GRID3

GEO-REFERENCED INFRASTRUCTURE AND DEMOGRAPHIC DATA FOR DEVELOPMENT

Case Studies on the use of geospatial technology in the development sector

Part 3: Examples from the **education sector**

BILL & MELINDA GATES foundation

UKaid from the British people

Center for International Earth Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY

UNFPA

WorldPop

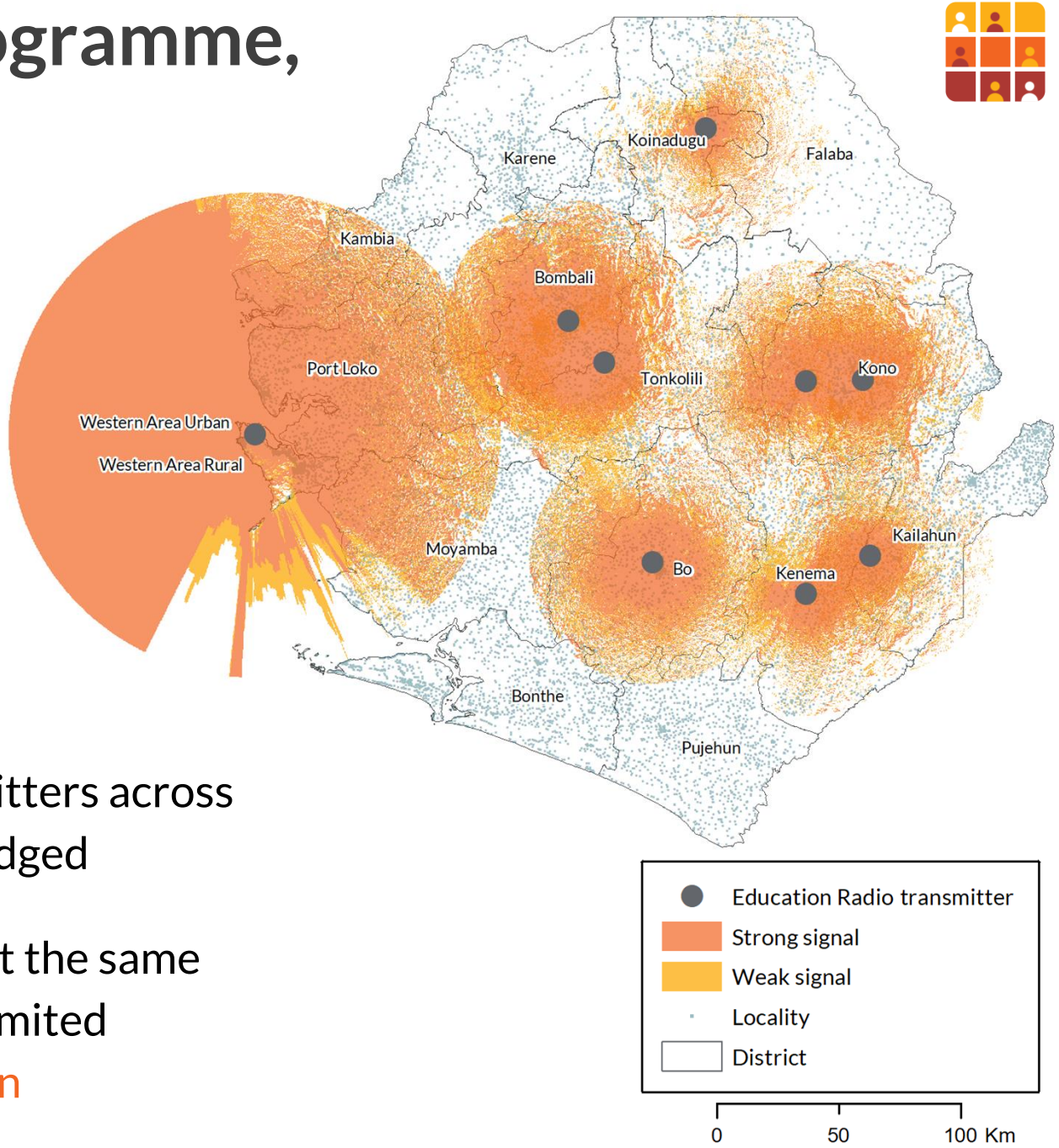
FLOWMINDER.ORG

Extending access to remote learning, during lockdown in Sierra Leone

Education Radio Teaching Programme, Sierra Leone

