

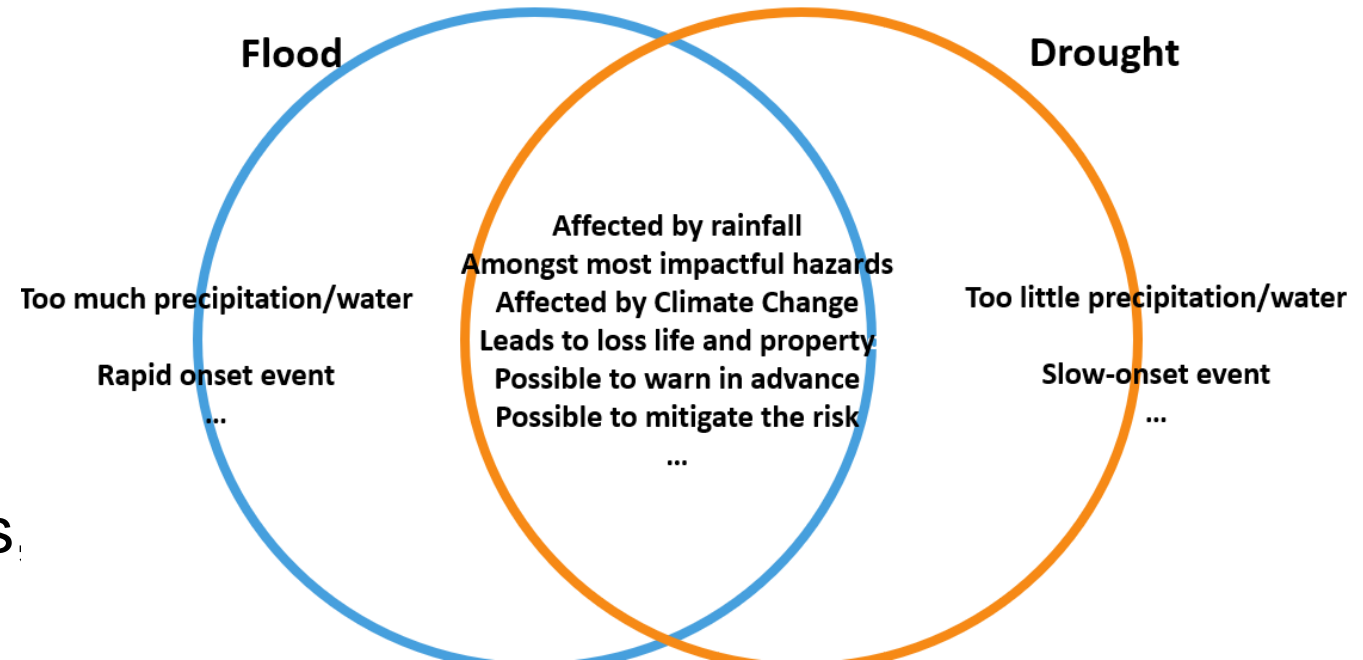
# Managing flood and drought together - an overview on practical approaches

- New joint FAO, APFM, IDMP (WMO,GWP) publication to be launched soon: “Integrating flood and drought management –Practical Common Approaches “
- Complimentary to EPIC Response
- Practical Examples and case studies

