

The Impact of Climate Change on Natural Disasters in Iran

M. Faravani, R. Aghnoum, A.A. Moayedi

Khorasan Razavi Agricultural and Natural Resources Research and Education Center, AREEO



IRAN is a disaster prone country

According to global estimates, Iran is placed in the list of the top ten countries facing disasters.

Major Natural disasters:

- Earthquake
- Floods
- Droughts
- Landslide
- Storms
- Desertification
- Deforestation
- Cold weather stress



Earthquake in IRAN

IRAN is part of the Alpine–Himalayan orogenic belt

More than **156000** people killed by Earthquake in Iran during the last century.

Iran is among top ten countries on the Mortality Risk Index for earthquakes.

Bam earthquake (Dec. 2003, 6.6 MMS)
-26,271 people killed, 30,000 injured



Tabas earthquake , 1978. 25,000 dead

Manjil-Rudbar earthquake, 1990, 40000 dead

Zarand earthquake , 2005

Lorestan earthquake, 2006

Tropical Cyclone Gonu, 2007

Floods

In recent years, flash flood intensities have been increased in flood prone areas

Goleta floods, 2001

**damaged more than 5000 km² of
rural and urban regions,
more than 300 people died**



No	Flood location	Flood type	Year
1	Golestan	Flash	2001
2	Shiraz	Urban	2004
3	Golidagh	Flash	2005
4	Karun 4 dam	Flash	2006
5	Chahbahar, Guno	Tidal	2007
6	Breaking of Jakigor bridge	Tidal	2007
7	Kheirabad Dam	Tidal	2008
8	Qum	Urban	2009
9	Qazvin province	Flash	2015
10	Hormozgan	Flash	2015

•Sand and dust storms, emerging risk factors

- In recent years, dust storms coming from western neighboring countries are drastically increased in western and even central part of Iran.
- Environmental
- Socio-economic
- Health problems



