Applying Analytics to contribute to the SDGs

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CTO, Analytics for a Better World Institute

12th October 2023

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Founding partners:

Universiteit van Amsterdam

ORTEC
OPTIMIZE YOUR WORLD

Jointly empowering Nonprofits to apply Analytics towards the

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My Journey

AMRITA VISHWA VIDYAPEETHAM

BTech in Electrical and Electronics Engineering

Cognizant

MTech in Energy Management
Bangalore

Researcher at IISc Bangalore and IIT Kanpur
Data Analytics in Energy Sector

Solar Energy Research Institute of Singapore
Research on PV Systems Data

Professional Doctorate in Data Science
Eindhoven University of Technology
the Netherlands

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CTO and Lead Data Scientist

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UNDP

Consultant/Advisor

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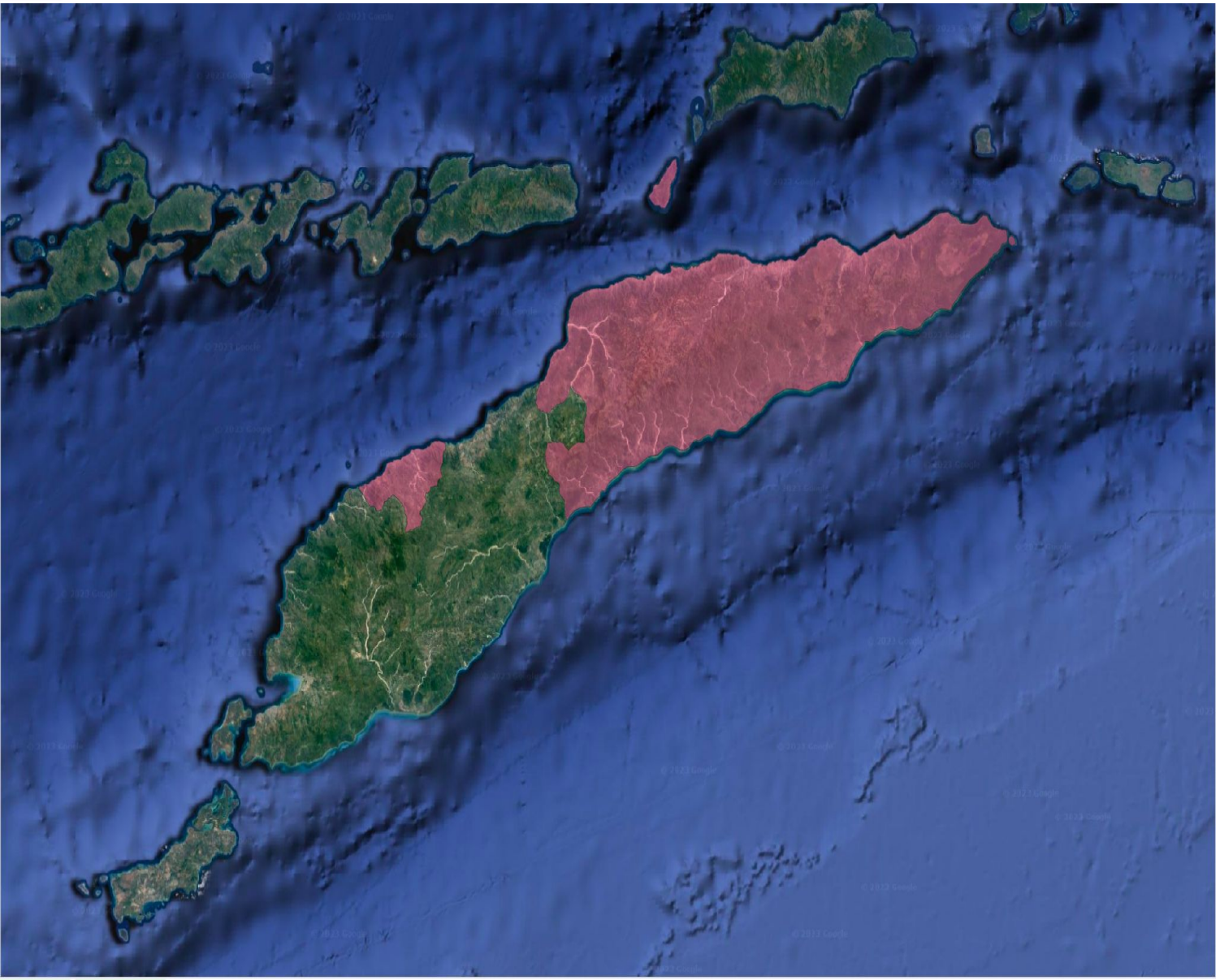
slido

How many minutes to reach the nearest healthcare provider?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.



Research article | Open access | Published: 30 September 2016

"I go I die, I stay I die, better to stay and die in my house": understanding the barriers to accessing health care in Timor-Leste

Jennifer A. Price, Ana I. F. Sousa Soares, Augustine D. Asante, Joao S. Martins, Kate Williams & Virginia L. Wiseman

BMC Health Services Research **16**, Article number: 535 (2016) | Cite this article

From one remote area, patients were carried 16 km to the nearest health post, travelling for 9–11 hours.

