Study Visit on Reducing Desertification and the Risk and Negative Impacts of Sand and Dust Storms

Policies, Strategies, and Programs of the I.R.Iran for Management, Adaptation, and Mitigation the Sand and Dust Storms

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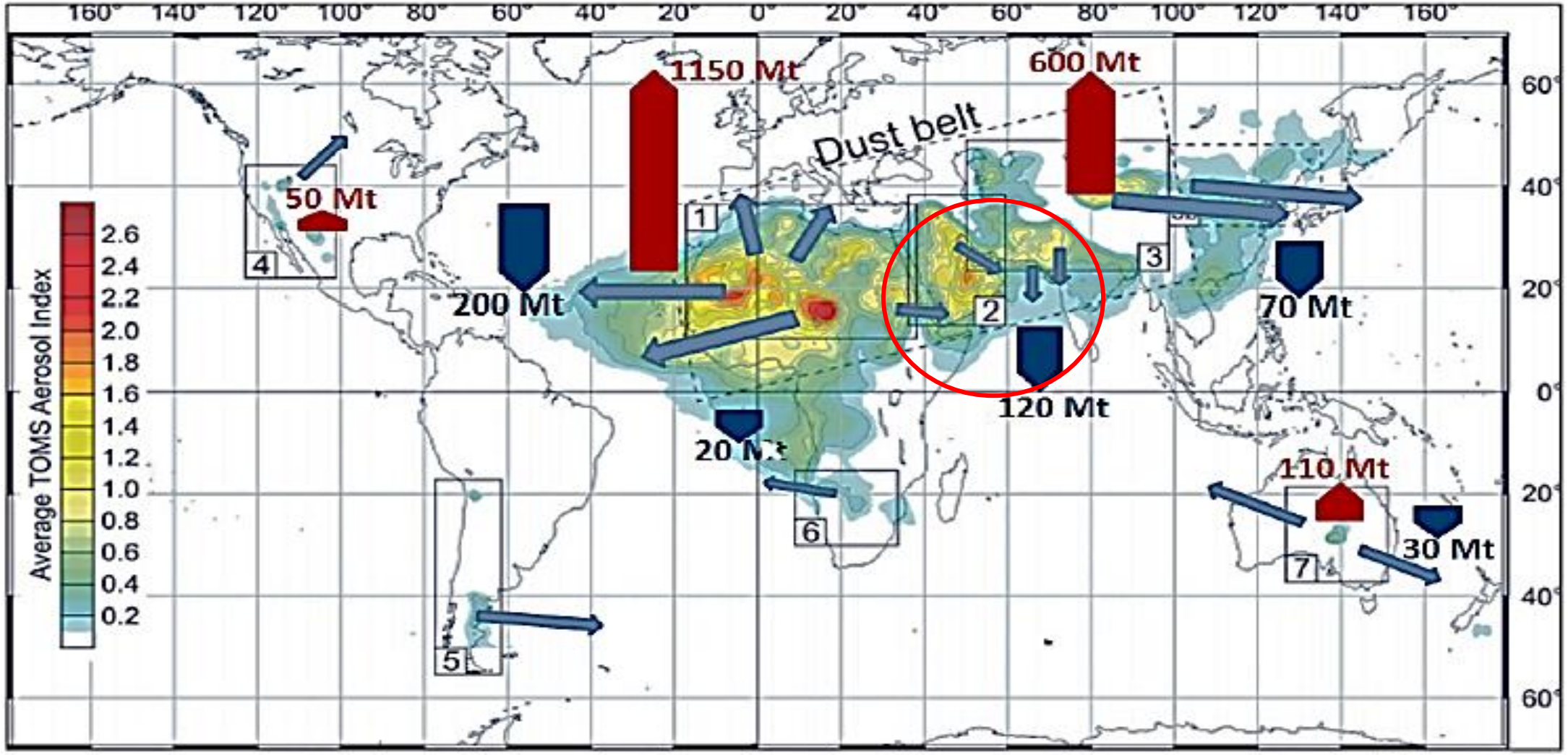
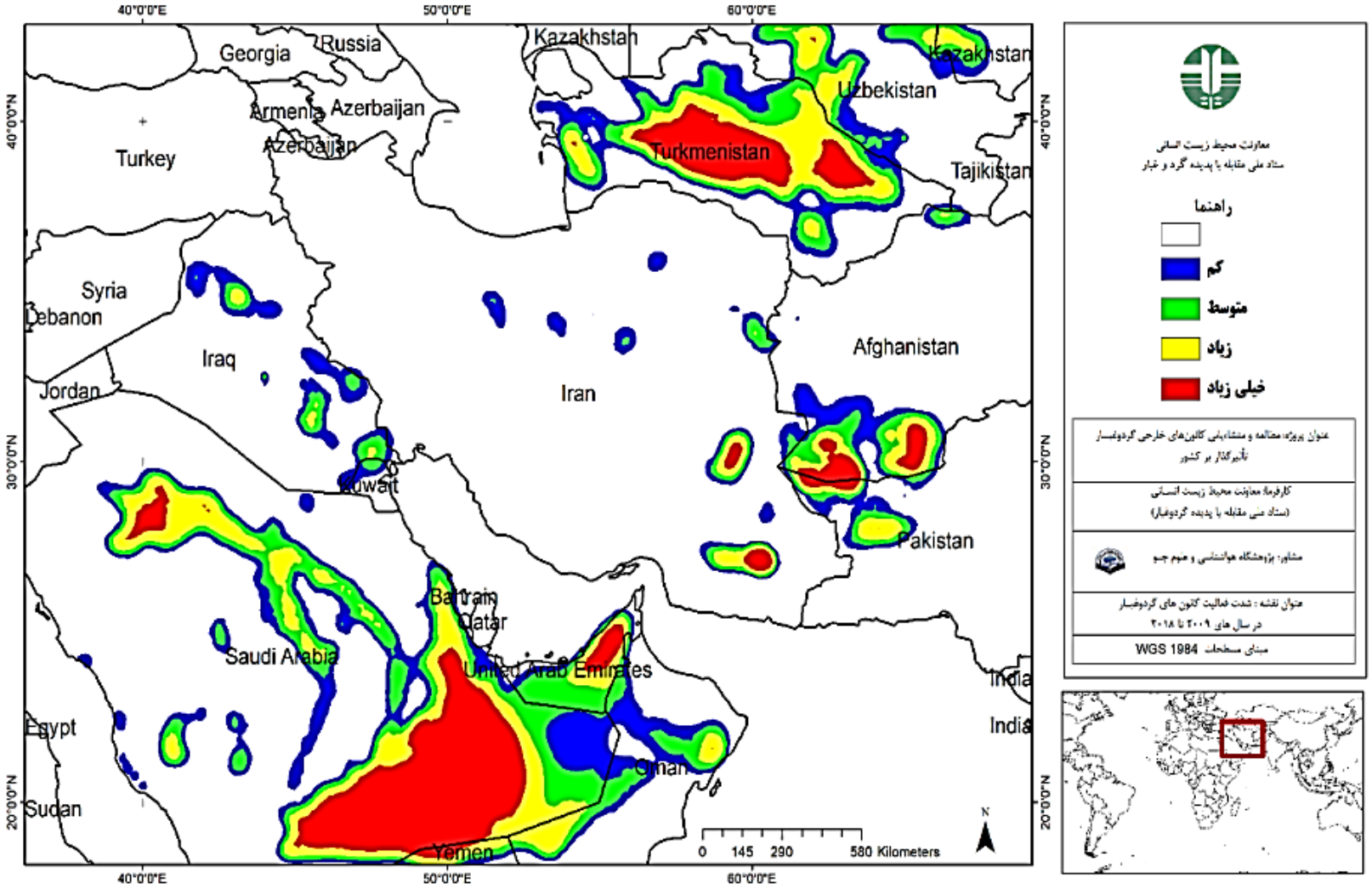
The primary locations of sand and dust sources, transmission pathways, and the magnitude of SDS emission production and dispersion worldwide



