Evaluation Of The **Human Activities** Impact On The occurrence Of Dust Storms

: Presentation by
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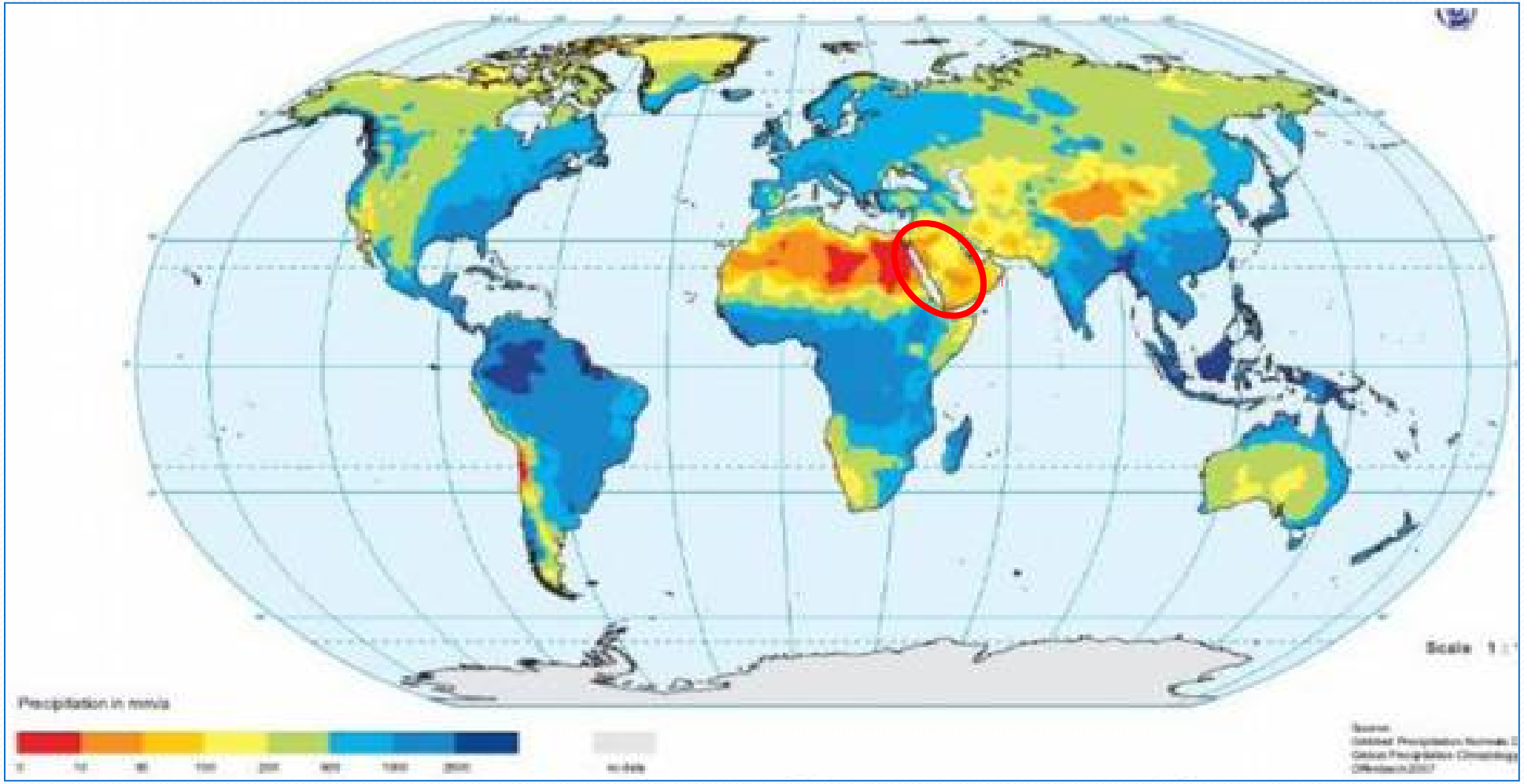
Introduction

