



VFDM Project: "Integrating Flood and Drought Management and Early Warning for Climate Change Adaptation in the Volta Basin"

Report of the VBA Regional Workshop in LOME
Training of country actors on the MyDewetra-VOLTALARM
early warning system

Lome, July 8th, 2022

Project Implementing Partners



With the technical support of:



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ACRONYMS AND ABBREVIATIONS

VBA	Volta Basin Authority
ANAM	National meteorological agency of Burkina Faso
ANPC	National agency for civil protection
ECOWAS	Economic Community of West African States
CIMA	International center for environmental monitoring
CILSS	Permanent Interstate Committee for drought control in the Sahel
DGRE	General directorate of water resources
DEIE	Directorate of studies and information on water
GLOFAS	Global Flood Awareness System
GWP-WA	Global Water Partnership West Africa
WMO	World Meteorological Organization
EWS	Early Warning System
NBS	Nature-Based Solutions
NFS	National Focal Structure
SODEXAM	airport, aeronautical and meteorological exploitation and development company (Côte d'Ivoire)
IUCN	International Union for Conservation of Nature
VFDM	Volta Flood and Drought Management
WASCAL	West African Science Service Centre on Climate Change and Adapted Land Use
WRC	Water Resources Commission

INTRODUCTION

From Wednesday July 6th to Friday July 8th, 2022, a regional workshop was held in the conference room of Hotel La Concorde in Lomé as part of the project "Integrating flood and drought management and early warning for the adaptation to climate change in the Volta Basin", the objective of which was to train actors from member countries of the Volta Basin Authority on the regional Early Warning System (EWS) VOLTALARM-MyDewetra. This regional workshop, organized by the consortium (VBA, GWP-WA and WMO) with the CIMA Research Foundation, was the continuation of the tenuous workshop from July 4th to 5th, 2022, on the finalization of the development of a regional program based on Nature-Based Solutions (NBS) in the Volta Basin.

Attending this meeting there were: the Executive Director of the VBA and his Deputy, the Executive Secretary of the Global Water Partnership for West Africa (GWP-WA), the World Meteorological Organization (WMO) representative, the representatives National Focal Structures of the VBA (NFS-VBA), technicians from the meteorological, hydrological and civil protection agencies of the VBA countries, CIMA Research Foundation, the project implementation partners and the Technical Support Partners (see list of attendance in the appendix).

The workshop took place in three stages:

- Opening ceremony of the regional workshop
- The progress of the work of the workshop
- The closing ceremony.

Day 1

1. Opening ceremony of the regional workshop

It was marked by five interventions, which were:

- Speech by the NFS representative of Togo;
- Speech by the representative of CIMA Foundation;
- Speech by the Executive Secretary of the Global Water Partnership for West Africa (GWP-WA);

- Speech by the representative of the World Meteorological Organization;
- Opening speech by the VBA Deputy Executive Director.

a. Speech by the NFS representative of Togo: In French

Mr. Gbadja AGOUDA, the NFS Togo representative, welcomed the participants to this Regional Training Workshop taking place in Togo. He mentioned the context of this training on the VOLTALARM platform, which is part of the Project "**Integrating flood and drought management and early warning for adaptation to climate change in the Volta Basin**". He wished a better handling of the tool and finally, a good stay to the participants.

b. Speech by the representative of CIMA Foundation: In English

Mr. Marco Massabò, Program Director at CIMA Foundation, presented this training session in the best possible way by recalling the climate risks in the basin region (especially floods and drought) and their possible impacts, which are numerous according to the studies carried out for the risk profiles of the Volta basin and also considering the effects linked to the demographic evolution in the coming years. After that, he mentioned that the floods have no borders and therefore limits, and that this workshop is an important moment of sharing and receiving among all the stakeholders of the project. He explained that the VOLTALARM system, developed by CIMA, is a platform that will inform decision-makers on issues related to floods and droughts, recalling that these phenomena can affect the populations of the Volta basin with an estimated loss of 50 million dollars. He ended his speech by saying he is delighted to help through this solution and by wishing that the system would be taken up by the experts and agencies of the riparian countries.

c. Speech by the representative Executive Secretary of the Global Water Partnership: In French

Mr. Armand HOUANYE, welcomed the participants and recalled that the project has a duration of 4 years, from 2019 to 2023, the launch of which was made in June 2019 in Abidjan.

He pointed out that the project will develop climate scenarios, as well as concept notes for disaster risk management projects through nature-based solutions. He said VOLTALARM-MyDewetra VoltAlarm will help monitoring climate change and securing investments against climate hazards. Finally, he thanked the participants.

d. Speech by the representative of the World Meteorological Organization: In English

Mr. Ramesh Tripathi welcomed the participants and said that the VOLTALARM-MyDewetra early warning system is a tool supporting flood and drought management and integrated water resources management (IWRM) and that this platform will enable forecasting and monitoring of hydrometeorological and climatic conditions. Finally, he wished the active participation of all the participants.

e. Opening speech by the Deputy Executive Director of the VBA:

Mr. Dibi MILLOGO welcomed all the participants in person and online.

He pointed out that climate change is affecting the Volta Basin through floods and drought and affecting millions of people. He said that VOLTALARM is a tool to be used and that the country technicians must take ownership of it in order to collect, process and disseminate information to the populations. He said that the VOLTALARM comprehensively addresses flood and drought management to also lead to the strengthening of the VBA observatory.

He invited the participants to be curious and ask questions and invited the trainers to be open with answers to the questions he wishes could come up very often....

He thanked the participants and announced the opening of the Training Workshop.

2. Workshop development

The actual work began with a *tour de table* for the presentation of the participants (face-to-face and online) and with the setting up of a Presidium, composed as follows:

☞ Establishment of the Presidium

The following presidium has been set up:

Presidium

- ✓ **President** :Togo (Mr ETOH)
- ✓ **Vice-president**: Burkina Faso (Mrs OUEDRAOGO)
- ✓ **2nd Vice-President**: Benin (Gildas TOSSOU)

Reporters

- **Mali** (Adama Mariko)
- **Côte d'Ivoire** (Ahmed Lamine SOUMAHORO)
- **Ghana** (Sylvester Darko)

After the adoption of the agenda, the various presentations followed successively.

- ***The first presentation was made by Mr NIAMPA Boukary,***

Mr. NIAMPA, in his intervention, recalled the context of the workshop, the objectives and the expected results

- ***The second presentation was made by Mrs. Anna MAPELLI,***

Mrs. Anna Mapelli presented the flood and drought risk profiles of the Volta Basin, going through the documents used, the working methodology, the climate projections and population growth considered, the impacts and key numbers in terms of losses caused by floods and drought in the Volta Basin and the strong recommendations made during the previous national training workshops from the technicians of project stakeholders.

A few questions after the two presentations:

- Why does the flood impact assessment not take into account the agricultural sectors?
- Why did you use RCP7 scenario instead of RCP8.5?
- Why were the projections not based on climatic zones in the Volta Basin?

The CIMA Foundation team responded by explaining that for the agricultural sectors the impacts of the floods were calculated in terms of hectares of cultivated areas affected because the estimate of the corresponding economic loss would have been based on far too many hypotheses. Regarding the climate projection scenario used, in the scientific community the RCP 7.0 scenario is increasingly considered to be the most realistic. This scenario is defined on a global scale, but the analysis of the projected hydrometeorological conditions was made on a local scale, which could allow taking into account in a certain way the climatic differences within the basin of the Volta.

- ***The third presentation was made by Mr. Marco Massabò,***

Mr. Marco Massabò presented the characteristics of the myDewetra.World system, which constitutes the basis of the VOLTALARM platform. It is a technological system that allows the integration in a single access point of data from different sources (satellite data, seasonal forecasts, hydrometeorological forecasting models, static data, etc.) to analyze them and extract useful information for early warning and early action.

