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TECHNICAL BROCHURE

Overview of weather information services to support agriculture activities in ACP regions

Funded by the European Union

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Introduction

Erratic weather forecasts disrupt horticultural planning, causing yield loss and elevated costs. Accurate, location-specific weather intelligence is therefore essential, yet many African, Caribbean and Pacific (ACP) producers do not have access to reliable weather information and are losing trust in the forecasts provided by their national meteorological offices. Emerging global and hybrid forecast models and commercial apps increasingly bridge these data gaps; however, their performance and affordability vary by microclimate and connectivity constraints.

This report contains the results of SBC4D research, which consisted of a systematic review of existing weather products tailored to ACP horticulture. The document is structured in seven sections. The first three general sections present the context of the study, the methodology, and the types of weather products and actors they target. Section 4 presents an overview of existing products and services. Sections 5 and 6 present the results of the analysis of solutions for smallholder farmers and for agribusiness. The last section presents SBC4D's overall conclusion and recommendations.

Context

COLEAD implements the European Union- (EU-) funded FFM+ programme, which provides support to the horticultural sector in member countries of the Organisation of African, Caribbean and Pacific States (OACPS). It aims to maintain and improve the capacities of smallholders, farmer groups, and horticultural MSMEs to access national, regional and international markets through the progressive and sustainable intensification of the horticultural sector, while adapting to the changes in their operating environment resulting from the COVID-19 pandemic and the changing climate.

As part of this programme, COLEAD supports private sector operators and public authorities to deliver healthy food across ACP countries and wants to contribute to accelerating investment in digital infrastructure, to upscale successes and promote best practices. COLEAD activities include support for testing smart and innovative technologies for sustainable production and trade. In a recent COLEAD study in Kenya (unpublished) on the bottlenecks affecting the competitiveness of the Kenyan horticultural sector, one of the major areas of interest was weather forecasts. For some years now, climate change has been severely impacting producers and disrupting production as a result of misaligned timing of field activities (e.g. sowing, pesticide application, delayed flowering) caused by changing climatic conditions. To optimise yields and minimise both economic and food losses, accurate weather forecasting is crucial in agriculture. However, obtaining accurate localised weather forecasts is challenging in countries where there are limited resources, particularly in terms of weather stations, which provide critical input for existing weather models.

The aim of this research is to review existing weather forecast models, applications and services that could support producers in ACP countries.

Methodology

The research presented in this report was structured into three phases.

- **Phase 1 – Global overview**: During the first stage, we conducted a broad review of all available weather products, without considering specific product types, specific audiences or specific regions. Each identified product was briefly analysed to understand its content. This analysis included:
    - products offered (forecast types and variables) and format (map, bulletin, etc.)
    - geographic coverage
    - technology
    - update cycles
    - total cost.

  At the end of this phase, we grouped the identified products according to their target audiences and primary focus.

- **Phase 2 – Deep dives**: In the second phase, we selected the products that could be directly usable by two specific target groups: **smallholder farmers** and **agribusiness**. The baseline profile for each of the target groups is summarised below.
    - Smallholder farmers: Leaders of farmer groups and/or cooperatives
        - Equipped with or having access to a smartphone and internet access
        - Able to read/write French or English
        - Able to use a mobile or web application and the internet (basic digital skills)
        - Without specific climate knowledge
        - Without specific technical and/or raw data skills
        - Can only afford free or very cheap solutions
        - Mainly interested in temperature and rainfall forecast, ideally 3–10 days ahead.
    - Agribusiness: Larger commercial farms
        - Manages their own farms or sourcing from outgrowers
        - Able to read/write French or English
        - Willing to invest in a product that could maximise their farm management (e.g. using weather forecasts to plan on-farm activities such as irrigation scheduling, deciding the best timing for spraying, or adjusting field operations) and yields
        - Equipped with a smartphone and and/or has access to the internet
        - Able to use a smartphone and web applications
        - Without any particular technical and/or raw data skills that are necessary to understand complex weather forecast maps

- May be able to manage local hardware such as a weather station
- Mainly interested in 3–10-day rainfall forecast, temperature and, potentially, other more advanced variables such as evapotranspiration
- Can afford solutions costing up to a couple of thousands euros per year (based on expert estimates).

- **Phase 3 – Analysis and recommendations**: The last phase focused on analysing the results from phases 1 and 2 and providing recommendations.

Disclaimer

This study does not claim to be exhaustive or to have explored all products and services that provide weather forecasts in the global south. There are thousands of weather applications available on major app platforms such as the Google Play Store and the Apple App Store, with new applications being added on a regular basis. We did our best to identify the different categories of products and, within each category, the most relevant and well-known solutions. We are confident that all major categories are covered and that each contains representative solutions. However, it is also important to note that the sector is extremely active, and a major transformation is ongoing with new artificial intelligence- (AI-) based predictive models being developed and improved by the most advanced AI teams in the world, such as Google research team and Microsoft research team. This transformation is likely to lead to new innovative and potentially disruptive products in the near future.

Weather products and actors

This section is structured into three subsections that present (i) how weather products are designed, (ii) the type of products and their use in agriculture, and (iii) the actors and their capacity to produce and interpret different weather products.

Weather forecast development: The construction of weather forecasts relies on a combination of observational data, numerical models and, increasingly, AI techniques.

Accurate forecasting begins with the systematic collection of atmospheric and environmental data from multiple sources. Ground weather stations measure temperature, humidity, wind, rainfall and atmospheric pressure at specific locations, providing highly reliable local data. Satellites offer global coverage, monitoring cloud patterns, sea surface temperatures, humidity profiles and other key variables in areas where ground observations are sparse. Weather radars detect rainfall intensity, storms and hail, while ocean buoys and aircraft provide additional data on sea conditions and upper-atmospheric dynamics. Figure 1 illustrates the main sources of data used for weather forecasting.

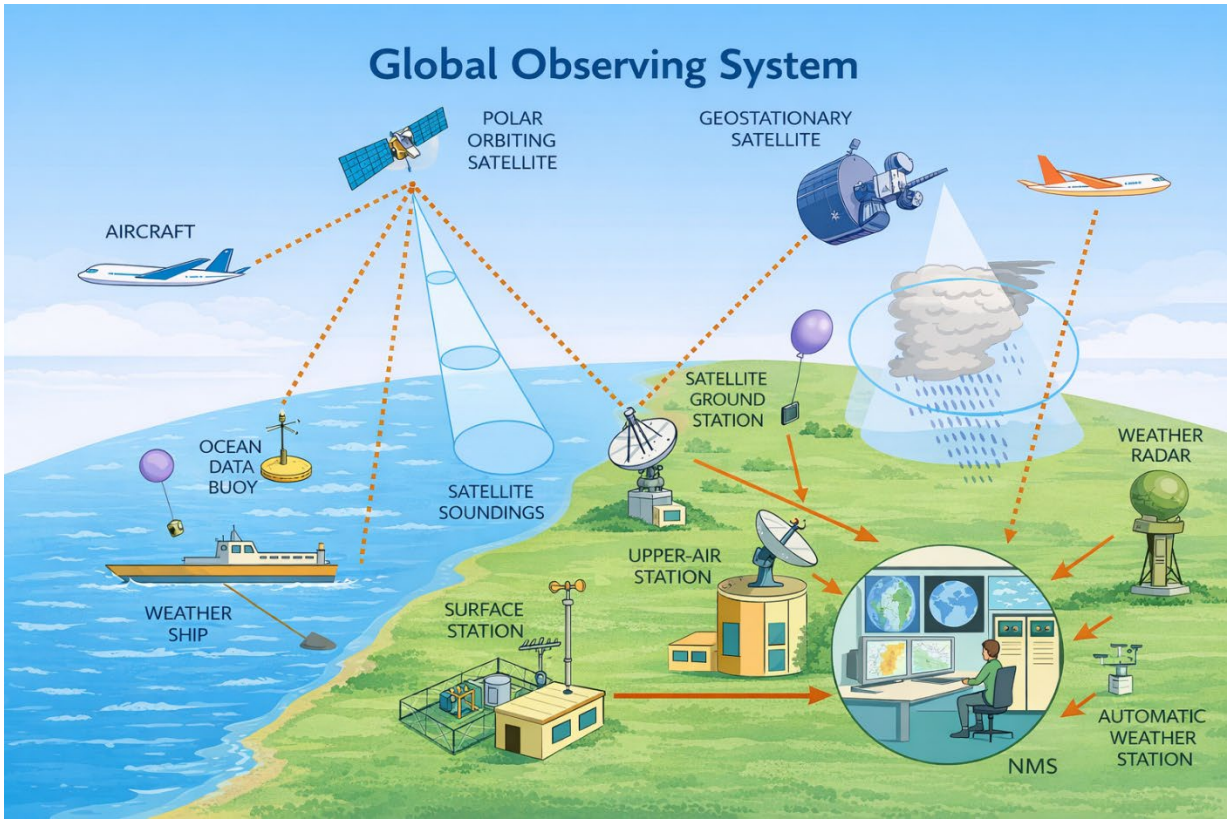

Figure 1. Data collection for weather forecasts

Weather forecasts primarily rely on physics-based numerical models that simulate the behaviour of the atmosphere. These models divide the atmosphere into three-dimensional grids and solve fundamental equations of fluid dynamics, thermodynamics and moisture transport to predict future conditions based on the data collected. Global models provide large-scale forecasts, whereas regional or high-resolution models focus on localised predictions essential for agricultural decision-making. Ensemble forecasting, in which multiple simulations with slightly varied initial conditions are run, is used to quantify uncertainties and provide probabilistic forecasts.

AI and machine learning increasingly complement traditional numerical models. These technologies can refine forecasts by integrating multiple data sources, downscaling global models to local microclimates, and predicting extreme weather events. While AI enhances forecast precision, it does not replace physics-based modelling, especially for medium- and long-term predictions.

It is important to note that different numerical and AI models exist and usually produce numerous scenarios that have different probability levels. Some forecasts integrate two or more models. However, in tropical regions, and with ongoing global climate change, forecasts need more regular updates as conditions are quickly changing, leading to the probability of scenarios evolving significantly.

Figure 2 summarises the process.

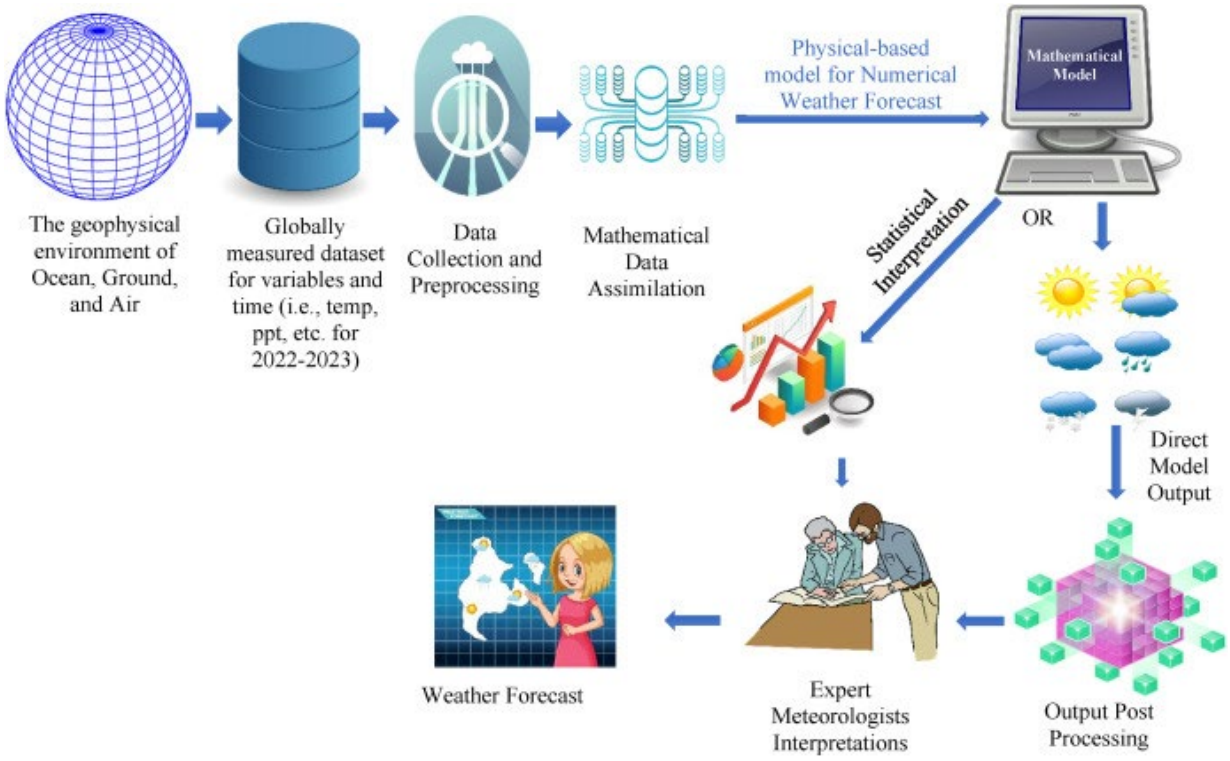

Figure 2. Weather forecast design model

Accuracy of weather forecasts

A key dimension of weather forecasts is their accuracy – their ability to provide reliable information. This quality aspect encompasses several dimensions.

- **The spatial resolution of the information**: International models used by core meteorological agencies (US National Oceanic and Atmospheric Administration [NOAA], US NASA [National Aeronautics and Space Administration], European Centre for Medium-Range Weather Forecasts) divide the earth into 15 km × 15 km or 9 km × 9 km grid cells and compute forecast for each grid cell. All products that use a GPS (Global Positioning System) location to provide forecasts leverage these models and therefore have the spatial resolution of their source model. Some products that deploy weather stations in the fields can provide hyper-localised forecasts at the field level. In such cases, the local information available from the local weather station is used to sort the various possible scenarios and adapt their probability of occurrence.

- **The accuracy of the variables (rainfall, wind, temperature, etc.) that are provided in the forecast**: All the models generate a large set of scenarios with various probabilities, and the accuracy of the weather forecasts is directly linked with the selection of the most probable scenario. Weather products and services use different strategies to select a single scenario. Some use local weather stations to inform the selection, some use AI models, but in general the exact approach is not fully documented and is part of the proprietary property of each product. That said, it is important to note that the selection of the most probable scenario depends on (1) the ability of models to compute the appropriate probability for each scenario, and (2) the variability of the weather. Concerning the latter point, tropical climates are far more unstable than other climates. This means that very different scenarios have similar probabilities, making the selection of one option more difficult. Concerning the former, data in developing countries is scarcer with far fewer weather stations, buoys, balloons, etc. While this lack of data is becoming less problematic as satellites capabilities increase[1] and as the quality of AI models improves, it still has an impact on the ability to compute accurate probability. As a result, the quality of the forecasts is usually lower in ACP regions, and they require more frequent updates. It is important to check the updated cycles of each product as some update their forecast only daily or weekly, and this increases the risk of low accuracy.

Finally, weather forecasts are key for numerous sectors (agriculture, transportation, energy, etc.) and the number of weather products and services is growing daily. There are regular evaluations and ranking of the accuracy of these products in the US and Europe. These evaluations are based on the correlation between forecasts and reality, and sometimes include crowdsourced information from users. However, as explained above, those evaluations are conducted in more stable climates, with forecasts computed with more data, and with models that have been optimised either for the US or for Europe. It is therefore not appropriate to directly rely on those evaluations to measure models' abilities to provide information in ACP regions. There is currently no literature or data about the accuracy of various products for these regions. This is one of the limitations of this study and it would be useful to conduct a field evaluation of the recommended products to measure their accuracy.