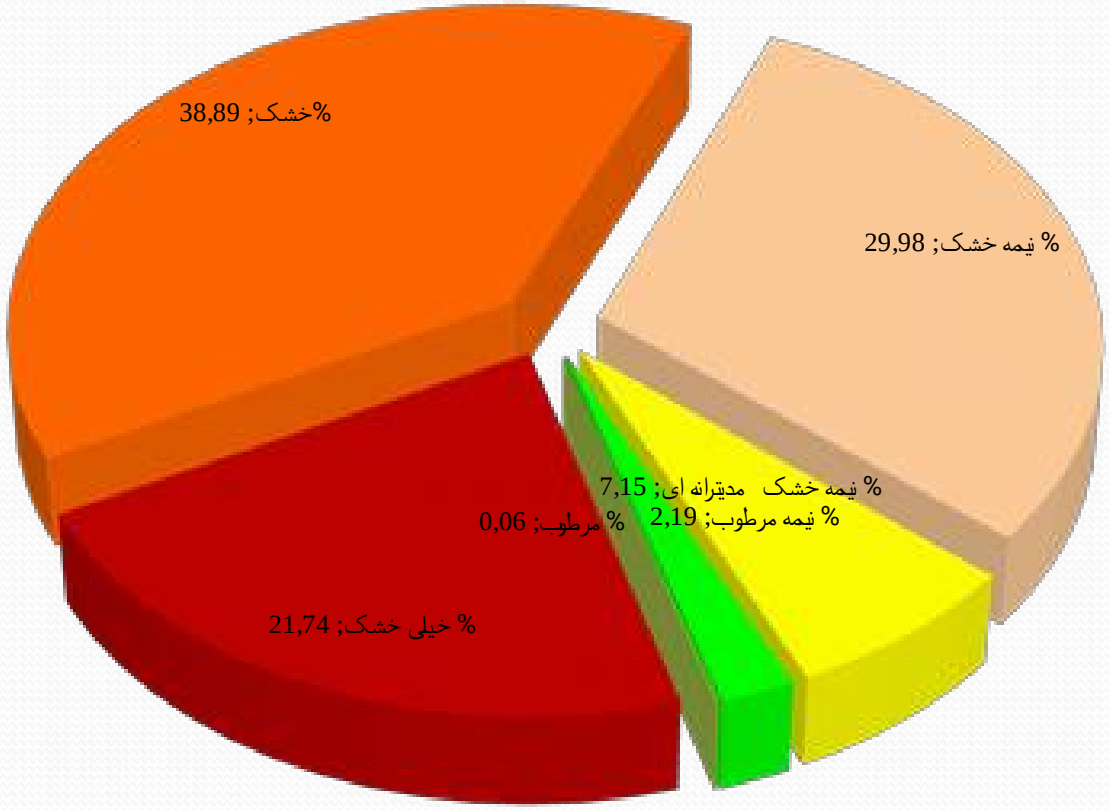
Iran is located at arid belt of the world and is subjected to dust storms.
The raining and evaporation in Iran respectively are 31 and 10 percent more than the world average.
The arid and extra arid areas in Iran are three time more than the world ratio.

