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BILBAO 2024

Informing Climate Change and Sustainable Development Policies with Integrated Data

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The Children's Climate Risk Index (CCRI)

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Outline

- CCRI overview
- Context: recent Kenya climate shocks
- CCRI framework
- What data do we use?
- Where we are? What do we need to move forward?

Children's Climate Risk Index (CCRI)

- Introduced in 2021, composite index for cross-country comparison.
- First-generated evidence for advocacy: **1 billion children** (~50% world's children) live in extremely high-risk countries.
- Piloted with government partnership at subnational level in four countries, e.g. **Kenya**, in 2023: promote the use of data for prioritizing risk reduction interventions.

Tana River Floods (May 2024)

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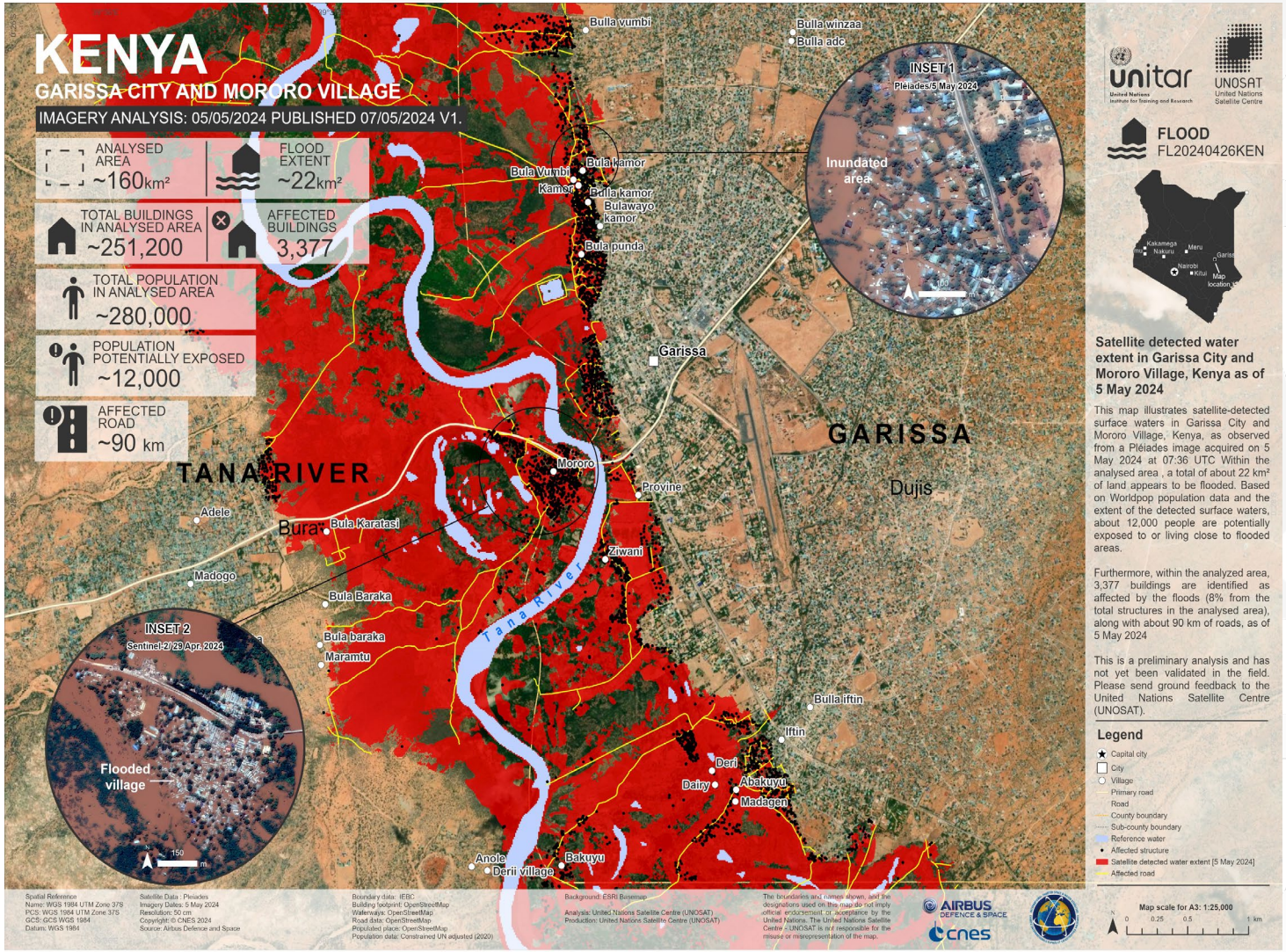

