INITIATIVE ON
Climate Resilience

AWARE Training Manual

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September 2024

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Suggested Citation

Alahacoon, N.; Amarnath, G. 2024. *AWARE training manual.* Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Initiative on Climate Resilience. 42p.

Cover photo: IWMI/ClimBeR -A photograph at AWARE training workshop in Zambia

Acknowledgments

This work was carried out with support from the CGIAR Research Initiative on Climate Resilience, ClimBeR. We thank all funders who supported this research by contributing to the CGIAR Trust Fund.

CGIAR Initiative on Climate Resilience

The CGIAR Research Initiative on Climate Resilience, also known as ClimBeR, aims to transform the climate adaptation capacity of food, land, and water systems and ultimately increase the resilience of smallholder production systems to better adapt to climate extremes. Its goal is to tackle vulnerability to climate change at its roots and support countries and local and indigenous communities in six low-and middle-income countries to better adapt and build equitable and sustainable futures.
Learn more about ClimBeR here: https://www.cgiar.org/initiative/climate-resilience/

Contents

1. Introduction

1.1. Purpose of the Manual:

AWARE is a software program that can help manage and analyze climate-related data. It is visualized in a platform as a user interface. The AWARE Platform Training Manual has been thoroughly produced to offer in-depth guidance on learning the details of the AWARE Platform. Throughout this manual, you will embark on a journey that explores the various functionalities and capabilities of the AWARE Platform. From data management to analytical insights, each section is tailored to provide a comprehensive understanding of leveraging the platform to its fullest potential.

By immersing yourself in the contents of this manual, you will acquire the proficiency needed to harness the power of the AWARE Platform in mitigating climate risks and fostering informed decision-making. Whether you are a novice seeking to familiarize yourself with the platform or a seasoned user aiming to enhance your expertise, this manual serves as your indispensable companion on the path to climate resilience and adaptation.

1.2. Overview of the AWARE Platform:

The AWARE Platform stands as an elevation of innovation, offering a multifaceted system particularly produced to seamlessly integrate a surfeit of modules aimed at bolstering comprehensive climate risk management. At its core lie several key components, each serving as a vital component in the proactive response and mitigation.

First and foremost, the Early Warning module stands as a sentinel, monitoring climatic indicators and swiftly alerting stakeholders to potential risks by defining the anticipatory alert. The Early Action module, jumps into action upon receiving these alerts, triggering a cascade of proactive measures designed to mitigate the impact of impending hazards before they rise into crises. Complementing these essential functions, the Early Finance module serves as a vital lifeline, ensuring that financial resources are readily available to fund these actions, thereby bolstering resilience and stimulating communities against the ravages of climate-related disasters.

Moreover, the Alert Dashboard provides a centralized system where forecast data streams converge, offering stakeholders a developing event and facilitating swift decision-making in response to growing threats. Beyond these core functionalities, the AWARE Platform boasts an array of supplementary features geared towards enhancing situational awareness and facilitating informed decision-making. Sectoral climate risk assessment tools provide invaluable insights into the vulnerabilities of various activities and sectors, enabling tailored strategies for resilience and adaptation. Emergency response mapping capabilities empower stakeholders to swiftly deploy resources to areas most in need, optimizing the efficiency of relief efforts in times of crisis.

Augmenting these capabilities are powerful analytical tools that sift through vast amount of data, distilling complex patterns and trends into actionable intelligence. By offering a centralized platform for data access, analysis, and visualization, the AWARE Platform empowers stakeholders to take proactive and anticipatory actions, effectively transforming the tide of climate hazards from an imminent uncertainty into a manageable challenge ripe for strategic intervention.

1.3. Intended Audience:

The AWARE Training Manual is carefully designed to cater to a broad audience engaged in climate risk management and response. It is produced to be accessible and informative, tailored to the specific needs of various professionals and stakeholders. Policymakers utilize the manual for formulating strategies and policies related to climate resilience and adaptation at different levels local, national, or international. Disaster Management Professionals rely on

accurate climate data to inform their actions in emergency response, disaster preparedness, and recovery efforts. Climate Analysts effectively utilize the manual for analysis and interpretation of climate data. Agricultural Planners utilize it for development and planning, optimizing crop management practices, and mitigating agricultural risks.

Other stakeholders, including researchers, environmentalists, community leaders, and NGOs, actively engage with the manual in addressing climate-related challenges and seeking practical solutions. By addressing this diverse audience, the AWARE Training Manual aims to equip stakeholders with the necessary knowledge and skills to leverage the platform's potential in their respective fields fully.

1.4. Structure of the Manual:

The manual is structured to guide users from basic setup and navigation to advanced features and troubleshooting, ensuring a comprehensive understanding of the AWARE Platform.

The technical setting of AWARE development: This section provides comprehensive technical details about the development of the AWARE platform, including information on cloud application infrastructure, software tools, programming languages, code development processes, and version control using GitHub.

2. Getting Started with AWARE

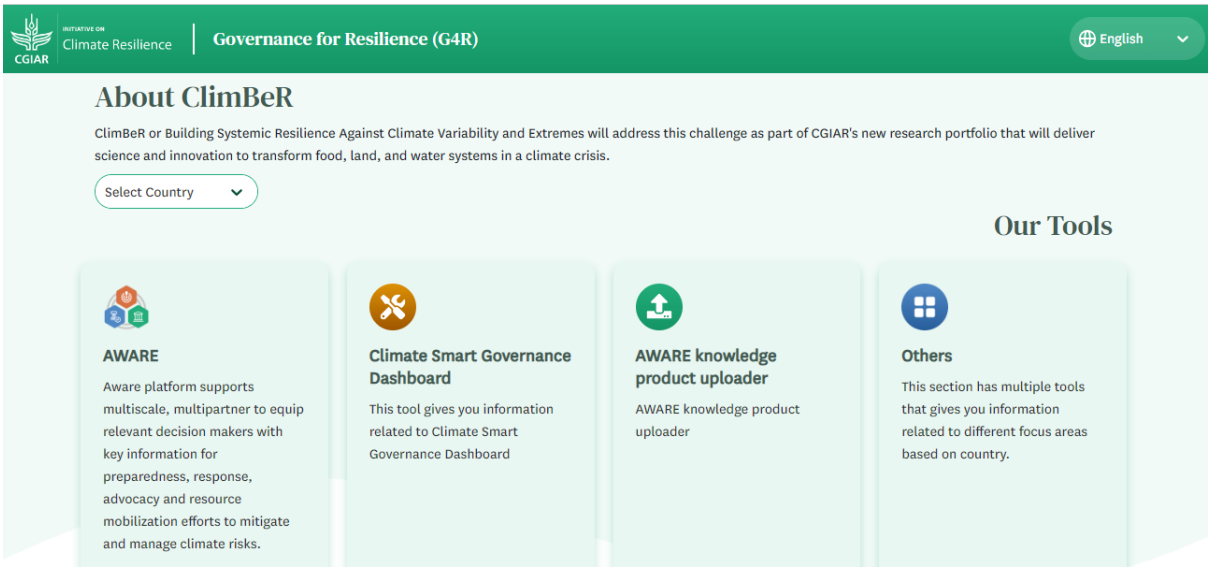
2.1. System Requirements:

Ensure your system meets the necessary requirements for optimal performance of the AWARE Platform. These include a modern web browser, a stable internet connection, and sufficient hardware specifications as outlined in the technical documentation.

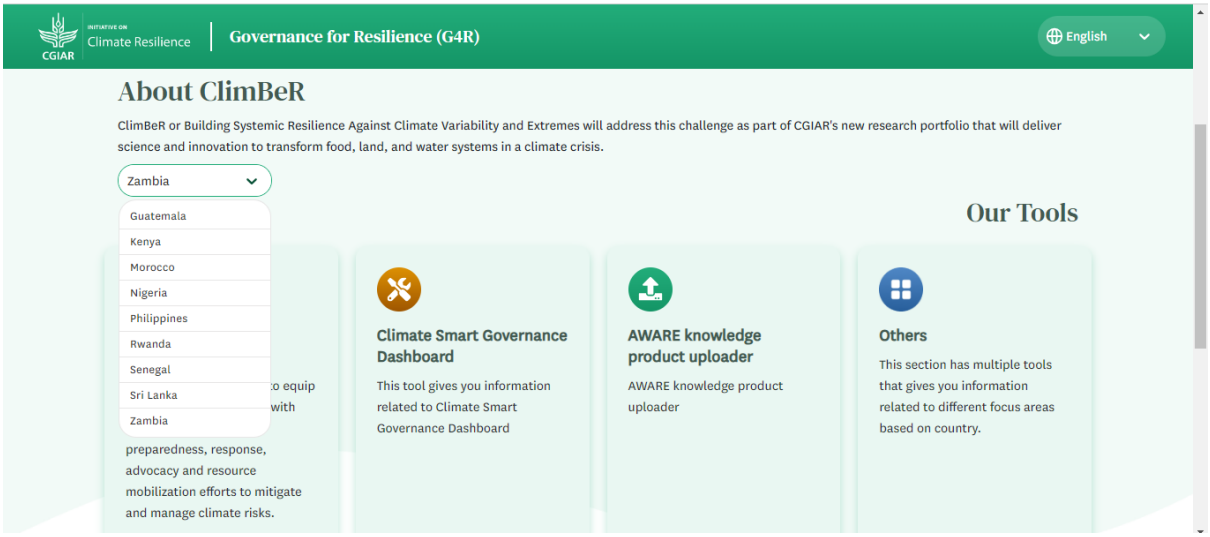
Landing page, Logging In, and access management:

2.2. AWARE Platform login page:

Please use the link to navigate to the AWARE platform, developed as part of the CGIAR Climate Resilience (ClimBeR) project. This link will direct you to the ClimBeR landing page, which also includes other tools of ClimBeR.



Please select the country the user wishes to navigate and click on AWARE.



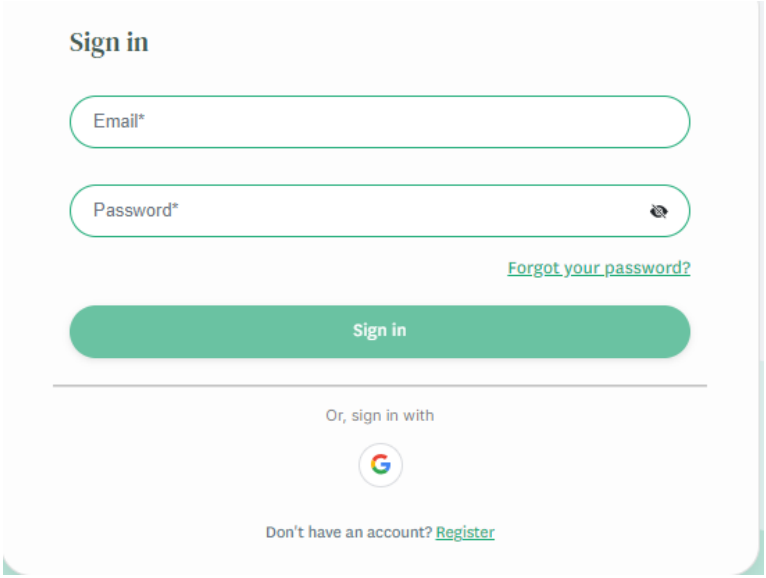
The user will then be directed to the AWARE landing page, which provides an overview of the AWARE concept, its submodules, the rationale behind AWARE, and the methodology flow, as shown below.

2.3. Add AWARE a landing page

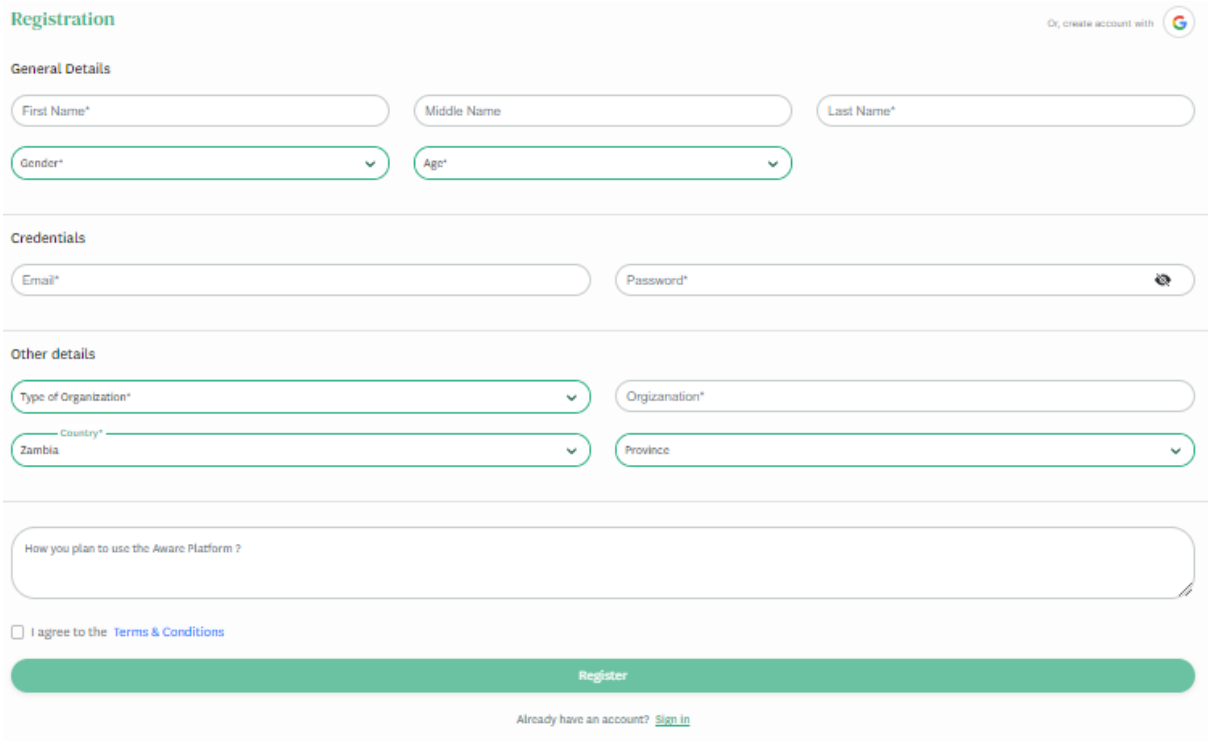
If this is the user's first time using the system, they must register for the system to visualize the module. Please complete the registration form as shown in the figures below. Upon registration, a verification email will be sent promptly to the registered email address. Once you receive the email and complete the verification, you can easily access the platform.

Steps to register:

a. Click on the "Register"



b. Fill the form with the details.



After registering in the system, users can log in using their unique credentials. Once logged in, they can navigate through all the available modules seamlessly. The system has a sophisticated access management feature, ensuring users have specific capabilities based on their roles and permissions. This means that different users will have varying access levels, allowing them to add, edit, or manage information as per their designated privileges. This hierarchical access control enhances security and ensures that information is handled efficiently and accurately within the system.

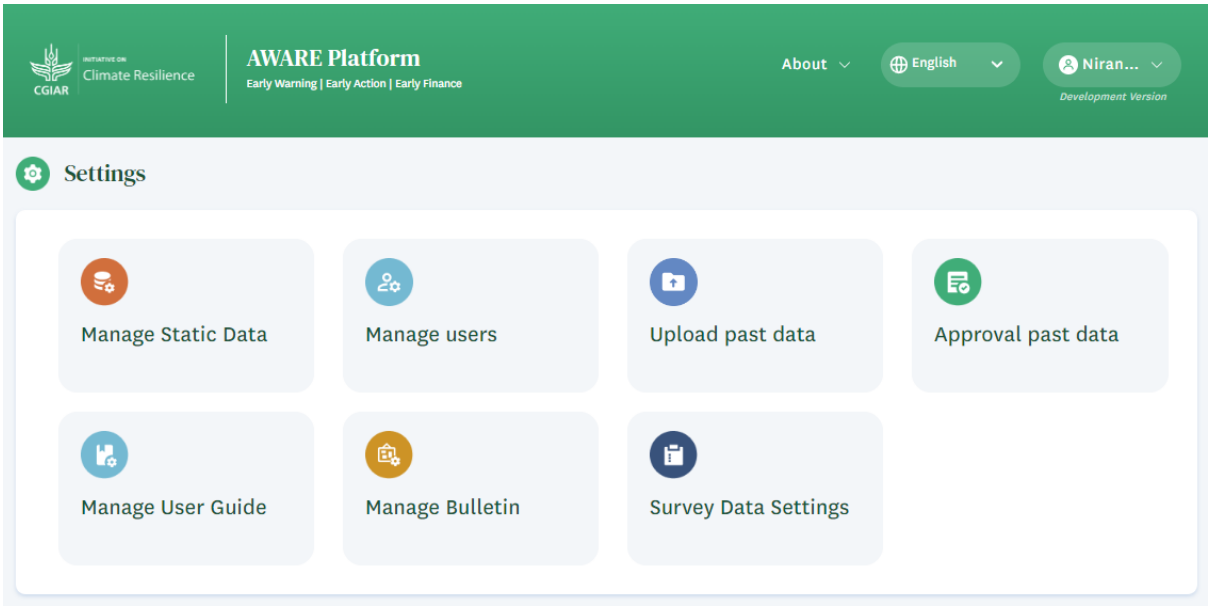
2.4. Backend data upload and access management

The AWARE platform offers a robust backend system designed for use by authorized users, as designated by the super admin. This backend system operates as follows:

- User Authorization: Only users with permission from the super admin can access the backend system, ensuring secure and controlled access.
- System Functionality: The backend system provides a comprehensive suite of tools and functionalities authorized users can utilize to manage and oversee various platform aspects.
- Operational Workflow: The system streamlines operations by allowing authorized users to perform critical tasks efficiently, such as data management, monitoring, and reporting.