The intensity, dispersion, area, and magnitude of SDS outbreaks from foreign sources in West Asia and the Middle East



- **Total Area: 270 million hectares**
- **Total Dustiness: 147 million tons per year**
- **Specific Dustiness: 540 kilograms per hectare per year**

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Intensity and dispersion of transboundary SDS centers impacting the I.R.Iran in West Asia

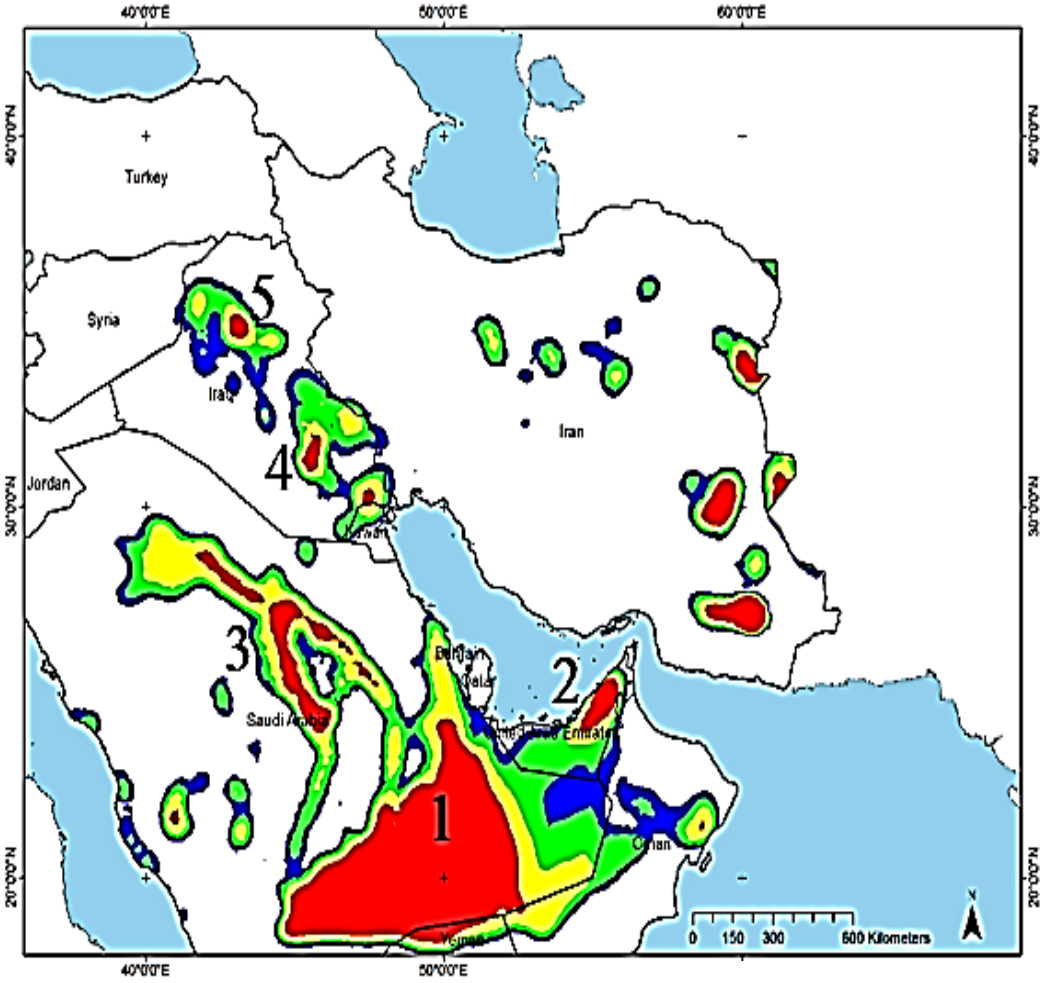
SDS Center 1 (Southern Saudi Arabia): Affects extensive areas in Saudi Arabia, Oman, Yemen, and the Red Sea, as well as southern regions of Iran in spring and winter.

SDS Center 2 (Northern United Arab Emirates): Affects areas in the United Arab Emirates, Saudi Arabia, Qatar, Bahrain, Oman, and the Makran Sea of Iran.

SDS Center 3 (Northern Saudi Arabia): Affects areas in Saudi Arabia, Jordan, Iraq, Syria, Kuwait, and southwestern regions of Iran (during winter).

SDS Center 4 (Southeastern Iraq): Affects parts of northern Kuwait, Iraq, Qatar, Bahrain, the United Arab Emirates, and southern and southwestern regions of Iran.

SDS Center 5 (Northwest Iraq): Affects areas in Iraq, Qatar, Bahrain, the United Arab Emirates, Kuwait, the Persian Gulf, and western regions of Iran (during different seasons).



