



Food and Agriculture  
Organization of the  
United Nations

*EM-DAT International Disaster Database  
Scientific & Technical Advisory Group (STAG) Meeting*

# Data requirements for assessing damage and loss in agriculture and its subsectors

ZEHRA ZAIDI, STATISTICS DIVISION (ESS)  
FAO

*20 MARCH 2023*



# Calculating Loss and Damage in Agriculture

- Global Reports (2015, 2017, 2021 -- **forthcoming 2023, Flagship**)
- Methodology to monitor the Sendai Framework Indicator C2 and SDG Indicator 1.5.2 -- e-learning; operational software
- More on nexus with Climate Change, in the pipeline
- Capacity Development – regional and national workshops
- Data collection through questionnaires to member countries



# Calculating Loss and Damage in Agriculture

- First global assessment of agricultural production losses due to disasters and extreme events
- Overlays data on disaster events from EMDAT with over 200 agricultural items (crops and livestock) from FAOSTAT
- Global modelling, based on counterfactuals. Annual losses for 197 countries from 1991 – 2021

Measure of the value of **direct loss** attributed to disasters in the crops, livestock, fisheries, aquaculture and forestry sectors, together with the **value of lost agricultural assets**.

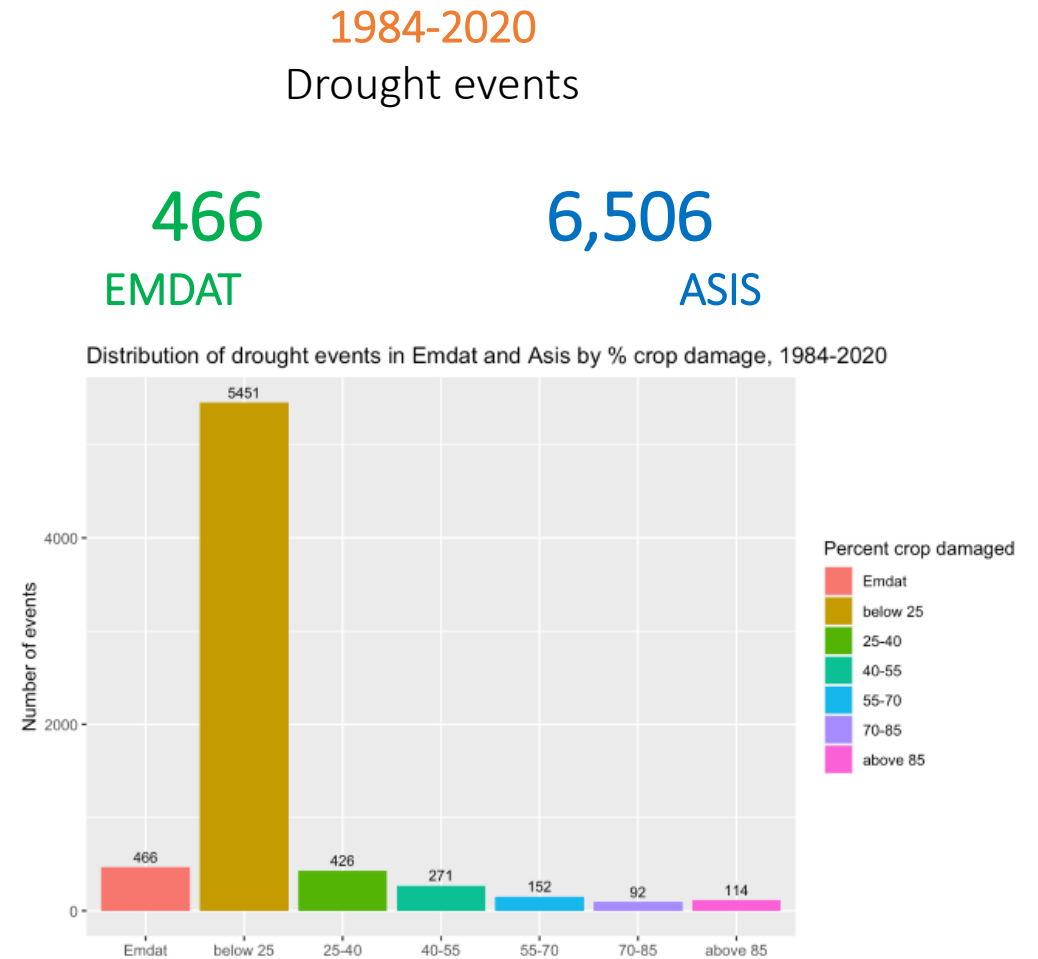
*The estimation is based on five sub-indicators:*