Weather products and their use in agricultural activities

Weather forecasts guide day-to-day and strategic agricultural activities. Short-term forecasts support irrigation scheduling, planting and frost protection, while medium- and long-term forecasts support crop selection, resource allocation and risk management for droughts, floods or pest outbreaks. Specialised forecasts, such as pentadal (5-day), dekadal (10-day) and seasonal forecasts, are particularly valuable for practical farm decision-making. Pentadal and dekadal forecasts allow farmers to plan irrigation, fertiliser application, pest and disease management, and labour allocation

[1] New satellites with new cameras (e.g. infrared) can measure more parameters.

over short periods, ensuring crops receive timely care. Longer-term and seasonal forecasts inform broader strategic choices, including crop variety selection, planting schedules, and preparation for extreme weather events or abnormal weather patterns (e.g. El Niño/La Niña[2]), helping farmers optimise yields and mitigate risks over several months.

Table 1 presents the various types of weather forecasts and their use in agricultural activities.

Table 1. Types of weather forecasts and their use in agriculture

Forecast product	Time range	Agricultural applications
Hourly forecast	0–24 hours	Irrigation timing, frost protection, greenhouse management, short-term pest control
Daily forecast	1 day	Scheduling planting, harvesting, irrigation, pesticide/fertiliser application
Weekly forecast	7 days	Planning labor-intensive activities, irrigation/fertiliser scheduling, crop protection measures
Pentadal forecast	5 days	Short-term crop growth monitoring, irrigation scheduling, early disease/pest management
Dekadal[3] forecast	10 days	Crop growth tracking, irrigation planning, early warning for pests/diseases, pre-harvest planning
Monthly forecast	1 month	Strategic irrigation planning, crop selection, yield prediction, extreme weather risk assessment
Bimonthly forecast	2 months	Seasonal crop planning, resource allocation, early warning for drought/flood risks
Seasonal/seasonal outlook	3–6 months	Crop variety selection, planting schedule optimisation, drought/flood preparedness, long-term irrigation planning

Weather forecasts usually include different variables that are useful for agricultural activities. Table 2 summarises the most common variables and their importance in specific agricultural activities.

Table 2. Weather forecast variables and their usefulness in specific agricultural activities

Weather variable	Measurement unit	Applications in agriculture
Temperature	°C	Crop growth monitoring, frost/freeze alerts, heat stress management, germination, flowering and fruiting schedules

[2]NOAA. What are El Niño and La Niña? National Ocean Service website, https://oceanservice.noaa.gov/facts/ninonina.html, 16/06/24.

[3] Note that a **dekadal** forecast is a 10-days forecast and is different than a **decadal** forecast which would be a forecast for up to the next 10 years.

Rainfall/precipitation	mm	Irrigation planning, planting schedules, waterlogging/flood risk, disease outbreak prediction
Humidity	Relative humidity (%)	Disease and pest risk assessment, evapotranspiration estimation, livestock comfort management
Wind speed	m/s, km/h	Spraying pesticides/fertilisers (drift control), preventing wind damage, soil erosion prevention
Wind direction	Degrees (°)	Planning spraying activities, windbreak placement, orchard microclimate management
Solar radiation/sunshine hours	W/m^2 or hours/day	Photosynthesis estimation, crop growth/yield prediction, greenhouse management, evapotranspiration
Atmospheric pressure	hPa	Prediction of short-term weather changes, storm/cyclone alerts
Cloud cover	oktas (0–8) or %	Temperature and soil evaporation estimation, solar radiation forecasting
Dew point	°C	Frost prediction, dew formation for disease risk, irrigation timing
Leaf wetness	hours or scale	Fungal and bacterial disease forecasting, irrigation management
Soil moisture	% volumetric water content or mm	Irrigation scheduling, drought management, seed germination assessment
Soil temperature	°C	Seed germination, root growth, microbial activity, fertiliser timing
Evapotranspiration (ET)	mm/day	Irrigation scheduling, water budget planning, crop growth modelling
Growing degree days (GDD)	°C-days	Predicting crop growth stages, harvest timing, pest development forecasting
Crop Moisture Index (CMI)	Index value	Drought assessment, irrigation and water resource management
Extreme weather indicators (frost, heatwave, storms)	Event-based, °C, km/h	Crop and livestock protection, harvesting and irrigation adjustments, disaster preparedness

Actors and skills

Weather forecasts are developed and used by different actors, with various levels of skills. Table 3 summarises these actors, their roles and their skills in the context of weather information in ACP regions.

Table 3. Actors and skills

Actors	Roles/needs	Skills
Main international-level weather offices, e.g. European Centre for Medium-Range Weather Forecasts (ECMWF) and the US National Weather Service (NWS)/NOAA	Produce high-resolution medium-range (up to 15 days) and extended-range forecasts	Highly skilled researchers

	Operate the most advanced global numerical weather prediction systems and use advanced AI models Provide forecasts issued from different models and their probability Provide seasonal outlooks	
Regional or national meteorological offices in ACP regions	Produce national or regional forecasts	National meteorological offices in developing countries are often under-resourced, which limits their capacity to produce accurate information Regional-level organisations are usually supported by international organisations and can produce quality information
International NGOs and specialised teams (e.g. Famine Early Warning Systems Network [FEWS Net], the Climate hazard center, International Research Institute for Climate and Society).	Produce specific analysis, transforming weather data into actionable insights (food security, climate change, etc.)	Have the skills to analyse technical weather information provided by international organisations and transform the information based on their needs (food security, specific products)
National-level agriculture non-governmental organisations (NGOs), national farmers' group, agriculture extension services	Advise, train, support and provide information to extension agents so that they can support smallholder farmers effectively	can analyse non-technical weather information and weather maps, and transform them in localised information for extension agents and smallholder farmers
Extension agents, lead farmers, agribusinesses	Support farmers in the production cycles	Can transform easy-to-understand weather information into recommendations for agricultural activities Require localised information
Smallholder farmers	Need actionable information and recommendations on activities induced by the weather forecast	Are not necessarily able to directly transform weather forecasts, particularly long-range ones, into agricultural activities (e.g. selection of crops, planting time, spraying)

Overview of existing weather products and services

The full list of solutions, services and products covered in Phase 1 of the programme is available in Annex 1 and online.[4] In total, more than 50 items were analysed. Solutions differ in terms of the type of information they provide, including the set of variables available, and in terms of the format used to present the information. Tables 4 and 5 present the different categories for each of those

[4] https://docs.google.com/spreadsheets/d/1liqukZwXcqlYG0AZBdvD9JHiKrLr_pPzAQhUdll2_8g/edit?gid=0#gid=0

dimensions. It is important to note that the categories presented in Table 4 include free, freemium[5] and paid-for solutions.

Table 4. Categories of solutions based on the information they provide

Type of solutions	Information provided	Target audience
Components useful for building weather forecasts	Products in this category provide components useful for others to build weather forecasts, but are not directly usable independently. This category covers different types of products from weather station data up to specific AI models that need to be trained	Meteorological offices and researchers building weather forecasts Developers of weather platforms
Global data sources	US and EU main weather forecast agencies. The data they provide are core data used by all other services and products	Meteorological offices, specialised agencies and teams, NGOs with experts in weather
Derived data sources/products	Regional or national-level weather forecasts derived from the global sources Products that leverage global data sources and provide added value (e.g. simplification, localisation)	Actors without specific weather forecast skills, but who can translate weather information into something meaningful for agriculture
Integrated product	Localised weather forecasts usually based on GPS coordinates. Products vary from simple smartphone apps providing weather information only, to complete products for farm management that may include agricultural activities advice and local deployment of weather stations to provide better accuracy	Farmers and extension agents
API (application programming interface)	Usually location-based weather information provided through an API to be integrated into products such as the one above	Product developers

Table 5. Weather forecast formats and required skills

Format provided	Description	Use & Required skills
Maps	Weather forecasts are presented in the forms of maps (world, regional/continental, country level) that usually present one or more variables (e.g. temperature, rainfall) and their absolute value (e.g. mm of rainfall) or as percentage anomalies and probability. Most complex and complete forecasts include multiple maps that present	Maps require some skills to be exploited: ● For simple forecasts, the challenge is to derive localised (GPS-based) information from the map ● For more complex forecasts, only individuals with weather expertise can effectively combine multiple

[5] A freemium product is a product that offers basic free content, and advanced paid content. It may also include advertisements. For the weather forecast, this may include, for example, access to shorter-range forecasts for free.

	various scenarios, and perspectives (anomalies and absolute values). In such a case, the most probable scenarios must be derived from combinations of the various maps	sources of information to produce an accurate prediction
Bulletins	Written bulletins that present weather forecasts in a text description	Bulletins are good to provide trends and long-range forecasts, but they do not support the identification of localised information
Localised information	Information provided based on GPS coordinates	This information is the simplest to use, as users directly get localised weather forecasts based on the geolocation of their device. However, it is important to note that the quality of the information directly depends on the spatial resolution of the model used to make the forecast. Most advanced models (i.e. from EU and US agencies) have a spatial resolution of 9×9 km or 15×15 km land spots. The most accurate forecast can be generated by the most expensive products that include the deployment of weather stations in the field. These products can provide ultra-local forecasts at the farm field level (e.g. 1 km around the weather station)
Raw data	Information provided by APIs,[6] usually in JavaScript Object Notation (JSON) format[7]	API data must be integrated into a product to be accessible by the actors who need the information

Weather products and services for smallholder farmers

Based on the Phase 1 overview, we selected 10 products to analyse in detail (see Annex 2 or the online spreadsheet[8]). Among these, three were global products with worldwide coverage, one was a country-specific product (Kenya), five were regional products developed by offices (East Africa, West Africa, Southern Africa, whole Africa and South Pacific), and one was developed by a specialised agency (Famine Early Warning Systems Network [FEWS Net] focused on food security). The selection of products from the global list developed in Phase 1 was guided by the following key factors:

- the information should be provided in an easy-to-understand format (bulletin or visual information)
- the information should be spatially located

[6] See Wikipedia, API, https://en.wikipedia.org/wiki/Bluebook (describing history and application of the Bluebook) (as of Nov. 12, 2025).
[7] See Wikipedia, JSON, https://en.wikipedia.org/wiki/JSON (as of Nov. 12, 2025).
[8] https://docs.google.com/spreadsheets/d/1jcmMl3hzm33T-2-a2CrbM79dGAYD3Hc-5UvoOic89gw/edit?gid=0#gid=0

- the information should include short-term forecasts (pentadal, dekadal), which are the most useful source of information for agriculture.

Based on this initial selection, we conducted a detailed analysis of each product and shortlisted products that fit the target audience[9]. The subsections below summarise the analysis and present the shortlisted products, identify those that were not shortlisted and explain the rationale for their exclusion, and highlight the limitations of the approach and potential mitigation strategies.

Shortlisted solutions

The table below presents the weather forecasts solutions that, according to our analysis, could be useful for smallholder farmers in the ACP regions.

Table 6. Selected products for smallholder farmers

Solution/Product	Geographic coverage	Strengths	Comment
La météo agricole[10]	Global coverage but only in French: mostly appropriate for francophone Africa, francophone Caribbean and francophone South Pacific islands	Free (with ads) Easy to use and easy to understand Hourly update and 3-day forecast (free) Both web & mobile app	
Google Weather / The Weather Channel[11]	Global coverage	Free Easy to use and to understand French & English Accurate according to the literature	
Meteoblue[12]	Global coverage with local models of up to 4 km resolution (especially accurate for Europe)	Free access to reliable forecasts (hourly, daily and 14 days) Clear and user-friendly visualisations Available both on web and mobile app (Android/iOS) Provides additional agro-tools for professional use (Meteoblue AGRO)	Forecasts based on multi-model ensembles Freemium model where basic forecasts are free; API and Point+ subscriptions provide enhanced data Interfaces and explanations make it easy for non-experts; however, interpretating probabilistic forecasts still requires more advanced understanding
Kenya Agricultural Observatory Platform[13]	Kenya (ward level)	Free Easy to use and to understand	

[9] Some of the products we selected for deep-dive based on a quick analysis eventually proved not to fit our target audiences.
[10] https://www.lameteoagricole.net/application-meteo.php
[11] https://weather.com/
[12] https://www.meteoblue.com/
[13] https://www.kaop.co.ke/

		Includes some agriculture advisory service Responsive design used for the website that is usable on mobile	
Tomorrow.io[14]	Global coverage with high-resolution forecasts (including Africa, Caribbean and Pacific regions) thanks to satellite-data assimilation and proprietary nowcasting models	Free mobile app (Android/iOS) available worldwide; clear and intuitive interface with alerts and visual forecasts Provides short-term (hourly/daily up to 14 days) weather forecasts including rainfall, temperature, wind and humidity Includes risk indicators for rain, heat and storms that are easy to interpret	Forecasts are generated through its proprietary ClimaCell model, which merges satellite, radar and IoT data to deliver hyperlocal predictions (as fine as 500 m grid in some regions) The free version is appropriate for small-scale farmers and communities The app is multilingual (including English, French and Spanish)

iOS, Apple/iPone operating system; IoT, Internet of things.

La météo agricole

"La météo agricole" is a web and mobile application (app) that provides weather forecasts in French including the following variables:

1. rainfall volume (in mm) and probability, plus an hourly rainfall forecast (rainfall in the next 60 minutes updated every 2 minutes)
2. maximum and minimum temperature in degrees Celsius
3. relative humidity (%)
4. wind direction, maximum and average speed
5. dew point
6. cloud cover
7. qualitative air quality index
8. atmospheric pressure
9. sunshine duration (hours)
10. UV index.

The location can be selected either by entering it in the search bar or by using the device's GPS (in the mobile app).

The business model follows a freemium structure with two paid tiers:

- **Free tier:**
    - intraday forecast available for 3 days

[14] https://weather.tomorrow.io/

    - daily forecast available for 10 days
    - advertisements included.
- **Ad-free option:**
    - removal of advertisements for €9.89 per year.
- **Premium tier:**
    - intraday forecasts extended to 7 days
    - daily forecasts extended to 15 days
    - additional variables, including evapotranspiration, solar radiation and crop-spraying recommendations
    - price: €39.89 per year.

The data is updated hourly.

Figures 3 and 4 show screenshots: the daily forecast and the intraday forecast.

