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22-23 September 2025, Geneva

ITU WTDC BAKU 2025
17–28 November 2025
Baku, Azerbaijan

Mapping Connectivity for Saving Lives

Early Warning Connectivity Map (EWCM)

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Disaster Connectivity Map (DCM) and Early Warnings for All (EW4All)
Climate Change and Emergency Telecommunication Division

97.9%
of the world population is covered by mobile network

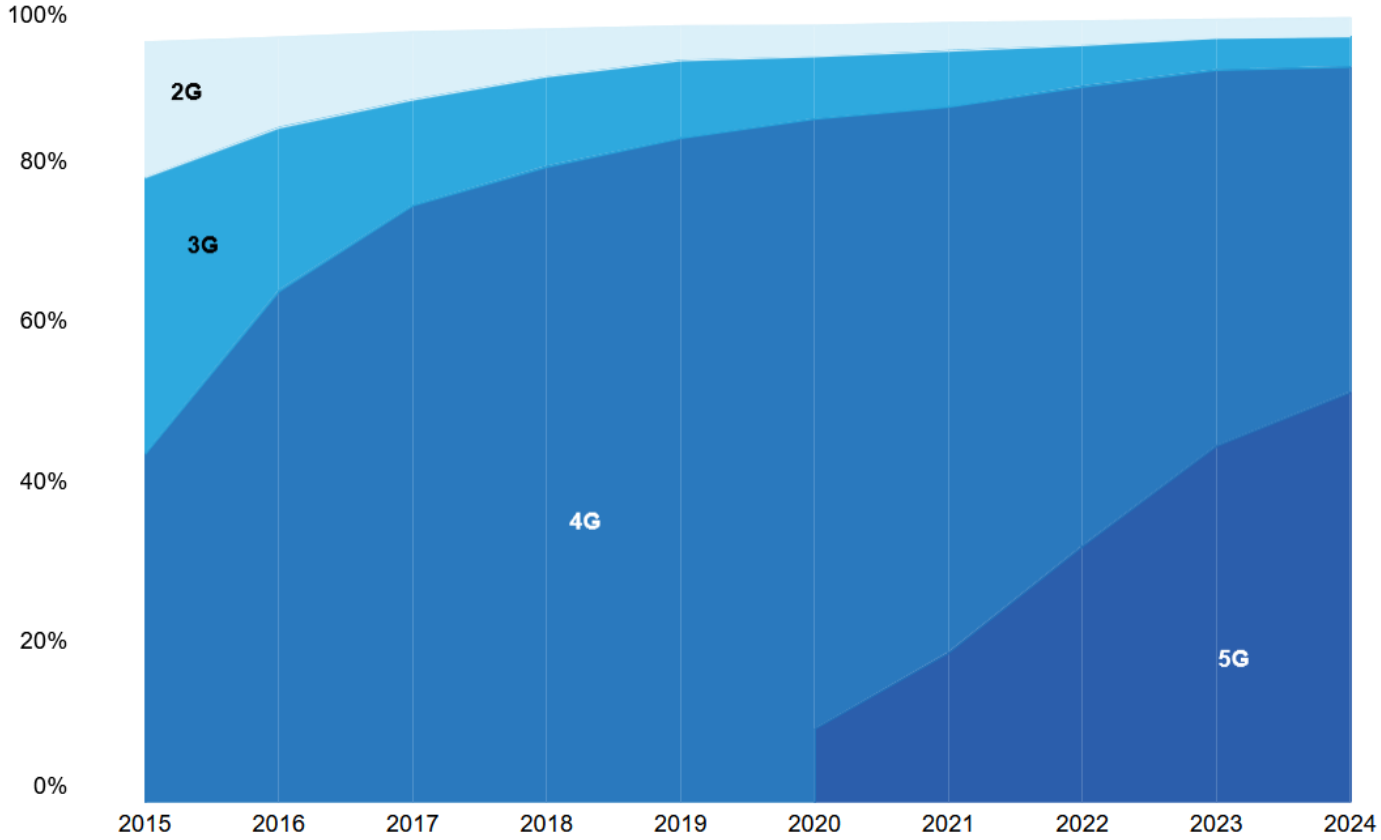
173 million (2.1%)
people beyond reach of 2G+ coverage

362 million (4.4%)
people beyond reach of 3G+ coverage

4 in 5
people own a mobile phone

yet, around 140 countries
have no inclusive mobile early warning systems

Population coverage by type of mobile network, 2015-2024



Note: The values for 2G, 3G and 4G networks show the incremental percentage of the population that is not covered by a more advanced technology network (e.g. in 2024, 96 per cent of the world population is covered by at least a 3G or above network, with 4 per cent having only 3G, 41 per cent having 4G, and 51 per cent having 5G). There are insufficient data to produce estimates for 5G coverage prior to 2020.