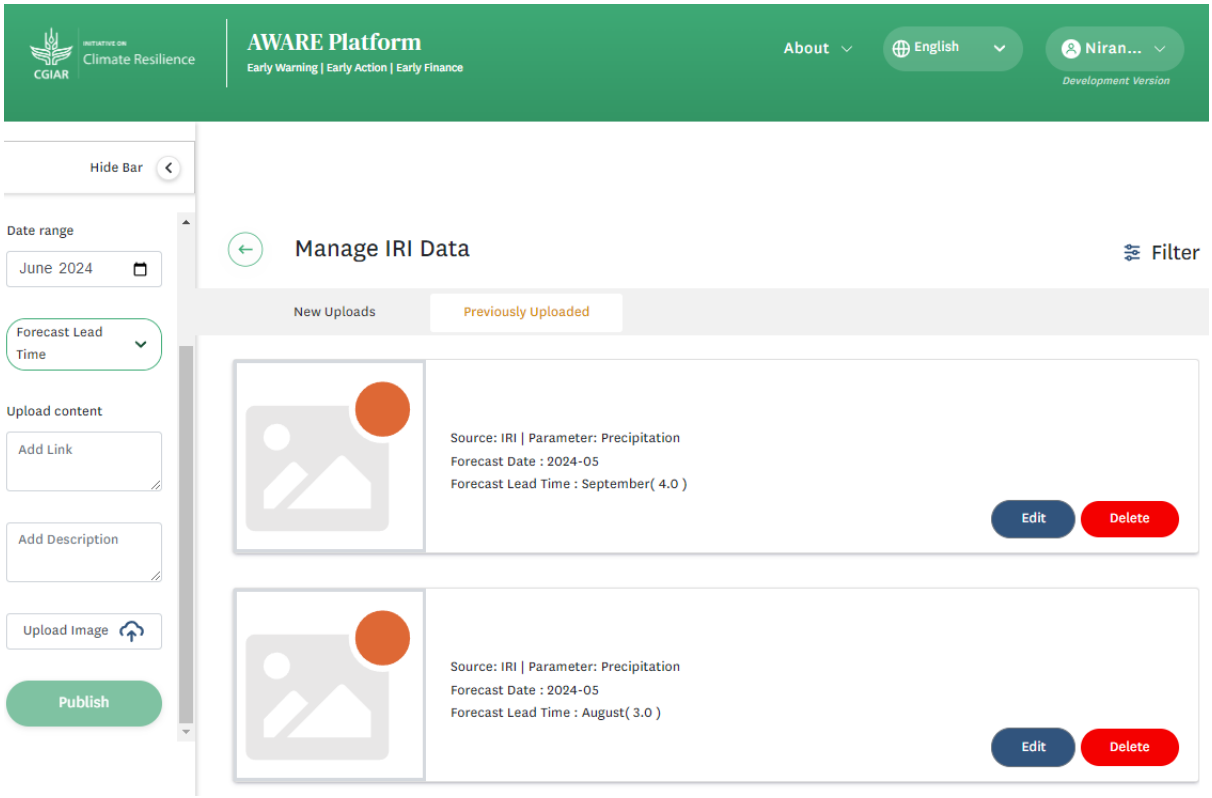
Please follow the login settings to access and visualize the backend panel, which is displayed below. This will allow user authorization, data upload, and different approval processes.

Once the user clicks on Settings, the panel will open as described below. It contains several cards for various functionalities, including Manage Static Data, Manage Users, Upload and Approval of Historical Data, Manage User Guide, Manage Bulletin and Survey Data Settings. These options allow users to efficiently handle different aspects of the platform's configuration and data management.



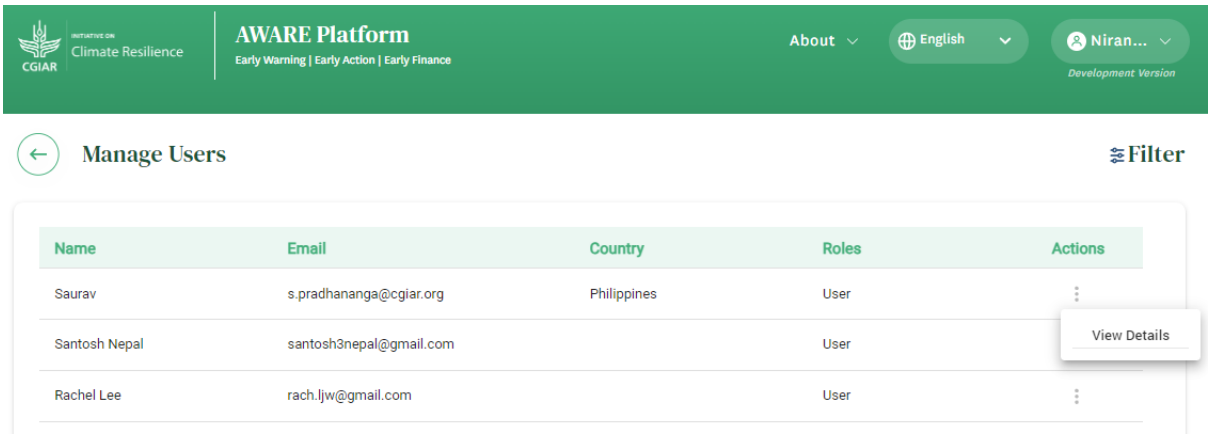
2.5. Manage static data

This feature allows users to upload third-party data into the system when such data is unavailable through an API. For example, the backend system is designed to facilitate the upload of IRI data. Users can provide the necessary parameters and dates by navigating to the physical location of the available data. Once all required fields are completed, users can click on "Publish." After publishing, the data will appear in the uploaded section and can be visualized on the frontend interface.

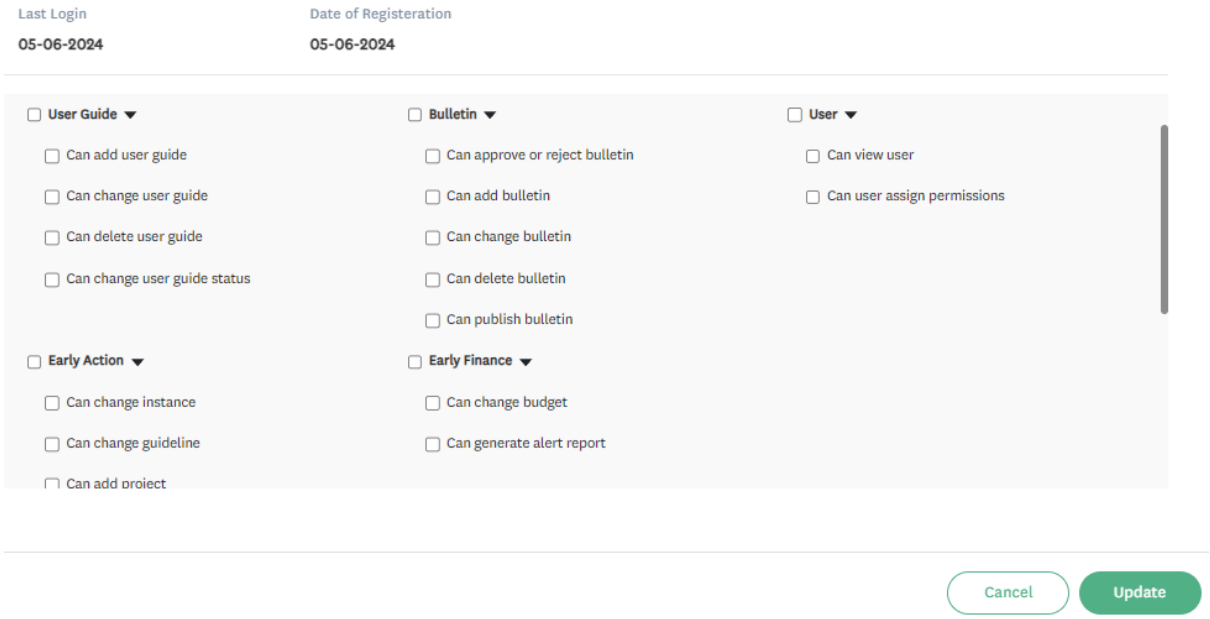


2.6. Manage user

In the "Manage User" section, the system administrator has the ability to visualize the list of registered users and assign them specific privileges to perform various activities.



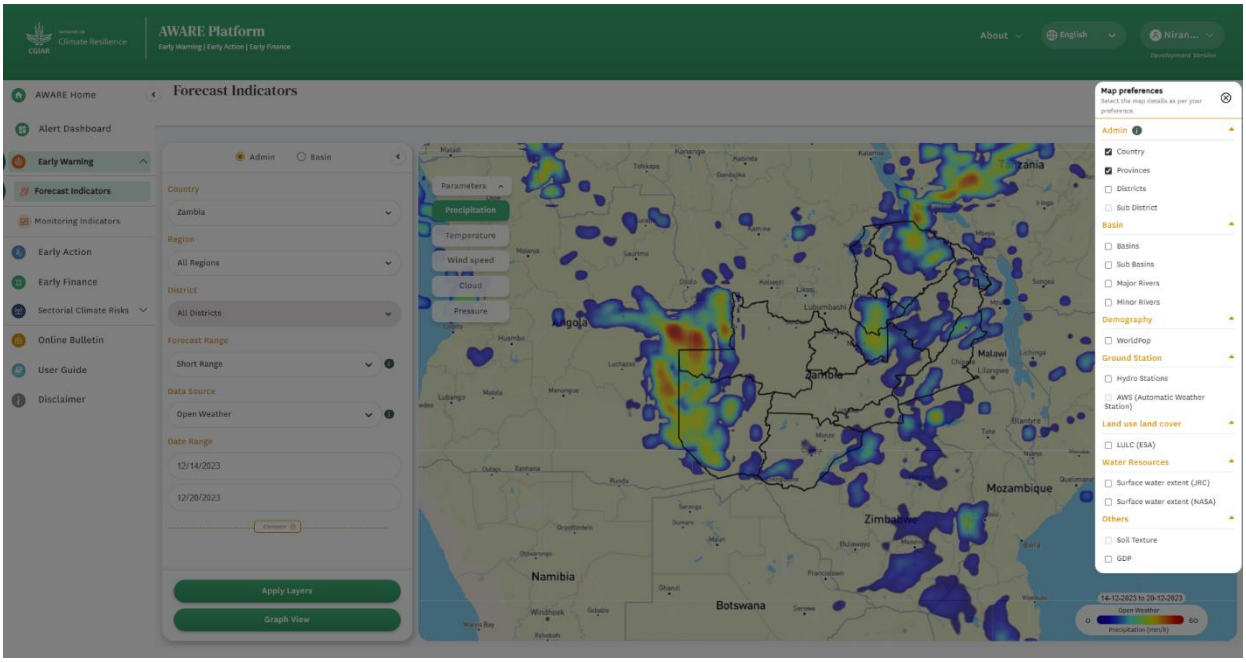
- When the system administrator clicks on "Manage User," the Manage User panel will open, displaying all registered users.
- The administrator can access the "View Details" option by clicking on the action button next to each user's name. This allows the administrator to assign different tasks and roles to each user, granting them the necessary permissions to carry out designated activities within the system.



- The administrator can customize the roles and responsibilities of each user, ensuring that they have the appropriate access levels and capabilities to perform their functions effectively.

2.7. Map Preferences

The AWARE platform offers a diverse array of base layers for users to employ, providing a broad spectrum for interactive data visualization. These base maps can be accessed through the Map Preferences tool within AWARE, organized into several categories, including Admin, Basin, Demography, Ground Station, Landuse, Land Cover, Water Resources, and others (refer to below figure). This categorization enhances the user experience, allowing for convenient selection and utilization of specific base layers tailored to their needs.



Moving forward, the subsequent sections elaborate on the components of the user guide, focusing on the Early Warning, Early Action, and Early Finance modules covering data sources and step by step application approach. These explanations provide a detailed breakdown of each module's features, ensuring a comprehensive understanding and effective utilization of the user guide within the essential components.

2.8. Early Warning

Forecast Indicators and Early Warning

The weather forecast is the prediction of what the atmosphere will be like in a particular place by using technology and scientific knowledge to make weather observations. In other words, it's a way of predicting things like cloud cover, rain, snow, wind speed, and temperature before they happen.

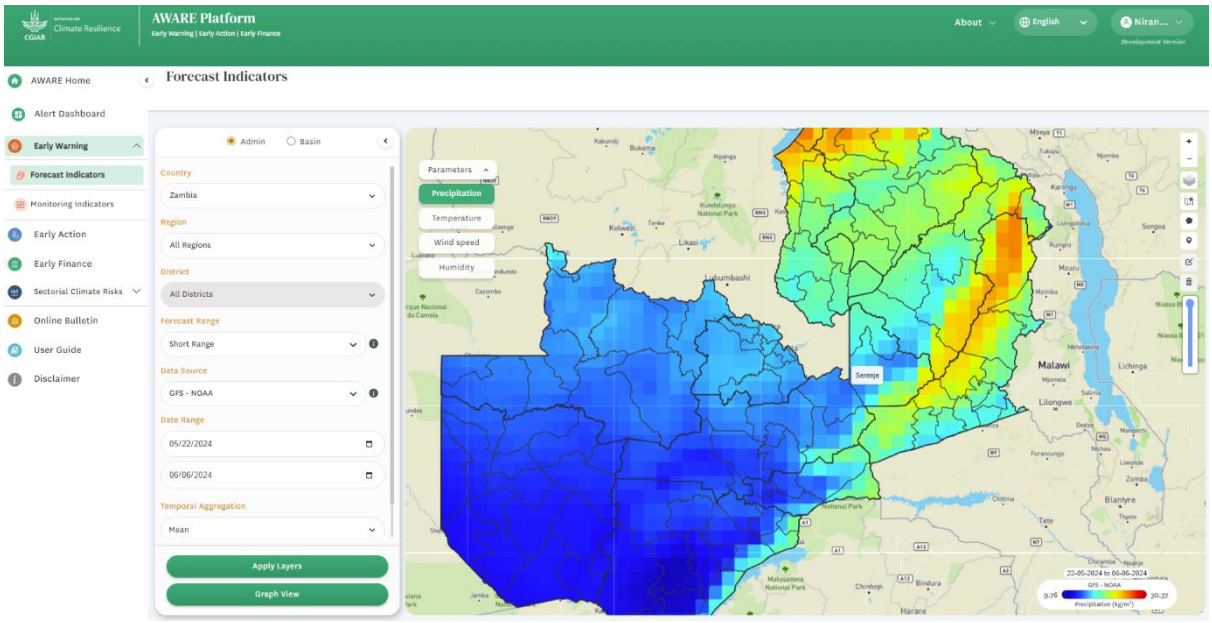
Forecast data is categorised into three groups based on the duration they cover: short, medium, and long-range forecasts. Each set is used to predict weather parameters over different periods, providing crucial information for effective climate risk management and planning. Short-range forecasts, typically provided by sources like OpenWeather and NOAA GFS offer detailed weather predictions for up to seven days to 15 days, including parameters such as temperature, precipitation, wind speed, and humidity.

Medium-range forecasts, such as those from the European Centre for Medium-Range Weather Forecasts (ECMWF), extend from 10 to 30 days, providing insights into weather patterns and potential severe weather events. Long-range forecasts, sourced from institutions like the International Research Institute for Climate and Society (IRI), offer climate predictions for periods from one month to four months ahead. These forecasts are essential for strategic planning and risk management, enabling stakeholders to anticipate and prepare for seasonal trends and climate variability. Each type of forecast data, with its specific time frame and resolution, provides critical information to enhance preparedness and mitigate the impacts of climate-related hazards by taking proactive measure.

The Early Warning System (EWS) in the AWARE Platform provides users with the tools to monitor and predict climate-related hazards across different administrative boundaries and time scales. This section will guide you through selecting geographic areas and forecast data ranges to use the EWS in AWARE platform effectively.

Steps to visualize forecast data:

a. Navigate to “Forecast Indicators” in the Early Warning module from the main menu on the AWARE Platform.
b. Choosing Geographic Areas (Country, Region/province, District) from drop-down
c. Selecting Forecast Ranges (short-range, medium-range, long-range) form drop-down
d. Select date source form drop-down.
e. Select date range from the Calander.
f. Click on “Apply Layers”
g. Click on Temperature, Wind speed and Humidity to visualize different parameters as given in the next figure.



Adjust the administrative units, forecast range, and data source to visualize additional parameters.

2.9. Open weather data visualization

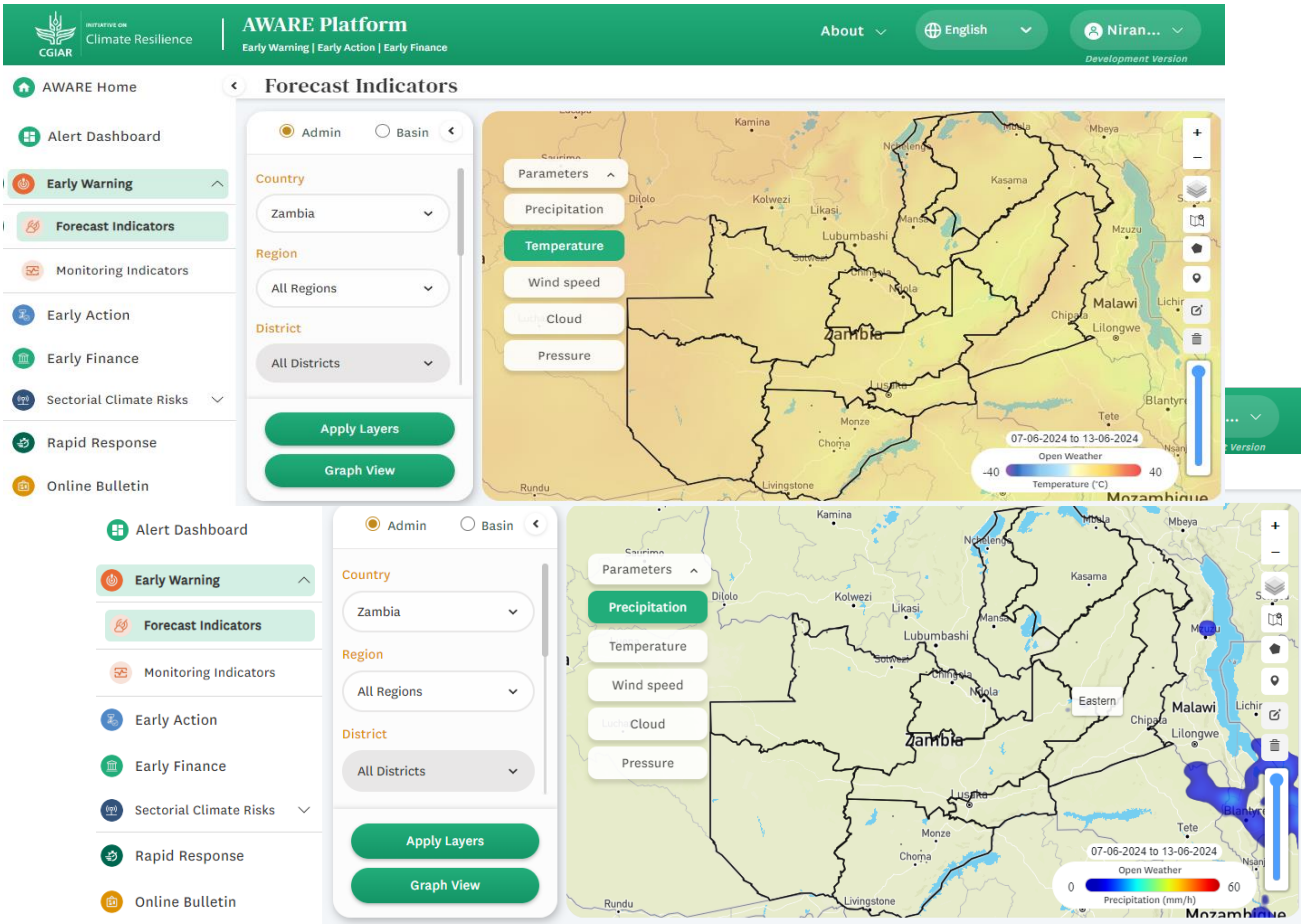
OpenWeather provides comprehensive meteorological data and APIs that cater to diverse needs, from everyday weather updates to specialized climate research. Their data offerings include current weather conditions, forecasts, historical weather data, and specialized information such as air quality, UV index, and pollen levels. Current weather data encompasses temperature, humidity, pressure, wind speed and direction, cloud cover, visibility, and descriptive weather conditions. Forecast data is available in hourly, 3-hourly, daily, and long-term formats, supporting planning for various timeframes.