> *"We start walking at 3 am and arrive* [at the health post] *12 midday. Therefore most pregnant women have the delivery process at home."*

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Physical Access critical across the SDGs

Access to all-season roads

Access to clean and safe drinking water

Access to Hospitals, Schools, etc…

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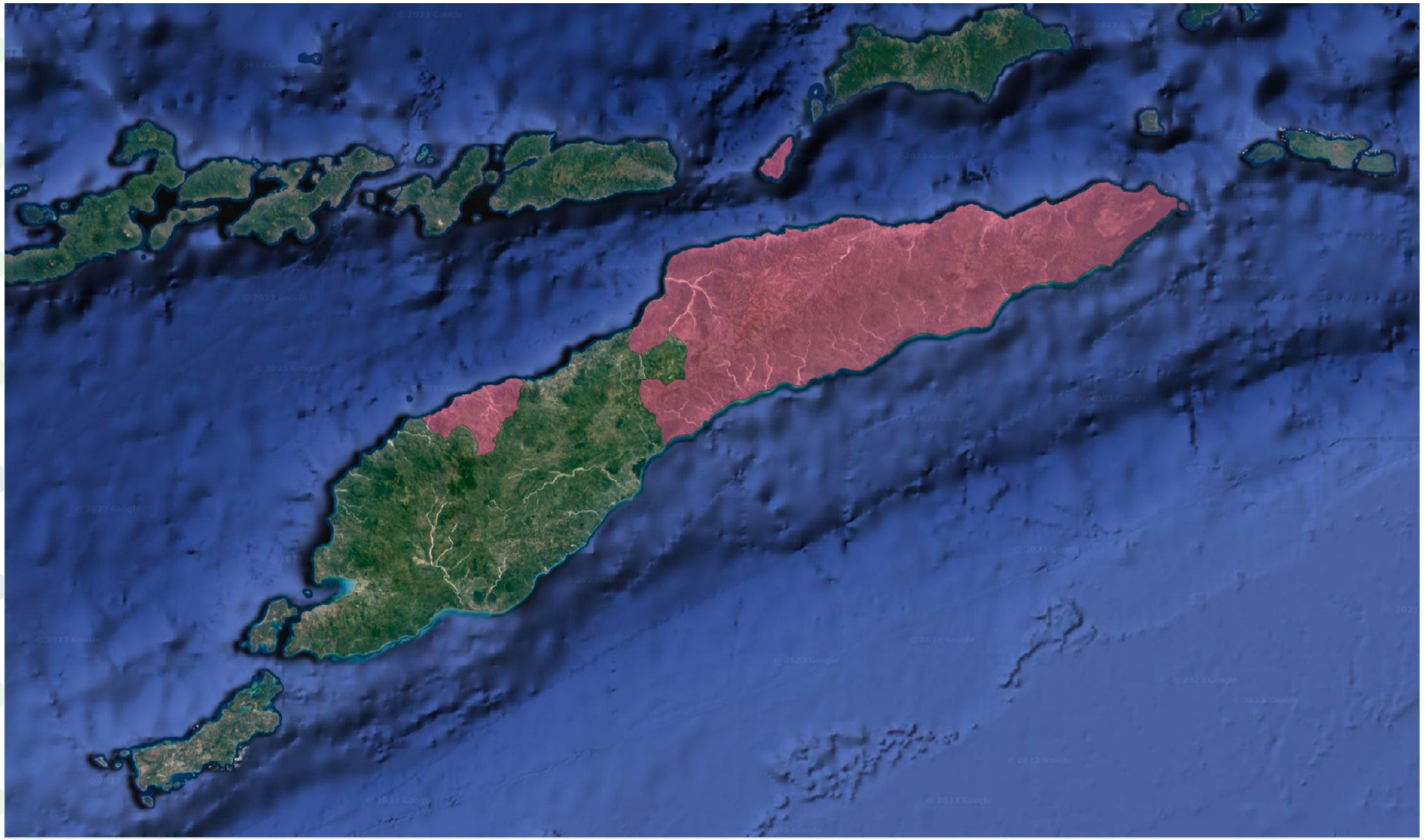
Timor-Leste Public Expenditure Review



