

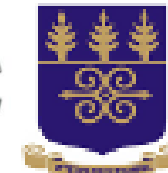
# MiFMASS

(Multi-Scale Flood Monitoring and Assessment Services for West Africa)

<https://gmes-mifmass.net>

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**GMES  
AND AFRICA**

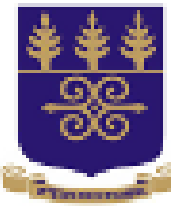


African  
Union 



Project funded by  
the EUROPEAN UNION

# Outline



**01.**

## About MiFMASS

The objectives, purpose, participants, stakeholders and the beneficiaries of the project.

**02.**

## Aims, Objectives & expected deliverables

List of deliverables to be delivered

**03.**

## AI Related Components

The aspects of the project that AI is considered

**04.**

## Discoveries and outlook

Findings so far and future plans

# About MiFMASS

01.

## MiFMASS An Action of GMES & Africa

- Multi-Scale Flood Monitoring and Assessment Services for West Africa (MiFMASS) is one of the actions under the Global Monitoring for Environment and Security and Africa.(GMES & Africa is a program of European Union and African Union.



02.

## CSSTE Ile-Ife, Nigeria is grant recipient

- The Centre for Space Science and Technology Education (CSSTE) located within Obafemi Awolowo University Ile-Ife, is one of the grant recipients of GMES & AFRICA support programme.

03.

## CSSTE Ile-Ife to manages MiFMASS

- Under this support programme, CSSTE will be managing Multi-Scale Flood Monitoring and Assessment Services for West Africa using Earth Observation satellite data.

04.

## Overall Objectives

- The overall objective of the project is “to enhance the efficiency of flood monitoring, assesment and management in West Africa by providing Earth Observation (EO) based services on real time basis to disaster management organisations and boosting their human capacity to adapt to their services”.

# Cosortium members



**INE-NWI – National Water Institute, Benin**



**UG – University of Ghana, Department of Earth Sciences, Ghana**



**VBA – Volta Basin Authority, Burkina Faso**



**CSIR-WRI – Council for Scientific and Industrial Research-Water Research Institute, Ghana**



**ISESTEL - Institut Supérieur d'Etudes Spatiales et Télécommunications, Burkina Faso**

**CU-SIGETA**



**CURAT - Centre Universitaire de Recherche et d'Application en Télédétection, Cote d'Ivoire**

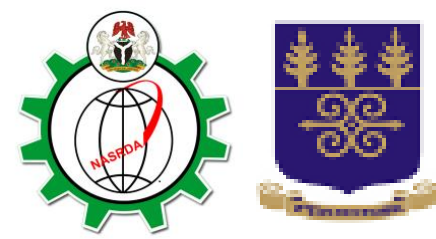


**Centre for Space Science and Technology Education in English, Nigeria –**

**Dr Ganiy Agbaje**

**Consortium Lead and Regional Implementation Centre (RIC)**

**Seven Institutions across  
five (5) West Africa  
Countries – Ghana, Benin,  
Cote D'Ivoire, Burkina Faso,  
and Nigeria**



# Aim & Objectives

## Aim

To enhance the efficiency of flood monitoring, assessment and management in West Africa by providing **Earth Observation (EO) based services** on near real time basis to disaster management organizations and boosting their human capacity to adapt to these services.