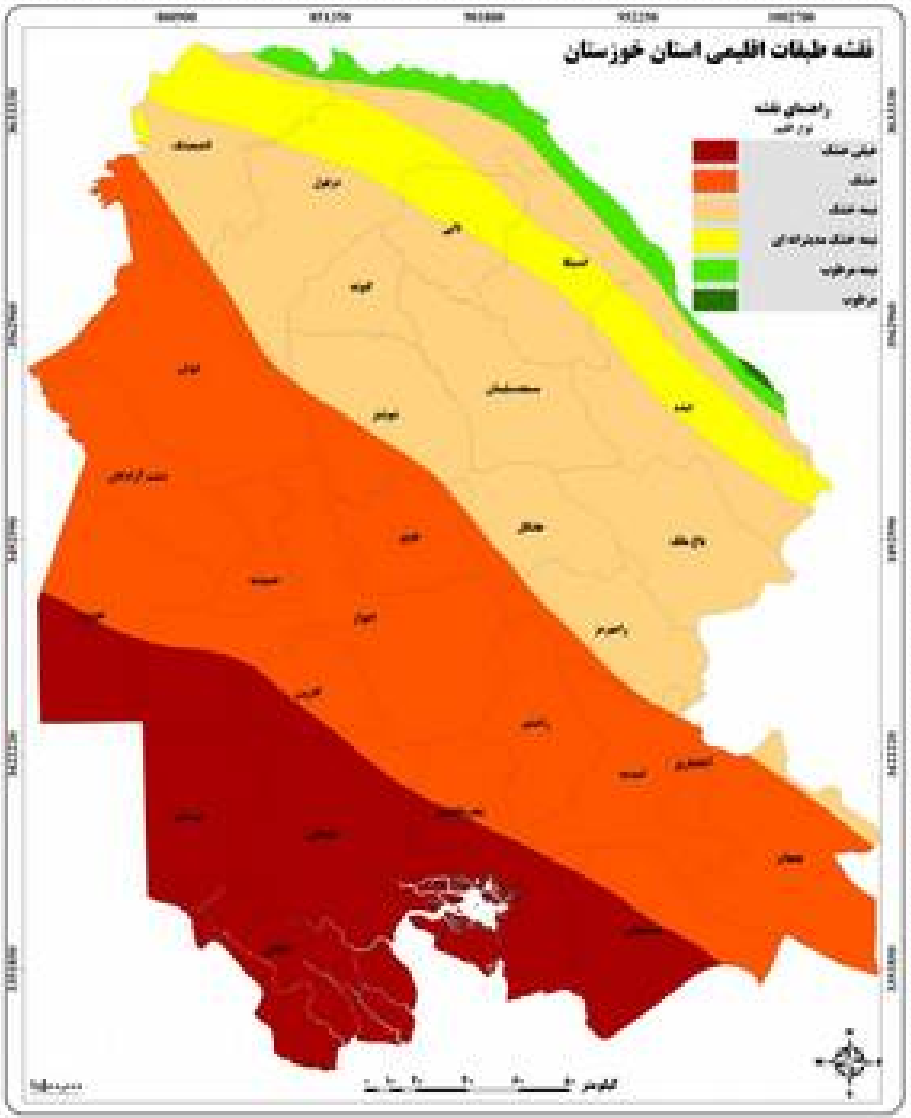


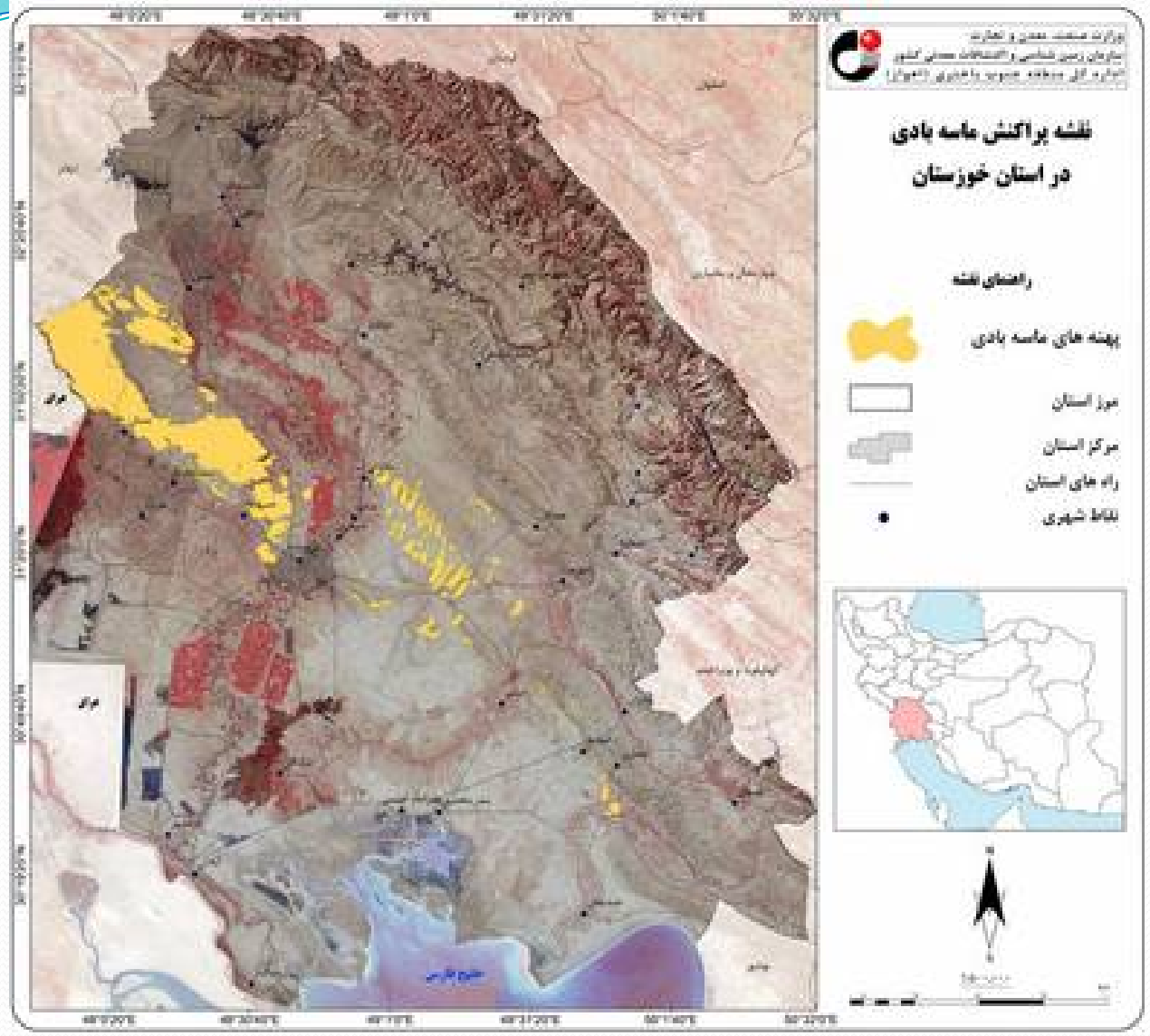
Investigation of effective factors in dust sources formation within Khuzestan province

