



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

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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**.

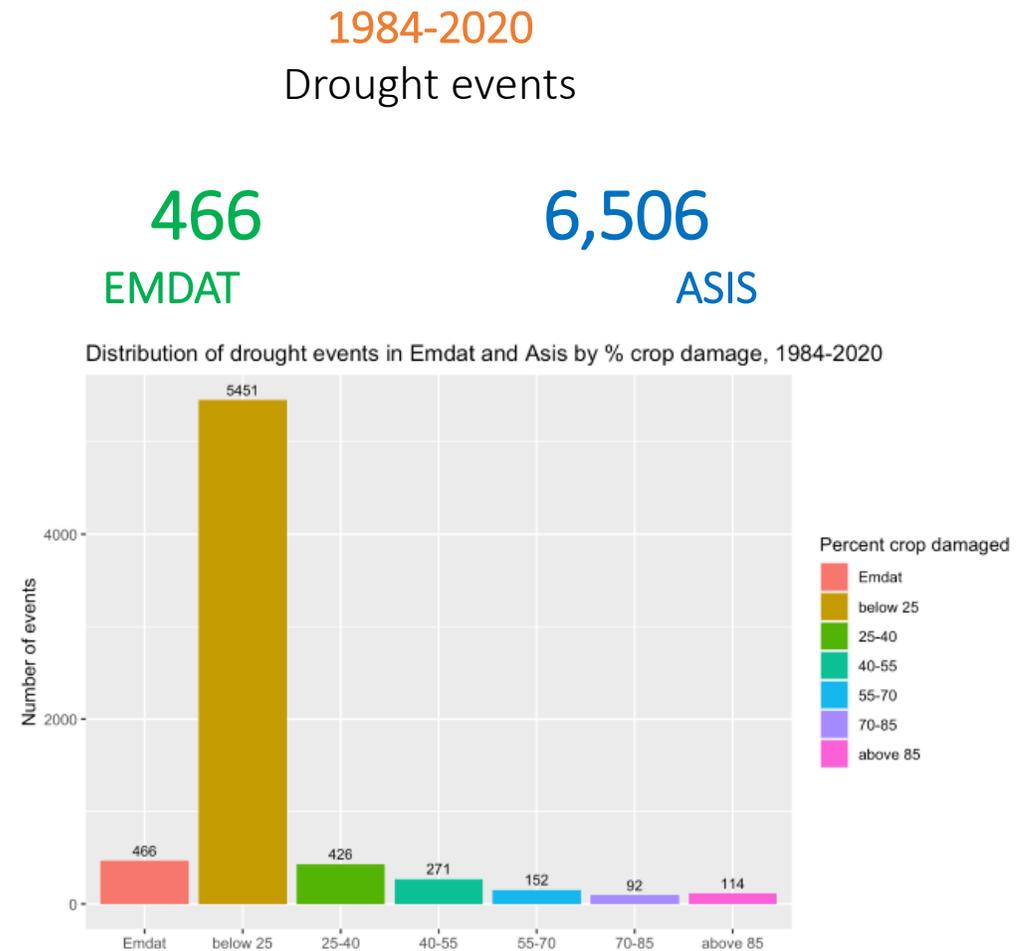
The estimation is based on five sub-indicators:

- *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



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

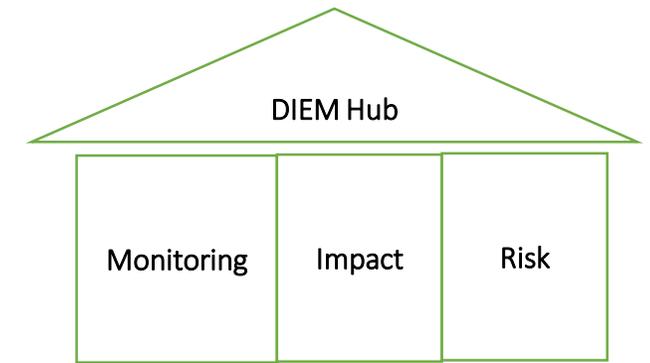
Ece Aksoy, OER Needs Assessment Team, FAO

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.