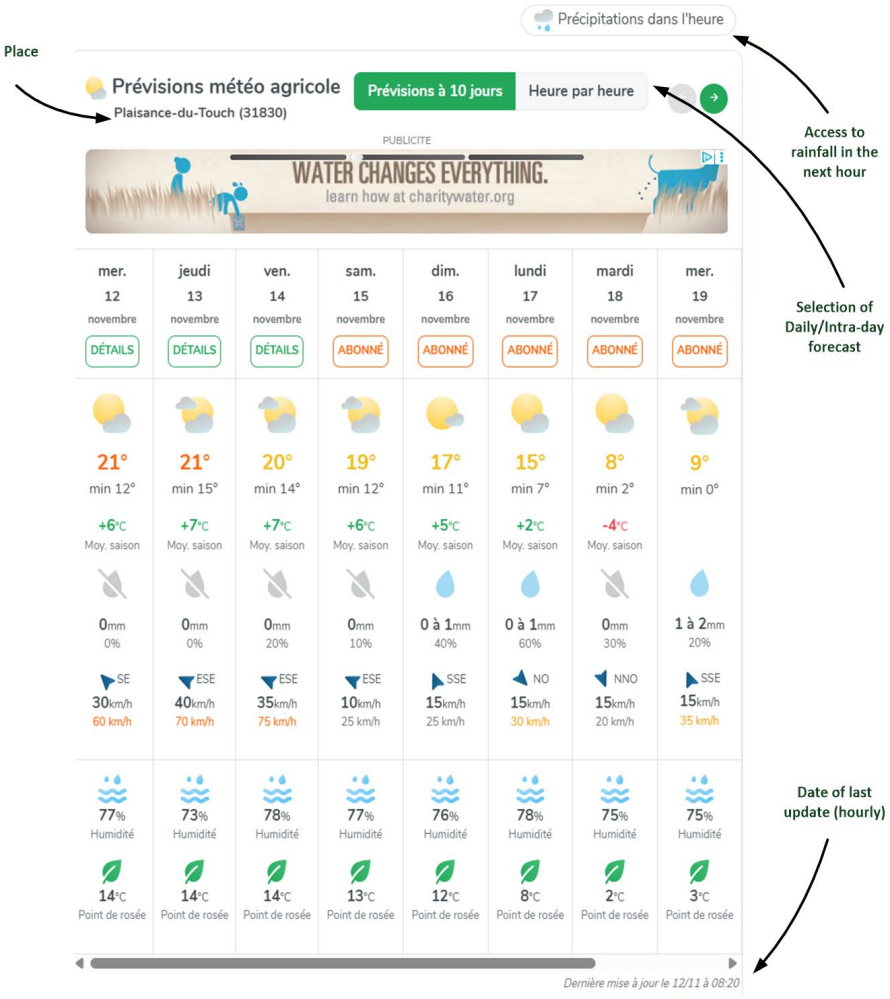

Figure 3. La météo agricole 10-day forecast screenshot

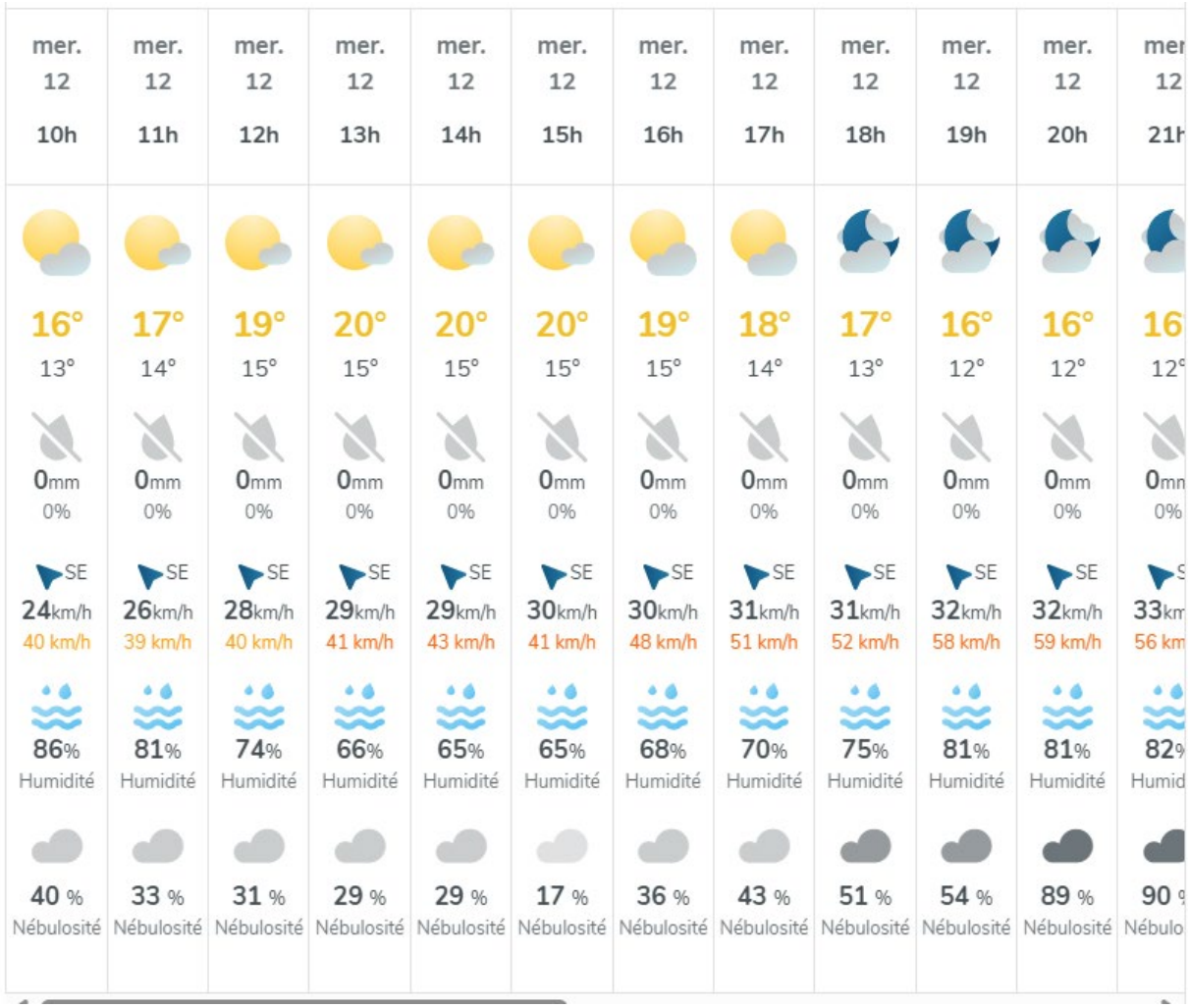

Figure 4. La météo agricole intraday forecast screenshot

Google Weather / The Weather Channel

This Android app provides an intraday forecast for the current day, and an overview of the daily forecast for the next 7 days. The intraday forecast includes the following variables:

1. rainfall probability plus an hourly forecast (expected rainfall in mm every hour for the next 5 hours)
2. maximum and minimum temperature in degrees Celsius
3. wind direction and speed
4. dew point
5. humidity
6. air quality (qualitative)
7. atmospheric pressure

8. visibility (in km)
9. UV index.

It also provides a radar map for rainfall. Data are updated every minute. Locations can be selected either by choosing a place on a world map or by using the device's GPS (mobile application). Multiple places can be saved for direct access.

The Android application provided by Google is based on data from The Weather Channel. The same information, presented with a different design, is available on The Weather Channel website that provides additional variables, such as cloud coverage and rainfall forecast for up to 10 hours. The Weather Channel also provides a longer set (9 days) of daily forecasts. The Weather Channel is directly linked from the Google Weather app (just clicking on the weather in the Google Weather app).

Both applications are free, include advertisements, and are localised based on the language settings of the device. Figures 5 and 6 show the Google Weather app.

Figure 5. Google Weather intraday and 7-day forecast screenshots

Figure 6. Google Weather intraday forecasts – rain radar, wind and air quality

Meteoblue

Meteoblue is a web and mobile app that provides intraday, 7-day and 10-day weather forecasts in 21 languages including English, French, Portuguese and Spanish. There is also a 14-day forecast on the mobile app, with a subscription. The units used are configurable. For intraday forecasts, information is provided on an hourly basis. For 7-day forecasts, data are available every 3 hours (and hourly with a subscription), while 10-day forecasts are provided on a daily basis. The variables included in the forecasts are:

- prediction quality, available in the 7-day forecasts (expressed on a 1–4 scale) and in the 10-day forecast (expressed as a percentage).
- rainfall probability and volume in mm
- rainfall radar (only in the intraday and 7-day forecasts)
- maximum and minimum temperature
- wind direction and speed (maximum and average), only in the intraday and 7-day forecasts
- dew point (only in the intraday and 7-day forecasts)
- humidity (only in the intraday and 7-day forecasts)
- qualitative cloud cover
- atmospheric pressure
- sunshine duration in hours (only in the 7-day forecasts)

- UV index
- visibility but as measured in meters in the last 30 min (intraday forecast).

The business model is based on advertisements, which can be removed on the mobile app for €4.99 per year; the subscription also includes access to the 14-day forecasts. The web subscription, which includes advanced weather maps, costs €10/month or €50/year and also provides a 14-day forecast with hourly forecasts. The web app also offers a €9 per year subscription to remove advertisements. Locations can be selected by entering a town name, by selecting a point on a map, or by using the device's GPS (mobile app).

The screenshots (Figures 7–9) illustrate the web app (intraday forecast, 7-day forecast, 10-day forecast).

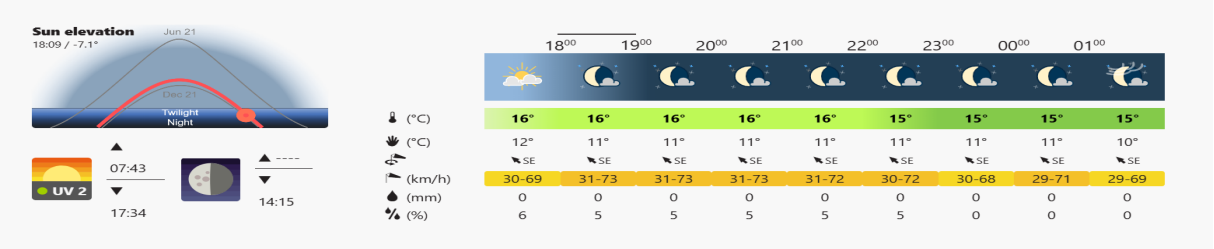

Figure 6. Meteoblue intraday forecast

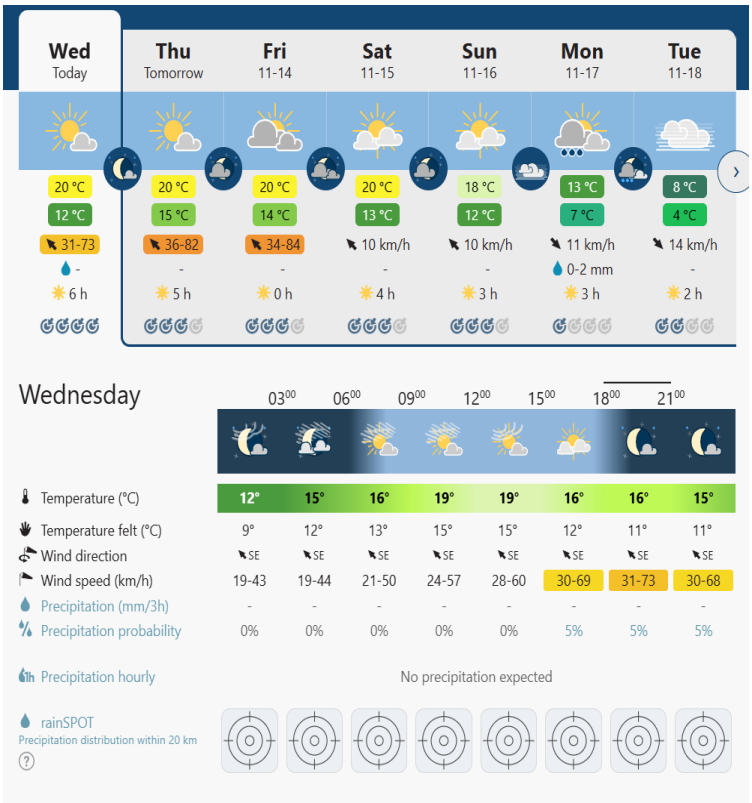

Figure 7. Meteoblue 7-day forecast screenshot

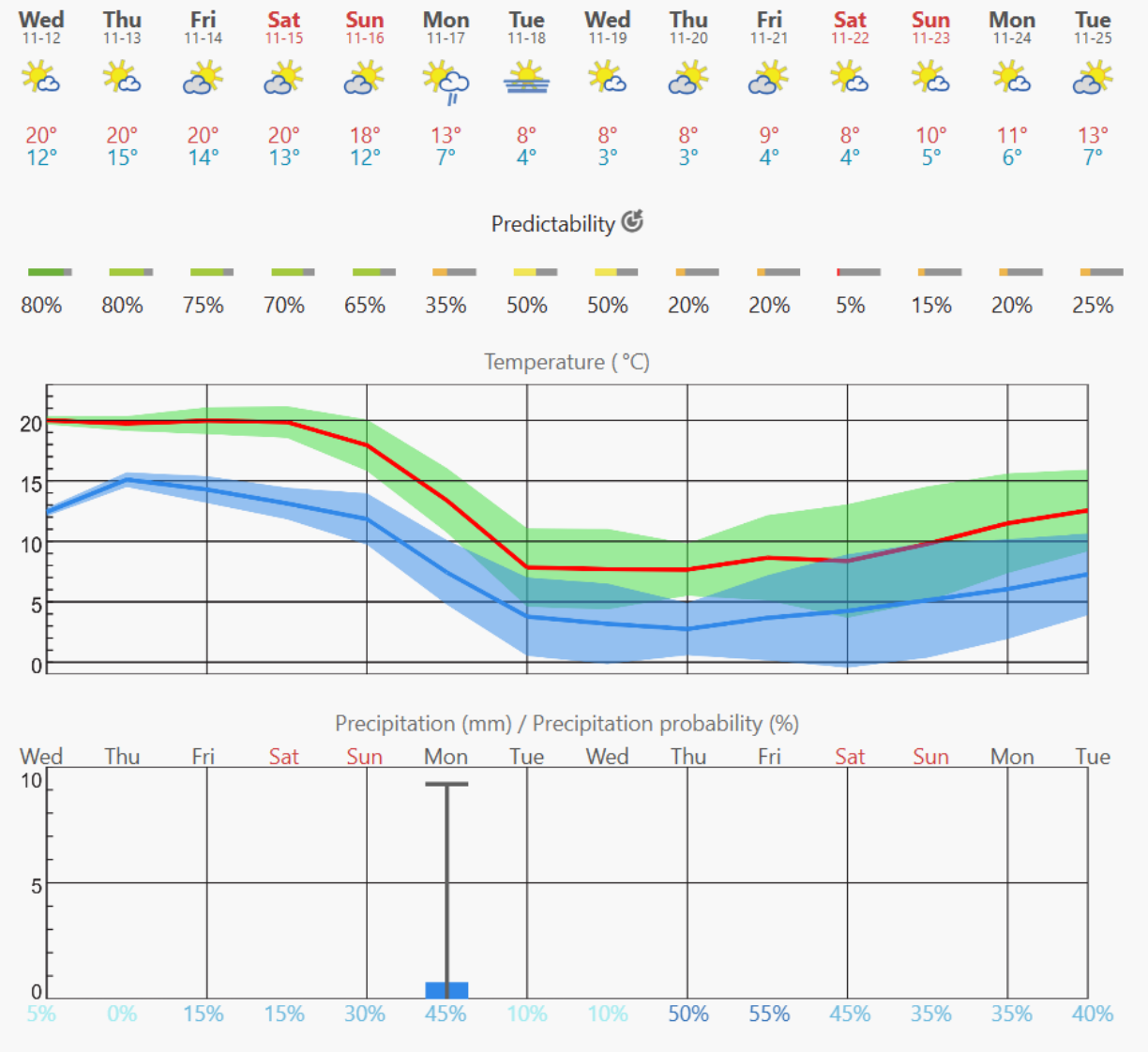

Figure 8. Meteoblue 14-day forecast screenshot

Kenya Agricultural Observatory Platform

The Kenya Agricultural Observatory Platform (KAOP) is a web app that provides a 14-day forecast for each ward in Kenya. The provided variables are:

- rainfall probability and volume in mm
- maximum and minimum temperature
- wind speed
- humidity
- qualitative cloud cover.

The location can be selected either through three drop-down menus (county, constituency and ward) or by entering free text via a chatbot. The service is free and accessible on mobile devices through a responsive web design.

The screenshot (Figure 10) shows the forecast for a selected ward.

