



Sustainable Rural Access and the Rural Access Indicator

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Specialised Technical Session on Sustainable Transport

25 November 2019, Vic Falls, Zimbabwe

Establishment of the RAI in 2006

Definition

Rural Access Index = ‘the proportion of the rural population living within 2 km of an all-season road’.

All-season = *“a road that is motorable all year round by the prevailing means of rural transport (often a pick-up or a truck which does not have four-wheel-drive), with some predictable interruptions of short duration during inclement weather (e.g., heavy rainfall) allowed.”*

2015 - SDG Indicator 9.1.1

SDG Target 9.1

Develop quality, reliable, sustainable and resilient infrastructure

SDG Indicator 9.1.1

Proportion of the rural population who live within 2 km of an all-season road.

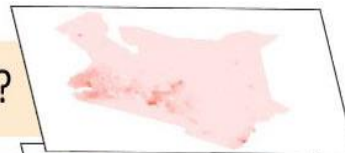
World Bank is the “custodian” of SDG Indicator 9.1.1

2015/16 – Pilot Geospatial approach

UKAid funding, through ReCAP, to update method of measuring the RAI. Pilot measurements in 8 ReCAP countries. Support moving SDG Indicator 9.1.1 to Tier II

Population distribution

- Where do people live?



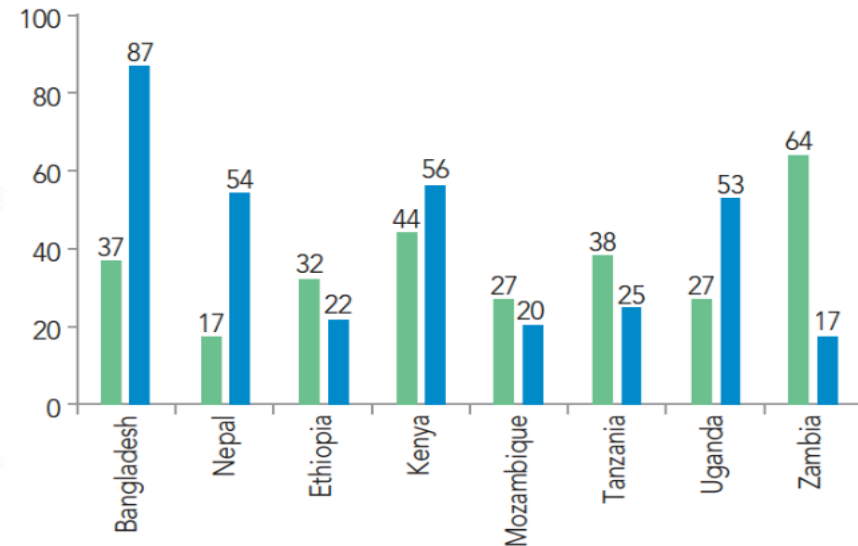
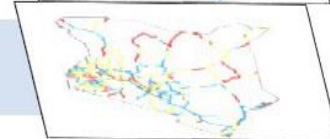
Road network

- Where do roads exist?



Road condition

- All-season roads?



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2018/19 – RAI Consolidation & Revision

- Refine, propose, and agree on **harmonised approach**
- **Refine the measurement framework** to provide a clear framework for data collection and validation
- **Trial proposed measurement framework** in 4 countries