OpenWeather's APIs are designed for easy integration into applications, websites, and services. The Current Weather API delivers real-time weather information for any location globally, while the Forecast API offers detailed weather predictions. The Historical Weather API provides access to past weather data, essential for trend analysis and research. The Weather Alerts API issues notifications about severe weather conditions, helping users prepare and respond promptly. Additionally, the Air Pollution API supplies data on various air pollutants, contributing to health and safety monitoring.

The data is aggregated from multiple sources, including weather stations, satellites, and radars, ensuring high accuracy and reliability. OpenWeather also provides interactive weather maps and customizable widgets for visualizing data on websites and applications.

Industries such as agriculture, transportation, energy, tourism, healthcare, and disaster management utilize OpenWeather's data and APIs to make informed decisions, optimize operations, and enhance safety. Comprehensive documentation and robust technical support facilitate seamless integration, making Open Weather a valuable resource for developers and businesses worldwide.

Users can switch the visualization by clicking on the parameters for temperature, wind speed, cloud cover, and pressure.



2.10. Parameter extraction:

The AWARE platform allows users to extract OpenWeather data by defining points or polygons based on their areas of interest. After specifying the point or polygon on the screen, users can click on the "Graph View" tab. The platform then presents the collected data in graphical form based on the selected parameters.

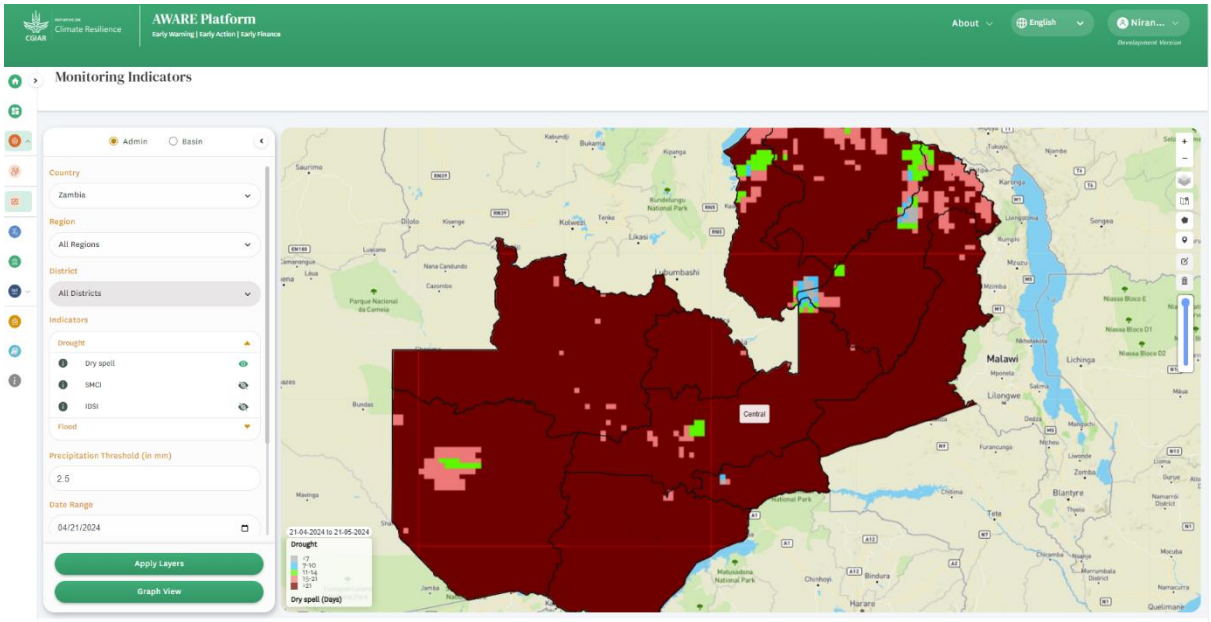
3. Monitoring Indicators (20 Minutes)

In the AWARE platform, monitoring indicators primarily focus on tracking flood and drought hazards, providing real-time data to manage and mitigate these risks effectively. For flood hazard monitoring, the platform utilizes key indices such as accumulated rainfall data from the Global Precipitation Measurement (GPM) mission and flood inundation extents derived from European Space Agency (ESA) and NASA satellite data. Additionally, the platform integrates data from the Global Flood Awareness System (GloFAS) and the GEOGloWS (Global Flood Monitoring System), offering comprehensive insights into flood conditions and potential impacts.

Regarding drought hazard monitoring, the AWARE platform generates critical indices to monitor conditions. These indices include the Dry-Spell, Soil Moisture Condition Index (SMCI), and the Integrated Drought Severity Index (IDSI). The system provides detailed information on precipitation deficits, soil moisture levels, and overall drought severity, enabling stakeholders to make informed decisions on water resource management, agricultural planning, and emergency response. By leveraging the AWARE platform ensures timely and accurate assessments of flood and drought hazards, supporting proactive and effective climate risk management.

Steps to visualize monitoring data:

a. Navigate to "Monitoring Indicators" in the Early Warning module from the main menu on the AWARE Platform.
b. Choosing Geographic Areas (Country, Region/province, District) from drop-down
c. Selecting Indicators by Click on the indicators either in Flood or Drought
d. Select date range from the Calander.
e. Click on "Apply Layers" as shown in the figure below.



Adjust the administrative units, indicators, and other relevant parameters to visualize all available data. Get familiar with the tool by experimenting with different indicators and changing the associated parameters to see how they impact the visualizations.

Monitoring Indicators

Monitoring indicators offer users the flexibility to observe the current conditions related to flood and drought hazards within a specific geographical area. The system consolidates key drought indicators, including Dry Spell, Soil Moisture Condition Index (SMCI), and Integrated Drought Severity Index (IDSI). Additionally, flood indicators comprise accumulated rainfall, flood extent derived from both Sentinel-1 and MODIS, GLOWFAS, and GeoGlows.

3.1. Drought indicators

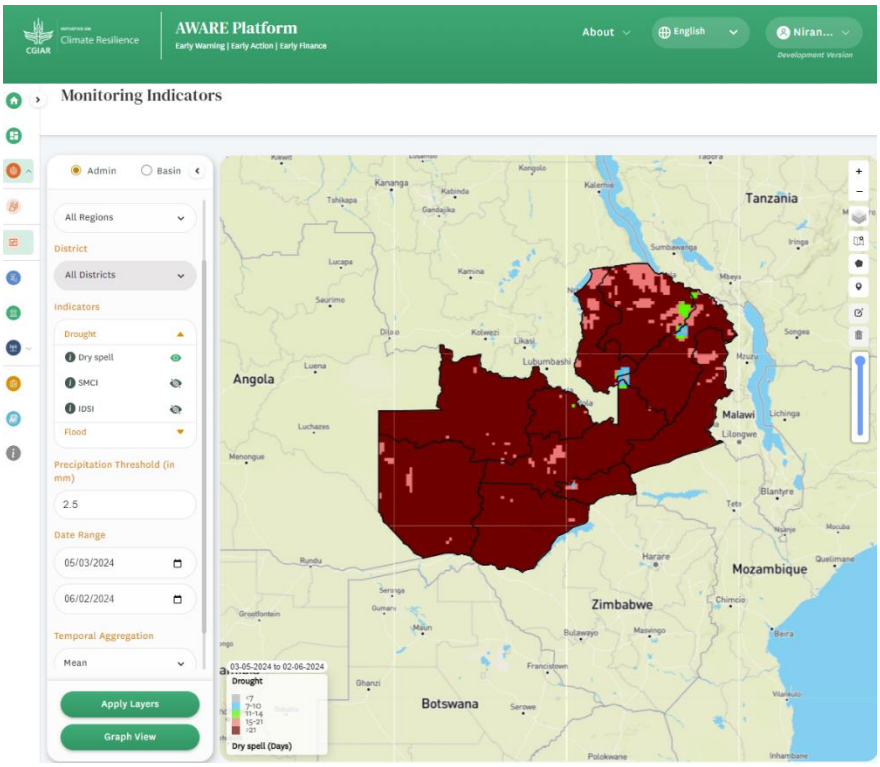
Dry spell

A dry spell is identified by a series of consecutive days within a one-month timeframe during which daily precipitation falls below a predefined threshold, such as 0.1, 1, 5, or 10 mm (Suppiah and Hennessy, 1998). This application employs CHIRPS data to calculate the number of dry days, enabling the assessment of dry spell durations over the course of a one-month period.

Steps to be follows:

- Select country
- Click on parameter (Dry spell)
- Define threshold (2.5mm)
- Define date range (start – end for a one month)
- Click apply layer

This common approach applicable for the all the drought indicators.



Soil Moisture Condition Index (SMCI)

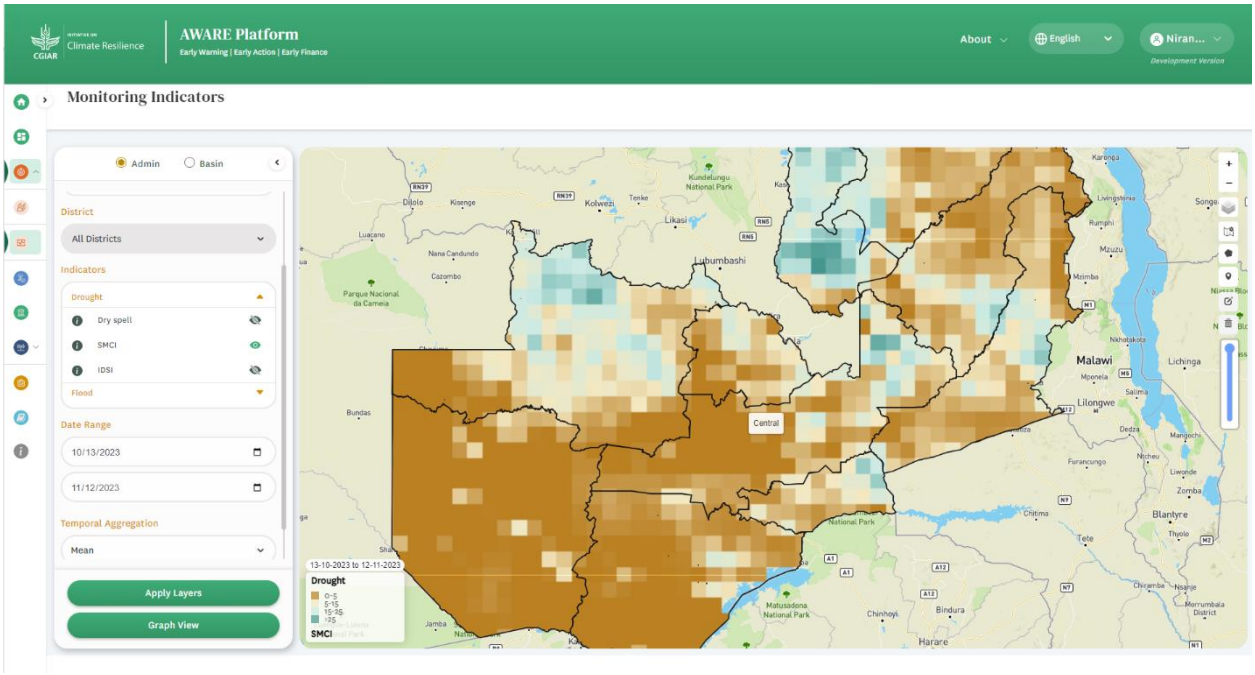
SMCI, denoting Soil Moisture Condition Index, is a metric expressing the soil moisture condition, calculated through the following equation (Bhuiyan et al, 2006):

$$SMCI = (SM_i - SM_{min} / SM_{max} - SM_{min}) 100$$

SM_i = Current Soil Moisture, SM_{min} = Minumum Soil Moisture, SM_{max} = Maximum Soil Moisture

The SMCI value ranges from 0 to 100, with a value nearing 0 indicating extreme soil moisture stress and values close to 100 representing a healthy soil moisture situation. Here, SMmin and SMmax denote the long-term minimum and

maximum soil moisture for a specific pixel, while SMi represents the current soil moisture for the same pixel. Follow the same procedure used in Dry spell to visualize the SMCI data as below.

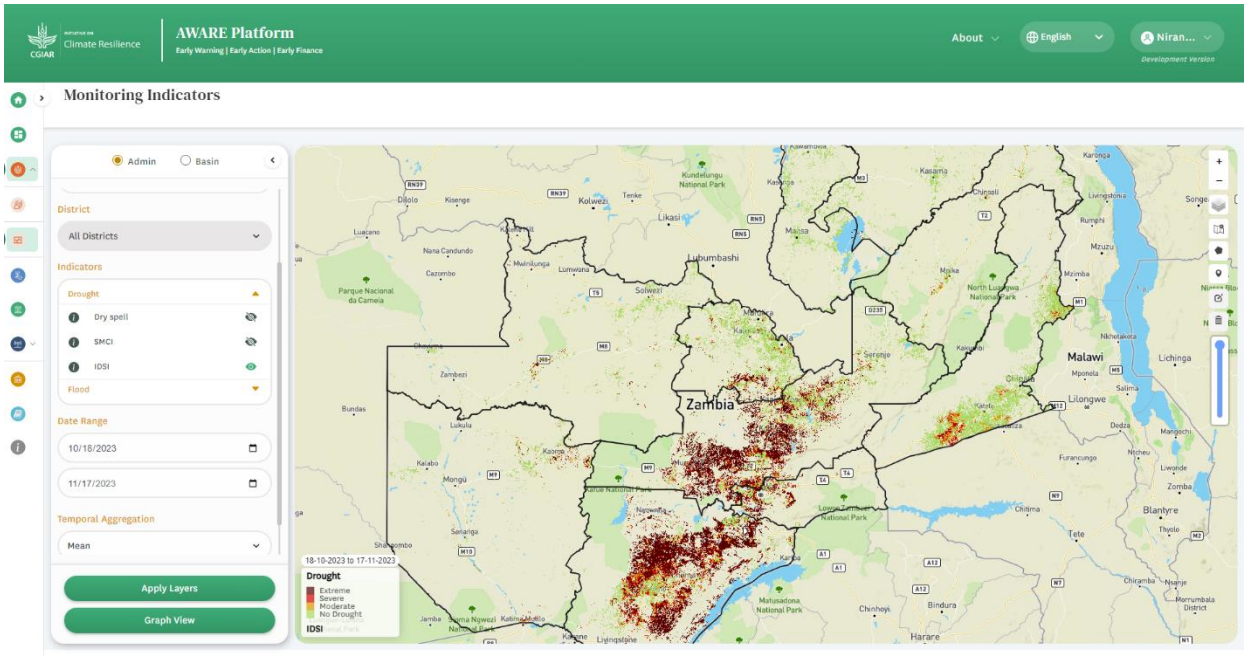


Integrated Drought Severity Index (IDSI)

IDSI, or Integrated Drought Severity Index (Amarnath et al, 2021), is derived from the fusion of multi-scale Vegetation Condition Index (VCI), Precipitation Condition Index (PCI), Soil Moisture Condition Index (SMCI) and Evapo-Transpiration Condition Index (ETCI) through advanced data fusion techniques. The IDSI values span from 0 to 100, mirroring the scale of previous indices. Near-zero values indicate extreme drought conditions, while values nearing 100 signify robust vegetation health and an absence of drought. The calculation of the Integrated Drought Severity Index (IDSI) is performed using the following equation.

$IDSI_{ijk}=0.6*VCI_{ijk}+0.1*SMCI_{ijk}+0.2*PCI_{ijk}+0.1*ETCI_{ijk}$

$IDSI_{ijk}$, VCI_{ijk}, TCI_{ijk} and PCI_{ijk} are IDSI, VCI, SMCI, ETCI and PCI values for a pixel (i) in a composite (j) of a year (k).



3.2. Flood indicators

To visualize flood indicators, users can follow a similar approach as employed for drought indicators. This involves utilizing the provided parameters for Accumulated Rainfall (GPM – Global Precipitation Measurement), Flood (ESA – European Space Agency), and Flood (NASA – National Aeronautics and Space Administration). Notably, these parameters support a comparative analysis, enabling users to assess and compare different indicators across various timeframes.