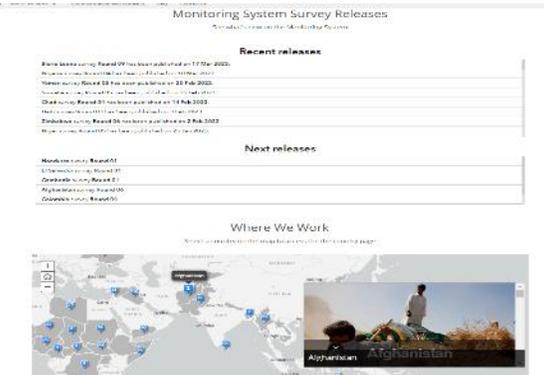
Outcome: Improved decision making in support of agricultural livelihoods in food crisis and high risk countries through: improved monitoring and analysis of livelihood, food systems, shocks and threats to food security; improved hazard impact assessment and improved risk analysis linked to anticipatory 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 slow onset natural and human induced, their impact contexts remote sensing, monitoring data review, household surveys, key informant interviews, focus group discussions and cross-cutting surveys, the assessments were designed and implemented to understand the impact on agricultural livelihoods of different sectors of damage and losses to the agricultural sector.

- Turkey and Syria earthquake - Agricultural areas impacted
- Ukraine - Impact of the war on agriculture and rural areas - Impact Assessment
- Pacific island countries - Impact of rising sea levels - Impact Assessment
- Pakistan Floods - Post-Disaster Needs Assessment (PDNA) - 2022
- Tchad

Afghanistan earthquake

The impact of the earthquake on agricultural livelihoods and food security

<https://arcg.is/1CySgk>

Tropical cyclone Chensu, Madagascar, 2023

The impact of the tropical cyclone on agricultural and food security: 2022-2023 cyclone season

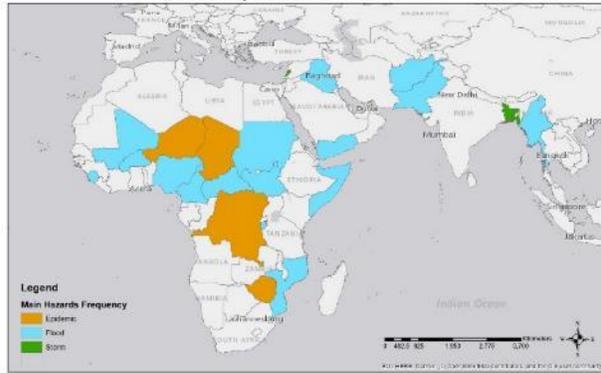
<https://arcg.is/0iaKzb>

Niger

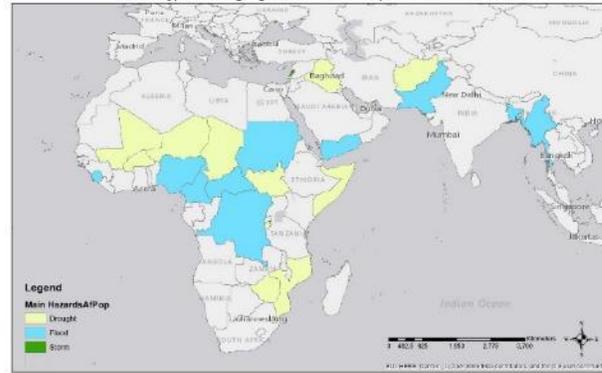
Consequences of the floods on the resilience of extensive agriculture in the semi-arid zone of Niger (Urb)

