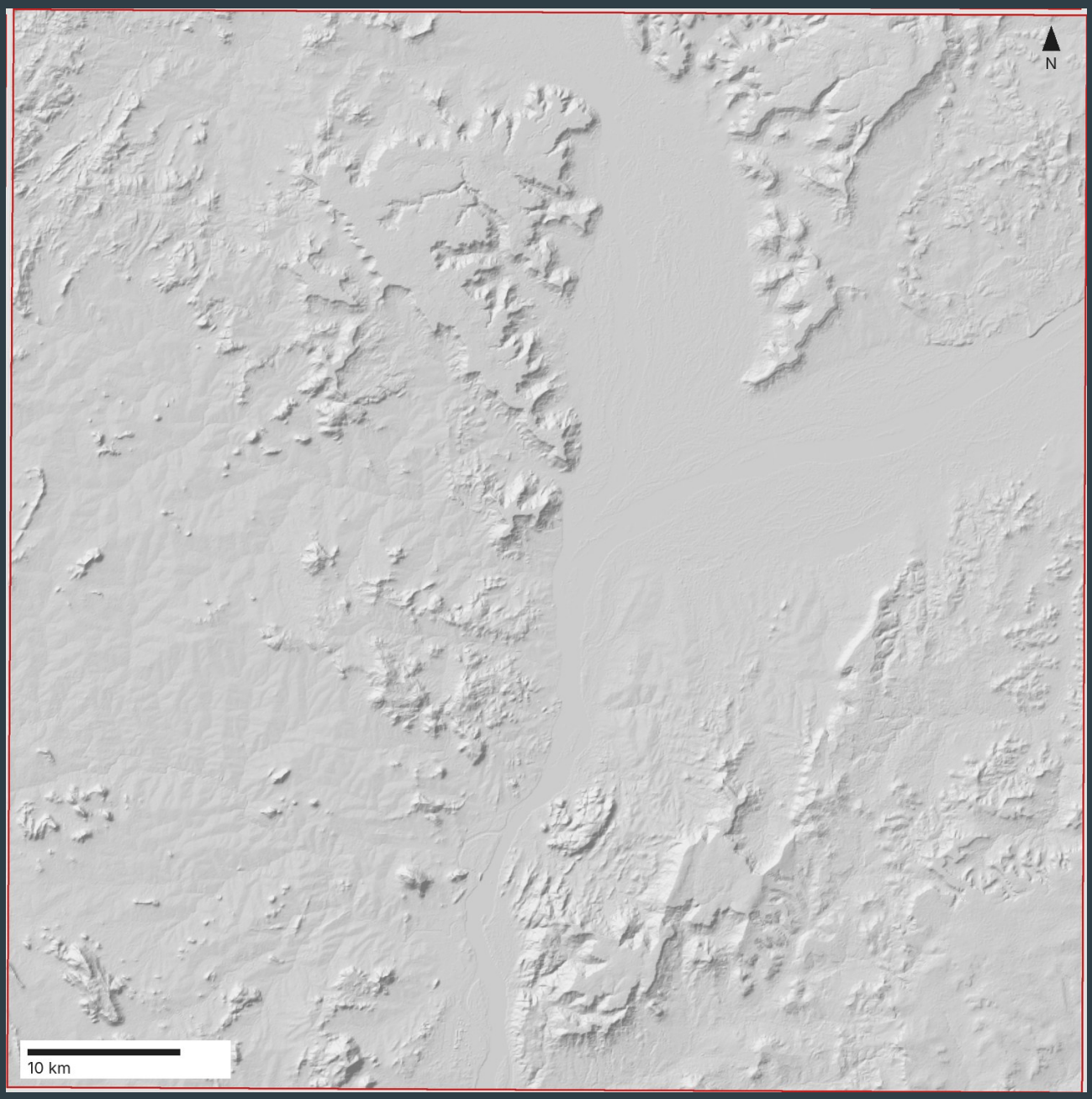
GEOVATRA BASELINE

General baseline: Lokoja

5,000 km² · a first look at the water situation, and which detailed Baseline to run next



Area	Lokoja, 5,000 km² (bounding box 6.42, 7.48, 7.06, 8.12, WGS84)
Date	22 November 2026
Run	cde30ec7-a543-4013-991d-907b9792bf80
Workflow and engine	baseline-general/1.1.0 · command line · code bd33677 · general-report 1.1.0

Produced automatically from open global data. Not checked in the field or by local experts: use it to see where to look and what to check, not to make decisions on its own.