Remote learning via radio broadcast

- 2014 to 2016 Ebola outbreak, all schools are closed, Education Radio Teaching Programme established
- Experienced teachers recorded lessons in local languages
- Lessons were broadcast via nine MoE transmitters across the country; gaps in coverage were acknowledged
- March 2020, Covid-19: the ministry rolled out the same initiative but enlisted GRID3 to address the limited transmission range and to reach more children



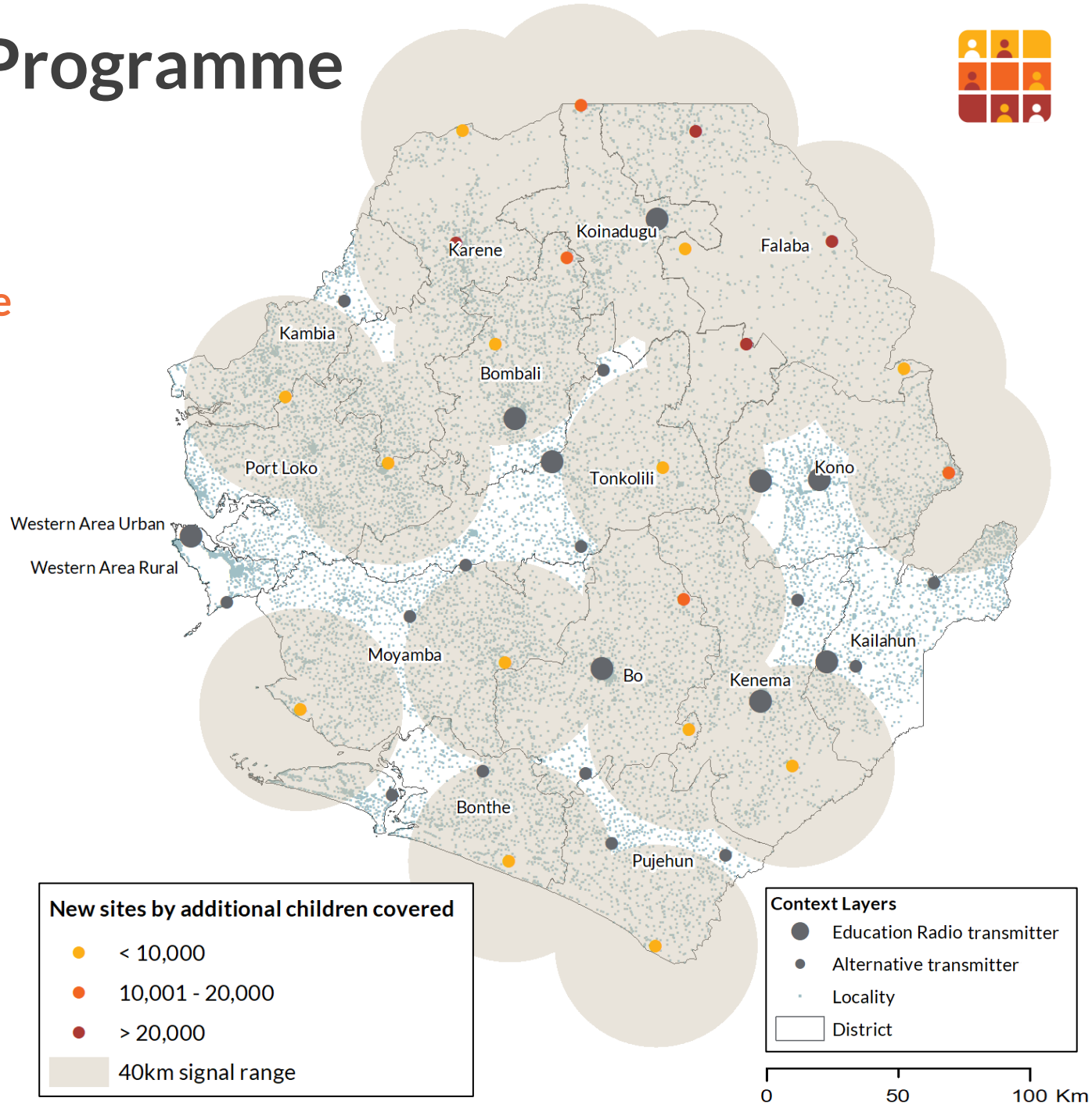
Education Radio Teaching Programme Sierra Leone