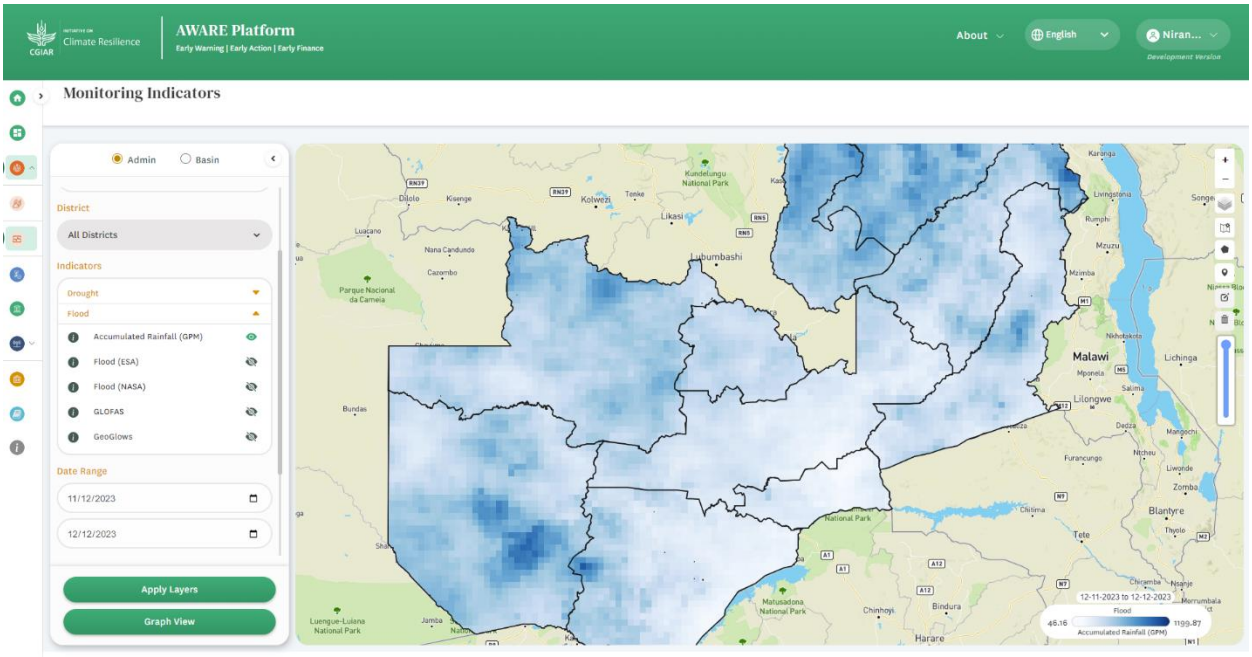
Steps to be follows

- Select country
- Click on parameter (Dry spell)
- Define threshold (2.5mm)
- Define date range (start – end for a one month)
- Click apply layer

This common approach applicable for Accumulated Rainfall (GPM), Flood (ESA), and Flood (NASA)

Accumulated rainfall

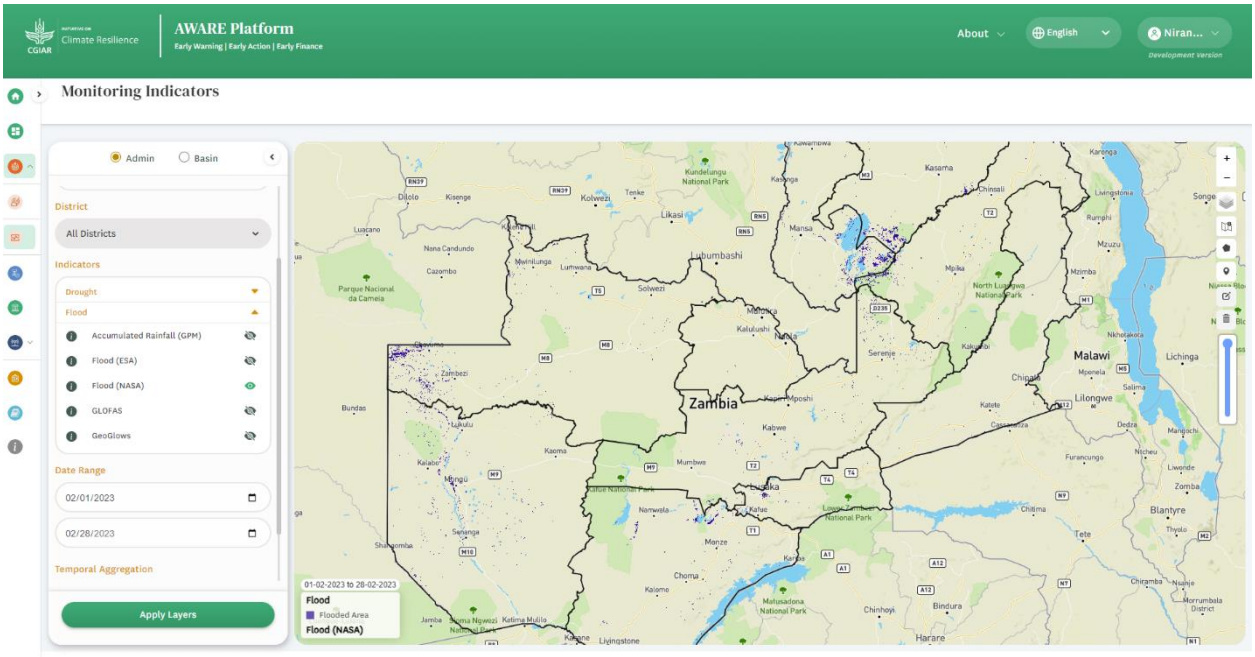
The Accumulated Rainfall (GPM – https://gpm.nasa.gov/data) metric offers an assessment of the total precipitation received within a specified area over a defined period. GPM, denoting Global Precipitation Measurement, employs a satellite-based system to measure precipitation. The calculation of Accumulated Rainfall (GPM) involves summing the precipitation measurements recorded at half-hour intervals over a designated area during a specific timeframe. The result provides a measure of cumulative rainfall, expressed in millimetres.



Flood (ESA & NASA)

The Flood (ESA – https://developers.google.com/earth-engine/datasets/catalog/COPERNICUS_S1_GRD) indicator is a method for measuring flood extent, utilizing data from the European Space Agency (ESA) Sentinel-1. The Sentinel-1 satellite employs radar sensors to capture detailed images of the Earth's surface, enabling the identification and mapping of flood extent. This approach is advantageous as it allows for flood monitoring at any time, irrespective of weather conditions, providing a reliable tool for assessing the spatial scope of floods.

The Flood (NASA – https://developers.google.com/earth-engine/datasets/catalog/MODIS_061_MOD09A1) indicator measures flood extent by leveraging the capabilities of the Moderate Resolution Imaging Spectroradiometer (MODIS) satellite, which developed by the National Aeronautics and Space Administration (NASA). This system consistently observes the Earth's surface twice daily through its Aqua and Terra instruments, employing moderate resolution optical bands. It can be specifically used for regional-level flood monitoring, the Flood (NASA) indicator proves particularly effective in scenarios without cloud cover. In contrast to Sentinel-1, which excels in monitoring local-level flood occurrences, MODIS-based observations from NASA offer comprehensive coverage suitable for broader geographical areas, making it a valuable tool for assessing flood extent on a regional scale.

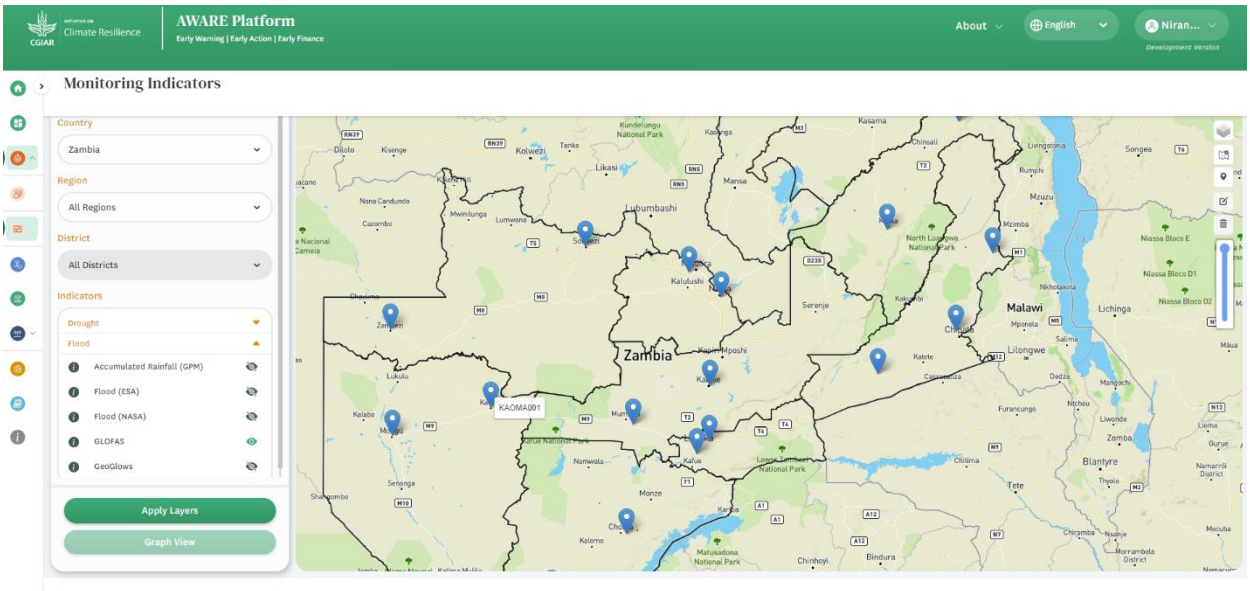


GLOFAS

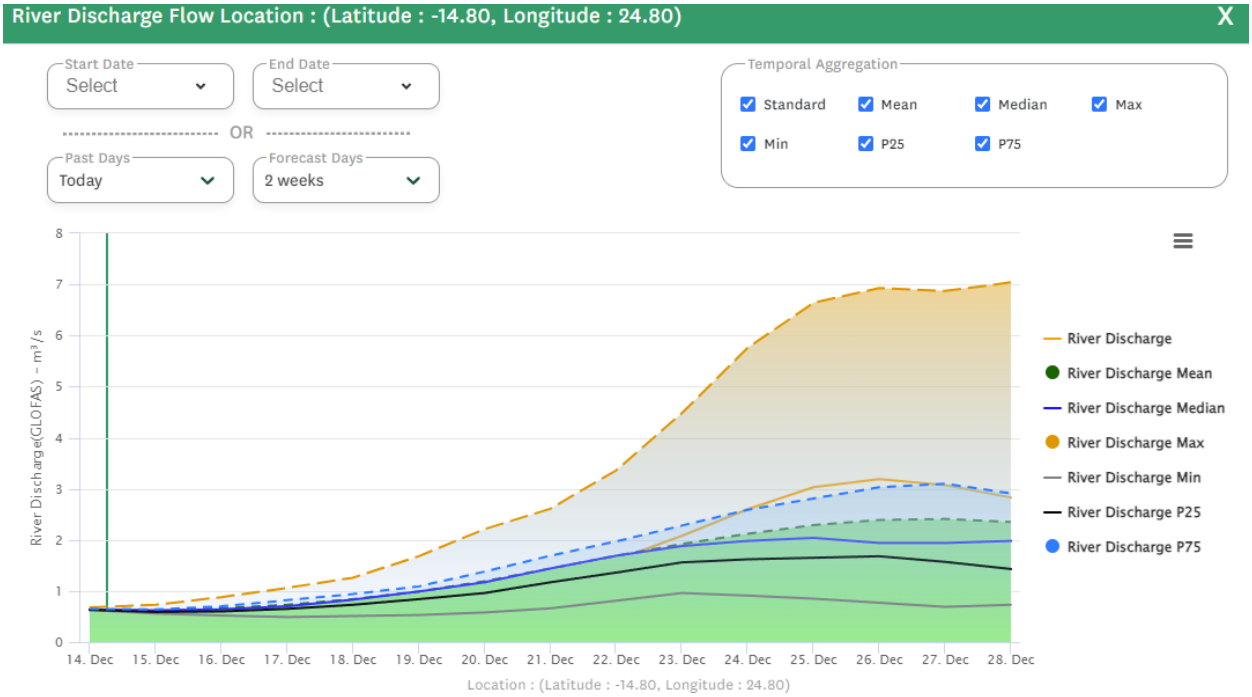
Global Flood Awareness System (GLOFAS – https://global-flood.emergency.copernicus.eu/) stands as a global initiative offering flood forecasts and early warning systems, facilitating community preparedness and response to floods. The GLOFAS indicator for river discharge relies on a hydrological model that simulates the movement of water within rivers and streams. Measured typically in cubic meters per second, the GLOFAS river discharge indicator assesses the potential for flooding in specific areas. The initiative provides real-time and near-real-time data on river discharge, aiming to enhance the comprehension and management of water resources. By offering timely information, GLOFAS supports communities in their efforts to prepare for and respond to floods. The hydrological model employed by GLOFAS produces daily forecasts of river discharge up to 30 days in advance. This foresight empowers water managers and emergency responders to strategically plan and prepare for potential flooding events.

How to visualize GLOFAS data in AWARE

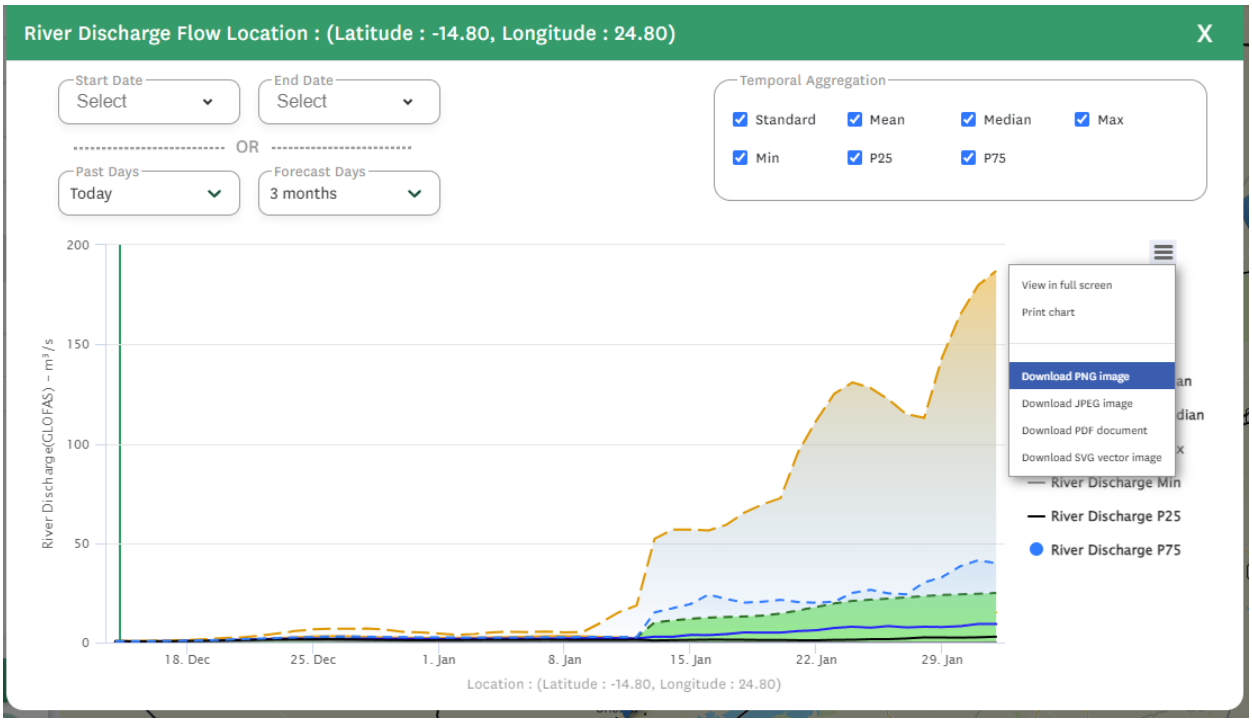
- Select GLOWFAS and Click on "Apply Layer" (available discharge locations Will be add together with rivers)



- Click on a gauge point to visualize the forecast data next 15day



It enables users to visualize both the 15-day to 3 months forecast as well as historical records by adjusting the time frame (start and end date) within the panel. Also, the System allows to download the images as well.

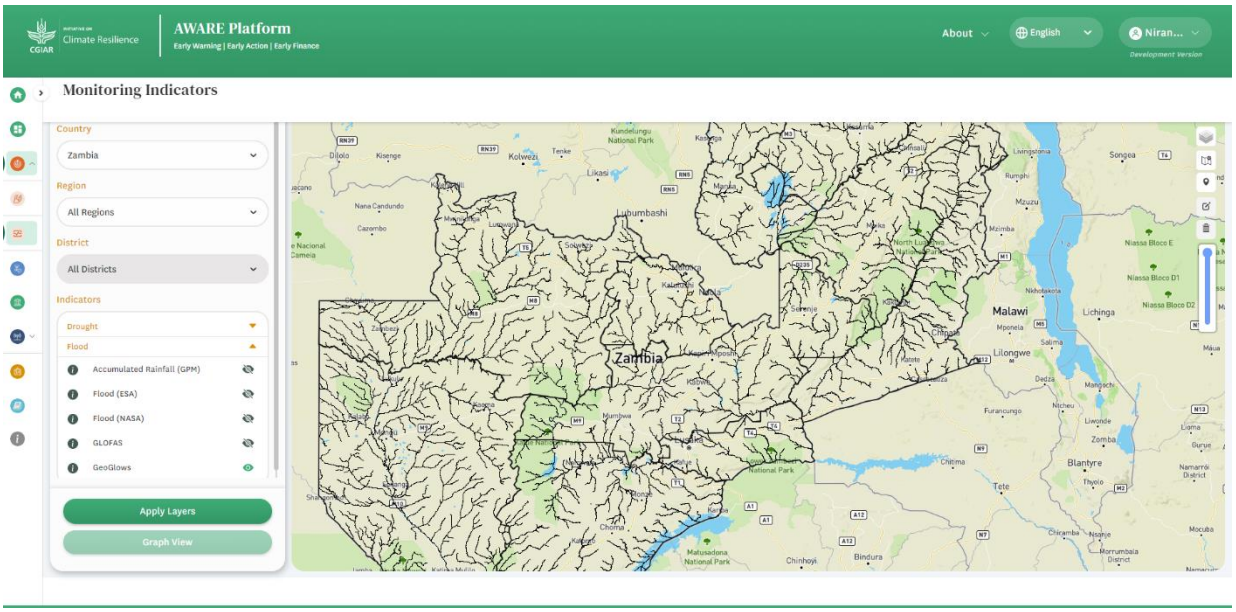


GeoGlows

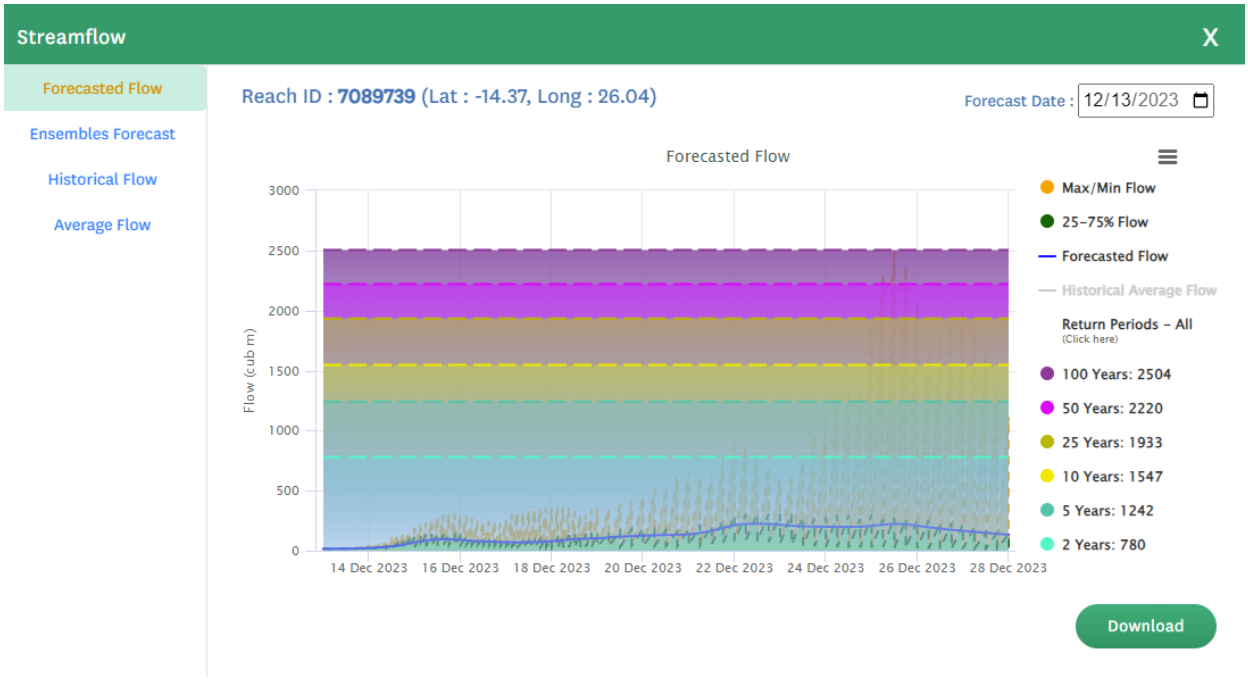
GeoGLOWS (https://www.geoglows.org/pages/geoglows-streamflow-forecasting) offering real-time and near-real-time data, GeoGLOWS presents a variety of water-related indicators, including river discharge, precipitation, and temperature. This comprehensive dataset aids water managers and policymakers in making well-informed decisions pertaining to water resource management. The GeoGLOWS river discharge indicator relies on streamflow data, typically measured in cubic meters or cubic feet per second. This indicator delivers up-to-the-minute information on the volume of water flowing in rivers or streams. This real-time insight enables water managers to evaluate the overall water availability in a specific region, facilitating informed decisions on water allocation and management strategies.