Summary

A first look at Lokoja (5,000 km²): the area and its climate, flood, drought and water supply, each from the area's detailed Baseline when there is one, otherwise from a quick screen. It doesn't replace the detailed Baselines: it says which to run next.

1,300,000
people in the area (two population models)

1,360 mm
rain in a normal year (1991-2020)

45,000-57,000
people on flood-prone land

Not assessable
walking time to water: too few water points recorded

What to run next

Run the WASH and water supply Baseline

- Only 0.09 working improved water points per 1,000 people are recorded: too few to assess walking time
- 50.7 % of the 229 water points with a known status don't work

The rules point to the Flood Baseline too; it was run on 22 November 2026, and its numbers are used here:

- 11.8 % of the land is flood-prone
- 45,000-57,000 people live on flood-prone land

From written rules, not from AI. Each recommendation shows the number that triggered it.

Where the numbers come from

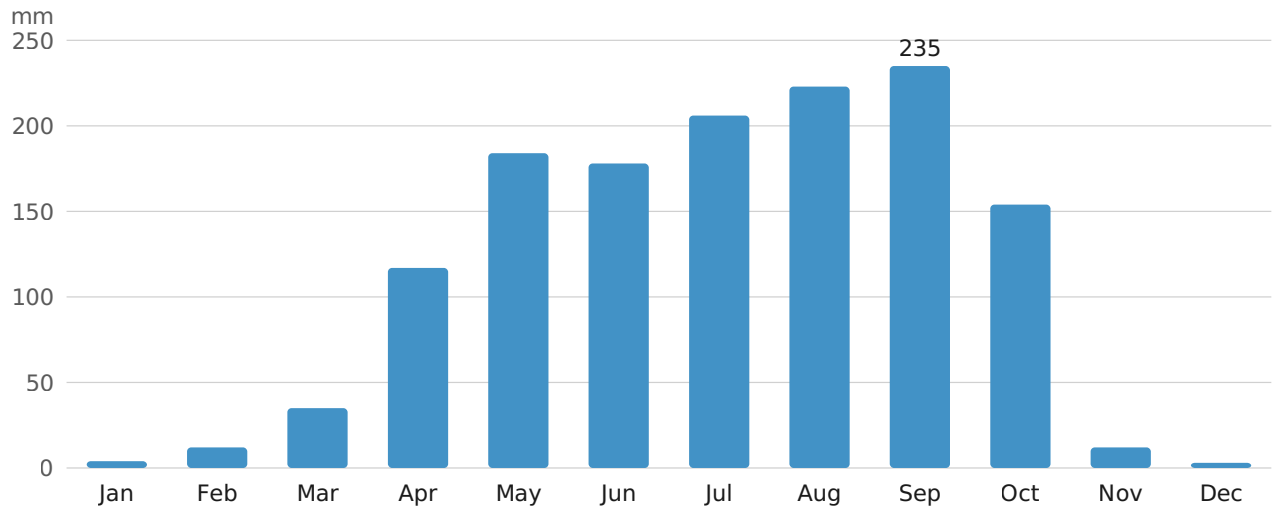
Flood	Baseline Taken unchanged: flood zones from the Flood Baseline of 22 November 2026.
Drought	Screen Quick screen, not a full assessment.
Water supply	Screen Quick screen, not a full assessment.

1. The area and its climate

Size	5,000 km²
Regions	Kogi (95.5 %), Nasarawa (4.5 %)
Districts	Lokoja (22.9 %), Bassa (20.5 %), Ajaokuta (16.5 %), Kogi (12.8 %), Dekina (10 %)
Largest river catchment draining through the area	2,100,000 km²
Distance to the coast	over 100 km
People	1,300,000 · 73.9-84.2 % in urban places
Main land cover	Tree cover (52 %)

Regions and districts holding at least 1 % of the area, from geoBoundaries; the largest catchment from HydroBASINS: a large number means a big river crosses the area.

