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Linking the Climate Change and Disaster Risk Reduction Communities

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- Climate change and disaster risk reduction are increasingly being linked to one another and to water resources management at the national, regional and global levels.

- At the global level, the Sustainable Development Goals, the Paris Agreement of the UNFCCC and the Sendai Framework on Disaster Risk Reduction demonstrate the importance of linking the two communities together in view of formulating integrated policies.

- Studies on climate change impact assessment in the Arab region (e.g. RICCAR) have proved that natural hazards, and particularly water-related disasters, will be exacerbated due to climate change.

- In view of this, ESCWA Water Development Report No. 7 was prepared on "Climate Change and Disaster Risk Reduction in the Arab Region"

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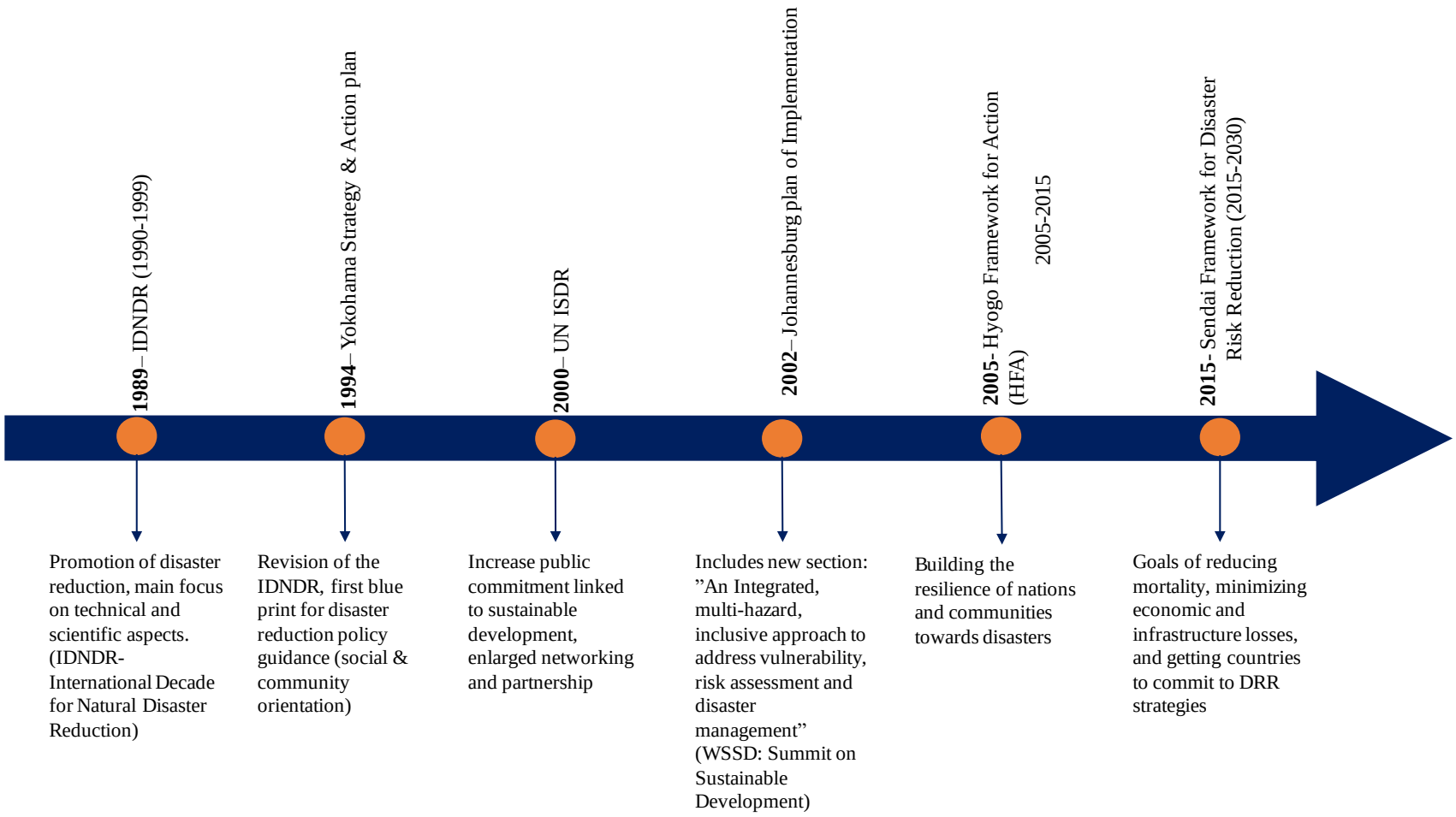
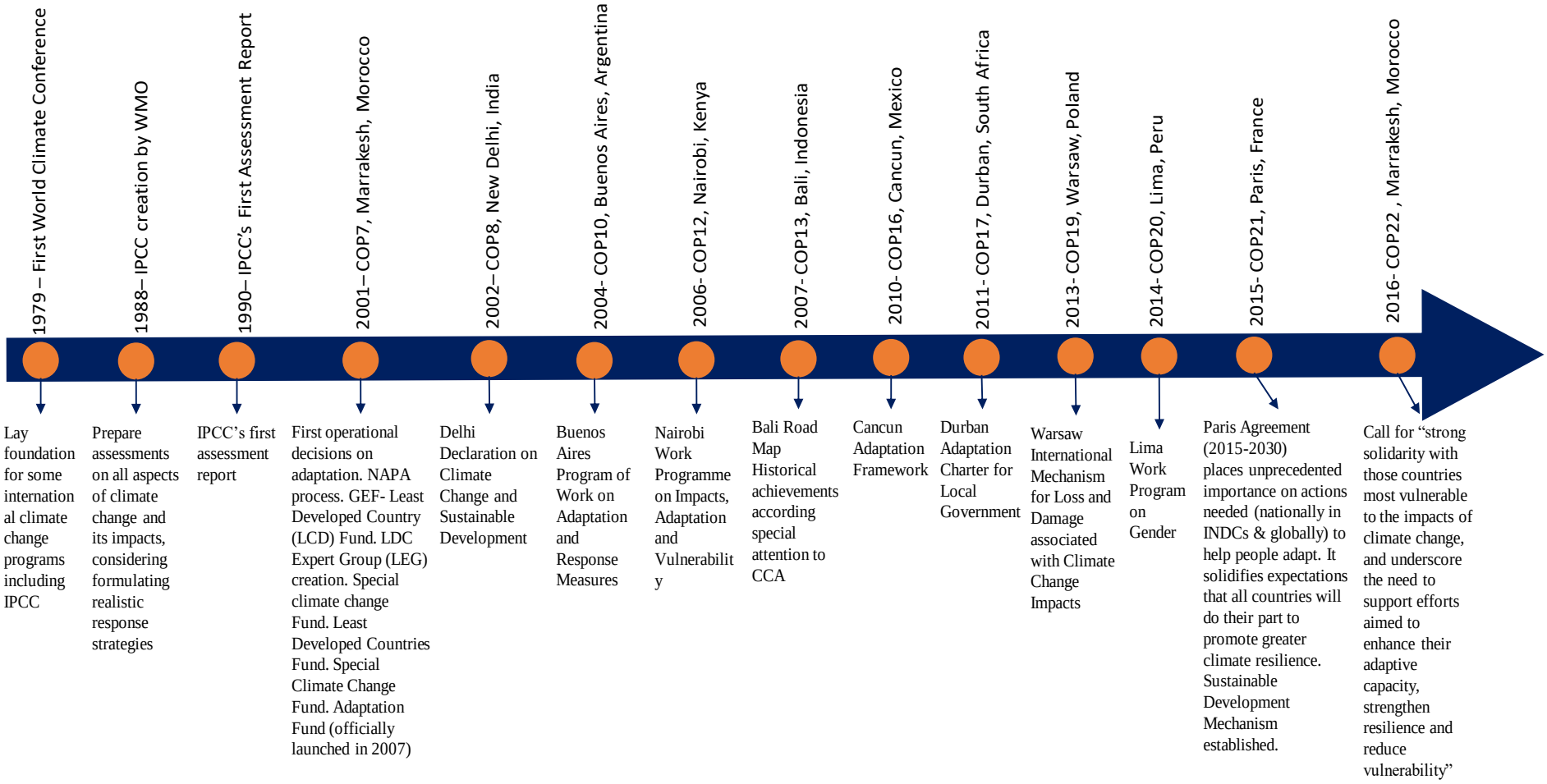
Evolution of Disaster Risk Reduction and Climate Change Adaptation