How to visualize GeoGLOWS data in AWARE

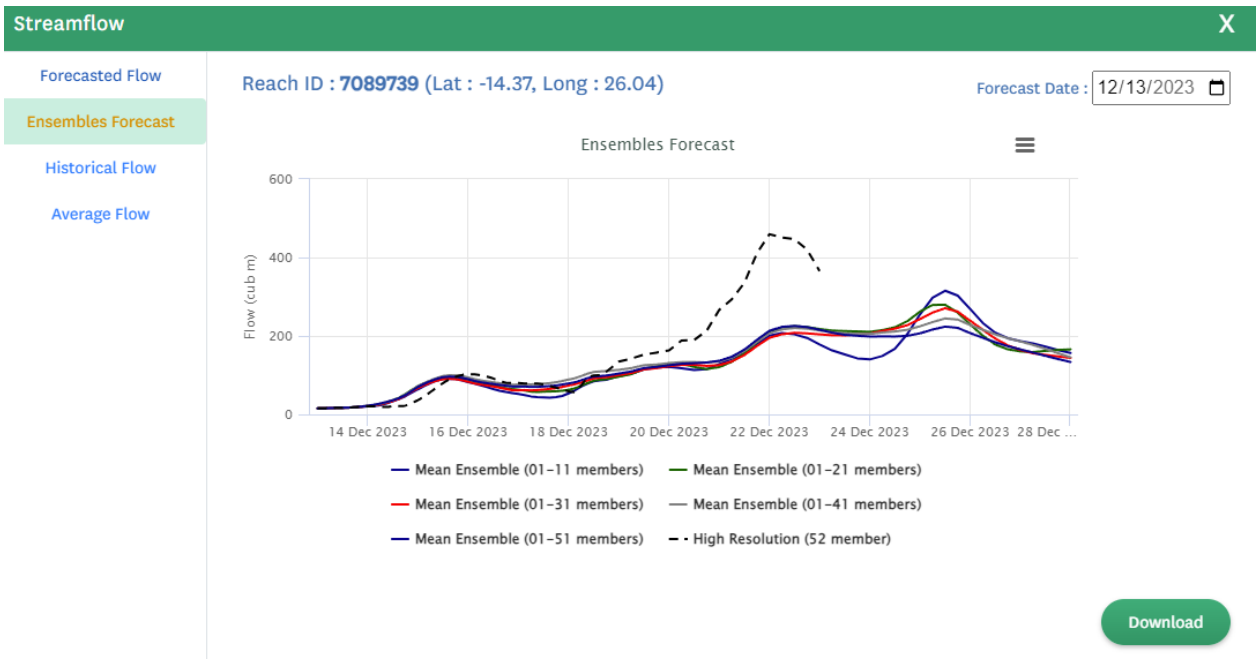
- Select GeoGlows and Click on “Apply Layer” (river network appears)

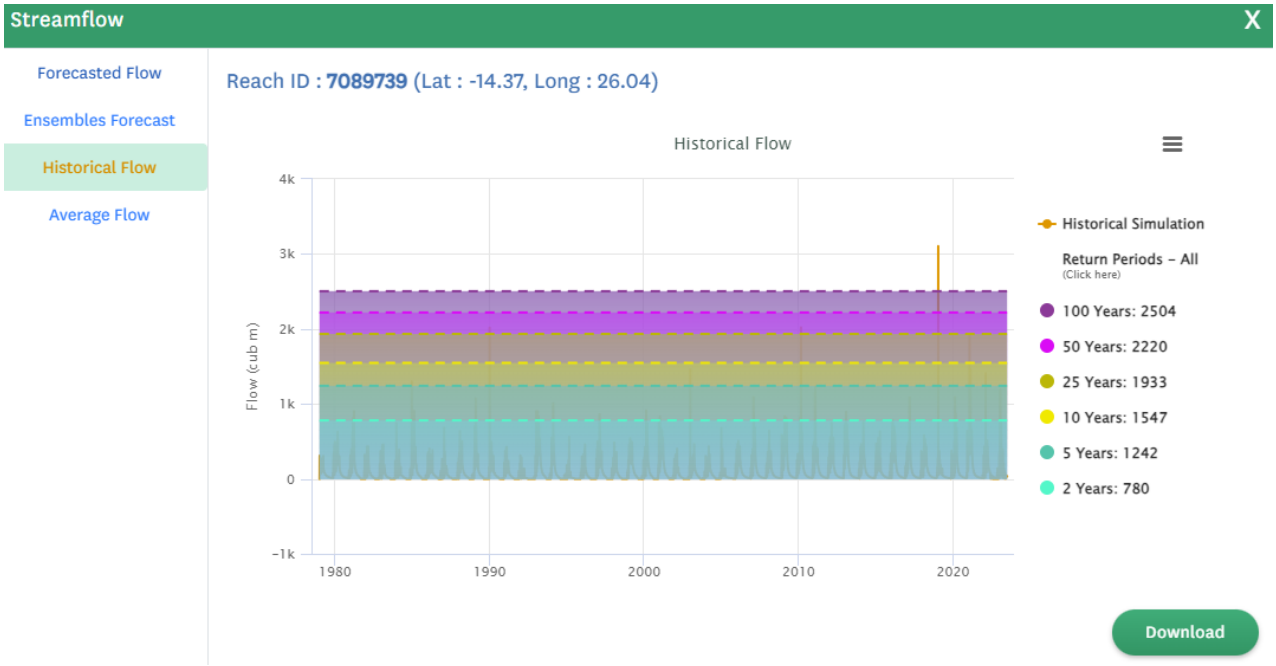


- Click on “Draw a marker” to create a point to visualize the forecast data.
- Click on any point on the river network.
- Start the parameter generation automatically.



The system enables users to visualize the forecast for the next 15 days, ensemble forecasts, historical flow data for the past 45 years, and average flow based on historical records. Additionally, the system provides the privilege to download the data as a CSV file using the download option shown in the figure above.

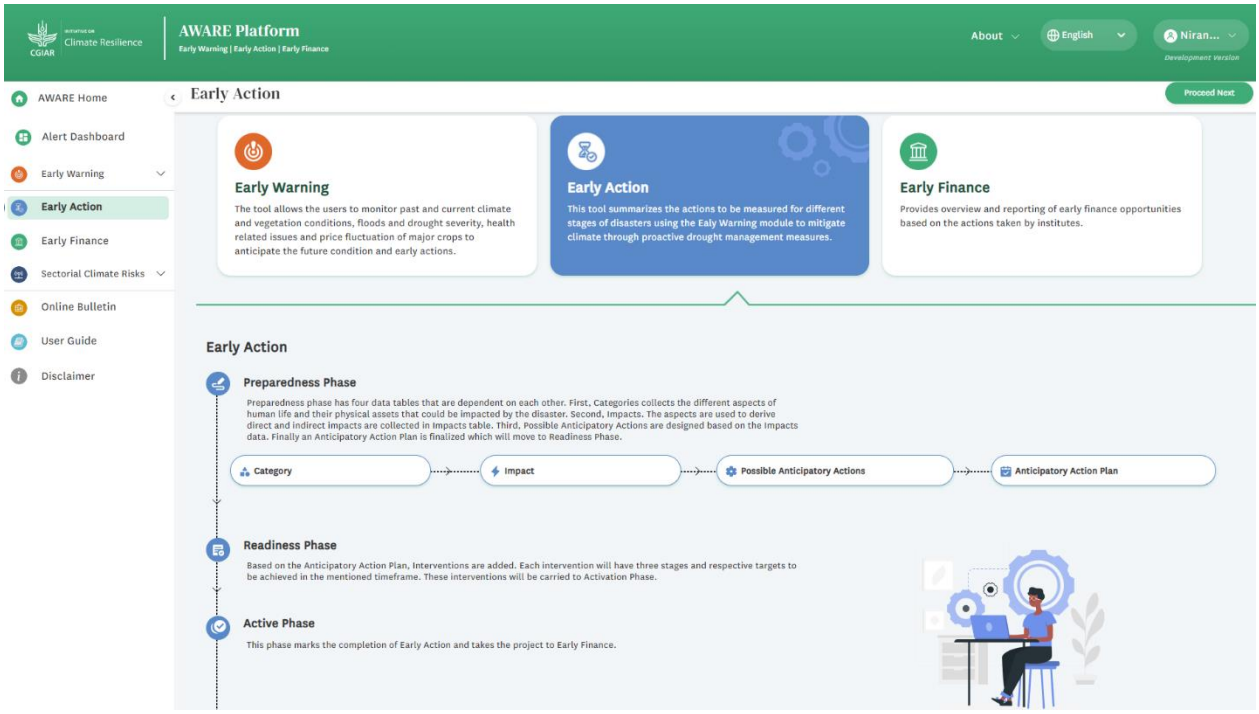



Streamflow
X
Forecasted Flow
Ensembles Forecast
Historical Flow
Average Flow
Reach ID : 7089739 (Lat : -14.37, Long : 26.04)
Historical Flow
Flow (cub m)
4k
3k
2k
1k
0
-1k
1980
1990
2000
2010
2020
Historical Simulation
Return Periods – All
(Click here)
100 Years: 2504
50 Years: 2220
25 Years: 1933
10 Years: 1547
5 Years: 1242
2 Years: 780
Download

4. Digitalization of Early Action Protocols

Early action within the anticipatory action framework entails the implementation of preventive or preparatory measures before the occurrence of an anticipated hazard event. This strategic approach aims to strengthen resilience, mitigate potential damage, and enhance overall response capabilities. In the context of the AWARE platform, early action set up a significant component, offering a digitalized framework for early action protocols across diverse geographical contexts.

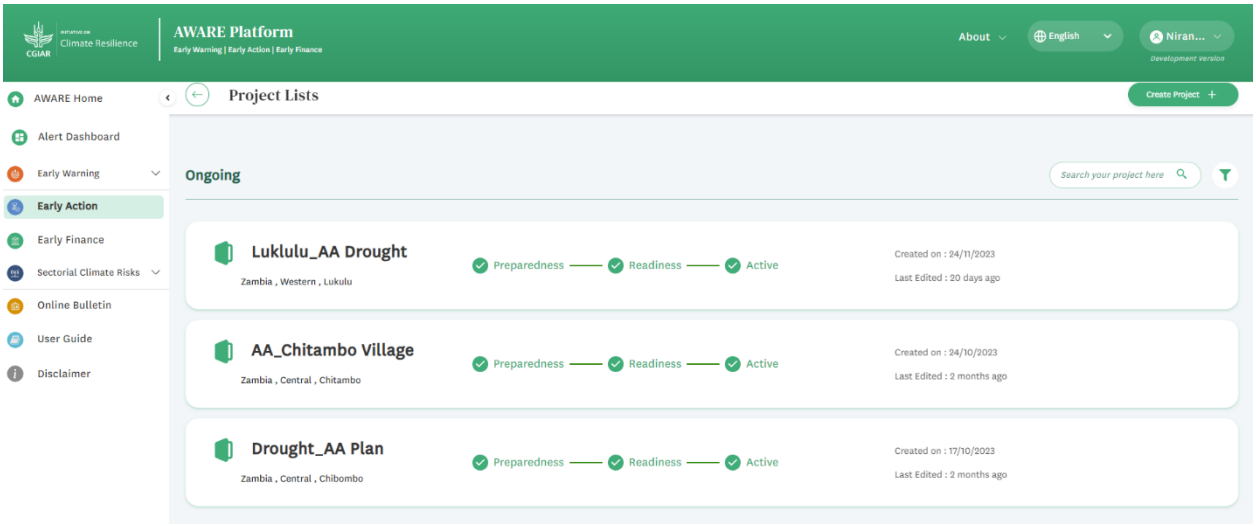
The early action process is structured into three important phases: preparedness, readiness, and active. AWARE facilitates a step-by-step approach for users to input actions corresponding to each of these phases. Additionally, the platform incorporates access management mechanisms, accommodating varying user levels and administrative roles. Users have the capability to visualize early action protocols, while administrators possess privileges to input these protocols into the system, facilitating seamless coordination and collaboration with partners. The integration of these features within the AWARE platform strengthening its role in facilitating comprehensive early action strategies and promoting efficient communication among stakeholders.



4.1. How to add Early action into AWARE platform

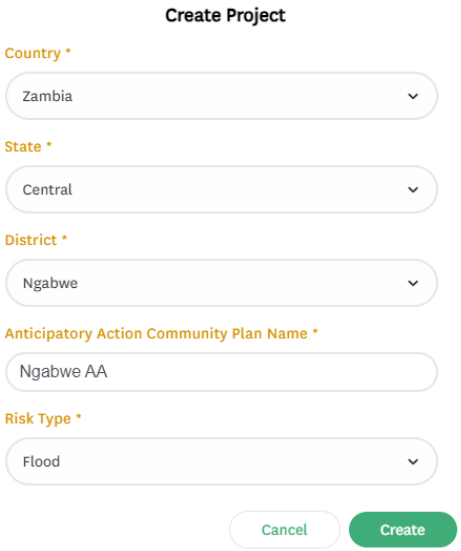
Upon entering the early action module of the AWARE platform, users can utilize the "Proceed next" feature to add Early Action protocols, as illustrated in below Figure.

The system displays previously formulated action plans for various areas, and users can proceed by selecting "Create Project" to introduce new early action plans.

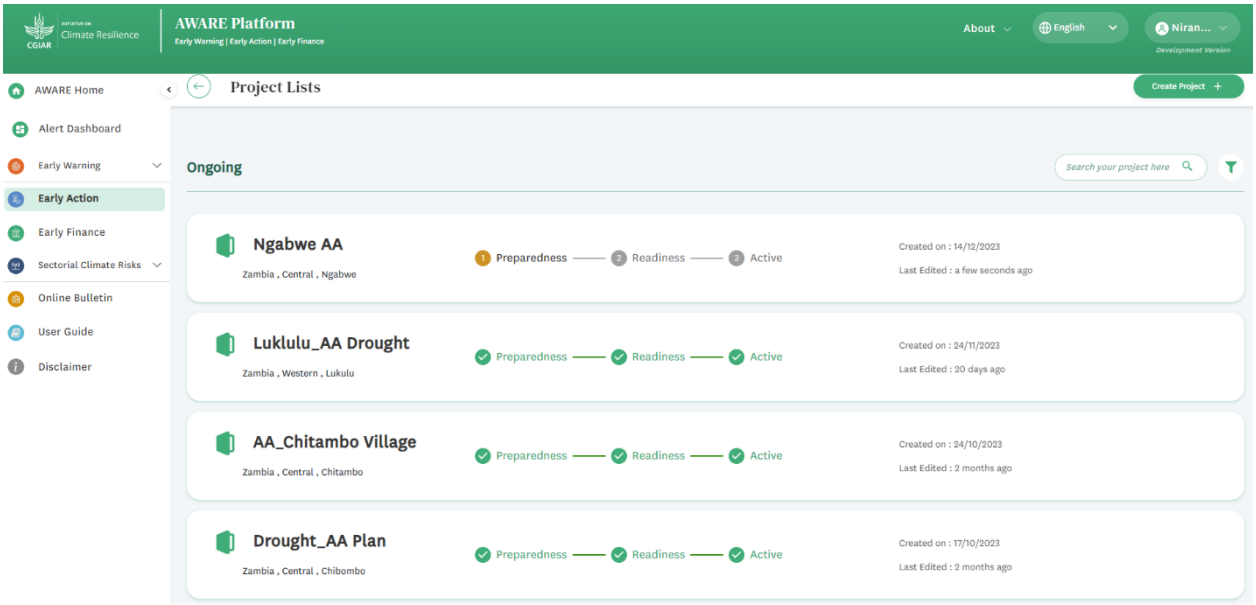


4.2. Create Project

Users are given the ability to choose a country, state, district, and the type of risk, as depicted below. After completing all the fields, click "Create" to initiate a new project template for the insert of new information.

