ESCWA Water Development Report No. 7:

Climate Change and Disaster Risk Reduction in the Arab Region

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Background

- 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.

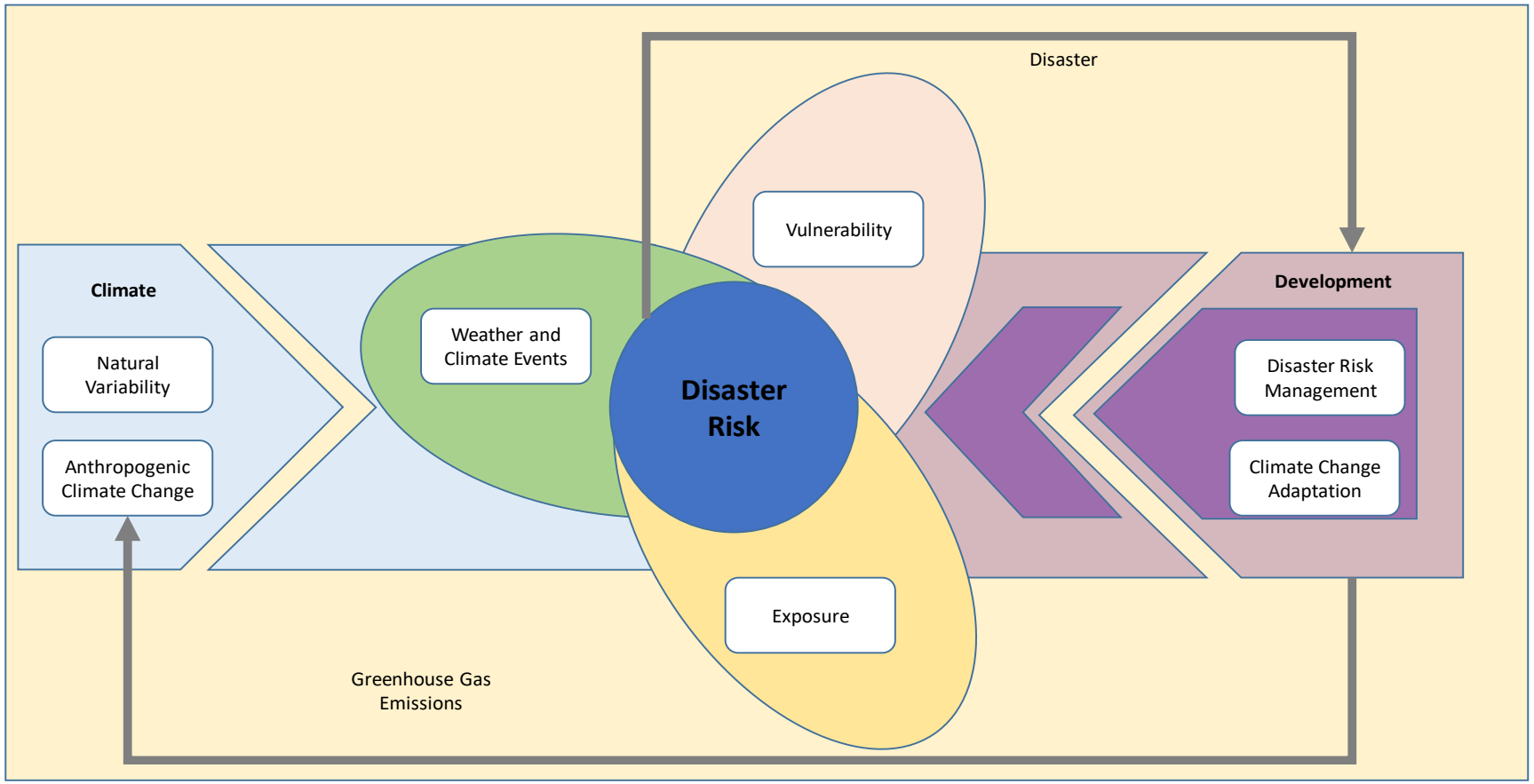
- Studies on climate change impact assessment in the Arab region (e.g. The Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region - RICCAR) have proved that natural hazards, and particularly water-related disasters, will 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"

Objectives

- Examine the global and regional processes on CCA and DRR as well as associated regional strategies and action plans taking into consideration the water scarce conditions that dominate the region.
- Present the challenges and opportunities in linking the CCA and DRR communities together.
- Examine the differences and similarities between methodologies and approaches applied in each community.
- Discuss the means of implementation, in view of pursuing synergy and coherence between them within the context of achieving the 2030 Agenda for Sustainable Development.
- Present key recommendations and messages to improve policy coherence across CCA and DRR.

Synergies between Climate Change Adaptation (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

Differences between Climate Change Adaptation (CCA) and DRR

- Approach and methodologies
- Organization and institutional settings, international mandates and agendas. etc.
- Terminologies on hazards, vulnerabilities, exposure, risk assessment, susceptibility, sensitivity, etc.
- Time horizon (short term and long term impacts and responses)
- Funding sources
- Scientific bodies (IPCC AR, GAR, etc.)
- Means of implementation
- Political interest
- ……

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.
- 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