Optimizing transmitter placement & coverage to reach more school-age children

1. GRID3 team quantified gaps in existing coverage

2. Assessed the broadcast potential of other existing transmitters, to fill gaps and expand coverage

3. Using Flowminder's optimisation algorithm, locations of possible new transmitters were plotted and ranked by 'in-reach' population count



Education Radio Teaching Programme, Sierra Leone

Summary of results

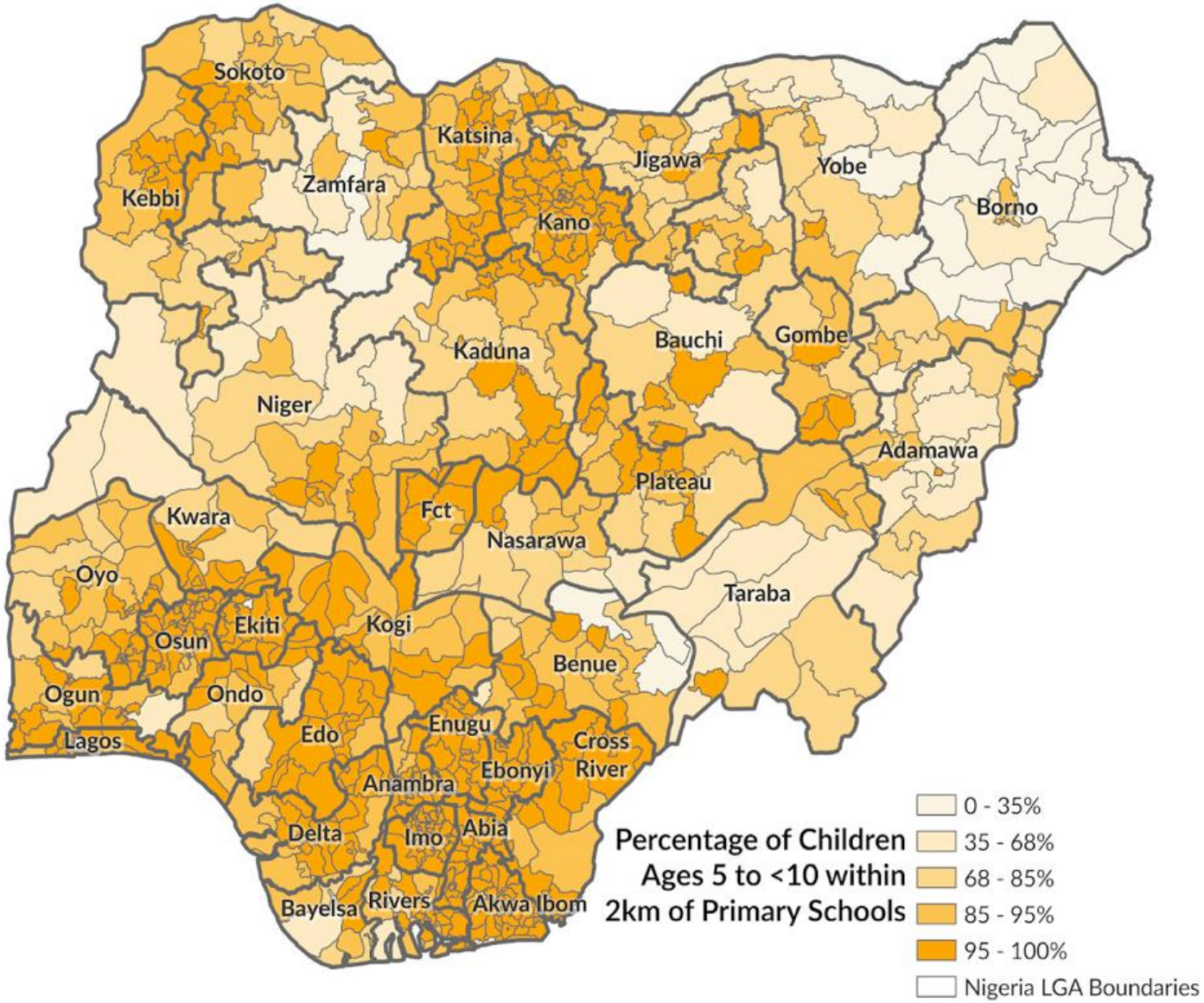
- GRID3 1. An estimated 66% of school age children are within broadcasting range of the nine Ministry transmitters
- Fourteen alternative transmitters from a list of 143 radio stations have good potential to expand the initiative's coverage to 90.9%
- a further three **new** transmitters would be required to ensure 96% of children are covered by the initiative
- Funding is secured, and planning continues; full report here

