# MiFMASS

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

*https://gmes-mifmass.net*


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GMES AND AFRICA

MIFMASS MULTI-SCALE FLOOD MONITORING AND ASSESMENT SERVICES

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 Assesment 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 receipient

- The Centre for Space Science and Technology Education (CSSTE) located within Obafemi Awolowo University Ile-Ife, is one of the grant receipients 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 Assesment 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 Télécomunications, Burkina Faso

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'Ivore, 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.

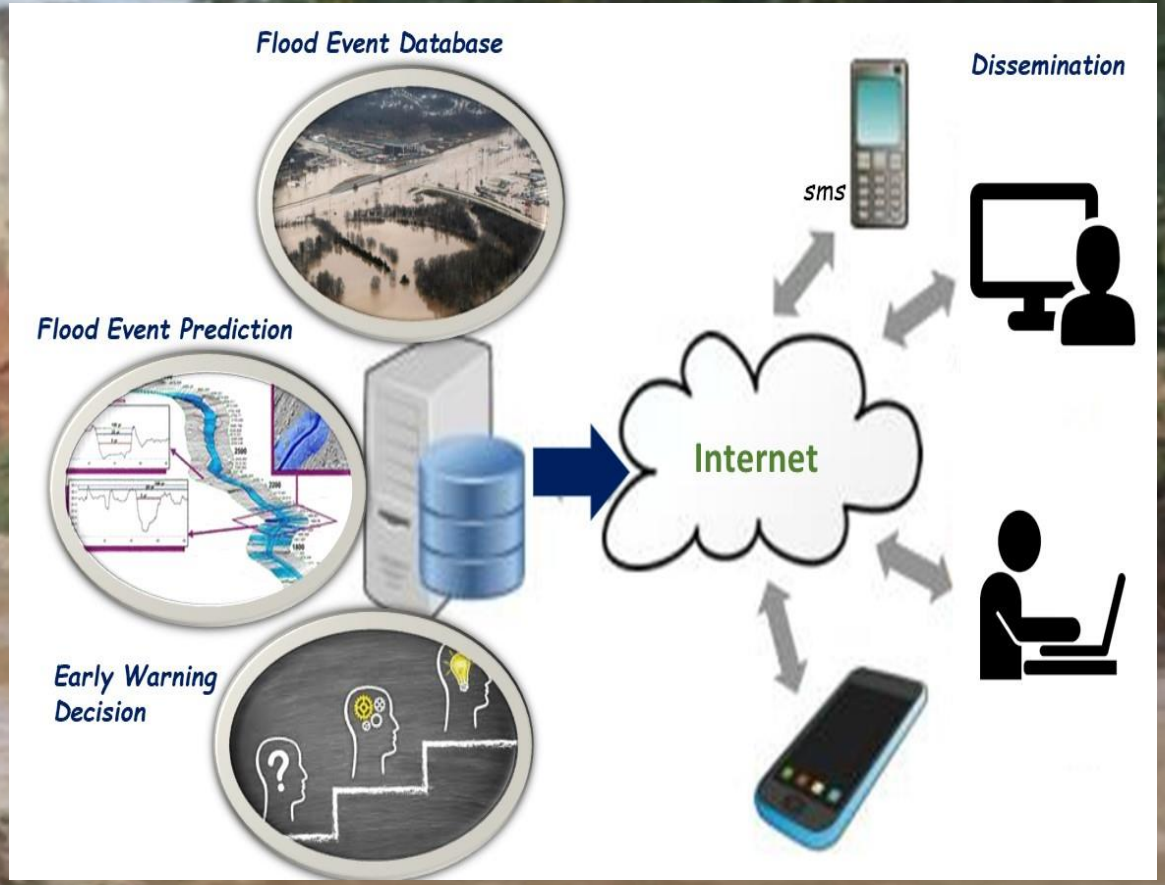
## Specific objectives

Establish an updatable flood event database

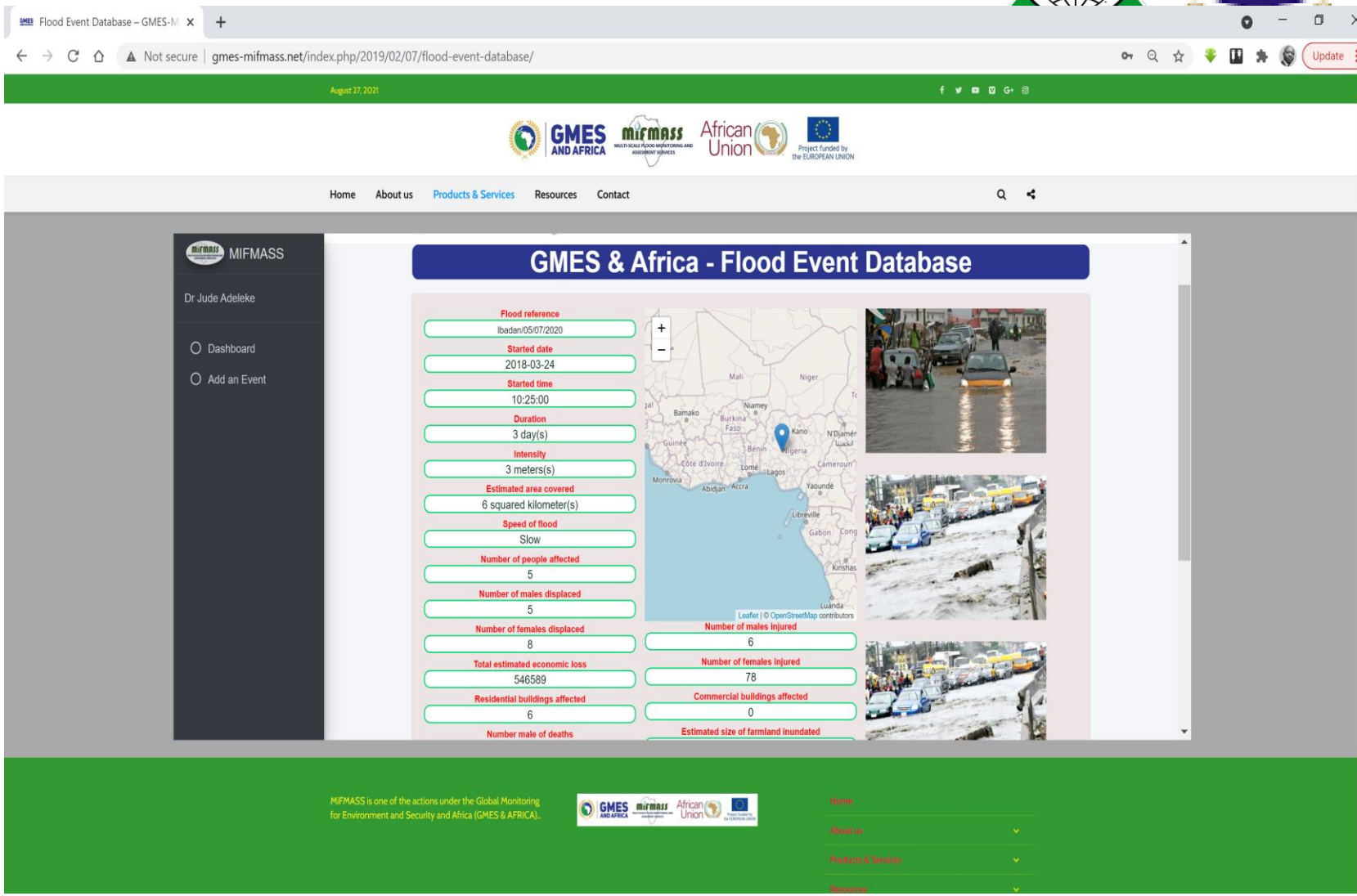
- ❑ Provide DMOs timely information before, during and after flood events
- ❑ Strengthen the capacities of DMOs and other target groups (Farmers, Local residents along flood plains) in the use of Earth Observation data for flood monitoring, Assessment and management