Khuzestan has various climate from extra arid to humid

Over 60 percent of it’s area has extra arid and arid climate





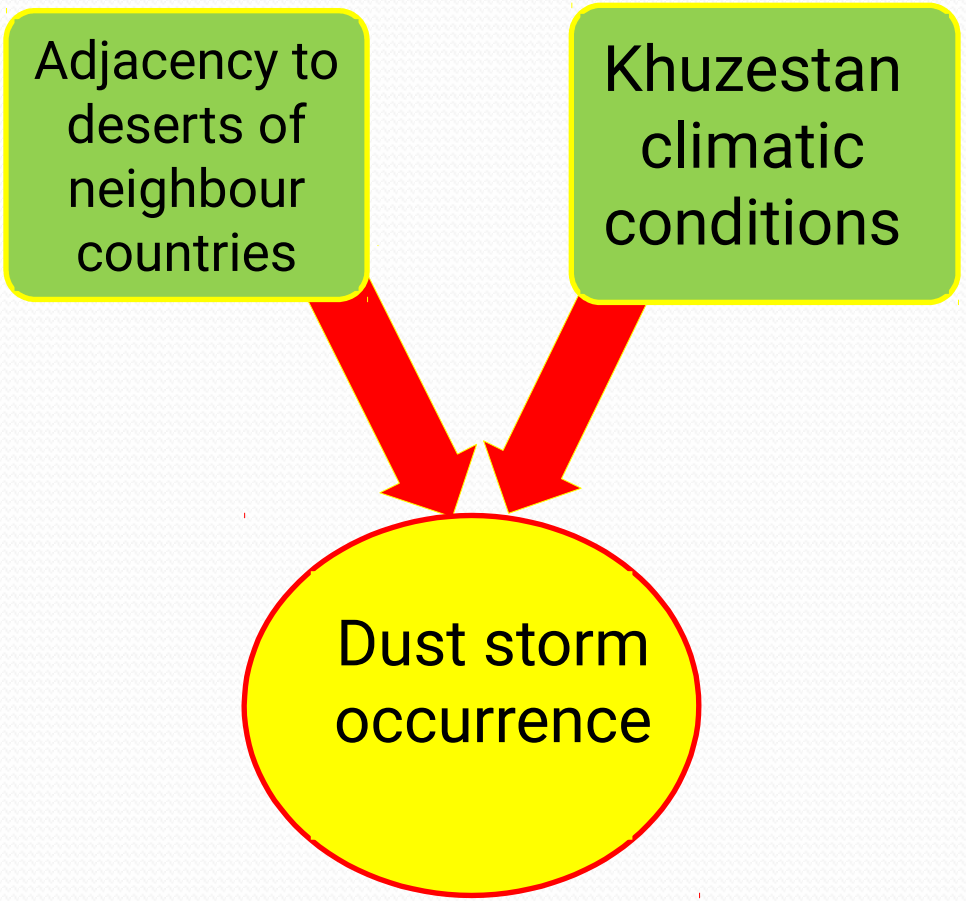


Sand dune dispersion of Khuzestan

Area: 226037 ha

Considering the geographical extension of deserts in the Middle East, the dust flows have been being formed and moved from Saudi Arabia, Syria and Iraq countries to the north and northeast.