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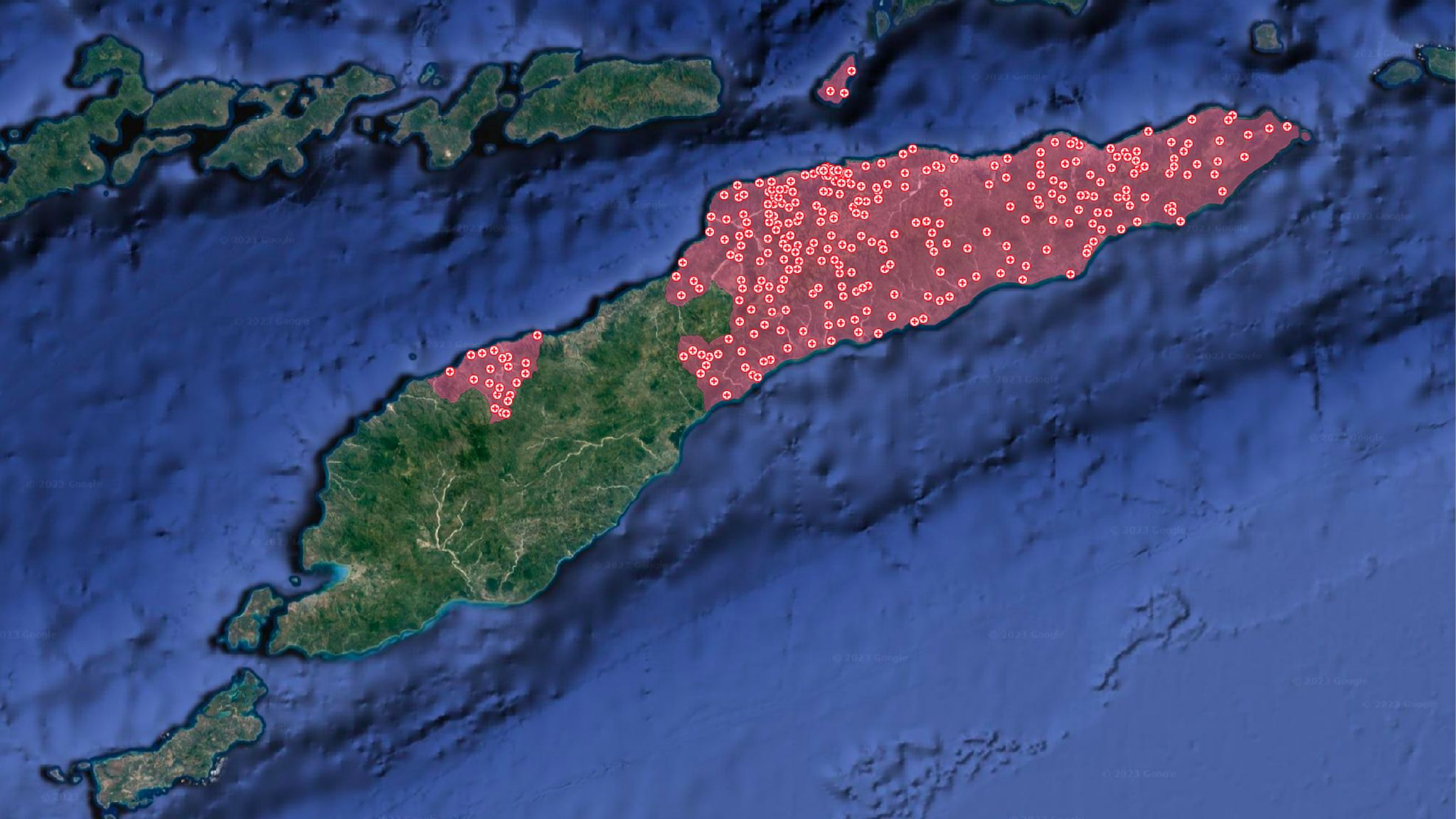
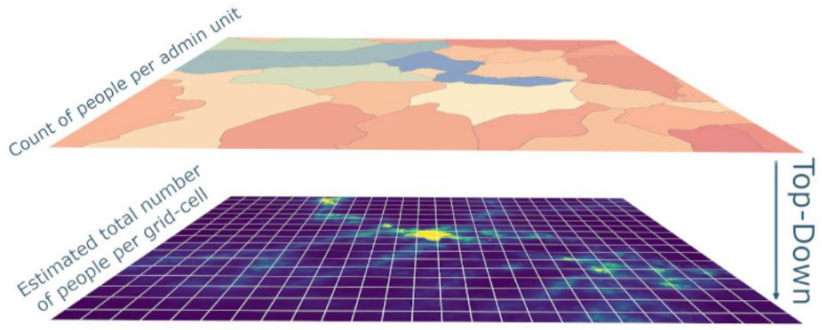


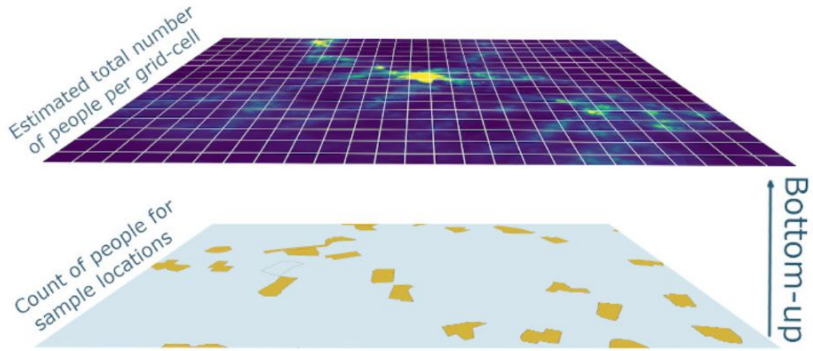
- Are you interested in a specific country where it has either been many years since the last census and simple projections from this baseline may be highly uncertain, or the most recent census did not cover the entire country due to inaccessibility/insecurity?

- Are you interested in global/continental coverage and/or changing population numbers over time?
- Do you need population totals to match census counts, official projections or UN estimates at national or sub-national scales?

If your answer to any questions in the red box were *yes*, then it is likely that our 'top-down' datasets are best for you. If you answered *yes* to the question in the blue box, then our set of 'bottom-up' datasets may make sense for you. Moreover, if you have access to new population estimates or survey data and want to experiment with using them to create your own simple and rapid gridded datasets, then you may want to consider our rapid population mapping tools.



Top-down datasets



Bottom-up datasets

WorldPop is based at the ***University of Southampton*** and maps populations across the globe. Since 2004, with partnerships with with governments, UN agencies and donors, they have produced almost 45,000 datasets, complementing traditional population sources with dynamic, high-resolution data for mapping human population distributions, with the ultimate goal of ensuring that everyone, everywhere is counted in decision making.

