



## CASE STUDY 2.4

### STRATA

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Across the globe, the impacts of climate change, environmental degradation, and the mismanagement of natural resources are undermining livelihoods and damaging essential infrastructure. In fragile or crisis-affected contexts, these impacts can exacerbate existing socio-economic risks, increasing competition over scarce resources, displacement, and conflict. At the same time, violent conflict and political instability can undermine climate change adaptation and the sustainable management of ecosystems, leaving vulnerable communities poorer, less resilient, and ill-equipped to cope with the effects of climate change.

Member states, the UN Security Council, the African Union, the EU, and civil society worldwide have called for improved analyses of environmental and climate-related risks to peace and stability to inform policy and programs in fragile and crisis-affected contexts. However, the capacity for data-driven assessments of converging complex risks has long remained in the hands of a limited set of experts.

The Strata platform—a joint initiative of UNEP and FAO within the framework of the EU-UNEP Climate Change, Environment and Security Partnership—aims to democratize the analysis of environmental and climate risks for peace by making such capacity available to practitioners and policy makers without prior technical know-how.

Strata is a web-based, open access, and free geospatial data platform to identify and track where environmental, climate, and security stresses converge with socio-economic vulnerabilities and instability. It requires no

technical knowledge of GIS or data tools to generate actionable information for a range of assessments and analyses, policy and planning processes, and programming investments.

Using FAO's Earthmap technology and powered by Google Earth Engine (GEE), the app aggregates multiple environmental, climate, and socioeconomic indicators to map hotspots where different risks are converging. Strata, which currently covers 82 countries, uses 28 indicators to monitor climate-related peace and security stresses in three main pillars:

**Climate and environmental hazards**, including flooding, drought, land degradation, deforestation, and heatwaves;

**Peace and security**, including battles, remote violence, protests, riots, and violence against civilians; and

**Socio-economic exposure and vulnerability**, including population (female, elderly and children), irrigation, food insecurity, population growth, travel time to healthcare, and urban expansion.

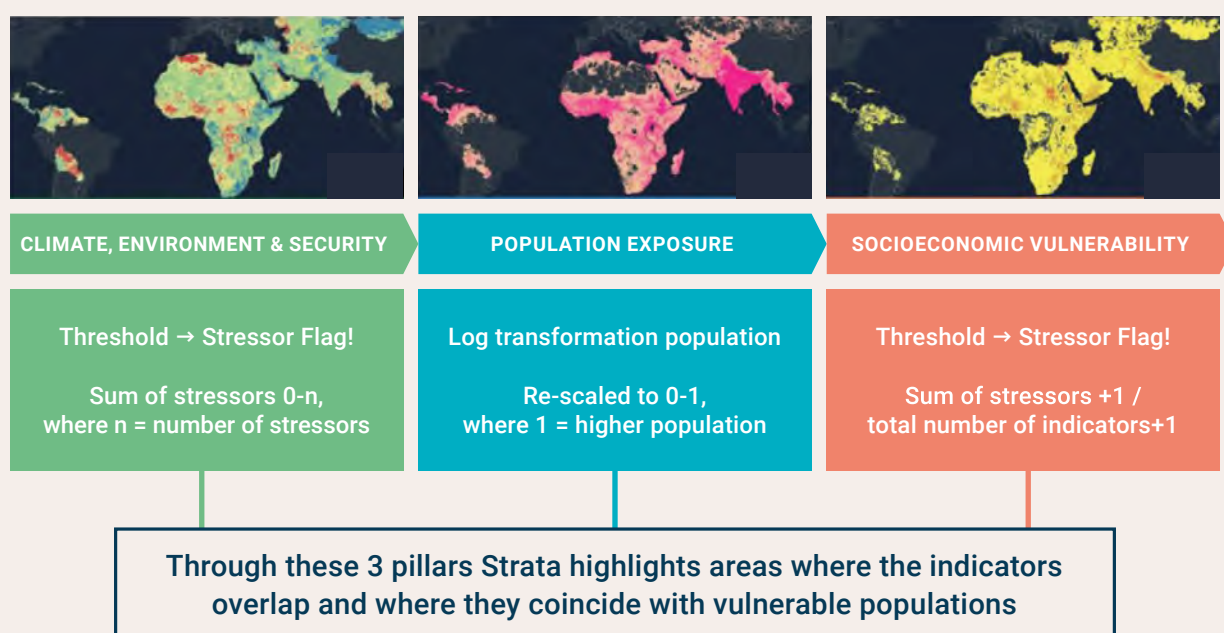
The indicators are calculated from near real-time geospatial data streams that are continuously updated, primarily through cloud computing based on satellite imagery and derived datasets. Recognizing the need to tailor analytical outputs to local contexts, Strata's datasets and indicators are available at subnational spatial resolution (adm1) and lower granularity in most cases.