A few questions after the third presentation:

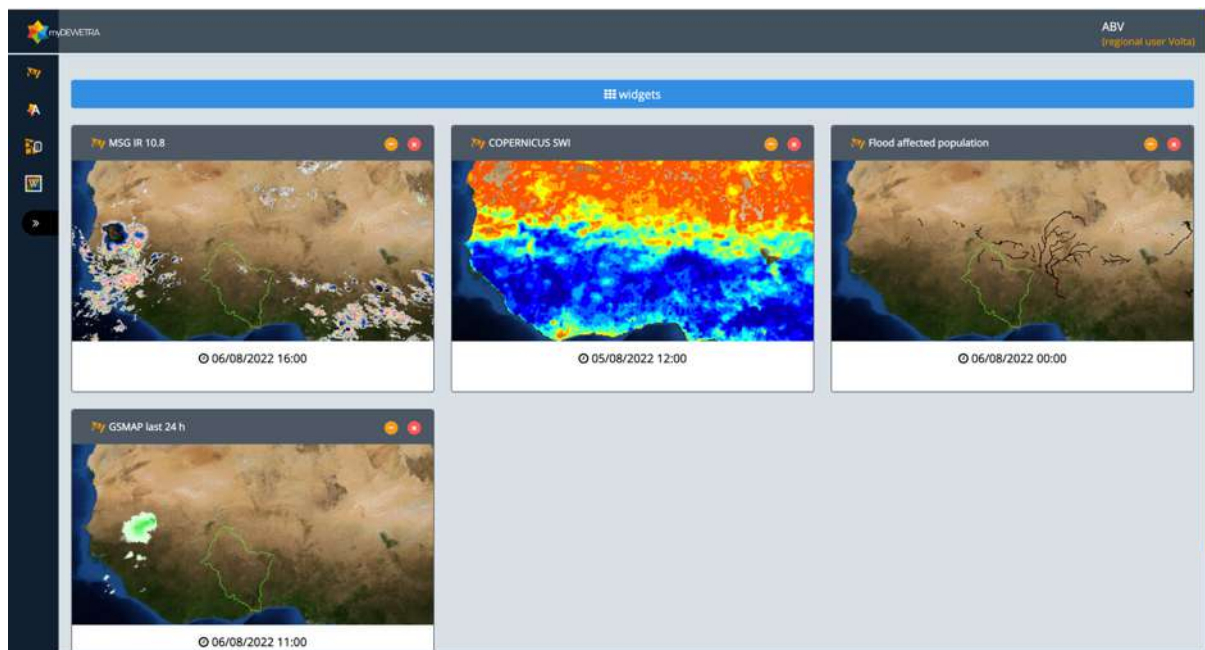
- How to maintain the system and ensure its sustainability?

- How to reconcile forecast data knowing that there are several forecasting tools?
- What is the resolution of the images?

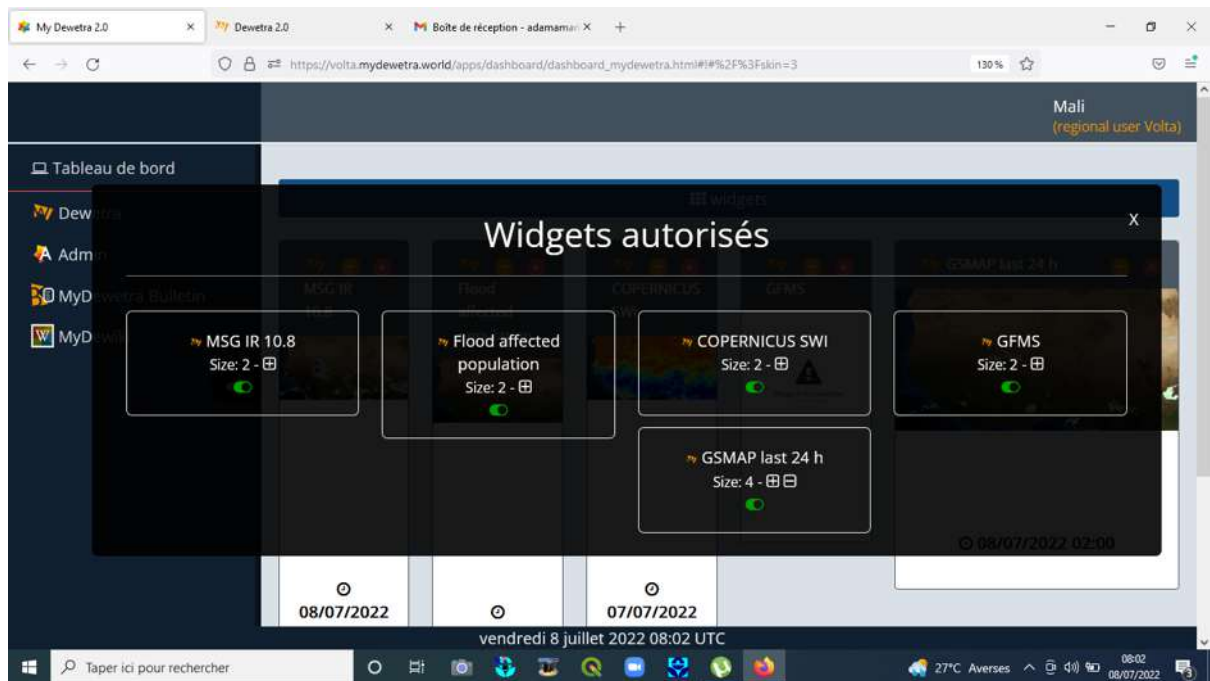
The CIMA Foundation team responded by explaining that during this workshop the aspects related to sustainability will be presented and that the central system myDewetra.World can be maintained by CIMA Foundation on behalf of the Italian Civil Protection Department (DPC) under an MoU agreement among CIMA, DPC and VBA. The use and the possibility of reconciling the different forecasting models and products will be presented in the following practical sessions, knowing that the key aspect remains the technical knowledge of experts from hydrometeorological agencies. Each satellite product integrated into the platform can have a different resolution, bearing in mind that these are global products: the online guide of the system, accessible from the dashboard, provides all the technical details of each product.

- ***General live demonstration of the platform: Ms. Anna Mapelli***

Mrs. Anna Mapelli presented, with a live demonstration, how to access the system and the functioning of the dashboard which consists of “widgets”, which are previews of certain products (at the user's choice) integrated into the platform.



Below is an example of the widget management interface, which can allow you to adjust the size of the windows of the different products in the dashboard.

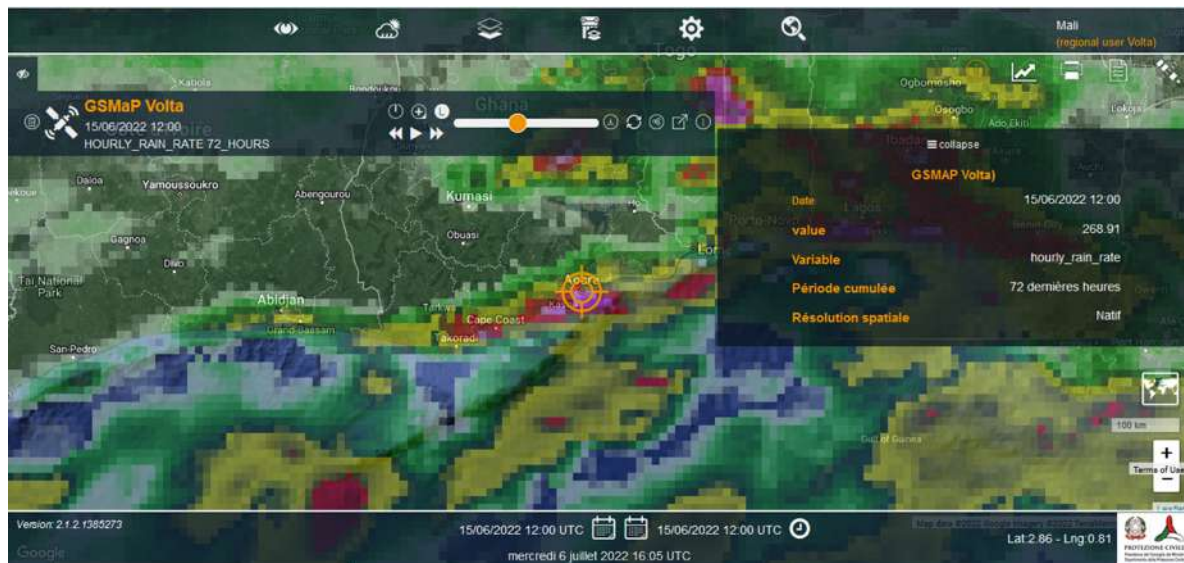


Then, Ms. Mapelli showed the data visualization platform and how to load the different layers and some features like transparency and spatial and temporal aggregation options, applicable to certain data.

Example 1: loading of the GSMaP Volta layer (precipitation estimation by satellite data)



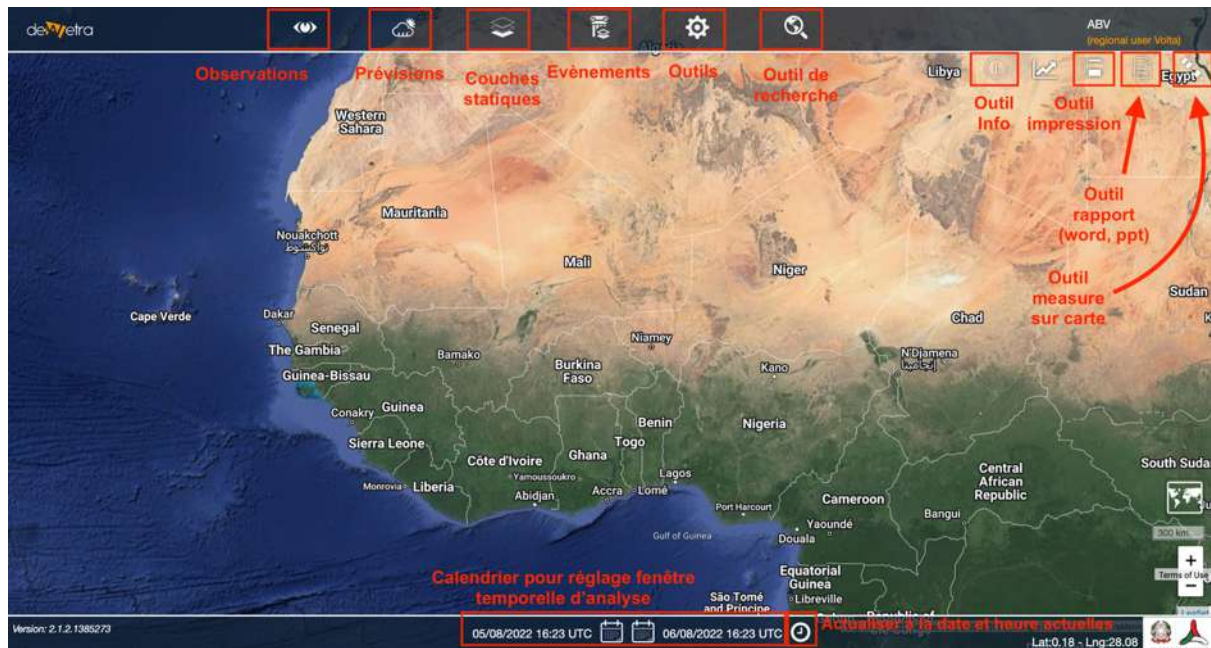
Example 2: applying transparency to the GSMap Volta layer (precipitation estimate by satellite data)