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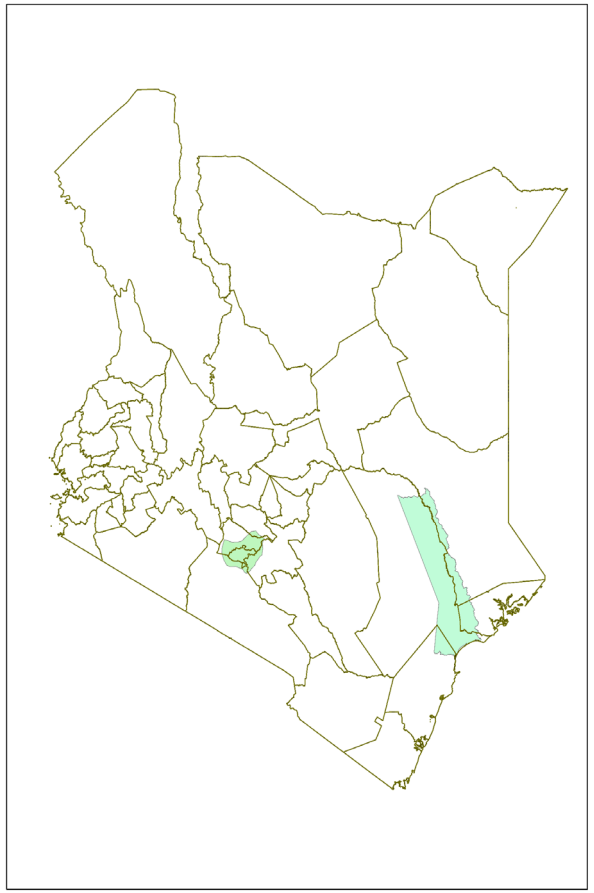
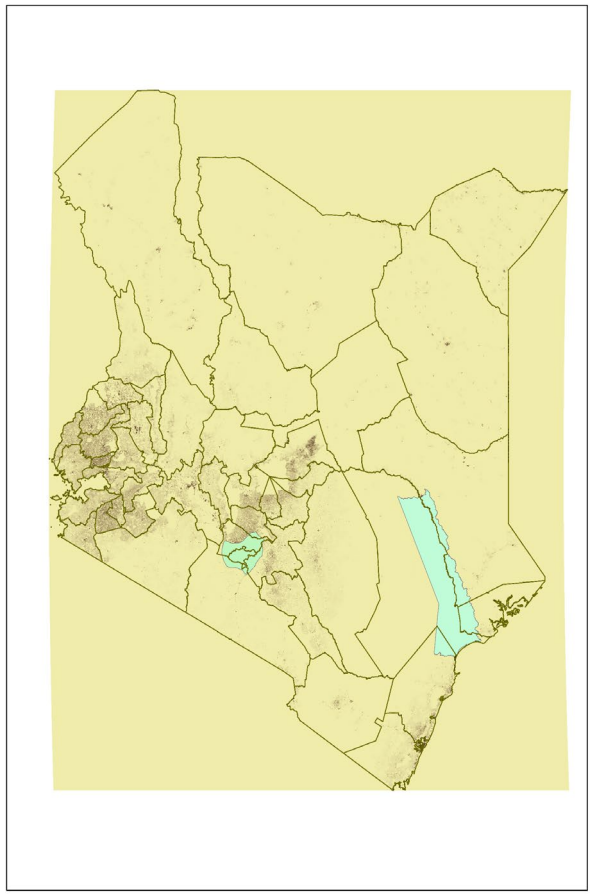
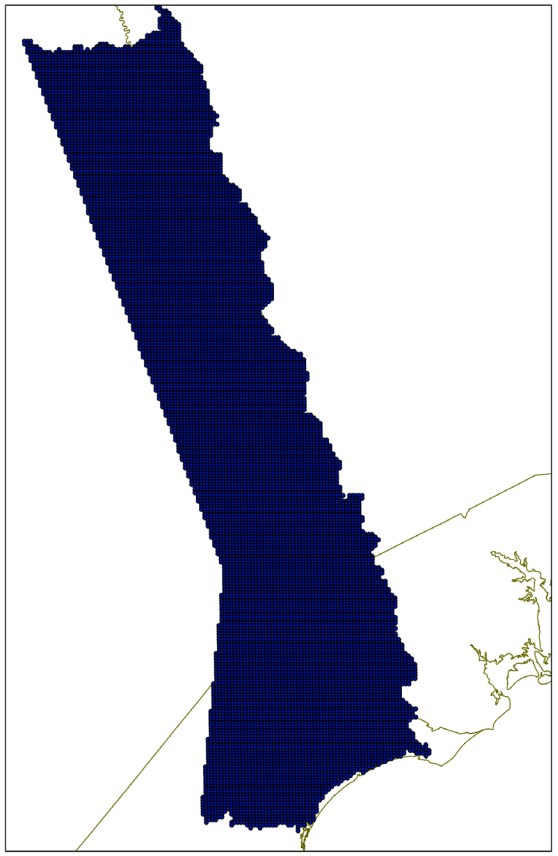
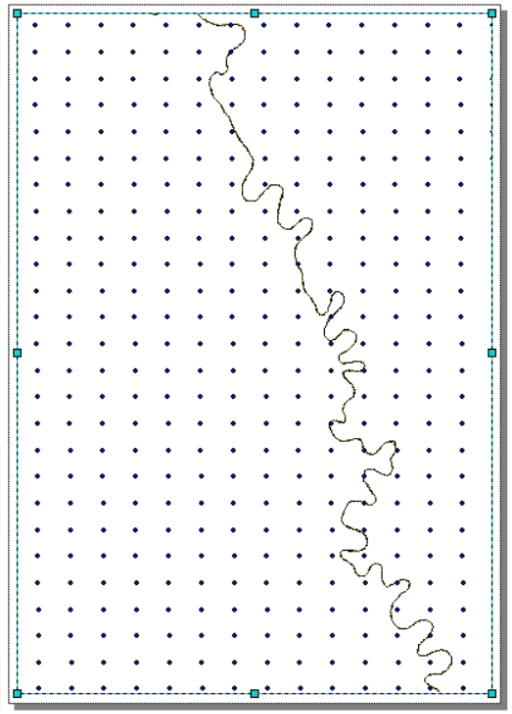
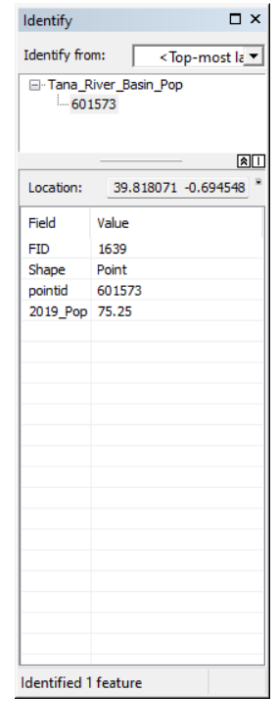
Population Affected by Tana River Floods









