



Food and Agriculture  
Organization of the  
United Nations

DIEM – Data in Emergencies

# GFP annual conference

*Monitoring flood impacts on agriculture  
in humanitarian contexts*

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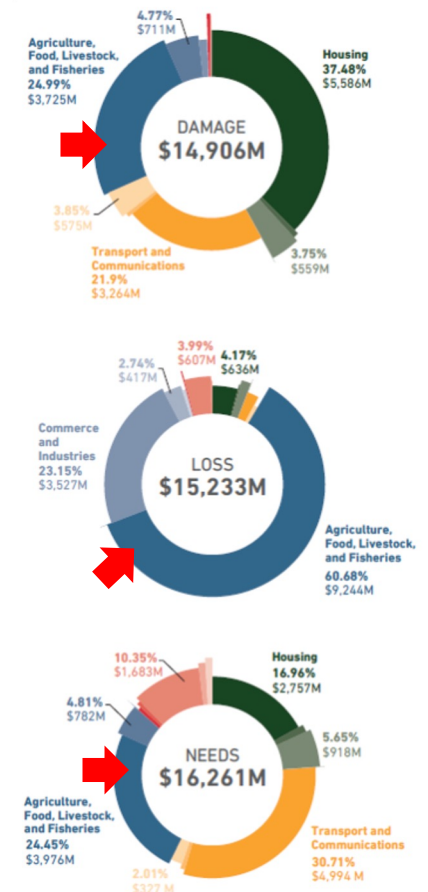
15 September 2025

# Why is it important

## Pakistan 2022

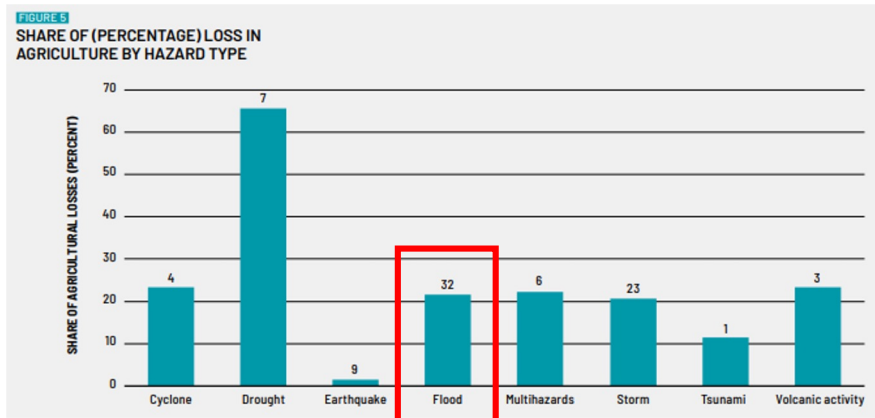


- ! 4.4 million acres damaged
- 🐮 0.8 million animals perished
- 💵 US\$ 12.9 billion damages & losses in agriculture sector
- 🏠 Up to 10 million IDPs



Sources: Post-Disaster Needs Assessment, IOM

# Why is it important



FAO, DIFA  
2023

- > 20% of flood-induced losses are in the agriculture sector (FAO, DIFA 2023)
- 16% of annual agricultural losses are due to floods (FAO, DIFA 2023)
- More and more extreme and frequent
- Widespread
- Food crisis countries, compound shocks

**Damages, losses and human impact caused  
by floods in the agriculture sector are  
underreported and not measured optimally**