Dust hazard map



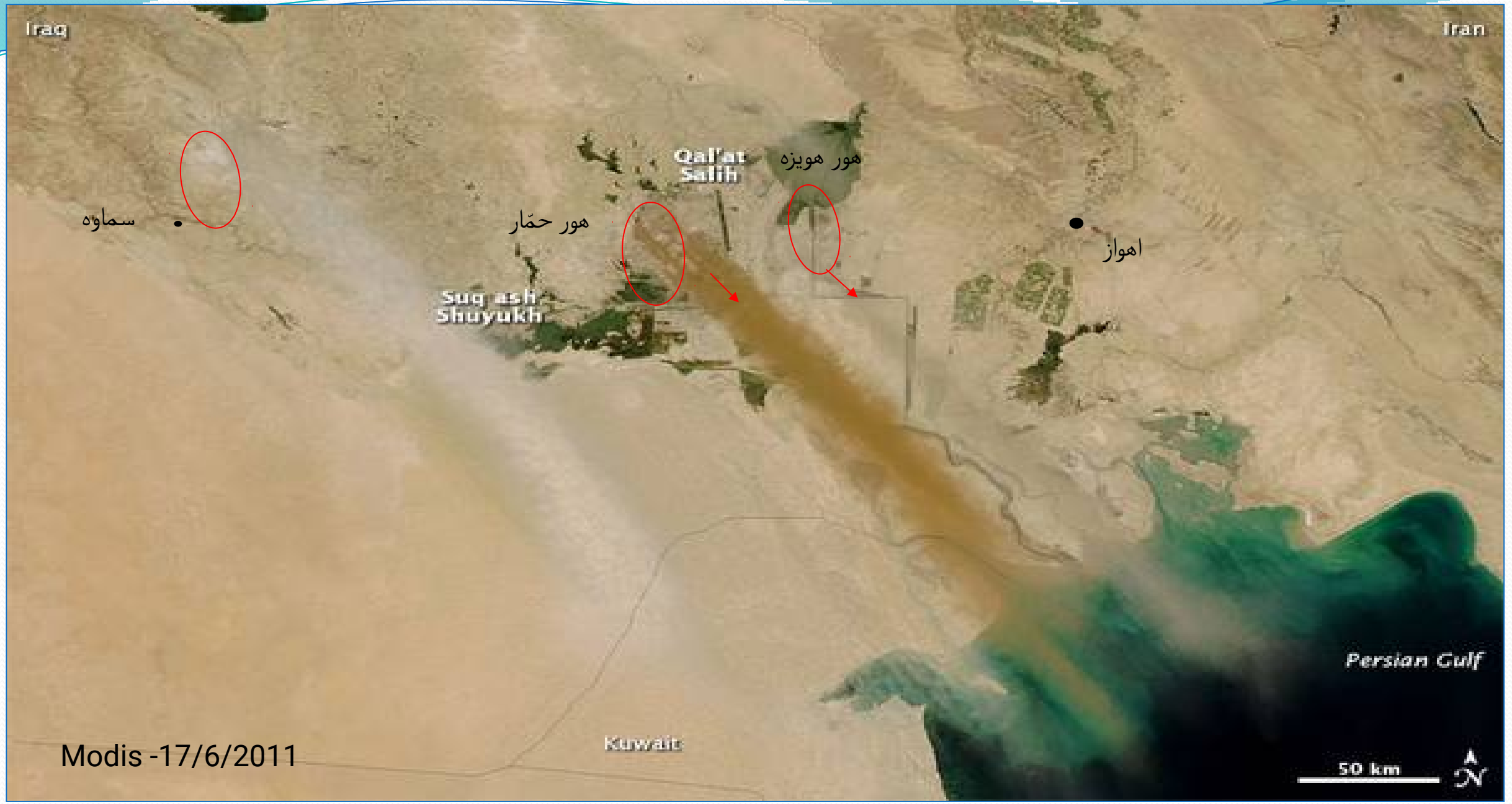
: Identification of dust sources

And Interior sources Exterior sources

Foreign dust produced in Khuzestan in order of priority

exterior sources

Exterior sources



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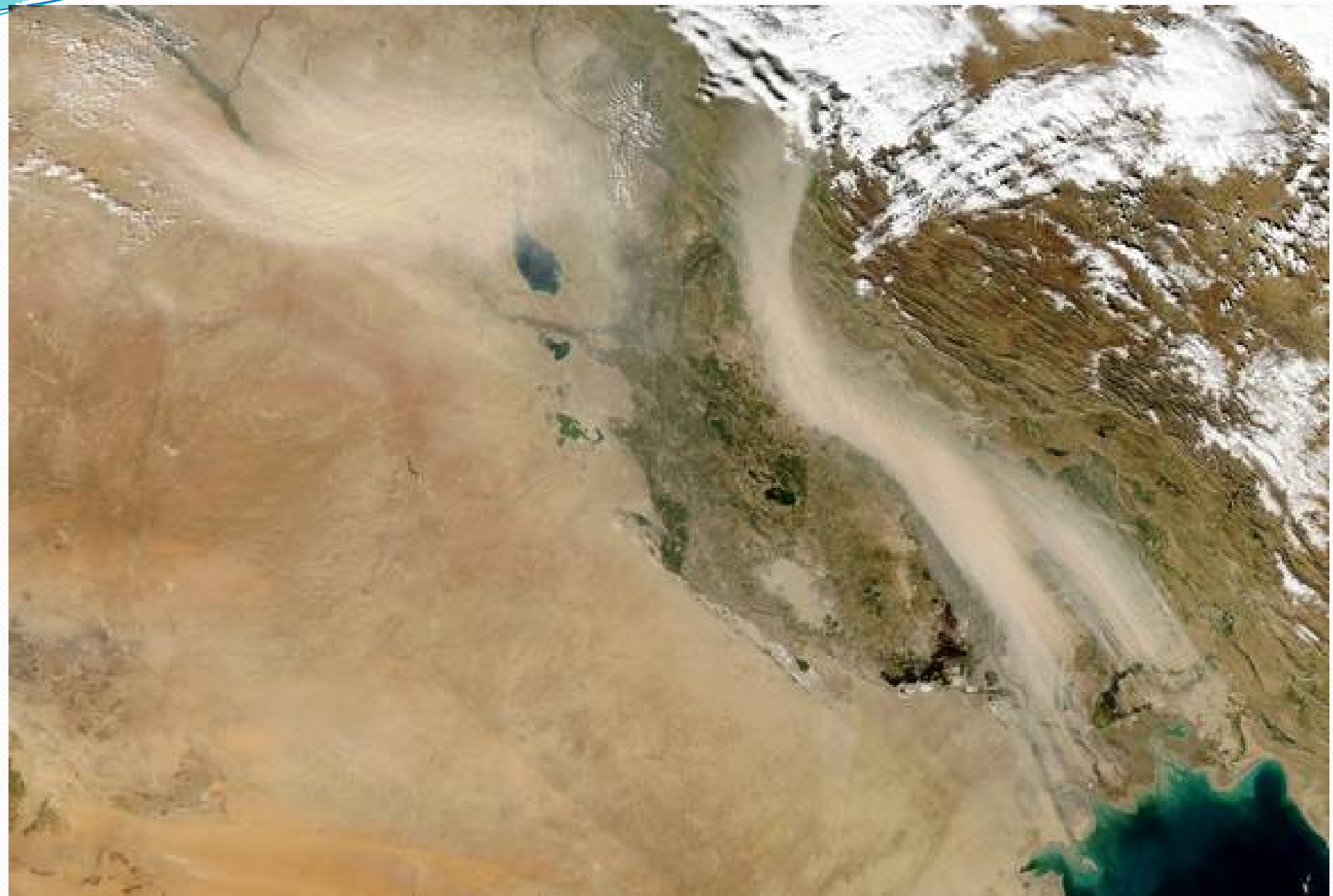
Identification and prioritization of dust sources



