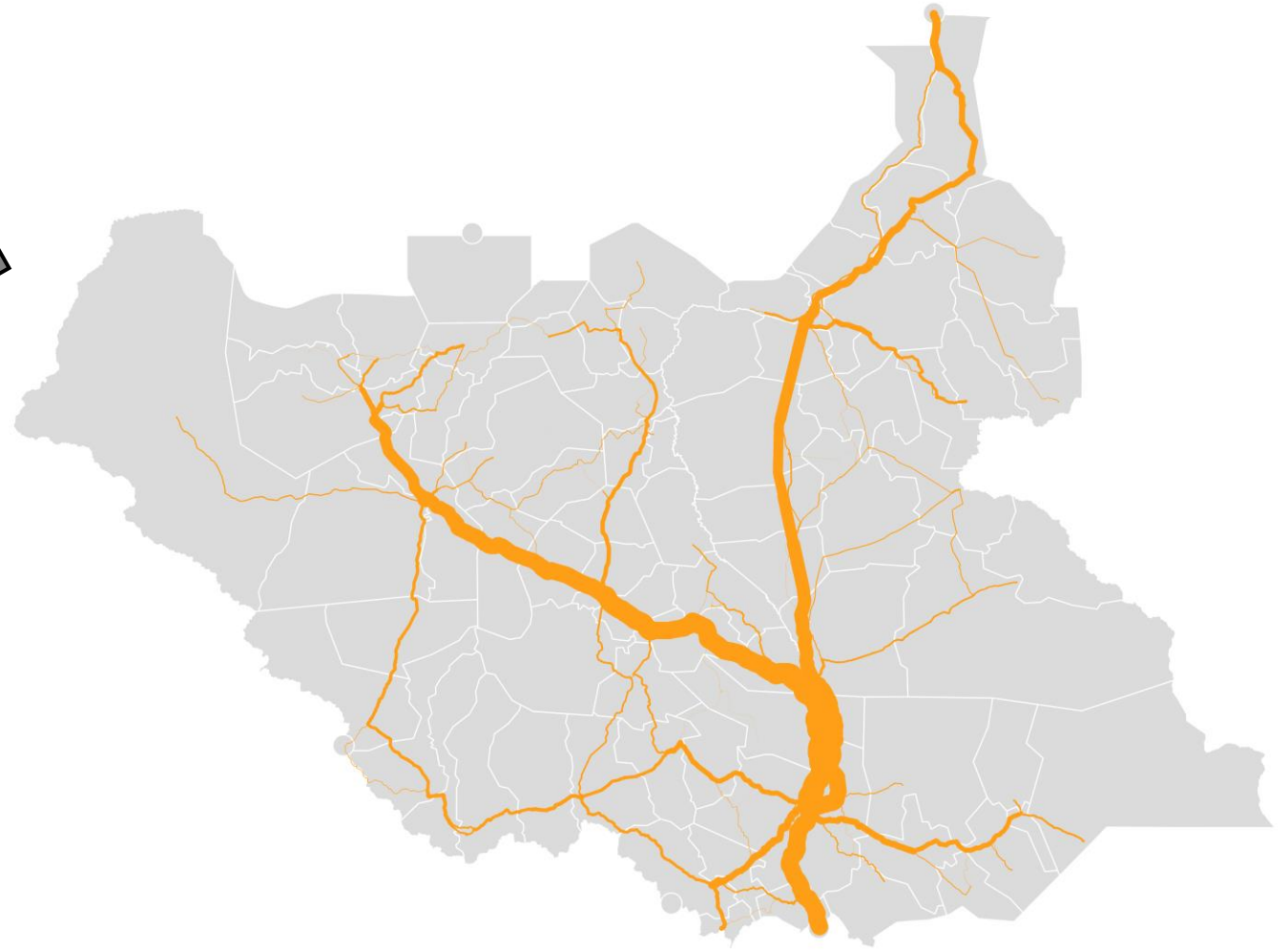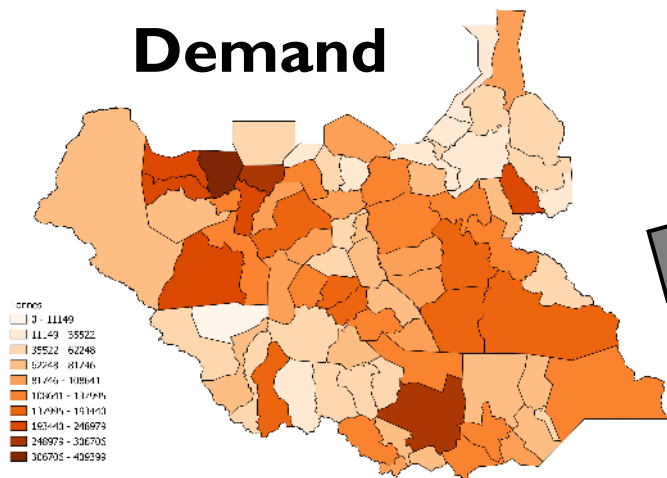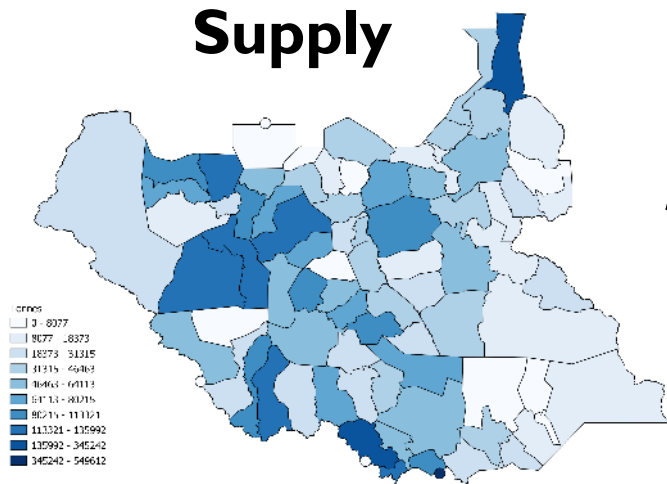
Grain Sorghum value chain - production