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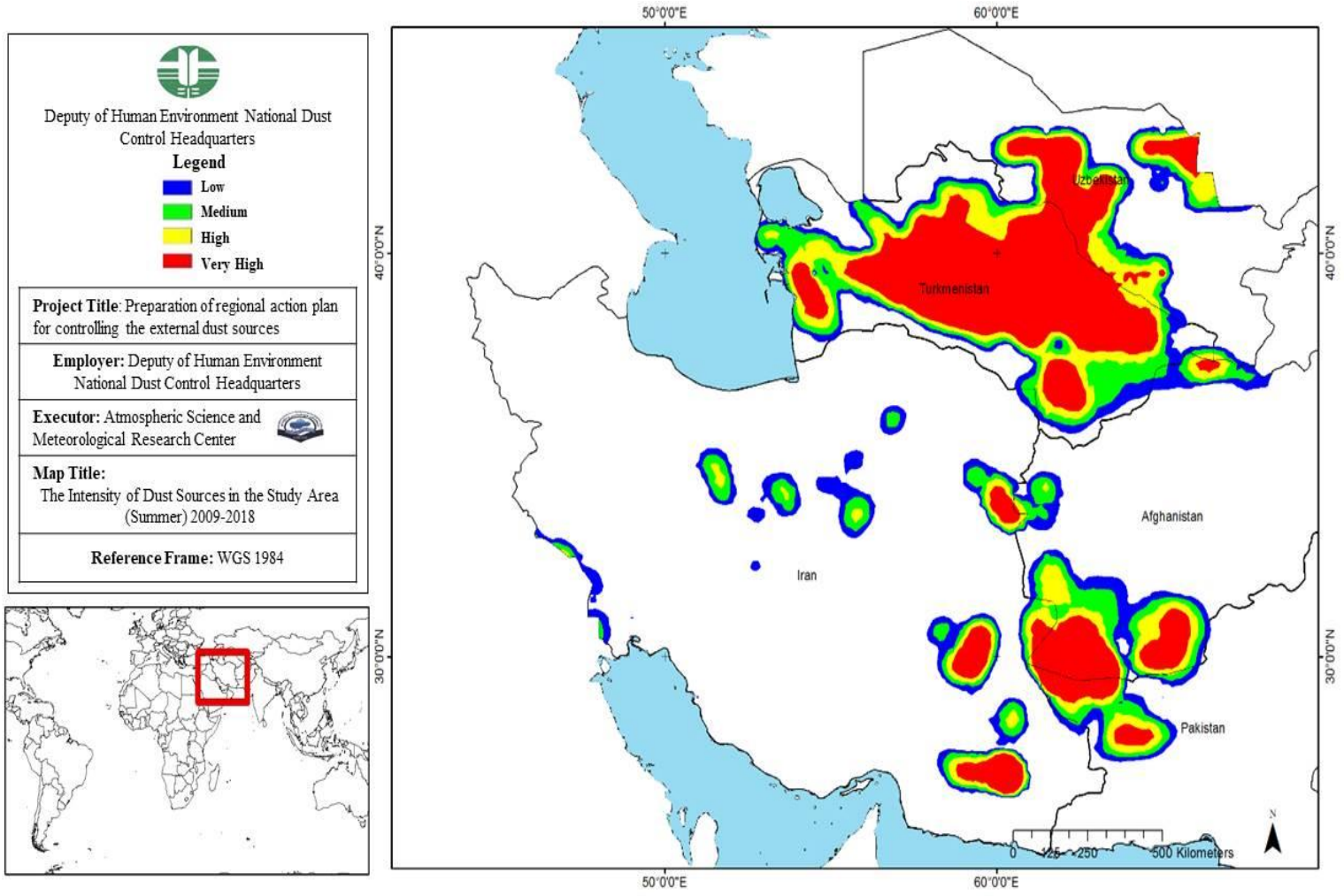
Intensity and dispersion of transboundary SDS centers impacting the I.R.Iran in Central Asia



SDS Center 1-Karakum (Akhal): Turkmenistan-Afghanistan-Caspian Sea

SDS Center 2-Chakhansur (Nimroz): Afghanistan-Pakistan-Makran Sea

SDS Center 3-Registan (Kandahar): Afghanistan-Pakistan

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Scope of the Sub-Regional Action Plan for West and Central Asia (initiated by the Islamic Republic of Iran)

Goal: Utilizing regional cooperation capacities to reduce the risk of SDS occurrences, enhance environmental standards, and improve the living conditions of affected communities.

Objectives:

Objective 1: Strengthening cooperation and coordination among regional countries to address SDS issues.

Objective 2: Enhancing public awareness and knowledge management regarding the formation, causes, processes, and consequences of SDS, and providing effective management, adaptation, and mitigation strategies.

Objective 3: Controlling the factors and centers of formation and development of SDS in the region.

Objective 4: Mitigating the social, economic, and ecological impacts and consequences of SDS phenomena in the region.

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International Measures of I.R.I to Combat SDS