Disaster Risk Reduction an Agenda in Progress



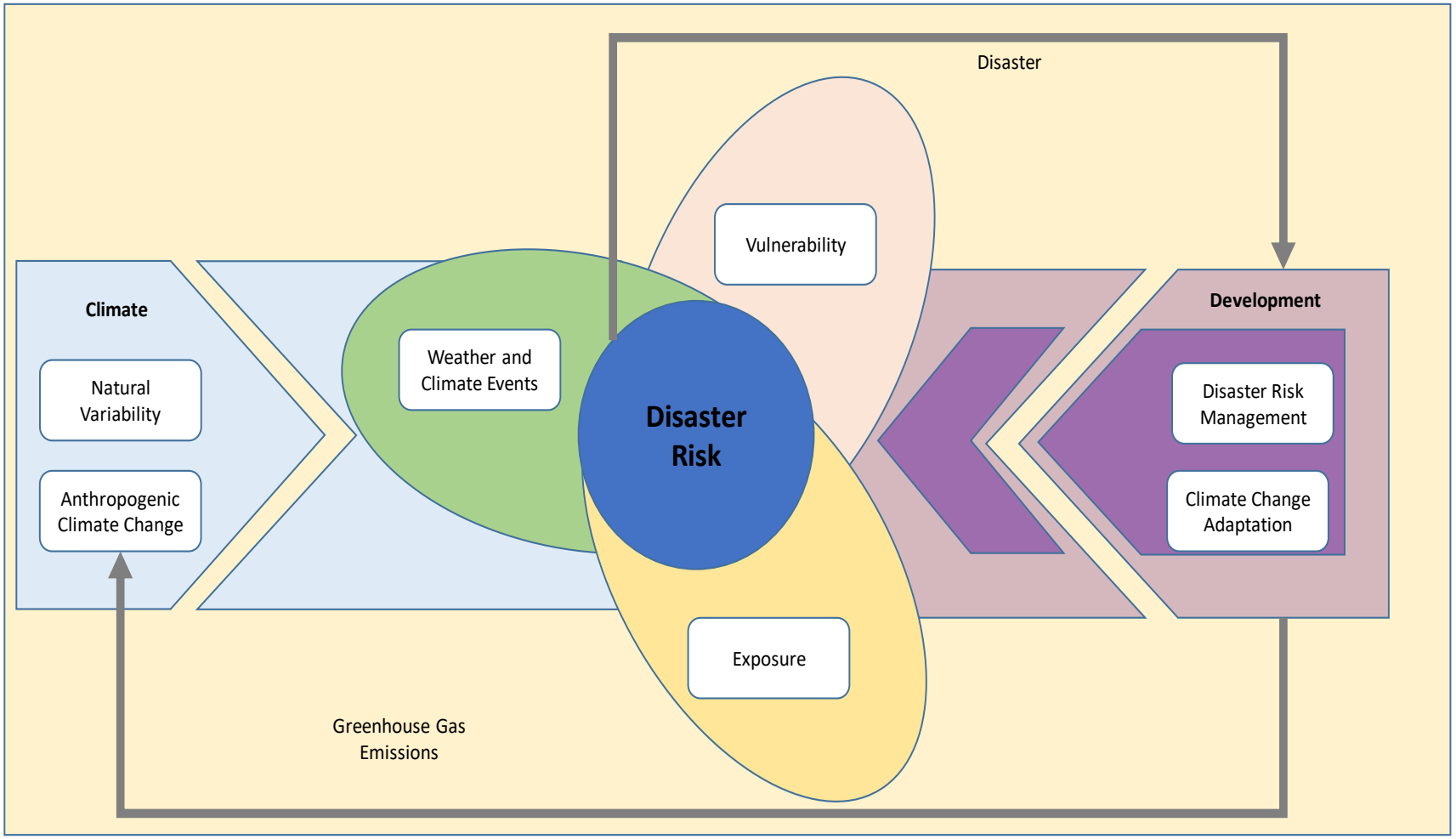
Source: Modified from UNISDR. (2009). Thematic note on DRR terminology and concepts, prepared for the DRR Swiss NGO Platform. http://www.drrplatform.org/images/DocPub/TerminologyConcepts.pdf