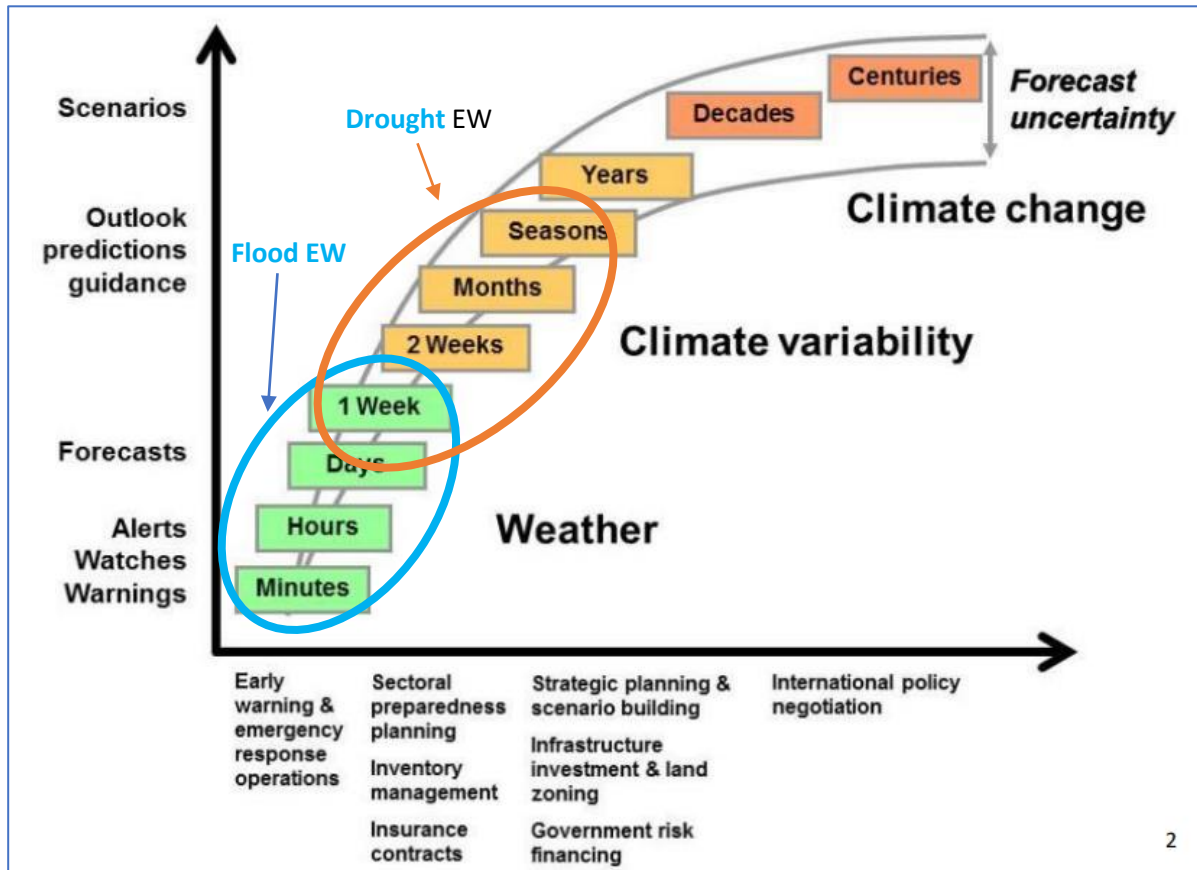


# Components of joint flood and drought management

1. Monitoring, forecasting and early warning of floods and droughts
2. Assessing the risks and impacts of droughts and floods
3. Actions for prevention, preparedness, awareness, and policy development



# Monitoring, forecasting and early warning



Traditionally two different scientific disciplines:

- Flood: Hydrology
- Drought: agricultural meteorology/climatology

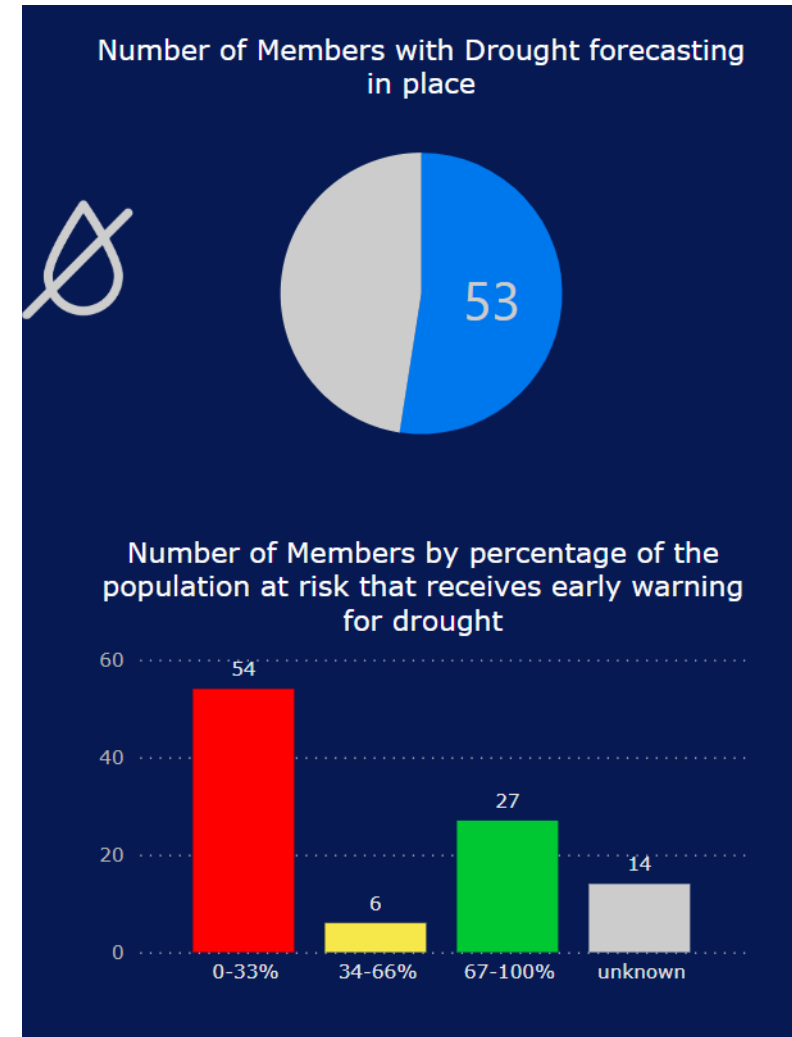
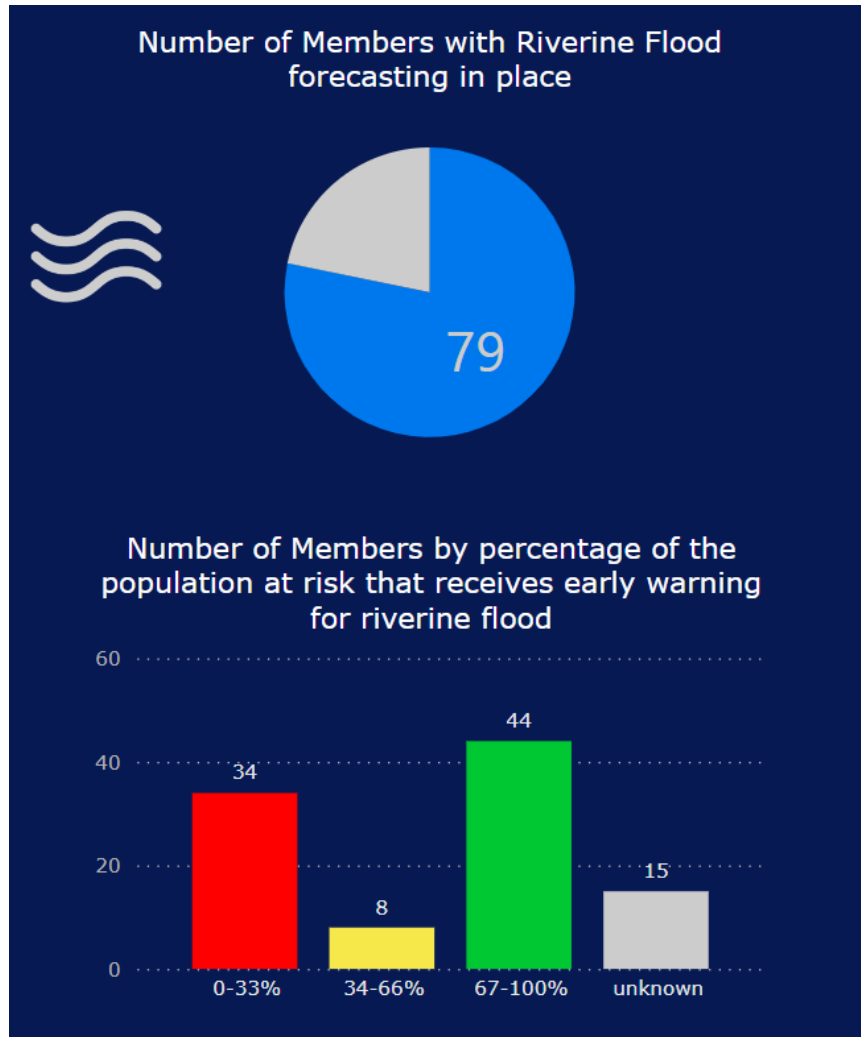
“Short term vs mid-to long term”