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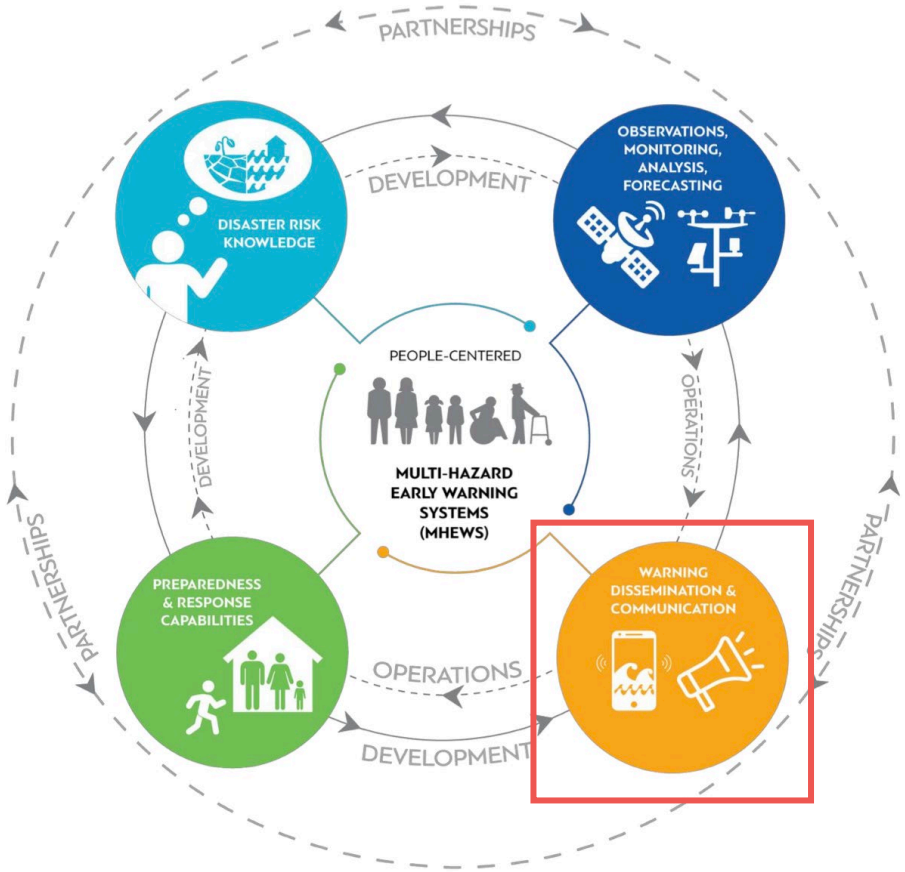
ITU

Under the UN Secretary-General's Early Warnings for All initiative (EW4All),

ITU is working to ensure early warnings reach people at risk…

…by identifying connectivity gaps, hazards and vulnerable populations



FOUR pillars of EW4All initiative, ITU leads Pillar 3: Warning Dissemination and Communication

Developed the Early Warning Connectivity Map (EWCM)

to see where and how many people are within coverage, and where connectivity ‘coldspots’ leave populations unreachable by mobile alerts

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By layering...

1. Connectivity Map

based on mobile coverage and crowdsourced connectivity data, leveraging today's widespread digital networks to map 'near-live' connectivity

2. Population Density Map

based on AI-powered population estimates and satellite analysis through collaboration with tech partners

3. Hazard Map

based on 11 natural hazards, from very low to high risk, to reveal population vulnerability

ThinkHazard!

Identify natural hazards in your project area and understand how to reduce their impact