SDG Indicator “Tier” system

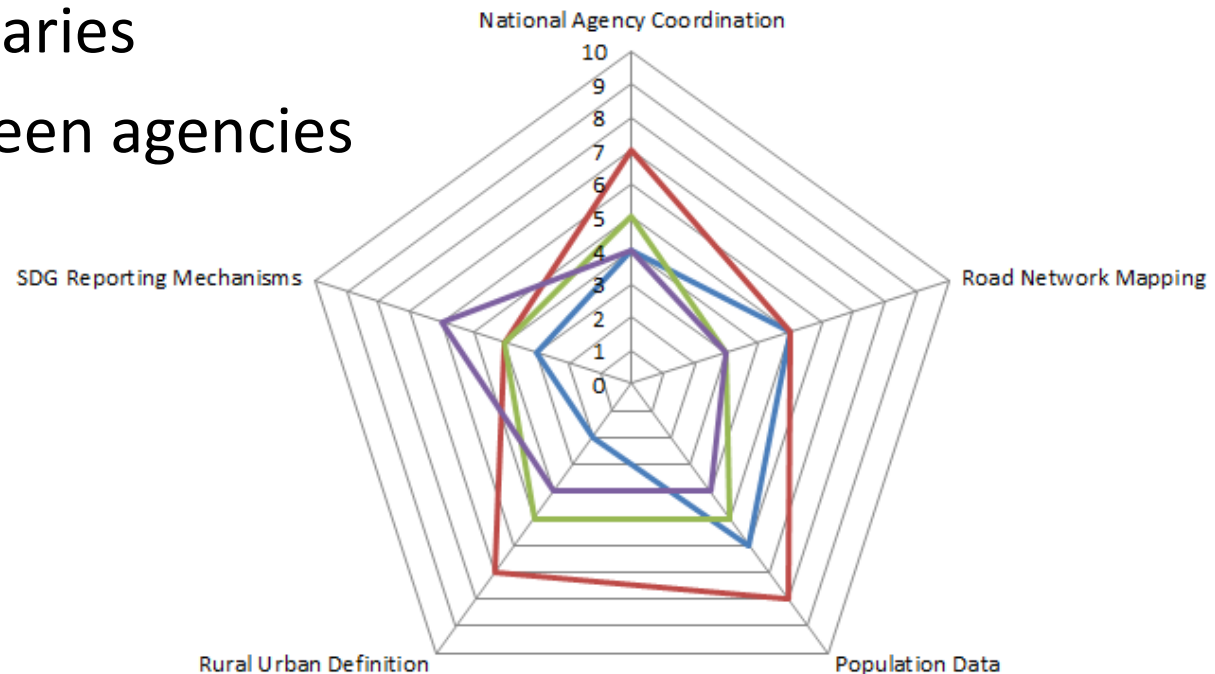
Tier I: Regularly produced for at least 50% of countries.

Tier II: **Conceptually clear, established methodology, but not regularly produced.**