Interior sources

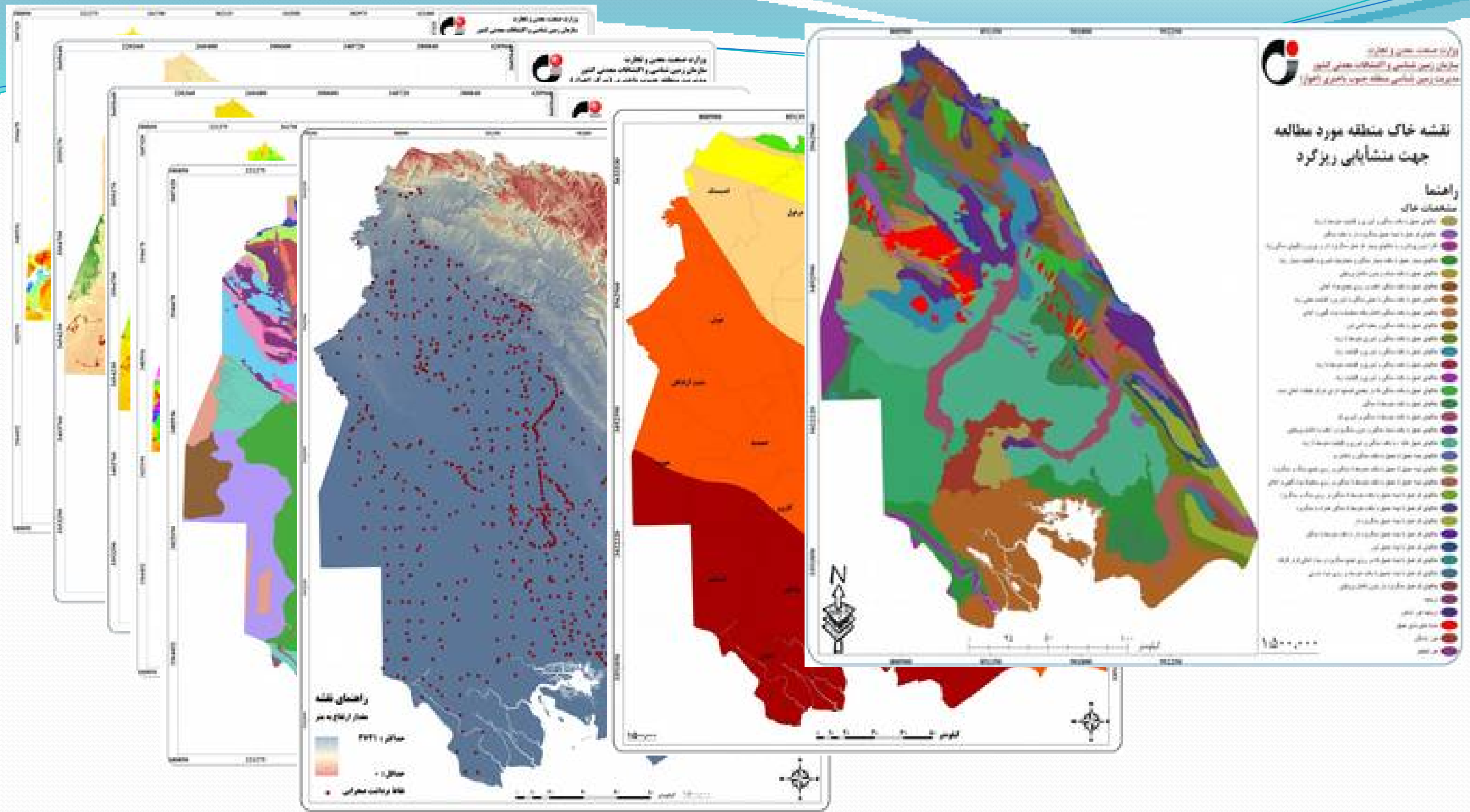
Identification and prioritization of dust sources