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EWCM Country Pilots

Sharing EWCM data

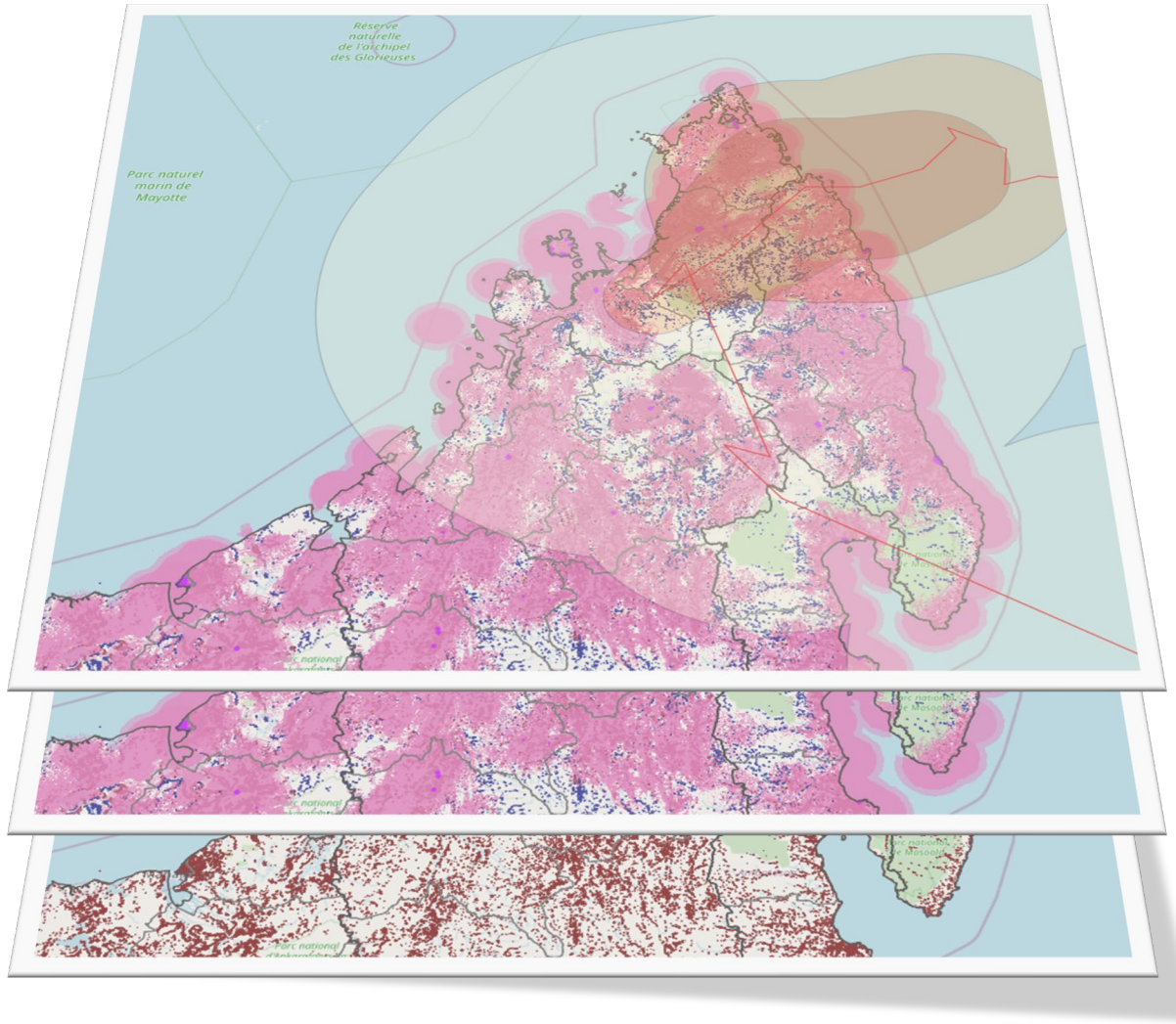
Mapping completed for 33 EW4All countries, scaling to more