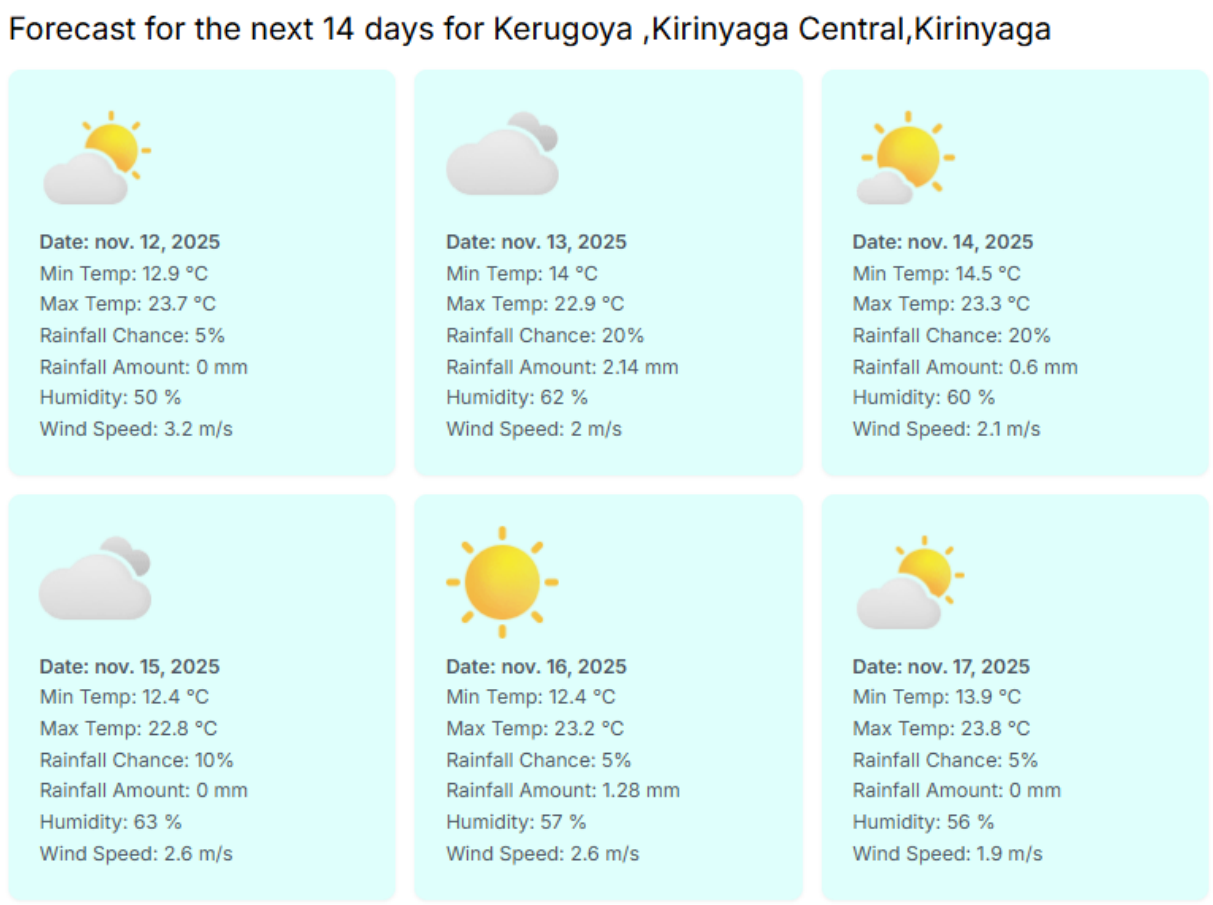

Figure 9. Kenya Agricultural Observatory Platform screenshot

Tomorrow.io

Tomorrow.io is a web and mobile app that provides hourly intraday forecast for up to 14 days. On the web app, however, 14-day forecasts are available only as daily averages. The variables included in the forecasts are:

- rainfall and snowfall volume in mm and probability
- maximum and minimum temperature (°C)
- wind direction and speed (maximum and average)
- dew point
- humidity
- qualitative cloud cover

- atmospheric pressure
- UV index
- visibility in km
- air quality including pollens and pollutants
- the web app also provides a radar map for rainfall, snowfall, sleet and freezing rain.

The forecasts are free. Locations can be selected using GPS (on both web and mobile platforms) or by entering a city name, or selecting a country, region and city. The screenshots (Figure 11) are from the mobile app.

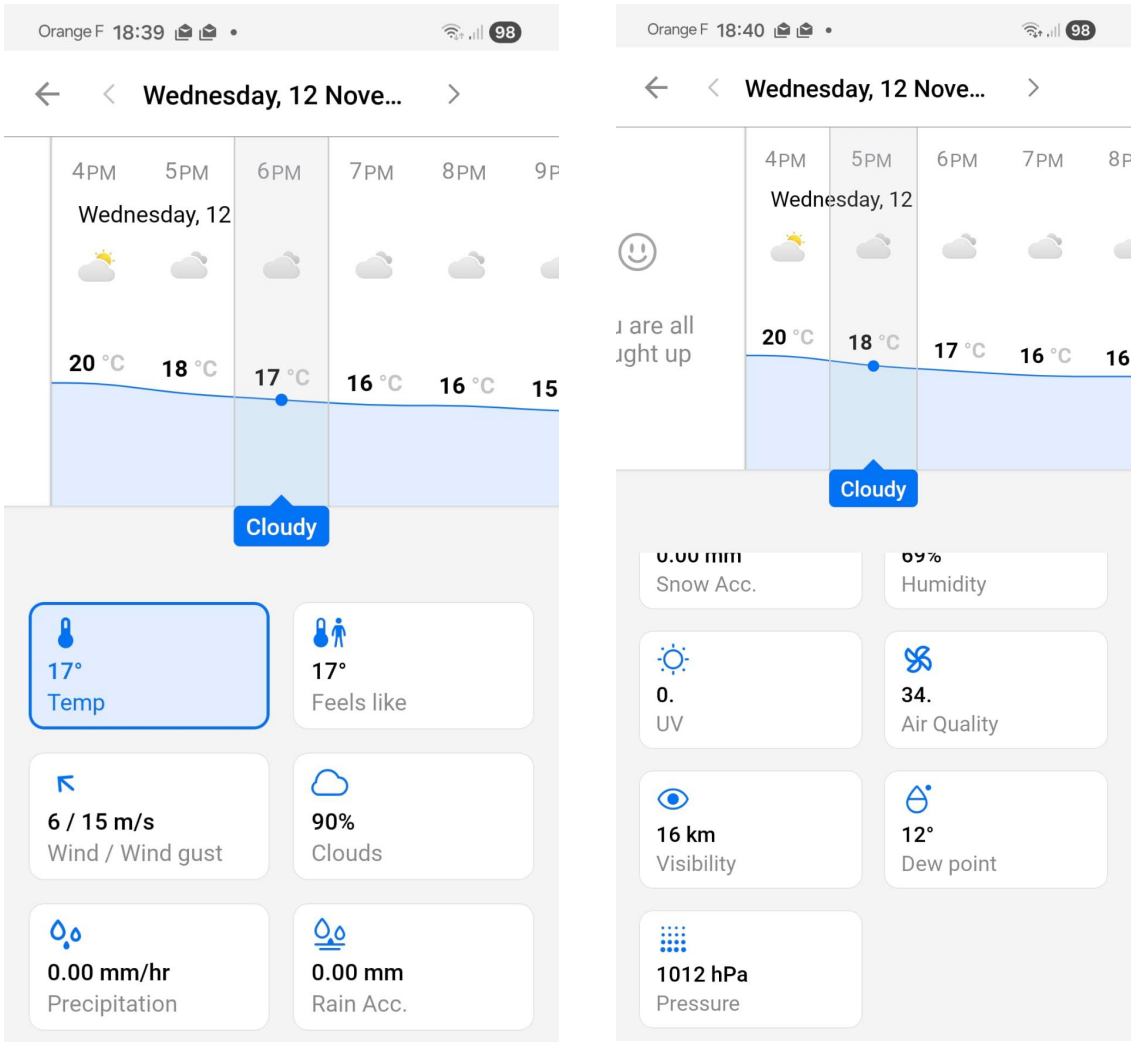

Figure 10. Tomorrow.io weather intraday forecast screenshots

General observations

It is important to note that the first three and the last solutions are global products that are not unique on the market. There are hundreds of similar applications available on mobile app stores and various websites, and they all tend to look and function in very similar ways. However, they are not equivalent and their quality depends largely on the source of their data and on the analytical processing applied. The apps selected in this shortlist rely on international data providers offering highly accurate, granular information with a 15 × 15 km spatial resolution. Some, such as meteoblue, use multiple sources and create their own forecasts. Based on this research, the core criteria to consider before using such general weather applications are the following.

- **The source of data**: Applications relying on international sources (NOAA, NASA, European Centre for Medium-Range Weather Forecasts) are reliable.
- **The variables**: Rainfall and temperature are key for agriculture and the minimum variables that a forecast should provide. Other useful variables include wind and cloud cover.
- **Accuracy of the forecast**: Weather forecasts are based on identifying possible scenarios and their probability. Providing probability information is an essential factor for users to evaluate the certainty of the forecast and adapt accordingly.
- **Update cycle**: Tropical weather is unstable. Climate change and local phenomena (e.g. El Niño and La Niña) have a massive impact on the forecasts. It is therefore essential to use products that regularly update the forecasts.
- **Geolocated forecasts**: Geolocated services using the GPS of the device are the most user-friendly and easiest app to use.

Less-accessible solutions

All regional (Africa, Pacific) and continental (Africa) services (IGAD Climate Prediction and Application Centre [ICPAC], Agrhymet, African Centre of Meteorological Applications for Development [ACMAD], Pacific Meteorological Desk & Partnership, Southern African Development Community [SADC] Climate Services Centre [CSC]) and FEWS Net produce bulletins that are high-level (country level), and more difficult to access and understand for smallholder farmers. While these solutions do not deliver information in a format that is directly usable by smallholder farmers, they can still serve as valuable inputs for organisations such as non-governmental organisations (NGOs) that are able to interpret and translate the information into practical advice.

Limitations of the approach

The outcomes of this part of the study present several limitations that are worth highlighting.

1. Except for Google Weather and meteoblue, the shortlisted solutions are only available in French or in French and English , which significantly limits their accessibility for smallholder farmers.
2. Similarly, these solutions require a smartphone, a data plan and the availability of at least a 3G signal, which remain common barriers for many smallholder farmers.
3. Tropical weather is unstable and hard to predict. The simplest applications provide data that must be interpreted alongside the associated probabilities, checked regularly (often several times a day) and cross-checked using two or more applications.
4. The selected solutions provide short-term forecasts that are useful to drive agricultural activities. However, these types of forecasts are only one element of a portfolio of services that are required to support farmers across the whole production cycle. In particular, regional organisations (ICPAC, Agrhymet, ACMAD, Pacific Meteorological Desk & Partnership, SADC Climate Services Centre) provide long-range forecasts (rainy season forecasts) that are essential, for example, for selecting appropriate crops. While this information is hard to understand and would need to be translated into actionable information, it is also critical for farmers and complements short-term forecasts.

A possible way to address the first three challenges could be to target and train community radio stations as intermediaries that could provide localised information a few times a day using the shortlisted applications. The fourth point would require identifying other types of intermediaries that could transform long-range forecasts into actionable information (e.g. crop selection based on agronomic zones) and make this information available to smallholder farmers and radio stations.

Weather products and services for agribusiness

Based on the Phase 1 overview, we selected 12 products for detailed analysis (see Annex 2 or the online spreadsheet[15]). The selection of products from the global list established in Phase 1 was driven by the following key factors.

- The information should be provided in an easy-to-understand format (bulletin or visual format).
- The information should be location-specific.
- The information should include short-term forecasts (pentadal, dekadal), which are the most useful source of information for agricultural decision-making.
- The prices should not exceed €2,000 per year.

[15] https://docs.google.com/spreadsheets/d/1jcmMl3hzm33T-2-a2CrbM79dGAYD3Hc-5UvoOic89gw/edit

The subsections below summarise the analysis, present the selected products, identified those that were not shortlisted and explain the rationale for their exclusion, and highlight the limitations of the approach and potential mitigation strategies.

Shortlisted solutions

Table 7. Shortlisted weather solutions for agribusinesses

Solution/Product	Geographic coverage	Strengths	Comment
Meteoblue Meteogram AGRO[16]	Global coverage with high-resolution models (up to 4 km for Europe, 30 km elsewhere); NWP coverage including Africa, Caribbean and Pacific	Freemium model combining short-term (up to 14 days) and seasonal outlooks Clear visualisation tools (sowing window, soil moisture, evapotranspiration)	Strong scientific base and transparent methodology Affordable subscription plans and API access, well below €2,000 per year
Sencrop[17]	Global coverage with up to 5 km^2 resolution. Multi-model framework integrating several established NWP models (such as GFS, ICON, ARPEGE) Evaluates their performance locally through its own station network Weather stations concentrated mostly in Europe but expanding internationally	Network of connected weather stations and an intuitive app delivering ultra-local forecasts and alerts	Hardware-plus-software model (approximately €500 station + €200 subscription/year) Precise and farmer-friendly Expansion underway
EOSDA Crop Monitoring[18]	Global gridded data at a 90x90 meter resolution Combines global meteo datasets from Meteomatic + satellite EO-derived indices Can also integrate data from ground meteorological stations	Integrates weather data with satellite-derived indices (NDVI, soil moisture, rainfall, temperature) and historical analytics	A powerful Earth observation platform offering weather layers within broader crop monitoring analytics
WeatherTrends360[19]	Global (location-based) 32 million grid points (approximately 16x16 km) Proprietary year-ahead model + blended short-term forecasts	Long-range (up to 12 months) statistical forecasts combining climate trends and proprietary pattern analysis	Unique predictive horizon useful for planning Enterprise plans remain affordable for fields up to approximately 1,000 ha Recommended for

[16] https://content.meteoblue.com/en/private-customers/website-help/agriculture/meteogram-agro
[17] https://sencrop.com/eu/
[18] https://eos.com/products/crop-monitoring/
[19] https://www.weather trends360.com/Agriculture-Weather-Analytics

	exploratory or aggregated agribusiness use

ARPEGE, Action de Recherche Petite Échelle Grande Échelle ; EO, Earth observation; GFS, Global Forecasting System; ICON, ICOsahedral Nonhydrostatic; NWP, Numerical Weather Prediction.

Meteoblue Meteogram AGRO

Meteoblue Meteogram AGRO is a web and mobile app designed for agricultural users, providing intra-day, 7-day and 14-day weather forecasts in over 20 languages, including English, French, Portuguese and Spanish. Forecasts are displayed hourly (intraday), every 3 hours (7-day) and daily (14-day), with optional hourly forecasts for longer horizons with subscription.

The AGRO version includes a broader set of agronomic tools and variables beyond the standard meteoblue app, such as evapotranspiration, soil moisture estimates, crop-spraying windows and crop-relevant radiation metrics. Core variables include:

- rainfall probability and volume (mm)
- temperature (min/max °C)
- wind speed (max and average) and direction
- dew point
- humidity
- cloud cover (qualitative)
- atmospheric pressure
- radiation and evapotranspiration
- soil saturation indices
- sunshine duration (7-day forecast)
- UV index
- radar-based precipitation maps (in supported regions).