Regional Conference on combating SDS July 2022

Resolution on Combating SDS UNEA6 February 2024

International conference on combating SDS September 2023

International Day of Combating SDS

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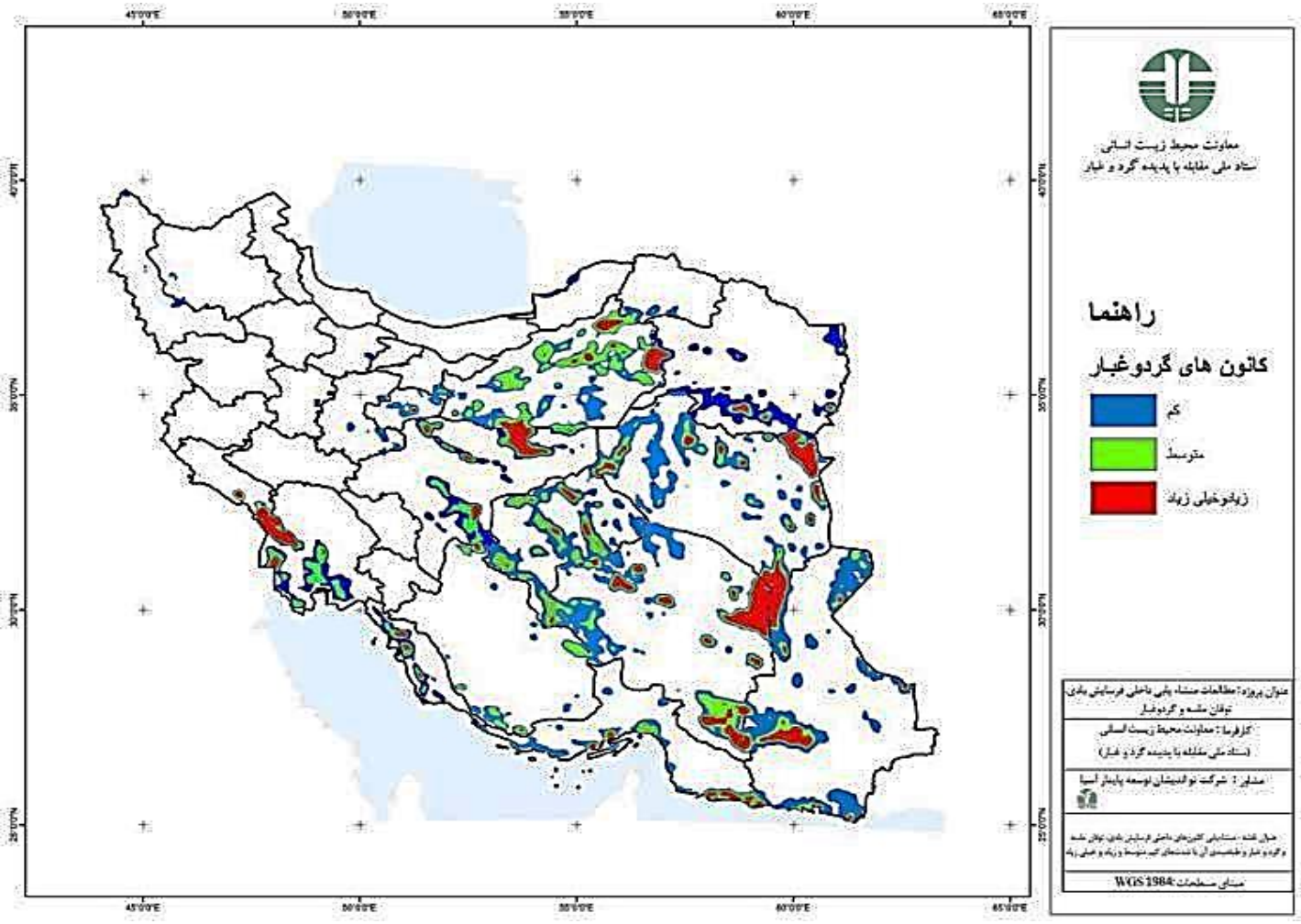
Intensity and Dispersion of Transboundary SDS Centers Impacting the Iran



- Number of dust-prone provinces: 23 centers
- Total area: 34.6 million hectares
- Total SDS emission: 4.3 million tons per year of particles smaller than ten microns
- Special SDS emission: 122 kilograms per hectare per year of particles smaller than ten microns

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Scope of the National Action Plan for combating SDS

Goals:

- **Implement comprehensive dust prevention policies and programs at provincial and municipal levels**
- **Build capacity and empower local authorities to effectively manage, reduce, and respond to SDS**

Policies:

- **Sustainable Land Management:** Protect, restore, and sustainably develop dust-prone areas.
- **Risk-Based Approach:** Shift from reactive crisis management to proactive risk assessment and mitigation strategies for SDS.
- **Integrated and Collaborative Management:** Adopt a holistic approach to address SDS, fostering inter-agency cooperation and alignment with sustainable development principles.
- **Community Engagement:** Promote active participation of citizens and organizations in SDS prevention and response efforts.
- **Knowledge and Investment:** Facilitate technology transfer and resource allocation to dust-prone regions.
- **Technological Advancement:** Invest in research and development to enhance SDS monitoring, forecasting, and control technologies.
- **International Cooperation:** Foster knowledge sharing and partnerships to address transboundary SDS issues and attract external resources.