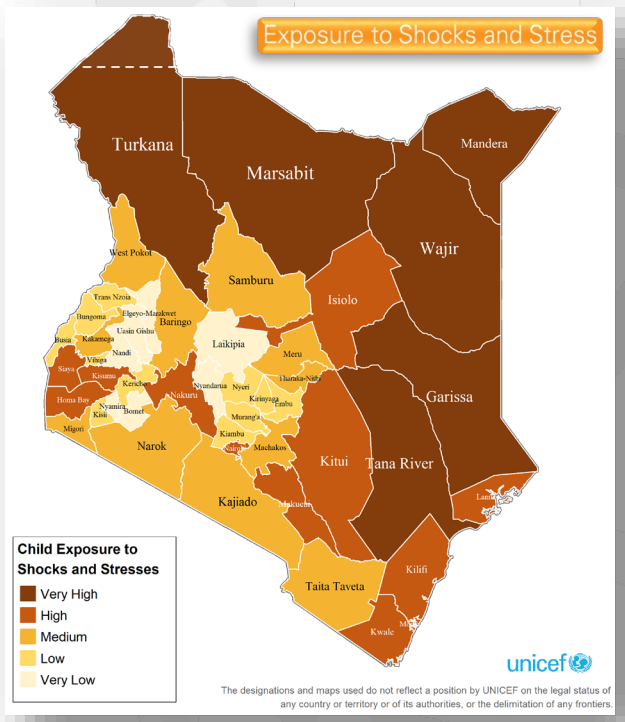


For Tana River Basin 464,391 Persons were affected by the floods

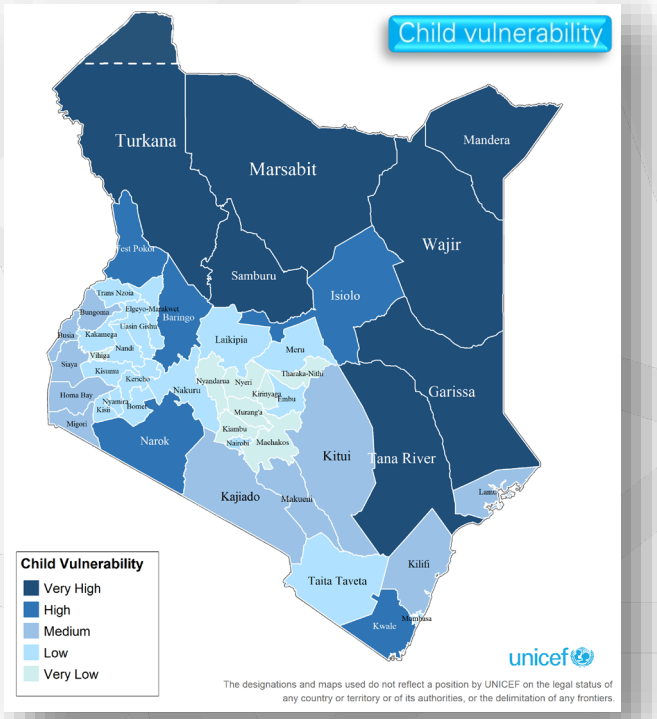
The Pillars

- Overall risk[1,2,3] is derived as the average of two Pillars that capture child Exposure and Vulnerability to climate and environmental shocks and stresses:

