

# Overview of Indicators and Datasets

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## Environmental and climate stresses

Indicator	Dataset source(s) and variable(s) used	Default threshold	Spatial resolution	Time resolution and period of available data	Update frequency
Drought (meteorological)	CHIRPS Daily precipitation (Funk et al. 2015), via Google Earth Engine selected (GEE), converted to Standardised Precipitation Index (SPI, McKee et al., 1993)	SPI $\leq$ -1.5 over the analysis period	0.05°	Daily data 1981 to present	Monthly
Drought (agricultural)	MOD13A1.006 Terra Vegetation Indices 16-Day Global 500m 16-day NDVI average (Didan, 2015), via GEE	NDVI $\leq$ 25 <sup>th</sup> percentile of historical conditions (2003 to year before selected end year) for the time of year in analysis period	500m	16-day data 2000 to present	16 days
Heatwave	ERA5-Land Hourly - ECMWF Climate Reanalysis (Muñoz Sabater, 2019), via GEE, maximum daily temperature calculated	Maximum temperature $>$ 40°C for at least 0.1° 3 consecutive days		Hourly data 1981 to present, converted to daily data	Monthly with 3- month delay
Flood (likelihood)	WRI Aqueduct Flood Hazard (Ward et al. 2020), via aqueduct.wri.org (accessed 12/2021)	A risk of flooding (to any depth) with a 25-year return period flood under baseline conditions (representing present day)	927.6m	Pre-calculated for a 40-year period centred on 1980 representing present day	Not updated
Coastal Inundation	SRTM Digital Elevation Data (Farr et al. 2007), via GEE	Areas $<$ 10m above sea level	30m	Estimate from 2000	Not updated
Deforestation	Hansen Global Forest Change v1.8 (Hansen et al. 2013), via GEE, Tree canopy cover in 2000 and loss per year converted to rate of loss	Forest loss in selected year is $>$ 10% above mean historic loss (mean loss per year between 2001 and selected year, for the pixel)	30m, converted to 10km square pixels	Annual data 2000 to present	Annually
Land degradation	SDG Indicator 15.3.1 Land degradation, calculated using Trends.Earth (Conservation International, 2018)	Grid cells with degraded area covering more than 10%	1km resolution converted to 10km grid cell	One estimate pre-calculated over the period 2000-2015	Not updated

## Climate change projections

Indicator	Dataset source(s) and variable(s) used	Default threshold	Spatial resolution	Time resolution and period of available data	Update frequency
Temperature (future)	NEX-GDDP: NASA Earth Exchange Global Daily Downscaled Climate Projections, tasmx, via <a href="#">GEE</a>	>0.6 degrees increase above the baseline (see guidebook for definition of the baseline)	0.25 degrees. This is roughly 25x25km at the equator.	2030, 2050, 2080	No updates
Rainfall (future)	NEX-GDDP: NASA Earth Exchange Global Daily Downscaled Climate Projections, pr, via <a href="#">GEE</a>	>10% increase above the baseline (see guidebook for definition of the baseline)	0.25 degrees. This is roughly 25x25km at the equator.	2030, 2050, 2080	No updates
Flood likelihood (future)	AQUEDUCT Riverine Flood hazard (Climate change scenarios RCP4.5 and RCP8.5 for 2030, 2050 and 2080 from NorESM1-M, GFDL-ESM2M, HadGEM2-ES, IPSL-CM5A-LR and MIROC-ESM-CHEM), , via <a href="#">GEE</a>	Where more than 3 of the models agree there will be flood risk.	5 × 5 arc minutes (5' × 5'). This equates to roughly 10 × 10 km pixels at the equator.	2030, 2050, 2080	No updates

## Peace and security

Indicator	Dataset source(s) and variable(s) used	Default threshold	Spatial resolution	Time resolution and period of available data	Update frequency
Violence against civilians	ACLED (Raleigh et al. 2010), events classified as “Violence against civilians” (Violent events where an organised armed group deliberately inflicts violence upon un-armed civilians. Perpetrators of such acts include state forces and their affiliates, rebels, militias, and external/other forces.)	An event day in the last year	Point data, converted to 10km square grid cells	Daily events 1997 to present	Weekly on ACLED
Remote violence/explosions	ACLED, events classified as “Remote violence/explosions” (One-sided violent events where tools used are explosive devices, such as bombs, grenades, air or drone strikes, suicide bombs etc.)	An event day in the last year	Point data, converted to 10km square grid cells	Daily events 1997 to present	Weekly on ACLED
Protests	ACLED, events classified as “Protests” (A public demonstration in which the participants do not engage in violence, though violence may be used against them.)	An event day in the last year	Point data, converted to 10km square grid cells	Daily events 1997 to present	Weekly on ACLED
Riots	ACLED, events classified as “Riots” (Violent events where demonstrators or mobs engage in disruptive acts, such as rock throwing, property destruction, etc.)	An event day in the last year	Point data, converted to 10km square grid cells	Daily events 1997 to present	Weekly on ACLED
Battles	ACLED, events classified as “Battles” (A violent interaction between at least two politically organised armed groups, such as organised state, non-state, and external groups. These groups operate around an agenda, identity, or political purpose.)	An event day in the last year	Point data, converted to 10km square grid cells	Daily events 1997 to present	Weekly on ACLED