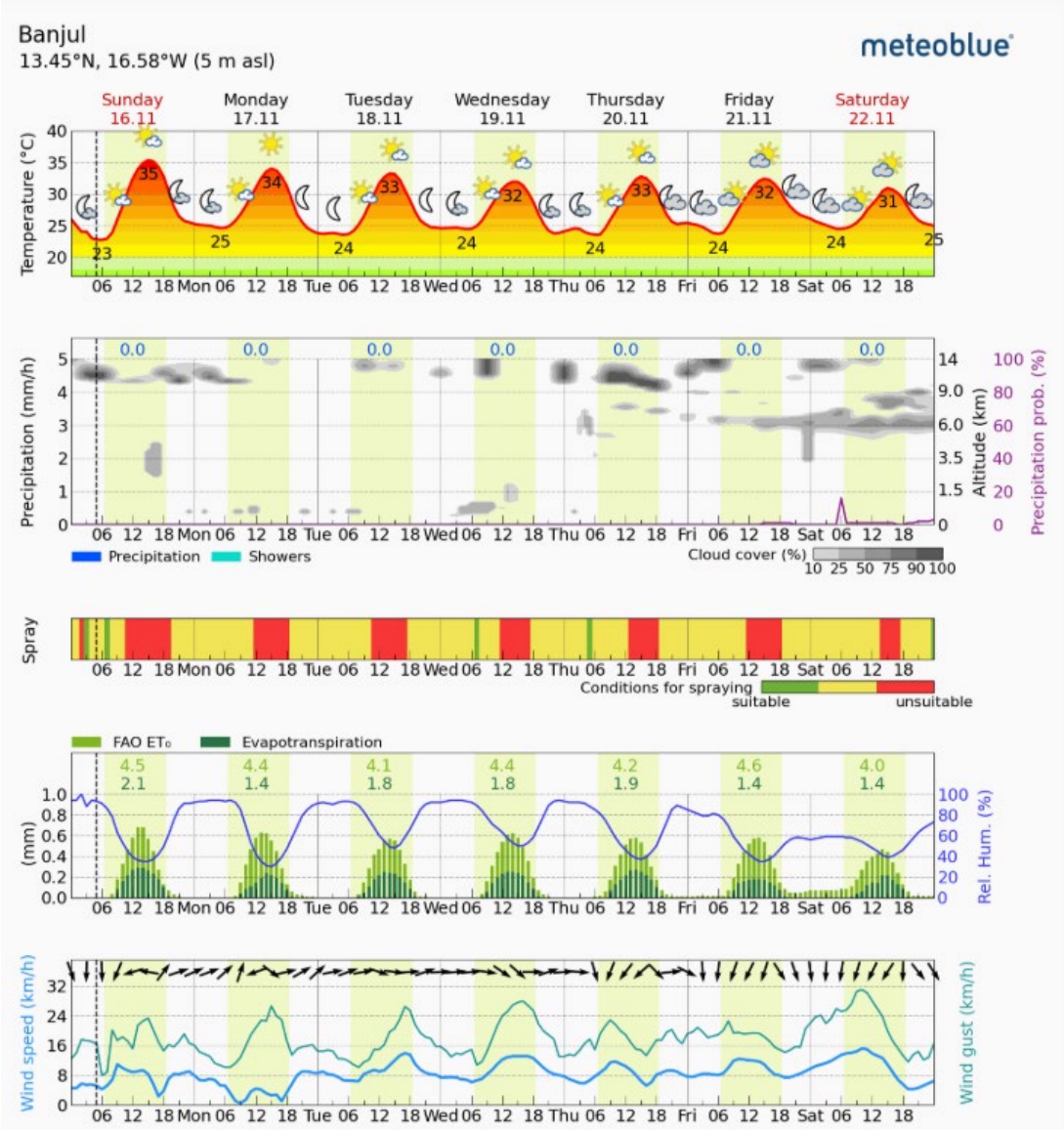

Figure 12. Meteoblue Meteogram AGRO screenshots

Meteoblue Meteogram AGRO uses a multi-model approach combining its own NEMS models (with resolution ranging from 4 km to 30 km depending on the region) with European Centre for Medium-Range Weather Forecasts (ECMWF), GFS, ICON (ICOsahedral Nonhydrostatic) and other sources. Location selection is made by searching for a city, pointing on a map or using geolocation. The business model follows a freemium structure: basic indicators are available for free, while AGRO and Point+ subscriptions provide access to extended tools and maps, starting at €50 per year.

Sencrop

Sencrop is a precision agriculture platform for web and mobile that relies on local weather stations to deliver short-term, hyperlocal forecasts. It provides minute-level and hourly weather data at the

field scale, driven by in-field sensors when available. It was originally deployed primarily in Europe, where its network of stations is more developed, but is increasingly used elsewhere through partnerships and pilot deployments. The catalogue of indicators includes (some of them only if local stations or sensors are available):

- rainfall in mm (real-time from local rain gauge when installed)
- temperature (min/max °C and hourly)
- humidity
- wind speed (average and gusts) and direction
- dew point
- atmospheric pressure (model-based)
- leaf wetness
- radiation and evapotranspiration
- spray windows and agronomic alerts.

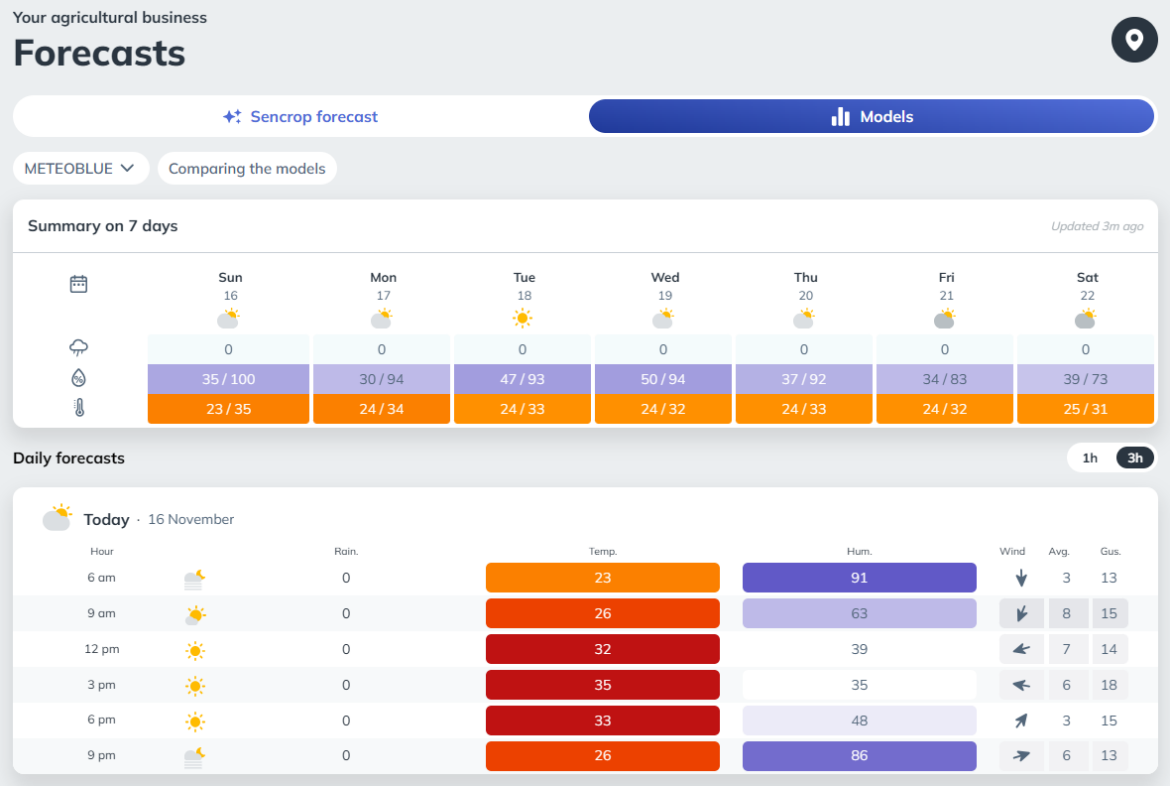

Figure 13. Sencrop weather forecast dashboard screenshot

Forecasts are updated multiple times per hour. If a farm has a Sencrop weather station installed, the platform automatically uses that station's coordinates for forecasts. If not, users can select their location manually by clicking on a map or letting the app detect it through geolocation. Forecast

variables depend on the selected weather model (GFS, ICON, ARPEGE and others aggregated by Sencrop) and include:

- hourly rainfall (mm) and probability
- hourly temperatures (°C)
- wind forecasts
- cloud cover.

Sencrop's business model combines a hardware component with a subscription structure combining weather stations (€500–700 one-off) and an annual subscription for data access (€200–300 per year).

EOS Data Analytics (EOSDA) Crop Monitoring

EOSDA Crop Monitoring is an online platform combining Earth observation (e.g. Normalized difference vegetation index [NDVI], Enhanced vegetation index [EVI], soil moisture, vegetation indices) with weather forecasts and historical climate data. It is designed for farms and agribusinesses that need integrated, field-level insights. The weather module includes:

- daily and hourly rainfall (mm)
- temperature (min/max °C and hourly curve)
- dew point
- humidity
- wind speed and direction
- cloud cover
- atmospheric pressure
- 14-day forecast horizon
- historical weather (5–15+ years depending on the variable)
- growing-degree days (GDD), accumulated precipitation, and other agro-climate indices

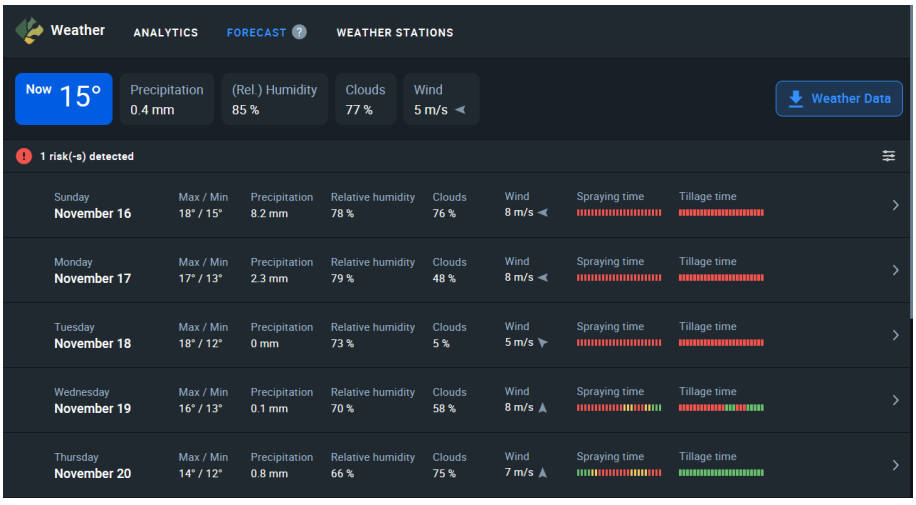

Figure 14. EOSDA Crop Monitoring – weather analytics dashboard screenshot

Weather data sources include ECMWF, GFS and proprietary downscaling techniques. Satellite data (Sentinel-2, Landsat) are integrated into the same dashboard to support field scouting, crop stress detection, and benchmarking across seasons. The platform is accessible on web and mobile browsers. Fields are geolocated through polygon drawing on a map or shapefile upload.

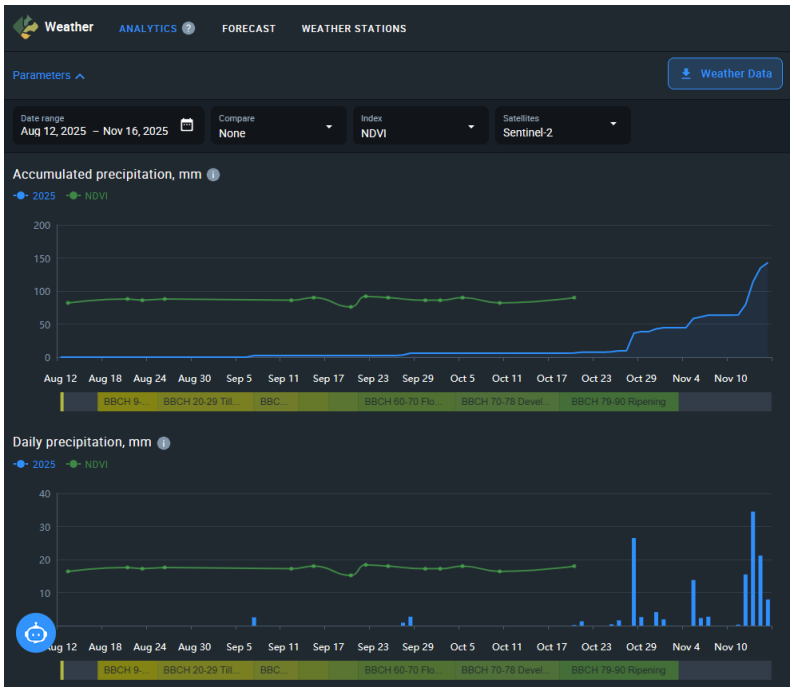

Figure 15. EOSDA Crop Monitoring – rainfall monitoring and NDVI analytics screenshot

The business model is based on a free tier providing access to basic satellite layers (with limited resolution and number of fields), and paid plans offering unlimited fields, weather history, API access and team management (€600 per year for up to 1,000 ha farm-level usage without zoning).

WeatherTrends360

WeatherTrends360 is a web-based forecasting platform offering both short-term and long-range weather outlooks. What makes it distinct from other tools is that it provides statistical forecasts up to one year in advance, using proprietary climate pattern analysis. The platform provides:

- daily rainfall forecasts (mm)
- temperature forecasts (min/max °C)
- humidity
- wind (speed and direction)
- cloud cover

- atmospheric pressure
- long-range statistical projections for rainfall and temperature anomalies
- GDD trends and seasonality indicators.

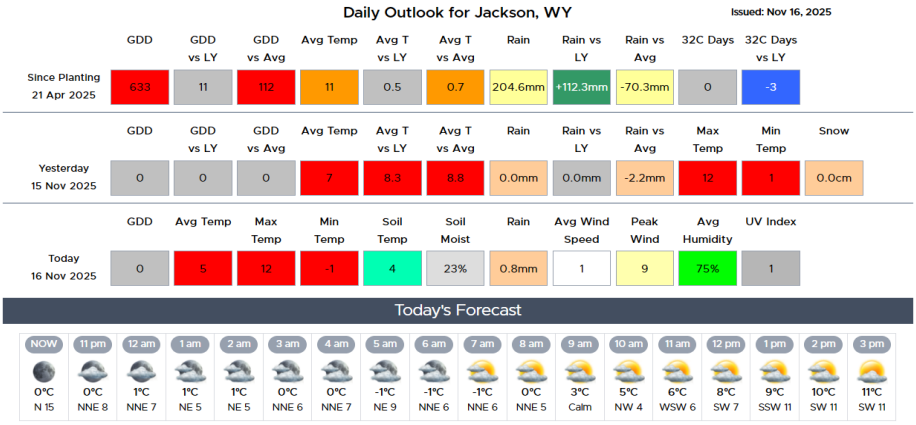

Figure 16. WeatherTrends360 agro-climatic dashboard screenshot

Short-term forecasts (0–14 days) are updated daily, while long-range projections are updated weekly. The tool is more oriented toward crop planning and strategic decisions rather than operational weather management. Location selection is via city search, map selection or geolocation. Global coverage includes ACP regions. Subscription tiers vary widely. Enterprise plans start at US$400 per year and allow forecasts for up to three different locations.[20] Fees may decrease significantly when negotiated for larger user networks or cooperatives.

[20] The product is based on the number of locations and not the size of each field.

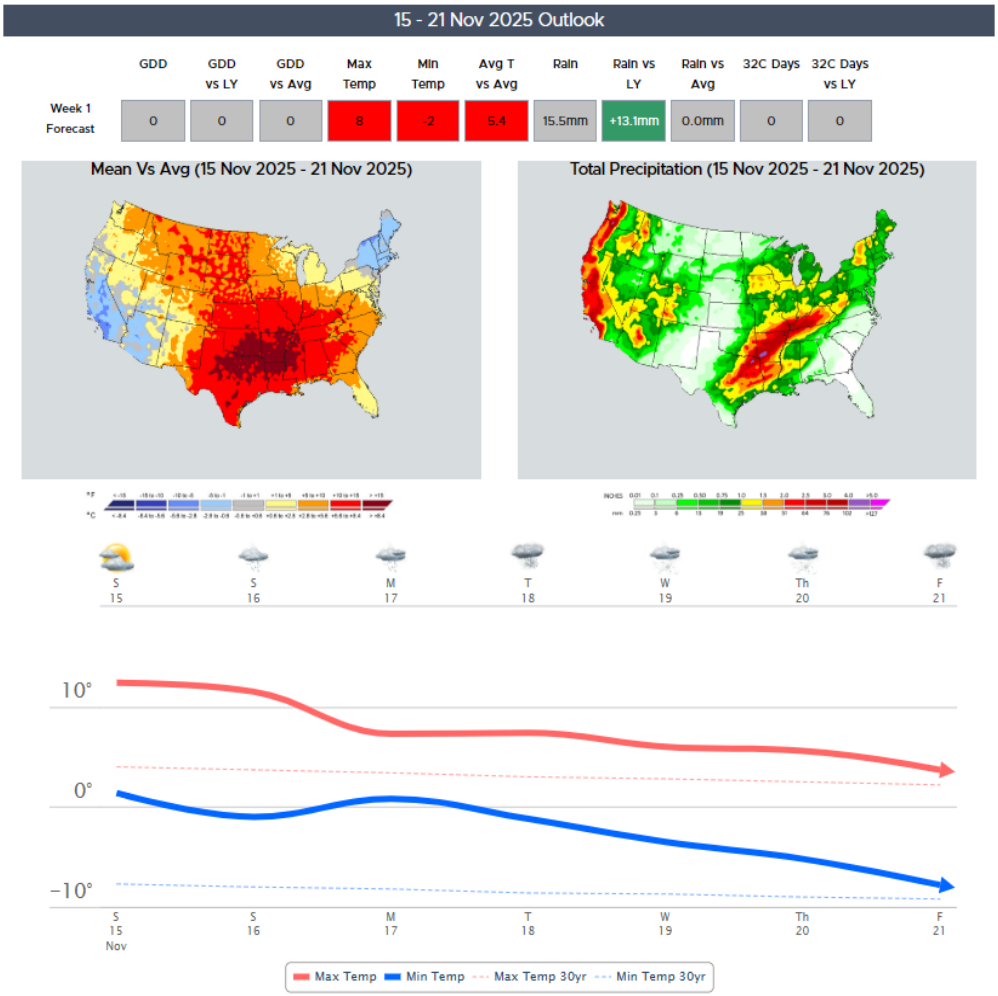

Figure 17. WeatherTrends360 long-range temperature monitoring screenshot

General observations

The most appropriate agribusiness solutions for ACP contexts balance global coverage, reasonable cost and actionable agronomic intelligence. Among them, Meteoblue Meteogram AGRO solutions, Sencrop, EOSDA Crop Monitoring and WeatherTrends360 provide the best compromise between precision, flexibility, usability and affordability for cooperatives or commercial farms operating in resource-constrained environments.