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

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

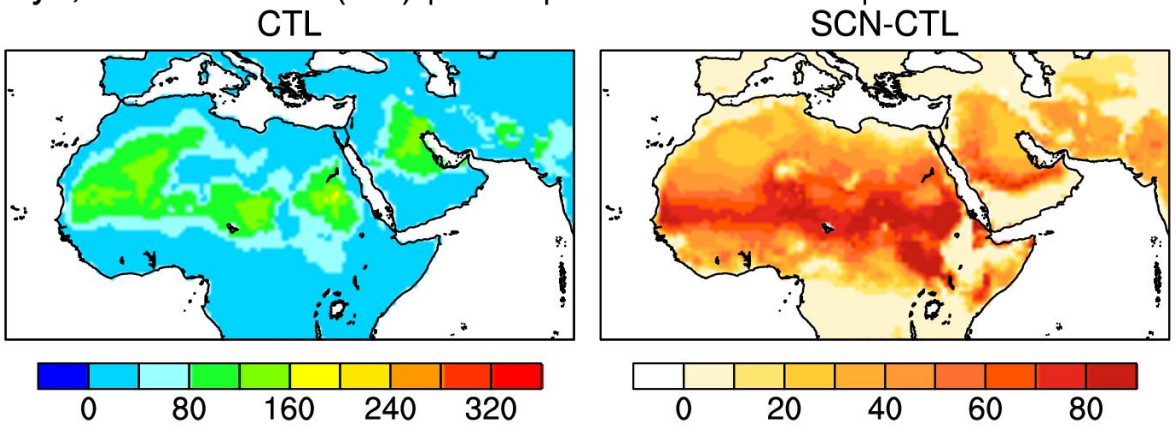
Human Settlement

Poverty & Employment

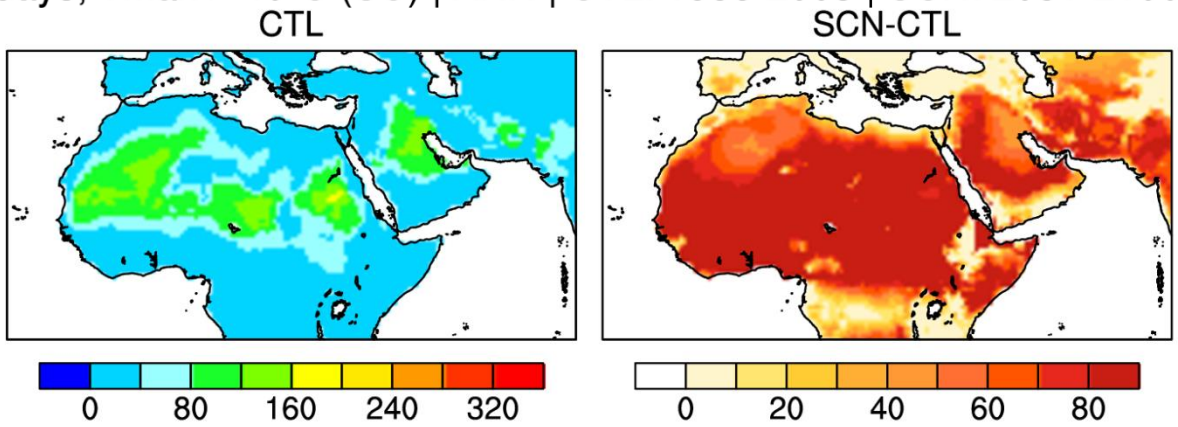
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR)

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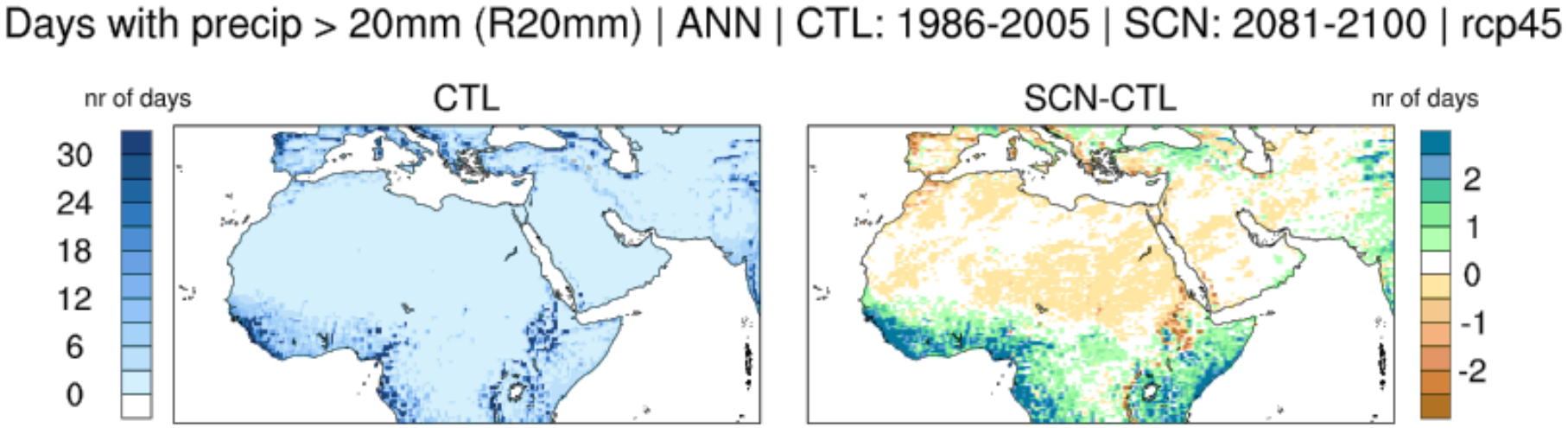
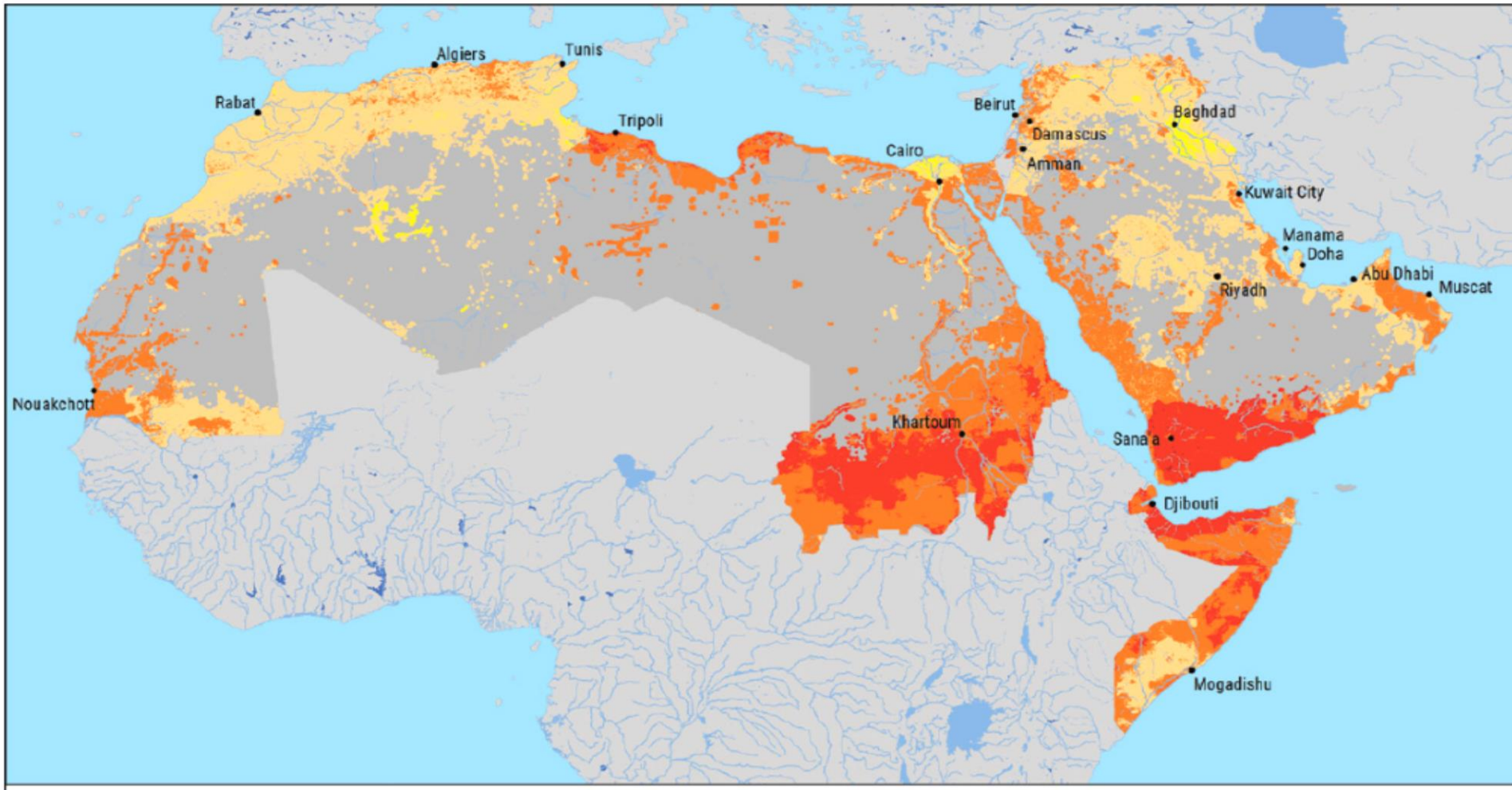
Changes in Precipitation Indices – Days with Precipitation > 20 mm (R20 mm)