Example 3: Presentation of the GSMap Volta layer (precipitation estimate by satellite data) with temporal (last 72h) and spatial (administrative regions) accumulation



The live demonstration was continued with the explanation of the organization of the data in tabs, a short tour of each tab (Observations, Forecasts, Static layers, Events) and all the small tools available in the platform for the data analysis.



The live demonstration ended with a further look into the dashboard to show how to access the online manual and the application integrated into the system for the elaboration of the warning bulletins.



- ***Practice with the tool: the "OBSERVATION" tab (M. Andrea Libertino)***

All observation data or satellite estimation are grouped under the “Observation” tab. This tab provides access to data related to information related to hydrometeorological variables in the past and up to the present and to assess the quantities of different variables. Among the data currently available, there are also the 6 automatic hydrometeorological stations installed in pilot sites in the Volta basin.



Mr. Libertino went through several layers, showing how to use them, consult the data and extract quantitative information for the different variables.

Then, the participants were divided into teams and an exercise was given to each team to allow the participants to really get their hands on the tool and test the different functionalities for the observation data.

DAY 2:

The work of the second day began with the restitution of the practical activities of the 1st day before resuming with other practical sessions concerning the other information and tools of the VOLTALARM platform.

Practice with the tool (continued):

The second day was marked by the presentation of the other data tabs, namely:

- The various global and regional meteorological and hydrological forecast products under the “Forecasts” tab;
- The “Static Layers” tab and its various integrated products;
- The “Events” tab and its various integrated products;
- The “Tools” tab and its various integrated products.

Meteorological and hydrological forecasts through the Forecasts tab and its various integrated products (M. Andrea Libertino)

This tab brings together all the products that allow the user to view information related to forecasted meteorological and hydrological conditions and to assess the quantities of the

different variables. Under the category of “hydrological models”, some global and regional river flow forecast products have already been integrated, such as GLOFAS and FANFAR. Other hydrological forecasting products present in the Volta Basin, such as the FEWS for the White Volta and Oti sub-basins, could be integrated when access to local servers is rehabilitated.



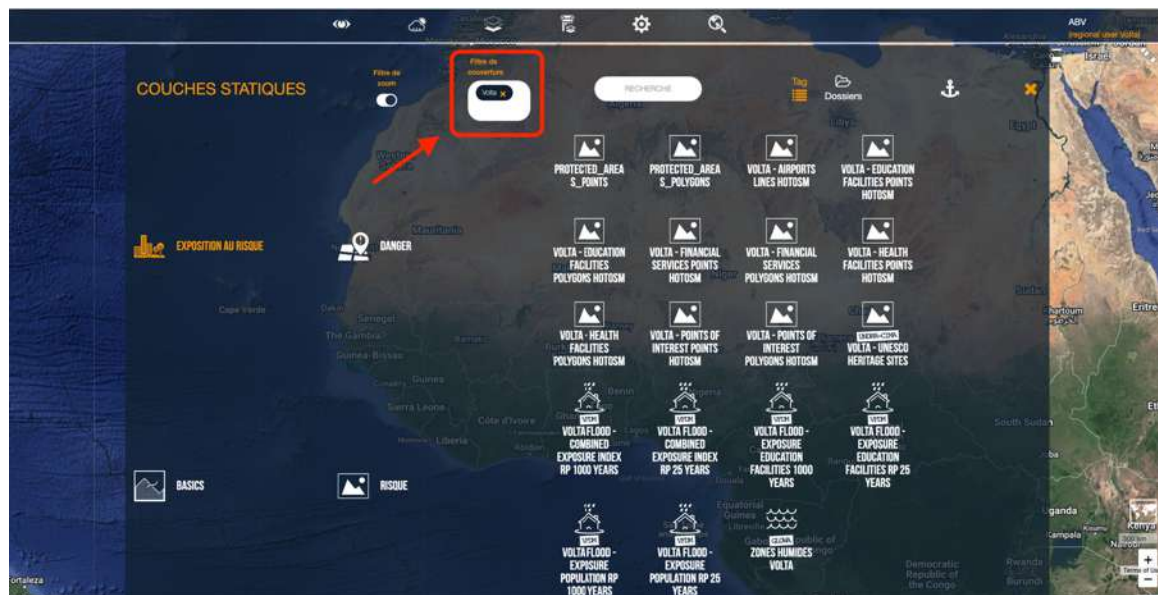
The different static layers under the “Static layers” tab (Ms. Anna Mapelli):

This tab brings together all georeferenced data with information related to the hazard, exposure and risk, as well as basic reference data (such as administrative boundaries, hydrographic network, watershed boundaries, etc.) in order to be able to overlay them with the dynamic information of hydrometeorological conditions and build risk scenarios in real time.



There are three filters that make it easier to find the products integrated into the platform: zoom filter, coverage filter and search filter.

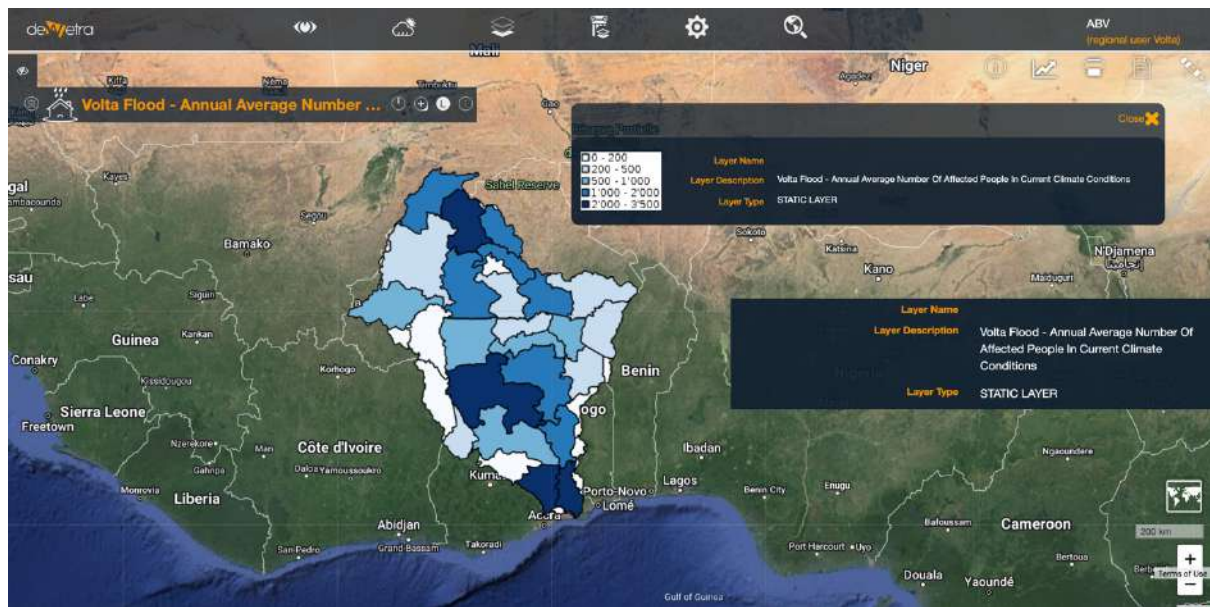
Example: Application of the coverage filter to visualize in the exposure data menu only the data concerning the extent of the Volta basin