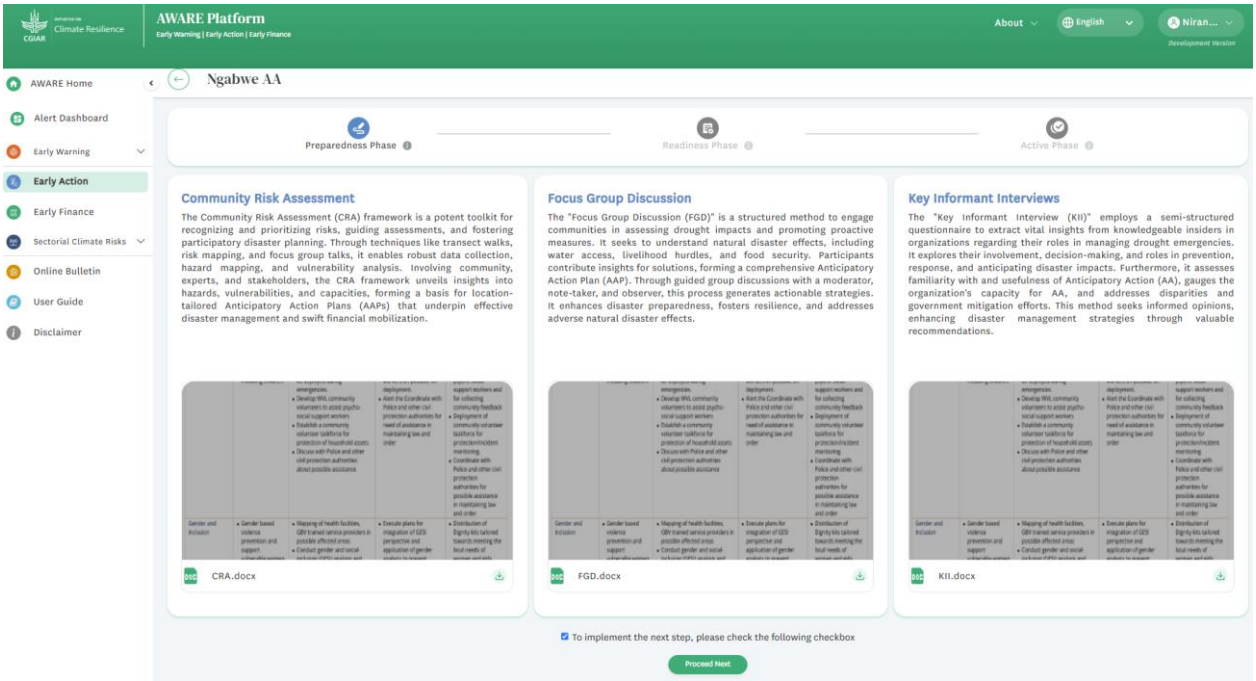


The newly created project is incorporated into the system, allowing the user to proceed and input all pertinent information for the preparedness, readiness, and active phases.



Click on the new Project to add the new protocols

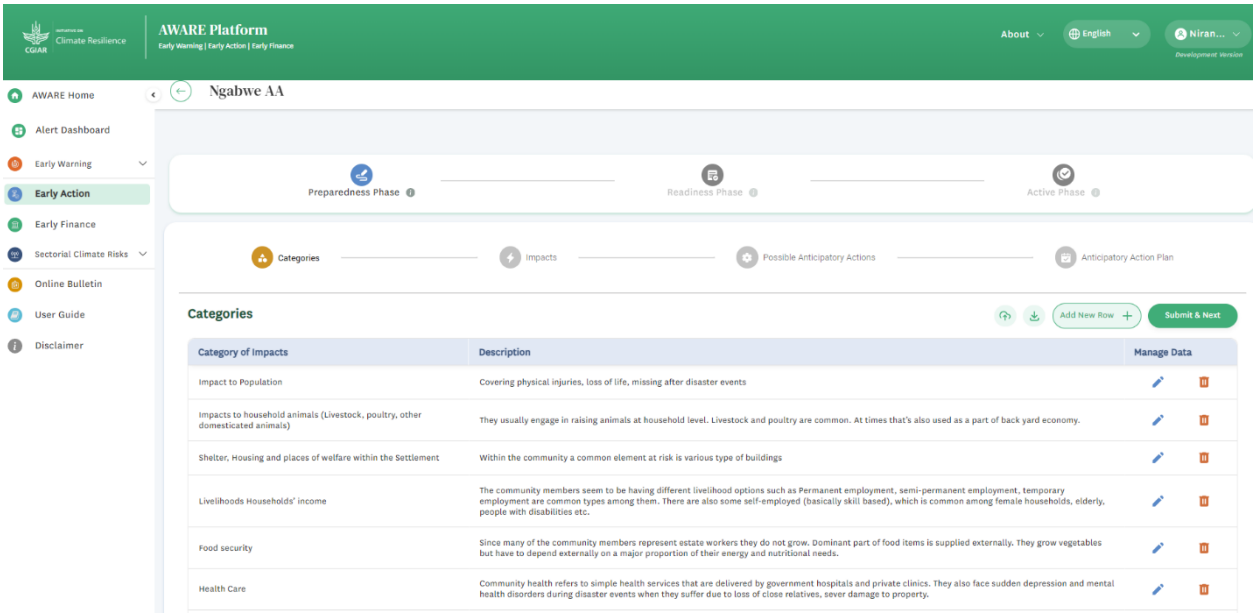
The system offers the necessary documentation required to complete the preparedness phase. If the user has already finished the on-ground activities for this phase, they can proceed by clicking on "Proceed Next" after checking the provided checkbox.



If the user chooses to follow existing protocols, the system provides them with editor access to select based on requirements. Alternatively, if the user needs to add a new action plan, they can proceed with a new action, allowing them to input all new information.

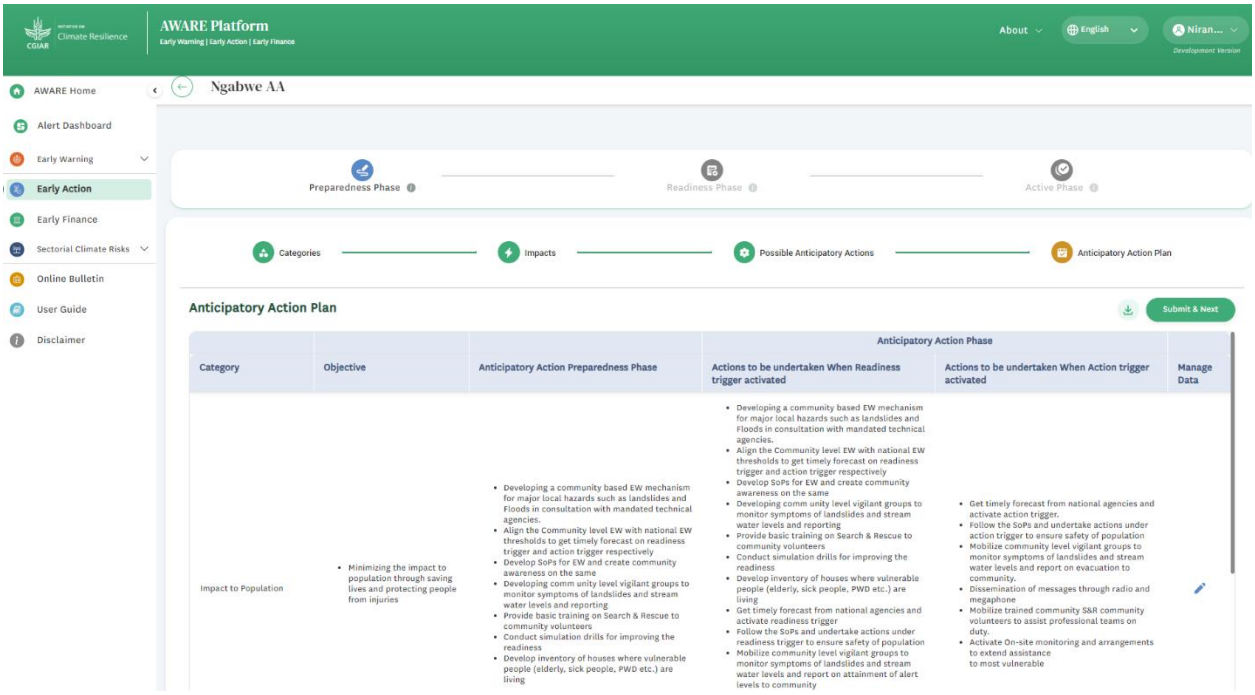
Users can navigate through the completion of the action plan step by step, either by editing or accepting existing protocols. This involves completing categories, impacts, possible anticipatory actions, and finalizing the anticipatory action plan by clicking on "Submit & Next."

Also it is allow user to add new ítems by clicking on “Add New Row”

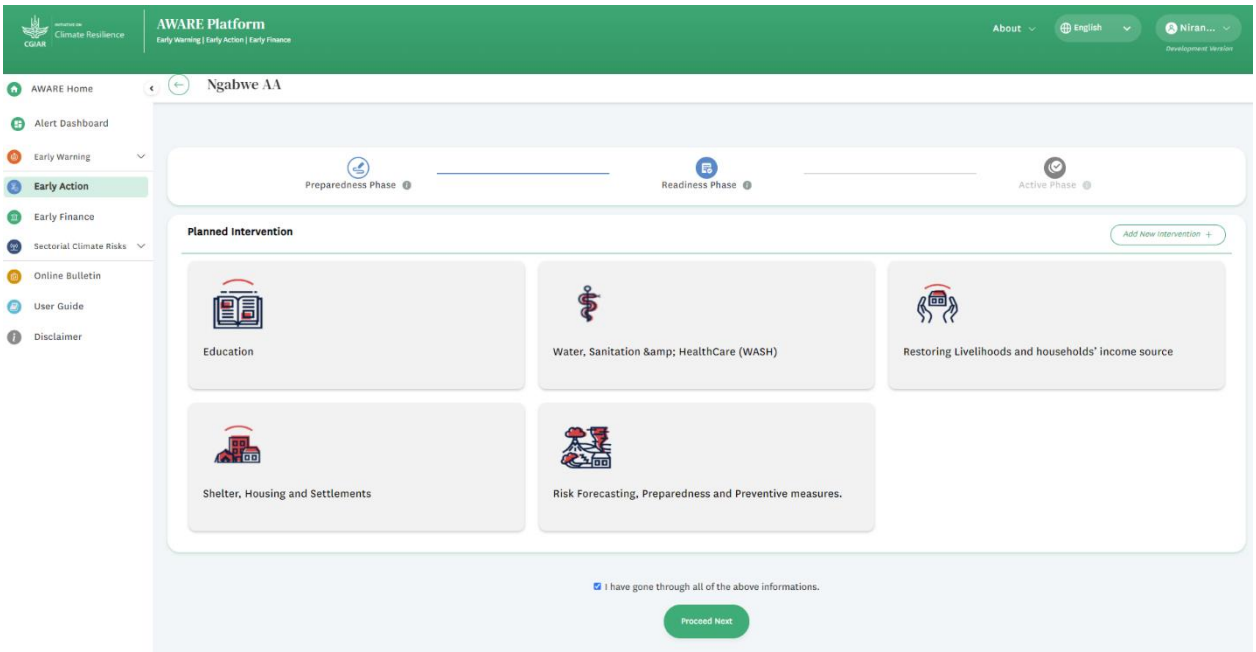


4.3. Edit Project

Once user reaching the conclusion of the Preparedness Phase, the categories, impacts, possible anticipatory actions, and anticipatory action fields turn green, guiding the user to input actions for the Readiness Phase. This visual cue signals the successful completion of the Preparedness Phase, prompting the user to transition seamlessly to the next phase of the process.

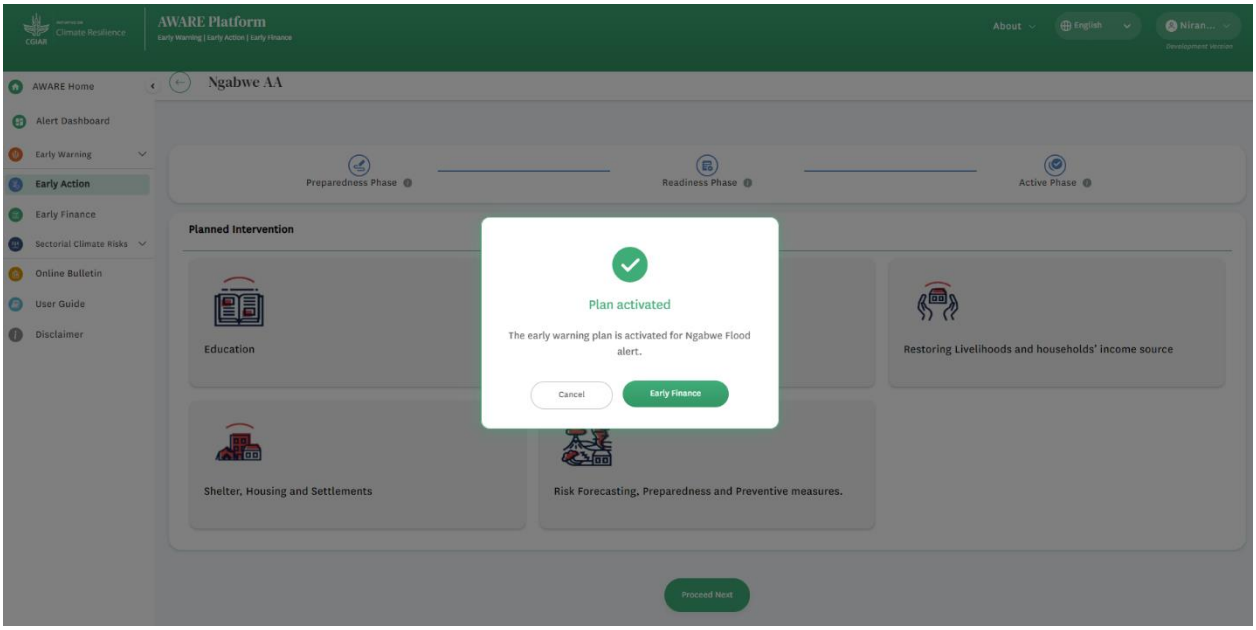


- In the reediness phase use has privileges to add new intervention or edit existing intervention.



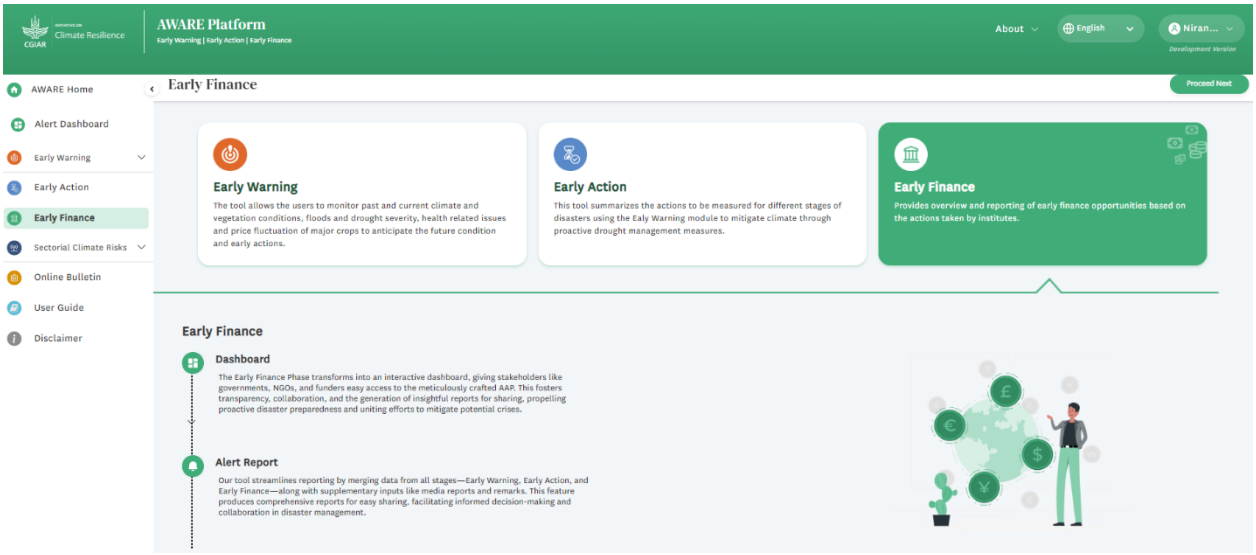
After the user completes the addition or editing of all interventions, they can confirm the interventions and proceed by clicking on "Proceed Next" to move Active the protocols.

- Then user can activate the plan
- Once activate the action plan user directly take into Early Finance modules.
-



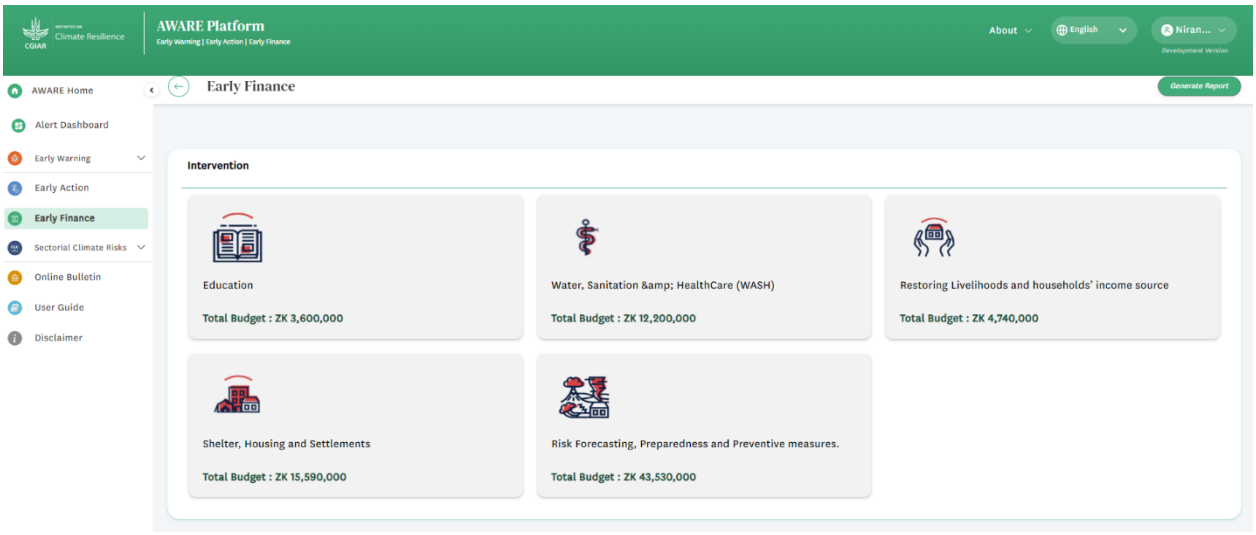
4.4. Early Finance

Early Finance within the scope of Anticipatory Action involves supplying financial resources in advance of predicted events or hazards. This proactive financial support is strategically designed to facilitate prompt and effective preparedness, response, and recovery phase, especially in anticipation of impending disasters or crises. To analyze the financial sources for each intervention, users must advance to the next step by selecting "Proceed Next." This step ensures a thorough assessment and verification of the financial backing associated with each planned intervention.