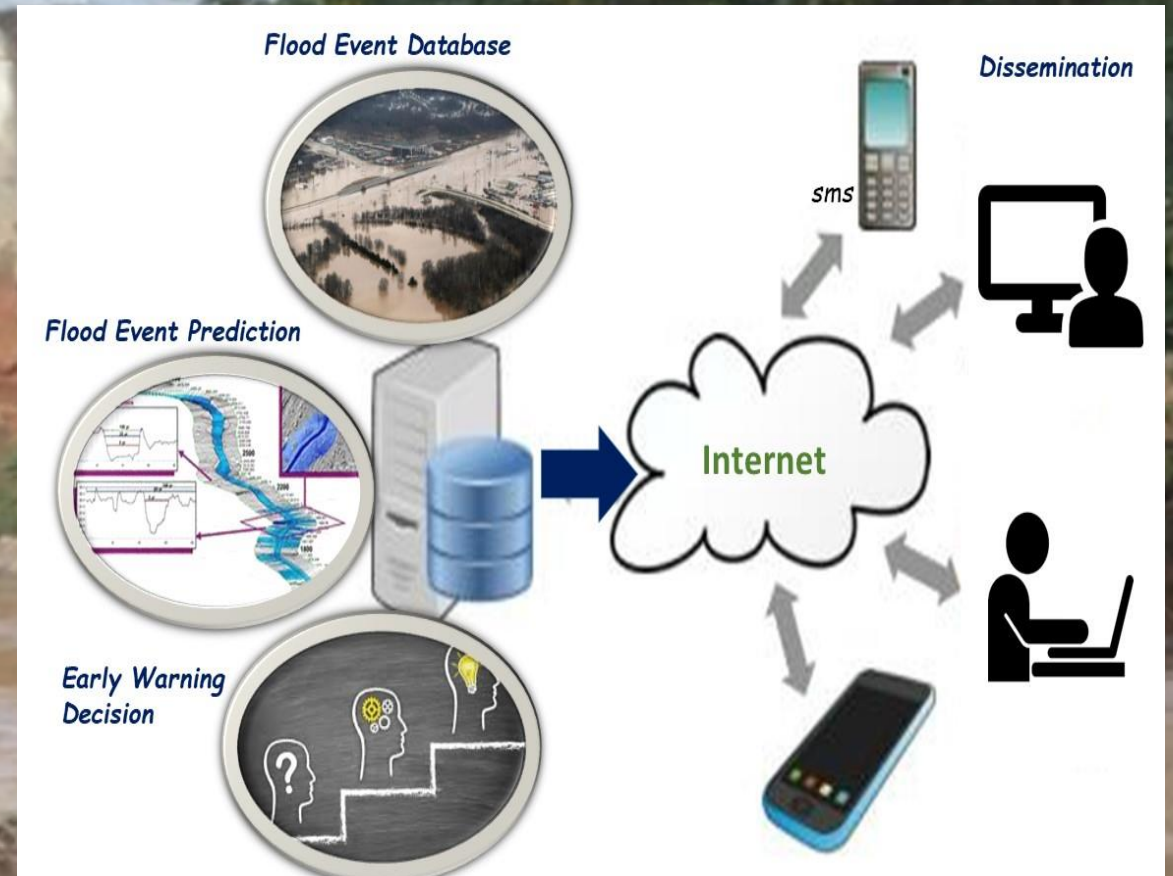
## Specific objectives

- Establish an **updatable flood event database**
- Provide DMOs timely information before, during and after flood events
- Strengthen the capacities of DMOs and other **target groups** (Farmers, Local residents along flood plains) in the use of Earth Observation data for flood monitoring, Assessment and management



# Expected Deliverables

- ❑ Develop an **updatable regional scale flood event database** of the Study Area for the five countries
- ❑ **Establish a Flood Forecasting and Assessment system**
- ❑ Establish an **image acquisition, processing and analysis system** to map flood extent during, or immediately after, flood events from EO data
- ❑ Develop a **damage assessment module** that will assist DMOs evaluate the degree of damage after flood events
- ❑ **Capacity Building**



# Flood Event Database

August 27, 2021

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## GMES & Africa - Flood Event Database

**Flood reference**  
Ibadan/05/07/2020

**Started date**  
2018-03-24

**Started time**  
10:25:00

**Duration**  
3 day(s)

**Intensity**  
3 meters(s)

**Estimated area covered**  
6 squared kilometer(s)

**Speed of flood**  
Slow

**Number of people affected**  
5

**Number of males displaced**  
5

**Number of females displaced**  
8

**Total estimated economic loss**  
546589

**Residential buildings affected**  
6

**Number male of deaths**

**Number of males injured**  
6

**Number of females injured**  
78

**Commercial buildings affected**  
0

**Estimated size of farmland inundated**

MIFMASS

Dr. Jude Adeleke

- Dashboard
- Add an Event

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# Geospatial database



Consortium members - MIFMAS | Geospatial Database - GMES-MIFMAS | August 27, 2021

Not secure | gmes-mifmass.net/index.php/geodatabase/ | Update

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Stream - CSSTE | Soils - CSSTE | Geology - CSSTE | Land Use - CSSTE

Landmark - CSSTE | Infrastructures - CSSTE | Buildings - CSSTE | Administrative Cities - CSSTE

10 m Contour - CSSTE | Villages - Volta Basin | Spot Heights - Volta Basin | Soils - Volta Basin

Powered by GeoNetwork 3.10.3.0 | About | Github | API | Share on social sites | f | in | e |

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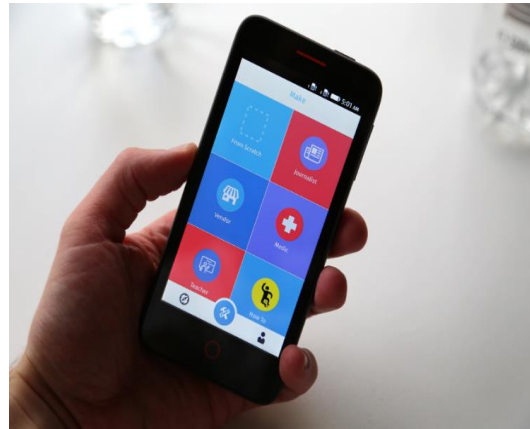
gp.gmes-mifmass.net:9090/geonetwork/srv/eng/catalog.search#/metadata/62b940f269c7fd238d18262518c4769b35f14e34



# Product dissemination channels



Website



Smartphones apps



Short Message Service  
(SMS)