<https://arcg.is/rCm991>

The Most Frequent Disasters between 2000 - 2022

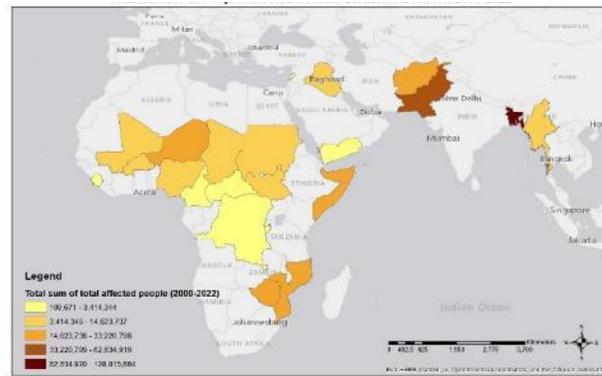
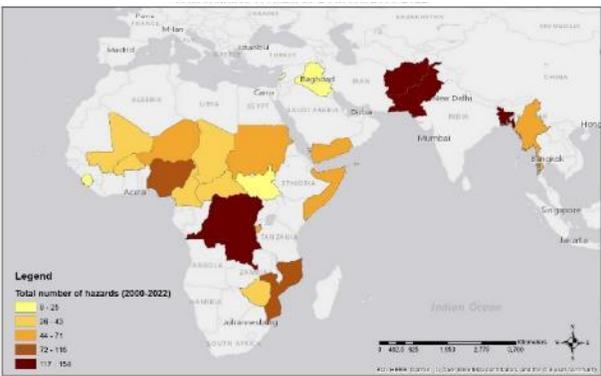


Disaster Type Affecting Highest Number of People Between 2000-2022

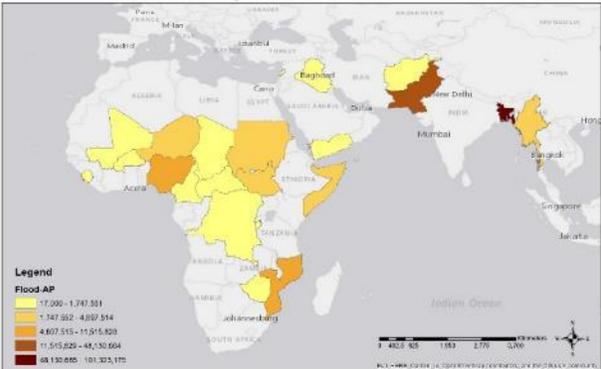


DIEM Risk – Country Profiles and prioritisation for baseline database

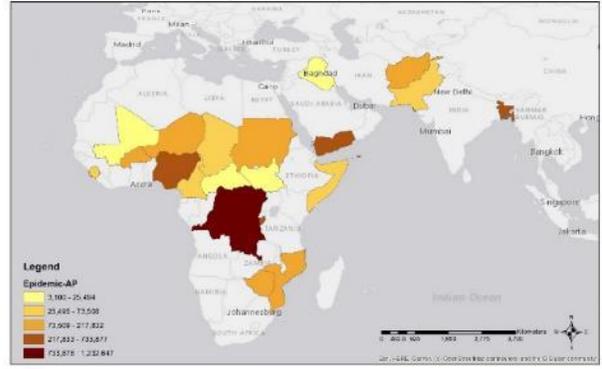
- Flood, epidemic and storm are the most frequent disasters in overall assessment.
- There are some regional similarities observed.
- The affected people from insect infestation could not be assessed due to lack of estimation of the impacts.
 - Even though, 2004 insect infestation in several countries 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.