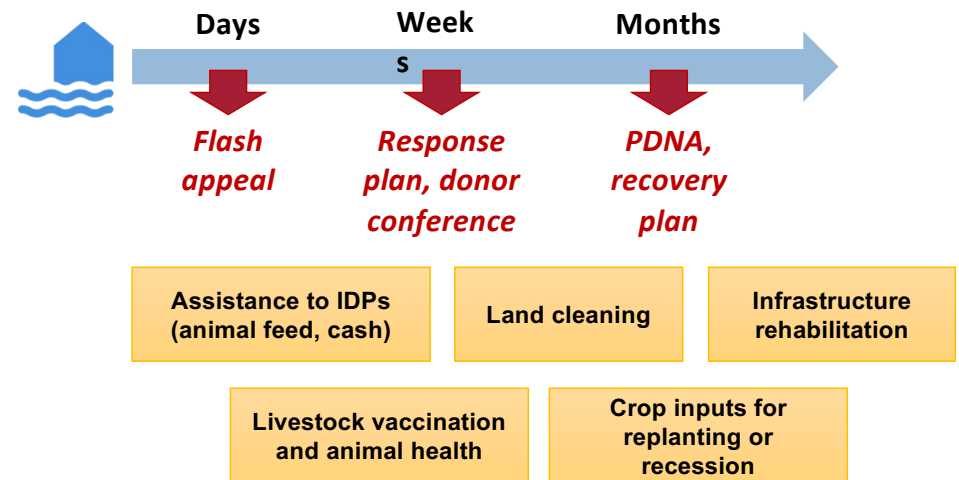
(FAO, 2023)

# How do humanitarians address floods

*Pakistan 2025*



Flood resilience, preparedness, disaster risk reduction, anticipatory action ...  
but there are massive **residual risks** calling for **emergency** response and **recovery** processes.



# Implications for evidence needs

## Who needs evidence?

- Different levels of decision: resource allocation, prioritization, programme design, advocacy
- FAO, UN agencies, government, donors, NGOs
- From a national technical officer to the UN resident coordinator / Minister of Agriculture



## What is needed to inform decisions?

- Flood type, temporal dynamics / persistence, flood depth
- Agricultural population exposed & affected, location, profile
- Agricultural assets, crop types, seasonal calendar,, livestock numbers, animal health
- % of crop damaged, \$ value of damages and losses, income loss
- Scales, flows (population, trade, aid), cascading effects
- Potential benefits (good rainfall in other areas, flood-recession crops)
- Scenarios and cost of agriculture sector recovery



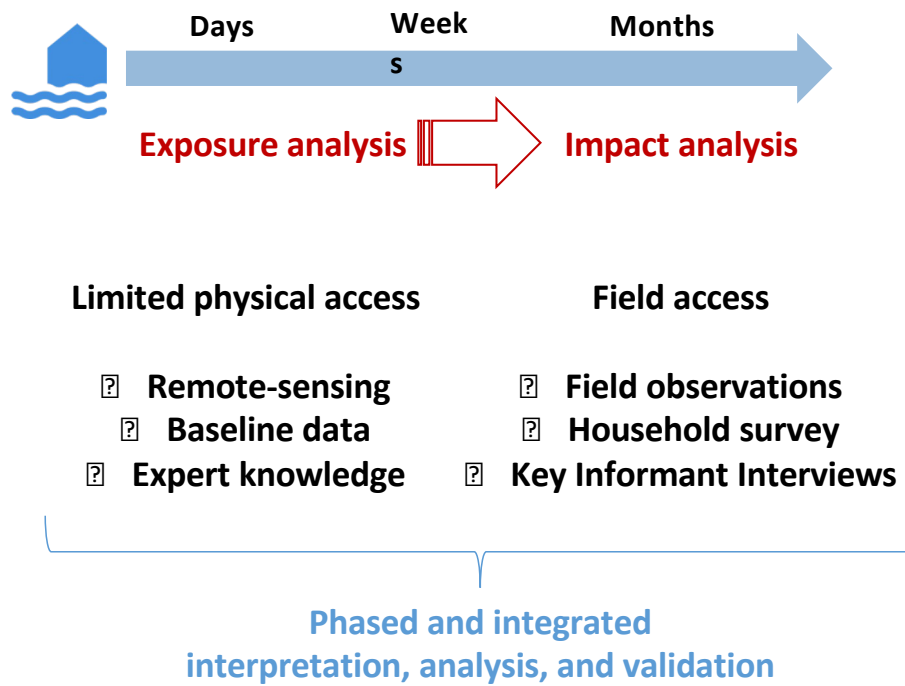
## Data requirements

Accessible  
At scale  
Validated  
Actionable  
Tailored to audiences  
Granular  
Compelling  
**Quick**  
Good enough