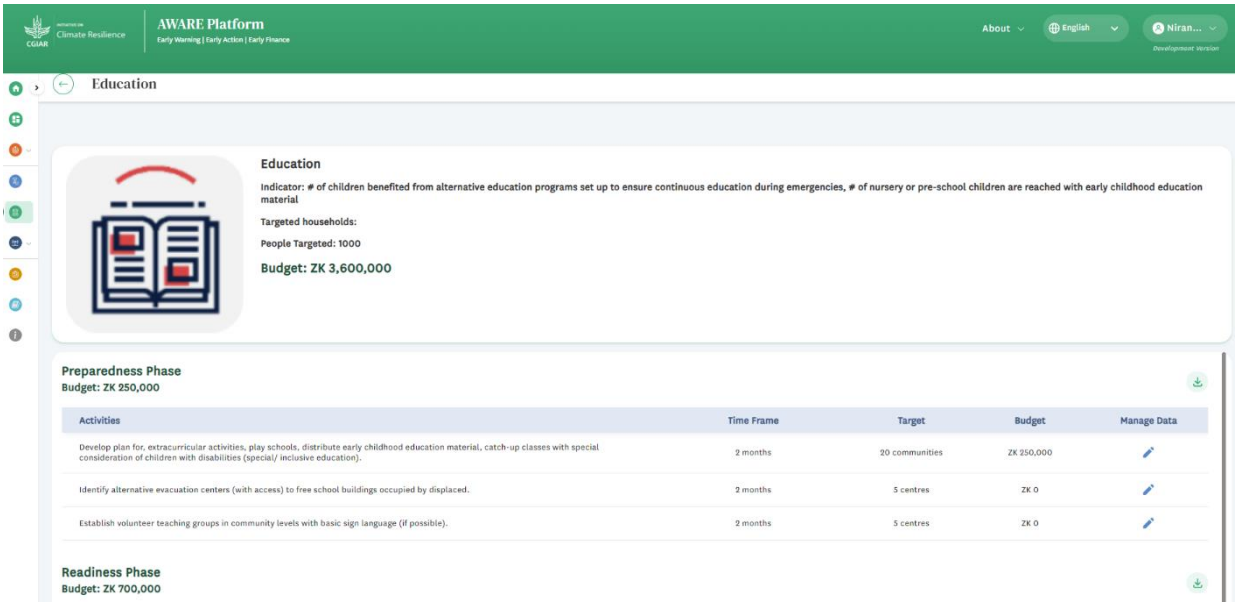
- Users have the option to carefully manage each intervention by selecting either the edit or visualize function based on their specific needs. Opting for the edit function empowers the user to add new elements or

remove existing items as necessary, providing a flexible and customizable approach to intervention management.

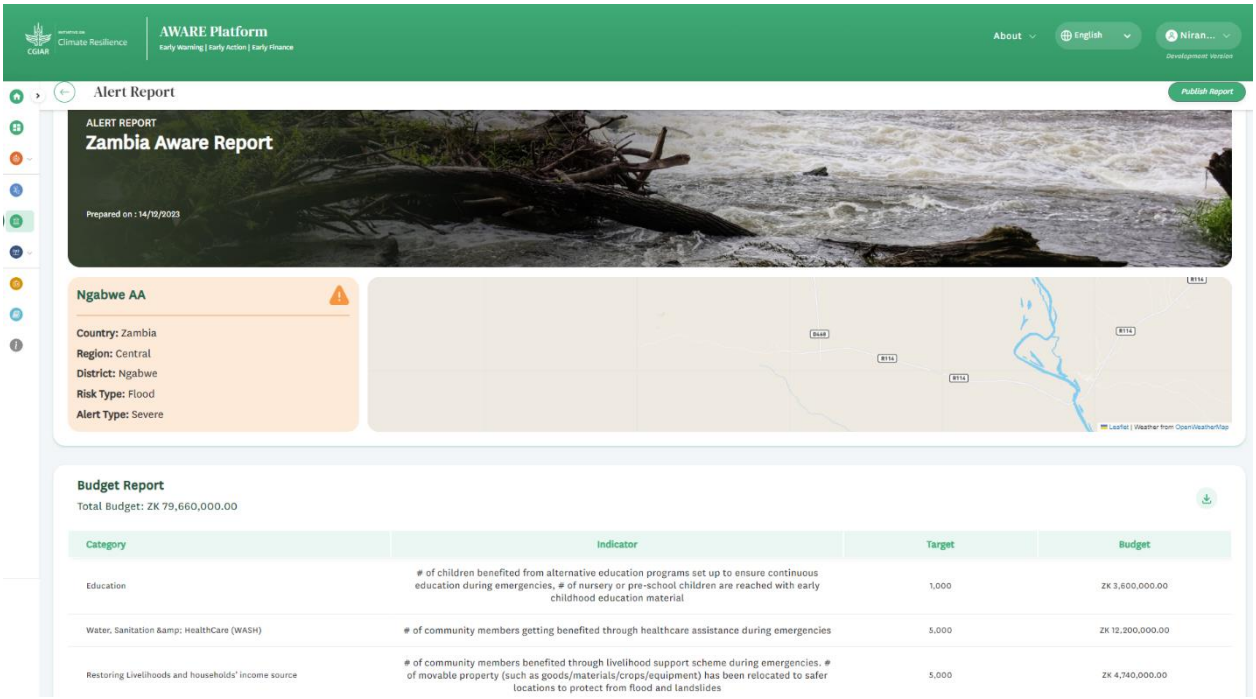


Upon the user's completion of all edits within the intervention, the system offers the capability to generate a comprehensive report. This report incorporates all anticipatory action protocols alongside the budgetary requirements, providing a consolidated overview of the planned actions and associated financial needs.

- Click on "Generate Report"



- During report generation, use can add Photos, Maps, and attachments based on the requirement.



Upon finalizing all the necessary information for report generation, users can click on "Publish Report." This action enables users to seamlessly share the report directly with other stakeholders or download it as a PDF, offering flexibility and convenience in disseminating crucial information.

4.5. Alert Dashboard

The Alert Dashboard of the AWARE platform is designed to define alert levels using various triggers for flood and drought indicators at the district level. This dashboard provides four distinct alert levels, which are used to trigger anticipatory action protocols for flood and drought hazards.

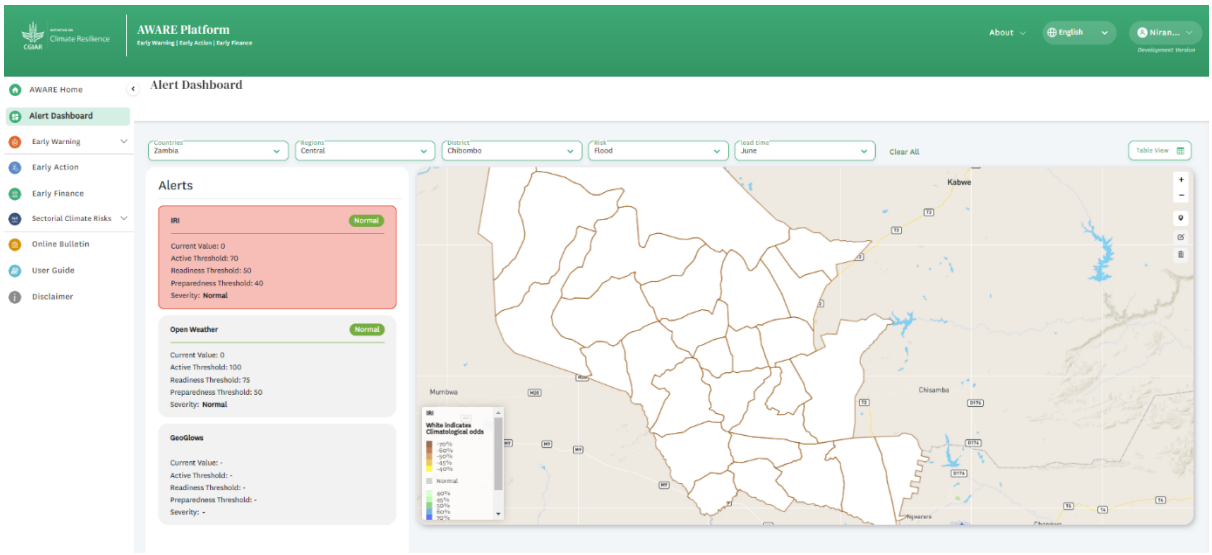
The design of the Alert Dashboard heavily relies on forecast data from several sources to ensure accurate and timely alerts. For flood indicators, it incorporates data from IRI rainfall, OpenWeather, and GloFAS. For drought indicators, it uses data from Dryspell, SPI, and other relevant sources. These datasets are utilized to define preparedness, readiness, and active triggers, which are critical components in the anticipatory action framework.

By integrating these diverse data sources, the Alert Dashboard can offer a comprehensive and dynamic system for managing flood and drought risks, ensuring that appropriate actions can be taken promptly to mitigate the impacts of these hazards.

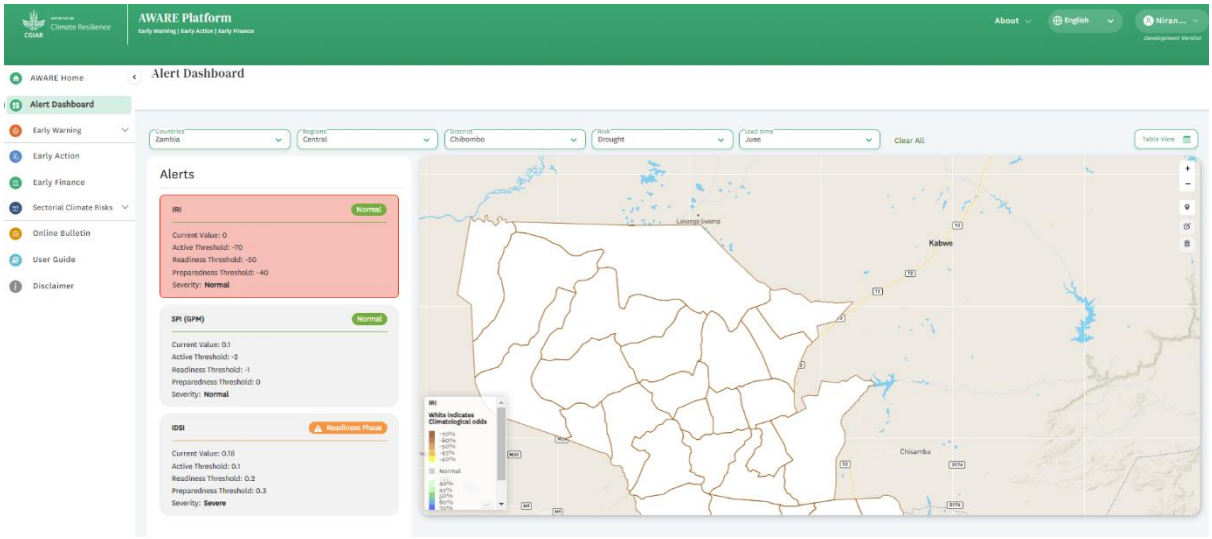
Flood alert level

Users have the ability to modify the region, district, and risk type by clicking on the down arrow. Once the selection is complete, the system will automatically generate the corresponding alert levels. This dynamic feature ensures that users can easily access and assess the alert status for various regions and risk types, enabling them to make informed decisions based on real-time data.

As clearly visualized on the dashboard, there are currently no flood alert levels active for the present situation according to the IRI forecast, OpenWeather data, and GloFAS information. These data sources collectively indicate that there is no imminent flood risk currently.

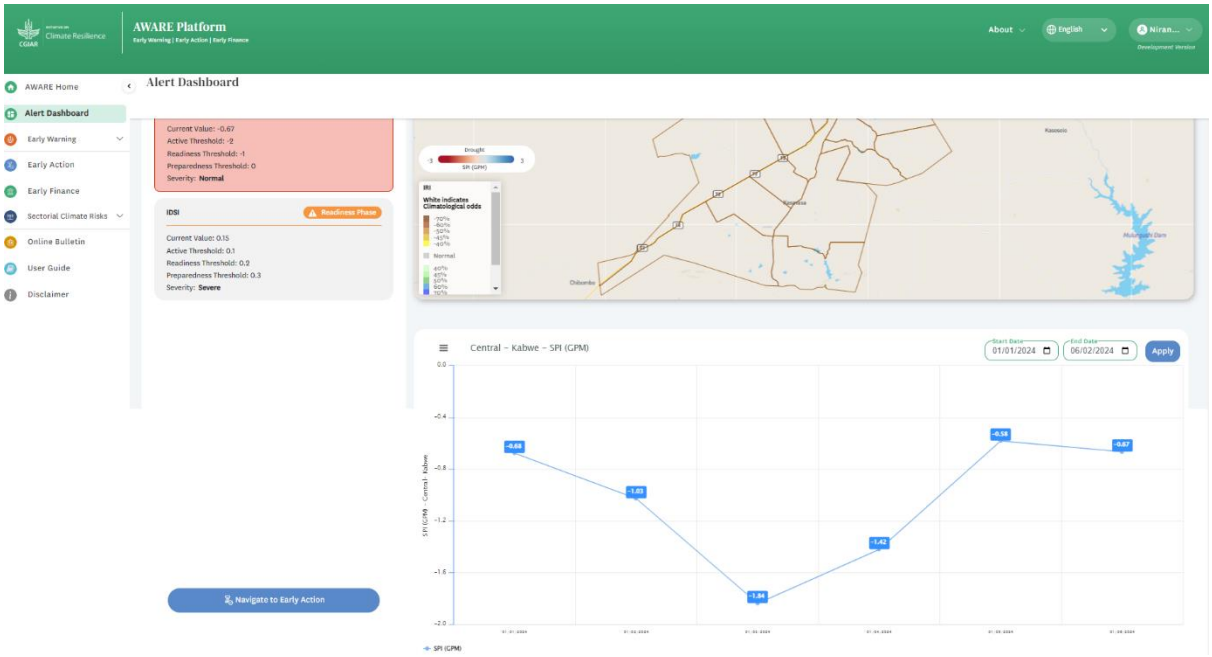


4.6. Drought alert



As you explore the agricultural drought alert generated through IDSI, you'll notice it's currently in the readiness phase. Now, you have the capability to seamlessly navigate towards Early Action protocols by simply clicking the "Navigate to Early Action" button located at the bottom of the page. Additionally, you can delve into the historical context using various indices parameters. By adjusting the start and end dates, depicted in the figure below, you can analyse both flood and drought situations.

Within the system, graphical representations of index values are provided, with the default parameter being IRI. However, you retain the flexibility to modify this parameter with a simple click. Consequently, both the map and the indices values in the graphs adapt automatically based on your selected parameter.



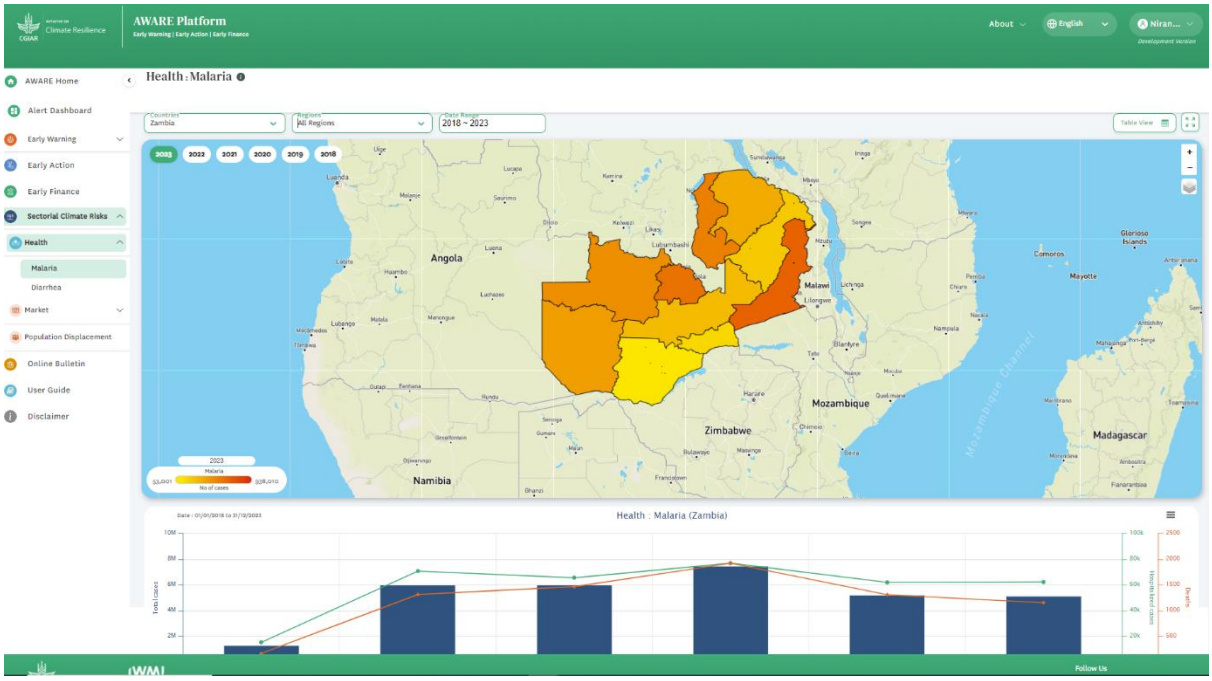
4.7. Sectoral Climate Risk

sectoral climate module was Inserted within the extensive architecture of AWARE platform with three integral components: the health, market, and population displacement sub-modules. Together, these sub-modules form a comprehensive compass, guiding stakeholders through sectoral climate risk. Delving into the health module, one encounters a comprehensive repository of data, and the focus is on elucidating the associated population exposure to prevalent diseases such as Malaria and Diarrhea, serving as a vital tool for policymakers and healthcare professionals for targeted interventions and mitigate the burden of disease. This health sub-module serves as a visualization tool for evolving landscape of health hazards across different hazard levels and temporal dimensions in different administrative levels.

