DPGs FOR CLIMATE ACTION COLLECTION

Framework Compliance Summary

VERIFIED DIGITAL PUBLIC GOOD

ClimWeb

Open-source software · WMO Regional Office for Africa

github.com/wmo-raf/climweb

A free, open-source content-management system purpose-built for National Meteorological and Hydrological Services (NMHSs), turning each service into a modern digital provider of forecasts, standardized warnings and climate information that reaches the public in real time.

At a glance

CLIMATE OBJECTIVES	SECTORS	DEPLOYMENT	COUNTRIES ACTIVE
Adaptation · Monitoring · Tech Transfer & Capacity Building · Cross-cutting	AFOLU · Water · Cross-sector	Regional · National	31
OWNER	**TYPE**	**DATA EXTRACTION**	**YEAR LISTED**
WMO Regional Office for Africa	Open-source software	REST/JSON API · CAP (XML, RSS and GeoJSON feeds) · MQTT · map tiles (XYZ raster, MVT vector, TileJSON) · GeoJSON	2026

CLIMATE DPG FRAMEWORK · COMPLIANCE STATUS All four layers met

L1	**DPG Standard**	Verified & listed on the Registry (13 Jan 2026)	✓ **VERIFIED**
L2	**Climate Alignment**	Climate-relevant by design	✓ **MET**
L3	**Infrastructural Approach**	Interoperability L4 · Adoption readiness L3	✓ **MET**
L4	**Measuring Outcomes**	Full KPI table with baselines & sources	✓ **MET**

✦ **Admitted to the Climate Action Collection**

LAYER 1 DPG Standard

ClimWeb is a verified digital public good, listed on the DPG Registry since 13 January 2026, having met all nine indicators of the DPG Standard. Layer 1 is a precondition for entry to the DPGs for Climate Action Collection.

LAYER 2 Climate Relevance

Climate-relevant problem addressed

Africa faces some of the highest climate vulnerability in the world, yet its National Meteorological and Hydrological Services (NMHSs) have long lacked the digital infrastructure to warn, inform and protect populations.

A January 2024 baseline across the continent found that:

- 85% of countries lacked the tools to fully support climate service delivery and public risk communication
- Around 52% of NMHSs had no website and almost no digital presence,
- further 33% had websites with very limited functionality
- 54% had never published a warning in the Common Alerting Protocol (CAP) format, the international standard that lets warnings be distributed automatically through channels such as Google Public Alerts and the WMO Severe Weather Information Centre
- Proprietary alternatives were unaffordable and unsustainable for most services.

ClimWeb closes this gap: Free and open source, it gives each NMHS a website and alerting platform that it owns and runs itself, so forecasts, standardized warnings and climate information reach the public in real time without the cost of proprietary systems. Built for Africa, it has also been adopted independently beyond the continent, by Syria's meteorological service.

Theory of contribution

ClimWeb removes the bottleneck between the production of climate information and its use. Through ClimWeb, forecasts and warnings reach the public through websites, interoperable CAP feeds and social media. It helps NMHSs streamline their operations, monitor data exchange, communicate climate information, publish short-term CAP warnings and highlight the anticipatory actions required. Its visualisation components turn complex data into usable information: an interactive MapViewer (National Hazards Watch) for weather, climate, hydrological, agricultural and socio-economic layers; CAP warning maps; city forecasts and city climatology; near real-time satellite imagery; an observing-network viewer and data-transmission performance monitoring; anticipatory action pages that bring together the hazard, areas at risk, key facts, recommended actions, risk maps and related CAP warnings; the Climate Change Atlas; and user-feedback dashboards. National teams are trained to own and maintain their own instances, building durable local capacity rather than dependency.