Grain Sorghum value chain - production - *<u>potential</u>
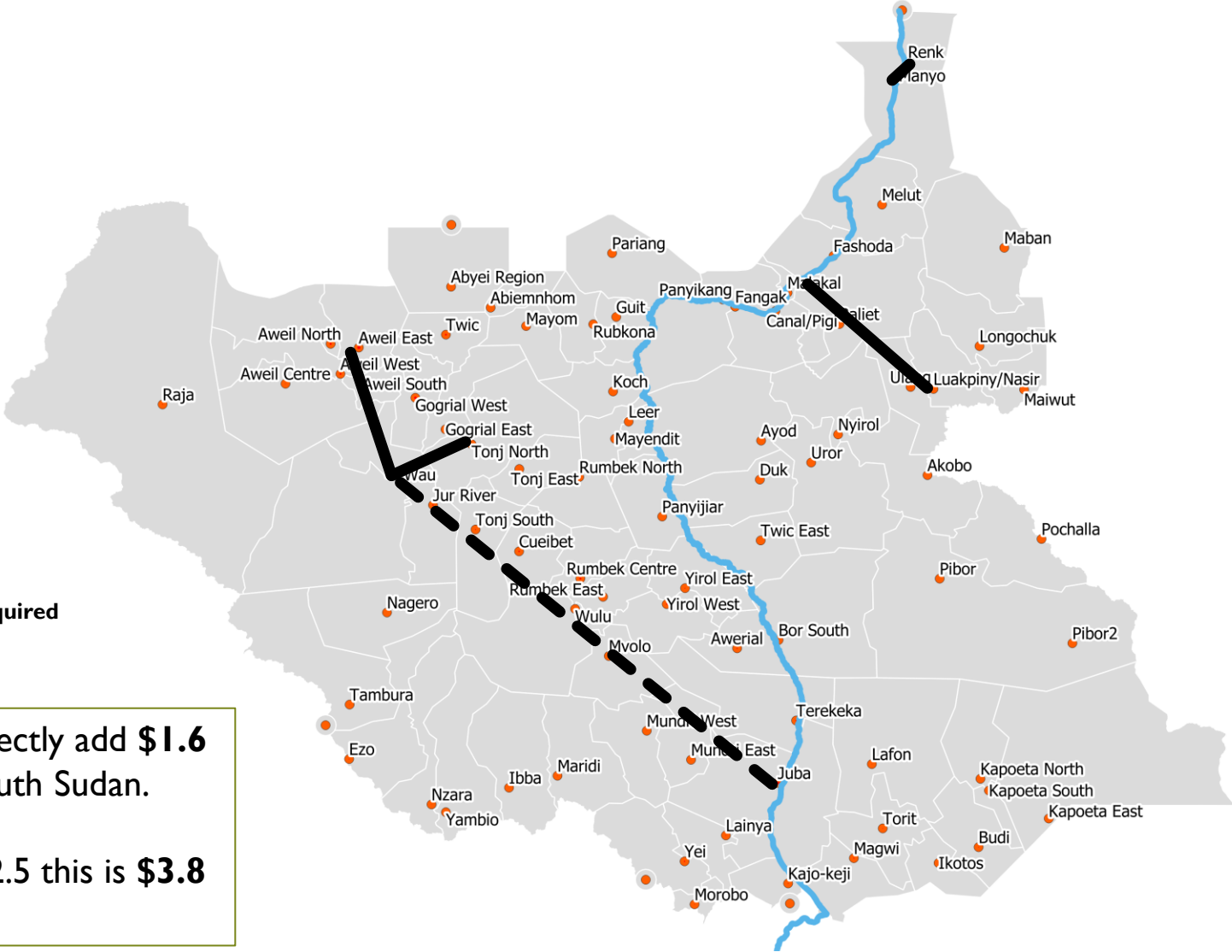