Optimising the location for new school placement in Nigeria

Determining access to education and optimal school locations, Nigeria

Addressing out-of-school populations

- With a large and overwhelmingly young population, Nigeria has one of the world's greatest out-of-school populations
- prohibitive distance to schools is a significant factor
- Research indicates that living 20 minutes or more away from a school reduces the odds of attendance by 52% (Kazeem et al., 2010)

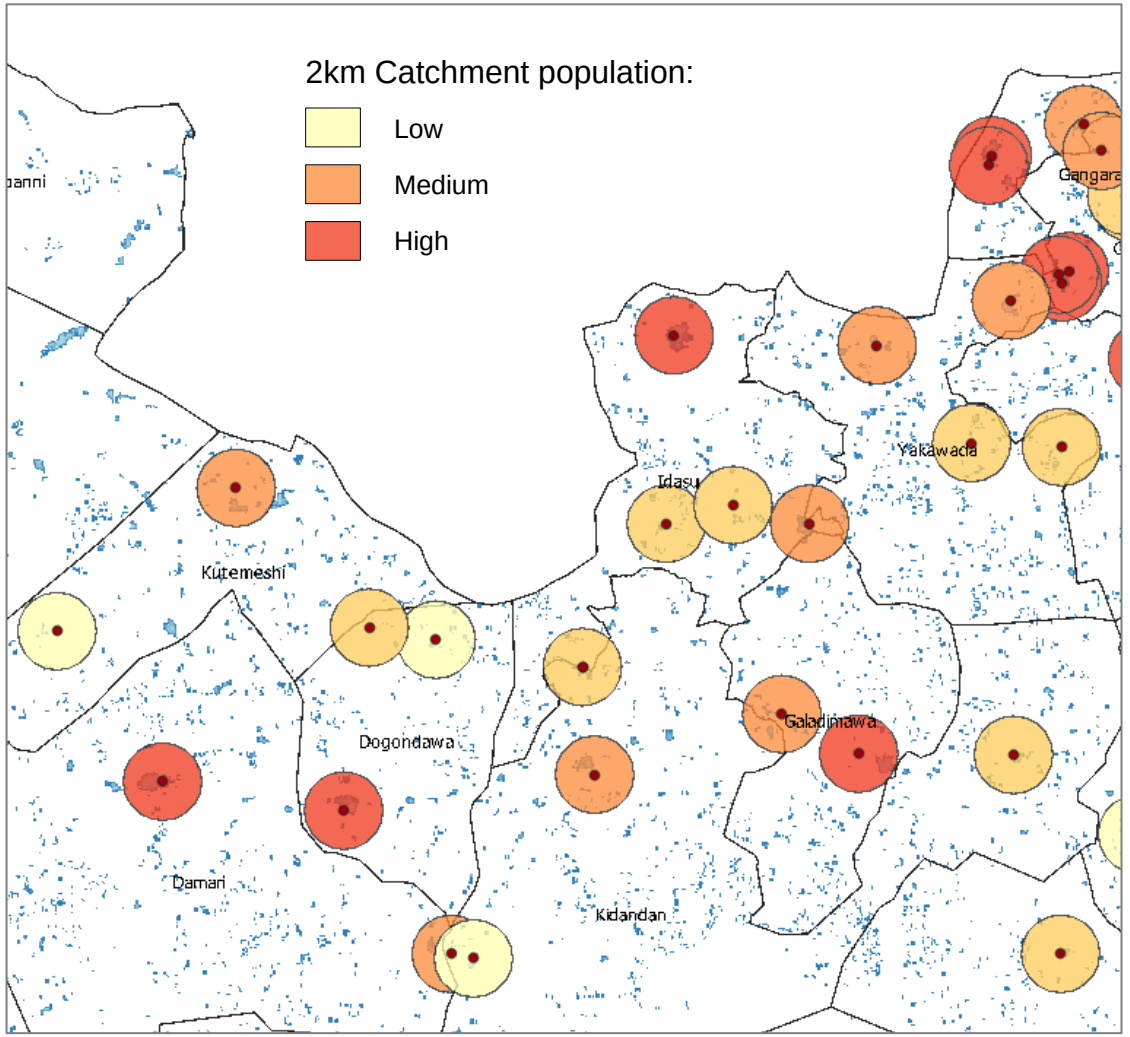


Source: Universal Basic Education Commission, eHealth Africa and Proxy Logics Limited

Determining access to education and optimal school locations, Nigeria

Improving the evidence-base to assess and improve coverage

- GIS and geospatial data can help us to resolve two important questions:
  - *How adequately does the current network of schools meet the needs of the population? where are the gaps?*
  - *Given finite resources, where are the optimal locations for building new schools, to reach maximum school-age children?*