•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



WATER: WATER AVAILABILITY

VULNERABILITY: RCP8.5 END-CENTURY (2081-2100)

Legend

Lakes
Reservoirs
Rivers
Intermittent rivers
Major cities
Area not relevant to subsector

Low Vulnerability — High Vulnerability

RICCAR

Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

RICCAR
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

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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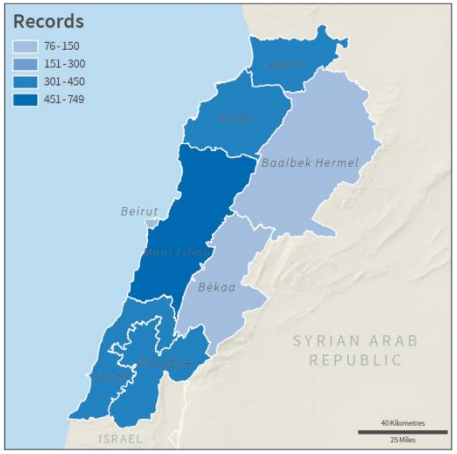
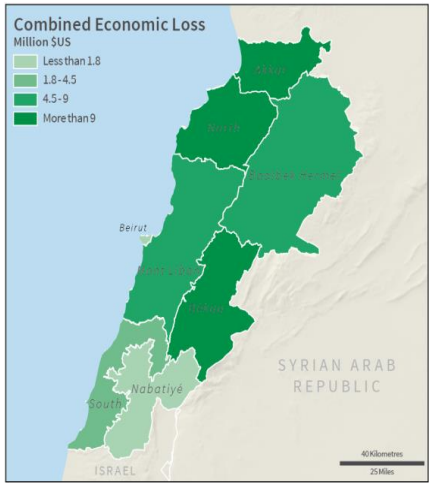