Frameworks it aligns with

- Paris Agreement (NDC tracking/implementation)
- National Adaptation Plans (NAPs)
- Climate technology development & transfer (TNAs, TAPs)
- Sendai Framework for Disaster Risk Reduction
- UN Integrated Geospatial Information Framework
- Early Warnings for All

How alignment is achieved

- NDCs / NAPs: the delivery infrastructure through which early-warning and climate-information commitments become operational services; Ghana's Climate Atlas turns projections into a public planning service.
- Technology transfer (TNAs/TAPs): open-source technology adopted in 42 African countries, 580+ experts trained, 2,169 hours of technical support and mentoring.
- Sendai (Target G) / Early Warnings for All: ClimWeb + CAP Composer is the delivery layer through which African NMHSs publish standardized, machine-readable warnings — over 3,690 CAP alerts since 2022 (3,694 by 9 November 2026); 27 of 30 supported countries now carry a live CAP feed in the WMO Register of Alerting Authorities.

Supported Decisions or Actions

ClimWeb supports three types of decisions. At the **operational** level, NMHSs use it to issue standardized early warnings that activate national preparedness protocols — for example, Ghana's meteorological service issued an aviation turbulence alert in June 2025 through the platform. For **policy and planning**, ClimWeb delivers climate bulletins, seasonal forecasts, and tools like Ghana's Climate Atlas that inform sectoral adaptation planning. It also drives **institutional strengthening**: the digital presence and service quality it provides has helped NMHSs gain recognition, form new partnerships, and access financing.

LAYER 3 Infrastructural Approach

Modular design

Built on Wagtail/Django with an app-based architecture: every capability is an encapsulated module with its own data models, templates and API surface (forecasts, products, publications, MapViewer/GeoManager, CAP Composer, Forecast Manager, station metadata, dashboards and more). Flagship components install as standalone packages in any Wagtail/Django system — CAP Composer (CAP v1.2, OASIS/ITU standard) and the MapViewer/GeoManager. The companion Automated Data Loader ingests station observations through a plugin architecture (12+ published vendor plugins).

Data processing

Ingestion Any product in OGC standards / common geospatial formats; a shared catalogue of ~800 ready-to-use datasets as of Nov 2026 (ECMWF, EUMETSAT, EU JRC, NASA, WorldPop, GHSL); observations via wis2box, the Automated Data Loader and OSCAR/Surface.

Validation Warnings validated against the CAP v1.2 schema before publication; structured Wagtail models with editorial draft/review workflows.

Dissemination Websites, CAP feeds, MapViewer visualisations, downloadable datasets; automated machine consumption by third parties.

Integrations & Adapters

ClimWeb is designed as a national node integrated with key international systems. CAP feeds are registered in the WMO Register of Alerting Authorities (27 of 30 countries) and machine-consumed by Google Public Alerts (18 of 30) and the WMO Severe Weather Information Centre, so national warnings surface automatically in third-party products. Observations flow to WIS2 via wis2box, station metadata pulls from OSCAR/Surface via API, and the data helper module connects each instance to a shared ~800-dataset catalogue from global providers (ECMWF, EUMETSAT, EU Joint Research Centre). Reusable components — CAP Composer, Automated Data Loader, and MapViewer — plug into standard OGC services rather than duplicating them. Beyond the programme, Syria runs the full ClimWeb package, while Caribbean countries and Bangladesh use the standalone CAP Composer; Haiti, Fiji, Afghanistan and Moldova have requested it.

Maturity scales

Interoperability Level 4 / 5 — Integrated.
Versioned APIs and machine-readable schemas that external systems pull without manual intervention: netCDF/GeoTIFF, Shapefile/GeoJSON (PostGIS vector tiles), CSV, JSON via REST APIs; consumes OGC WMS; serves XYZ raster and MVT vector tiles (TileJSON) and GeoJSON; CAP v1.2 XML with RSS and GeoJSON feeds + real-time MQTT. Automated third-party consumption: Google Public Alerts (18 of 30 countries), WMO Severe Weather Information Centre, WMO Register of Alerting Authorities.