- *C2(C): Impact to crops*
- *C2(L): Impact to livestock (and apiculture)*
- *C2(FO): Impact to forestry*
- *C2(AQ): Impact to aquaculture*
- *C2(FI): Impact to fisheries*

***Impact to Agriculture:  $C2 = C2(C) + C2(L) + C2(FO) + C2(AQ) + C2(FI)$***

# Challenges in use of EMDAT data for Agricultural losses

- No breakdown of economic losses by productive sectors (no data on agricultural losses)
- Geolocation of impacts at subnational scale – area affected
- Hazard intensity data
- Temporal lag between disaster event and agricultural production cycles
- Under-representation of droughts and plant and animal disease outbreaks
- ‘Unquantified’ losses – forestry and fisheries
- Agricultural livelihoods – people affected



# Data for improved agricultural loss assessment

## Sub-sectoral Data Needs

**Crops and plant protection:** Life stage, season, crop type greatly influence level of loss; Important to know where, when and how long disaster unfolds

**Livestock:** Direct impacts can include unmeasured impacts such as fall in reproduction rates and milk productivity

**Fisheries:** Compound and cascading impacts; Marine disasters in international waters; Attribution of national disasters to international capture fishing fleets

**Forestry:** Valuation of loss; Multiple uses and services provided by forest; Compound and cascading hazards; Recovery and regeneration capacity



*EM-DAT International Disaster Database  
Scientific & Technical Advisory Group (STAG) Meeting*

## Use of EM-DAT Database in DIEM Risk and Impact Assessment

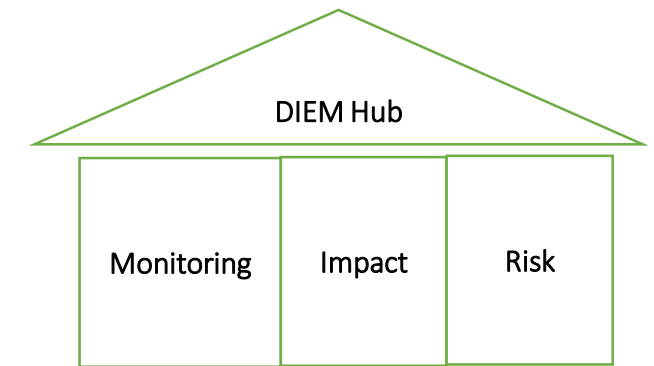
Ece Aksoy, OER Needs Assessment Team, FAO  
*20 March 2023*



# Data In Emergencies

- Development of a data-driven geo-spatial information system to analyse risks and shocks to agricultural livelihoods and food systems in food crisis and disaster contexts

<https://data-in-emergencies.fao.org/>



**Objective:** To contribute effectively to strengthening the resilience of agricultural livelihoods in the face of multiple livelihood shocks in high priority countries.