Tier III: No internationally established methodology or standards

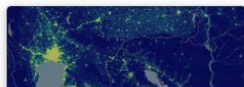
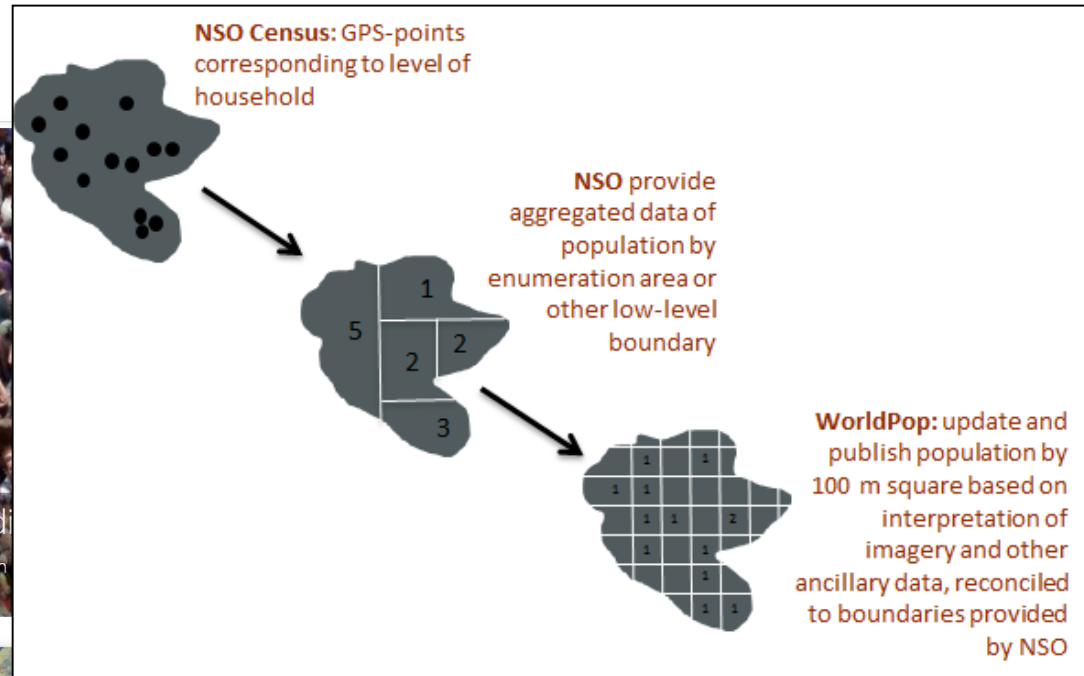
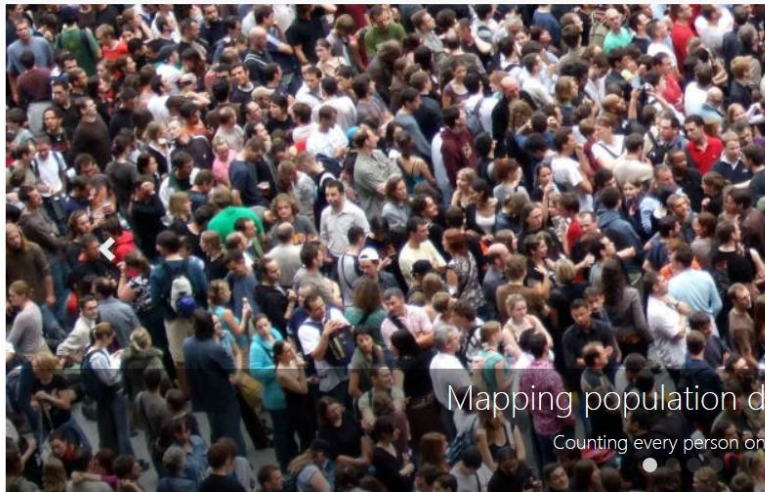
Issues:

- Data quality
- Data completeness
- Rural/urban boundaries
- Coordination between agencies
- SDG reporting
- Resources
- Secondary access
- Open source data



Population Data

WorldPop, Rural / Urban boundaries



Mapping populations »



Spatial demographics »



Mapping development indicators »