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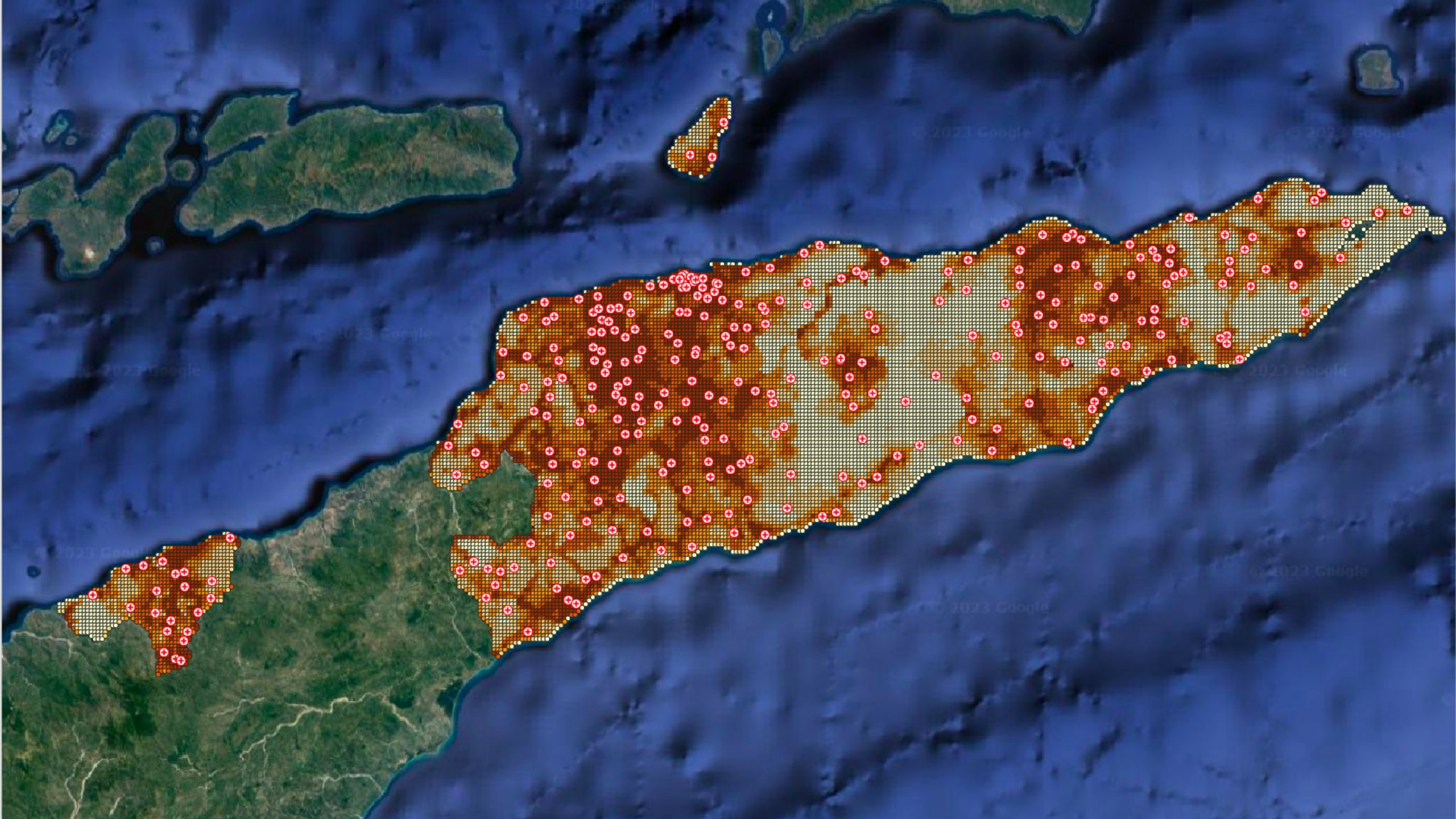