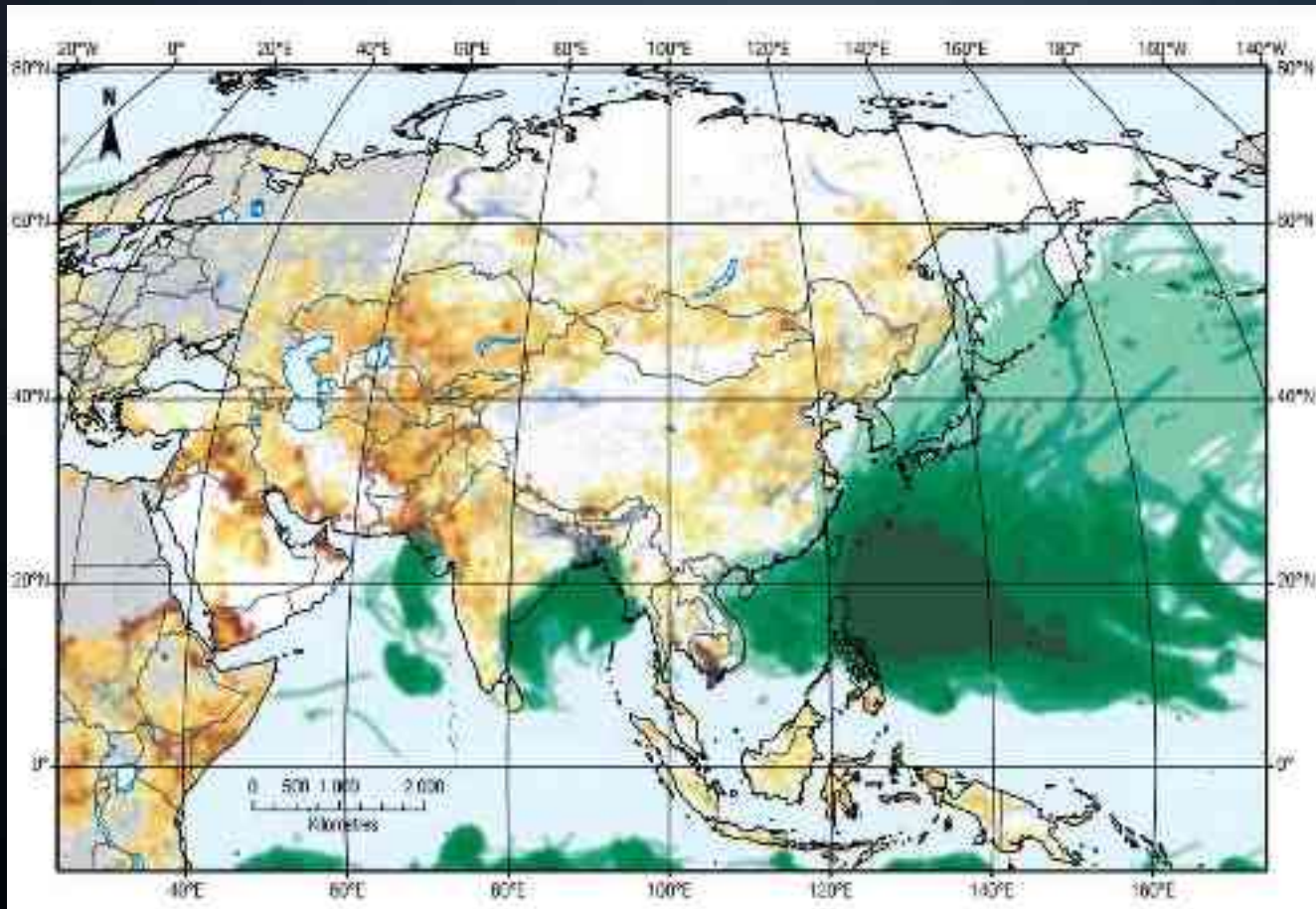
southwestern province, Khuzestan



southeastern province, Sistan-Baluchestan

Consequences of climate change

- Droughts
- Climate: Arid and Semi Arid
Average Annual Precipitation: 240 mm
- Iran is heavily affected by drought events .



Multi-hazard map of Asia



•Drought affects lives and communities in three major ways.

1-The economic impact of drought

- decrease in cultivation and in the yield of Agricultural crops
- fishery industries....

2-The social impact of drought

- increased likelihood of conflict over commodities, fertile land, and water resources
- Population migration from villages to cities

-3-Environmental impacts of drought

- Loss of species biodiversity
- Increased soil erosion.



The Zayandeh-rood River in the historic city of Isfahan.

Iranian Drought Monitoring system

■ Meteorological Data

Iranian Meteorological Organization (IRIMO)

Monitored Indices: Daily, weekly, and monthly rainfall, snow fall.

■ Hydrological Data

Ministry of Power

■ Monitored Indices: Water storage in reservoirs/ponds/lakes, river flow, groundwater level, water loss through evaporation, ..