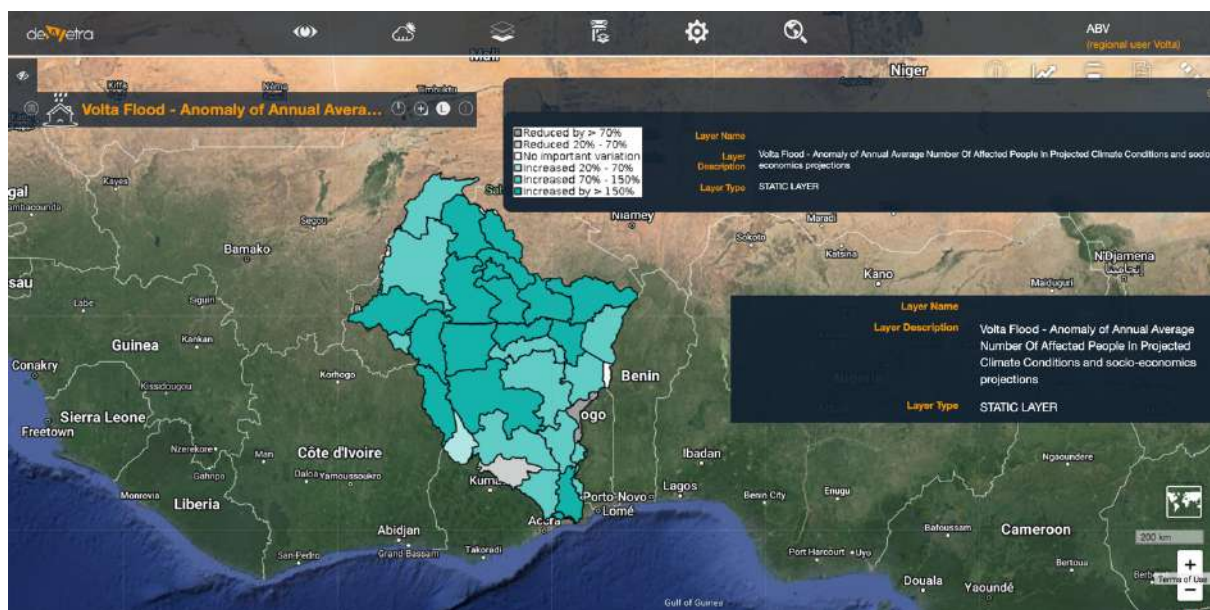
In particular, in the "Risk" category, users will be able to find the risk maps elaborated for the current and projected climate scenarios in the framework of the elaboration of the flood and drought risk profile in the Volta basin.



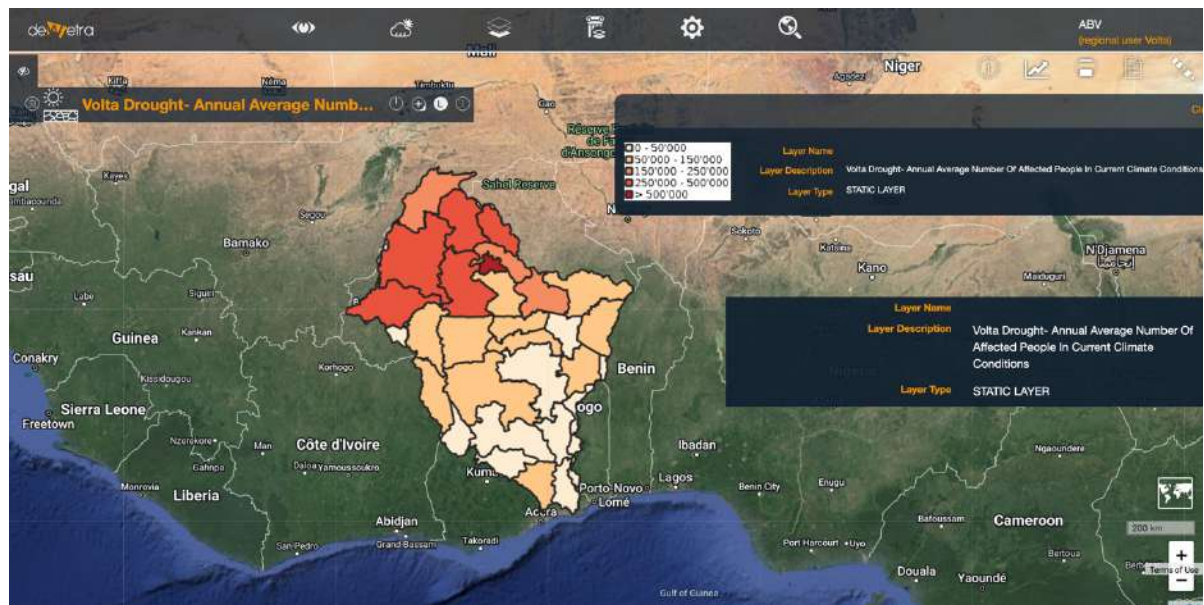
Example1: Flood risk map for the population under current climate conditions



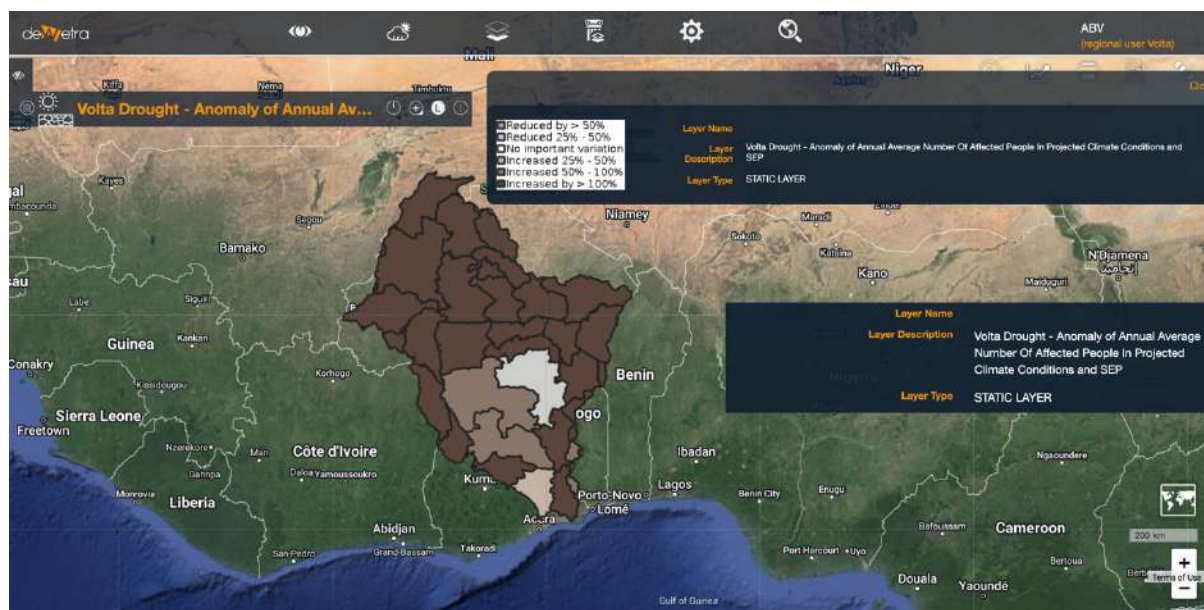
Example2 : Map of relative variation of flood risk for the population under projected climate conditions and with demographic evolution



Example3: Drought risk map for the population under current climate conditions

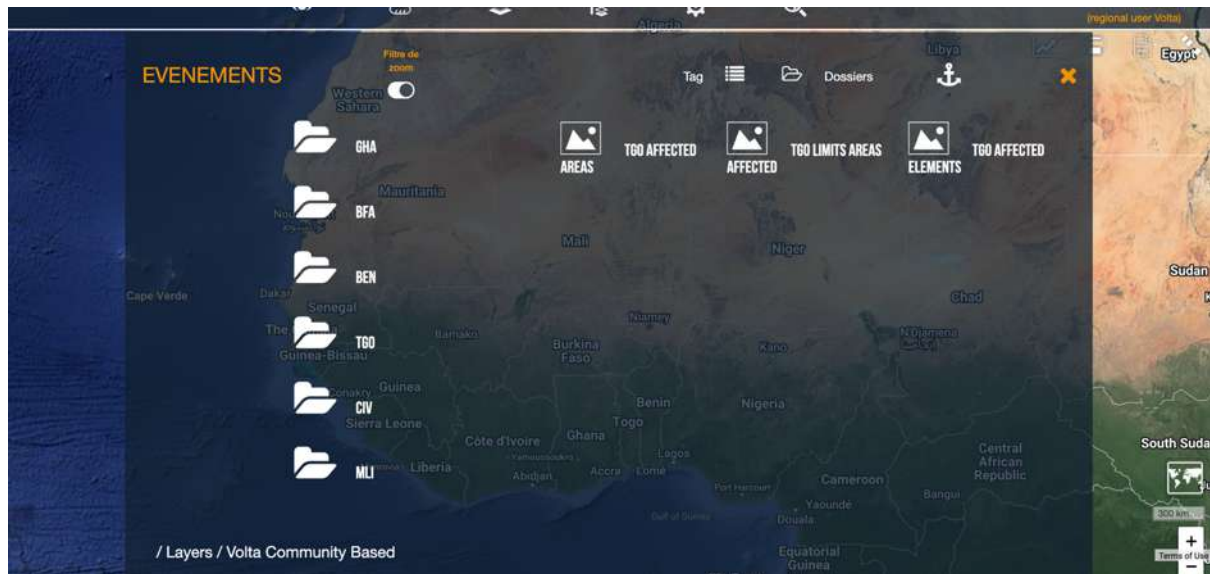


Example4 : Map of relative variation of drought risk for the population under projected climate conditions and with demographic evolution