Identification of dust sources applying a combination of remote sensing, GIS and sedimentology

Therefore, we applied 8 layers of data including:

1- Humidity	2- surface temperature (LST)
3- NDVI index	4- SAVI index
5- gradient	6- land use
7- soil and	8- sedimentation

We applied FAHP method for the first project


نقشه خاک منطقه مورد مطالعه
جهت منشأیابی ریزگرد
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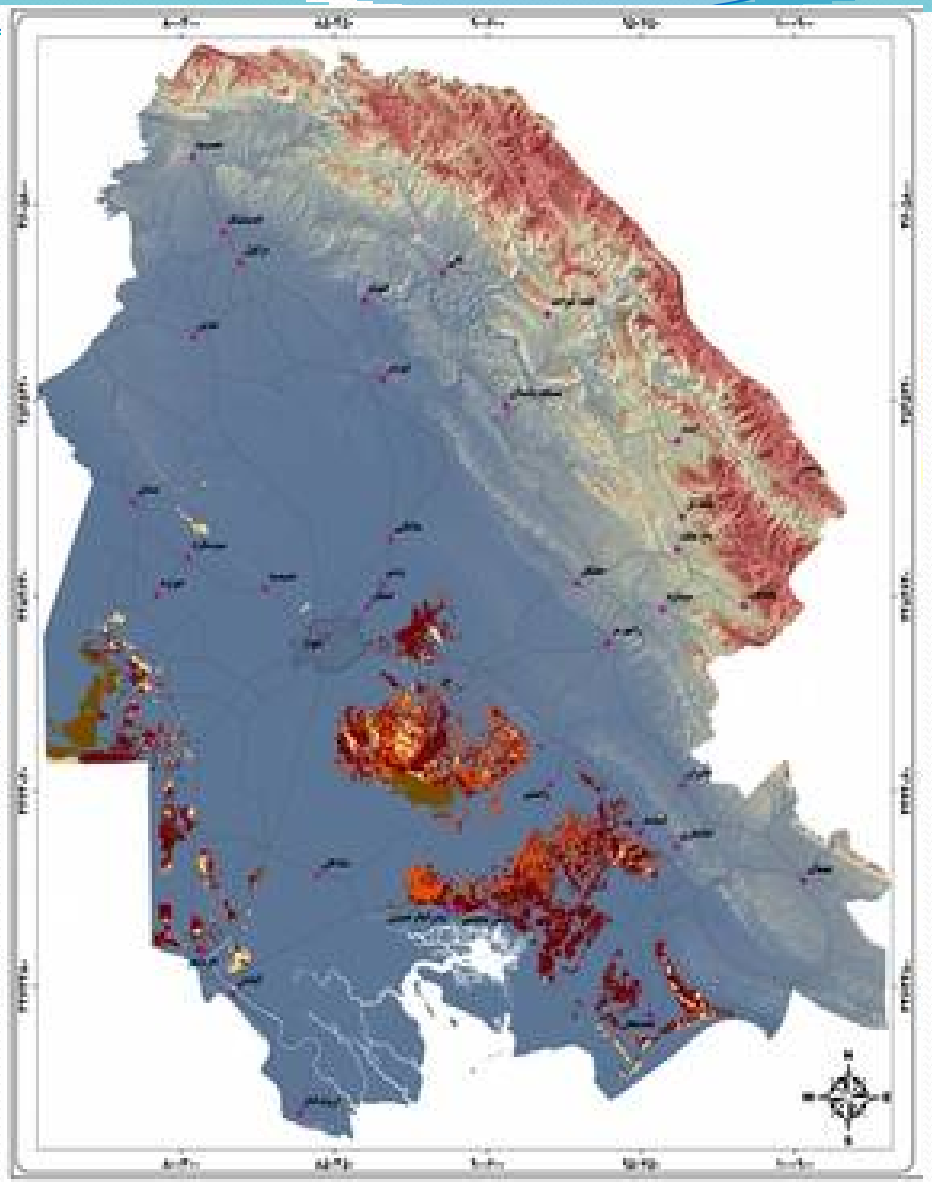
This is a national and extremely important project and we have been working on since 2015 and released the first results in 2017. The first results come out after 6 months of surveying data, sampling and geochemical analyzing and indicated the distribution dust sources.