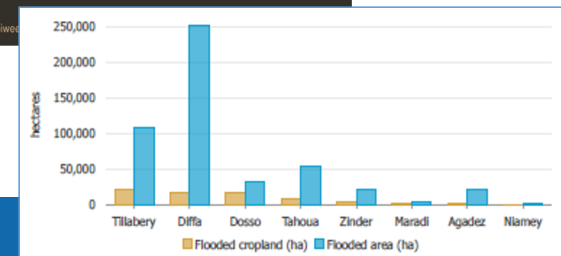
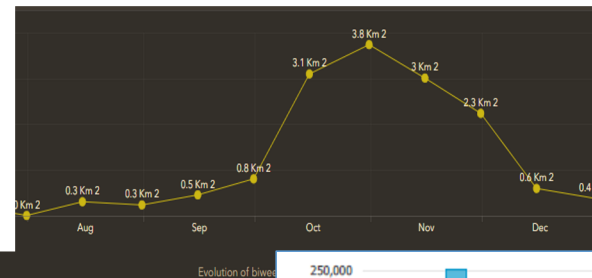
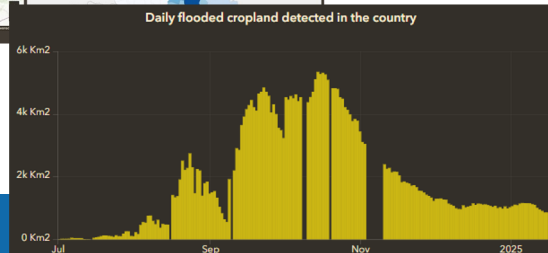
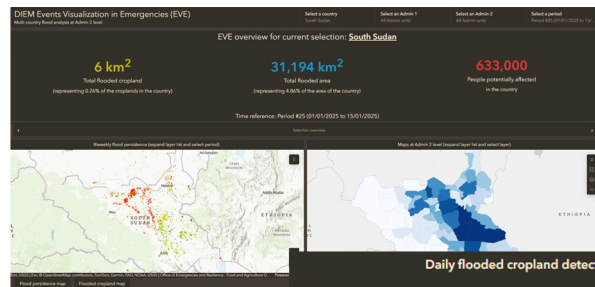