Climate



CHIRPS v3 (UCSB CHC), cells ~5 km; mean of 1991-2020

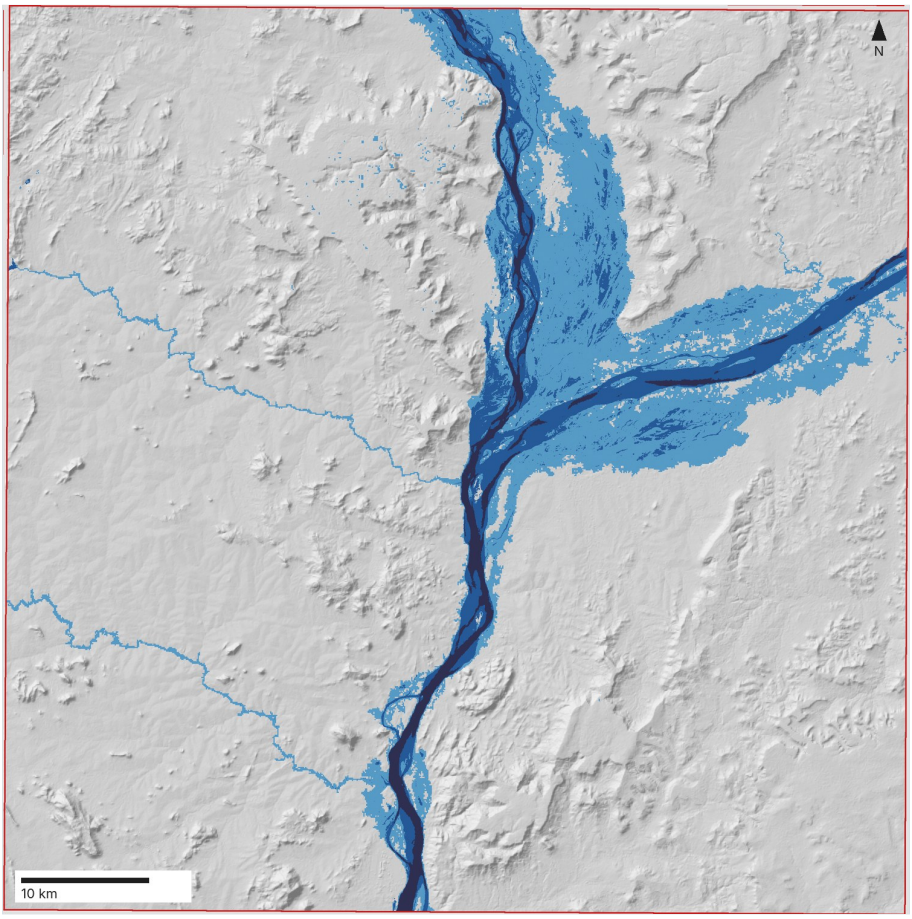
Rain in a normal year (1991-2020)	1,360 mm
Wet season	May-Oct
Year-to-year variation of the annual total	11 %
Last 12 months (2025-11 to 2026-10) against normal	92 %

- Rainfall cells are about 5 km (CHIRPS) or 28 km (ERA5): detail smaller than a cell isn't resolved.

2. Flood and drought

Flood Baseline

Taken unchanged: flood zones from the Flood Baseline of 22 November 2026.



Zone A: water seen, and model or terrain agree Zone B: one kind of evidence Permanent water

Flood-prone land (zones A and B)	580 km² (11.8 % of the land)
People on it	45,000-57,000
Confidence	medium
Water seen by satellite at least once, 1984-2020	210 km²

- The JRC flood model covers only rivers that drain about 500 km² or more, as its makers give it: smaller streams, where flash floods happen, are not in it.

Drought Screen

Quick screen: the area's average rainfall and vegetation index, with no maps.

Rainfall, last 3 months (SPI-3, 2026-10)	-0.9 · near normal
Rainfall, last 12 months (SPI-12, 2026-10)	-0.8 · near normal
Vegetation now (VCI3M, 2026-10)	60.5 · above normal vegetation greenness

Months in drought (SPI-12 at -1 or less), 1981-01 to 2026-10	103 of 539
The worst drought on record (SPI-12)	1981-12 to 1984-09, lowest -3.1

- SPI compares rainfall with the same months in 1991-2020: -1 or less is drought. VCI3M compares vegetation with its own record since 2001: under 35 is stressed (Kenya's drought early warning line).
- Months in drought say little about how drought-prone a place is: SPI puts about one month in six at -1 or less over 1991-2020 anywhere.
- Screen, not a full assessment: rainfall drought from the area's average rainfall, not the Drought Baseline's 5 km cells, so nothing is mapped and the rainy seasons aren't judged one by one.
- Vegetation stress is the area's VCI3M now; how often it was stressed, and where, needs the Drought Baseline.
- No water sources that last through a drought, and no people by drought class.