## Monitoring, forecasting and early warning

- Most variables to be monitored for both hazards
- The management of both hazards profits from joint approach:
  - Water resources information for drought
  - Longer term forecast and more socio-economic for flood
- Seamless prediction capabilities increasing
- Stakeholder engagement relevant for both

Parameter/variable	Flood	Drought
<b>a) Continuously monitored parameters</b>		
<b>Meteorological variables</b>		
Precipitation	X	X
Air temperature	X	X
Potential Evapotranspiration (depending on formula can include air temperature, wind speed, solar radiation, etc.)	X	X
Wind Speed	X	
<b>Hydrological variables</b>		
River level	X	X
River discharge	X	X
Ground water level	X	X
Soil moisture content	X	X
Reservoir/lake level	X	X
Snow cover/depth/snow water equivalent	X	X
Glacier cover/mass	X	X
Permafrost Active Layer Thickness	X	X
<b>Vegetation/crops</b>		
Crop data		X
Remotely-sensed vegetation indices (NDVI, fAPAR, etc., full list on <a href="#">Handbook of Drought Indicators and Indices</a> )		X
<b>a) Static/slow dynamic parameters for setting up models for simulation and forecast</b>		
Soil texture	X	X
Land cover/land use	X	X
Topography	X	X

# Monitoring, forecasting and early warning



Still a long way to go, but Early Warning for all initiative

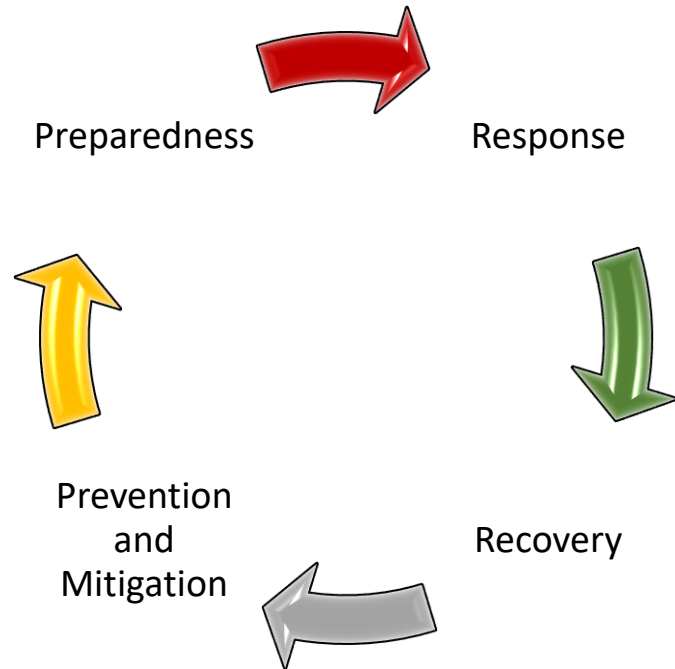
## Assessing the risk and impacts of droughts