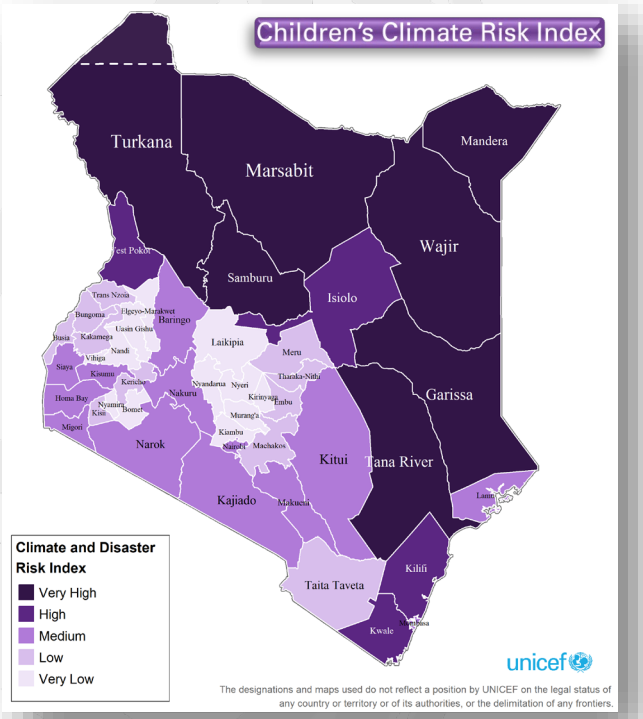
Risk = Avg(Shock Exposure, Child Vulnerability)



Pillar 1



Pillar 2



Kenya CCRI (admin 1)

[1] UNICEF Guidance for Risk Informed Programming, 2018
[2] Index for Risk Management (INFORM), 2017
[3] Sharma et al. Applying IPCC 2014 framework for hazard-specific vulnerability assessment under climate change, 2019

Methodological Approach

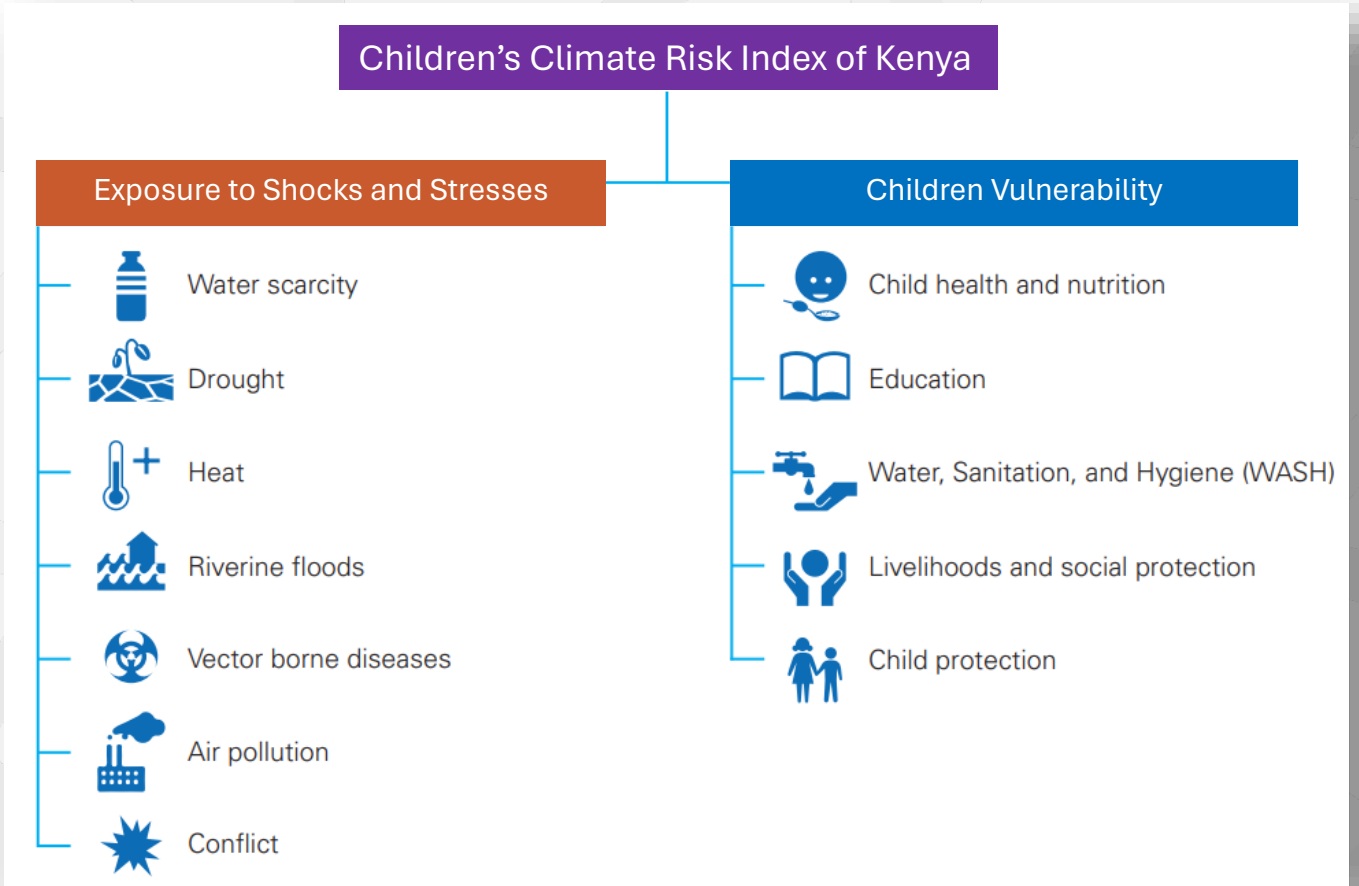
- Top-down and Bottom-up process:

CCRI

Pillars

Components

53 Indicators

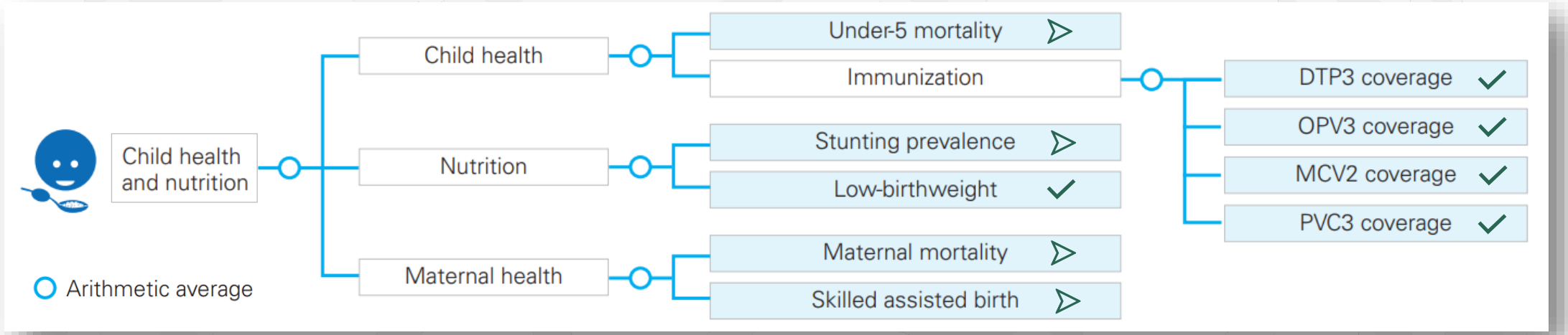


CONSTANT for all models

TAILORED to country context

What Data do we use for Pillar 2?

- Pillar 2 uses familiar sources in Official Statistics, e.g. Health Component:

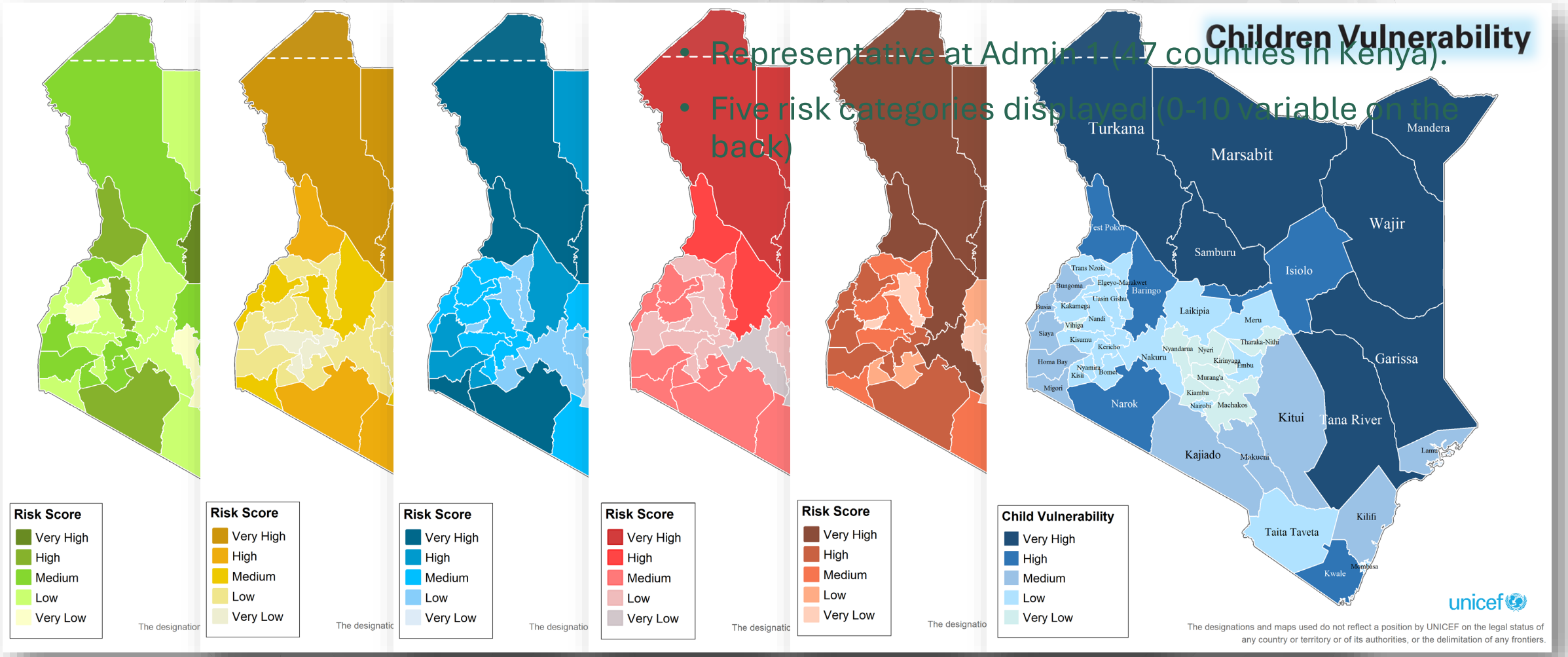


✓ **Kenya Health Information System, 2022 (KHIS)** ➢ **Demographic and Health Survey, 2022 (DHS, KNBS, ICT)**