■ Data from Space

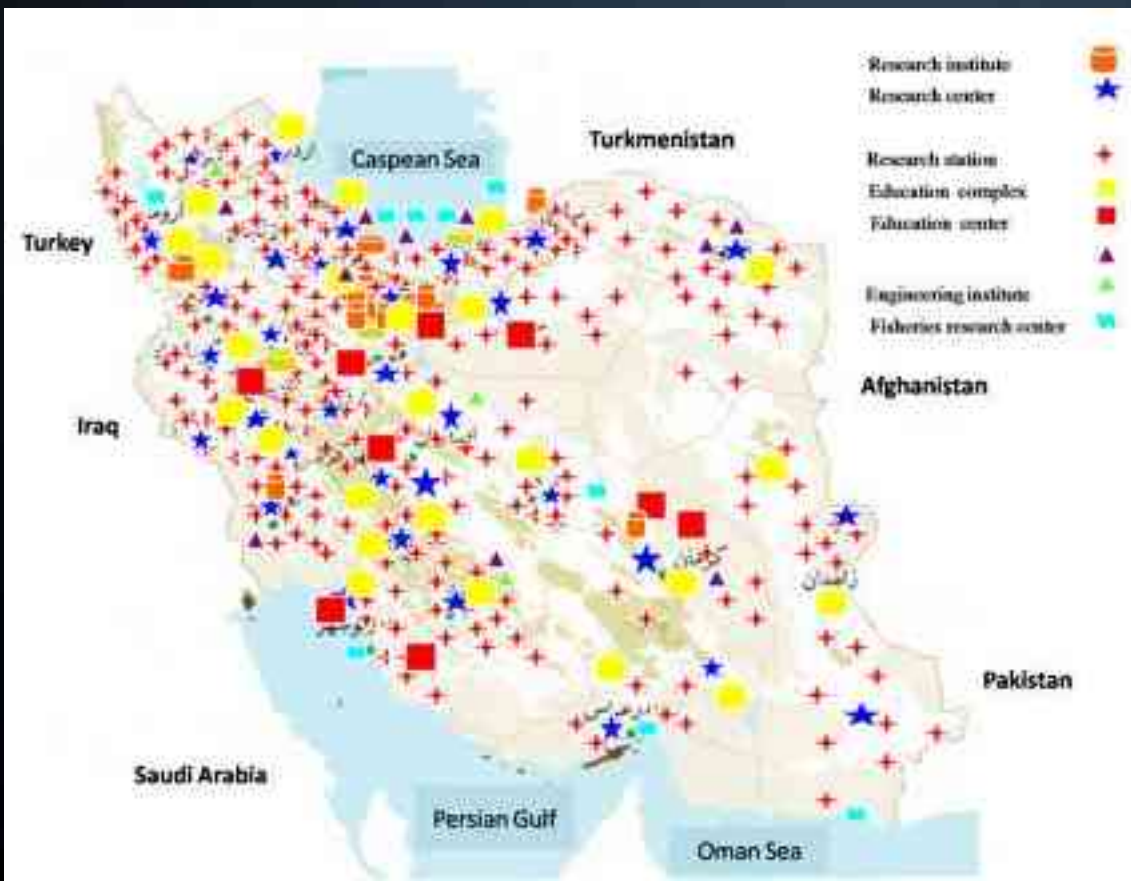
Agencies: Iranian Space Agency, National Geographic Organization, National Cartographic Centers

Monitored Indices: Vegetation monitoring, rainfall, surface wetness and temperature

■ Agricultural Data

Agency: Ministry of Agriculture, Agricultural Research , Education and Extension Organization (AREO)

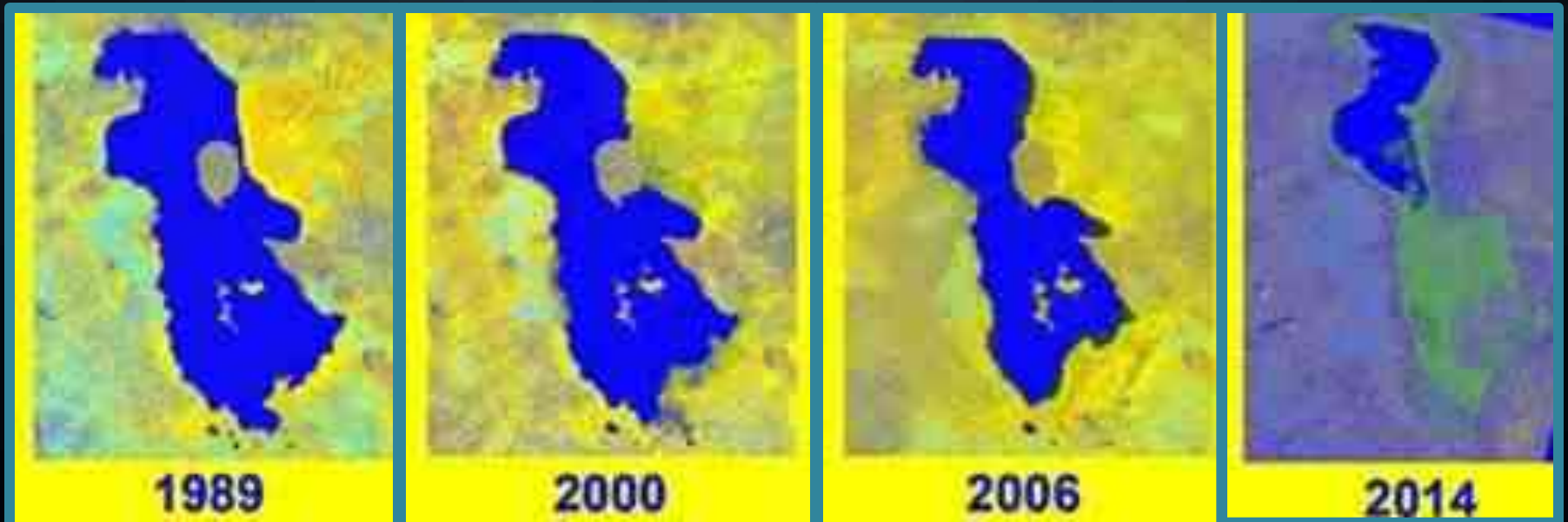
Monitored Indices: Soil moisture, area under sowing, type of crop, crop water requirement, status of growth, crop yield, alternative cropping possibilities