# Expected Deliverables

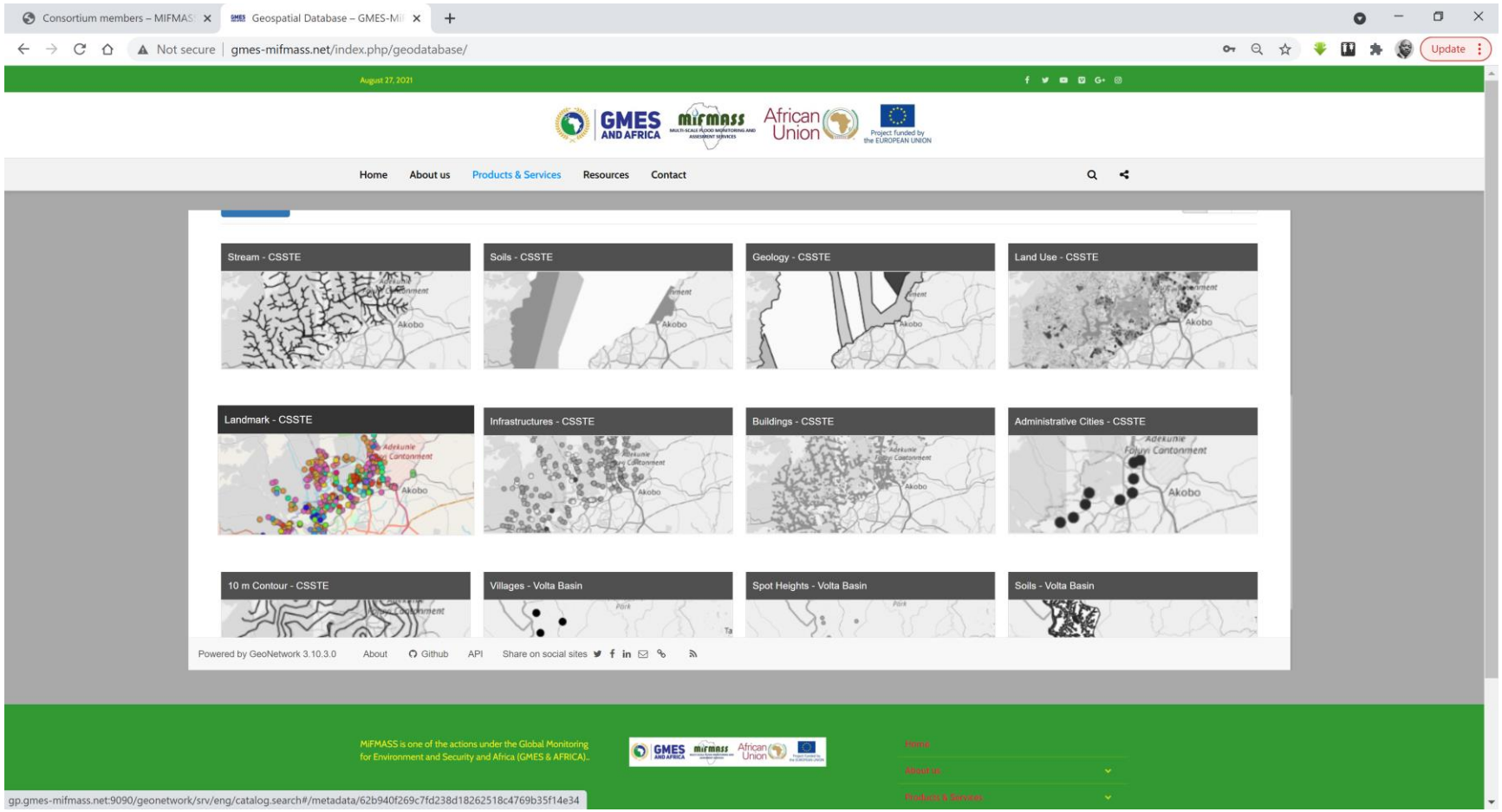
- Develop an **updatable regional scale flood event database** of the Study Area for the five countries
- **Establish a Flood Forecasting and Assessment system**
- Establish an **image acquisition, processing and analysis system** to map flood extent during, or immediately after, flood events from EO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