“EVENTS” tab”:

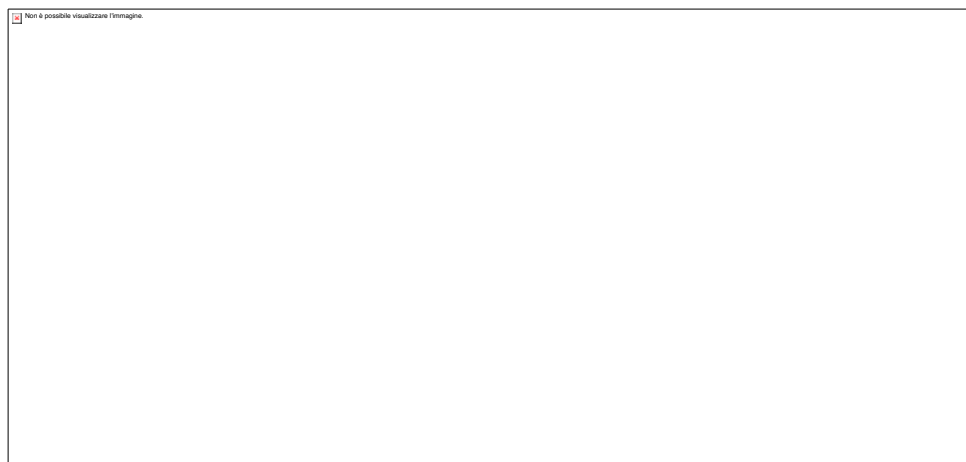
This part allows to visualize the data collected within a risk mapping activity at the local scale in 60 sites in the Volta Basin during the previous phase of the project. These are the boundaries and extent of areas typically affected by floods and droughts and features affected by flood and drought events in the past.



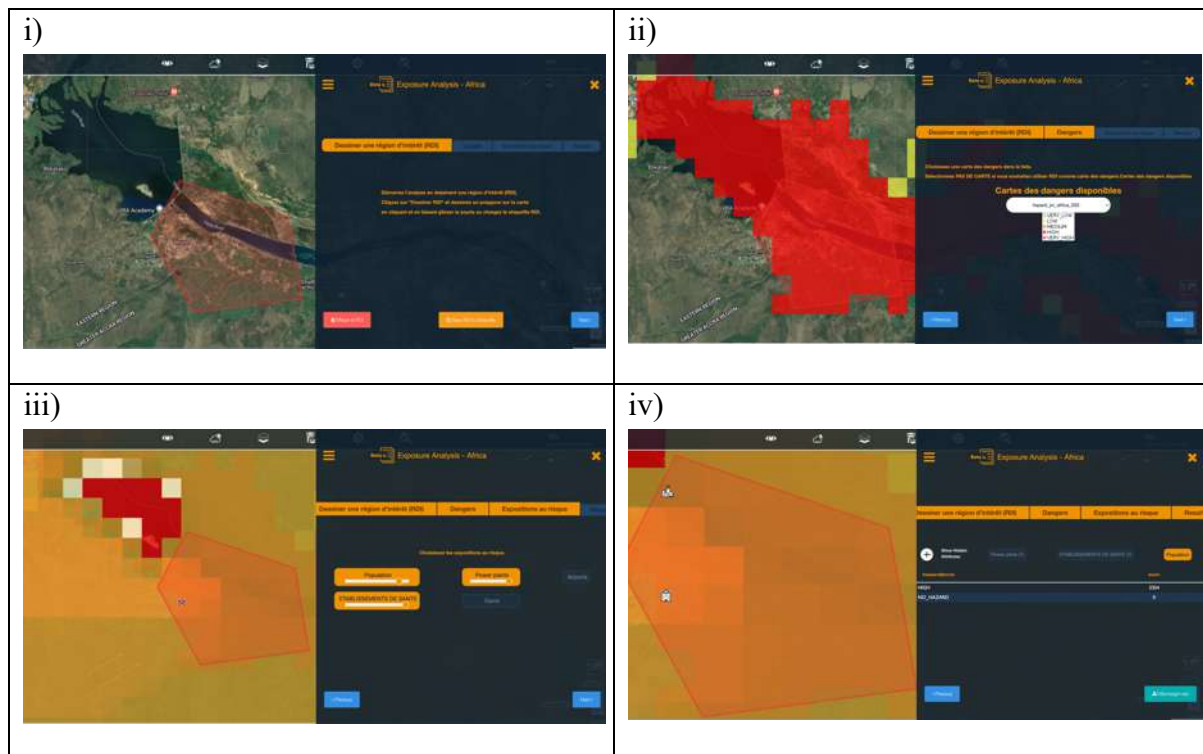
“TOOLS” tab:

This tab presents two tools:

- A tool that allows adding temporary layers from WMS services
- A tool that allows the user to carry out an exposure analysis at local scale.



With the exposure analysis tool, the user can (i) draw the area of interest for the analysis, (ii) select a hazard map with a specific return period (between several hazard maps available), (iii) select the exposed elements to be identified (between several categories of elements) and (iv) get the results of superposition between hazard and exposure presented as dynamic tables. The results can be downloaded in Excel format.

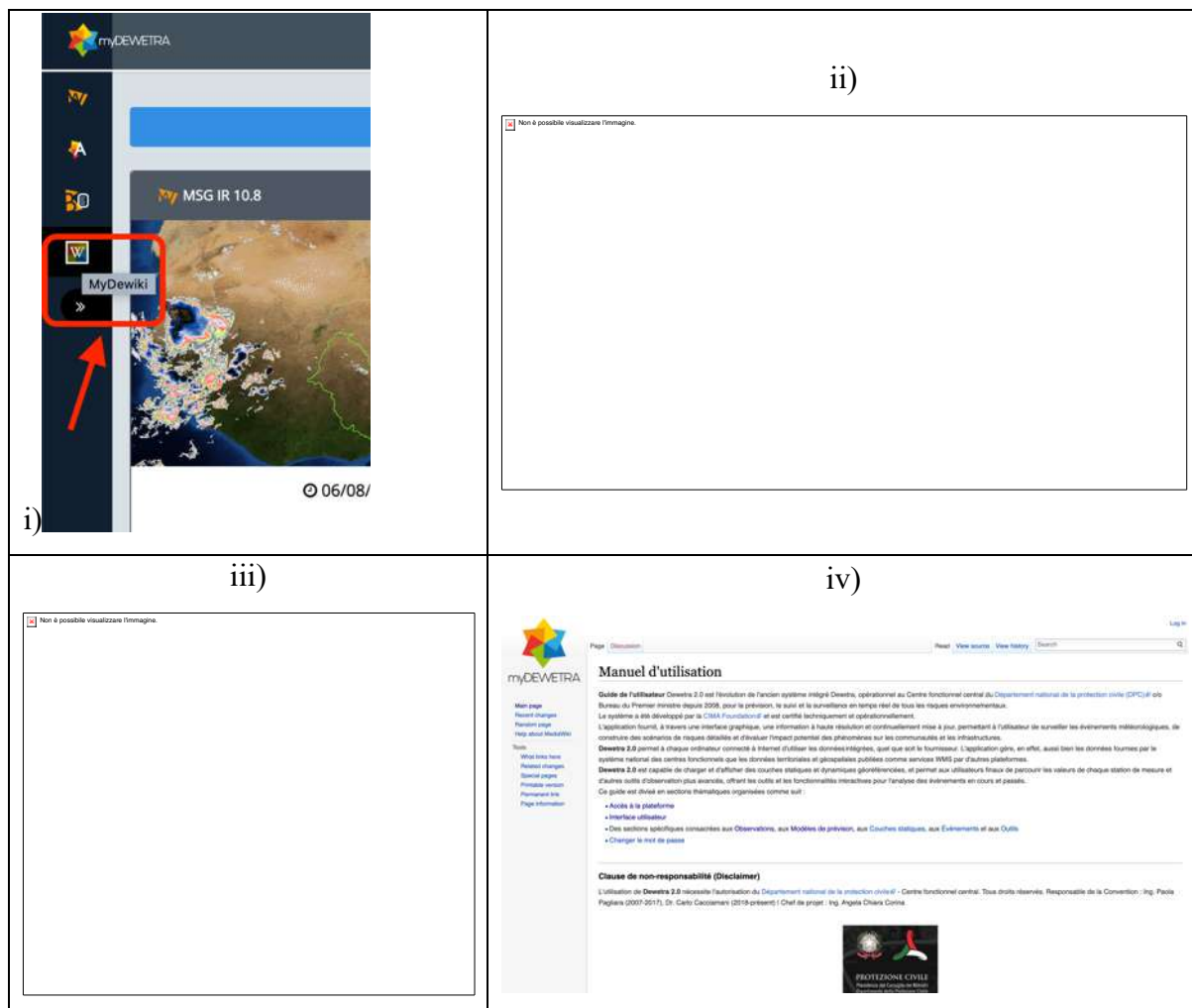


A few questions after the presentation of the interface:

- Does the platform make it possible to calculate the propagation time of a flood in the Volta basin?
- Is there a user manual for the platform and its different products?
- What models do GLOFAS and FANFAR use?