3. Water supply Screen

From the WASH Baseline's own steps for people, water points and walking time (WPdx+ and OpenStreetMap water points, the Malaria Atlas Project's walking surface).

People walking over 30 minutes one way to a known working improved water point	Not assessable: too few water points recorded
Water points recorded	236
Working, not working, unknown (at the last report)	113 · 116 · 7
Working improved water points per 1,000 people	0.09

- Walking time is not assessable here: too few water points are recorded (0.09 working improved points per 1,000 people; below 0.5, the time measures how many points someone recorded, not how far people walk). Ask the water office for its inventory of water points.
- Walking times rest on recorded water points only: where piped water, private wells or vendors are common (towns especially), they read too long.
- Water points are counted, never located, in this report and its data package (the water-point rule).

What this first look doesn't assess

- Flood: river flooding only; flash floods in dry river beds, coastal and urban flooding are not mapped.
- Drought: groundwater and soil moisture are not measured; vegetation and rainfall stand in for them.
- Water supply: only water points someone has recorded; water quality, yields, queues and sanitation are not assessed.
- People are modelled estimates (two models, a range), not a census.

> Screening from open global data, not checked in the field. The detailed Baselines map each topic, rate their confidence and list questions for the field.

Appendix A. Methods log

Every step of run cde30ec7-a543-4013-991d-907b9792bf80 (baseline-general/1.1.0), in order, with the operation version, settings and data read. The full machine-readable log is the run's run.json.

Software: gdal 3.10.3, django 5.2.5, engine python, python 3.11.18. Engine command line, code bd33677. Working grid: EPSG:32632, 30 m (maps and land cover), 90 m (flood screen), 100 m (people), about 930 m (walking speed); water points and walking within a 20 km margin. Compute time 229 s.

Report text (): plain template text only (nothing was sent to an AI). .

#	Operation	Settings and data	Time, s
1	**flood_link** data.link_flood_baseline 1.0.0	Geovatra Flood Baseline (run 3ef1a910) baseline/1.3.0, accessed 2026-11-22	0.7
2	**drought_link** data.link_drought_baseline 1.0.0		0
3	**wash_link** data.link_wash_baseline 1.0.0		0
4	**area** module.general_area 1.0.0		8.7

5	**population**
	data.fetch_population 1.1.0
		GHSL GHS-POP population GHS-POP R2023A, epoch 2025, 3 arc-seconds (V1-0), accessed 2026-11-14
		`R9_C19`
		WorldPop population (constrained, 100 m) 2025, constrained, 100 m (R2025A v1), accessed 2026-11-14
		`NGA/nga_pop_2025_CN_100m_R2025A_v1.tif`
			1.8

6	**urbanisation** data.fetch_urbanisation 1.0.0	GHSL GHS-SMOD degree of urbanisation (R2023A) GHS-SMOD R2023A, epoch 2025, 30 arc-seconds (V2-0), accessed 2026-11-22	1.1

7	**land_cover**
	data.fetch_land_cover 1.2.0
		`year = 2021, buffer_m = 0, output_crs = EPSG:4326, resolution_deg = 0.0001`
		ESA WorldCover 10 m (2020 v100, 2021 v200) 2021 v200, data 2021-01-01 to 2021-12-31, accessed 2026-11-22
		`ESA_WorldCover_10m_2021_v200_N06E006`
			1.1

8	**rainfall**
	data.fetch_rainfall 1.0.0
		`start_year = 1981`
		CHIRPS v3.0 rainfall v3.0 monthly, accessed 2026-11-22
		`1981.01 to 2026.10`
			81.6

9	**hazard**
	data.fetch_flood_hazard 1.1.0
		`buffer_m = 0, return_period = 100`
		JRC/GloFAS global river flood hazard maps v2 2.1.2, accessed 2026-11-22
		`RP100/ID118_N10_W0_RP100_depth.tif`
			2.5