The Transboundary Impacts of SDS on the Biological and Economic Resources of the Country

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The Transboundary Impacts of SDS on the Biological and Economic Resources of the Country

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The successful experiences of the I.R.Iran on combating SDS

The operations of care and irrigation for cultivated seedlings and the management of afforestation in desert forests

The operations of managing surface water runoff, coupled with seeding and afforestation in dusty desert regions

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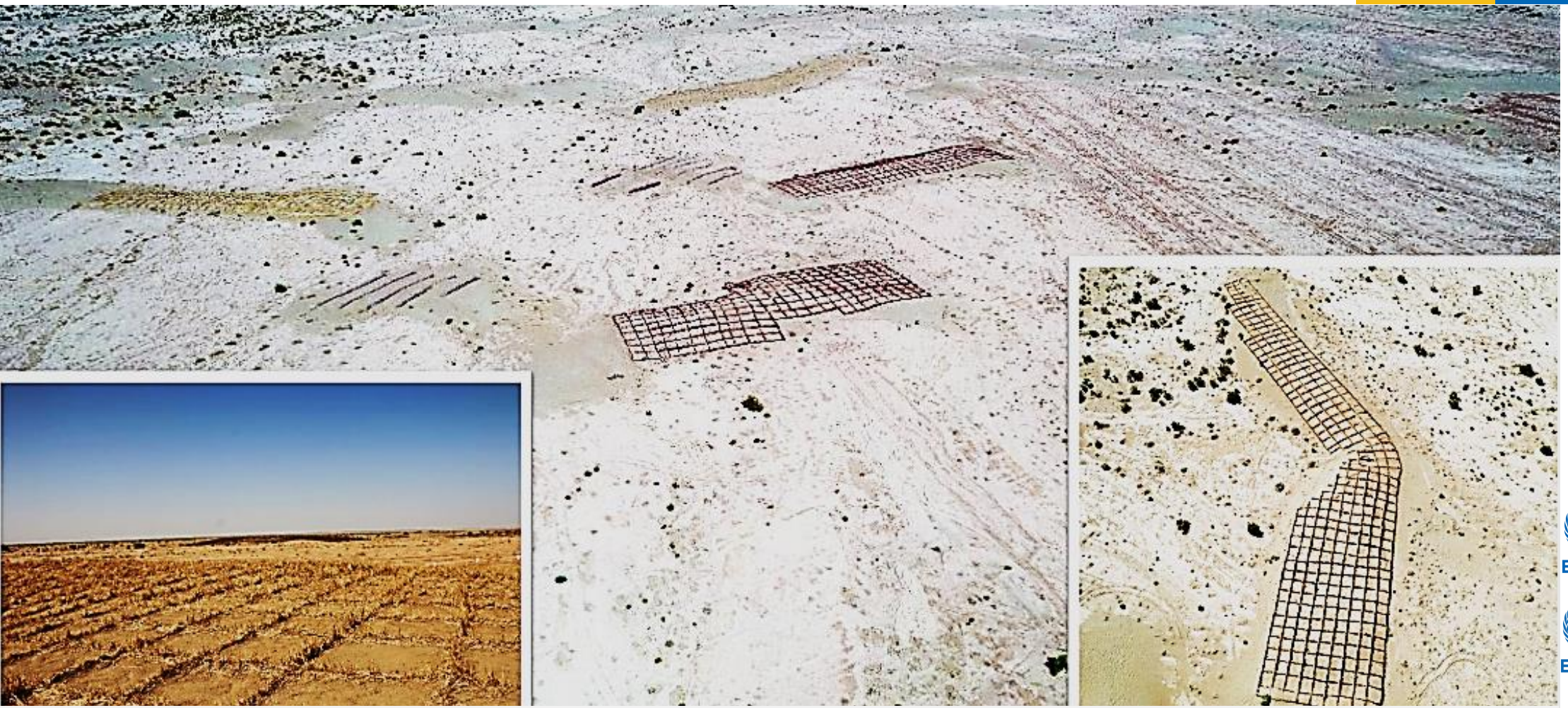
The successful experiences of the I.R.Iran on combating SDS



Establishment of a short-chessboard windbreak using plant residues (wheat and barley stems) as a pilot project in Iran

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I.R.I Measures to Combat Desertification

- Plantation: 2,353,332 ha
- Mulching: 305,347 ha
- Run-off management: 439,505 ha
- Windbreak construction:2,432 ha
- Desert regions management study plans: 10,722,911 ha