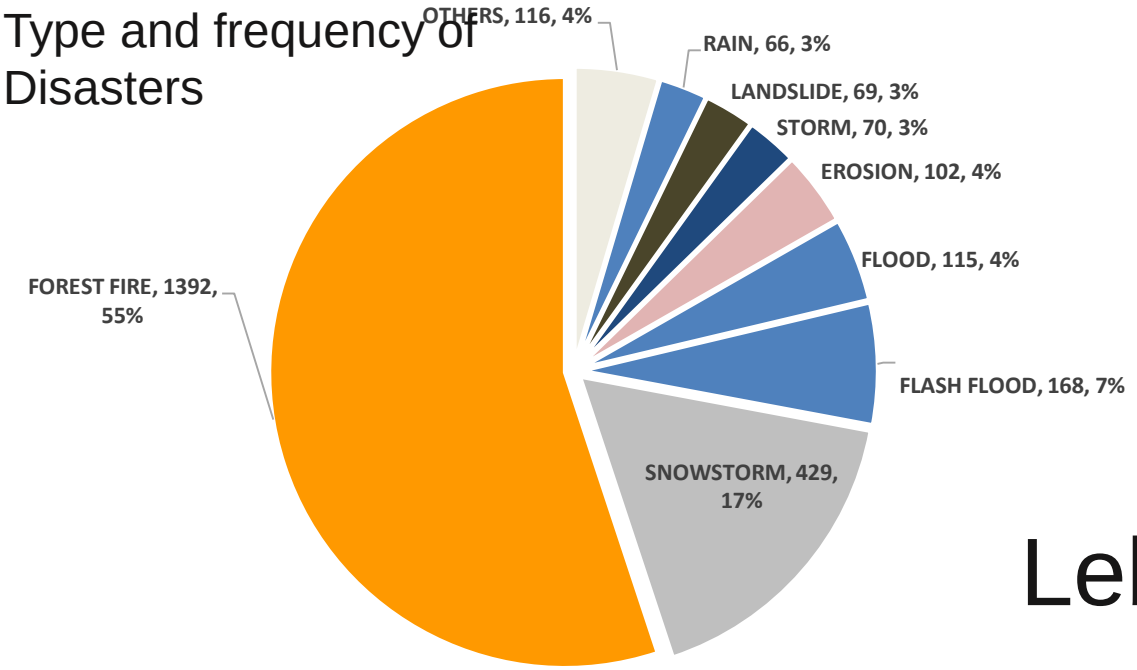


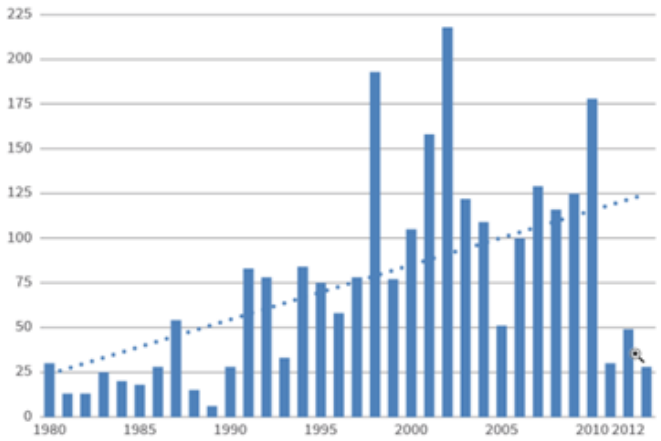
Total estimated losses of 48 million US$

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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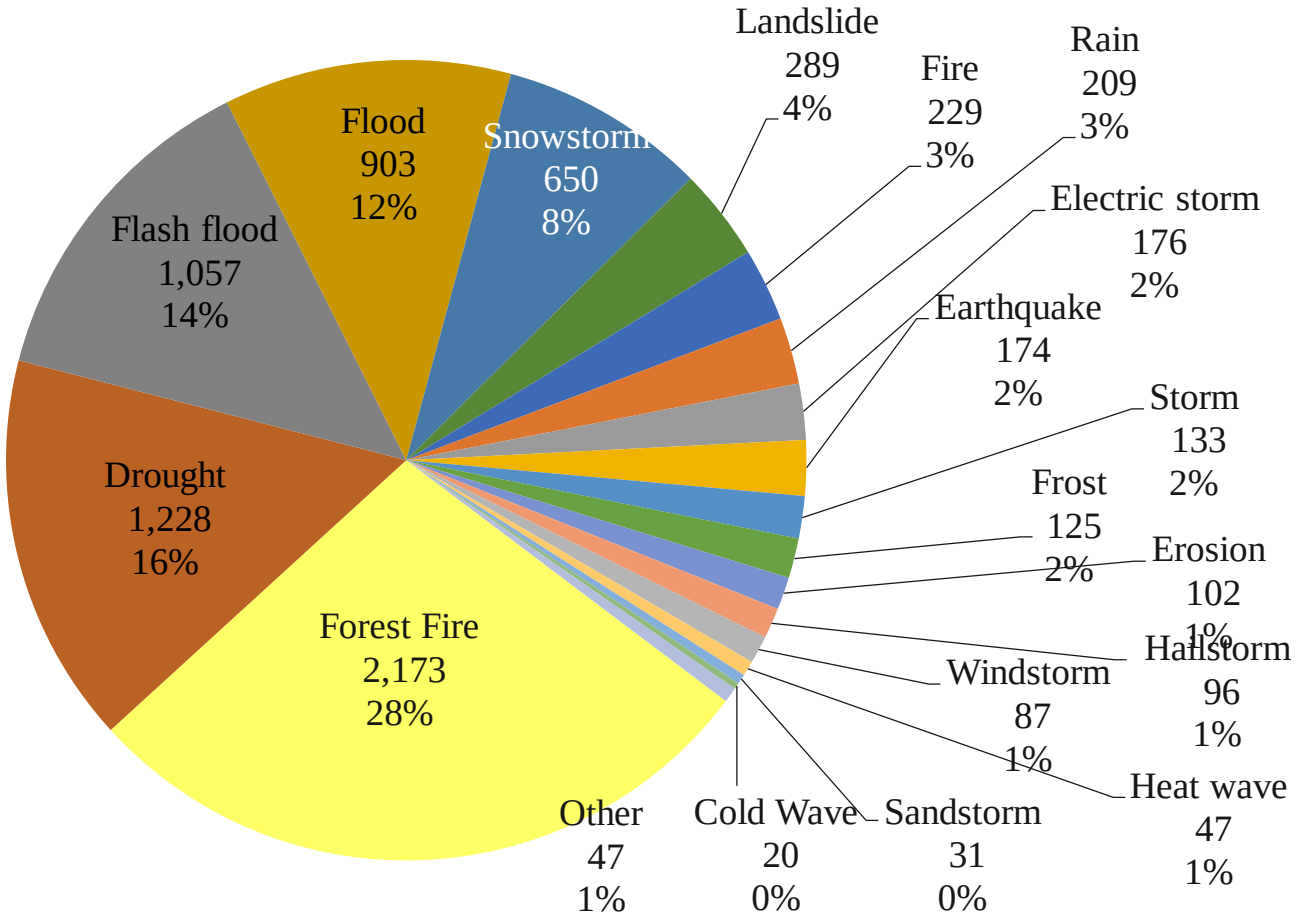
Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region