Elements of answers were given with the contribution of all the participants.

The CIMA Foundation team contributed by explaining that the platform itself does not allow the calculation of the propagation time of a flood, but the visualization of hydrological models, through different points of report on the hydrographic network, makes it possible to follow the evolution of the discharge over time in each reporting point (at least for the following 5 days) and therefore also to have information concerning the propagation of the flood along the hydrographic network. The user manual for the platform and the various products is accessible from the dashboard of the platform itself (see the passages to access it in the following table). The GLOFAS product is based on the LISFLOOD model, developed by the Joint Research Center (JRC), while the FANFAR products are based on the HYPE model, developed by the Swedish Meteorological and Hydrological Institute (SMHI).

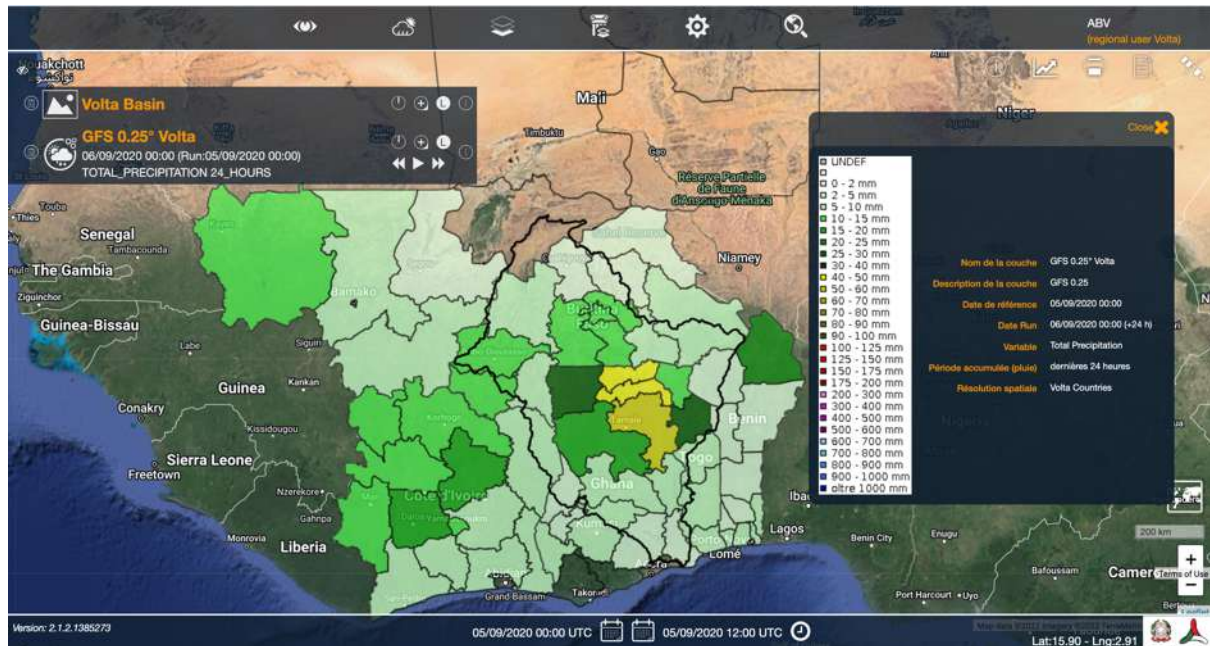


Practical case: Evaluation of observed and forecast hydrometeorological conditions for the edition of a warning map for the Volta Basin

The afternoon of the second day was characterized by a practical session of re-analysis of a past event using several products available in the platform and with the objective of managing to draw up a warning bulletin for the Volta Basin. The reference date for the analysis was September 5th, 2020 (the user should place himself in the system calendar between 00:00 and 12:00).

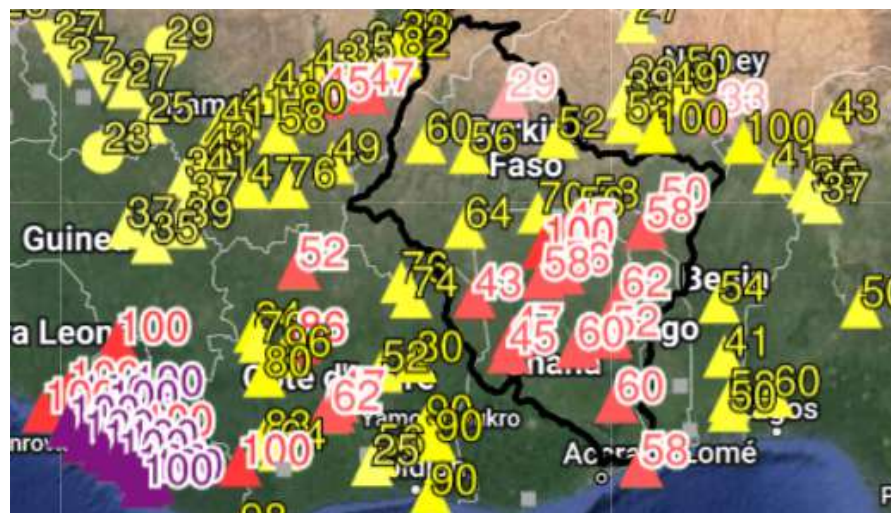
- Evaluation of cumulative precipitation over the next 24 hours and comparison with thresholds to identify a possible warning level

Forecast tab → **Meteorological Models** → **GFS 0.25 VOLTA**

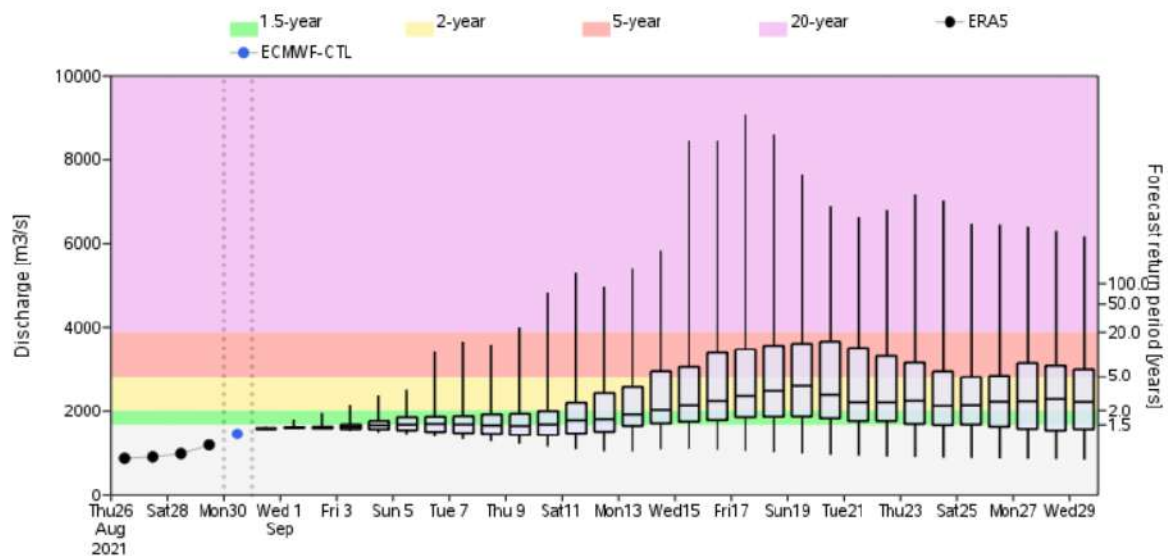


- Evaluation of the conditions of possible river flooding with analysis of the hydrographs, identification of the return period exceeded by the peak of the hydrograph (also considering the date of the exceeding) and comparison with threshold values to identify a possible warning level