**RISK = HAZARD x EXPOSURE x VULNERABILITY**

- Overlaps of flood and drought vulnerability/resilience and exposure
- Often similar information needed: age, gender, income, disability, etc.
- INFORM Risk Index developed by Joint Research Center
  - combining 54 indicators into three dimensions of risk
  - Redone on regular basis (bi-annually)
- Main challenge are the separated responsibilities in most countries
- Participatory/community approaches often consider all risks incl. flood and drought
- Big synergies in communication

# Actions for prevention, preparedness and awareness

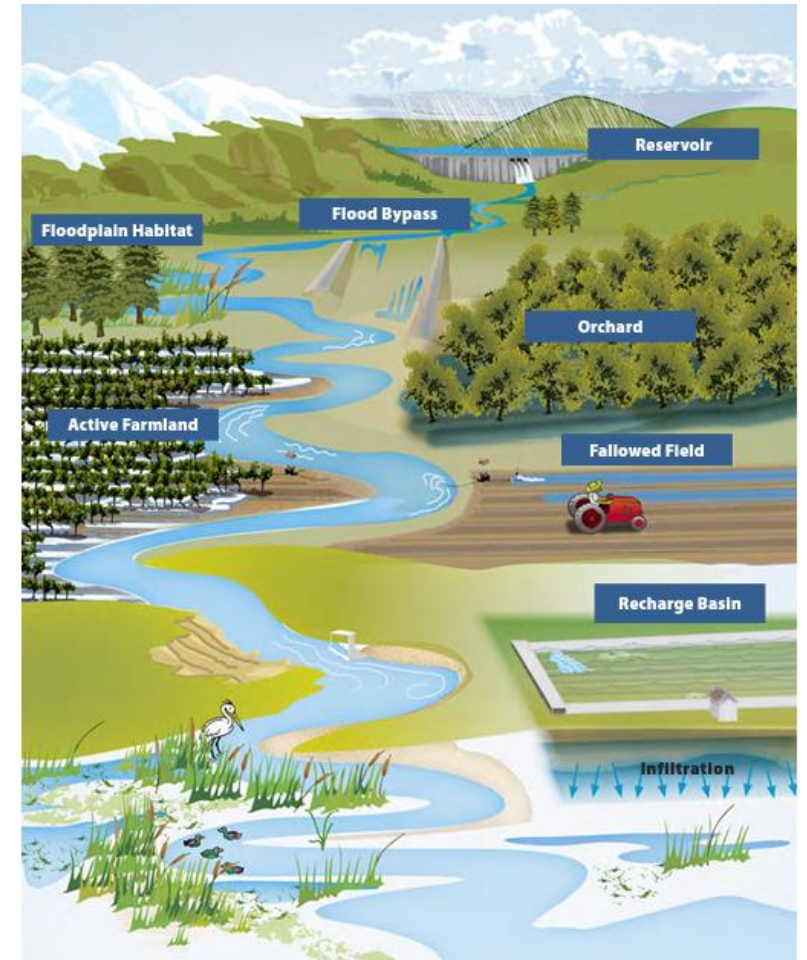


Disaster Risk Cycle holds for floods and droughts (incl. “hydro-illogical cycle”)



# Actions for prevention, preparedness and awareness

- All measure to prevent/mitigate flood and drought hazard aim on balancing excess/lack of water on different spatial and temporal scales:
  - Reservoirs
  - Nature-based solutions on different scales (surface, subsurface aquifers and soil, land cover restauration/protection)
  - Flood-Managed Aquifer Recharge (Flood-MAR)
  - Urban water storages



*Elements of Flood-MAR. California DWR 2018.*



## 8 Recommendations

1. Reiteration of the benefits of integrating drought and flood management
2. Highlight economic benefits
3. Adopt a common risk management framework
4. Stakeholders are the key to the integrated approach – they are the same stakeholders
5. The importance of taking a strategic or proactive approach to reduce BOTH drought and flood risks by effective planning of land and water management (Integrated Water Resources and Land Management)
6. Importance of managing drought and floods at the basin and sub-basin scales (across administrative boundaries) and the related benefits at local level
7. Identifying needs and building the capabilities in the most vulnerable communities
8. Future needs and challenges for successful integration of both flood and drought