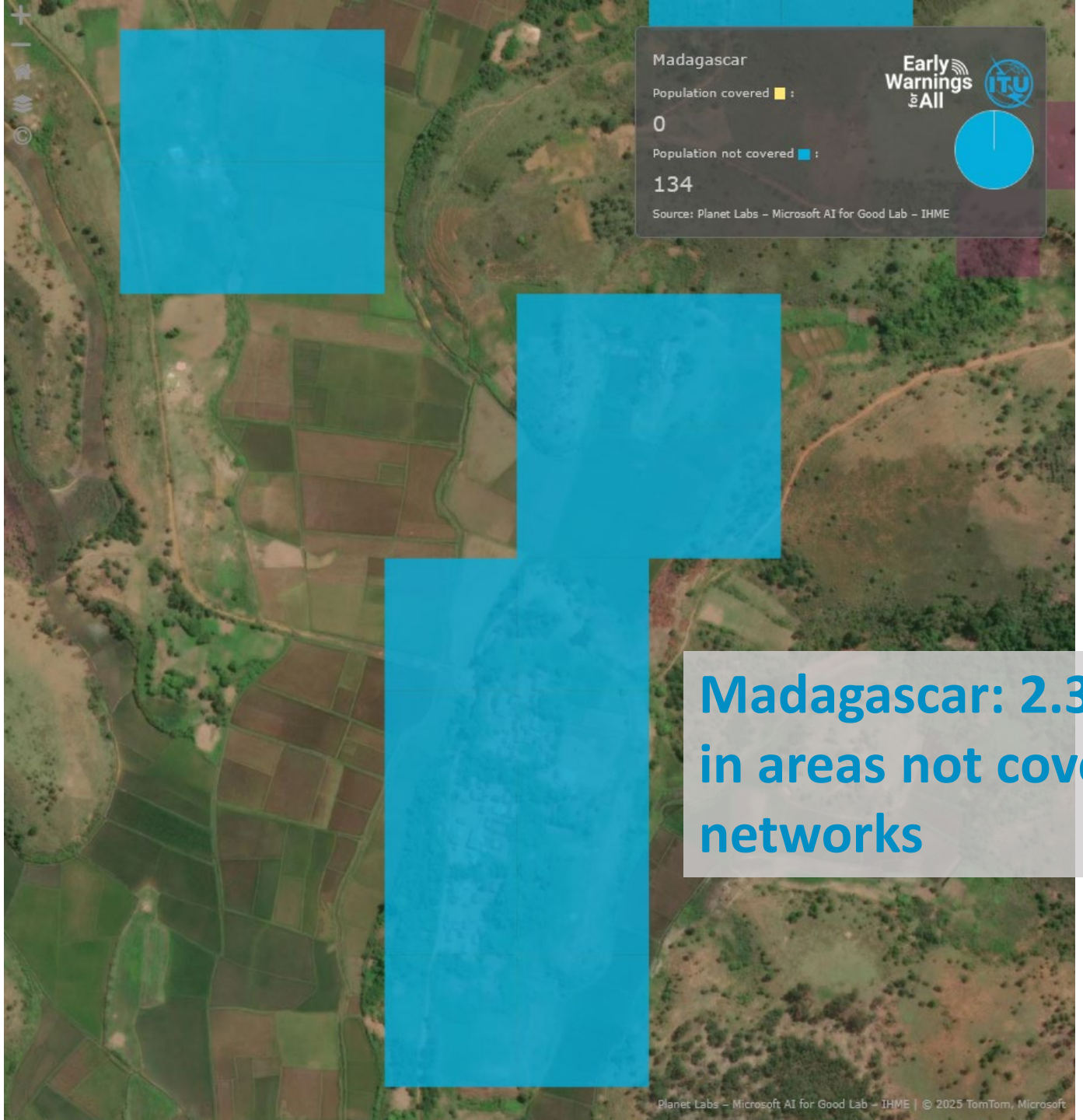
Data validation

Collaborating with member states and mobile network operators during EW4All workshops to validate results

Capacity building

Training telecom regulators and relevant national stakeholders in geospatial data analysis to produce and use the EWCM data independently





