

Goal 9

Target number: 9.1

Indicator Number and Name: 9.1.1 Proportion of the rural population who live within 2 km of an all-season road

Agency: World Bank

Has work for the development of this indicator begun?

Yes, with significant progress made during the last 3 years.

Commonly known as the Rural Access Index (RAI), the indicator's methodology has been developed and socialized with partner agencies and countries. A review process has been undertaken to assess the indicator's relevance for country planning, and viability for rollout. Data has been formally published for 8 countries, with another 14 under development.

Who are the entities, including national and international experts, directly involved and consulted in developing the methodology/and or data collection tools?

World Bank: Simon Ellis, Atsushi Iimi, Adam Diehl, Muneeza Alam, Umar Serajuddin

ReCAP: Jasper Cook, Annabel Bradbury

African Development Bank: Jean Kizito Kabanguka, Jean-Pierre Kalala, Jeremy Aguma, Richard Malinga

DFID: Liz Jones

The World Bank has partnered with the UKAid funded Research for Community Access Partnership (ReCAP), DFID, and several of the regional development banks to form an RAI working group. This group meets quarterly to discuss progress on the RAI, review proposed changes/alternate data sources, and plan for the socialization of the indicator with country partners.

In collaboration with the World Bank, the ReCAP programme is currently funding a research project to develop and implement a harmonized approach to data collection and measurement of the RAI, and to scale up implementation of the RAI across UN member countries.

What is the involvement of or how do you plan to involve National Statistical Systems in the development of the methodology?

For sustainability and ownership purposes, the Rural Access Index (RAI) is designed to rely on data typically held by the national road agencies, such as road location and road condition. As a result, during the methodological development and testing stages, the World Bank engaged closely with countries, typically the Ministry of Transport/responsible road authorities, ensuring that data quality and availability and sharing the estimated results. In some countries, such as Ethiopia and Kenya, the road agencies spent their budget on necessary data collection. In other countries, such as Liberia and Malawi, available data turned out insufficient. In such cases, the World Bank mobilized some resources, if available, to help the Governments to collect data, while supporting their capacity building to internalize data collection for the future.

While the developed methodology is fairly simple (again, for sustainability and ownership purposes), the World Bank also helped the road authorities to compute the actual RAI in many countries. The results were shared with the countries, particularly with the transport-sector authorities. During the dissemination process some concerns were raised by some countries, such as Bangladesh and Zambia, basically because the results were higher or lower than they expected. However, an advantage of the

current RAI methodology is transparency. As the data used for the calculation are owned by the government, there is no ambiguity to over- or underestimate the results.

The dissemination and consultation processes are mostly confirmatory, constructive and dynamic (see the status review report by ReCAP)¹. Since the RAI is a global indicator what has long been used in the transport sector, some countries, such as Bangladesh and Ethiopia, had their own estimates based on similar but not the same methods. In the case of Bangladesh, it turned out that there was no significant difference between the new RAI estimate (86.7%) and country estimate (84%).

Most recently, the World Bank held a consultation with the Kenya Roads Board (KRB) and the Kenya National Bureau of Statistics (KNBS) on October 5, 2018. Kenya was included in the World Bank's initial pilot, with road data provided by KRB based on their most recent (2009) road condition survey. The overall national RAI was calculated at 56.8% at that time. KRB has recently updated its own RAI calculation based on the latest road condition survey (2017), KNBS geolocated census estimates for population and national definitions for urban areas. This calculation was done as part of an effort to establish a national RAI baseline for sustainable update over time, as well as for use for KRB's investment planning purposes. Some ancillary data were also updated, such as population and rural/urban boundary, as well as definition of road passability. The result was 62.5%, a slight improvement over 8 years. In general, both the KNBS and KRB expressed interest in the RAI and a strong intention to update it every five years, in coordination with their road condition survey schedule. In addition, KRB calculated the RAI at a much more granular level than the World Bank to better leverage it for road maintenance and planning purposes.