Climate Change Adaptation an Agenda in Progress



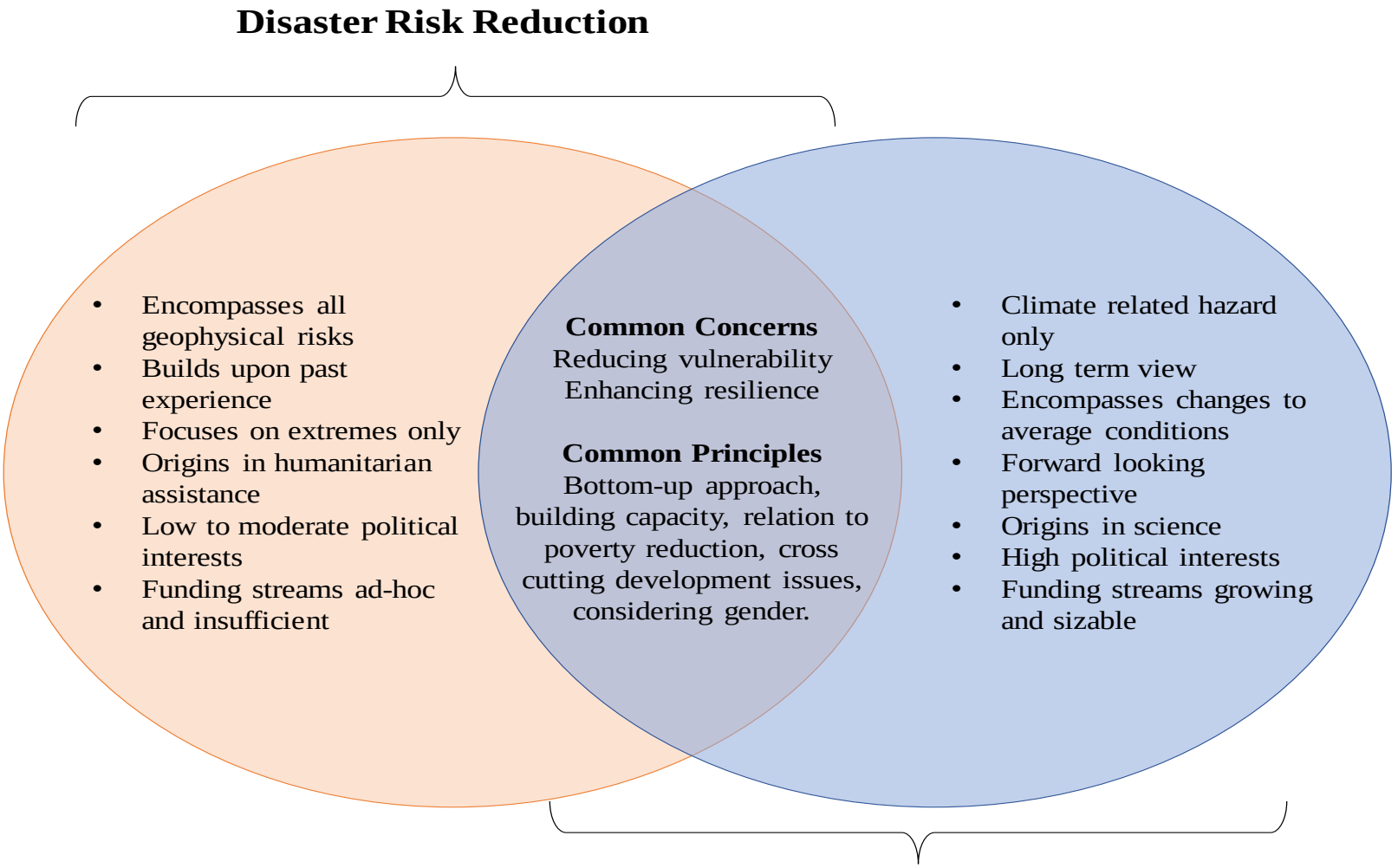
Source: Modified from Kelman, I. (2015). Joint action on climate change: Facts and figures. Sci Dev Net. http://www.scidev.net/global/climate-change/feature/joint-action-climate-change-facts-figures.html

Synergies between CCA and DRR



Source: IPCC. (2012). Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf

Similarities and differences between DRR and CCA



Modified from UNISDR, UNDP (2012). Disaster Risk Reduction & Climate Change Adaptation in the Pacific: An Institutional and Policy Analysis. http://www.unisdr.org/files/26725_26725drrandccainthepacificaninstitu.pdf

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Regional Technical Challenges

- Lack of integrated disaster loss and climate–related hazards database.
- Lack of integrated approach for risk assessment.
- Lack of Multi-Hazard Early Warning Systems.
- Insufficient access to information.
- Inadequate understanding of data related to social vulnerability.
- Uncertainty in assessing the economic costs of extreme events and disasters.
- Lack of science-based analyses and projections of climate change scenarios.
- Lack of credible data and information

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Regional Institutional Challenges

- Separate global/regional/national frameworks for DRR and CCA
- Weak or poor risk governance challenge
- Low capacity
- Insufficient financial resources
- Incoherent policies and lack of monitoring and evaluation framework
- Gap between research and policy-making
- Lack of awareness

Assessment Tools for Climate Change Impacts and Vulnerability

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Climate Change modeling

Hydrological modeling and water resources management

Socio-economic vulnerability and impact assessment

Climate database

Models (GCM and RCM)