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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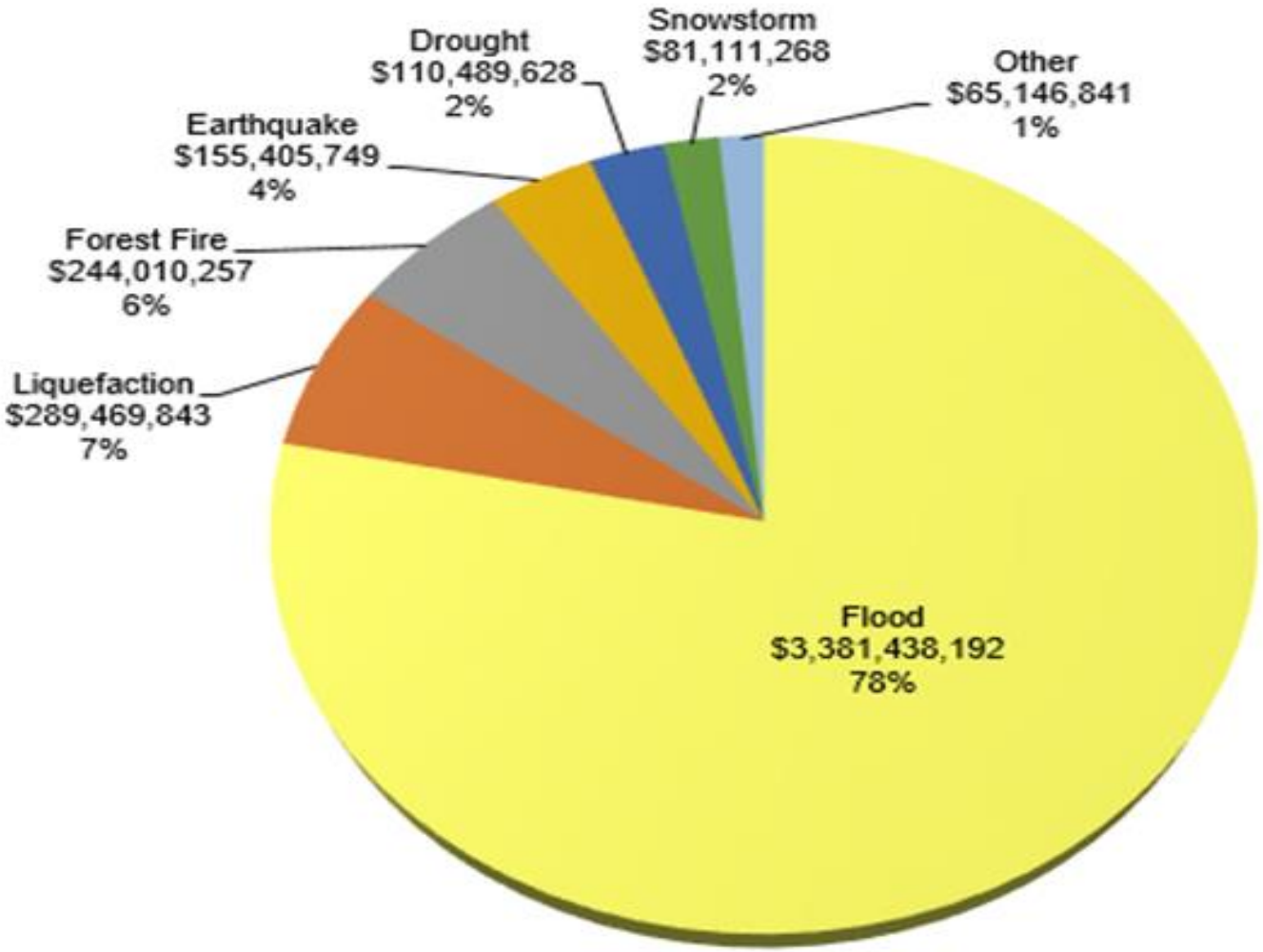
Economic Losses of Disasters for the Surveyed Arab Countries