Total Number of People Affected from Flood Between 2000-2022

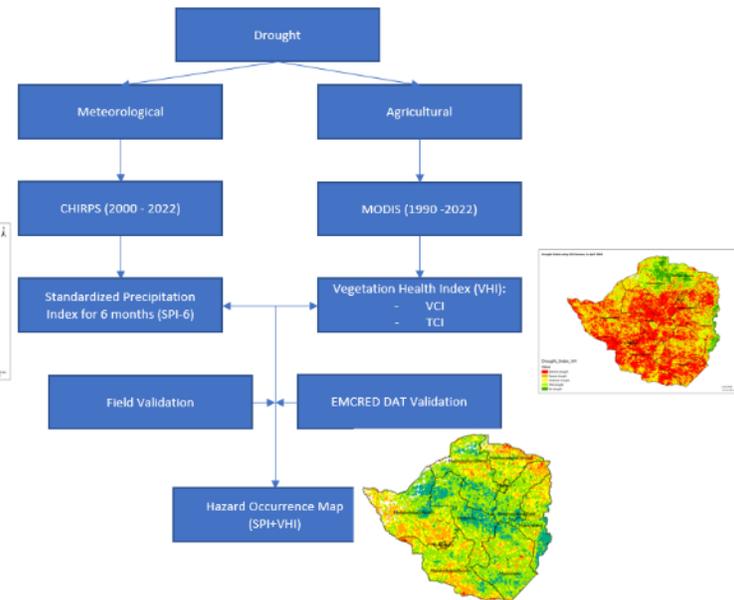
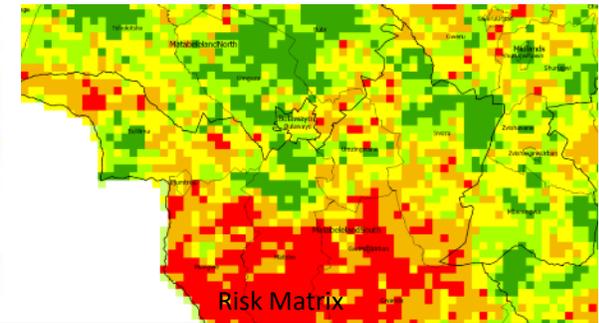
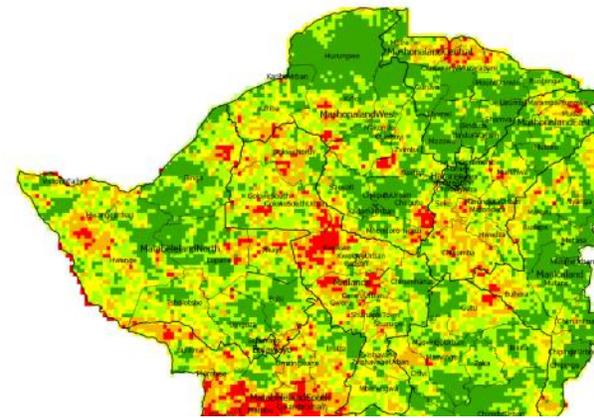


Total Number of People Affected from Epidemic Between 2000-2022



Drought in Zimbabwe – EM-DAT data use for validation tool for EO findings

- 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.



IMPACT	EXTREME	Medium	High	Extreme	Extreme	Extreme
	MAJOR	Medium	High	High	Extreme	Extreme
	MODERATE	Low	Medium	Medium	High	Extreme
	MINOR	Low	Medium	Medium	High	High
	TRIVIAL	Low	Low	Low	Medium	Medium
		VERY LIKELY	LIKELY	MODERATE	UNLIKELY	RARE
		LIKELIHOOD				

Year	Event ID	Category	Phase	Start	End	Country	Region	Location	Origin	Associated Dis
2001	9122	Natural	Climatolog	Drought	Drought	Zimbabwe ZWE	Eastern AI Africa	central, south east and west		
2007	9675	JT-2008-0 Natural	Climatolog	Drought	Drought	Zimbabwe ZWE	Eastern AI Africa	Southern (Matabeleland)		Water shortage
								Gokwe North districts (Midlands province), Mvuma city (Chirumhanzu district, Midlands province), Chipinge district		
								Masvingo, Matabeleland North, Matabeleland South, Midlands, Manicaland, Mas		Food shortage
								Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Masvingo, Matabeleland North, Matabeleland South, Midlands provinces		Food shortage
2010	9181	Natural	Climatolog	Drought	Drought	Zimbabwe ZWE	Eastern AI Africa	Manicaland, Masvingo, Matabeleland North, Matabeleland South, Ma		Slow onset Food shortage
2013	9478	May	Natural	Climatolog	Drought	Zimbabwe ZWE	Eastern AI Africa			Erratic rain Famine
2017	9088	Natural	Climatolog	Drought	Drought	Zimbabwe ZWE	Eastern AI Africa			
2021	9786	DR-2021-4	Natural	Climatolog	Drought	Zimbabwe ZWE	Eastern AI Africa	Matabeleland South, Manicaland, Masvingo,		Covid 19 p; 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.