Long term research program on the impact of climate change on Agriculture and climate change risk reduction

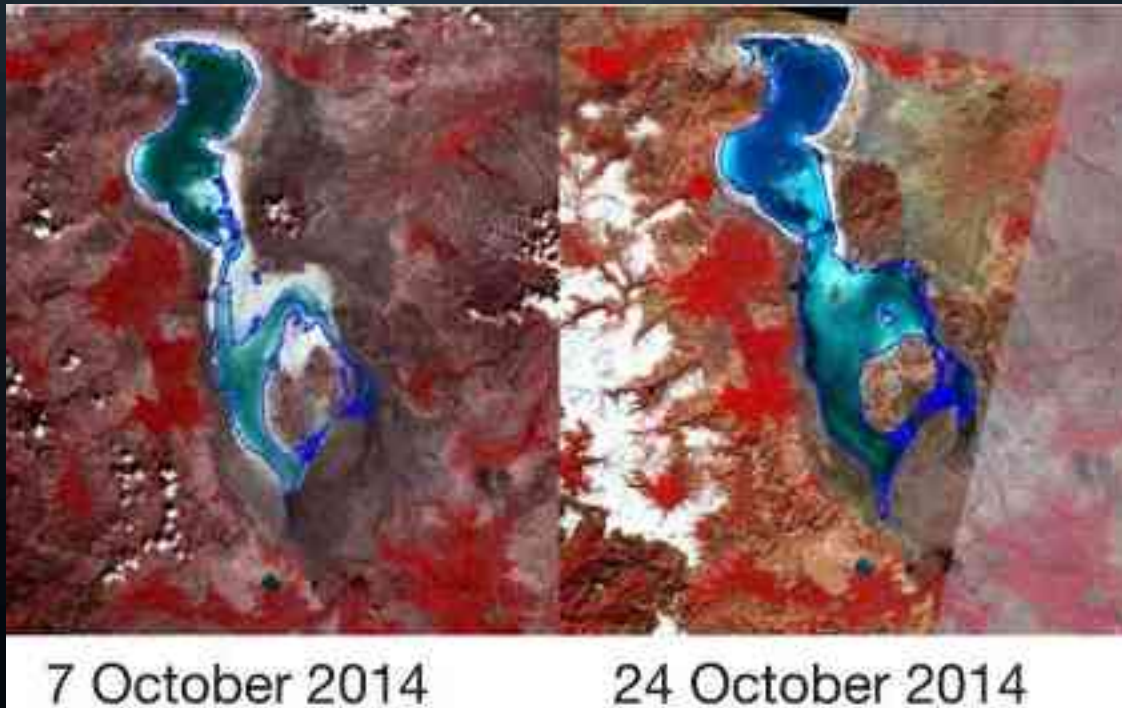
Death of Urmia Lake, a silent disaster

Urmia lakes water levels decreased heavily over the last 30 years due to drought and water use mismanagement.



Urmia Lake Recover Plan

Decreasing agricultural water use and restoration of the local environment are water management strategies adopted by government in the framework of a rescue plan. The plan was approved in 2013 with a budget of \$500 million for the first year.