Interoperability Evidence ClimWeb exchanges data through standard, machine-readable formats at every layer of the stack, which is the basis for the Level 4 selection (versioned APIs and machine-readable schemas that external systems pull without manual intervention):

Data formats: netCDF for gridded data (time dimension parsed automatically) and GeoTIFF, served as raster tiles; Shapefile and GeoJSON for vector data, served as PostGIS vector tiles (MVT); CSV for tabular and station data imports; JSON through versioned REST APIs.
OGC services: WMS layers consumed directly, plus raster and vector tile services (XYZ, TileJSON, MVT); the ~800 dataset data helper catalogue is delivered largely through OGC-standard WMS endpoints (ECMWF, EUMETSAT, Copernicus services, EU Joint Research Centre).
Alerting: CAP v1.2 XML (OASIS standard, ITU-T X.1303) with an RSS feed on every instance, same pattern fleet-wide, e.g. https://meteosudan.sd/api/cap/rss.xml; real-time distribution via MQTT (Eclipse Mosquitto).
Automated third-party consumption, with no manual intervention: Google Public Alerts, 18 of 30 supported countries live (Benin, Burundi, Chad, Comoros, Congo, DR Congo, Ethiopia, Ghana, Guinea, Guinea-Bissau, Kenya, Malawi, Mali, Mozambique, Seychelles, Sudan, Togo, Zimbabwe, per Google's published coverage list, 7 September 2026); the WMO Severe Weather Information Centre; WMO Register of Alerting Authorities entries carrying the live feeds (https://alertingauthority.wmo.int, 27 of 30 supported countries).

Station and observation exchange: station data pulled from OSCAR/Surface via API; observations published to WIS2 via wis2box under the standard WIS2 topic hierarchy (e.g. https://wis2.meteotchad.org, https://wis2.meteo.sc/).
Documentation: https://climweb.readthedocs.io and https://github.com/wmo-raf/climweb

Adoption readiness Level 3 / 5 — Portable / Containerized.

Scalability, Performance & reliability Demonstrated operationally: 34 live instances (33 in Africa + Syria) across on-premises, Google Cloud and AWS; rollout continues to 50 institutions across 42 countries, plus 1 Regional Climate Centre (CAPC-AC) in development; ACMAD is live and ICPAC runs the MapViewer (GeoManager) module; RSMC (Regional Specialized Meteorological Centre) Yaoundé is queued to install. Fleet-level automated weekly monitoring (uptime, SSL, CAP feed health, content freshness); 31 of 33 monitored instances up at the latest collection.

Computing & energy intensity Deliberately lightweight: a full national deployment runs on a single Linux VM (4–8 vCPUs, 16 GB RAM), no GPUs or ML workload. Indicative cloud cost ~USD 325/month (Google Cloud estimate) for the full toolchain, ClimWeb alone below USD 200/month, or on-premises at no hosting cost. Efficiency in low-resource environments is a first-class design requirement.

LAYER 4 Measuring Climate Outcomes

Measurable outcomes it facilitates

- Strengthened adaptation planning or resilience capacity,
- Improved early warning systems (lead time, coverage, accuracy),
- Policy, regulatory, or investment decisions informed,
- Enhanced inter-agency coordination or governance,
- Climate finance access, readiness, or mobilisation supported,
- Climate data infrastructure, interoperability, or accessibility improved

Reach in numbers

3,694 cumulative CAP alerts since 2022 (9 Nov 2026) · 27 of 30 countries with a live CAP feed in the WMO Register · 34 live instances · 27,233 product pages across 29 publishing instances.