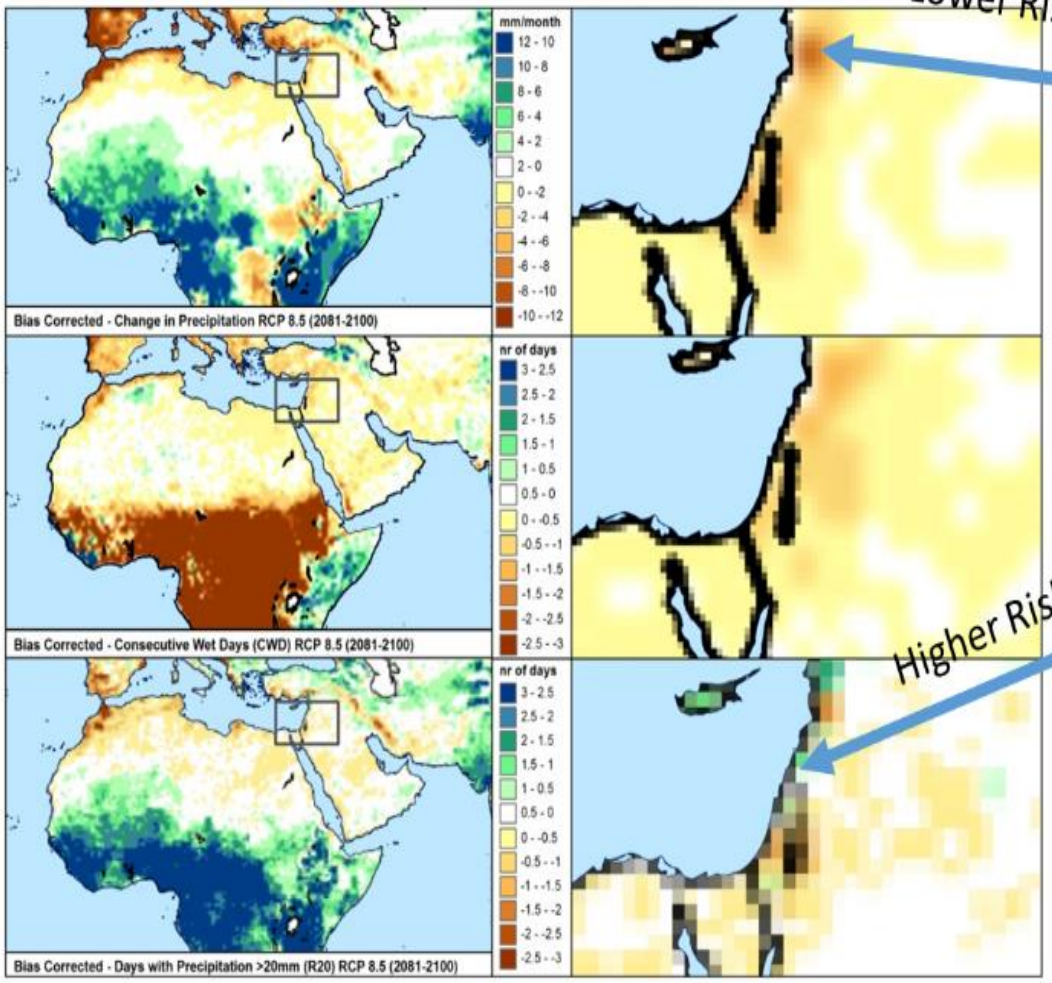
Linking Historical Disaster Loss Database and RICCAR Projected Extreme Indices Hotspots and Vulnerable Areas

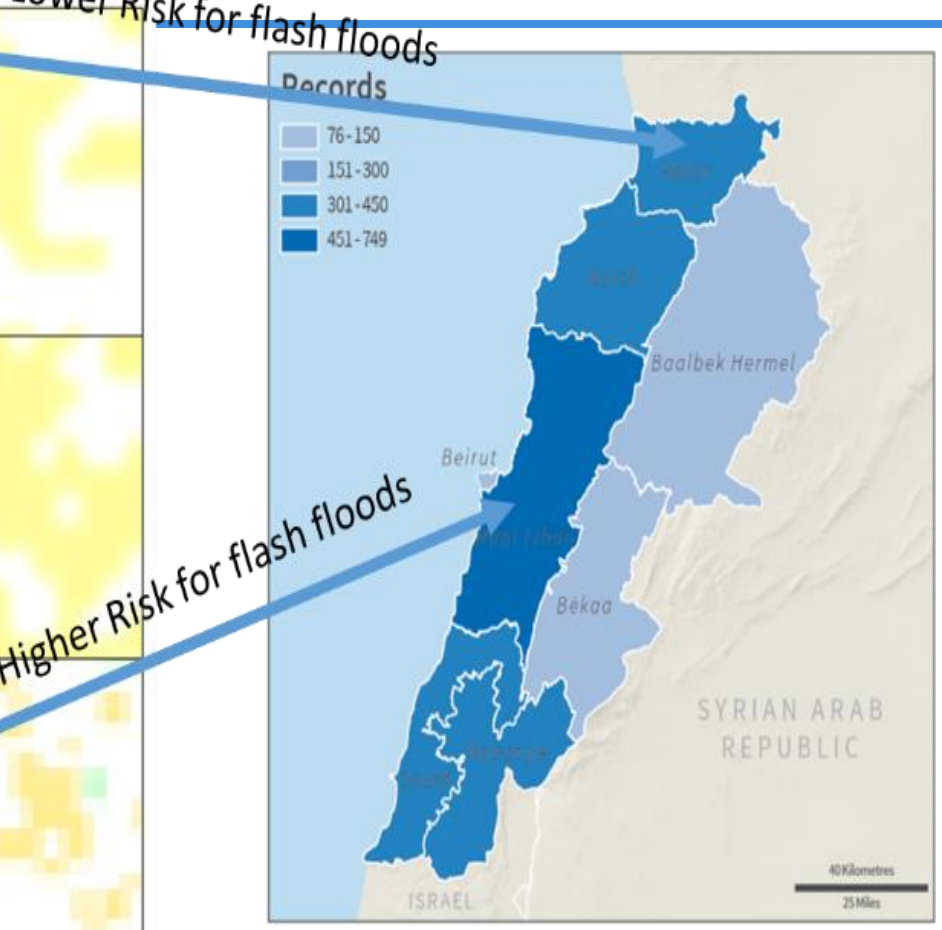
•Disaster loss databases can play an important role in climate change analysis by helping in the identification of 'hot spot' areas where impacts are higher or more frequent than normal.

•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.