Madagascar: 2.3M people live in areas not covered by digital networks

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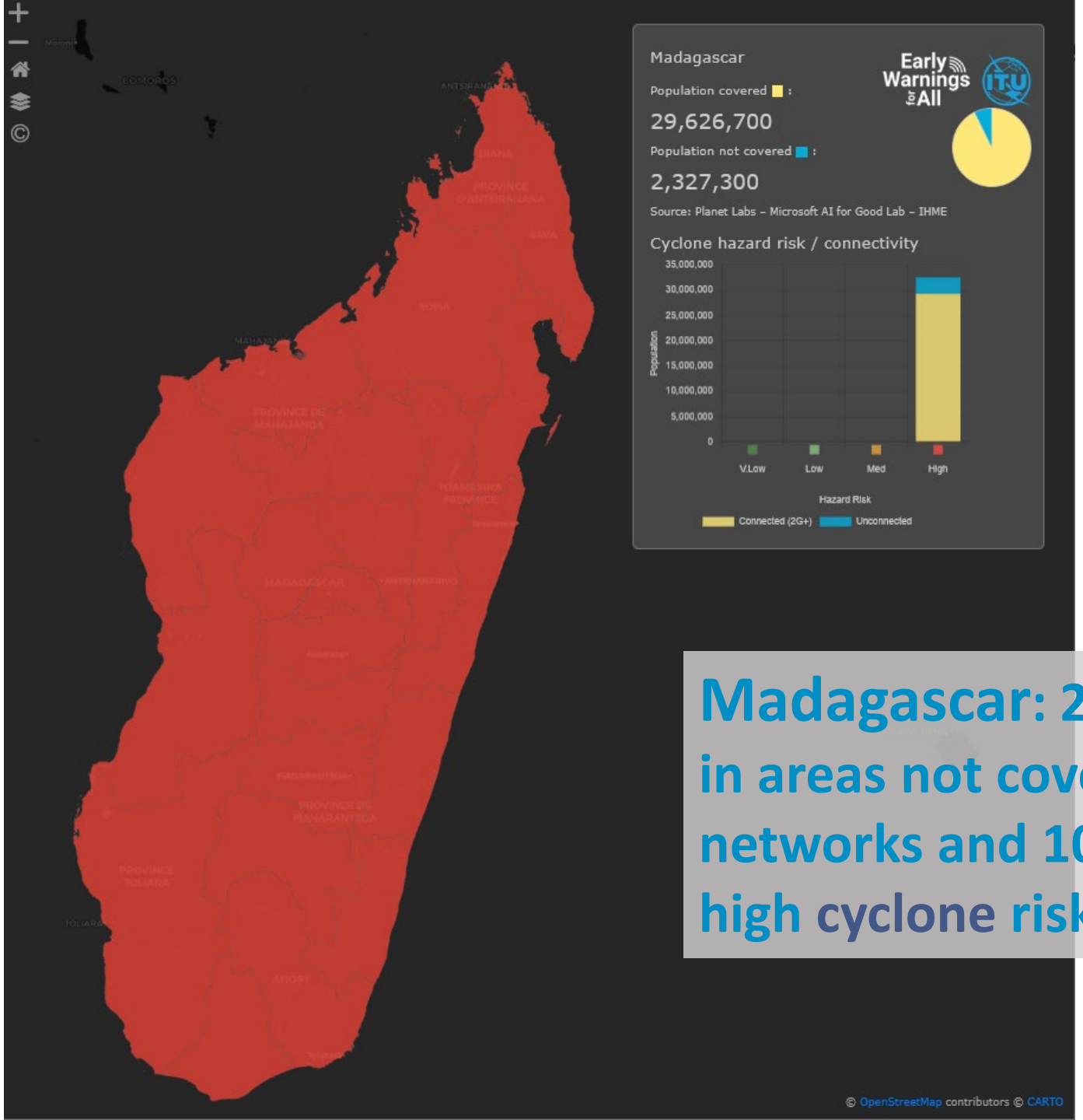

Madagascar: 2.3M people live in areas not covered by digital networks and 100% exposed to high cyclone risk

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EWCM data complements official statistics, providing policymakers with an evidence-base for emergency preparedness and telecommunications planning

Applications for Policy

Identify Vulnerable Populations

Reveals communities with limited digital network connectivity requiring alternative warning systems and targeted preparedness.

Develop Multi-Channel Approach

Combine sirens, radio broadcasts, and community-based alerts to reach populations.

Prioritize Infrastructure Investment

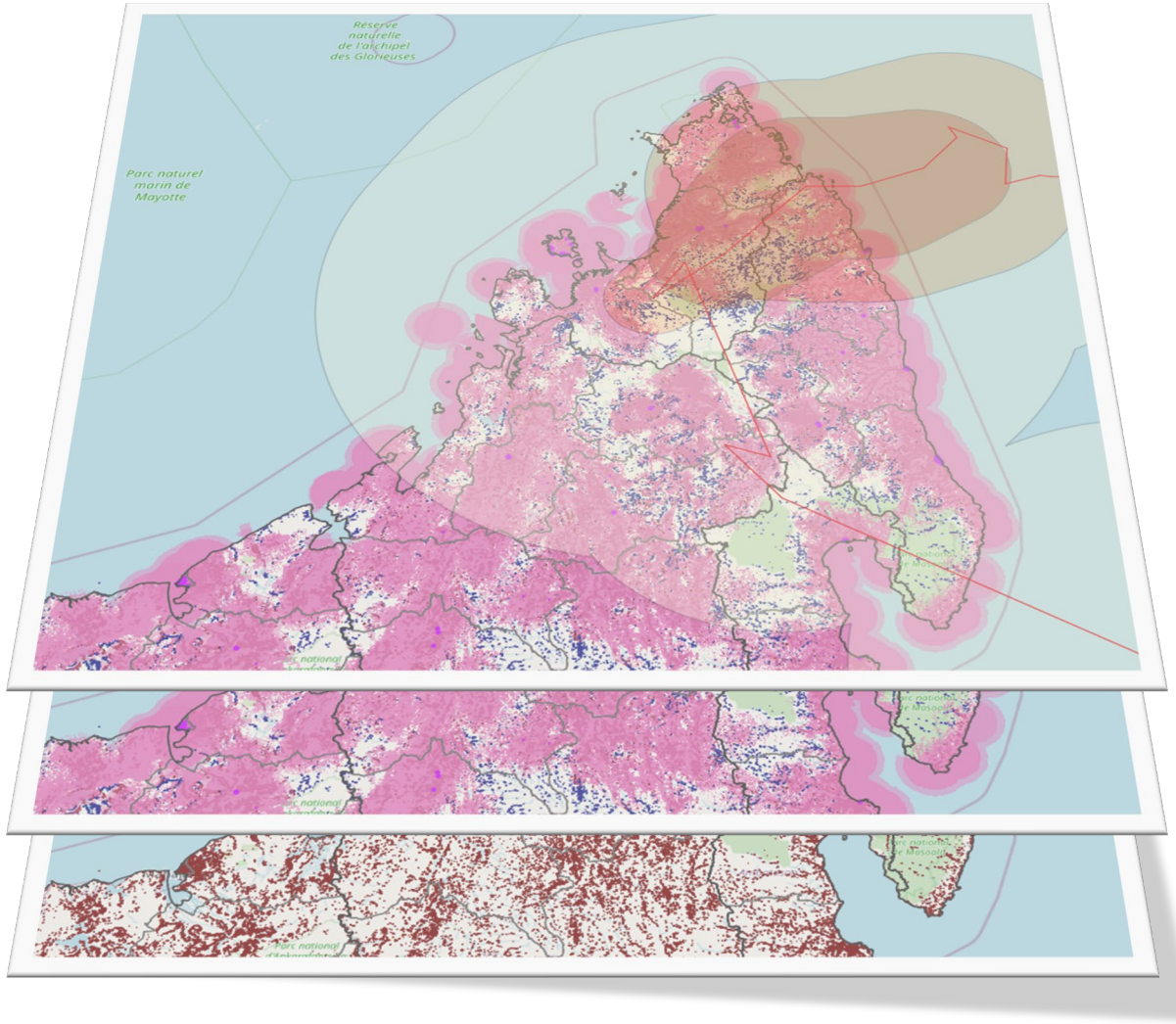
Utilize connectivity gap data to guide investment for network expansion and strengthen resilience.