- Impacts on water resources
- Long term scenario development in water policies

Agriculture

Food Security

Health

Biodiversity

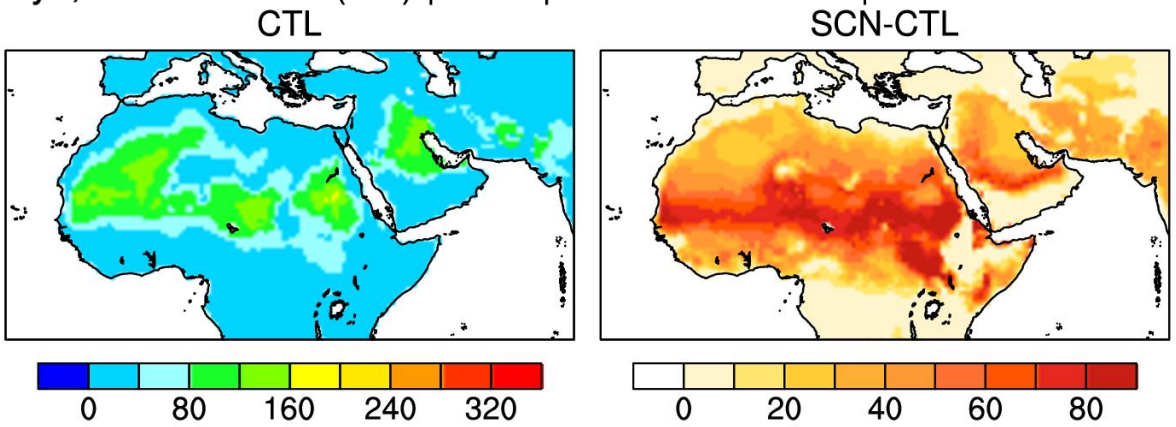
Industry

Human Settlement

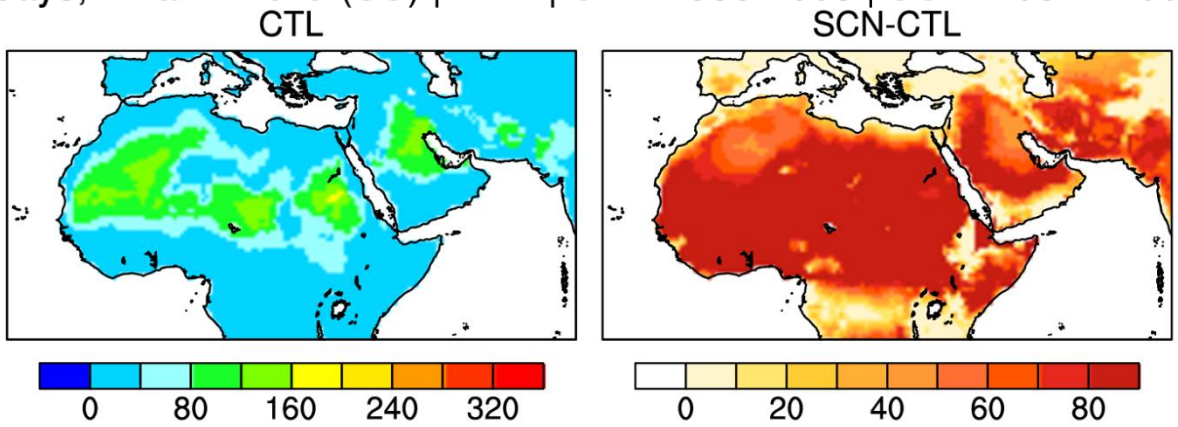
Poverty & Employment

Extreme Climate Indices
Changes in Temperature Indices – Summer Days >40

Summer days, Tmax > 40°C (SU) | ANN | CTL: 1986-2005 | SCN: 2081-2100 | rcp45 (nr of days)



Summer days, Tmax > 40°C (SU) | ANN | CTL: 1986-2005 | SCN: 2081-2100 | rcp85 (nr of days)



•Changes in the Summer days with Tmax > 40°C (i.e. annual number of days when Tmax >40°C) for the period 2081-2100 for RCP 4.5 and RCP 8.5 compared to the baseline period 1986-2005 for the ensemble of the three projections.

• The results show strong warming in the Sahara and Central Peninsula Areas for RCP8.5. The increase in the extreme temperature on the coastal areas would be lower than the central parts of the region for both scenarios.

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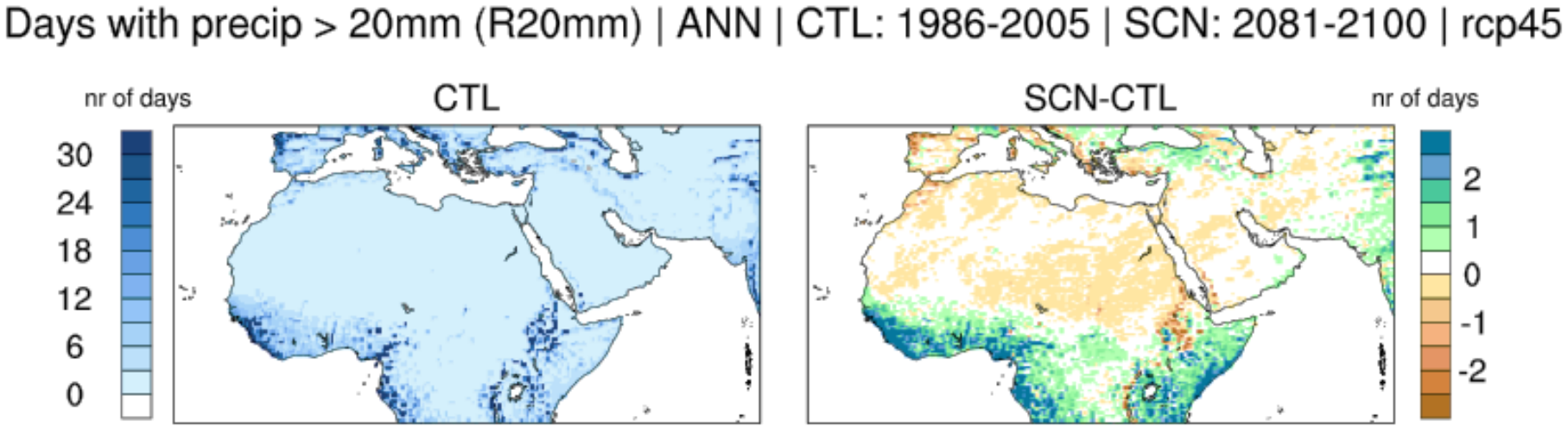
Changes in Precipitation Indices – Days with Precipitation > 20 mm (R20 mm)



•Changes in the “heavy precipitation days” (R20mm, annual number of days when precipitation ≥ 20 mm) for the period 2081-2100 for RCP4.5 compared to the baseline period 1986-2005 for the ensemble of the three projections.

• The results are similar to the R10mm showing decreasing trends and an overall reduction in rainy days with intensity greater than 20 mm for the Arab region

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Development of the National Disaster Loss Databases in the Arab Region

- National surveys were conducted for the development of Disaster Loss Databases in six selected countries, namely, Tunisia, Morocco, Palestine, Jordan, Yemen and Lebanon implemented by UNISDR/the Regional Office for Arab States.
- DesInventar methodology was followed, which is a publicly available methodology and open source tool for building disaster databases.
- This methodology allows for the homogeneous capturing, analysis and temporal and spatial graphic representation of information on disaster occurrence, frequencies and loss.
- The nationally reported disaster databases collected under RICCAR activities were customized by UNISDR for the 2015 Global Assessment Report on Disaster Risk Reduction (GAR, 2015)

Development of the National Disaster Loss Databases in the Arab Region (UNISDR/ROAS)