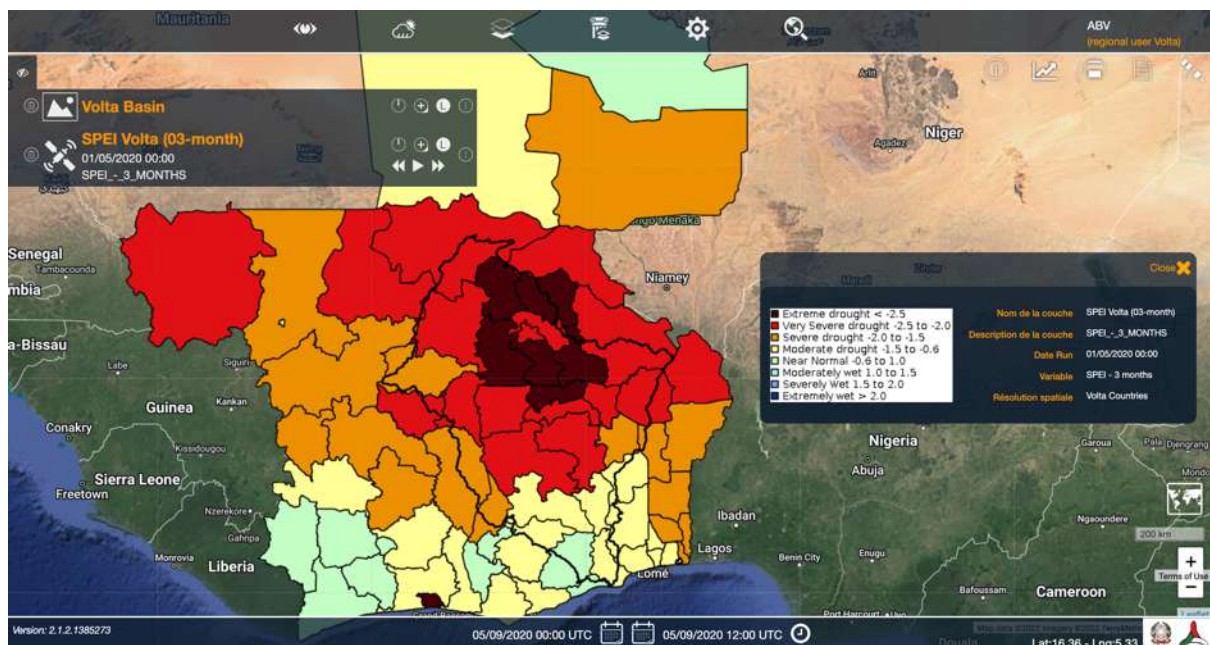
Forecast tab → Hydrological models → GLOFAS Reporting point



Example: The discharge hydrograph for a relevant area in the Volta Basin portion of Côte d'Ivoire for the period considered.



- Evaluation of drought conditions through the global SPEI index and comparison with threshold values to identify a possible warning level



DAY 3:

There was a short reminder of the previous day's sessions by Ms. Anna MAPELLI of the CIMA Foundation before starting the day's program.

The aim was to finalize the practical case started the day before with the objective to draw up the map of the warning bulletin at the level of the Volta basin, to be edited in the corresponding tool integrated into the VOLTALARM platform.

Integrated Bulletin tool home page for flood warning bulletins.

OLLETTINI | Version: 1.8.1.e879c3e ABV
Déconnexion Regional User Volta

TYPOLOGIE DE DOCUMENT

- Volta Floods
- Volta Drought

Volta Floods

[+ Nouveau](#)

ID	Statut	Date de création	Dernière Modification	Validité	Publié	Actions
4	Ouvert	08/07/2022, 06:38	04/08/2022, 08:53	08/07/2022 - 09/07/2	Pas Publié	✎ ↺ ✕ 🗑️ 📄
3	Fermé	08/07/2022, 05:54	08/07/2022, 06:30	08/07/2022 - 15/07/2	Pas Publié	✎ ↺ ✕ 🗑️ 📄
2	Fermé	08/07/2022, 04:50	08/07/2022, 05:52	08/07/2022 - 15/07/2	Pas Publié	✎ ↺ ✕ 🗑️ 📄
1	Fermé	07/07/2022, 08:16	07/07/2022, 08:18	07/07/2022 - 14/07/2	Pas Publié	✎ ↺ ✕ 🗑️ 📄

4 total

Once you have entered the newly opened bulletin, here is the page for editing the elements that are part of the bulletin (validity dates, map and analysis text).

OLLETTINI | Version: 1.8.1.e879c3e ABV
Déconnexion Regional User Volta

PAGE D'ACCUEIL / Volta Floods 4 [AFFICHER L'APERÇU](#) [GÉNÉRER PDF](#)

NO DATA NO ALERT **BE AWARE** BE PREPARED TAKE ACTION

Situation

[+](#)
[-](#)

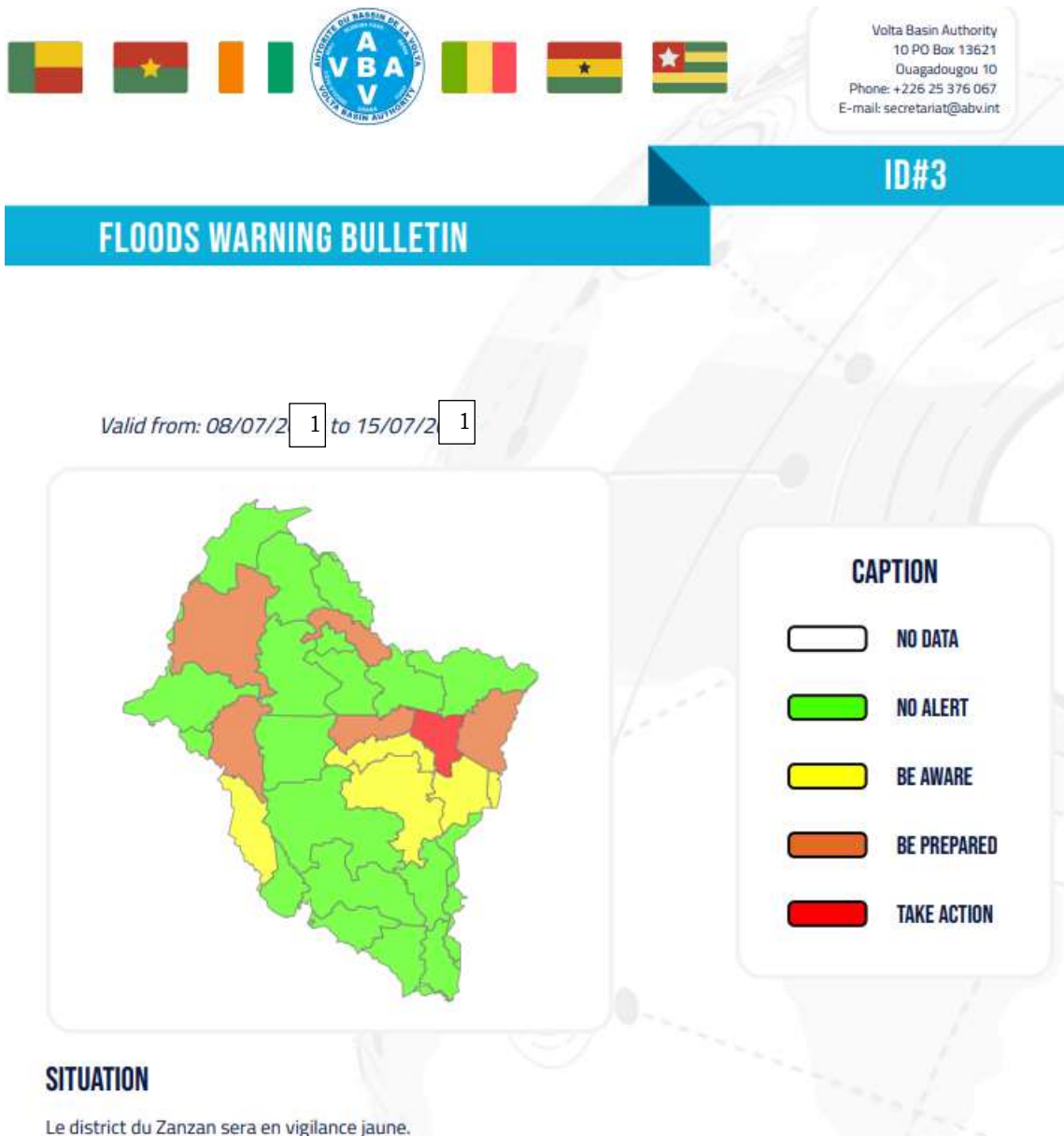
[Map](#)
[Situation](#)

Situation

🔍 **C** **B** **I** **U** **S** **x₂** **x³** **-** **x**

Le district de Zanzan sera en vigilance jaune.

The map was finally edited after the analyses of each country over the period considered and the bulletin could be finalized in a standardized PDF format for download.



After the coffee break we had a series of 2 presentations from CIMA Foundation by Anna Mapelli, Andrea Libertino and Marco Massabò on examples of application of myDewetra based systems in other countries and projects and how the platform would be improved with the integration of data from in situ hydro-meteorological monitoring networks and new products such as an impact-based flood forecast chain and a drought monitoring index based on existing datasets.

Marco mentioned the terms of the continuation of the implementation and operationalization of the platform by indicating that to guarantee the sustainability of the platform it would be good to base the system on the centralized engine of myDewetra-World (developed and maintained by the Foundation of CIMA research on behalf of the Italian Department of Civil Protection, DPC). He also indicated that, within the framework of an agreement which could

be signed between the VBA, CIMA and the DPC, the ordinary functioning of this central engine as well as the availability of global and continental products could be guaranteed even after the project, while the maintenance and availability of national and regional datasets will be responsibility of the different stakeholders as data providers.

The presentations were followed by discussion sessions on sustainability, data exchange, densification of the meteorological and hydrological observation networks.

The Executive Director of the VBA mentioned in his speech the forthcoming realization of other projects, such as "REWARD", which will start next year and which will allow the acquisition of stations helping to densify the observation network.