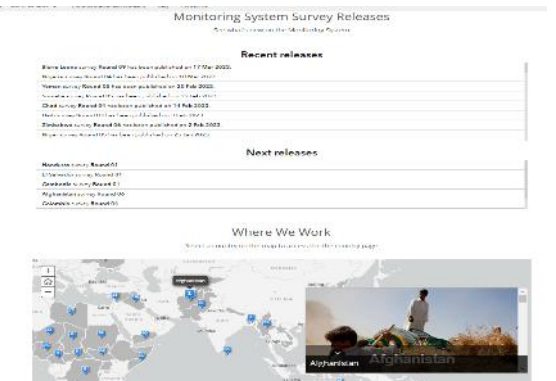
**Outcome:** Improved decision making in support of agricultural livelihoods in food crisis and high risk countries through: improved monitoring and analysis of livelihood, food systems, shocks and threats to food security; improved hazard impact assessment and improved risk analysis linked to anticipatory action.

**Output 1: Monitoring** of impact of various shocks on agricultural livelihoods and food systems in food crisis countries continued and improved

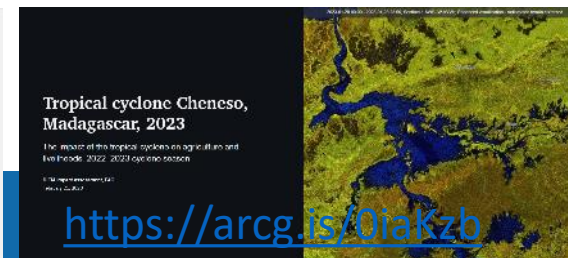
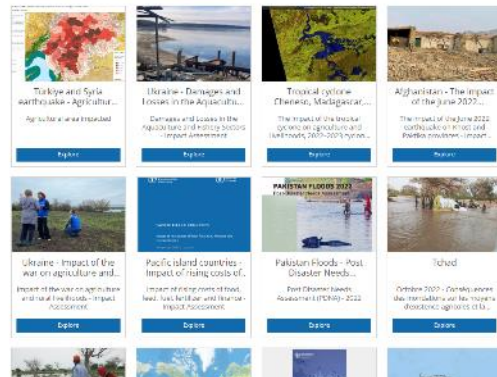
**Output 3: Strengthened assessment of risks** to inform DRR and Anticipatory Action