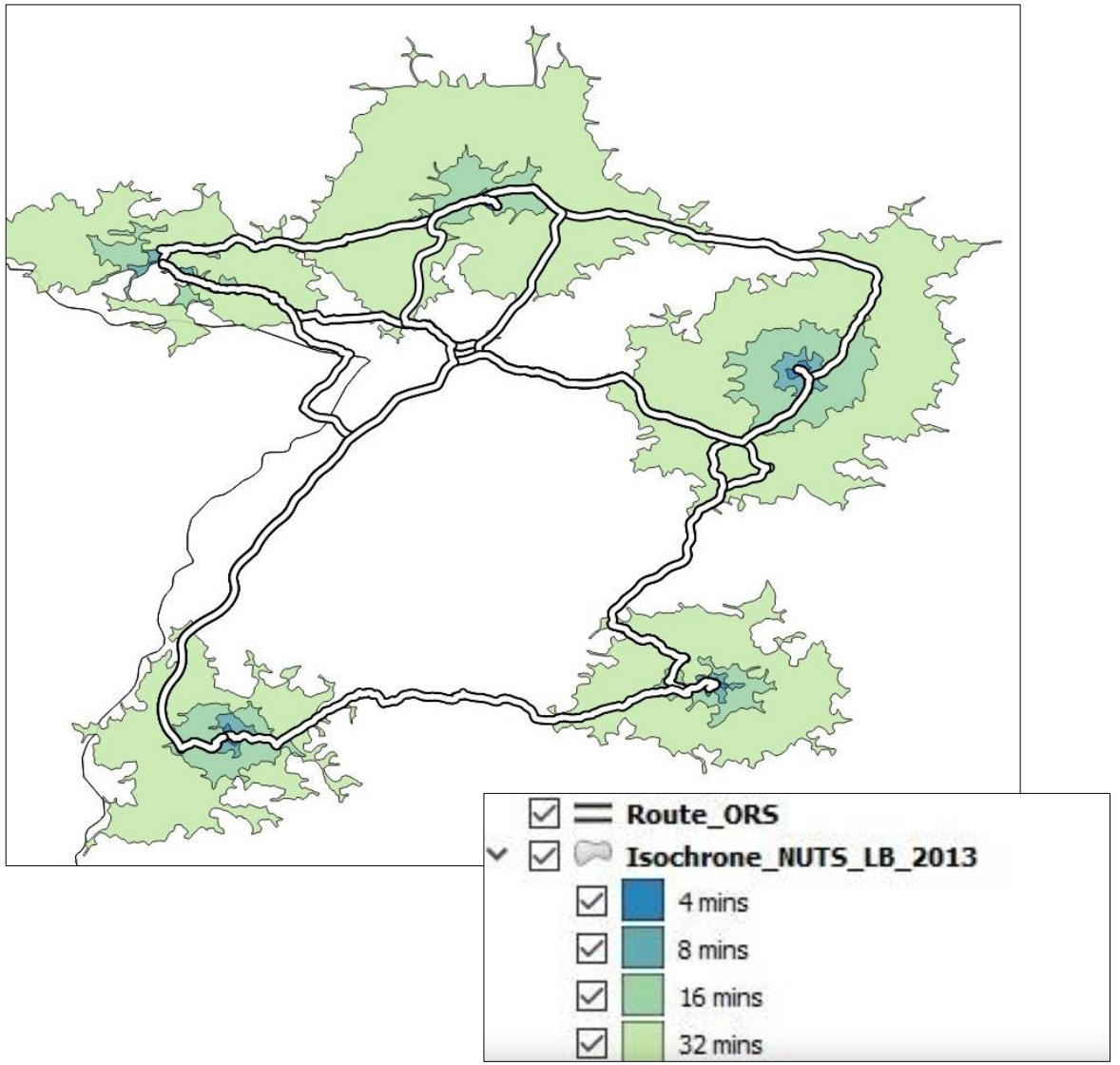


Determining access to education and optimal school locations, Nigeria

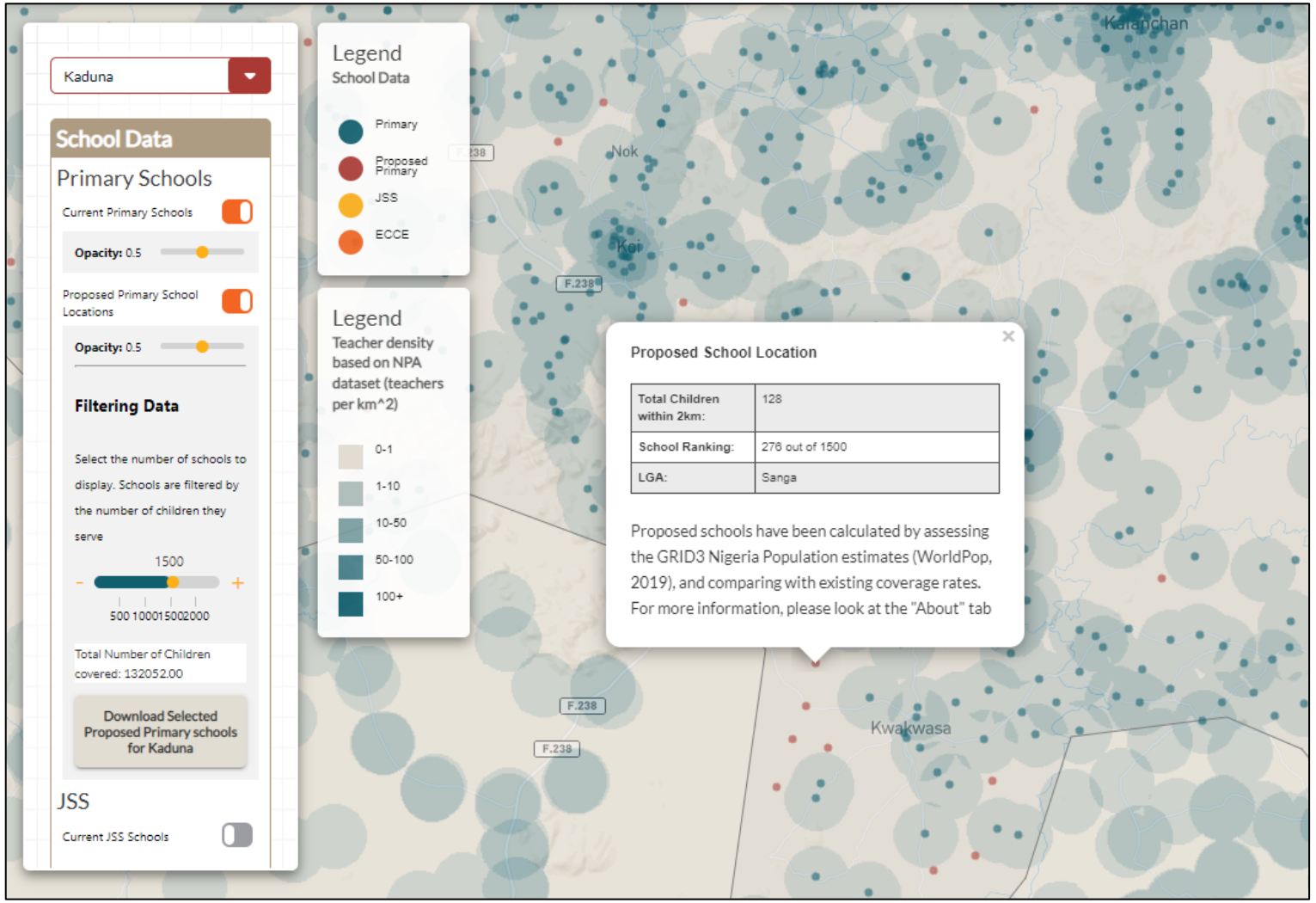
Which tools, methods and metrics to use?

- Distance-based buffers
- Travel-time based buffers (isochrones, *pictured*)
- Accessibilty surface based on travel-time, land cover/land-use, etc

  https://www.accessmod.org/
- GRID3 Optimisation Tool (Flowminder)



GRID3/UBEC School Placement Optimisation Tool (SPOT)



https://grid3.gov.ng/ubecspot/#/

Optimal locations for new school placement, maximising catchment population

1. Assessment of coverage from existing schools
2. calculate the population outside of catchment areas
3. New school locations are proposed, maximising school age population
4. Suggested locations are ranked by size of catchment population

GRID3/UBEC School Placement Optimisation Tool (SPOT)

UBEC-SPOT Demo site:

https://grid3.gov.ng/ubecspot/#/

In summary

- The application of GIS and spatial data for assessing and planning education service delivery
  - Where is the target population?
  - How is the current provision and infrastructure?
  - How do we optimise and extend coverage
- Going further with school coverage and infrastructure analysis – Ongoing work in Sierra Leone
- Going further with optimisation – multi-criteria evaluation, constraint mapping, leverage all available datasets to improve your model!

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Questions?

Please post any questions or comments in the course forum below!