Road connectivity required

Thousand tons
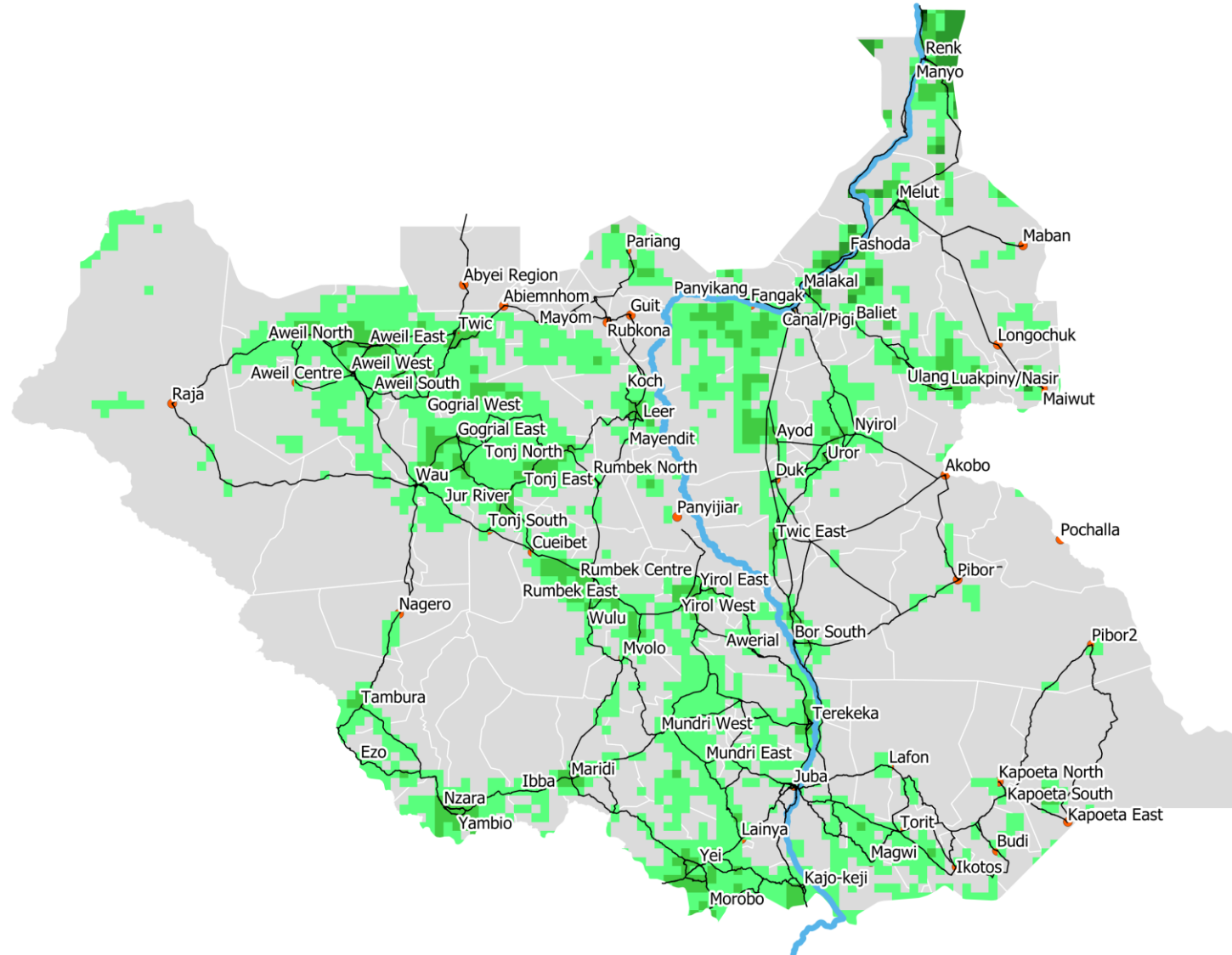
*Increase Grain Sorghum up to 9 times – increase average yield –
from 600kg or as low as 300kg per HA to 3 tones per HA.

Milk value chain - production - *potential

Road connectivity required

Thousand tons

*Increase Milk 2 times – average consumption is
3 times a comparative average – expected wastage.