Applications Beyond Early Warnings

- Multi-sector applications: Connectivity data supports social and economic inclusion, health and education delivery, network performance monitoring, and more.
- Policy & development: Data-driven decisions and resource targeting.
- Technical enhancement: Greater data granularity and advanced technical capabilities.

Support us on testing and refining the EWCM

- Sharing data (up-to-date cellular coverage data)
- Verifying results
- Providing feedback
- Contributing case studies



Together, we can build more connected, resilient communities where no one is left unreachable in times of disaster

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Thank you

Disclaimers

The EWCM 'near-live' connectivity map layer is based on the Disaster Connectivity Map (DCM) which uses multiple sources for network infrastructure, cellular coverage and connectivity measurements. These sources include the ITU Transmission Map, GSMA and CollinsBartholomew Ltd cellular coverage maps, Opencellid, Meta for Good, Measurement Lab (M-Lab), netBravo, Ookla for Good, and Speedchecker. The infrastructure and coverage data has been validated by ITU Member States and supplied by Mobile Network Operators, and is then augmented with updated and real-time crowd-sourced connectivity data from a number of data sources.

A number of ground truth tests have been carried out to compare results to connectivity levels observed on the ground, including by first responders. The connectivity levels, availability and gaps displayed in the map reflect the availability of these data sources and may in certain cases not provide the full connectivity picture. To further improve the quality and reliability of the map, engagement is ongoing with different partners to identify new data sources and AI applications that could be used to further improve the quality and reliability of the data.

Member States, Mobile Network Operators, and partners are invited to review, validate, and help improve the results.