Key performance & impact indicators

Category	Indicator Name	Definition / Unit of Measurement	Data Source	Baseline (if available)	Most Recent Value	Reporting Frequency / Evidence Link

Adaptation & Resilience	Standardized (CAP) alerts published by supported NMHSs	CAP alerts per year	ClimWeb CAP feeds, monitored weekly by the programme fleet dashboard	January 2024: 54% of countries had never issued a CAP warning	1,385 (2025); 1,435 in 2026 to date (9 Nov); 3,694 cumulative since 2022	Weekly automated monitoring
Adaptation & Resilience	Countries with live CAP feed in the WMO Register of Alerting Authorities	Count of countries	alertingauthority.wmo.int	0	27 of 30 supported countries	Weekly
Adaptation & Resilience	Live national ClimWeb platforms	Operational government websites	Instance directory + uptime monitoring	85% of African NMHSs had no website or a website with poor functionality (Jan 2024)	34 live instances (33 in Africa + Syria); 8 national services and 1 regional centre (CAPC-AC) in development; ACMAD live; ICPAC MapViewer live; RSMC Yaoundé and 6 national services queued for installation; 78% of African NMHSs adopting (50 institutions in 42 countries)	Weekly

Adaptation & Resilience	Climate and weather products published on ClimWeb instances	Count of product pages (forecasts, bulletins, sectoral products)	ClimWeb instance content, fleet monitoring	Most NMHSs published no digital products (Jan 2024 baseline)	27,233 product pages across 29 publishing instances (as of 7th Sept 2026); 1,254 updated in the last 30 days; ~800 ready-to-use datasets in the shared MapViewer catalogue	Weekly
Adaptation & Resilience	Public reach: Social media following of supported NMHSs	Followers across platforms (Facebook, WhatsApp, YouTube, X, LinkedIn, Instagram)	Programme social monitoring	354,209 followers (Aug 2022 programme survey, Facebook only)	1,914,615 followers (9 Nov 2026), up 360% since August 2022; e.g., Burkina Faso WhatsApp channel: about 192,000 followers	Weekly
Adaptation & Resilience	Public reach: People exposed to climate information through NMHS digital channels	People reached when Red Cross/Red Crescent societies, disaster-management agencies and other institutional accounts relay NMHS forecasts and warnings, plus the NMHS channels themselves	Monitoring dashboard amplifier-network tracking (verified relaying accounts per country)	Not measured before the programme; NMHS own channels totalled about 354,000 followers (Aug 2022)	About 41.8 million people in Africa, plus 1.8 million in Syria (9 Nov 2026)	Weekly

Technology Transfer & Capacity-building	Capacity: Experts trained across NMHSs	ICT, meteorologists, sectoral experts, communicators	Programme training records	0	580+ people; 2,169 hours of technical support and mentoring, plus 13 one-week in-country training missions	Weekly
Cross-cutting (data infrastructure, interoperability, digital MRV)	Cross-cutting (data access): Global data-centre products made available through ClimWeb MapViewers and across websites	Ready-to-use datasets from global centres (ECMWF public and Member-only products, EUMETSAT/MTG satellite imagery, flood products) connected to national MapViewers	ClimWeb MapViewer catalogues	Not comprehensive. However, over 60% of NMHSs had lost access to Member-only ECMWF products; no shared catalogue	~800 ready-to-use datasets per instance; 32 instances with MapViewer catalogues (7 Sep 2026); 78% of NMHSs improved access to global-centre products	Weekly
Cross-cutting (data infrastructure, interoperability, digital MRV)	Data transmission monitoring: Stations transmitting reliably in countries using ClimWeb's transmission-monitoring module	Monthly average of stations exchanging observations internationally (supported countries); module surfaces silent or degraded stations so teams can act on them	WDQMS, tracked through ClimWeb's monitoring module and the programme dashboard	275 (2022 yearly average, supported countries)	458 (2026 yearly average to date); 470 in August 2026; plus 753 stations connected via 21 wis2box nodes	Weekly

Deployment countries · 31

South Sudan, Sudan, Ethiopia, Niger, Chad, Togo, Ghana, Gambia, Mali, Malawi, Burundi, Seychelles, Benin, Burkina Faso, Zimbabwe, Guinea-Bissau, Congo [Republic], Democratic Republic of the Congo, Guinea, Comoros, Sierra Leone, Kenya, Liberia, Zambia, Djibouti, Somalia, Mauritania, Central African Republic, Lesotho, Mozambique, Syria.