- Using **Indicators** (different units of measure) to quantify Sub/Components **Scores**:
  - Normalize (identical re-scaling from 0 to 10).
  - Invert (if necessary, with the notion that higher is worse).
  - Aggregate (arithmetic average).

How do Scores look like?

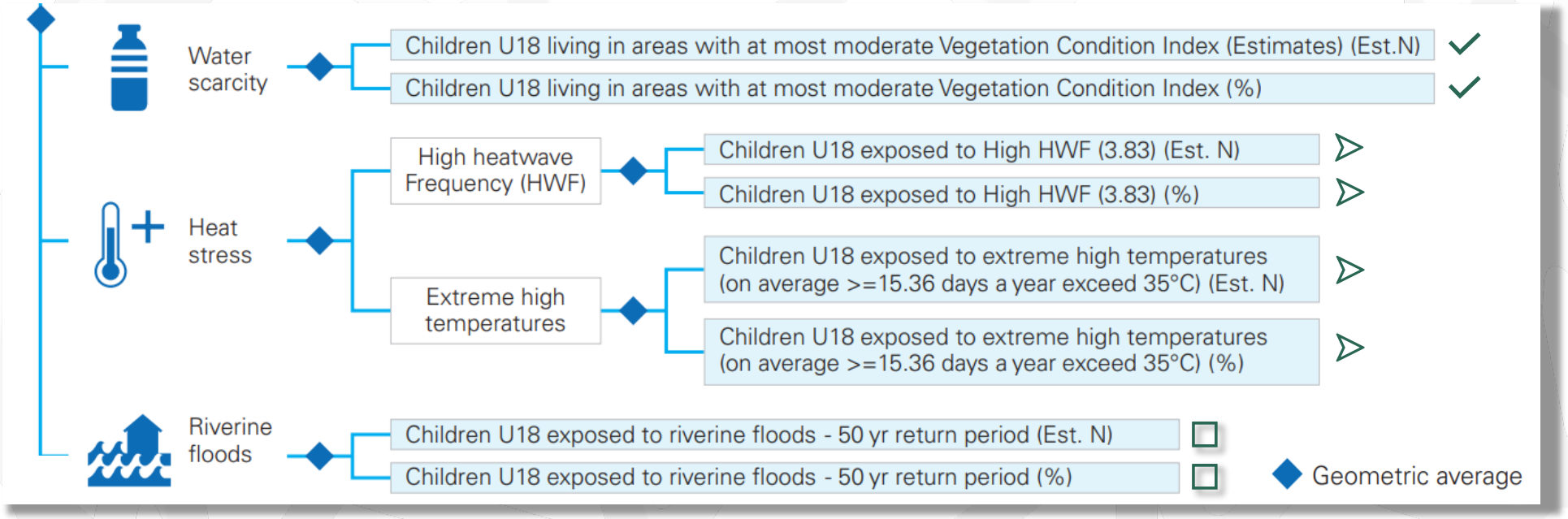
- Pillar 2 components Risk Scores:



- Representative at Admin-1 (47 counties in Kenya).
- Five risk categories displayed (0-10 variable on the back)

What Data do we use for Pillar 1?

- Pillar 1 uses mostly Earth Observation Data, e.g. Water Scarsity, Heat and Floods:



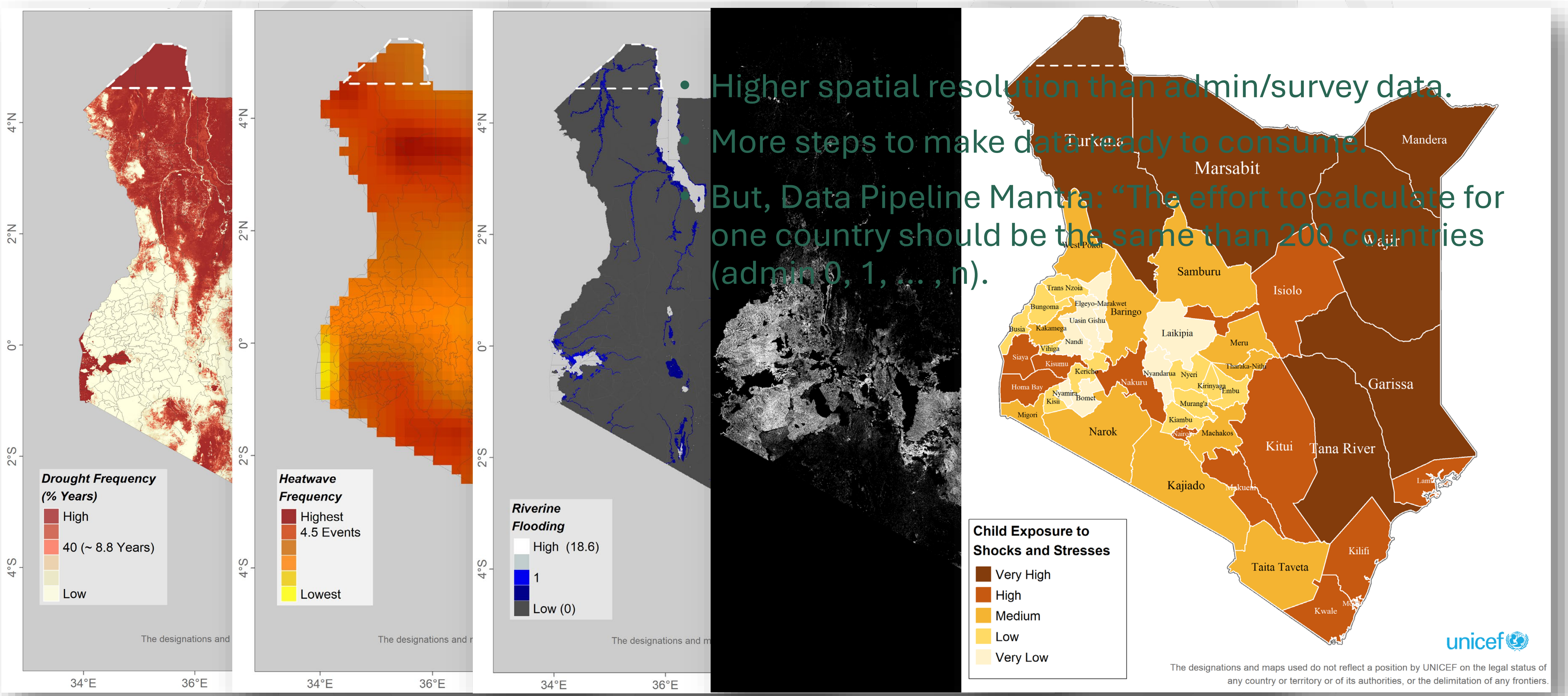
✓ Normalized Difference Vegetation Index, 2023 (NDVI, NASA)
➢ Berkley Earth Surface Temperatures, 2022 (BEST)
❑ World Resources Institute Aqueduct 4.0, 2023 (WRI)

\+

Children U18 Gridded Population, 2020 (WorldPop)

How does Earth Observation Data look like?

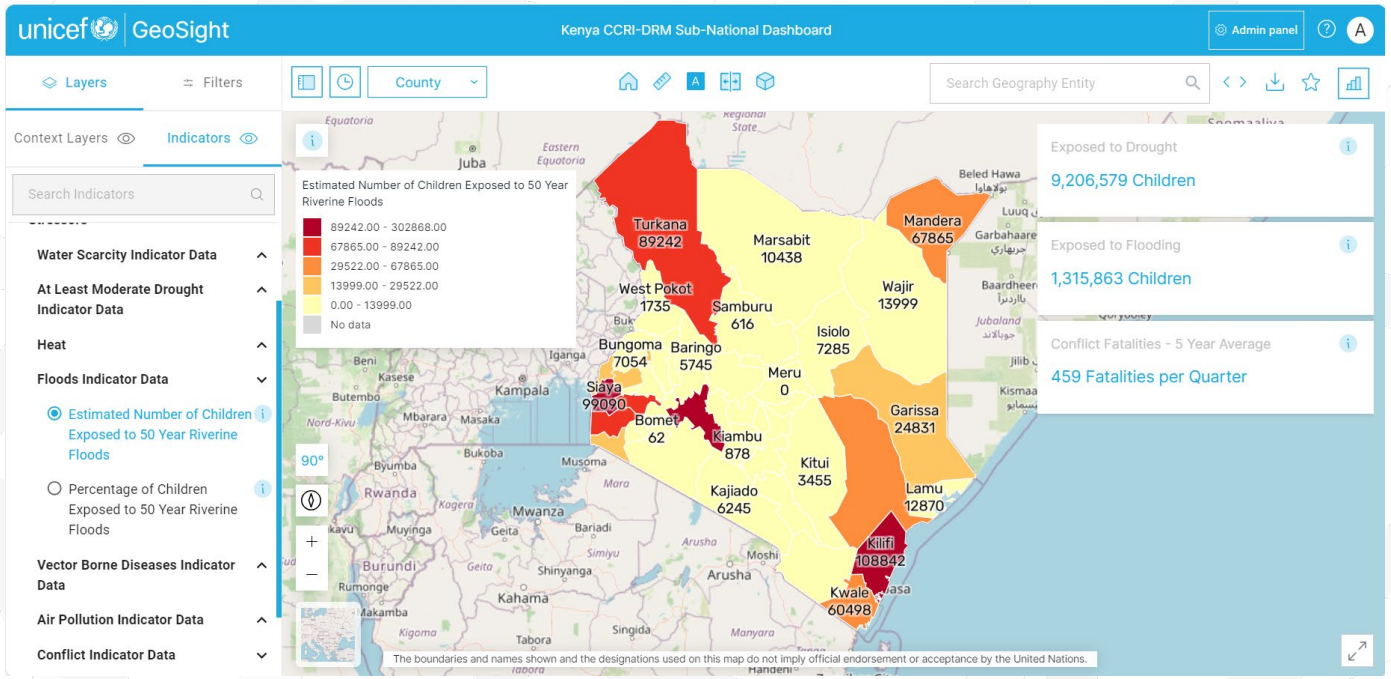
VCI < 35% (current ND… **HWs > 23.81** … **Riverine Flood** … 2021) in 50yr return period … **Children Exposure** … Risk Score (multi-shock)