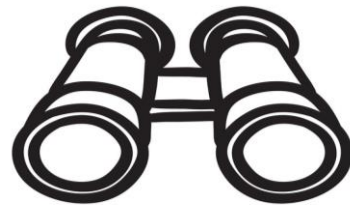


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# Artificial Intelligence Related componets



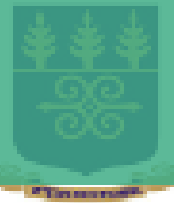
**Flood forecasting**



**Forecast Visualisation**



# Artificial Intelligence Related componets



Hydrological  
modelling

**VS**

Machine learning (ML)  
techniques



# Artificial Intelligence Related componets



## Hydrological modelling

- Professional expertise required
- Steep learning curve
- Modelling depends on dem, and hydraulics of the basin
- Difficult to implement online scenarios
- Cumbersome processes
- Requires a lot of data (e.g. rainfall, water discharge, etc)

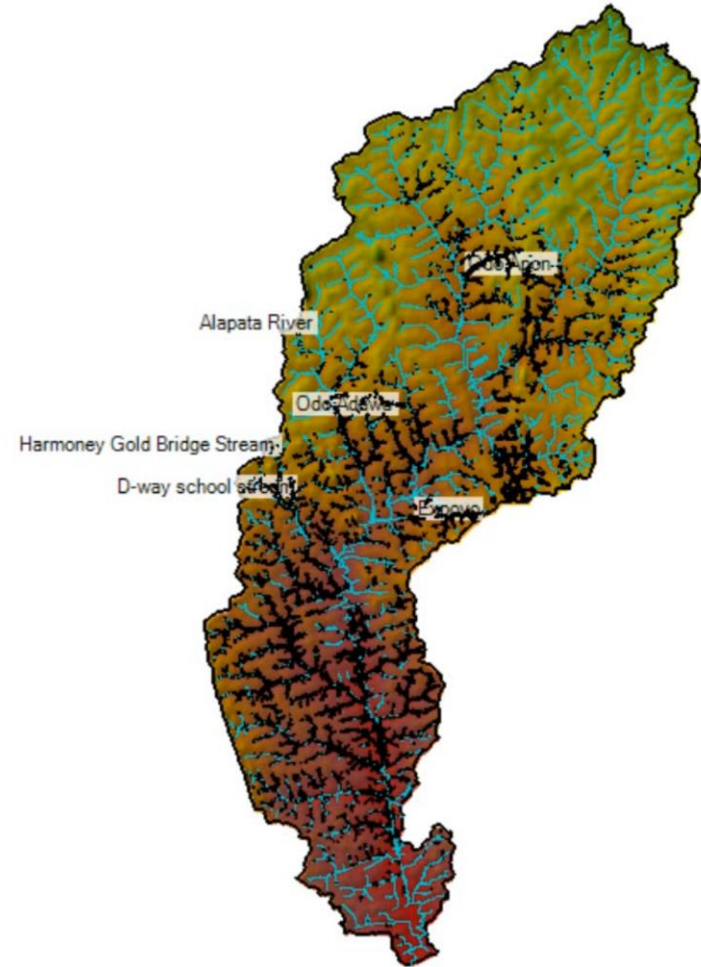
**VS**

## Machine learning techniques

- Professional expertise required
- Predictive modelling depends on learning the relationships between data and flood events
- Much easier to integrate as an enterprise system online
- Requires a lot of historical flood event data



# Flood forecast maps & runoffs



# Flood forecast maps & runoffs - video demo



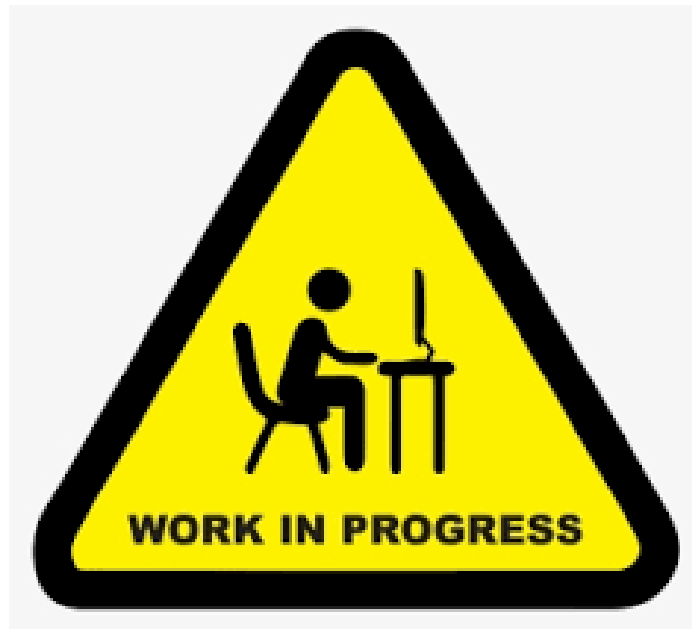


## Challenges with ML techniques

- Lack of adequate flood event records for the study area



## Flood Forecast Visualisations





# Thank You



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