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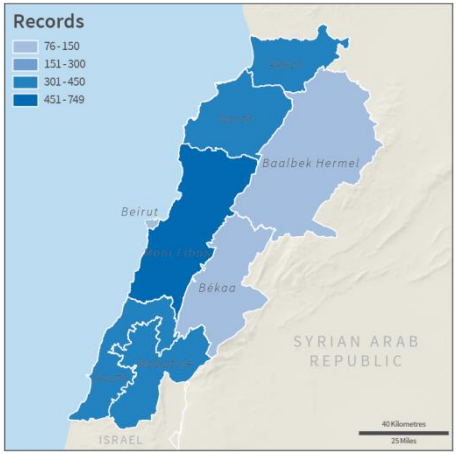
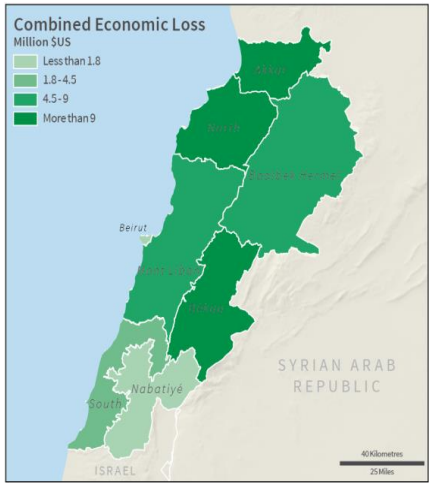


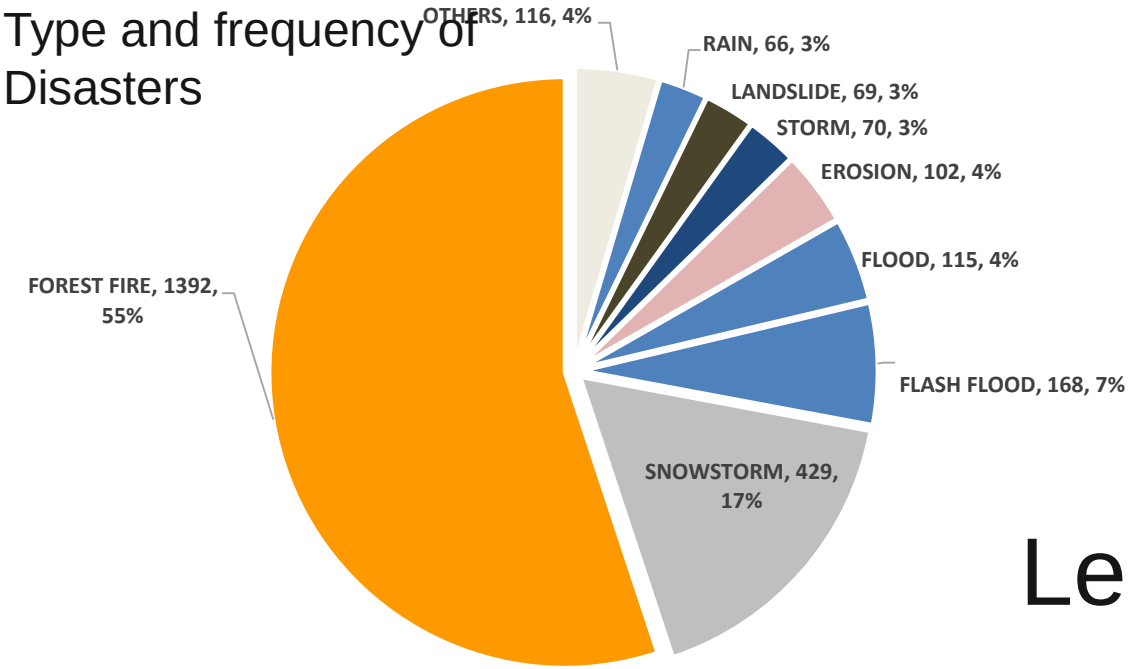


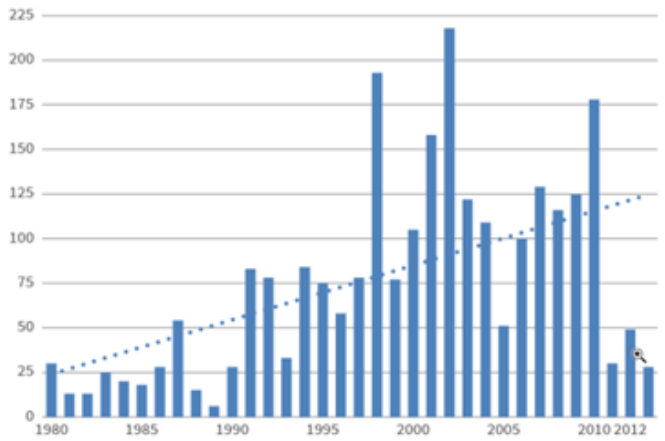
Total estimated losses of 48 million US$

Hydro-meteorological related impacts:

75% of all records
100% of mortalities.
86% of economic losses.

Type and frequency of Disasters





Lebanon 1980 – 2011

Development of the National Disaster Loss Databases in the Arab Region (UNISDR/ROAS)