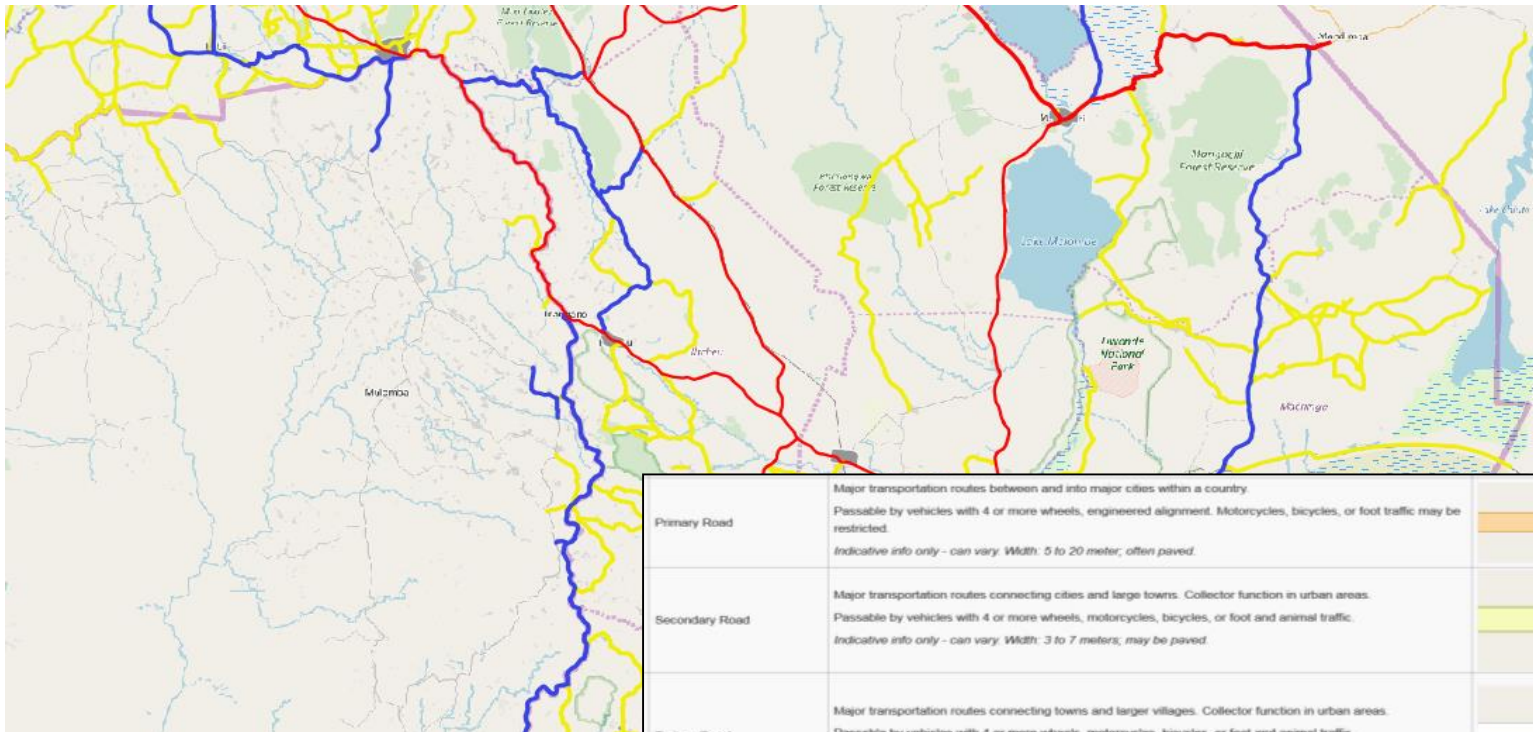
Maternal and newborn health »



Population dynamics »



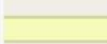



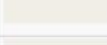

Road Network Data

Open Street Map – almost the *de facto* standard for mapping of road network, buildings, health centres, schools etc.