## Population exposure and socioeconomic vulnerability

Indicator	Dataset source(s) and variable(s) used	Default threshold	Spatial resolution	Time resolution and period of available data	Update frequency
Exposed population	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Linard et al., 2012), via GEE, population converted to log(population)	No threshold applied for exposure score <sup>1</sup>	100m	Annual data 2000 to 2020	Ad hoc dataset updates
Elderly	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Tatem et al. 2013), via GEE, Proportion of total population above 65 years converted to z-score <sup>2</sup>	Z-score > 1 (More than 1 standard deviation above the mean for the area)	100m	Annual data 2000 to 2020	Ad hoc dataset updates
Children	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Tatem et al. 2013), via GEE, Proportion of total population under 5 years converted to z-score	Z-score > 1 (More than 1 standard deviation above the mean for the area)	100m	Annual data 2000 to 2020	Ad hoc dataset updates
Female	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Tatem et al. 2013), via GEE, Proportion of total population who are female converted to z-score	Z-score > 1 (More than 1 standard deviation above the mean for the area)	100m	Annual data 2000 to 2020	Ad hoc dataset updates
Urban expansion (increasing population density in urban areas)	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Linard et al., 2012), via GEE, population.  ESA WorldCover 10m v100 (Zanaga et al., 2021), via GEE, land cover class.	Population in urban area in analysis year > 1 standard deviation above 2015 population	100m	Population: annual data 2000 to 2020	Ad hoc dataset updates
Population growth	WorldPop Global Project Population Data ( <a href="http://www.worldpop.org">www.worldpop.org</a> , Linard et al., 2012), via GEE, population change over 5 years	above 3.2% (natural rate of population increase in Somalia) <sup>3</sup>	100m	Annual data 2000 to 2020	Ad hoc dataset updates
Night time light intensity (Governance proxy)	VIIRS Stray Light Corrected Nighttime Day/Night Band Composites Version 1 (Elvidge et al. 2017), via GEE, changes in monthly average radiance	Decreased night time light intensity compared to historic baseline (average of 2014 to year before selected end year) for any month within selected period	464m	Monthly data 2014 to 2021	Monthly
Displacement	International Organization for Migration (IOM), Displacement Tracking Matrix (DTM) <sup>4</sup> , number	Z-score>1	District	One-off download. Dataset aggregates	No updates

	of displaced people per region converted to z-score			mobility over 2015-2019.	
Travel time to urban areas (proxy for accessibility to public services and infrastructure)	The Malaria Atlas Project Accessibility to Cities 2015 (Weiss et al. 2018), via GEE, Travel time to the nearest densely-populated area converted to z-score.	Z-score>1	1km	One-off download, travel times in 2015.	No updates
Travel time to healthcare	The Malaria Atlas Project Accessibility to Healthcare 2019 (Weiss et al. 2020), via GEE. Travel time to the nearest hospital or clinic using motorized transport or non-motorized transport (user can select), converted to z-score.	Z-score>1	1km	One-off download, travel times in 2019.	No updates
Freshwater (proxy for safe drinking water and sanitation facilities)	FAOSWALIM: Somalia Strategic Water Sources 2018 (FAOSWALIM/OSM <sup>5</sup> ), Presence of a water source	Grid cells with <10% area with a water source	Point data, converted to 10km grid cells	One-off download, water sources in 2018.	No updates
Irrigation	FAO AQUASTAT Global Map of Irrigation Areas (Siebert et al. 2013), Presence of irrigation system. GFSAD1000: Cropland Extent (Teluguntla et al. 2016), via GEE, Crop land covers.	Grid cells with <10% cropland irrigated	Irrigation at 5 mins, Cropland at 1km, converted to 10km grid cells	One-off download. product based on data from 2000-2008 Croplands: 2010 product based on data from 2007-2012	No updates
Food insecurity	FEWS NET food security classification ( <a href="https://fews.net/">https://fews.net/</a> ; IPC Global Partners 2021)	Food insecurity classification >= Phase 3	111319m	March 2020 to present	Monthly