10	**water**
	data.fetch_water_occurrence 1.2.0
		`buffer_m = 0, output_crs = EPSG:4326, resolution_deg = 0.00025`
		JRC Global Surface Water v1.3 (1984-2020) v1.3 (1984-2020), data 1984-03-01 to 2020-12-31, accessed 2026-11-22
		`0E_10Nv1_3_2020`
			4.5

11	**friction** data.fetch_walking_friction 1.0.0	`buffer_m = 20000` Global walking-only friction surface 2019 (Malaria Atlas Project) Global walking-only friction surface, nominal year 2019 (MAP, released 2020), accessed 2026-11-22	1.9
12	**wpdx** data.fetch_wpdx 1.0.0	`buffer_m = 20000` Water Point Data Exchange (WPdx+) WPdx+ (latest record per water point), accessed 2026-11-22	1

13	**water_points**
	data.fetch_osm 2.0.0
		`kind = water_points, max_features = 20000`
		OpenStreetMap Geofabrik extracts of 2026-11-12, accessed 2026-11-22
		`nigeria (2026-11-12)`
			4.3

14	**dem**
	data.fetch_dem 1.2.0
		`buffer_m = 0, output_crs = EPSG:4326, resolution_deg = 0.0008333333333`
		Copernicus DEM GLO-30, accessed 2026-11-22
		`Copernicus_DSM_COG_10_N07_00_E006_00_DEM, Copernicus_DSM_COG_10_N07_00_E007_00_DEM, Copernicus_DSM_COG_10_N08_00_E006_00_DEM, Copernicus_DSM_COG_10_N08_00_E007_00_DEM`
			1.1

15	**m4** module.m4_rainfall 1.0.0	`compare_years = 2012,2022,2024`	0
16	**m5** module.m5_land_cover 1.1.0	`buffer_m = 0`	4.6
17	**flood** module.general_flood_screen 1.0.0		0.9
18	**m2** module.m2_water_history 1.0.0	`buffer_m = 0`	2.4

19	**drought**
	module.general_drought_screen 1.2.0
		`vegetation = True`
		MODIS Terra Vegetation Indices 16-day 500 m (MOD13A1 v061) MOD13A1 v061; record 2001-01 to 2026-10, accessed 2026-11-22
		`MOD13A1.A2001001.h18v08.061.2020061200111, MOD13A1.A2001017.h18v08.061.2020061215716, MOD13A1.A2001033.h18v08.061.2020064143926, MOD13A1.A2001049.h18v08.061.2020062005300, MOD13A1.A2001065.h18v08.061.2020062024229, MOD13A1.A2001081.h18v08.061.2020062051538 and 581 more`
			143

20	**w1** module.w1_people_settlements 1.0.1		0.8
21	**w2** module.w2_water_points 1.0.0		0
22	**w3** module.w3_walking_time 1.1.0		0.2
23	**summary** module.general_summary 1.1.0		0

Appendix B. Licences and attribution

Every dataset this report uses, with its licence and how it must be credited, from Geovatra's dataset catalog.

Dataset	Licence	Attribution and citation
CHIRPS v3.0 rainfall UCSB Climate Hazards Center	CC BY 4.0 checked 2026-11-05	Climate Hazards Center, UC Santa Barbara Funk, C. et al. (2015). The climate hazards infrared precipitation with stations. Scientific Data 2, 150066 https://www.chc.ucsb.edu/data/chirps3
Copernicus DEM GLO-30 ESA / Copernicus (via Microsoft Planetary Computer)	Copernicus DEM licence (GLO-30): free use with attribution	© DLR e.V. 2010-2014 and © Airbus Defence and Space GmbH 2014-2018 provided under COPERNICUS by the European Union and ESA; all rights reserved European Space Agency, Sinergise (2021). Copernicus Global Digital Elevation Model. Distributed by OpenTopography. https://doi.org/10.5069/G9028PQB https://planetarycomputer.microsoft.com/dataset/cop-dem-glo-30
ESA WorldCover 10 m (2020 v100, 2021 v200) ESA (via Microsoft Planetary Computer)	CC BY 4.0 checked 2026-11-12	© ESA WorldCover project / Contains modified Copernicus Sentinel data processed by ESA WorldCover consortium Zanaga, D. et al. (2022). ESA WorldCover 10 m 2021 v200. https://doi.org/10.5281/zenodo.7254221 https://esa-worldcover.org/
GHSL GHS-POP population European Commission JRC	CC BY 4.0 (European Commission reuse policy) checked 2026-11-22	Schiavina, M. et al. (2023). GHS-POP R2023A - GHS population grid multitemporal (1975-2030). European Commission, JRC https://human-settlement.emergency.copernicus.eu/
GHSL GHS-SMOD degree of urbanisation (R2023A) European Commission JRC	CC BY 4.0 (European Commission reuse policy) checked 2026-11-22	European Commission, Joint Research Centre (JRC) Schiavina, M., Melchiorri, M., Pesaresi, M. (2023). GHS-SMOD R2023A - GHS settlement layers, application of the Degree of Urbanisation methodology (stage I) to GHS-POP R2023A and GHS-BUILT-S R2023A, multitemporal (1975-2030). European Commission, JRC. doi:10.2905/A0DF7A6F-49DE-46EA-9BDE-563437A6E2BA https://human-settlement.emergency.copernicus.eu/ghs_smod2023.php