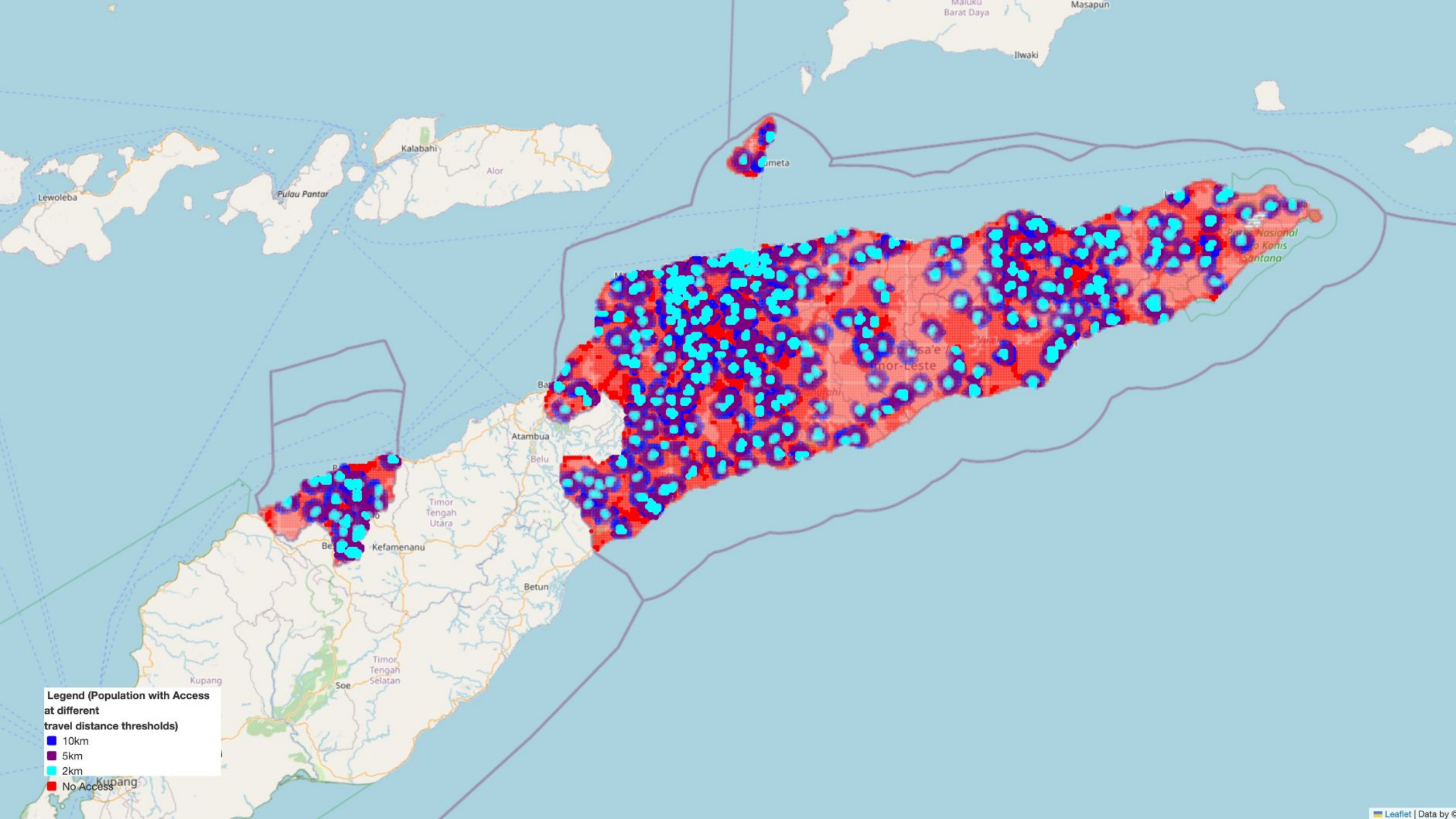
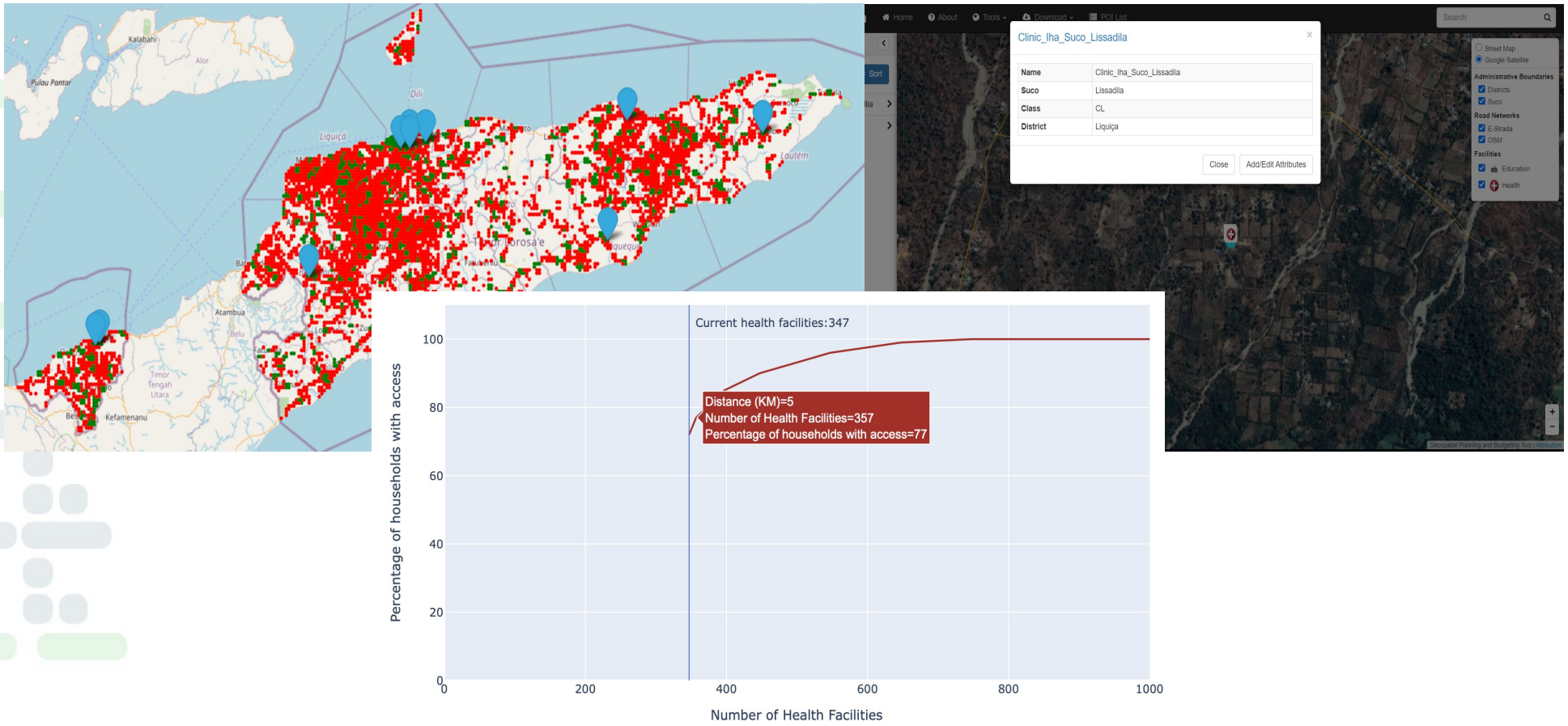