Based on our analysis, some core criteria that agribusinesses should consider before investing in weather applications are the following.

- **Data sources and model transparency**: Reliable services rely on recognised meteorological datasets (e.g. ECMWF, GFS, ICON, ARPEGE) or multi-model approaches validated through ground-station feedback.

- **Integration potential**: Professional users should favour tools that can be integrated with farm management systems, irrigation planning modules and/or sensor networks (Internet of Things, IoT).
- **Forecast precision and granularity**: Models offering hyperlocal downscaling, when available, provide added value.
- **Coverage of agronomic variables**: In addition to rainfall and temperature, decision-relevant parameters include wind, evapotranspiration, soil moisture and disease-risk indicators.
- **Historical and predictive analytics**: Access to historical datasets and yield-related indicators is a major advantage that increases the usability of forecasts for strategic planning and risk assessment.
- **Service sustainability and support**: The ability to maintain continuous updates, technical support and data availability is key for long-term adoption.

Less accessible solutions

Several other tools analysed were not retained for recommendation because of cost, accessibility or technical focus. Enterprise solutions such as Tomorrow.io (enterprise version) and DTN are more oriented towards corporate agribusiness clients in developed markets, as they include upfront investments (both time and financial) during a design phase in which the applications and dashboards are tailored to the specific needs of the business. Similarly, API-only services such as Meteomatic and Climavision require programming and integration capacities that most ACP agribusinesses currently lack.

Project-based or donor-funded services (e.g. Weather Impact, Ignitia) provide valuable support for smallholder outreach through simple SMS or chat-based communication and are worth considering as interesting business-to-customer (B2C) or (business-to-business-to-customer) B2B2C intermediary alternatives. However, they generally lack the analytical depth or continuity expected by commercial farms.

Finally, regional and continental services (ICPAC, AGRHYMET, ACMAD, SADC CSC, Pacific Meteorological Desk & Partnership [PMDP]) produce high-level bulletins rather than operational, field-level forecasts. They remain relevant reference sources for macro-level climate monitoring but are not directly usable for farm management.

Limitations of the approach

While this assessment identified a small set of weather forecasting tools that best meet the needs of agribusinesses in ACP countries, several methodological and contextual limitations should be acknowledged. First, the weather-service market is extremely broad and constantly evolving, with hundreds of mobile applications, data providers and commercial platforms available worldwide. As

such, this review cannot claim to be comprehensive. The tools examined here represent a curated selection based on relevance, availability and expected suitability for ACP partner contexts.

In addition, the analysis is based primarily on publicly available information and vendor claims rather than on independent technical validation or long-term field testing. Furthermore, differences in data quality, coverage and usability across regions mean that actual performance may vary significantly depending on local conditions and infrastructure. The following points summarise the main constraints identified during this review.

- **Geographic validation gaps**: While these solutions claim ACP coverage to various degrees, the accuracy of regional models (especially over small islands and equatorial zones) has not been independently verified.
- **Connectivity and language barriers**: All selected tools rely on stable Internet connections and are mostly in English and other European languages.
- **Cost uncertainty**: Subscription prices can vary depending on variables such as acreage; maintaining affordability below €2,000 per year may sometimes require selecting low-to-mid-tier plans in some cases or be impossible in others.
- **Forecast horizon**: These products mostly offer short-term (0–14 days) forecasts. Only meteoblue AGRO and WeatherTrends360 complement these with limited seasonal or historical analytics.

Conclusion and final recommendations

Agriculture is one of the most weather-dependent sectors of the global economy. From selecting crops to planting to harvesting, every stage of crop production is influenced by weather conditions such as rainfall, temperature, humidity and wind. Favourable weather can lead to abundant yields, while adverse conditions – such as droughts, floods or heatwaves – can cause severe losses. As climate variability increases, farmers face growing uncertainty in managing their crops and livestock.

In this context, weather forecasting plays a crucial role in modern agriculture. Accurate and timely forecasts enable farmers to make informed decisions about when to sow, irrigate, apply fertilisers or pesticides, and harvest. By anticipating extreme weather events, farmers can protect their investments, reduce risks and enhance productivity. Ultimately, understanding and responding effectively to weather patterns is essential for ensuring food security, improving livelihoods and supporting resilient agricultural systems in an era of changing climate.

As presented in the “Weather products and actors” section, there are different types of weather products, from intraday forecasts to seasonal forecasts, and they all have their usefulness for specific activities. The research presented in this report shows that all the required weather products are available on the web, and most of them are free. However, they are not all easily accessible and

directly usable, particularly by farmers in the least developed countries that still face major barriers to effective use. The most significant are limited digital access, language constraints, and low trust or understanding of probabilistic forecasts, which often prevents farmers from translating data into actionable farming decisions.

Some of the products require specific skills to analyse and localise the information. For example, short-term forecasts are usually available through easy-to-use smartphone apps that use the onboard GPS to provide localised information, while long-range seasonal forecasts are less accessible and provided in the form of national/subnational-level bulletins that need to be analysed. Even short-term weather forecasts may be challenging for less educated and more vulnerable smallholder farmers to interpret and convert into practical guidance. These farmers typically require tailored, crop-specific activity advice generated from the forecast data. Our first recommendation is therefore to ensure that each actor is able to get information that is accessible and usable. Table 8 summarises our recommendation for training.

Table 8. Required training to improve the use of available weather products

Actors	Training	Expected output
National-level NGOs, agriculture extension services, farmers' associations	Training on the different weather products provided by major international meteorological agencies	Ability of the actors to generate easy-to-understand timely weather information for extension agents and lead farmer groups
Extension agents, lead farmer groups	Training on transforming weather information into actionable advice for farmers	Ability of the actors to provide specific agricultural advice to smallholder farmers based on expected weather
Farmers	Training on weather patterns, and probabilities to understand basic weather information	Ability to directly use weather information for farm-level decisions

A second key outcome of the study is the growing number of weather information services available through application programming interfaces (APIs). The use of APIs could be an interesting way to build a country-specific application that covers the entire production cycle and that is more accessible to farmers in terms of, for example, languages or channels (e.g. WhatsApp bot). This is an interesting opportunity that could be explored through hackathons or competitions and that could integrate and make available all the required types of weather forecasts.

Moreover, as mentioned in the "Weather products and services for smallholder farmers" section, the use of smartphones and apps remains a major barrier in least developed countries and for the most disadvantaged farmers. One way to address this issue could be to leverage radio stations which remain the primary information channel in rural areas, and to train stations to use existing applications to deliver localised weather information multiple times per day.

In contrast, for agribusinesses and cooperatives, the main barriers relate to the cost, integration and validation of digital weather tools. Many available platforms offer high-quality forecasts but remain priced and designed primarily for large corporate users or require complex technical integration (APIs, data pipelines) beyond the capacity of medium-sized farms. Strengthening partnerships between local service providers or local innovation/technology hubs, digital-agriculture platforms and local cooperatives could help close this gap, encouraging the emergence of affordable, locally calibrated professional solutions for ACP agribusinesses.

Another significant constraint identified across multiple tools is the uneven spatial coverage and model performance in the ACP regions. Forecast accuracy typically decreases in areas with sparse ground-station networks, particularly across small islands, mountainous terrain and tropical zones with high micro-climatic variability. Many global or regional models (e.g. GFS, ECMWF, ICON) rely heavily on satellite data and assimilation schemes developed for mid-latitude contexts, which can introduce biases in rainfall and convective storm predictions over equatorial areas. While new AI-enhanced and satellite-driven approaches are expected to reduce these gaps, ground validation and local calibration remain essential to ensure the forecasts' reliability and relevance for on-farm decisions. Strengthening local observation networks and promoting data-sharing between national meteorological services, private providers and farmer organisations would significantly improve the effective coverage and trustworthiness of these solutions in ACP countries.

Finally, it is critical to emphasise that the weather forecast domain is currently undergoing a major transition process with the emergence of AI technologies. Major AI companies, Google and Microsoft in particular, are massively investing in the domain and in the design of dedicated AI models that have the potential to significantly transform the quality and timeliness of weather forecasts worldwide. This research is currently ongoing, and new products are expected over the next few years. In this context, it is important to continue monitoring market developments and regularly reassess available solutions. Continuous observation of these new trends will be essential to identify emerging tools and partnerships that could open new opportunities for farmers and agribusiness in the ACP region, enabling them to finally benefit from the next generation of digital weather intelligence and improve resilience to climate variability.

Annex 1 Overview of existing weather products and services

The list of products analysed in the phase-1 is presented in the table below and available online at https://docs.google.com/spreadsheets/d/1liqukZwXcqlYG0AZBdvD9JHiKrLr_pPzAQhUdll2_8g/edit?gid=0#gid=0

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
Google GenCast & GraphCast model https://deepmind.google/discover/blog/graphcast-ai-model-for-faster-and-more-accurate-global-weather-forecasting/ https://deepmind.google/discover/blog/gencast-predicts-weather-and-the-risks-of-extreme-conditions-with-sota-accuracy/	AI model	Google AI models for weather prediction	AI	Global	NA	NA	AI model
MS Aurora https://www.microsoft.com/en-us/research/project/aurora-forecasting/faq/	AI model	10-day global weather forecasts at both 0.25 deg and 0.1 deg resolution	AI	Global	NA	NA	AI model
European Centre for Medium-Range Weather Forecasts (ECMWF) https://charts.ecmwf.int/	Global data source	ECMWF is a research institute and a 24/7 operational service, producing global numerical weather predictions. This model forecasts	Satellite + model	All regions	10/15-day forecasts	Free	Maps

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		global weather at a 9 km resolution					
NASA Prediction of Worldwide Energy Resources (POWER) https://power.larc.nasa.gov/	Global data source	NASA POWER is a free, globally available service that provides downloadable agro-meteorological and solar-energy datasets derived from NASA satellite and model-assimilated products. It is widely used in agriculture, climate services, irrigation scheduling, and modelling because it gives easy access to site-specific hourly, daily, monthly weather and climate variables, especially in data-sparse regions	Satellite + model	Earth	Hourly & daily with a latency of ~2–4 days	Free	Datasets
Copernicus Climate Data Store (CDS) – ERA5-Land https://cds.climate.copernicus.eu/datasets/reanalysis-era5-land?tab=overview	Global data source	ERA5-Land is a global, hourly, land-surface climate reanalysis dataset at ~9 km resolution from 1950 to near-real time	Satellite + model	Earth	Daily	Free	Datasets

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		It essentially fuses weather observations, satellite data and land-surface models into one consistent gridded dataset to reproduce "what the weather actually was" – even in places without local weather stations					
NOAA Climate Prediction Center (CPC) https://www.cpc.ncep.noaa.gov/products/international/	Global data source	CPC delivers real-time products and information that predict and describe climate variations on timescales from weeks to years thereby promoting effective management of climate risk and a climate resilient society	Satellite + model	Africa, south Pacific, Caribbean	Daily/weekly forecast	Free	Map (png) & bulletins
Climate Hazard Center https://chc.ucsb.edu/monitoring/early-estimates https://chc.ucsb.edu/monitoring	Global data source	A 19-year-old alliance of multidisciplinary scientists and food security analysts from the UC Santa Barbara Geography Department, Africa, and Latin America working alongside partners in the US Geological Survey (USGS), NASA, FEWS Net, NOAA and the	Satellite + station + model (CHIRPS3)	Africa, Central America & Caribbean Haiti	2nd, 7th, 12th, 17th, 22nd and 27th of each month – pentad (5–6 days) 1, 2, 6, 12, 18	Free	Map (png)

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		United States Department of Agriculture (USDA) Includes collaborations with organisations like The Regional Centre for Mapping of Resources for Development (RCMRD), AGRHYMET Regional Centre, ICPAC, SADC CSC and the World Food Programme (WFP)					
International Research Institute for Climate and Society (IRI) https://iri.columbia.edu/	Global data source	A science-based approach to enhance society's capability to understand, anticipate and manage the impacts of climate in order to improve human welfare and the environment, especially in developing countries	Satellite + models	All regions (dedicated map per continent/region)	Every month (15th) a forecast for the next 6 months is issued (experimental) sub-seasonal climate forecasts updated every Friday for the next 4 weeks	Free	Map + bulletin
Food and Agriculture Organization of the United Nations (FAO) WaPOR database https://www.fao.org/aquastat/en/geosp	Miscellaneous	As part of its Remote Sensing for Water Productivity programme, FAO developed and implemented the online WaPOR platform, which provides free access	Satellite + model	Africa and part of Middle East	Dekadal	Free	Datasets

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
atial-information/wapor		to satellite-based data for monitoring and reporting on agriculture water productivity over Africa and the Near East Supports national governments and other organisations to monitor and report on (agricultural) water productivity and to identify and mitigate water productivity gaps					
Trans-African Hydro-Meteorological Observatory (TAHMO) https://tahmo.org/	Miscellaneous	Has installed over 700 weather stations across 23 African countries, including Ghana, Kenya, Uganda, Nigeria, Mali, Senegal, South Africa, Cameroon, Chad, Democratic Republic of Congo These stations are primarily situated in schools, providing students with hands-on experience in data collection and fostering climate literacy	Weather station	Africa see "Description"	Data recorded every 5 minutes and transmitted hourly	Data access is free for national meteorological offices and researchers; pay-for for businesses (weather station US$200–500)	API available for businesses

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
Kenya Agricultural Observatory Platform (KAOP) https://www.kaop.co.ke/	Organisation – country	14 days rain/ temperature forecast per ward	based on tomorrow.io	Kenya	Daily updates	Free	Online website
IGAD Climate Prediction and Applications Centre (ICPAC) https://www.icpac.net/	Organisation – regional	A climate center accredited by the World Meteorological Organization that provides climate services to 11 East African countries	Satellite + model	East Africa	Weekly, monthly & seasonal forecast	Free	Maps
Agrhymet https://agrhymet.cilss.int/	Organisation – regional	West Africa regional met office with a focus on agriculture	Satellite + model	West Africa	Seasonal rainfall forecast (rain season)	Free	Bulletins
African Centre of Meteorological Applications for Development (ACMAD) https://acmad.org/index.php/about-acmad-2/	Organisation – regional	Continental centre that enables provision of weather/climate monitoring, forecasts and regional early warning on drought, tropical cyclones and other extreme weather/climate events	Satellite + model	Africa	2 weeks forecast	Free	Bulletin
Pacific Meteorological Desk & Partnership (PMDP) https://www.pacificmet.net/index.php/	Organisation – regional	A specialised subsidiary body of SPREP (Secretariat of the Pacific Regional Environment Programme), established at the Fourteenth Regional	Satellite + model	Pacific	Weekly climate bulletin	Free	Bulletin