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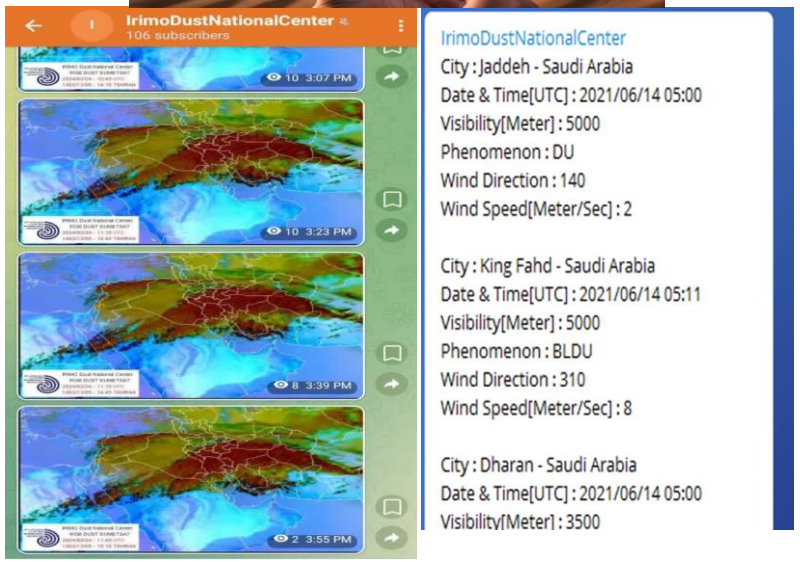
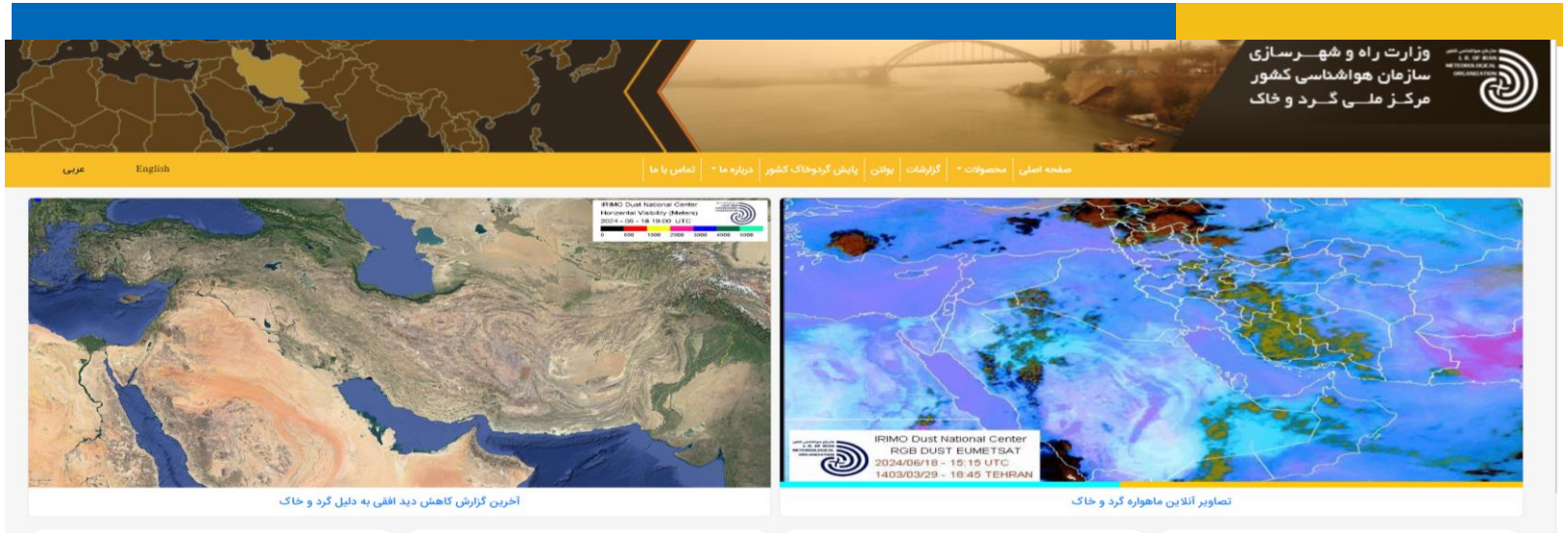
Iran Meteorological Organization National Dust Center

In 2018, an Early dust storm alert system was established based on the Iranian social network, Eitaa, which sends reports of dust storm occurrences along with Eumetsat -Dust RGB images of the area from synoptic weather stations to users.





Early warning system based on station reports (the latest report on reduced horizontal visibility due to dust at the stations that is updated every 60 minutes.)

The latest satellite(Dust RGB EUMETSAT) images (last 6 hours in animation) that are updated every 15 minutes.

Pollution and dust products from the CAMS model (Copernicus Atmosphere Monitoring Service).

Precipitation based on global models and AI.