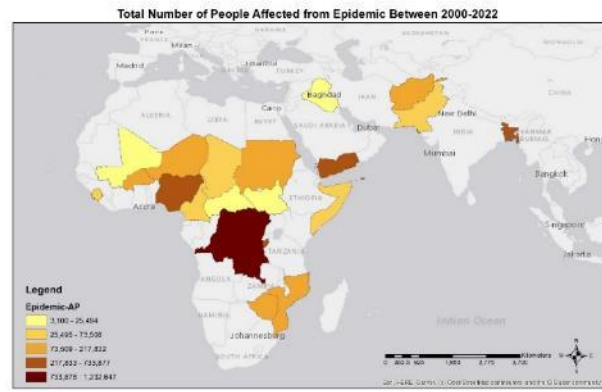
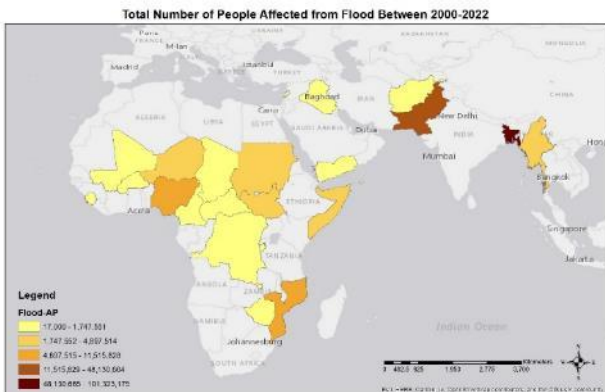
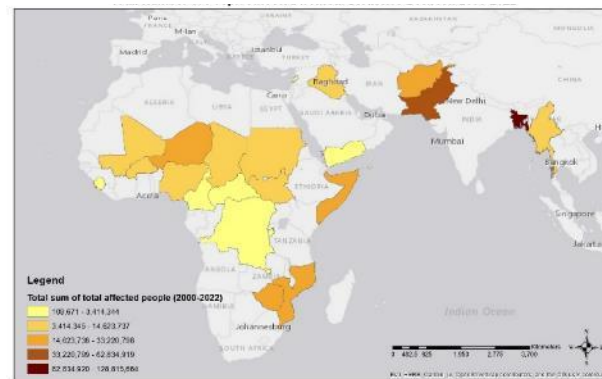
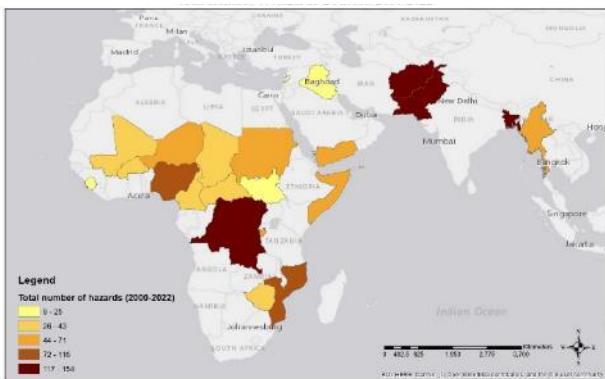
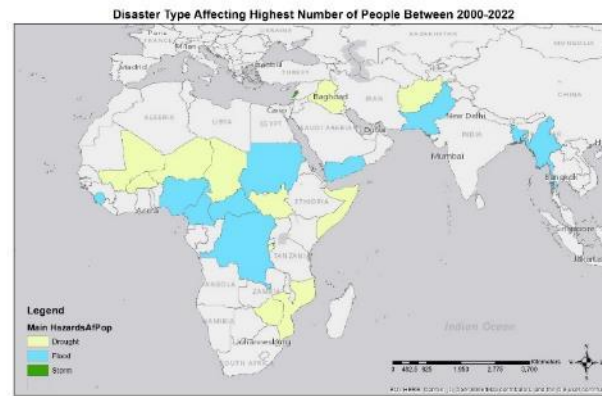
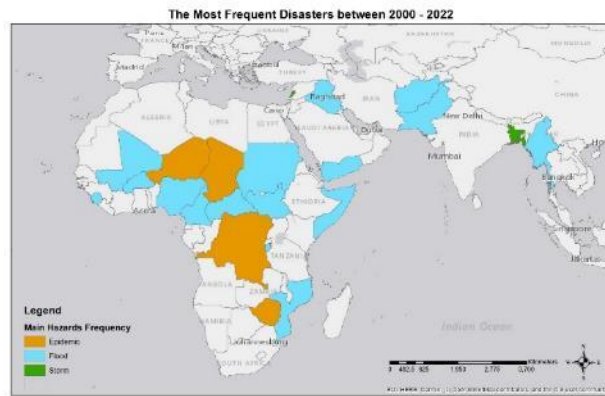
**Output 2: Assessment of impact** of large scale hazards on agricultural livelihoods improved

**Output 4: Data in emergencies hub** upgraded, institutionalized and leveraged to inform food security and agriculture decision-makers



**DIEM - Impact**  
In order to understand the impact of large scale hazards, sudden onset shocks, natural and human induced, DIEM impact conducts remote sensing, monitoring data review, household surveys, key informant interviews, focus group discussions and cross-cutting surveys. The assessments provide a qualitative and quantitative understanding of the impact on agricultural and agri-food livelihoods and livelihoods in terms of damage and losses to the agricultural sector.