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		Meteorological Services Directors meeting in Majuro, Republic of Marshall Island in August 2011 to facilitate and coordinate the scientific and technical programme and activities of the Regional Meteorological Services. The PMC replaces the Regional Meteorological Services Directors body and provides policy relevant advice to the SPREP Meeting on the needs and priorities of its member countries and territories in relation to meteorology (weather and climate) and related fields					
SADC Climate Services Centre (CSC) http://csc.sadc.int/en/about/sadc-climate-services-centre	Organisation – Regional	Provides operational, regional services for monitoring and predicting extremes in climate condition. The Centre develops and disseminates meteorological,	Satellite + models+ station	Southern Africa (SADC region)	Monthly forecast generated every 3 months + actual data	Free	Map + bulletin

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		environmental and hydro-meteorological products. Its products contribute to improved disaster risk management in the region, and help to ensure Member States are better prepared for weather and climate disasters, conservation and protection of natural resources.					
ENACTS https://iri.columbia.edu/resources/enacts/	Project	Led by the International Research Institute for Climate and Society, ENACTS is a multi-faceted initiative designed to bring climate knowledge into national decision making by improving availability, access to and use of climate information Its goal is to provide reliable and readily accessible climate data at high resolution to decision makers across Africa	Satellite + model	Bangladesh, Ethiopia, Ghana, Guyana, Kenya, Lesotho, Madagascar, Malawi, Mali, Rwanda, Senegal, Somalia, South Sudan, Tanzania, Uganda, Zambia	Daily & weekly monthly seasonal	Free	Datasets and maps

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		It delivers robust climate data, targeted information products and training that is relevant to user needs, enabling them to apply climate information to decision making with confidence It integrates sparse station data with satellite products to produce high-resolution climate info; used to power national advisory systems					
Sencrop https://sencrop.com/	Service – integrated	Makes agri-advisory services including weather forecasts based on model plus local deployment of weather stations (six types of weather stations depending on the type of crops and required variables)	Weather station + satellite + AI	concentrated mostly in Europe but expanding internationally	The weather data is recorded in real time and transmitted to the application every 15 to 20 minutes.	Need to contact to get a quote	Integrated app
Farmonauts https://farmonaut.com/	Service – integrated	Global integrated farm management that includes weather forecast		All regions	Daily updates	Check online for pricing: https://sat.farmonaut.com/pricing.html4%20plans%20from%204.99/mo	Web + mobile platform

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
						4 plans from 4.99/month	
Agricolus https://www.agricolus.com/en/technologies/forecast-models/	Service – integrated	Weather forecasts based on the deployment of local weather stations and dedicated to specific crops (olive, citrus, tobacco, corn, vineyard; tomato, winter cereal)	Weather station + satellite + ai	Global	Up to 7 days, updated every hour: temperature, humidity, wind speed, rainfall	Different plans from free solutions for specific crops ranging from €400per year to €1,200 per year	Web + mobile platform
Australian Farm Safety Software Tool (airagri) https://www.airagri.com.au/farm-weather/	Service – integrated	Weather forecast based on satellite + model + AI + local stations	Weather station + satellite + AI + model	Australia and Pacific islands	Realtime	Aus$39.95/property	App
Famine Early Warning Systems Network (FEWS Net) https://fews.net/data/agroclimatology-data	Service – weather	Provider of early warning and analysis on acute food insecurity around the world A full set of tools for agroclimatology, particularly on rainfall	Satellite + models	Most of Africa, Central America and Haiti	Pentad forecast for rainfall (EWX tool), monthly report	Free	Map (png) & bulletin & GIS
Global Access Platform https://tngap.sta.do.kartoza.com/	Service – weather	A scalable AgroMet intelligence hub created by tomorrownow.org	Based on tomorrow.io	Uganda, Kenya, Burundi, Rwanda, Nigeria, Tanzania, Malawi, Zambia	Short term (0–2 weeks) and seasonal (2–52 weeks) include advisory service	TBD	API data

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
OpenWeather https://openweathermap.org/	Service – weather	A global weather data and forecasting service provider It offers APIs and platforms that deliver real-time, historical and forecast weather data for any location worldwide, including Africa	Satellite + models	All regions (TBC)	Minute forecast: Next hour Hourly forecast: Next 48 hours Daily forecast: Next 8 days	First 1,000 API calls per day are free Each additional call costs €0.0014 Weather forecasts starting from US$250/month	API data
Xweather https://www.xweather.com/	Service – weather	A commercial weather and environmental data platform, hyperlocal, API-first weather service for businesses and developers	Satellite + models	All regions (TBC)	Hourly and daily forecasts (short to medium range, up to 16 days)	Need to contact to get a quote	API data
Weatherbit Ag-Weather API https://www.weatherbit.io/api/agweather-api	Service – weather	Derived data specific to the agriculture industry This API utilises the state-of-the-art GLDAS (Global Land Data Assimilation System), and ERA5 reanalyses to provide global coverage at a spatial resolution of 0.25°	Satellite + models	All regions (TBC)	Hourly and daily data going back 10 years 8-day (daily) forecasts	4 plans available starting with a free tier	API data
Frogcast https://www.frogcast.com/en/	Service – weather	AI-enhanced global weather forecasting API, particularly tailored to support agriculture and business decision-making	Satellite + models	All regions	Data refresh every 1 hour	7 plans available starting with a free plan	API data

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
Weather API https://www.weatherapi.com/	Service – weather	Provides a comprehensive live weather API with global coverage: Real-time weather data 14-day weather forecast Historical weather data Weather alerts Air quality data Astronomy information	Satellite + models	All regions	Near real time	Prices online, start free: https://www.weatherapi.com/pricing.aspx free for 1M call/month with only 3 days forecast	API data
AccuWeather API https://developer.accuweather.com/	Service – weather	Known for its accurate forecasts and offers a comprehensive API suite: Current conditions Daily and hourly forecasts Indices (UV Index, air quality, etc.) Severe weather alerts Historical weather data	Satellite + models	All regions	Near real time	Packages start at free trial, then US$2/month up to US$500/month	API data
weathertrends360 https://www.weathertrends360.com/	Service – weather	Offers year-ahead weather forecasting models	Satellite + models	All regions (TBC)	Daily updates	US$399/year for 3 locations	Reports
meteoblue https://content.meteoblue.com/en/business-	Service – weather	The meteoblue Weather API provides access to the world's largest	Satellite + models	All regions	Daily, 7-day, 10-day forecasts	Free access up to 5,000 calls/month	API data

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
solutions/weather-apis		weather database, allowing for quick and easy retrieval of weather and environmental data in various output formats and as ready-to-use visualisations					
EOS Data Analytics https://eos.com/	Service – weather	Provides satellite data analytics, with a deep focus on agriculture and forestry	Satellite + models	All regions (TBC)	14-day hourly forecast	No information provided	Web platform; mobile apps; APIs
Tomorrow.io https://www.tomorrow.io/ https://tomorrownow.org/	Service – weather	Weather intelligence platforms include agriculture as a target	Satellite + models	All regions (TBC)	Daily, hourly weather forecast	Pay-for service with a Corporate Social Responsibility (CSR) arm and a free version	API data, satellite data
The Weather Company https://www.weathercompany.com/weather-data-apis/	Service – weather	Weather intelligence platforms include agriculture as a target	Satellite + models	All regions (TBC)	Continuous 15-minute forecast updates for the first 6 hours and hourly for days 1–15	Pay-for service	API data
DTN https://www.dtn.com/ https://www.dtn.com/agriculture/agribusiness/clearag/	Service – weather	Different APIs, including a weather API to get forecast	Satellite + models + sensors	All regions (TBC)	Daily, hourly weather forecast	Pay-for service	API data
Climavision https://climavision.com/agriculture/	Service – weather	Weather intelligence platforms include agriculture as a target	Satellite + models	All regions (TBC)	Daily, hourly weather forecast	Pay-for service	API data
Meteomatics	Service – weather	Weather intelligence platforms include	Satellite+ models	All regions (TBC)	Near Realtime update	Pay-for service	API data

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
https://www.meteomatics.com/en/agriculture-industry/		agriculture as a target					
Visual Crossing https://www.visualcrossing.com/agriculture-weather-data/	Service – weather	Weather intelligence platforms include agriculture as a target	Satellite + models	All regions (TBC)	15-day forecast	Pay-for service US$35/month or US$0.0001/record	API data
Weather Impact https://www.weatherimpact.com/services/agro-meteorological-forecasts/	Service end-to-end	Active in 19 countries in Africa, sends SMS messages to farmers. WI farm management service translates localised weather information into tailored messages for agricultural planning. The service supports farmers and other stakeholders to make the right decisions for their farm management. The advisory services inform farmers and other stakeholders in the agri-value chain about: The suitability of the weather for specific activities, e.g. planting, fertilising, or spraying; The favourability of the weather for the	Satellite + models	Mostly Africa and a couple of Asian countries	3-day forecast updated every Tuesday	Pay-for service	SMS messages

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		development of diseases; The number of days that temperatures will approach detrimental highs or lows; Current and potential drought conditions, based on the Standardized Precipitation Index (SPI) and forecast evapotranspiration; The likelihood that irrigation will be needed. Weather forecast use ECMWF model Also offers an API					
ignitia **https://www.ignitia.info/**	Service – weather and integrated	Real-time extreme weather alerts for early warning systems, without the need for ground sensors Weather and climate intelligence for early warning systems and smart cities, digital farming advisory, and climate risk scores for insurance Advanced satellite data and machine	Satellite + models	East and West Africa, Brazil	Up-to-the-minute updates – 48h weather forecast	No information provided	Different options: SMS, API data, app including advisory services

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
		learning, 1–9 km resolution					
Windy windy.com	Aggregator/ Platform	Visualises ECMWF, GFS, ICON & more with layers including wind, rain, temperature, pressure		Global		Free (Pro version available)	Preview not available
Ventusky ventusky.com	Visualisation	Visual weather model outputs (ICON, GFS, etc.) with intuitive interface		Global		Free	Preview not available
PlantVillage Nuru plantvillage.psu.edu	Service – integrated	Weather + pest alerts for African farmers		Africa		Free	Preview not available
TAMSAT tamsat.org.uk	Drought warning	Rainfall estimates for Africa, including alert systems				Free	Preview not available
WeatherSafe https://www.weathersafe.co.uk/	Platform	Cocoa/coffee climate advisories		Pilot use in Uganda, Tanzania		Pilot use in Uganda, Tanzania	Preview not available
MetNet-3 (Google DeepMind) https://research.google/blog/metnet-3-a-state-of-the-art-neural-weather-model-available-in-google-products/	AI model	Deep learning model with 1–2 h nowcasting				Research only	AI model
ICON (Deutscher Wetterdienst) https://www.dwd.de/EN/Home/homenode.html	AI model	Open model from Germany, good tropical performance				Free	AI model

Solution name & URL	Type	Description	Technologies	Geographic coverage	Update frequency	Cost	Required skills and infrastructure for setup and operation
Google Weather https://support.google.com/websearch/answer/13692898?hl=fr&sjid=3514359767213287293-EU	Android widget	Provides rain, temperature, air quality forecast				No information provided	None
La météo agricole https://www.lameteoagricole.net/application-meteo.php	Android application and web application	Provides rain temperature wind up to days forecast and includes intraday rainfall		Worldwide	Daily	2-day forecast is free, 10-day forecast on subscription (€40/year)	None

Annex 2. Detailed presentation of selected weather products

The list of products analysed in the phase-2 is presented in the tables below and is available as a single table online at https://docs.google.com/spreadsheets/d/1jcmMl3hzm33T-2-a2CrbM79dGAYD3Hc-5UvoOic89gw/edit?gid=0#gid=0

Short description and links

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
Kenya Agricultural Observatory Platform (KAOP)	Weather forecast information by Kenya Meteorological Department based on either their own model, the Global Forecasting System (GFS) or the mix of the two	Smallholder famers (SHF)	Website	https://www.kaop.co.ke/	NA
ICPAC	A climate centre accredited by the World Meteorological Organization that provides climate services to 11 East African countries. products include weekly, monthly and seasonal forecast (3 months)	SHF	Website + mail	https://www.icpac.net/weekly-forecast/ https://www.icpac.net/monthly-forecast/ https://www.icpac.net/seasonal-forecast/	NA
Agrhymet	Agrhymet is a regional centre that publishes well-recognised rainy season forecasts and debriefs. The bulletin (AKA PRESASS for Prévisions Saisonnières des caractéristiques Agro-hydro-climatiques de la saison des pluies) is published in French and English in April for the May–September season (and the debrief usually around the end of September in French only).	SHF	Website	https://agrhymet.cilss.int/ Example of 2025 bulletin in French https://agrhymet.cilss.int/wp-content/uploads/2025/05/COMMUNIQUE-FINAL_PRESASS_Bamako_2025_VF.pdf.pdf Example of 2025 bulletin in English https://agrhymet.cilss.int/wp-content/uploads/2025/05/C	NA

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
	Then a debrief of each month is published in French before the 15th of the following month			OMMUNIQUE-FINAL_PRESASS_Bamako_2025_EN.pdf Example of monthly report: https://agrhymet.cilss.int/wp-content/uploads/2025/08/bulletin-mensuel_Juillet25.pdf	
African Centre of Meteorological Applications for Development (ACMAD)	Produces different types of bulletins; the most relevant for this study is the 13-day forecast published every 10 days. They also publish a long-range forecast: every month for 3 month forecast	SHF	Website	https://acmad.org/index.php/bulletins/	NA
Pacific Meteorological Desk & Partnership	Monthly climate bulletin that delivers climate and ocean monitoring and prediction data relevant to the tropical south-west Pacific, including diagnostics of El Niño Southern Oscillation, the Madden–Julian Oscillation, ocean temperature, cloud and rainfall patterns; and tropical cyclone information and seasonal outlooks	SHF	Web	https://www.pacificmet.net/products-and-services/climate-bulletin	NA
SADC Climate Services Centre	Monthly and seasonal forecast	SHF	Web	http://csc.sadc.int/bulletins	NA
Sencrop	Farmers' network of local weather stations + app for hyperlocal data and forecasts; integrates with DSS (e.g. disease models)	Agribusiness	Mobile/web app + hardware (optional)	https://sencrop.com	Android: https://play.google.com/store/apps/details?id=com.sencrop.app iOS: https://apps.apple.com/es/app/sencrop-local-weather-app/id1447941336

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
Farmonauts	Different services and platforms serving satellite-driven farm monitoring platform with weather and advisory features; APIs and mobile apps	Agribusiness	Web & mobile apps; WhatsApp integration; personalised AI advisor; APIs	https://farmonaut.com/	Android: https://play.google.com/store/apps/details?id=com.farmonaut.android iOS: https://apps.apple.com/us/app/farmonaut/id1489095847
Agricolus	Precision farming platform (DSS) and app with weather forecasts, models, satellite imagery & IoT integration	Agribusiness	Web app; mobile app; APIs	https://www.agricolus.com/en/solutions/compare-the-solutions/	Android: https://play.google.com/store/apps/details?id=it.agricolus.agricolusfarmernew iOS: https://apps.apple.com/es/app/agricolus-precisione-in-campo/id6447698456
FEWS Net	Early warning system providing agroclimatology data, rainfall estimates and climate monitoring for food security analysis. It provides a very large set of products from bulletins to maps from various agencies. For the purpose of this deep dive we focused on bulletin, other products would require training. There are two types of bulletin: Seasonal Forecast Monthly Briefings for seven focus regions: East Africa, Yemen, West Africa, Southern Africa, Latin America and the Caribbean, the Middle East and Central Asia, and Ukraine	SHF	Web	https://fews.net/topics/agroclimatology	NA