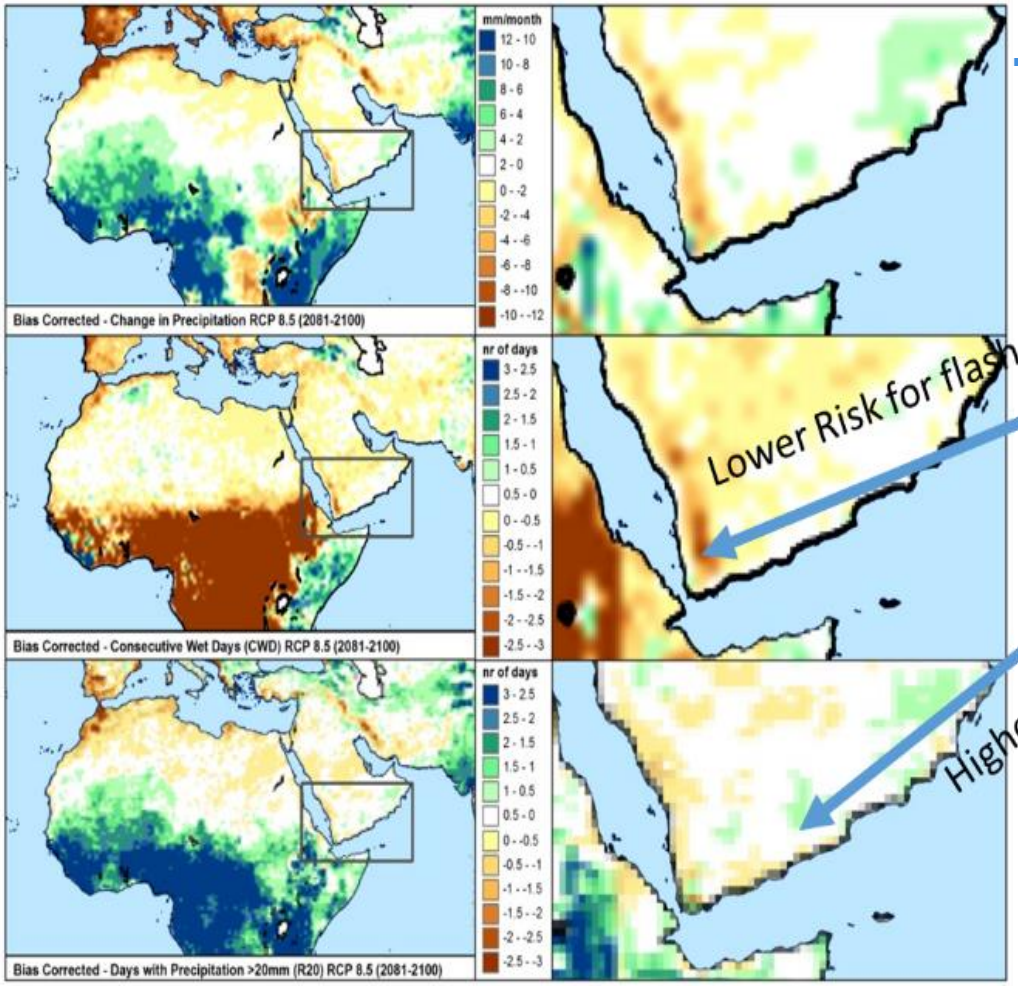
•RICCAR projected climate extreme indices and vulnerability maps can be utilized to identify future risks of related disasters.

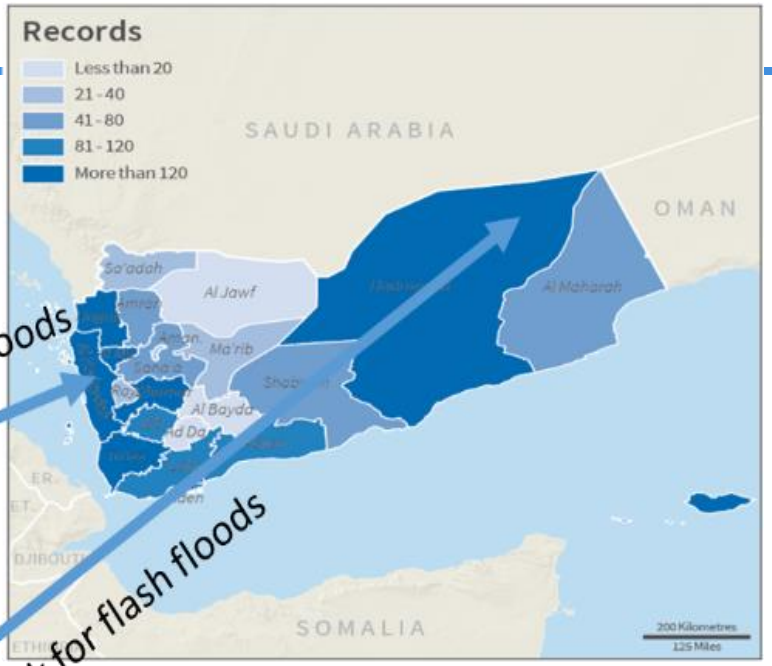
Future projections for flood related indices in RICCAR (precipitation change, CWD and R20 mm from top to bottom at left) and the spatial distribution of historical disasters (at right) for Lebanon





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





Global agenda mandates and related action plans for DRR, CC, and SDG's related to water

Components	Disaster Risk Reduction (DRR)	Climate Change Adaptation (CCA)	SDGs related to Water, CCA and DRR
Agency Involved	United Nations Office for Disaster Risk Reduction (UNISDR)	United Nations Framework Convention on Climate Change (UNFCCC)	United Nations Agencies (Regional Commissions, UN-Water, UNDP, UNEP, FAO, UNESCO, etc.)
Policy/Mandates	The Sendai Framework for Disaster Risk Reduction (2015-2030)	The Paris Agreement on Climate Change (2015-2030)	Transforming our world: the 2030 Agenda for Sustainable Development Goal 1. End poverty in all its forms everywhere Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture Goal 6. Ensure availability and sustainable management of water and sanitation for all Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable Goal 13. Take urgent action to combat climate change and its impacts
Priorities of Actions	- Understanding disaster risk - Strengthening disaster risk governance to manage disaster risk - Investing in DRR for resilience - Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction	Article 7. Adaptation - The Paris Agreement establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience and reduction of vulnerability to climate change. It aims to significantly strengthen national adaptation efforts, including through support and international cooperation. It also recognizes that adaptation is a global challenge faced by all. All Parties should engage in adaptation planning and are expected to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions. Developing country Parties will receive enhanced support for adaptation actions. Article 8. Loss and Damage - The Paris Agreement significantly enhances the Warsaw International Mechanism on Loss and Damage, which will develop approaches to help vulnerable countries cope with the adverse effects of climate change, including extreme weather events and slow-onset events such as sea-level rise. The Agreement provides a framework for Parties to enhance understanding, action and support with regard to loss and damage. Article 12. Climate change education, training, public awareness, public participation and public access to information is also to be enhanced under the Agreement.	1.5 build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters 2.4 ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality 11.5 significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations 11.b substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries 13.2 Integrate climate change measures into national policies, strategies and planning 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning 13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