Global walking-only friction surface 2019 (Malaria Atlas Project) Malaria Atlas Project	CC BY 3.0 (MAP open access policy for its maps) checked 2026-11-22	Malaria Atlas Project, CC BY 3.0 Weiss, D.J. et al. (2020). Global maps of travel time to healthcare facilities. Nature Medicine 26, 1835-1838. doi:10.1038/s41591-020-1059-1 https://data.malariaatlas.org/
JRC Global Surface Water v1.3 (1984-2020) European Commission JRC / Google (via Planetary Computer)	Free use with attribution	Source: EC JRC/Google Pekel, J.-F., Cottam, A., Gorelick, N., Belward, A. S. (2016). High-resolution mapping of global surface water and its long-term changes. Nature 540, 418-422 https://global-surface-water.appspot.com/
JRC/GloFAS global river flood hazard maps v2 Copernicus Emergency Management Service / JRC	ODbL 1.0 (README); the EC's own rights also CC BY 4.0 (copyright.txt) checked 2026-11-12	Contains information from the Global river flood hazard maps (European Commission, JRC; Copernicus Emergency Management Service), made available under the Open Database License (ODbL) v1.0 Baugh, C. et al. (2024). Modelled flood inundation for different return period scenarios at the global scale. European Commission, JRC https://jeodpp.jrc.ec.europa.eu/ftp/jrc-opendata/CEMS-GLOFAS/flood_hazard/
MODIS Terra Vegetation Indices 16-day 500 m (MOD13A1 v061) NASA LP DAAC	Openly shared without restriction on use, sale or redistribution (NASA EOSDIS data use guidance); cite the dataset checked 2026-11-14	NASA LP DAAC (MODIS MOD13A1 v061) Didan, K. (2021). MODIS/Terra Vegetation Indices 16-Day L3 Global 500m SIN Grid V061. NASA EOSDIS Land Processes DAAC. doi:10.5067/MODIS/MOD13A1.061 https://doi.org/10.5067/MODIS/MOD13A1.061
OpenStreetMap OpenStreetMap contributors (via Geofabrik extracts)	ODbL 1.0 checked 2026-11-05	© OpenStreetMap contributors © OpenStreetMap contributors, https://www.openstreetmap.org/copyright https://www.openstreetmap.org/copyright
Water Point Data Exchange (WPdx+) Water Point Data Exchange (data.waterpointdata.org; also on HDX)	CC BY-SA (Creative Commons Attribution Share-Alike), as WPdx publishes its country datasets on HDX checked 2026-11-22	Water Point Data Exchange (WPdx), www.waterpointdata.org Water Point Data Exchange (WPdx+), data.waterpointdata.org, dataset eqje-vguj, accessed on the date in the methods log https://www.waterpointdata.org/
WorldPop population (constrained, 100 m) WorldPop, University of Southampton	CC BY 4.0 checked 2026-11-05	WorldPop (www.worldpop.org) https://www.worldpop.org/

Map data © OpenStreetMap contributors, available under the Open Database Licence (ODbL). This report gives only totals derived from it; derived OpenStreetMap data is shared under the same licence.

Report general-report 1.1.0. Numbers are rounded: 1 decimal under 10, whole numbers under 100, otherwise 2 significant figures; people to 2 significant figures.