Pathways to beneficiation

Road connectivity required

These pathways could directly add **$1.6 billion** to the GDP of South Sudan.

Assuming a multiplier of 2.5 this is **$3.8 billion**.

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The case for Grain Sorghum in South Sudan
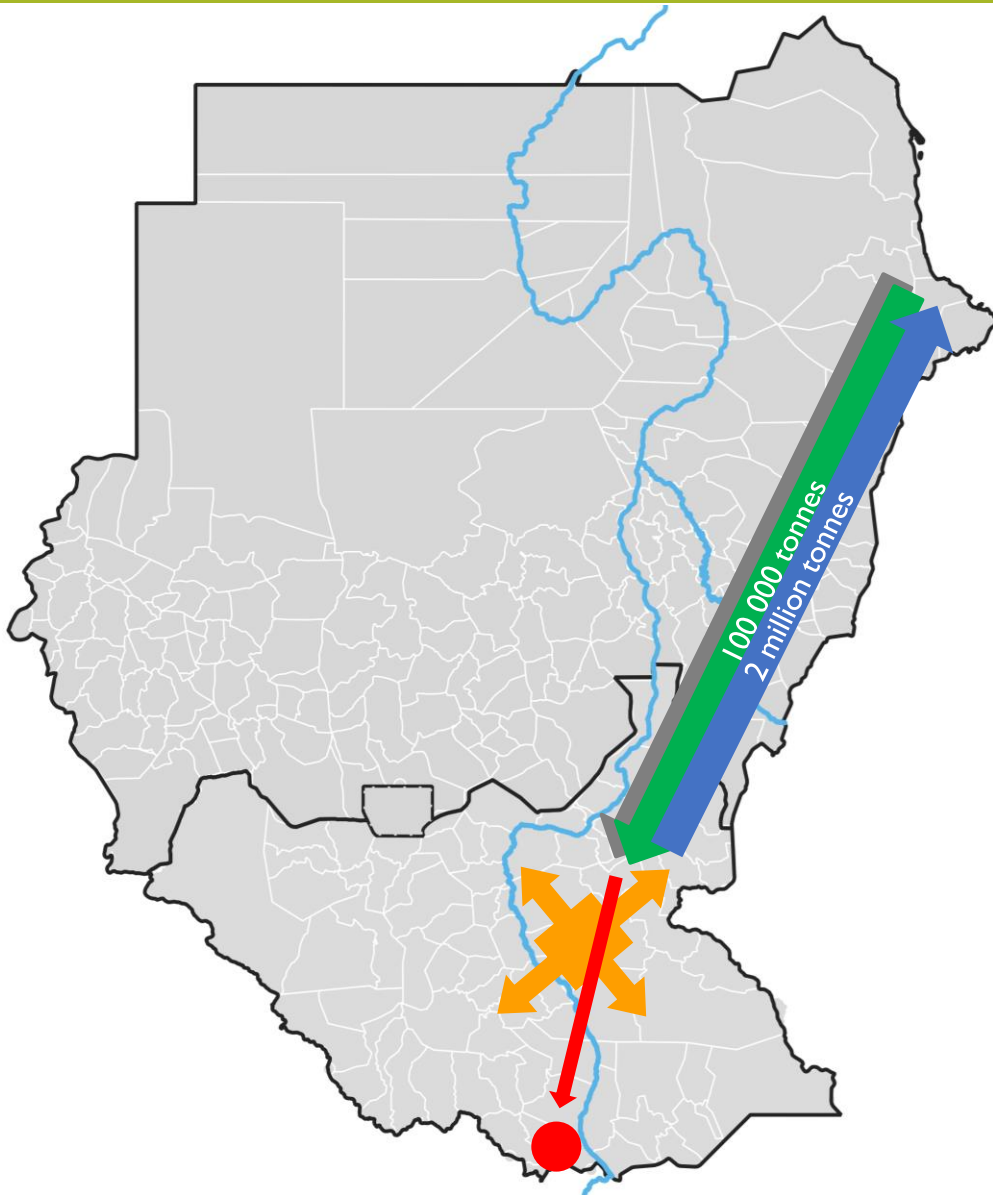
- Current:
  - Production of 840 000 tonnes
  - 1.4 million hectares
  - Yield of approximately 0.6 T / H

- Potential:
  - Yield of 3 T / H
  - Production of 4 million tonnes (3.2 million tonnes extra)

- Production factors required
  - Nitrogen fertiliser
  - 100 000 tonnes for the 1.4 million hectares
  - Machinery and equipment

- Application of the 3.2 million tons extra:
  - 1 million tonnes for local consumption
  - 2 million tons for export
  - 200 thousand tonnes for local industry such as beer

The process could eliminate substantial waste, increasing calorie output per kg of carbon emissions.

Thank you!