# FAO DIEM approach



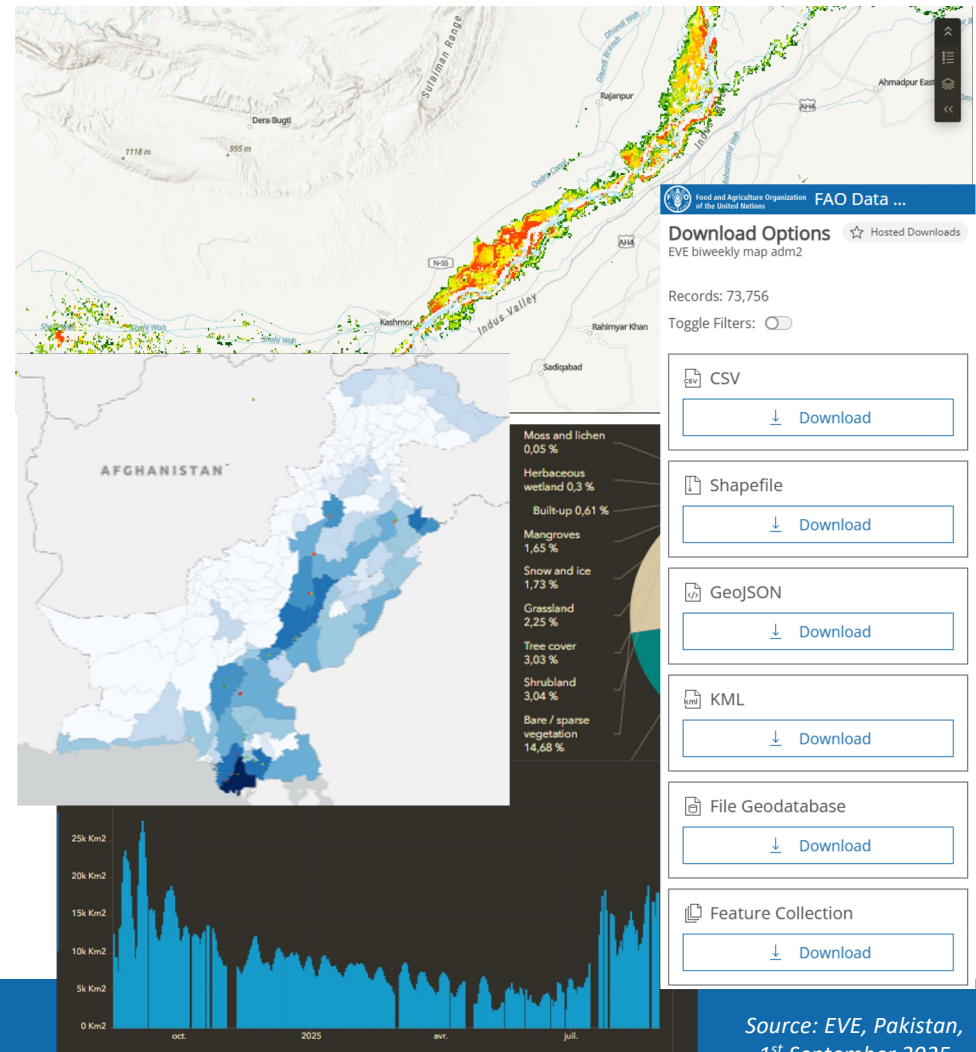
# Foundation: Events Visualization in Emergencies (EVE)

- Interactive, intuitive and open-access platform [https://data-in-emergencies.fao.org/pages/diem\\_eve](https://data-in-emergencies.fao.org/pages/diem_eve)
- Powered by fully automated process
- Continuous analysis across 40+ countries
- Biweekly updates on flood dynamics at adm2 level



# EVE's key capabilities

- Flood persistence analysis
- Land cover types analysis
- Cropland and population exposure to flood
- Time analysis
- National Adm2 maps
- Output data available for manual download or via API



Source: EVE, Pakistan,  
1<sup>st</sup> September 2025



# Data sources and technology stack

*In close collaboration with*



- **Data:**

- NOAA VIIRS: Provides daily surface water at 375m resolution, at global scale
- ESA WorldCover: High-resolution (10m) land cover data
- WorldPop: Population density data at 100m resolution

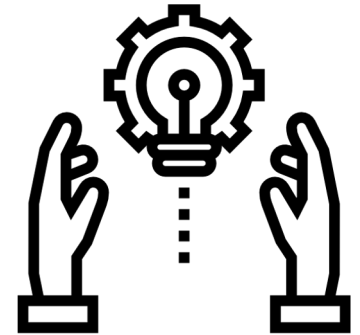
- **Technology:**

- Google Earth Engine python API: Powers large-scale geospatial analysis and efficient data processing
- Python: used for post-processing, data engineering and statistical analyses.
- ArcGIS Online: facilitates interactive visualization and user-friendly dashboards.

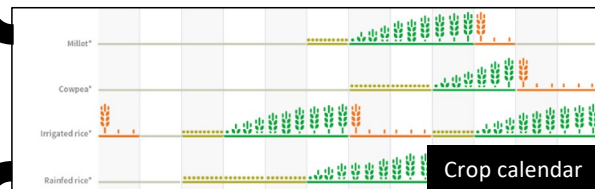
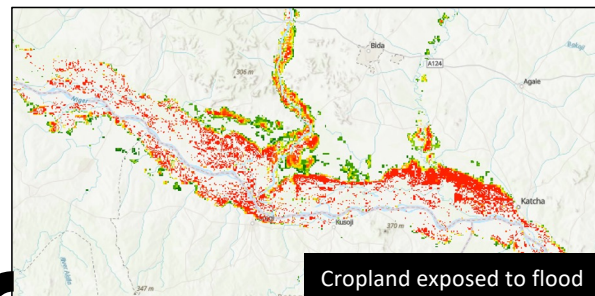