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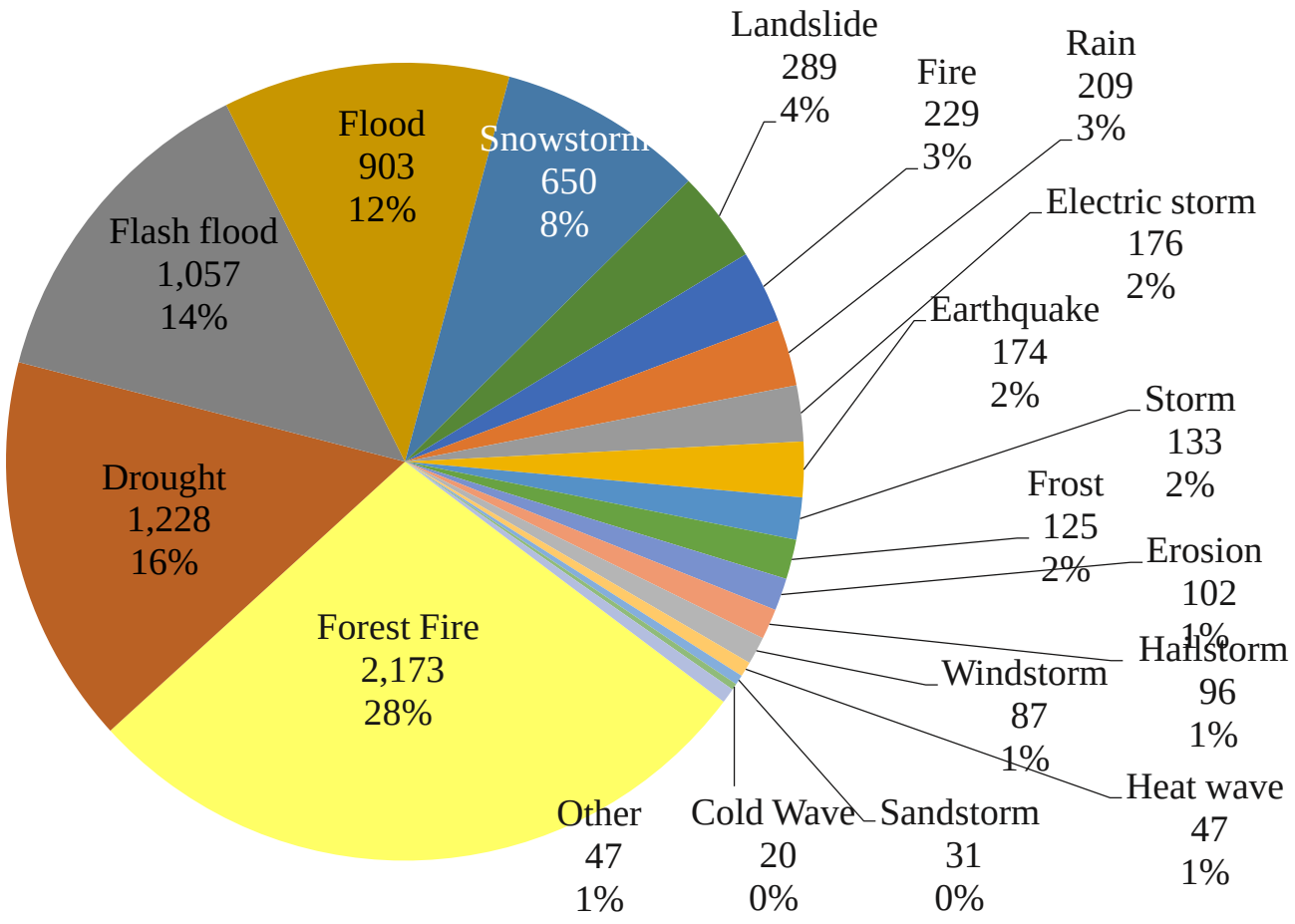
Type of Hazards and Frequency of Disasters for the Surveyed Arab Countries



Development of the National Disaster Loss Databases in the Arab Region (UNISDR/ROAS)

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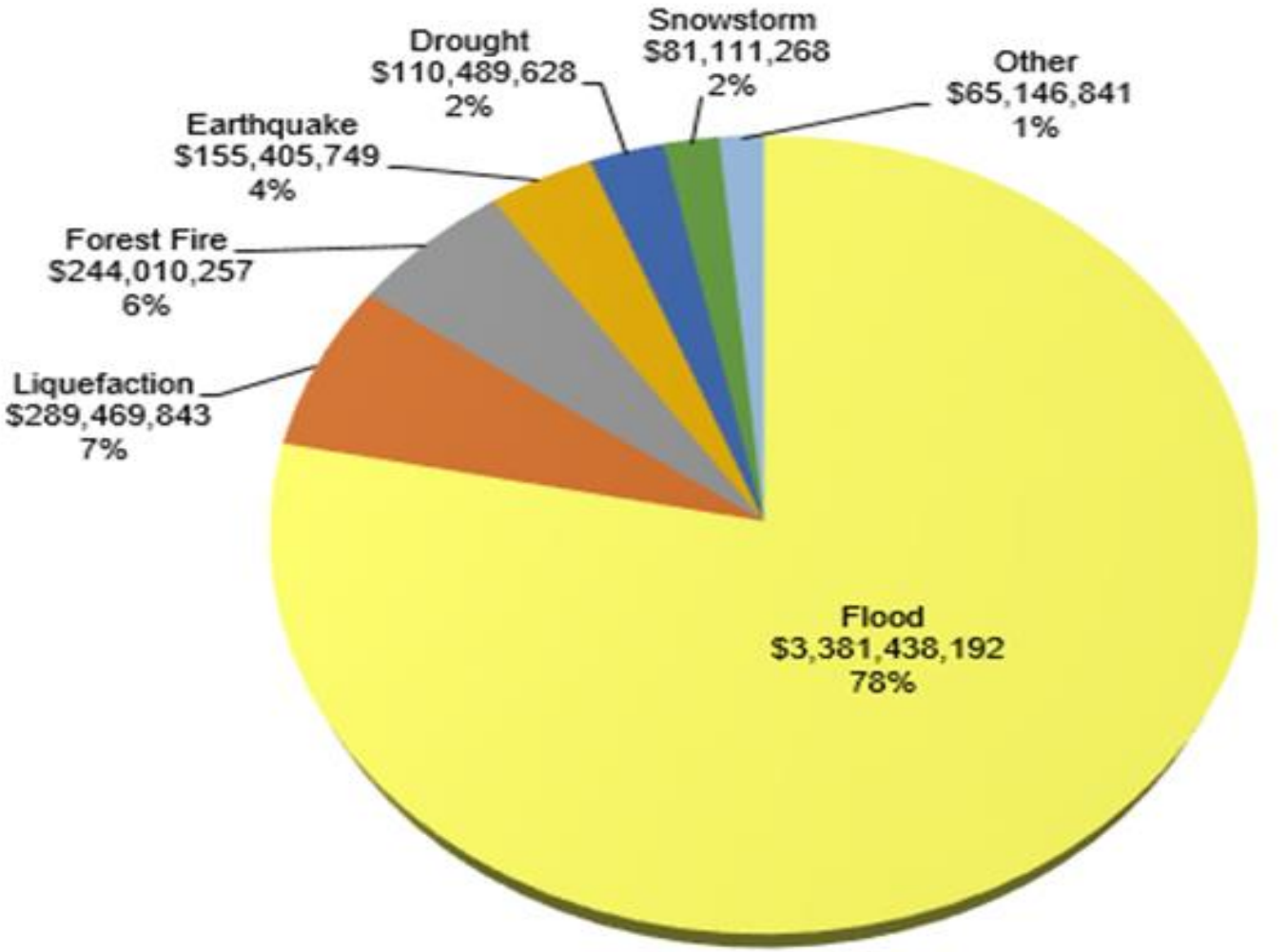
Economic Losses of Disasters for the Surveyed Arab Countries



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Linking Historical Disaster Loss Database and RICCAR Projected Extreme Indices Hotspots and Vulnerable Areas

- Disaster loss databases can play an important role in climate change analysis by helping in the identification of 'hot spot' areas where impacts are higher or more frequent than normal.
- It can help prioritizing actions based on evidence, and by providing strong justification for investments in CCA and DRR in certain locations in national development plans.
- RICCAR projected climate extreme indices and vulnerability maps can be utilized to identify future risks of related disasters.