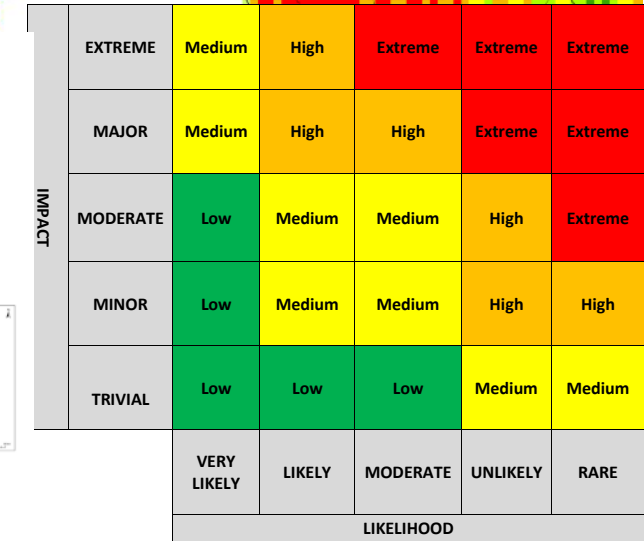


## DIEM Risk – Country Profiles and prioritisation for baseline database

- Flood, epidemic and storm are the most frequent disasters in overall assessment.
- There are some regional similarities observed.
- The affected people from insect infestation could not been assessed due to lack of estimation of the impacts.
  - Even though, 2004 insect infestation in several countries in Africa in 2004 was well recorded in the database, 2019-2021 desert locust was not observed in some of the country data, such as Yemen; but some of them are recorded (Sudan and Somalia).
- Useful data for understanding the need of baseline database, but sub-national data and analyses would be required as a better support for preparedness.



- There is no clear precision on the “Total Affected”; therefore “indirectly affected” might be also included;
- More precision on time and location about initiation of slow onset hazards (specifically for drought) is needed;
- Providing detail information for geolocations (coordinates) would be much helpful
- Insights on the intensity (magnitude) of the hazards based on well-known scientific scales would be recommended.



n	Continue	Location	Origin	Associated Dis	A
m	AI/Africa	central, south east and west			
m	AI/Africa			Water shortage	
m	AI/Africa	Southern (Matabeleland)			
Eastern AI/Africa		Gokwe North districts (Midlands province), Mvuma city (Chirumhanzu district, Midlands province), Chipinge district			
Eastern AI/Africa		Masvingo, Matabeleland North, Matabeleland South, Midlands, Manicaland, Mas		Food shortage	
Eastern AI/Africa		Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Masvingo, Matabeleland North, Matabeleland South, Midlands provinces		Food shortage	
Eastern AI/Africa		Manicaland, Masvingo, Matabeleland North, Matabeleland South, Ma		Slow onset Food shortage	V
Eastern AI/Africa				Erratic rail famine	
Eastern AI/Africa		Matabeleland South, Manicaland, Masvingo,		Covid 19 Food shortage	

# Improvements

- Support to automating disaster data collection and filling data gaps:
  - DIEM monitoring data and survey information would be useful for update/validation of EMDAT statistics.
    - The information on shocks captured in DIEM Monitoring (HH), which possibly triangulates other data on shocks or sheds light on shocks that were under the radar.
    - DIEM impact assessment outputs (numbers and impacted regions), which are produced based on the geospatial data but then validated with country offices.
  - Need for better coordination around data sharing following disasters, including our data but also WFP, PDC, UNOSAT etc.) also assure interoperability of systems across organizations producing disasters data.
    - Our technical partnership with Global service providers (WFP ADAM and PDC) and what we are trying to build on those is good examples.
- EO related:
  - The contribution of remote-sensing and geospatial technologies to quickly identify and map out the disaster extent and potential impact of disasters.
  - Analysing long-term remote sensing data to find the most vulnerable locations (in pixels or/and in ADM-3 level) in target countries.
  - Update of disaster calendars for each regions, in collaboration with countries and with the help of EO data for floods/cyclones.
  - More scientific studies based on the real case studies in the countries to improve forecasting (drought for example) with the help of EO and improved EMDAT database.
  - Drought study example indicated that the need of sub-regional data, at least ADM-2 level, or ideally GPS locations would be useful.