# EVE limitations and future developments

- Mismatch with field observations in some situations due to
  - False negatives (flash floods, cloud cover)
  - False positives (surface water VS flood)
  - Inaccuracy of global land cover map in some contexts
- Inclusion of local datasets (crop types, irrigated areas) for refined impact assessments
- Integration of agricultural calendars to improve the relevance of analyses
- Integration of other baseline datasets (agricultural infrastructure, livestock, fisheries & aquaculture)



# Building on EVE



ANNUAL CROPS CULTIVATED (list all crops cultivated during agricultural season when disaster hit)	2021				2022			
	Average yield (ha)	(ton/ha)	Total Production (mt)	Price / ton (nati. currency)	Total area cultivated - ha	Average yield (ton/ha)	Total Production (mt)	Price / ton (nati. currency)
Maize	1,700.0	116,467.0	195,630	154,694	1,676.5	259,346.0	167,366	
Millet	703.1	49,188.0	174,920	78,618	848.7	66,723.0	177,913	
Rice	2,043.5	42,426.0	281,596	20,149	2,613.6	52,661.0	280,634	
Sorghum	759.9	258,061.0	155,608	372,736	939.7	350,268.0	158,158	
Wheat	-	-	-	-	-	-	-	
Potato	692.5	16,183.0	-	17,578	900.0	15,820.0	-	
Sunflower	-	-	-	-	-	-	-	
Cassava	-	-	-	-	-	-	-	
Sweet potato	-	-	-	-	-	-	-	
Yams	-	-	-	-	-	-	-	

Production, yield and prices baselines

+ Secondary data

+ Expert knowledge

Potential crop loss estimation

\$ value

Kcal equivalent

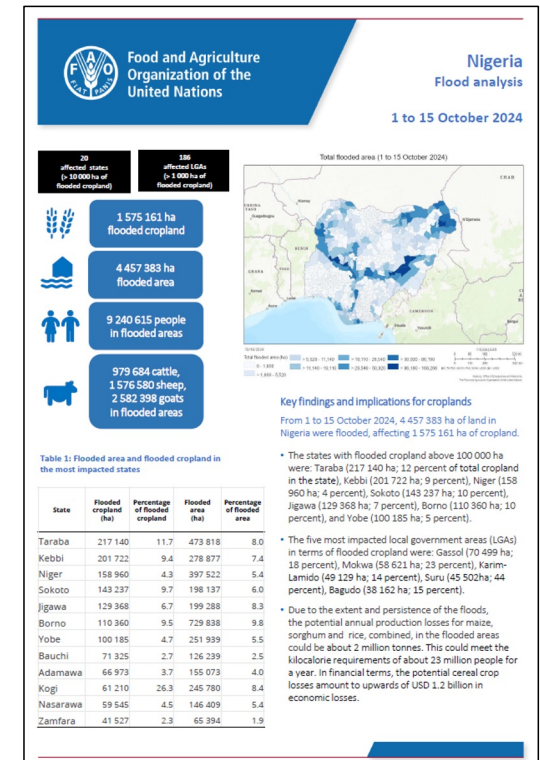
Number of people who could have been fed

Potential implications on livelihoods and food availability



Within a week

## Executive brief



# Augmenting the analysis



**Key-informant interviews  
with local government agents**

**Flood impact field reporting tool**

DIEM Floods Impact Field Reporting Tool

General

Reporter name

Reporter organisation

Reporter email

Auto location\*

Rechercher une adresse ou un lieu

**Field verification using crowdsourcing**  
*Pilot: Sahel floods 2025*

# Conclusions

- Funding cuts, humanitarian data ecosystem at risk
- Diversifying and augmenting data sources
- Data sharing, systems interoperability
- Importance of data preparedness
- More dialog between evidence providers and users
- Data are ingredients of a story which remains to be told







**Thank you !**