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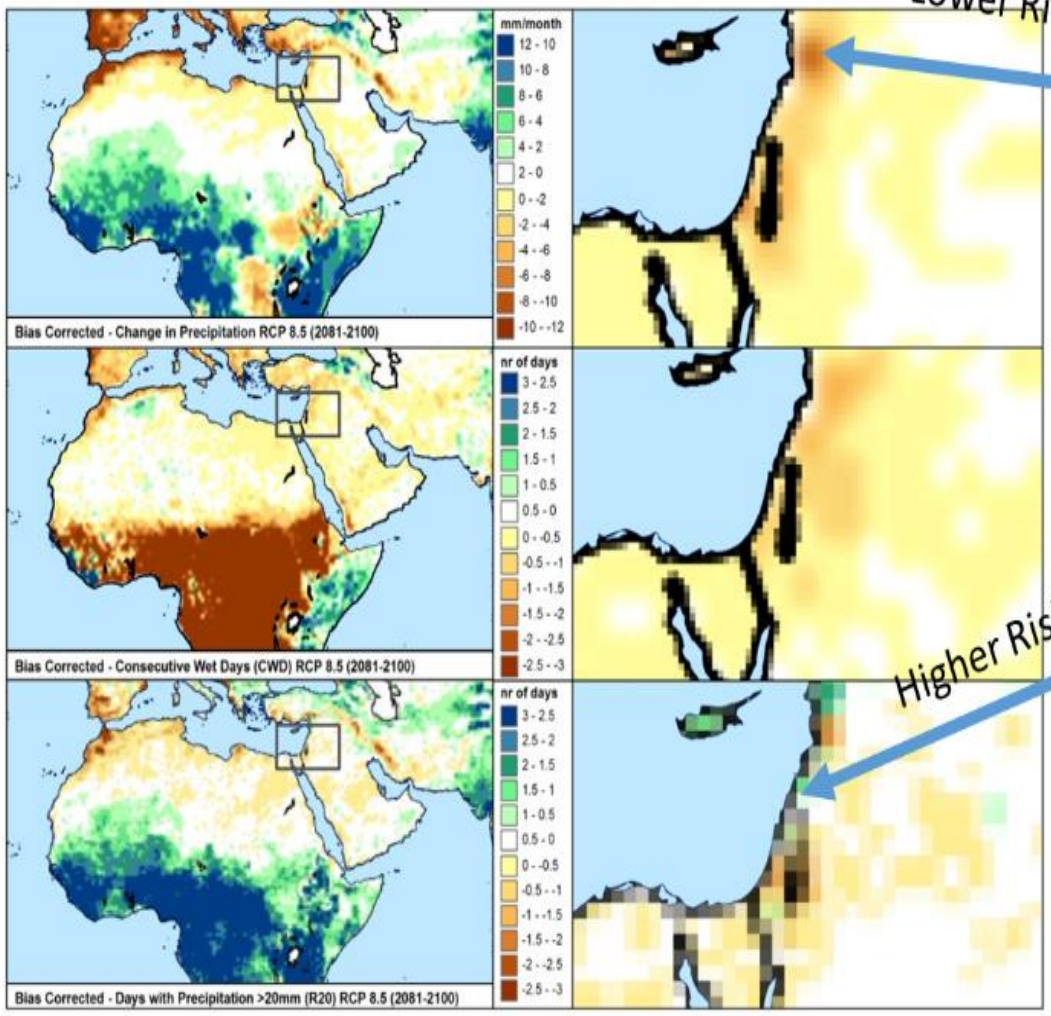
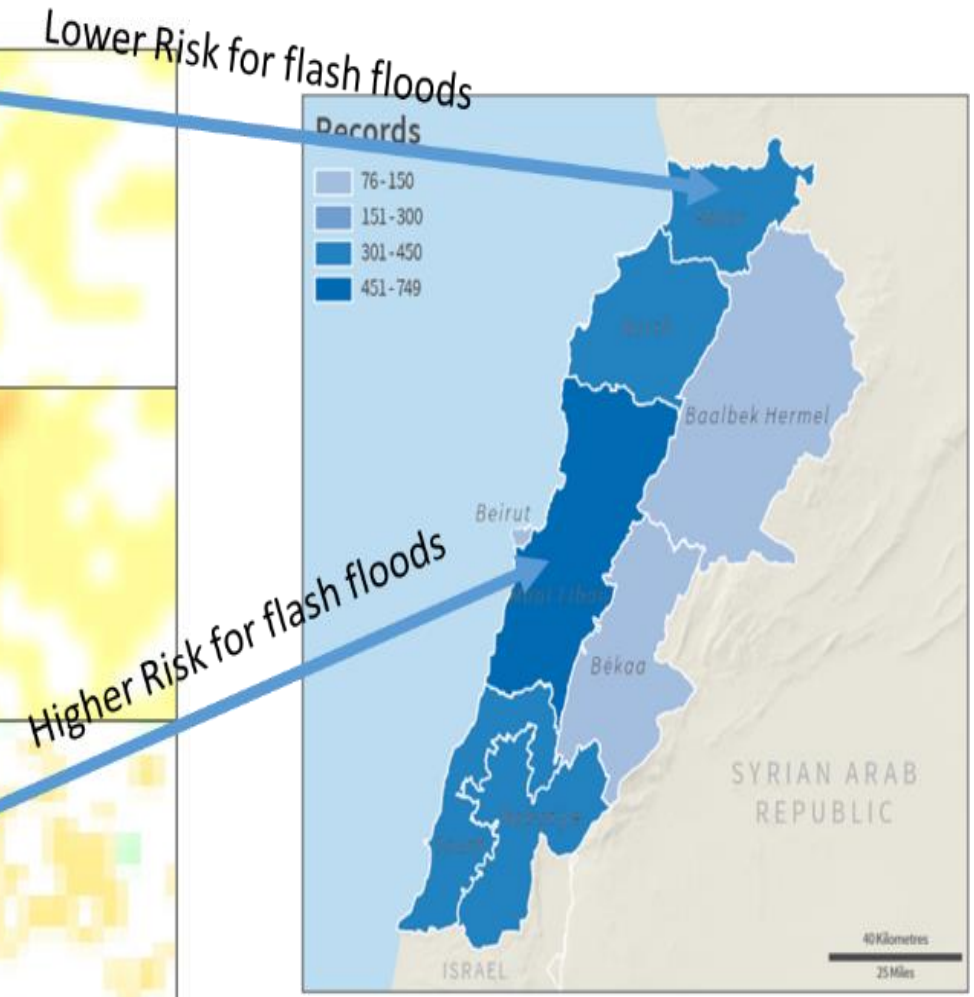
Future projections for flood related indices in RICCAR (precipitation change, CWD and R20 mm from top to bottom at left) and the spatial distribution of historical disasters (at right) for Lebanon