In the transport sector, of course, the RAI is contributing to facilitating policy dialogue between the countries and international donors. For instance, the World Bank approved a rural road project for Zambia where one of the prioritization criteria to select rural roads was the RAI. In Mozambique, the RAI was also used to identify priority investment areas where economic potential exists, but connectivity is low (Mozambique: Integrated Feeder Road Development Project). Other similar projects are also under preparation in Tanzania and Madagascar. The RAI has proved to be an important policy tool for prioritization purposes. All these discussions are based on the close collaboration with the national entities.

Please briefly describe the process of developing the methodology for the indicator

The RAI was originally developed by the World Bank in 2005, and defined as the proportion of the rural population living within 2 km of an all-season road. Initial measurements of the RAI for 64 countries were published in 2006, based largely on household survey data. However, due to cost considerations, further systematic updates of the RAI did not take place. In 2016, the Sustainable Development Goal (SDG) Indicator 9.1.1 was agreed with the same definition as the RAI, requiring regular update of RAI data for the majority of UN countries.

As custodian agency for the RAI, the World Bank with financial and technical support from DFID and ReCAP, developed a methodology for calculating the RAI utilizing spatial analysis techniques, and piloted it in 8 countries² during 2016. This pilot validated adopting a geospatial approach for calculating the indicator. An additional 14 countries have been added subsequently, with additional consultation ongoing with various countries and agencies.

Please indicate new international standards that will need to be proposed and approved by an intergovernmental process (such as UNSC) for this methodology.

¹ http://www.research4cap.org/Library/Vincent-CDS-2018-StatusReviewUpdatedRAI-FinalReport_GEN2033C-180529.pdf

² Pilot countries include: Kenya, Tanzania, Ethiopia, Uganda, Mozambique, Zambia, Nepal, Bangladesh

None

When do you expect the methodological work on this indicator to be completed?

The methodology has already been completed. Ongoing work is assessing the impact of variance from the agreed methodology due to data availability or country systems. This work is expected to be an ongoing process as additional countries are incorporated and specific realities are addressed.

Are data and metadata already being collected from the National Statistical System for one or more components of this indicator?

Yes

If yes, please describe:

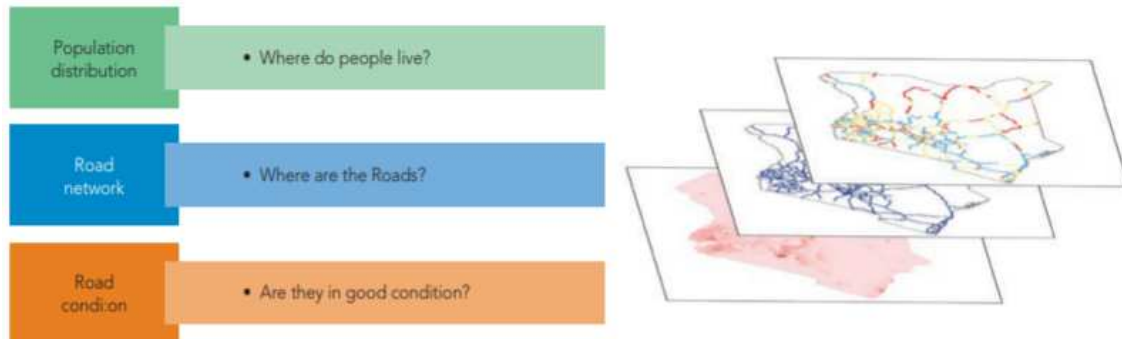
For global consistency purposes, the indicator generally relies on geospatial data of the population distribution and the road network (extent and condition). This approach aims at using as many existing data as possible and avoiding unnecessary data collection, hence, strengthening sustainability of the index. While the global population data, such as WorldPop, are primarily based on the national census data, the road network data are normally sourced from national road agencies or other such custodians mandated to manage various classes of the road network. Although there are alternate sources for this information (open source, satellite imagery, etc.), under the best-case scenario the RAI relies on leveraging national data. For those countries where the indicator has already been calculated, such national road data was obtained through cooperation with road agencies.

How do you plan to collect the data?