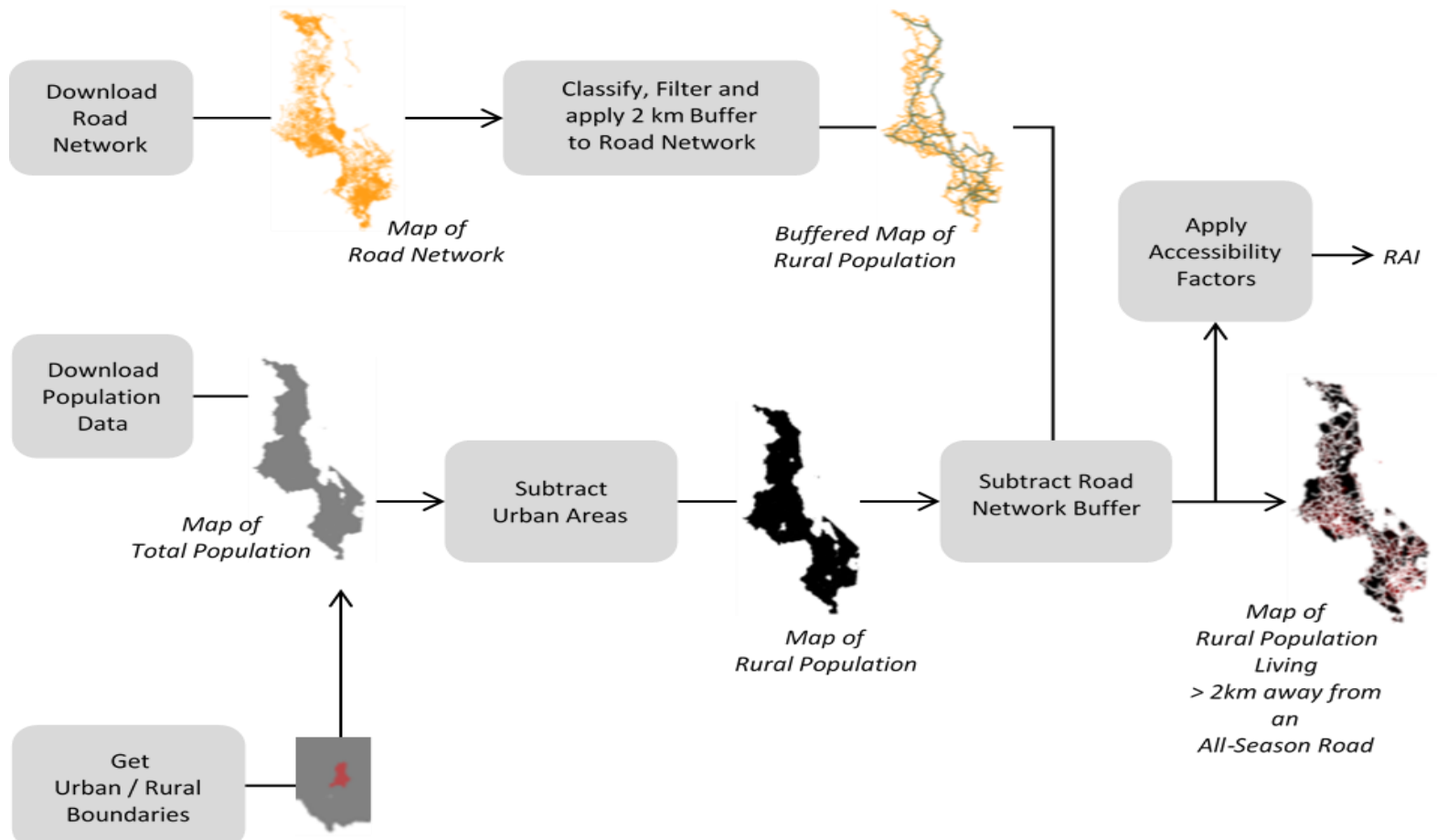


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Primary Road	Major transportation routes between and into major cities within a country. Passable by vehicles with 4 or more wheels, engineered alignment. Motorcycles, bicycles, or foot traffic may be restricted. <i>Indicative info only - can vary. Width: 5 to 20 meter, often paved.</i>		
Secondary Road	Major transportation routes connecting cities and large towns. Collector function in urban areas. Passable by vehicles with 4 or more wheels, motorcycles, bicycles, or foot and animal traffic. <i>Indicative info only - can vary. Width: 3 to 7 meters, may be paved.</i>		
Tertiary Road	Major transportation routes connecting towns and larger villages. Collector function in urban areas. Passable by vehicles with 4 or more wheels, motorcycles, bicycles, or foot and animal traffic. <i>Indicative info only - can vary. Width: 3 to 7 meters, may be paved.</i>		
Minor/Unclassified Road	Minor collector roads that allow travel and commerce from paths and residential roads to and between settlements. While generally not residential, there can be houses along the road. May be passable by vehicles with 4 or more wheels, motorcycles, bicycles, or foot traffic. <i>Indicative info only - can vary. Width: 3 to 7 meters, may be paved.</i>		

GIS process



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Accessibility factor as a proxy for ‘all-season’

Alternative approach based on “accessibility factors” defined by each country, to be used where road condition is unavailable or unreliable. Ground truth to determine the accessibility factors.