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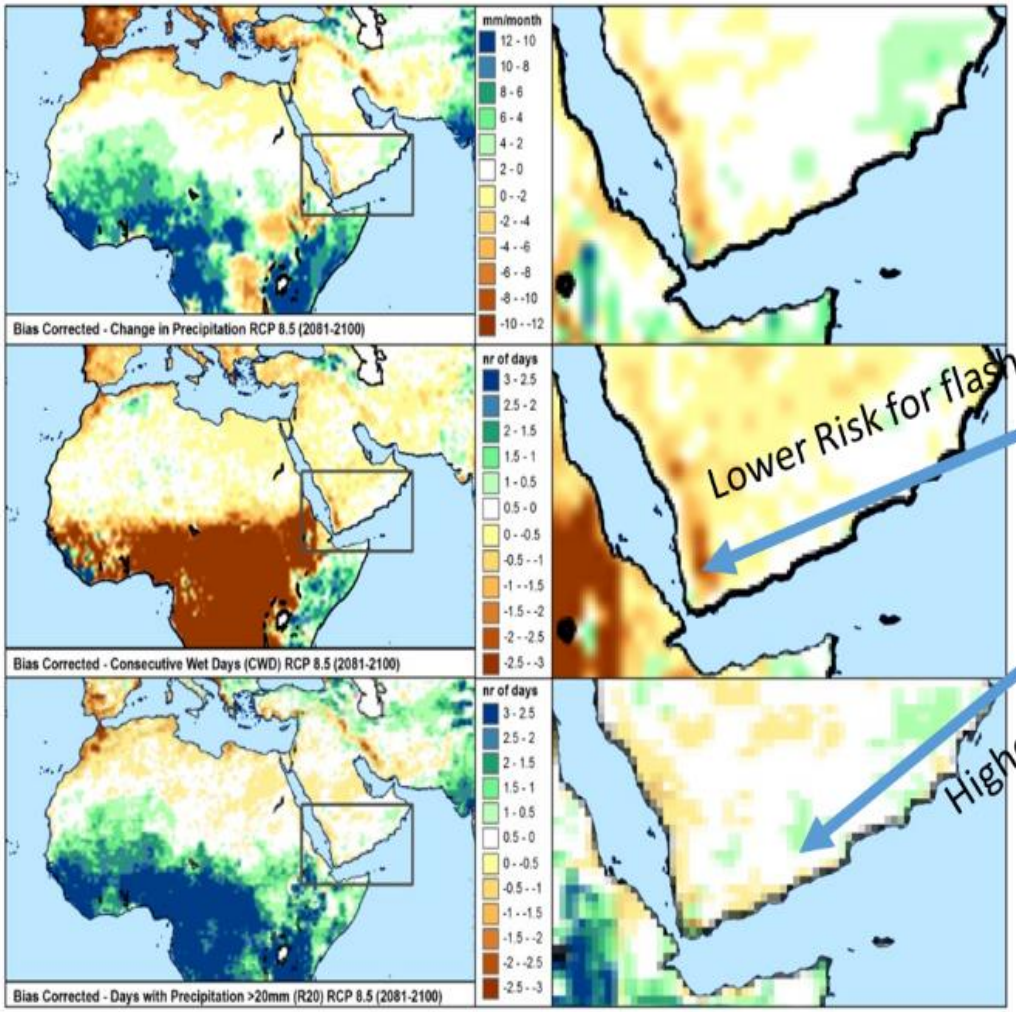
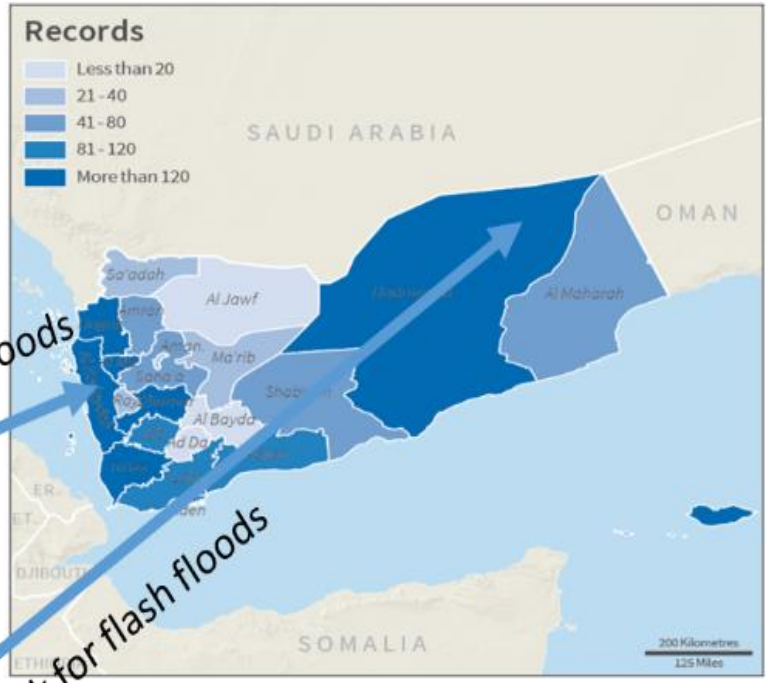
Future projections for flood related indices in RICCAR (precipitation change, CWD and R20 mm from top to bottom at left) and the spatial distribution of historical disasters (at right) for Yemen





Lower Risk for flash floods

Higher Risk for flash floods

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Recommendations: Suggested areas for improved policy coherence across the DRR and CC communities

- **Establishing and continually maintaining a single, online database** of past, current and planned DRR, CCA and related projects;
- **Developing a comprehensive risk assessment process** based on both climate change modelling and disaster losses surveys specific to the Arab region/countries;
- **Promoting technological innovations and the use of global platforms**, using GIS and information and communications technology innovations;
- **Establishing regional scientific platforms for jointly addressing the issues of CCA and DRR**;
- **Identifying clearly roles and responsibilities** with respect to risk assessment, risk management and implementation of DRR and CCA policies and actions, and enhancing governance;
- **Supporting countries to adopt remote sensing techniques in developing hazard maps** and developing early warning system at large.

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Thank you!