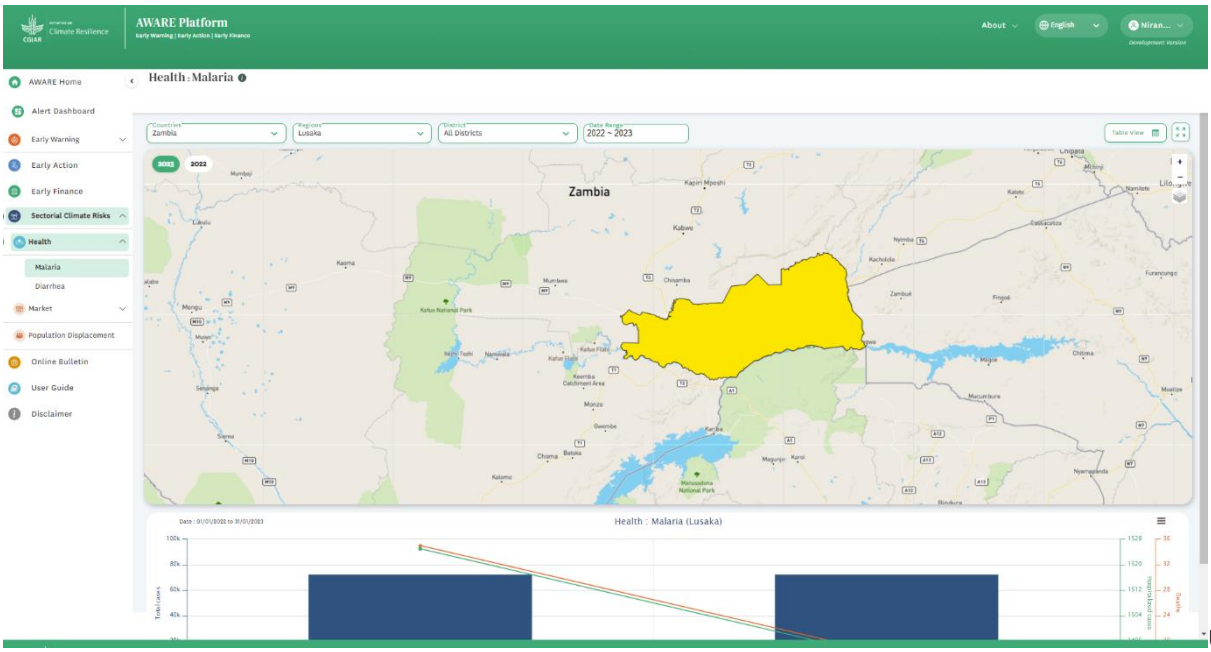
The market sub-module is presented the historical market dynamics, particularly Maize crop. Drawing upon government sources, this sub-module carefully documents the market prices over time, providing stakeholders to understand the complex economic implications of climatic fluctuations. Through its multilayered lenses of health, market dynamics, and population displacement, it offers stakeholders to understand relationships underpinning way for informed decision-making and proactive interventions in the domain of climate risk management.

4.8. Health Module

To access the Sectoral Climate Module, navigate through the module navigation panel and choose the Malaria sub-module, as illustrated in the figure below. Upon clicking on the module, the malaria data is automatically visualized, presenting the number of cases in each province both as a map and within a table format.



By default, the system presents data for the most recent year across all provinces. However, users have the capability to visualize data from different years and provinces, leveraging the foundational data available at the regional level. To explore data from different years, simply click on the years located in the top left corner. Utilize the down arrow next to "Regions" and adjust the date range to visualize provincial data across distinct years.

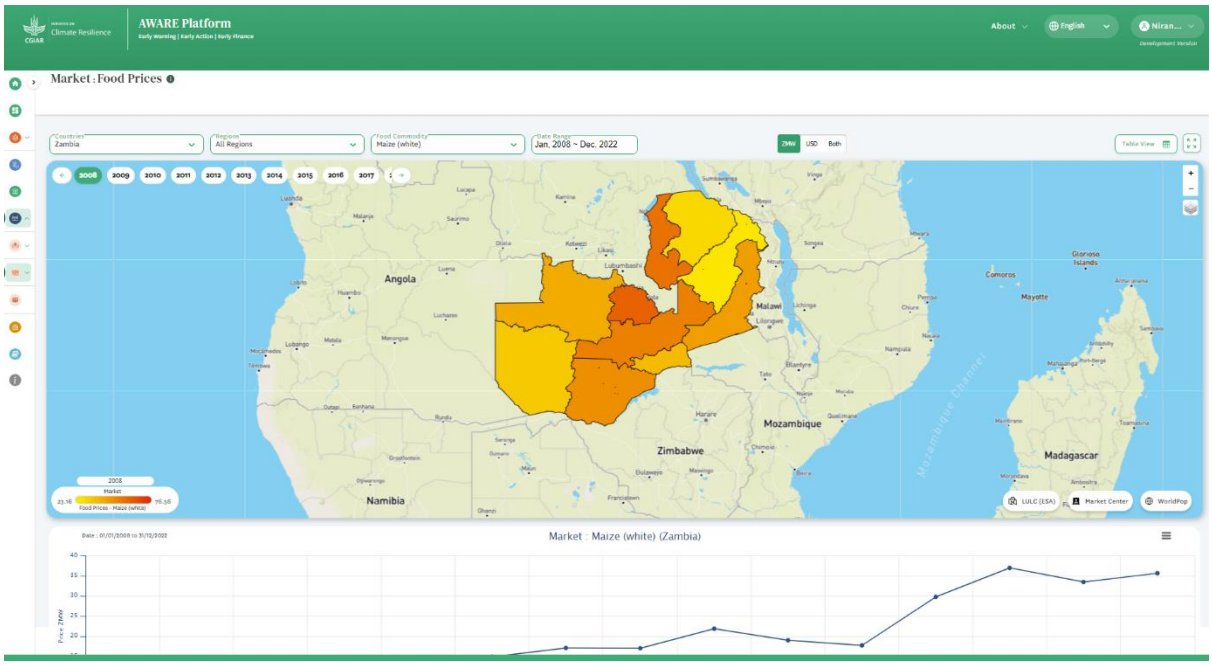


User

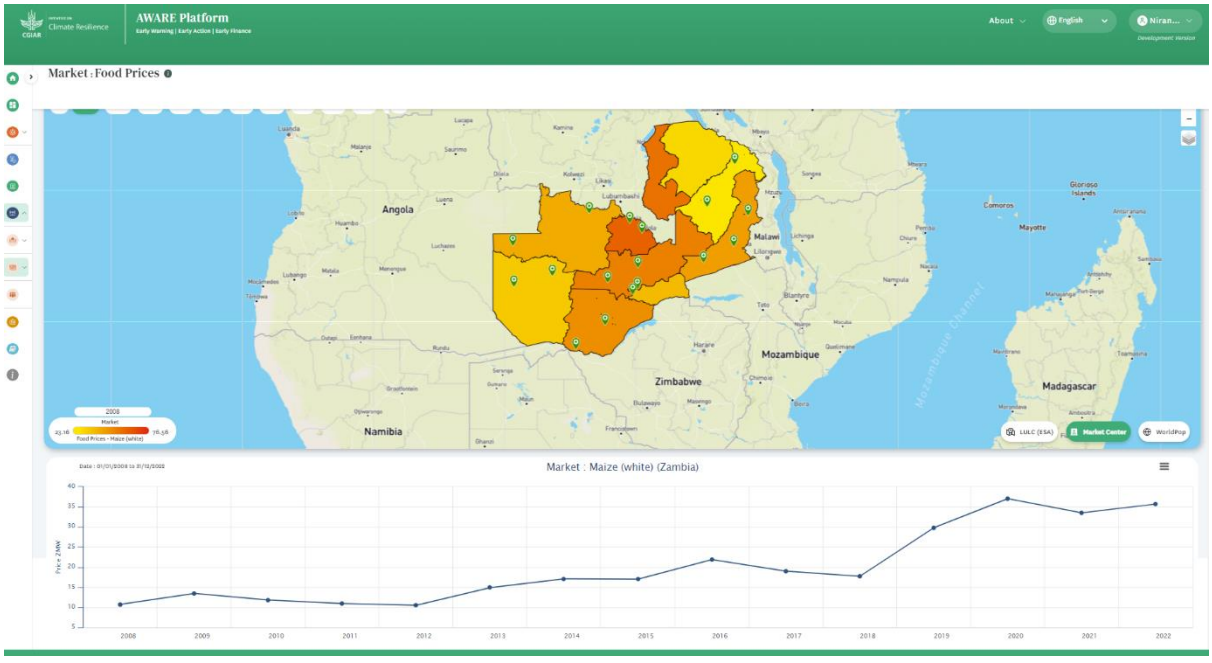
- see the changes in map and graph according to the selection of years, Regions, and District
- Use a similar approach to visualize the diarrhea data.

4.9. Market Prices

Importantly, market prices can be visualized using the same approach described for the health sector. Additionally, the system allows users to view market values in both USD and ZMA, providing a comprehensive understanding of the data.



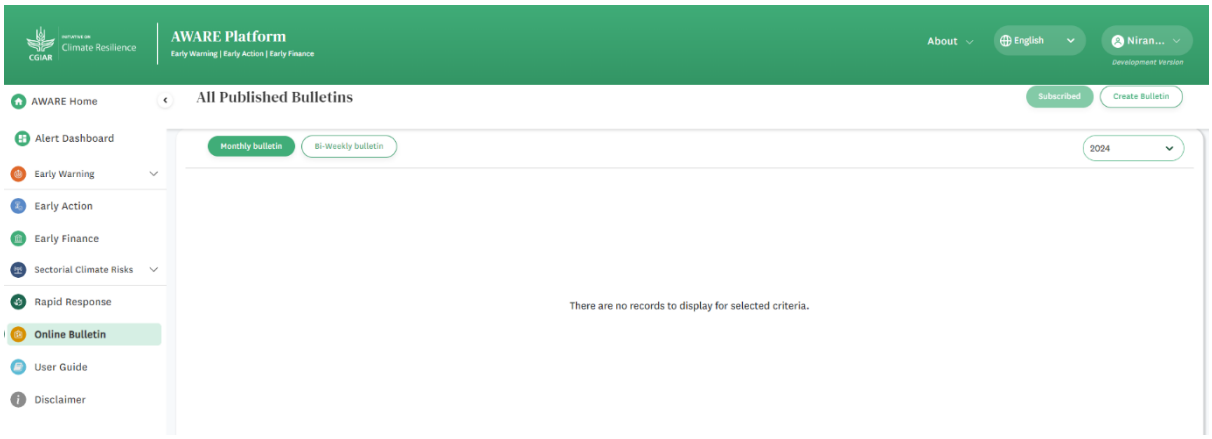
Furthermore, the system enables users to visualize market centers, population distribution, and land use and land cover by using the icons located in the lower right corner of the window.



4.10. Online Bulletin

Our online bulletin feature within the AWARE platform represents an innovative approach, empowering users to create, manage, and distribute digital bulletins with unparalleled ease and efficiency. This innovative solution is designed to cater to a diverse array of users, ensuring that anyone can leverage its powerful capabilities regardless of their technical expertise. The AWARE platform facilitates the preparation of both Monthly and Bi-weekly bulletins, utilizing a variety of predefined templates available within the system. These templates are designed to streamline the bulletin creation process, allowing users to focus on content rather than design.

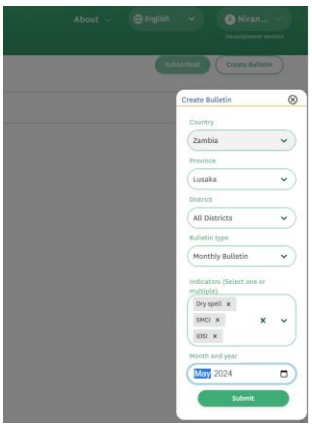
Moreover, the platform offers significant flexibility, enabling users to personalize their bulletins extensively. Users can incorporate dynamic indices and add textual content tailored to the specific preferences and requirements of the bulletin creator. This dynamic content capability ensures that each bulletin is not only informative but also highly relevant and customized to meet the specific needs of its intended audience.



To access the Online Bulletin, navigate through the module navigation panel and choose the Online Bulletin, as illustrated in the figure below. Once the user selects the desired year using the dropdown arrow located next to the year marker, it becomes possible to visualize the historical drought bulletin as well.

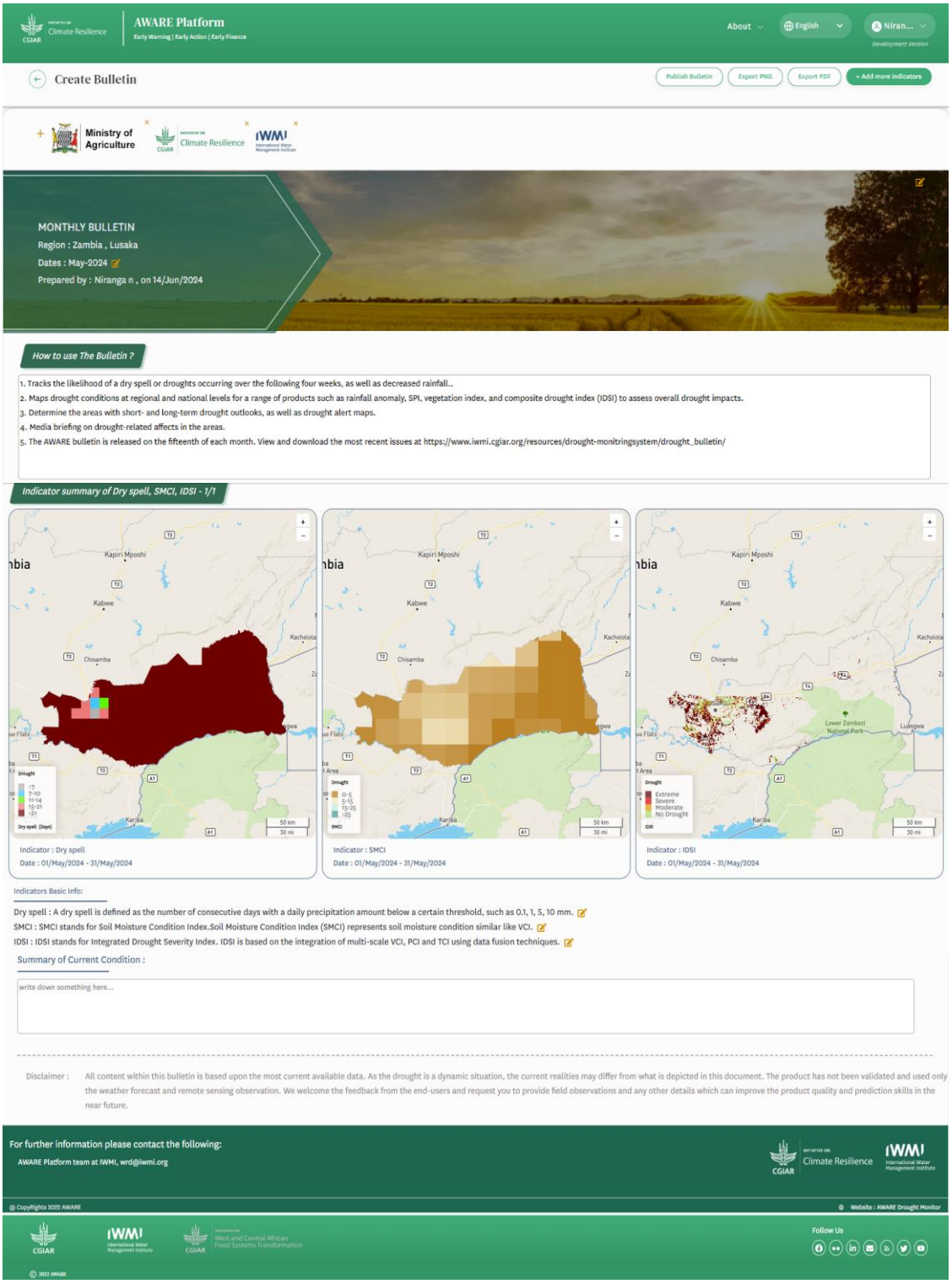
Create a bulletin

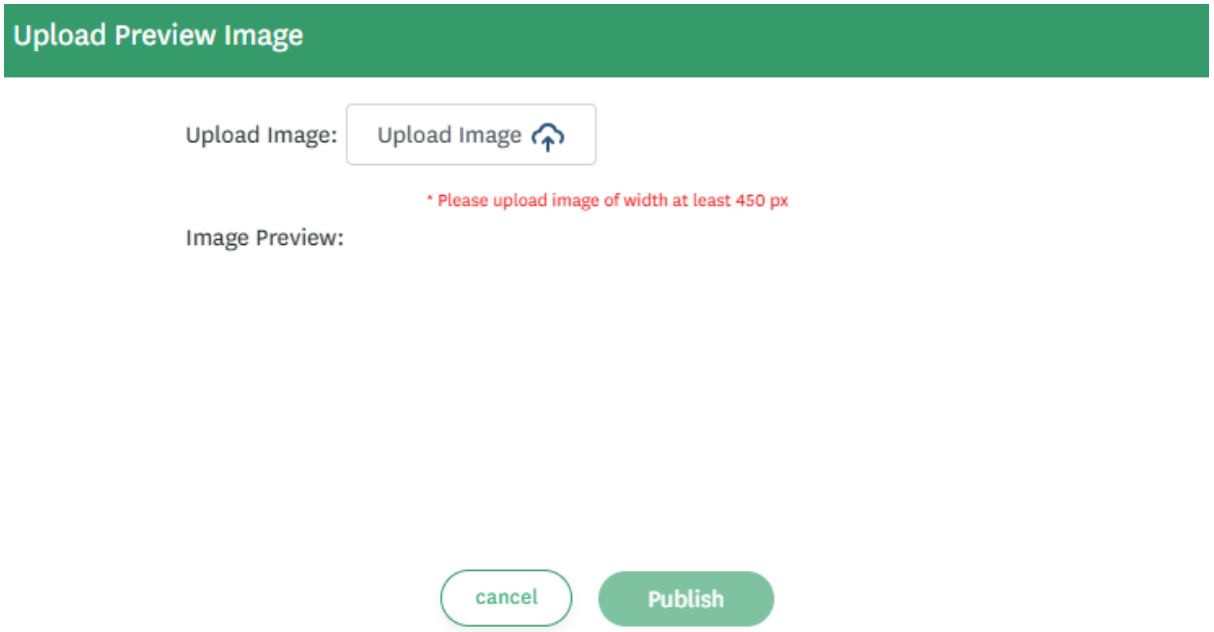
- To create a new Online Bulletin, please click on "Create Bulletin." This will open the parameter selection panel, where you can choose the geography, indicators, and timeframe, as illustrated below.



- Select the parameters as required and then click on submit to open the drought bulletin interface.
- User can edit the bulletin as needed and export it as an image or PDF by using the "Export PNG" or "Export PDF" icons.
- To add extra indices, please click on "Add More Indices."

- To publish the bulletin, click on "Publish Bulletin," upload the relevant image to appear as an icon, and then click "Publish." The bulletin will then appear in the Monthly Bulletin section.

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5. List of References

Amarnath, G.; Ghosh, S.; Alahacoon, N.; Nakada, T.; Rao, K.V.; Sikka, A. 2021. Regional drought monitoring for managing water security in South Asia. In: Amaratunga, D.; Haigh, R.; Dias, N. (eds.) Multi-hazard early warning and disaster risks. Selected papers presented at the International Symposium on Multi-Hazard Early Warning and Disaster Risk Reduction, Online Symposium, December 14-16, 2020. Cham, Switzerland: Springer. pp.465-481. https://doi.org/10.1007/978-3-030-73003-1_32

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