Paved roads

Unpaved roads

		Terrain	
		Low Risk (e.g. Flat, Rolling)	High Risk (e.g. Mountainous, Flood plains)

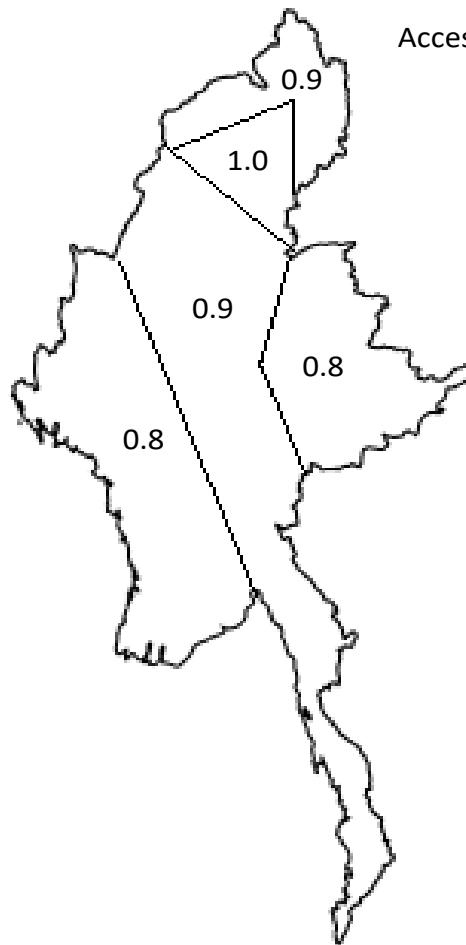
		Terrain	
		Low Risk (e.g. Flat, Rolling)	High Risk (e.g. Mountainous, Flood plains)

Climate	Low Risk (e.g. Benign Climate)	1	1
	High Risk (e.g. Tropical or Monsoonal Rains)	1	0.95

Climate	Low Risk (e.g. Benign Climate)	1	0.90
	High Risk (e.g. Tropical or Monsoonal Rains)	0.90	0.80

Accessibility Factor applied

(example Myanmar)



Accessibility factor map: Unpaved roads

Accessibility factor table for unpaved roads (from Figure 1)

		Terrain	
		Low Risk (e.g. Flat, Rolling)	High Risk (e.g. Mountainous, Flood plains)
Climate	Low Risk (e.g. Benign Climate)	1	0.90
	High Risk (e.g. Tropical or Monsoonal Rains)	0.90	0.80

2020 – Next Steps for RAI

RAI Calculation Tool (by Azavea)

<https://rai.azavea.com/>



azavea About

Rural Access Indicator

This map, developed in partnership with [ReCAP](#), [Cardno](#), [TRL](#), and [Azavea](#) is a proof of concept tool that displays the Rural Access Indicator (RAI) for all countries. It utilizes three open datasets ([OpenStreetMap](#), [WorldPop](#), [GRUMP](#)) to provide a rough estimation of the RAI which is also the UN SDG Indicator 9.1.1: the proportion of a country's rural population that is within two kilometers of an all-season road. This score is provisional because it is based on open datasets that have not been confirmed by every country.

Three countries working with the ReCAP program (Nepal, Malawi, and Myanmar) have submitted country specific data that is of greater accuracy to generate their RAI score.

mapbox



Discussion:

- Feedback on methodology: practical, achievable, sustainable?
- Future technologies to measure RAI?
- Does anyone measure RAI already?.. if so, what methodology is being used?
- Is RAI data useful for local planning?
- Is the data sensitive, i.e. any concerns with using the calculation tool?
- Do countries have the resources to measure RAI?



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