Challenges in mapping travel distance/time

- Only 8% of core roads were in fair condition, with the remaining in poor (22%) or very poor condition (70%).
- Rural roads are also generally in poor condition. Frequent landslides and road closures caused by intense rainfall and geotechnical instability in mountainous areas compound the poor condition of the roads.


Legend (Population with Access at different travel distance thresholds)
10km
5km
2km
No Access
Kalabahi
Alor
Pulau Pantar
Lewoleba
Atambua
Belu
Timor Tengah Utara
Kefamenanu
Betun
Timor Tengah Selatan
Soe
Kupang
Masapun
Ilwaki
Leaflet | Data by

Applying Optimization Algorithms



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Beyond AI and Digital Platforms

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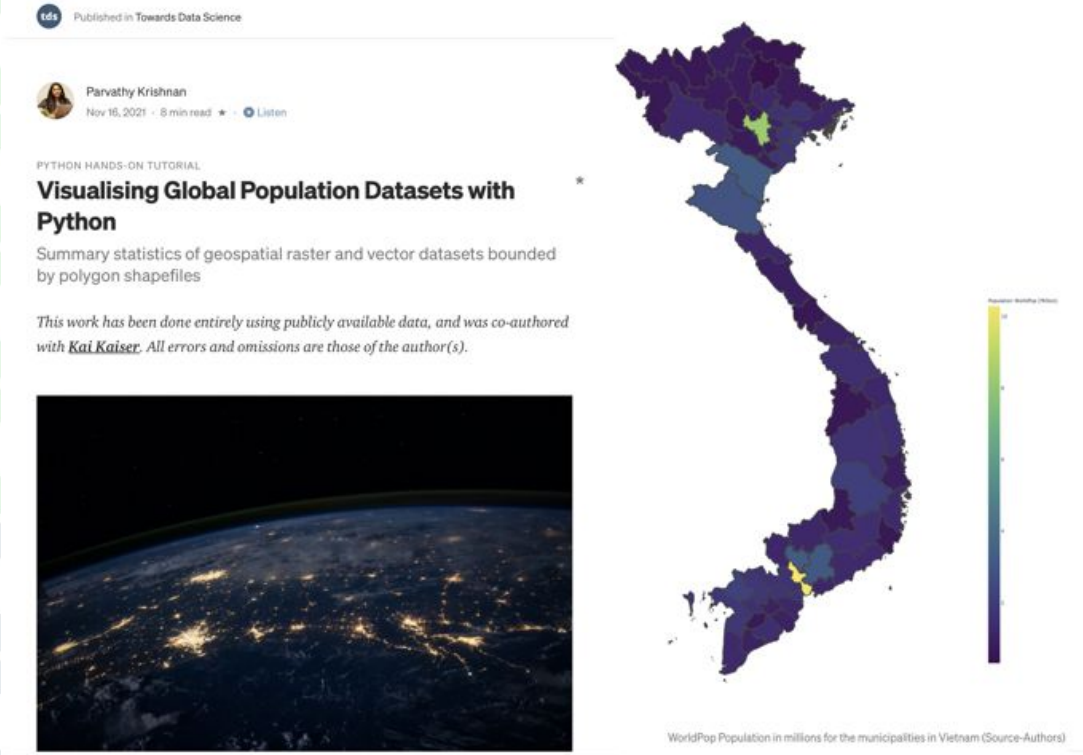
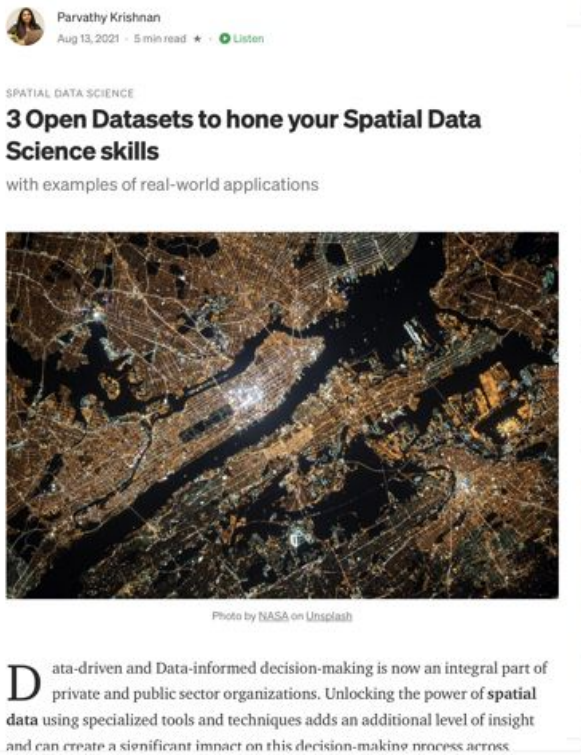
Beyond AI and Digital Platforms