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
	Seasonal Monitor that updates rainfall totals, impacts on production, and the short-term forecast. It is produced every 20 days during the production season				
weathertrends360	Year-ahead statistical forecasts + short-term FarmCast for agriculture, with alerts and reports	Agribusiness	Web dashboard; mobile app; email reports; API/feeds	https://www.weathertrends360.com/Agriculture-Weather-Analytics	Android (wt360 Lite): https://play.google.com/store/apps/details?id=com.wxtrends.wt360lite iOS: https://apps.apple.com/us/app/wt360-lite/id526771531
Meteoblue	High-resolution weather forecasts and advanced agriculture tools & solutions (meteogram AGRO, sowing windows, trafficability), mobile apps and APIs.	SHF	Web; mobile app (Android/iOS); APIs	https://www.meteoblue.com/ https://content.meteoblue.com/en/business-solutions/weather-apis	https://content.meteoblue.com/en/private-customers/weather-apps
EOS Data Analytics	EOSDA Crop Monitoring with 14-day weather forecasts, historical weather, soil moisture & agronomic analytics	Agribusiness	Web platform; mobile apps; APIs	https://eos.com/products/crop-monitoring/	Android: https://play.google.com/store/apps/details?id=com.eos.scouting iOS: https://apps.apple.com/us/app/crop-monitoring/id1474361532
Tomorrow io	Weather intelligence platform and API with 30+ parameters and a wide range of products, high-res precipitation and risk layers; agriculture solution	SHF	Web platform; mobile apps; APIs	https://www.tomorrow.io/	https://www.tomorrow.io/consumer-app/
DTN	Agriculture weather decisioning tools (DTN Ag Weather Tools app) & enterprise dashboards;	Agribusiness	Web platform; mobile apps; APIs	https://www.dtn.com/ https://www.dtn.com/agriculture/agribusiness/clearag/	Android: https://play.google.com/store/apps/details?id=com.dtn.agweather

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
	farm-level forecasts and alerts				iOS: https://apps.apple.com/us/app/dtn-ag-weather-tools/id445062163
Climavision	Radar as a service for low-level coverage areas + Enhanced Numerical Weather Prediction (NWP) models + AI enhanced forecasting	Agribusiness	APIs; enterprise dashboards	https://climavision.com/agriculture/ https://climavision.com/horizon-ai-point/ https://climavision.com/horizon-ai-global/ https://climavision.com/horizon-ai-hires/	NA
Meteomatics	Meteomatics Weather API: unified access to 1,800+ weather parameters, nowcasts to climate scenarios; agriculture-focused endpoints; MetX online platform	SHF (app); agribusiness	APIs; mobile app; weather calendar; web tools	https://www.meteomatics.com/en/agriculture-industry/	https://www.meteomatics.com/en/weather-app/
Weather Impact	Provider of tailored real-time and location-specific agri-weather services (including SMS forecasts) for smallholders, including Africa and Asia	SHF; agribusiness	API; SMS; chatbot; mobile app; web portal (on a project basis)	Information provided by the company and https://www.weatherimpact.com/services/agro-meteorological-forecasts/	https://www.weatherimpact.com/wi-app/
ignatia	Hyperlocal weather forecasts for smallholder farmers; PDF bulletins; hyperlocal SMS/WhatsApp services	SHF	SMS; WhatsApp; mobile app; web dashboard; APIs (enterprise)	https://www.ignitia.info/	NA
PlantVillage Nuru	AI app for crop disease/pest detection that also incorporates basic weather forecasts, soil & crop calendars to guide actions	SHF; agribusiness	Mobile app (Android/iOS)	https://plantvillage.psu.edu/panel/home?country_code=KE&page=1	NA
Google Weather / The Weather Channel	Google weather widget on Android	SHF	Web and widget on Android (native)	https://weather.com/	Widget

Solution name	Solution short description	Main targeted audience	Access method	URL of the reference web page	Mobile app/Online app URL (if applicable)
La météo agricole	Weather forecasts dedicated to agriculture activity. Available only in French	SHF	Web and app	https://www.lameteoagricole.net/application-meteo.php	https://play.google.com/store/apps/details?id=fr.lameteoagricole.meteoagricoleapp&hl=fr

Solution detailed information

Solution name	Model and/or data source for the forecasts	Forecast variables included	Type of forecast provided	Update frequency of the forecast	Geographic focus & accuracy (size of the area the forecast is relevant for), and easiness to scope the focus	Easiness to understand the data (low, medium, high)	Cost & payment options	Additional comments
Kenya Agricultural Observatory Platform	GFS model https://en.wikipedia.org/wiki/Global_Forecast_System	Rainfall (volume & probability), temperature (min/max), humidity, windspeed	14-day forecast	Daily update	Covers only Kenya and up to the ward level	High	Free	The geographic accuracy is supposed to be at a 9x9 km square (https://www.the-star.co.ke/news/2020-06-28-kalro-weather-app-monitors-rainfall-patterns-in-individual-farms) There are positive stories on the web (e.g. https://thinklandscape.globallandscapesforum.org/69695/in-kenya-theres-an-app-for-food-security/).
ICPAC	Uses the Weather Research and Forecasting Model	Rainfall (forecast, heavy rainfall forecast and	8-day forecast, monthly forecast, seasonal forecast	Weekly update on Tuesday for a weekly forecast, monthly	East Africa + Somalia	The web version is hard to exploit as it is maps and text. The	Free	Requires skills to both analyse map and identify a

Solution name	Model and/or data source for the forecasts	Forecast variables included	Type of forecast provided	Update frequency of the forecast	Geographic focus & accuracy (size of the area the forecast is relevant for), and easiness to scope the focus	Easiness to understand the data (low, medium, high)	Cost & payment options	Additional comments
	(WRF) to produce forecasts in a resolution of 10x10 km	anomalies), temperature (forecast & anomalies), flood, heat stress		update for seasonal and monthly update		mail bulletin is easy to understand (only the text part of the online version)		specific area. The mail bulletin is easy to understand but information at country level or at best big region of a country (e.g. western Ethiopia)
Agrhymet	Face-to-face meeting with the 17 national met offices from all West Africa	Seasonal forecasts include rainfall (forecast start and end season, volume, dry period and anomalies), hygrometry (river flow and height), sea temperature. Also include agri advice Monthly debrief includes other data such as locust invasion, and some agri-related data (availability of water, etc.)	Seasonal only	Generated in April for the May–September period and updated every month	West Africa	Low	Free	The seasonal forecast is useful for determining early agriculture activities and crop selection, but the overall bulletin is general and would need some training to be analysed properly plus adapted monthly
African Centre of Meteorological Applications for Development (ACMAD)	Uses various satellite and international met services, in particular NOAA	Rainfall forecast for the 10-day forecasts, temperature and anomalies for the 3-month forecast	10-day forecast and 3-month forecast	Every 10 days for the 10-day forecast, and every month for the 3-month forecast	Africa-wide	Medium	Free	While the 10-day and 3-month bulletins are relatively easy to understand, they are very high level, giving some general information at country level or at best large region of a country (e.g. North Morocco) which is

Solution name	Model and/or data source for the forecasts	Forecast variables included	Type of forecast provided	Update frequency of the forecast	Geographic focus & accuracy (size of the area the forecast is relevant for), and easiness to scope the focus	Easiness to understand the data (low, medium, high)	Cost & payment options	Additional comments
								largely insufficient to be directly usable
Pacific Meteorological Desk & Partnership	Uses various models: ACCESS-S model forecast (Australia), Copernicus multi-model outlook, APEC Climate Centre multi-model and NASA GMAO GEOS-5	Rainfall and temperature	Monthly bulletin published in the last week of each month	Monthly	Pacific Islands region	Low	Free	Bulletins are hard to exploit as they present the results of multiple models without providing hints on the most probable one. Moreover, the details are limited to country level and hard to exploit at an individual level
SADC Climate Services Centre	ECMWF SEAS5.1, NOAA/NCEP CFSv2, NASA GEOS S2S and UCAR CCSM v4, plus a multi-model (merging of the four models)	Rainfall, temperature	Monthly and seasonal	Monthly	Southern Africa (SADC region)	Low	Free	Bulletin does not seem to be continued (no update since May 2025). Other products are map-based that are hard to exploit and do not provide localised information.
Sencrop	Integrates seven external forecast models, own station network, data feeds Decision Support System	Rainfall, temperature, wind, humidity; forecast & radar in app	Up to 7 days (depending on model selection); nowcast, hourly and daily short-range forecasts (through station + sensor observations)	Real-time observations; forecasts updated multiple times each day	Global coverage; up to 5 km^2 (depending on model selection); 35,000+ stations EU network with field-level measurements; expanding globally	Medium – farmer-oriented app	Subscription plans (from €200 standard and €300 pro); personalised quotes; hardware purchase optional (from €500); 14-day free trial	
Farmonauts	Undisclosed underlying model (space agencies); combines satellite EO datasets +	Rainfall, temperature, wind; soil moisture; evapotranspiration;	Up to 7 days; short-range hourly and daily forecasts	Multiple updates per day	Global coverage (app/API)	Medium to high – farmer-oriented app	Paid APIs/enterprise plans (from US$50/year up to 5 ha to US$2250 for	

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	integrated weather APIs	plus EO-derived indices					up to 5,000 ha); freemium app	
agricolus	Integrates meteoblue forecast models; virtual weather station included (physical stations and sensors can be purchased or integrated)	Rainfall, temperature, wind, humidity; disease/pest risk indicators	Up to 7 days; short-range hourly and daily forecasts (with local stations) + model outputs	Multiple updates per day (every hour)	Global coverage; localised with sensor integration	Easy (app) to medium (DSS interface)	Free basic tier (10 ha max and without connection to weather stations); paid plans for advanced tools (€150–600/year)	
FEWS Net	Bulletins are produced using different data sources: US Geological Survey (USGS), NOAA, NASA and USDA	Rainfall estimates/ anomalies, temperature, flooding, drought indicators	Monthly forecast	Monthly update	East Africa (+ details on Somalia, South Sudan, Sudan), West Africa, Haiti, Southern Africa, Afghanistan	Low	Free	Complex to read bulletins, large geography covered and no localised data
weathertrend360	Proprietary year-ahead model + blended short-term forecasts	Temperature, precipitation, wind; soil moisture; evapotranspiration, humidity, pressure; alerts; commodity and weather analytics	Year-ahead trends + short-range 1–14-day forecasts	Daily and weekly updates; year-ahead outlooks; some metrics are also available on an hourly basis out to 8 days	Global (location-based); 32 million grid points (approx. 16x16 km)	Low/medium for email reports; medium/high for business dashboard	FarmCast listed at US$399/year; enterprise tiers and bulk options available	
Meteoblue	Multi-model blends including NEMS; station, radar and satellite assimilation	Rainfall, temperature, wind, humidity; evapotranspiration; soil metrics	Nowcast, hourly, daily up to 10 days; seasonal tools	Multiple updates per day (depending on the model)	Global; from 4 km (Central Europe) to 40 km (global) resolution	Medium to high – clear charts and tools in general with some more advanced options	Point + subscriptions (from €50/year); API demand-based or flat rate; free web/app tier	Wide range of business-oriented advanced solutions
EOS Data Analytics	Combines global meteo datasets from Meteomatic + satellite EO-derived indices; can also integrate data from	Wind speed, humidity, cloud coverage and expected precipitation, soil moisture,	Short-range hyperlocal forecast (up to 14 days) + historical climatology (since 2008)	Hourly forecast with multiple updates per day	Global gridded data at a 90x90 m resolution	Medium/high – dashboard	There are 2 main paid plans: Essential (USUS$600/year) and Professional (USUS$1.5/ha/year).	Full user guide at https://eos.com/user-guide/crop-monitoring/

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	ground meteorological stations	evapotranspiration, radiation; historical & forecast					The main difference is the absence of the zoning feature in the Essential plan + the Essential plan is paid for a fixed number of hectares (50 to 1,000 ha) while in the Professional plan, you can subscribe to the needed number of hectares (starting from 50 ha); gift functional trials available (for an area of up to 300 ha)	
Tomorrow.io	Proprietary blended modelling + radar/satellite; minute-by-minute nowcasts	Rainfall (including minute-by-minute), temperature, wind, humidity; ET0 (Evapotranspiration) (via models)	Nowcast, hourly (up to 120 h), daily (up to 14–15 days)	Continuous/near-real-time updates (for premium users)	Global	High – simple dashboards	Basic free online dashboard and API basic tier + paid plans (requires contacting sales)	Advanced Agri services also available at https://www.tomorrow.io/solutions/agriculture/
DTN	Blended NWP + radar/satellite; proprietary analytics	Temperature, precipitation, wind, humidity; agriculture commentary and alerts	Nowcast, hourly and daily; seasonal outlooks (enterprise)	Multiple updates per day; alerts in real time	Global	Medium – farmer-focused app & dashboards	Enterprise pricing; subscriptions can be tailored to the exact ClearAg models or data and the number of users that the organisation needs (contact sales)	
Climavision	Proprietary NWP high-res model + private radar network data assimilation	Precipitation, wind, temperature; severe weather nowcasts; 40+ parameters	Nowcast; short-range forecasts; daily update to 15 days	Near real-time updates; fresh forecast every 6 hours out to 10 days, hourly increments	Global up to 2x2 km, 0.67x0.67 km sub-domain	Low/medium – enterprise tools	Enterprise ad-hoc pricing; requires contacting sales	

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Meteomatics	Blends global/ regional NWP + stations, meteo drones, radar and satellite; downscaling and post-processing	Rainfall, temperature, wind, humidity; evapotranspiration; soil moisture (derived)	Nowcast, hourly and daily up to 46 days (depending on model – typically up to 15–16 days); historical since 1979	Multiple updates per day (depending on the model); temporal resolution 1–6 hours (depending on the model, 5-min steps for nowcasts)	Global; 25–15–10–3 km resolution (depending on the model); 1,000 models for the USA and EU (with 90 m downscale post-processed)	Low – business- & developer-centric	Paid API (free trial available); monthly licence fee based on usage scope and specific functionalities. Contact sales for personalised dashboard quote	
Weather Impact	Uses regional models and local calibration; ECMWF model combined with state-of-the-art satellite data, World Meteorological Organization (WMO) validated ground stations and crowd-sourced rain observations	Rainfall, temperature; alerts (extreme rainfall, strong winds); rainy season	Weekly and daily forecasts; Subseasonal-to-Seasonal (S2S) forecast (6 weeks and up to 5 months ahead)	Sub-daily, daily and weekly (project dependent)	Global with particular expertise in Africa & Asia (project regions); high spatial resolution (9x9 km)	High for end-users (SMS, chatbot, simple mobile app)	Project-based; donor/partner funded; requires contact and ad-hoc budget	Offers highly adapted weather services and other additional value-added services such as capacity building and consultancy
ignitia	Physics-informed AI models; high-resolution tropical forecasting	Rainfall onset/ probability, intensity; temperature; storm risk	Short-range hourly, daily and weekly; seasonal risk indicators	Unclear but seems to be on a daily basis for forecast and multiple updates a day for alerts	Global coverage (particularly adapted to the tropics); 1–9 km resolution	High – SMS/bulletin guidance	Farmer SMS subscriptions (local currency – typically 1–2% of farmer income); partnering with Mobile Network Operators (B2C) or partners along the agriculture supply chain (B2B2C); ad-hoc enterprise data services	More details at https://www.youtube.com/watch?v=MOvmBuXtb3A
PlantVillage Nuru	Unclear; integrates external weather	Rainfall & temperature (integrated), growing	Short-range weather context	App-refreshed (provider-dependent)	Africa focus; global applicability	High – farmer-facing app	Free app	

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	forecasts + agronomic datasets	degree days, advisories						
Google Weather/ The Weather Channel	Multiple models including AI model	Temperature, wind, humidity, pressure, UV, visibility, rain radar	12-hour forecast for 10 days (day and night forecast) hourly forecast for the next 24 hours	Hourly update	Town name (limited), geolocation of the phone; access other than by geolocation is difficult	Easy (graphical)	Free on Android, The Weather Channel has subscription on the web	The accuracy reports are for the USA, the accuracy in ACP countries should be validated Also offer an API
La météo agricole	TBC	Rainfall, humidity, solar, wind, rain radar In the pay-for version, UV index, solar radiation, spray advice, evapotranspiration, air quality, air pressure	Free version: 10-day forecast with the next 3 days having hourly detail, and the following 6 days only a daily average, hourly pressure forecast Pay for version: 15-day forecast, 7-day hourly forecast and 14-day forecast every 3 hours, then 15-min rain forecast for the next 3 hours	Hourly update	Entering a town name or geolocation (mobile)	High	Free version has lots of advertisements. €9.89 per year to have a free version without ads, €39.49 per year for the pay-for version. Payment by credit card or buy on Google Play	

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