Drought Frequency (% Years)
High
40 (~ 8.8 Years)
Low
Heatwave Frequency
Highest
4.5 Events
Lowest
Riverine Flooding
High (18.6)
1
Low (0)
Child Exposure to Shocks and Stresses
Very High
High
Medium
Low
Very Low
Turkana
Mandera
Marsabit
Wajir
West Pokot
Samburu
Isiolo
Trans Nzoia
Elgeyo-Marakwet
Baringo
Bungoma
Uasin Gishu
Laikipia
Busia
Kakamega
Meru
Nandi
Vihiga
Siaya
Tharaka-Nithi
Kisumu
Kericho
Nyandarua
Nyeri
Garissa
Nakuru
Kirinyaga
Homa Bay
Embu
Nyamira
Kisii
Bomet
Murang'a
Migori
Kiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Kwale
unicef
4°N
2°N
0°
2°S
4°S
34°E
36°E
The designations and maps used do not reflect a position by UNICEF on the legal status of any country or territory or of its authorities, or the delimitation of any frontiers.

- Higher spatial resolution than admin/survey data.
- More steps to make data ready to consume.
- But, Data Pipeline Mantra: "The effort to calculate for one country should be the same than 200 countries (admin 0, 1, … , n).

Where we are?

- Subject-matter experts: Health, WASH, Education, Nutrition, Child Mortality, Protection and Poverty.
- New UNICEF DAPM climate unit: global CCRI update and revision.
- Subnational CCRI: completed in 4 countries, ongoing in 17 countries, guidance materials.
- UNICEF Indicator Data Warehouse: REST API.
- UNICEF GeoSight: open source web mapping and analysis.

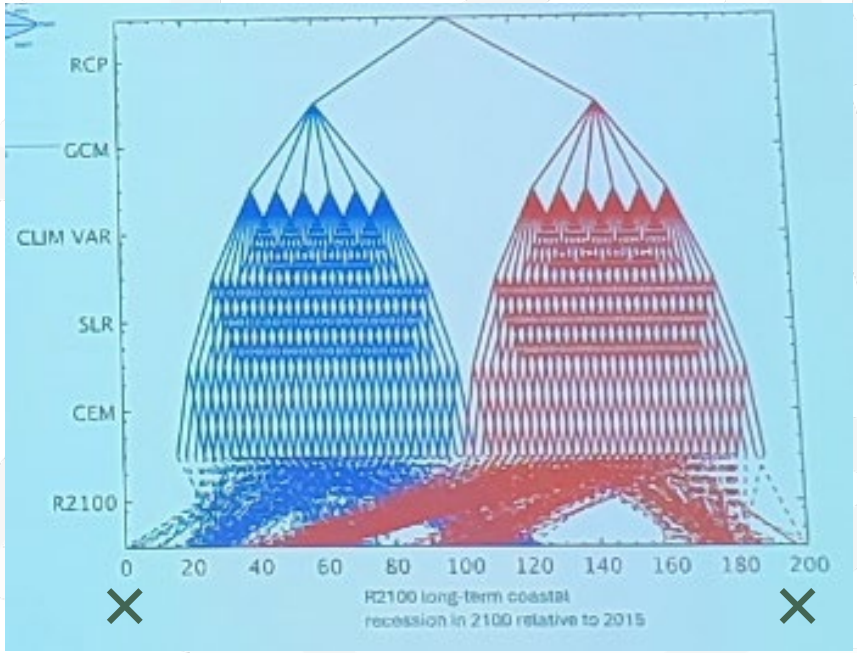


What does it take?

- Coordination, e.g. Kenya: 15+ institutions involved during Consultation and Validation workshops.
- Collaboration: reusing open data, open-source analytics.
- Roadmap for the NSO or other Governmental office to produce subnational CCRI in a regular basis?

What do we need?

- Methods: Small Area Estimates for Pillar 2, CCRI validation against more sophisticated risk models, is ARIES a good test candidate?



Iñigo Losada's Coastal Flood presentation

- Process: CCRI industrialization for scalability and repeatability (trends and projections, not just snapshots)

Acknowledgements

- UNICEF: Kenya CO, CEED, RAPS/EMOPS, FDN/DAPM.
- Government of Kenya: Climate Change Directorate
- USAID Bureau of Humanitarian Affairs (BHA)

Thank you for your attention !!!