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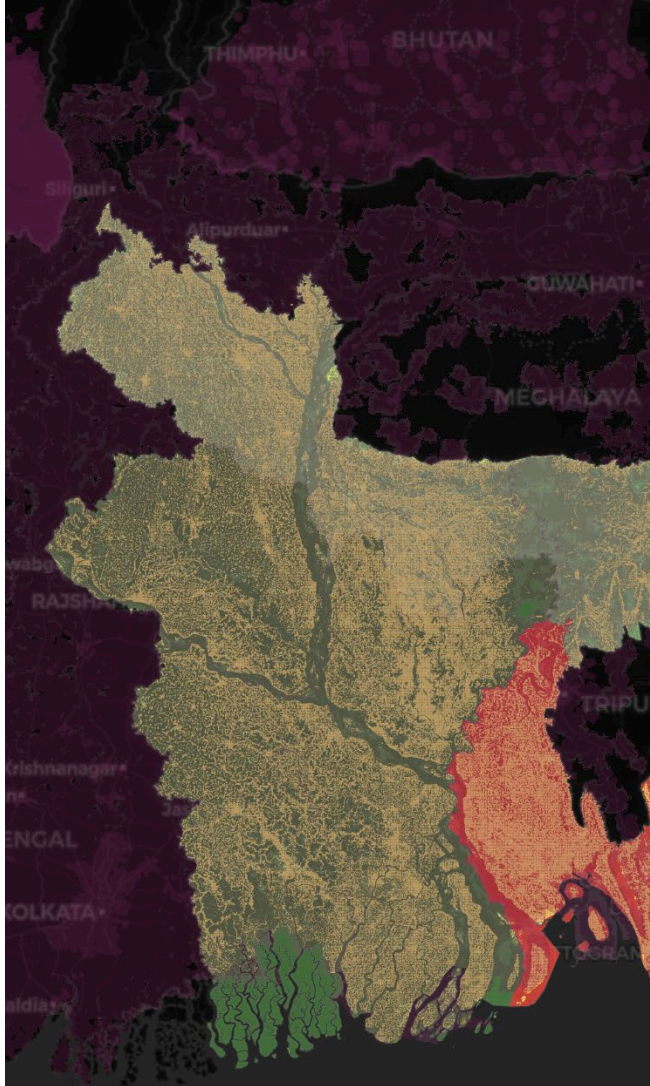
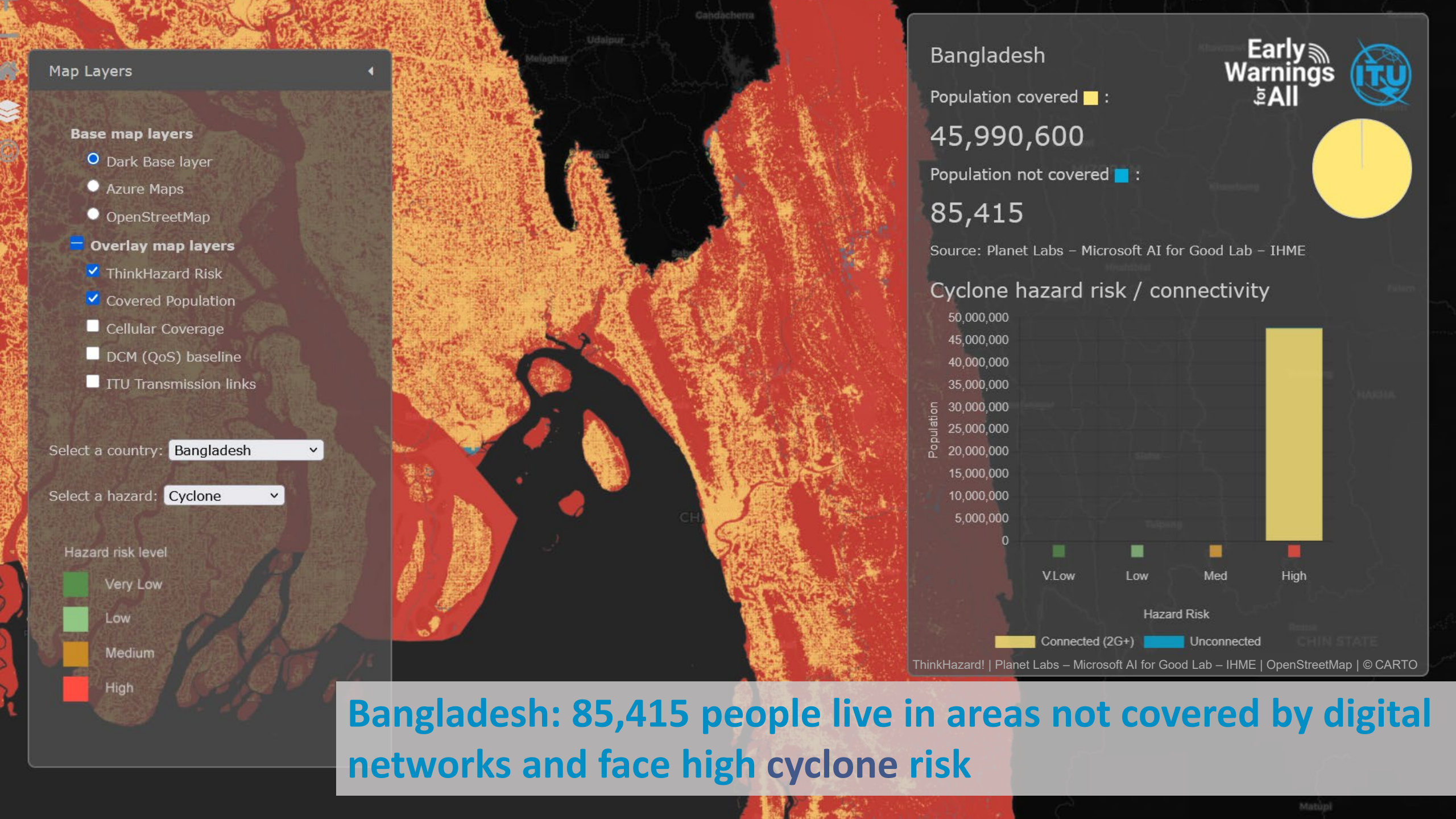
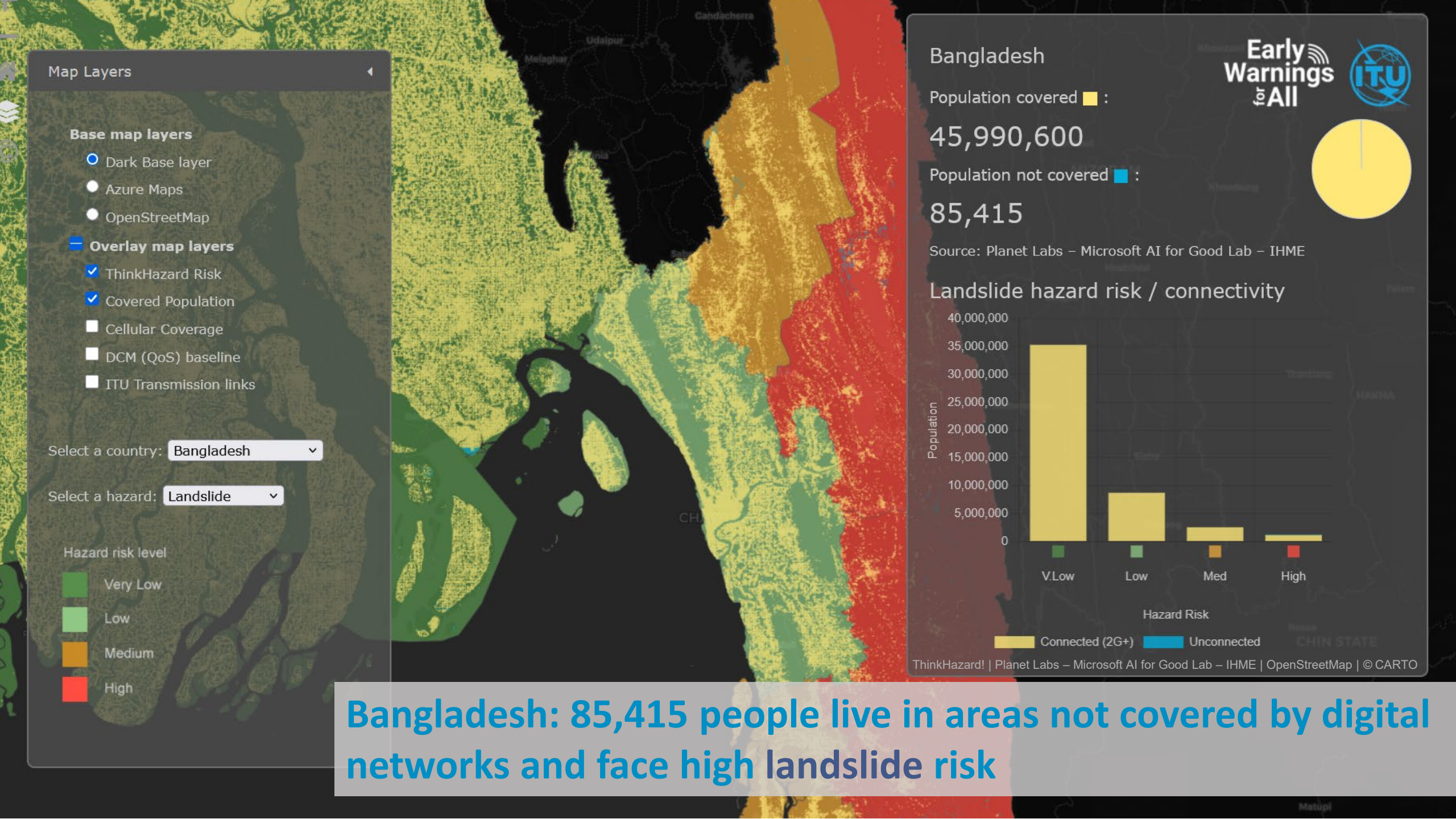
Learn more: www.dcm.itu.int





Bangladesh: 85,415 people live in areas not covered by digital networks and face high cyclone risk



Bangladesh: 85,415 people live in areas not covered by digital networks and face high landslide risk