Arab region mandates and related action plans for DRR, CC, and SDG's related to water

Components	Disaster Risk Reduction (DRR)	Climate Change Adaptation (CCA)	Water
Agency Involved	LAS, UNISDR, UNDP, UNEP, WB	LAS, UN-ESCWA, UNDP, UNEP, WB	LAS, UN-ESCWA, UNESCO, WB
Policy/Mandates	Regional Arab Strategy on Disaster Risk Reduction (2015-2030)	The Arab Framework Action Plan on Climate Change (2010-2020)	- Arab Strategy for Water Security in the Arab Region (2010-2030) - Sustainable Development Goals (2015-2030)
Priorities of Actions	Priority 1: Strengthen commitment for comprehensive DRR across sectors Priority 2: Develop capacities to identify, monitor and assess disaster risks Priority 3: Build resilience through knowledge, advocacy, research and trainings Priority 4: Improve accountability for disaster risk management at the sub national and local level Priority 5: Integrate disaster risk reduction into emergency response, preparedness and recovery.	Priority 1: Reduce the risks of climate change and the readiness to confront its potential impacts through programs of mitigation and adaptation. Priority 2: Preservation of the natural and human resources and to ensure a decent standard of living for Arab citizens. Priority 3: Enhancement of the pace of sustainable development in the Arab states, including achieving MDGs. Priority 4: Strengthening and building the national and regional institutional capacities to deal with issues of climate change and cope with disasters. Priority 5: Establishment of favorable conditions to stimulate regional and international cooperation necessary to support national programs.	Priority 1: In the medium term (by 2020), raising water use efficiency by 15 to 25 per cent for meeting increased water demand and ensuring water and food security for facing the future challenges in accordance with the available water resources and the principals of sustainable development. Priority 2: Adoption, in the short term (by 2015), of integrated water policies which secure water for all sectors to achieve a maximum socioeconomic benefits and insure the implementation of the millennium development goals. Priority 3: Develop, in the medium term (by 2020), alternative and practical solutions for using non-conventional water with focusing on the use of renewable energy in water desalination and water treatment for meeting the increasing water demand. Priority 4: By 2020 the signing of permanent agreements on shared water resources in the Arab region according to the "Arab Convention on Shared Water Resources in the Arab Region" and International Water law. Priority 5: In the medium term (by 2020), each Arab countries has defined a national policy for including CCA policy into national water policy.
Regional and National Actions	- Regional Arab Strategy on DRR (2015-2030) - The Arab Cooperation Agreement in Organization and Facilitation of Relief Operations (2009); - A draft Arab Protocol (2008) on Cooperation for Speedy and Immediate Response within Arab Countries to Transfer Equipment and Expertise in Cases of Disasters, Crisis and Emergencies; - Statutes for the Arab Centre to Prevent Risks from earthquakes and other natural disasters (2004).	- Regional Action Plan - National Policies - National Adaptation Plans of Actions (NAPA) - Intended Nationally Determined Contributions (INDCs) - National Communication Reports - National Sectoral Action Plans (Water, food, etc.)	- Regional Action Plans - SDG-based Development Strategies and Action Plans (National)
Coordination Mechanisms	- Regular intergovernmental meetings on DRM - Regional/sub regional disaster risk management center (under development) - Joint Committee on Environment and Development in the Arab Region (JCEDAR)	- The Council of Arab Ministers Responsible for Environmental Affairs (CAMRE)/ TC - Working Group on Climate Change, established by ESCWA	- Arab Ministerial Water Council (AMWC) - The Council of Arab Ministers Responsible for Environmental Affairs (CAMRE) / Technical Committees (TC)

National mechanisms existing in the Arab region and stakeholder/actor analysis

- Lebanon's DRR Collaborative Agenda (Political will and leadership, DRR and management Unit under the PMO 2009, Communication Strategy for DRR in 2011, strengthening local authorities)

- Egypt's DRR and CCA Strategies (Crises and Disaster Management Unit under the Cabinet in 2000, National Strategy for CCA and DRR 2010 -2030)

- Jordan's National Committee on Climate Change and CC units established in concerned ministries

- Algeria's DRR Agenda following 2001 flooding and 2003 earthquake and strengthening the role of the Civil Protection Directorate and local authorities and communities.

Regional DRR and CC mechanisms

- The DRR Arab States Coordination Network
- LAS Committee of Risk Information Management of Weather and Climate
- Making Cities Resilient Campaign
- The UN Regional Coordination Mechanism/ Thematic Working Group on Climate Change
- The Regional Working Group on the 2030 Agenda for Sustainable Development in the Arab Region
- The SDG’s Data Working Group in the Arab Region

Means of Implementation

- The role of science and technology, finance, and capacity building in providing evidence for policy is gaining prominence, with demand growing for multidisciplinary enquiry to address the complex and inter-related problems of climate change, disasters and sustainable development.

- The Sendai Framework calls for empowering local communities, raising awareness on disaster risks, developing partnerships at all levels, and providing financing, technology transfer and capacity building support to reduce risks of disaster and the number of lives and livelihoods lost to hazards.

- The Paris Agreement recognizes that developed and developing countries share common climate-related challenges, but have different abilities to adapt to climate change. The process focuses on national ownership and calls for the submission of NDCs. The agreement recognizes the need to enhance adaptive capacities of developing and most affected countries, strengthen resilience and reduce vulnerability to climate change.

Thank you!