Ongoing discussions with road agencies, Ministries of Transport and NSO are being leveraged to socialize the indicator and collect information on road networks. Normally, road agencies through a Road Management System (RMS) or otherwise, are updating their road network data at least every 3-5 years, though this is of course subject to individual countries' fiscal resources. The other data necessary for calculation of the RAI (population distribution and Rural/urban boundaries) are available publicly for most countries from sources such as WorldPop.

If the indicator involves multiple components from different data sources, please describe how each individual component of the indicator will be collected here.

As described above, the RAI relies on geospatial data on three data sources:



Quality **population distribution** data are essential for correct measurement of rural access. However, detailed and contemporary census data may not be available in many developing countries. To overcome this challenge, the methodology relies upon publicly available global population. Although

they remain subject to available data, modeling, and assumptions, these data sets distribute subnational data at the more detailed subnational level, using spatial data and techniques. A review was conducted and WorldPop was determined to be the most appropriate for this purpose. Based on population census data, it provides the highest spatial resolution and continuous update whenever data becomes available. As the definition of the indicator also explicitly excludes urban areas, a rural/urban boundary must be applied. Using similarly available global datasets (such as the Global Rural-Urban Mapping Project - GRUMP), these areas can be readily removed.

Measuring and plotting **road location** is a trickier question than would appear at first glance, especially in developing countries. In particular in Africa, road density is extremely low, and varying proportions of the road network are classified. As a significant number of roads are unclassified, it is not uncommon to have different figures of road network length, depending on the definition of roads and the coverage of the data. There are several sources of georeferenced road network data. Each has advantages and disadvantages. On the one hand, an increasing number of countries are developing their own official road network data. On the other hand, several open data sets, such as OpenStreetMap, are also available. Global road network data sets are also available on a commercial basis. The RAI relies on government data whenever available. They are consistent with the road network for which road agencies are responsible and are relatively easily merged with other operational databases, such as road asset management systems and traffic count data. From a sustainability point of view, it is also important to foster ownership by and partnership with governments, which will encourage data collection and use of the resultant RAI outcomes directly in their operations.

Road Condition data can be collected through a variety of means, although the accuracy level may vary. The World Bank has tested the viability of several sources, depending on the country, with the understanding that having a variety of data sources will support the sustainability of the RAI. Road agencies are encouraged to collect and maintain such data as is required to meet their existing operational needs. Among the initial pilot countries, some road agencies already had good data, and others have just carried out their own road surveys. In cases where governments may not have good road data, the World Bank has worked with government counterparts to collect information through various means (traditional road condition surveys, mobile phone apps, satellite data, etc.), both for use in calculating the RAI, and to inform agency operations.

With what frequency is data expected to be collected?

The RAI will be updated on a rolling basis as new data is collected. Where specific projects have been developed with the RAI as an indicator, the data shall be updated at project completion. From a practical point of view, the road condition data is frequently the most difficult to obtain as it requires an active, country wide effort. Thus, in countries where regular road condition surveys are conducted, update of the RAI will be aligned with the same schedule (up to 5 years between updates). In countries where more regular data is collected, or when there are significant population movements, update of the index may be required, pairing existing road data with updated population estimates.

Is there a process of data validation by countries in place or planned for this indicator?

Yes

If yes, please briefly describe:

The World Bank has partnered with government road agency counterparts to obtain the necessary data underlying the RAI calculation. These counterparts are briefed and validation is sought prior to the release of the results. Comments received through the ReCAP community have highlighted the need

for wider consultation among various governmental agencies to increase awareness and buy-in, with such consultations currently ongoing within pilot countries and planned for future roll-out.

If you have any additional comments that you believe would be helpful to IAEG-SDG members in analysing the work plan and methodological development of the indicator, please provide them here:

In terms of additional information, the best link is here, providing access to the methodological paper:

<http://documents.worldbank.org/curated/en/367391472117815229/Measuring-rural-access-using-new-technologies>

Also, we attach Nepal statistics for RAI as an example of statistics gathered for RAI.

(As of October 2018)