# Flood Event Database

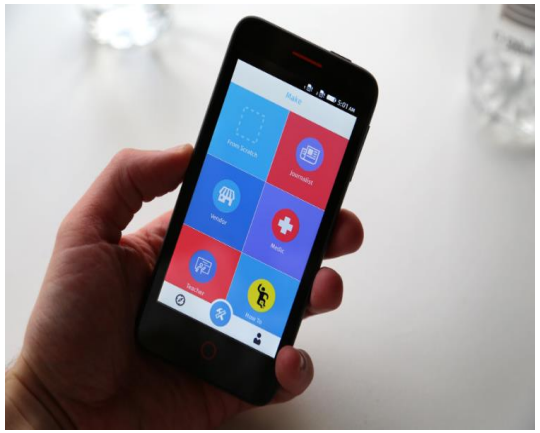


# Geospatial database



# Product dissemination channels

Website

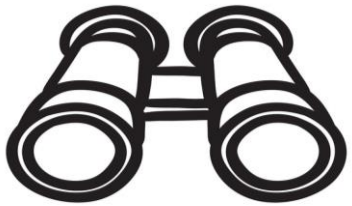


Smartphones apps

Short Message Service (SMS)

Rado jingles

# 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

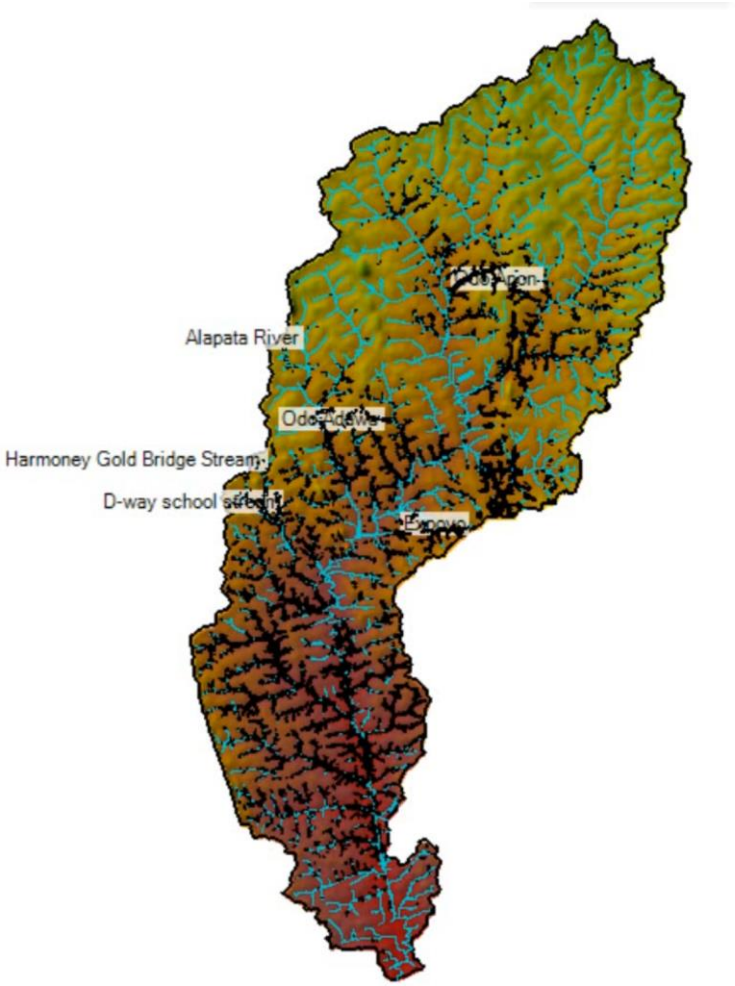
- Professional expertise required
- Steep learning curve
- Modelling depends on dem, and hydraulics of the basin
- Difficult to implement online scenarios
- Cumbersome processes
- Requires a lot of data (e.g. rainfall, water discharge, etc)

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

# Artificial Intelligence Related componets

## Challenges with ML techniques

- Lack of adequate flood event records for the study area

# Artificial Intelligence Related componets

## Flood Forecast Visualisations

Thank You
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