Adopting Organizations

Live deployments span 31 countries — 30 in Africa, plus Syria, which adopted ClimWeb independently from the open-source repository — serving 34 national meteorological and hydrological services (e.g. Ghana Meteorological Agency, Ethiopian Meteorological Institute, Sudan Meteorological Authority, Kenya Meteorological Department, Mali-Météo), including dedicated hydrological services in Sudan, Mozambique and Burkina Faso. A further 8 national services and 1 regional centre (CAPC-AC) are in development; ACMAD is live and ICPAC runs the ClimWeb MapViewer (GeoManager) module; RSMC Yaoundé and 6 national services are queued to install. Overall, ClimWeb is in use or deployment across 42 African countries and 50 institutions, plus Syria; hosting combines national infrastructure, CREWS-supported projects and incoming Google.org cloud credits.

Evidence & Additional Resources · 40+ sources

Live government portals, monitoring dashboards, deployment trackers and awards documenting real-world uptake.

Evidence Sources

All figures come from the programme's live monitoring system: automated weekly collectors across every instance and companion system, gathering website uptime and SSL status, CAP feed health and alert counts, content freshness and product publication, station transmission (WDQMS), station metadata (OSCAR/Surface), wis2box telemetry, GBON designation status, WMO Register of Alerting Authorities records, Google Public Alerts coverage and social-media audiences. A consistency check gates every figure. The Country Impact Report (per-country before/after evidence) is generated from this dashboard.

- Live monitoring dashboard (internal, available on request)
- Public rollout tracker: https://climtech.africa/climweb
- Source code & release history: https://github.com/wmo-raf/climweb (plus wmo-raf/cap-composer and wmo-raf/adl)
- DPG Registry entry (DPG since 13 January 2026): https://www.digitalpublicgoods.net/r/climweb
- UN 2.0 Innovation Awards, June 2026 — People's Choice & Scale-up Excellence (2 of 6 across the UN system): https://wmo.int/media/news/climweb-wins-united-nations-20-innovation-awards; https://www.un-two-zero-week.org/shortlistedprojects-un-2.0-awards

Evidence of Adoption

Live portals, each an operational government service (full directory at climtech.africa/climweb):
Sudan · South Sudan · Mozambique · Ethiopia · Niger · Chad · Togo · Ghana · Gambia · Mali · Malawi · Burundi · Seychelles · Benin · Burkina Faso · Zimbabwe · Guinea-Bissau · Congo · DR Congo · Guinea · Comoros · Sierra Leone · Kenya · Liberia · Zambia · Djibouti · Somalia · Mauritania · Central African Republic · Lesotho · Syria · Sudan (hydrology) · Burkina Faso (hydrology) · Mozambique (hydrology) · ACMAD (regional) · ICPAC (regional, MapViewer)

In development (9 institutions): Botswana, Cabo Verde, Cameroon, Egypt, Madagascar, Namibia, Senegal and Uganda (8 national services), plus the Regional Climate Centre for Central Africa (CAPC-AC). Queued for installation (7 institutions): Eswatini, Libya, Mauritius Meteorological Services, São Tomé and Príncipe, Liberia Hydrological Service, Mauritius Hydrology Division, and RSMC Yaoundé.

Independent validation

The product owner has identified the following types of external validation applicable to this solution:

- **Government validation** — real-world adoption, deployment, or formal endorsement by a national government authority — e.g. a ministry, designated national authority, or national meteorological service
- **Other — Intergovernmental validation** - adoption by Regional Climate Centres.
- **Other — UN 2.0 Innovation Awards 2026** — People's Choice and Scale-Up Excellence (two of six awards across the UN system)

The information above reflects the self-reported responses provided by the product owner as part of a structured compliance submission against the Framework for Identifying Digital Public Goods for Climate Action.