A discussion ensued regarding the hosting of the application in the VBA servers which could ensure the sustainability of the use of the VOLTALARM-MyDewetra platform. Mr. Massabò explained that the experience in other projects in the last 10 years had shown that real sustainability was guaranteed by the choice to rely on the central engine of myDewetra.world rather than on a local installation of the system. Then, he reassured the VBA regarding the establishment of an agreement between VBA, CIMA and DPC to set up the terms of the functioning of the platform with guarantee of maintenance of the central engine by CIMA Foundation on behalf of the DPC even after the project. The VBA therefore accepted the CIMA Foundation's proposal.

A certificate of participation was given symbolically to some participants.

➡ **Testimonials from the Workshop:**

Mr. Boris from the Meteo Benin, in his final speech on behalf of the participants, emphasized the problem of data sharing: when the project makes it possible to strengthen local capacities, to densify the observation and monitoring network, it is obvious that the data will be shared but it should be noted that in the case of a project that does not provide this type of support, it becomes difficult to participate in this exchange of data.

3. Recommendations from the workshop

At the end of the three (03) days of the workshop, the recommendations made are as follows:

R1: Sharing the recommendations of the Volta Basin Risk Profiles so that all participants integrate their additions and its final adoption; recommendations to the countries and the VBA will be the subject of the follow-up activities of the VFDM project.

R2: The storage and exploitation of local data through a server or cloud service must be considered for effective sustainability of data access through the VOLTALARM platform. The regional or national data servers will be connected to the main central engine of the myDewetra-World system, and the maintenance of these data servers will be responsibility of the regional or national stakeholders as data providers.

R3: In situ meteorological and hydrological data at the level of each country must be integrated into the platform for better reliability of the analysis of hydrometeorological conditions.

R4: The workshop invites the Directors of the national meteorological and hydrological agencies to support the process of operationalization of the platform by facilitating, as much as possible, the task of the focal points designated during the workshop for the support to the operationalization, maintenance and proper functioning of the VOLTALARM-myDewetra platform.

R5: Ensuring the sustainability of the platform by all means through the strong involvement of the Member States of the Volta Basin.

R6: Working on a connection between the VOLTALARM-MyDewetra system and the VBA observatory.

R7: Working to integrate a discharge-discharge model on the myDEWETRA platform. An impact-based flood forecasting system integrating the Continuum model (an open-source model developed by CIMA) and the risk profiles of the Volta basin could be put in place.

R8: Strengthening effectively the VOLTALARM-myDewetra platform with the contribution of all technical partners and actors involved in the project

R9: The workshop suggests that phase 2 of the project could consider the achievements of phase 1 project.

R10: The workshop participants agrees on the implementation of the regional EWS VOLTALARM-myDewetra platform based on the centralized engine of myDewetra-World. It is also recalled the commitment of the CIMA Foundation to guarantee, free of charge and within the framework of an agreement between VBA, CIMA and DPC, the operation of the central engine myDewetra-World, being the basis of the VOLTALARM platform.

R11: Sharing the knowledge acquired with all colleagues within the various agencies with the objective of providing sustainability to the use of the platform

R12: the VBA should strengthen cooperation with universities for the supervision of research work on the themes related to the project.

4. Closing ceremony :

All the officials thanked the participants for their effort throughout this training period; thanks to the trainers and all the logistics put in place within the framework of this workshop were also expressed.

Mr. DESSOUSSI Robert, Executive Director of the VBA, was delighted with the holding of the workshop and the strong recommendations that were formulated for the VBA, the countries and the technicians. The workshop provided training on the VOLTALARM-MyDewetra platform, which is a tool that will undoubtedly provide a solution for warnings in the Volta Basin. Especially he highlighted the integration of more refined models with better resolution that will provide a more notable impact in the development of warning maps.

Mr. AGOUDA KPADJA, National Focal Structure of VBA Togo representing the Minister of Water and Village Hydraulics of Togo, took the floor to thank all the participants again, and was also delighted of the choice of Togo to host these joint regional workshops.

Finally, on behalf of the Minister, Mr. AGOUDJA declared the ceremony closed.

The session chairman

Mr ETOH (Togo)

The reporters

Mr. Ahmed Lamine SOUMAHORO (Côte d'Ivoire)

Mr. Adama MARIKO (Mali)

Mr. Sylvester Darko (Ghana)

Annexes

Annex 1: attendance list

ATTENDANCE LIST FOR THURSDAY 07 JULY 2022

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
1	DESSOUASSI Yaovi Robert	H	VBA	OF	Burkina Faso	robertdessouassi@gmail.com _ Tel: (+226) 77719797
2	TRAORE Daouda	H	DNH	SFN-VBA	mali	ddsspdnh@gmail.com Tel: (+223)76387303
3	Pr KOUAME Koffi Fernand	H	DGRE/MINEF	VBA Focal Point Representative	Ivory Coast	dgpre.minef@gmail.com Tel: (+225) 0748655978
4	HOUNKPONOU K. Saïd	H	Directorate General of Water	DGEau/SFN VBA	Benign	kolawoles79@gmail.com Tel: (+229) 97686896
5	OUEDRAOGO/TAPSOBA Christine	F	DGRE/MEEA	DEIE/SFN VBA	Burkina Faso	tctapsoba@yahoo.fr

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
6	HOUANYE Armand	H	GWP-AO	Executive Secretary	Burkina Faso	armand.houamye@gwpao.org
7	TEBLEKOU Maxime	H	GWP-AO	Project manager	Burkina Faso	maxime.teblekou@gwpao.org
8	AGOUDA Kpadja	H	DRE/ME HV	Director / SFN VBA	Togo	agoudakpadja@yahoo.fr Tel: (+228) 90266284
9	RUIZ Veronica	F	IUCN	Program coordinator	SWISS	veronica.ruiz@iucn.org
10	NIAMPA Boukari	H	VBA	VFDM CTP	Burkina Faso	niampaboukary@yahoo.fr
11	RAMESH Tripathi	H	WMO	Project coordinator VFDM	SWISS	rtripathi@wmo.int
12	MAPELLI Anna	F	CIMA	Project manager	Italy	anna.mapelli@cimafoundation.org
13	MILLOGO Dibi	H	VBA	DEA	Burkina Faso	fredmilfr@yahoo.fr

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
14	OUYA Jean-Marie Durel	H	VBA	DAAF	Burkina Faso	jmouya.VBA@gmail.com
15	NIKIEMA P. Michel	H	WMO	Project Officer	WMO Abuja/Nigeria Regional Office	pmnikiema@wmo.int Tel: (+234) 9048146382
16	ASAMOAH Joshua	H	Ghana Meterological agency	Meterologist	Ghana	joshuaasamoah19@gmail.com Tel: (+233) 24862173
17	MUALA Eric	M	Water Resources Commission (WRC)	Principal Monitoring Officer/SFN VBA	Ghana	ericmuala25@gmail.com Tel: (+233) (0) 234502258
18	Silvestre DARKO	H	HSD Ghana	HCAD OF Hydrology	Ghana	slykwesi@yahoo.vsom
19	AGBOTO Aba	F	DGMN	Head of watch and weather forecasting division	Togo	ablaagb@yahoo.fr Tel: (+228) 91975641

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
20	ISSAOU Latifou	H	DGMN	General director	Togo	isslat@yahoo.fr Tel: (+228) 93286661
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22	DJOBOS Sadikou	H	ANPC	Chief natural risk prevention section	Togo	djobosadikou@gmail.com Tel: (+228) 91807991
23	ADJEKLO Kodjo Amétépé loved	H	ANPC	Geologist-Geomatician-Topographer	Togo	aimeametepe92@gmail.com Tel: (+228) 70137223
24	ANATO Boris Polynice	H	BENIN WEATHER	Director of Meteorological Forecasting and Observation	Benin	banato@meteobenin.bj Tel: (+229) 66431818
25	TOSSOU Gildas	H	DG-Water	Head of the Water Resources and Risk	Benin	giltosfr@yahoo.fr Tel: (+229) 97728752

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
				Prevention Department		
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28	MARIKO Adama	H	National Directorate of Hydraulics	Hydraulic Engineer	mali	adamamariko111@gmail.com Tel: (+223) 74526462
29	DENE Salifou	H	VBA	IT Expert	Burkina-Faso	dene.VBA@gmail.com
30	ZONGO Gerard	H	DGRE/MEEA	Head of GDRE department	Burkina-Faso	zongo.gerard@gmail.com

No.	LASTNAMES AND FIRSTNAMES	SEX (M/F)	INSTITUTION	FUNCTION	COUNTRY	CONTACTS (Email and Tel)
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34	Andrea LBERTINO	H	CIMA	Former	Italy	andrea.libertino@cimafoundation.org
35	ZOUNGRANA Rayimwende	H	ANAM-Burkina Faso	Weather Forecaster	Burkina-Faso	rayimwendvz@yahoo.fr Tel: (+226) 54468770
36	TRAORE Ibrahima	H	Mali-Weather	Forecaster	mali	ibrahimatraor7@gmail.com Tel: (+223) 70717195

Annex 2: some images of the workshop







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