Global dust models that are updated daily

Regional model (WRF-chem) that is updated every 24 hours

www.dust.irimo.ir

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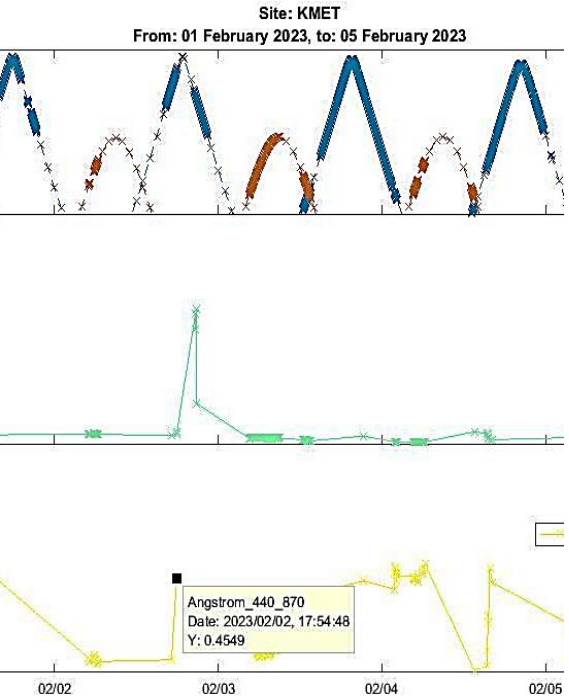
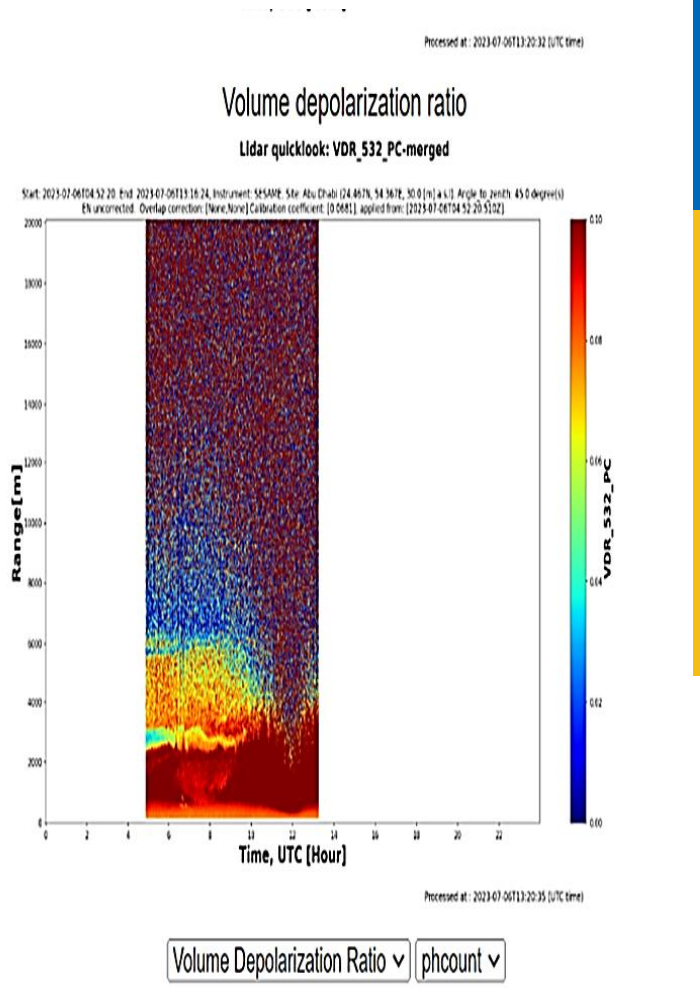
- **Raman LIDAR instrument**
- **SUNPHOTOMETER**



Aerosol Optical Depth (AOD)

Ångström Exponent (AE)



VDR (Volume depolarization ratio)

Recently, the IRIMO National Dust Center installed one LIDAR and one sunphotometer in Ahvaz, located in the southwestern part of Iran (I.R. Iran).

LIDAR is an active remote sensing instrument used for aerosol retrieval.

It works by emitting laser light into the atmosphere and measuring the light that scatters back to the instrument.

This data helps determine aerosol properties such as concentration, distribution, and type. LIDAR is effective in providing detailed vertical profiles of dust aerosols, which are crucial for understanding their impact on climate, air quality, and weather patterns.

Additionally, a sunphotometer provides important products such as Aerosol Optical Depth (AOD) and Ångström Exponent (AE).

Suggestions

- Support for the implementation of the Resolution on Combating SDS-UNEA6 2024 (Regional Center and Establishment of Regional Fund to Combat SDS);
- Establishing knowledge and experience exchange through information, knowledge, technology, and experience sharing;
- Exchange of meteorological and climatic data through the establishment of SDS prediction and early warning systems in collaboration with international organizations such as the WMO;
- Deploying innovative methods to combat SDS by leveraging the capabilities of both countries' knowledge-based and technological companies especially in Empowering Local Communities;
- Training and capacity-building for experts in the field of SDS mitigation in both countries through educational and research tours in cooperation with universities and research institutes;

Thank you

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