Strata aggregates the indicators into the hotspot map using the [Convergence of Evidence methodology](#) developed by the EU's Joint Research Centre. The data and results are open access with clearly annotated scripts of the algorithms through Google Earth Engine.

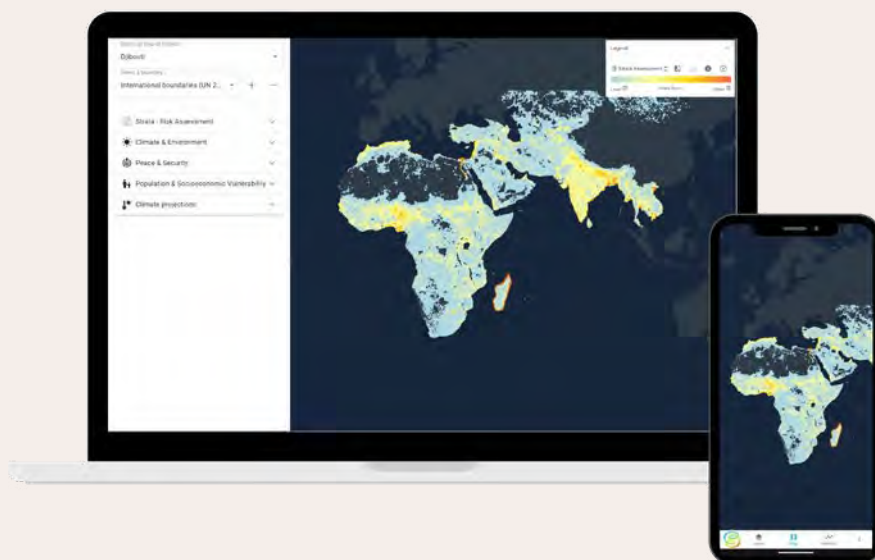
For each indicator, the STRATA methodology (FIGURE 2.6) uses a threshold to determine where conditions reach stress levels. These thresholds vary according to the indicator and are classified as: (i) Absolute thresholds,

where a fixed value is set as a threshold that determines when particular stresses are experienced; this value is fixed across all locations; (ii) Thresholds relative to past conditions, where the threshold is set to flag conditions that are significantly different from historical conditions; and (iii) Thresholds relative to other locations: where data is only available at one point in time or is updated very infrequently, thresholds are set to flag the locations with the values corresponding to the highest level of stress or vulnerability across the selected area.

**FIGURE 2.6:** DESCRIPTION OF EACH STEP IN STRATA'S METHODOLOGY.



## Strata Risk Assessment



Users can use Strata to:

**Identify hotspots** where environmental vulnerabilities intersect with historical conflicts at local and national scales.

**Prioritize areas for intervention** through climate adaptation, natural resource management, and peacebuilding programs.

**Design conflict-sensitive interventions** that address environmental challenges while considering local social dynamics.

**Monitor and evaluate** the impact of interventions for adaptive management and informed decision making.

By leveraging Strata for analysis and decision making, users are better equipped to address complex challenges and promote resilience among vulnerable communities, countries, and regions.