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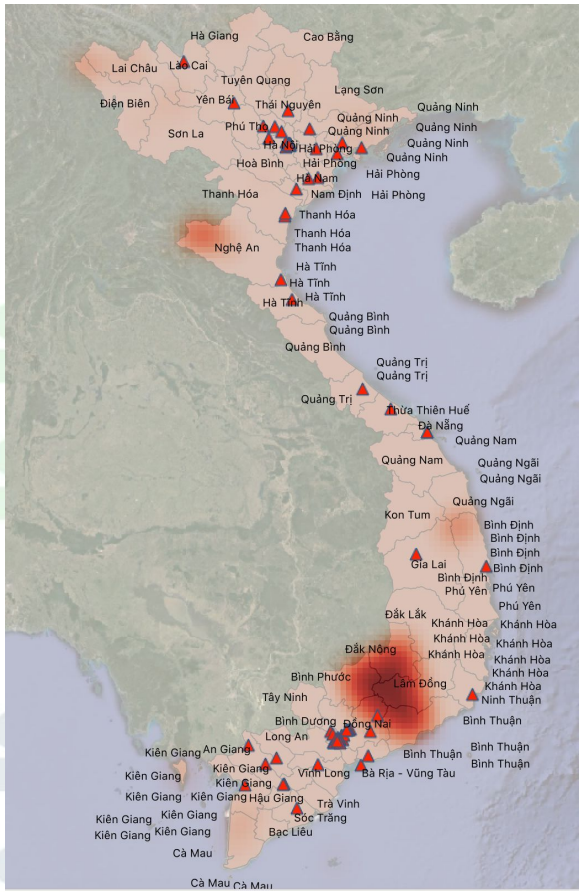
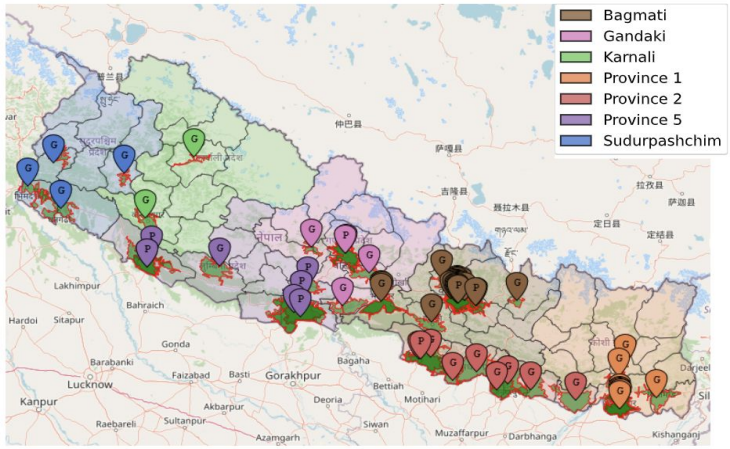
Collaborating to create impact

Improving access to healthcare, water and optimizing garbage collection





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World Health Organization

UN environment programme

amref health africa

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An initiative of the Netherlands Red Cross

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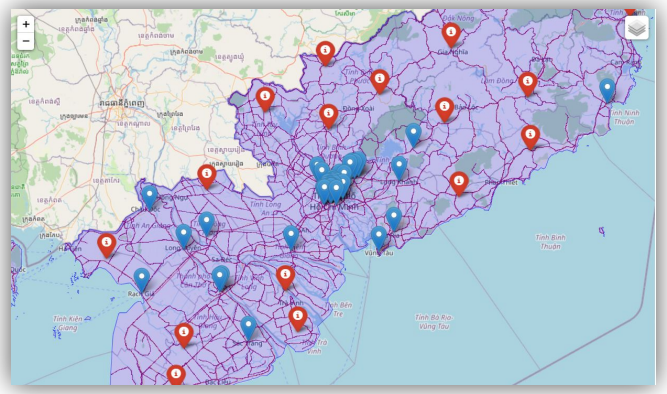
Analytics accelerates the mission of nonprofits by

Speeding up plastic removal from the great pacific ocean



Improving access to healthcare and WASH facilities

Combating hunger by optimizing food aid baskets and supply chains

Reducing poverty by optimizing farmer's purchasing of cattle feed

Trained 200+ nonprofit employees on analytics skills

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14 LIFE BELOW WATER

THE OCEAN CLEANUP

and

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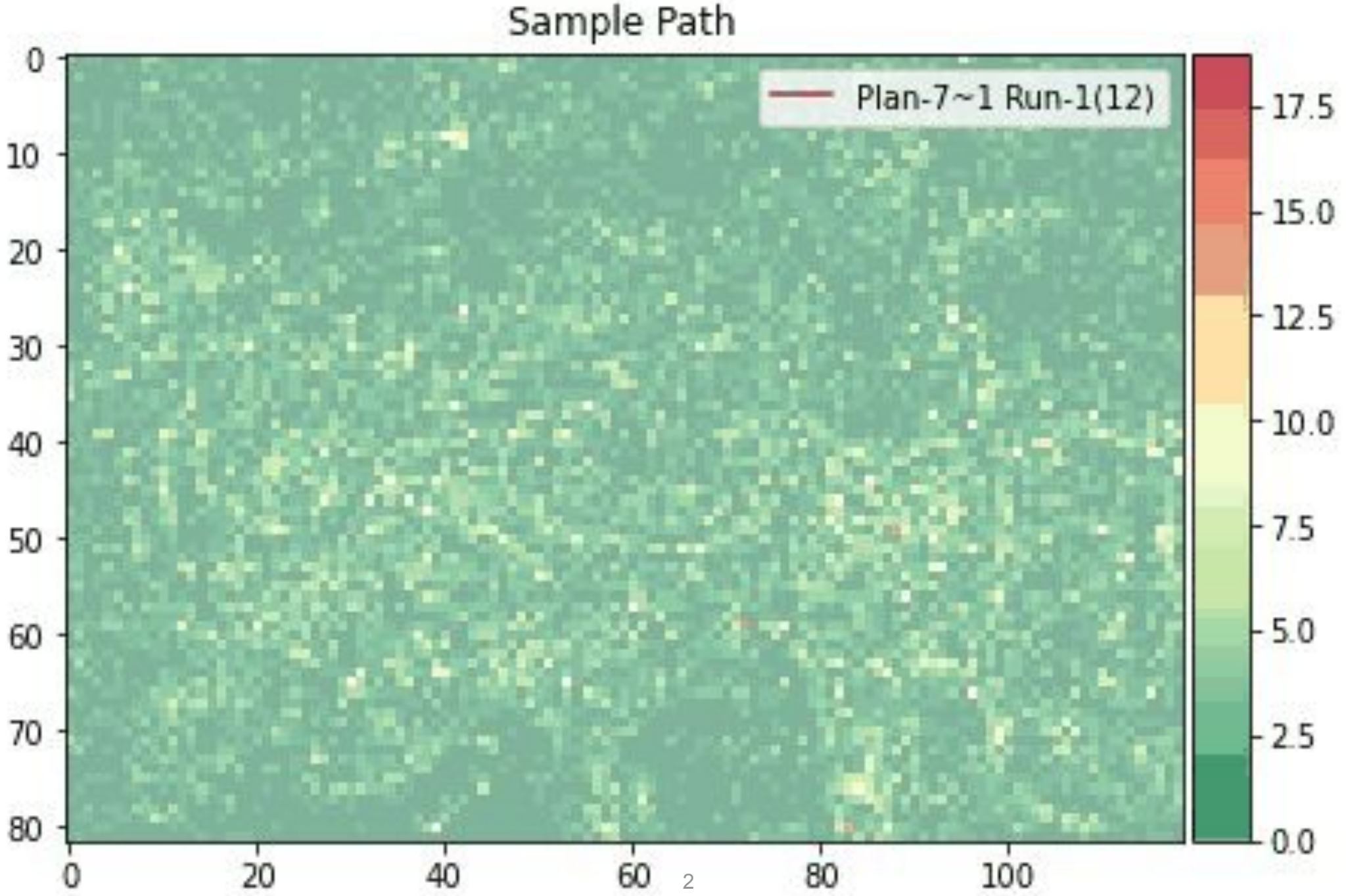
13 CLIMATE ACTION