The National Disaster Management Organization (NDMO)

- established in 2008, chaired by Interior Deputy Minister

The main functions of the **NDMO** are as follows:

- 1- Development of policies and plans of action related to the four phases of disaster management,
- 2- Facilitate coordination and create cohesion among the various organizations in the country
- 3- Arrange for review and develop policies and comprehensive plans on culture, research, training, and propagation, dissemination of information
- 4- Strengthen regional and international cooperation, exchange of views and make use of experiences
- 5- Coordination and supervision over development and expansion of effective prevention systems

The High Council for Disaster Management is chaired by the President and its members consist of:

Heads of Management and Planning Organization

relevant Ministers

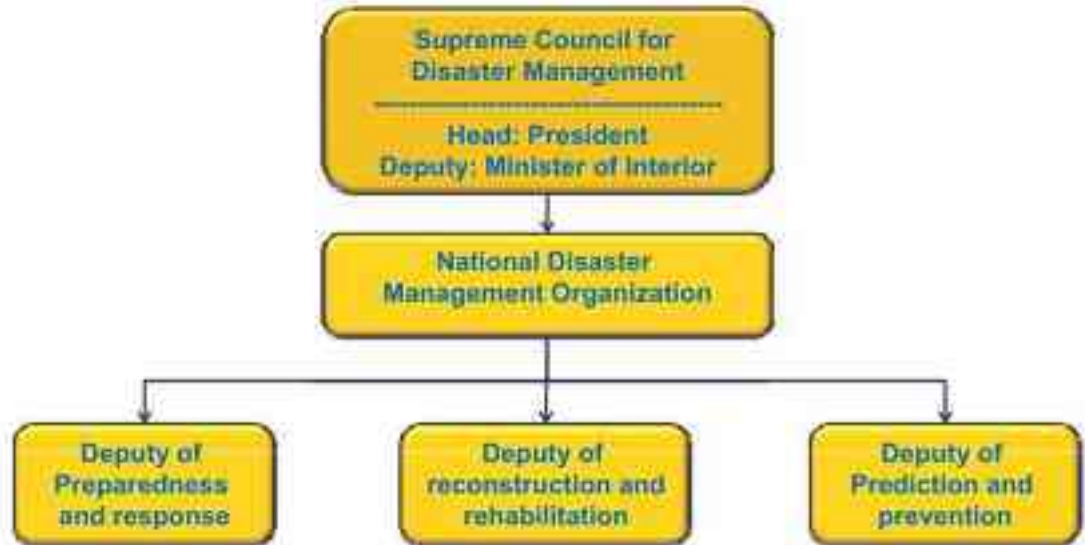
Commander of Armed Forces

First deputy of the Judiciary

Iran Broadcasting Corporation

Head of Red Crescent Society

.....



The provincial and township sub- units formed under the supervision of Governor
Generals and Governors.

Regional and International Cooperation

1- The United Nations Office for Disaster Risk Reduction (UNISDR)

2- Implementation of Hyogo Framework for Action (HFA), 2005-2015

Iran was one of the first countries to establish an Executive Secretariat to follow up on the implementation of Hyogo Framework for Action (HFA) at the national level.

2- Iran is a member of The Asian Disaster Reduction Center (ADRC)

3- The UN Development Assistance Framework (UNDAF) for 2012-2016 in IRAN was signed in 2011



Research and Education are key points

The National Disaster Management Organization (NDMO)

- Public training (Families, Women, Childs, School Teachers)
- Specialized Training Programs, Conferences....



- Natural Disaster Research Institute (NDRI),**
- The NDRI is affiliated to the Housing Foundation of the Islamic Revolution
- The Earthquake Research Center, Ferdowsi University of Mashhad**

Research and Education are key points

•University Educations

- University of Tehran
- Masters in Disaster management, Ph.D. in Disaster and Emergency health

Iran University of Medical Sciences

- Ph.D. in Disaster and Emergency health

•International Institute of Earthquake Engineering & Seismology (IIEES)

- Ph.D. & Masters in geophysics, Masters in Disaster Risk Reduction

•Shahid Beheshti University (SBU)

- Masters in Disaster management, Masters in Reconstruction after Disasters

Suggestions

1- Investment in scientific, technological and applied researches to identify the effective risk layers and capacity building on Disaster Risk Management.

2- Development of regional and international cooperation to facilitate sharing the information and advanced technologies needed for Disaster Risk Management.

3- Development of regional cooperation in preventing the effects of disasters on the basis of geological, geographical and social-economic similarities is of great importance in sharing good practices and common capacities.

Acknowledgement:

-The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre)

-National science and technology commission of Sri Lanka

-Agricultural Research , Education and Extension Organization (AREO)

Thank you!