STEERING STRATEGY

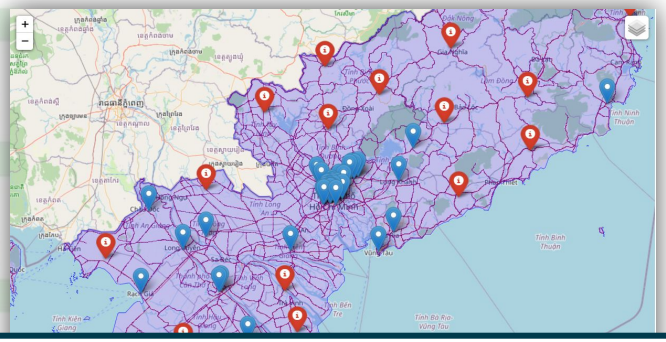
- **Hotspot prediction** using computational model to place the cleanup systems

- Finding the **optimal route** through the Great Pacific Garbage Patch through:
  - Looking 7 days ahead
  - Considering the plastic density
  - Including practical considerations, like making U-turns


Sample Path
Plan-7~1 Run-1(12)
0
10
20
30
40
50
60
70
80
0
20
40
60
80
100
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0

for a
rld

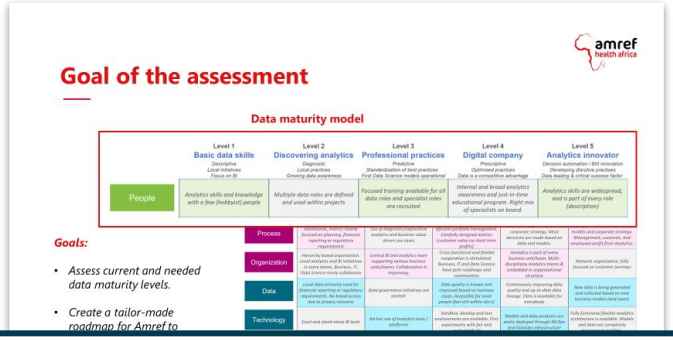
We increase the impact of our nonprofit partners through the following domains



Optimizing decisions around facility location, routing and supply chains

Impact improvement by applying machine learning to (unstructured) data

Increase donor contributions by applying marketing analytics techniques



Increase analytics capability by maturity scans and strategic roadmaps

Nonprofit projects and collaborations

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amref health africa

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Sanquin

Growing and exploring:

WFP World Food Programme

UN environment United Nations Environment Programme

OXFAM Novib

UNDP

data.org

Research and business Partners and Contributors

Founding partners:

ORTEC
OPTIMIZE YOUR WORLD

Universiteit van Amsterdam

In-kind contributors:

Cmotions
creating a better future with data

Deutsche Post DHL Group

MIT MANAGEMENT SLOAN SCHOOL

BUILDING BLOCKS

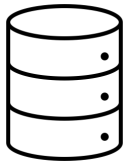
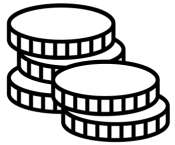
GUROBI OPTIMIZATION

London Business School

PIPPLE
DATA SCIENCE WITH PURPOSE

Tilburg University

How to contribute?

Skills  Data Technology  Funding

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Knowledge Sharing

Implementation

Research

Our mission:
Apply analytics to contribute to the Sustainable Development Goals

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Our Core Team

Parvathy Krishnan
- CTO at ABW
- Consultant for World Bank and UNDP

Dick den Hertog
- Science to Impact co-director ABW
- UvA Professor of Operations Research

Dimitris Bertsimas
- Science to Impact co-director ABW
- MIT Professor of Operations Research

Robert Monné
- Managing Director at ABW

Kate M. Henry
- Lead of operations and project managers at ABW

Britt van Veggel
- PhD student
- TU Delft Applied Mathematics graduate

Joaquim Gromicho
- UvA Professor of Business Analytics
- Researcher at ABW
- Science officer at ORTEC

Marta Bordignon
- Outreach and Event Manager at ABW

Claudia Orellana-Rodriguez
- Data Scientist in ABW
- PhD in Machine Learning

Supervisory board: Marc Salomon (Dean UvA ABS), Michael van Duijn (CEO ORTEC), Frans van Helden (MD ORTEC), Franka Rolvink Couzy (Self-Employed)

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Contact Us:

hello@analyticsbetterworld.org or
www.analyticsbetterworld.org

Time for Questions?

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