Prioritizing Of Dust Sources By GIS Combination And Fuzzy MCDM

Therefore, we applied 6 layers of data including:

1- population- distance density

2- Total population densities

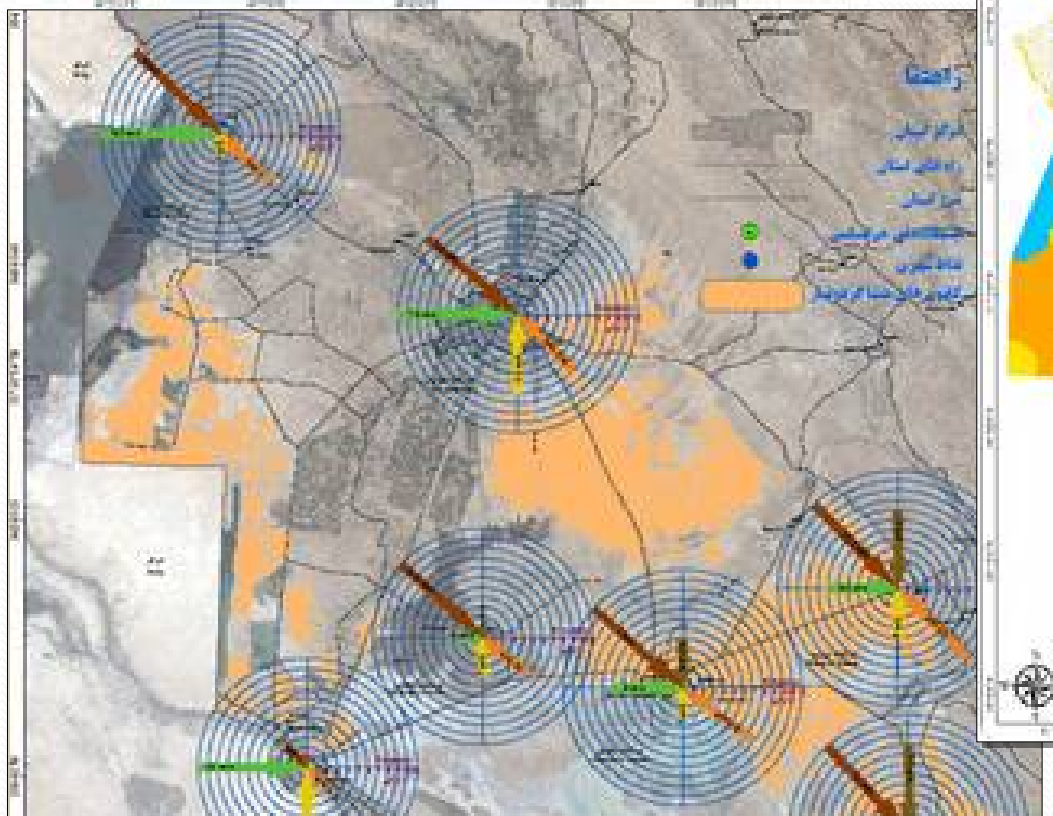
3- dust sources area

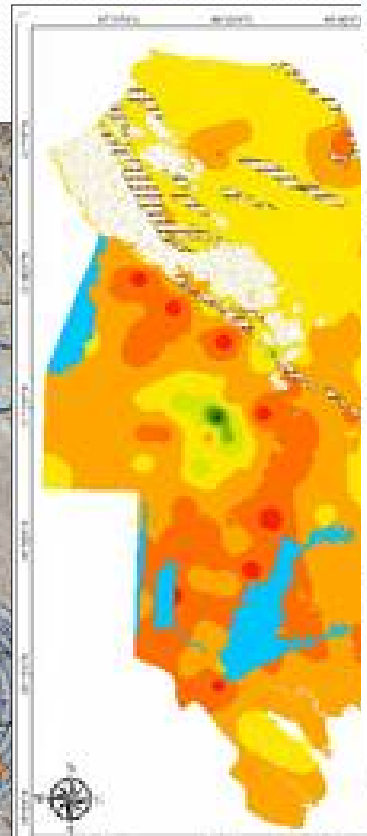
4- geochemistry

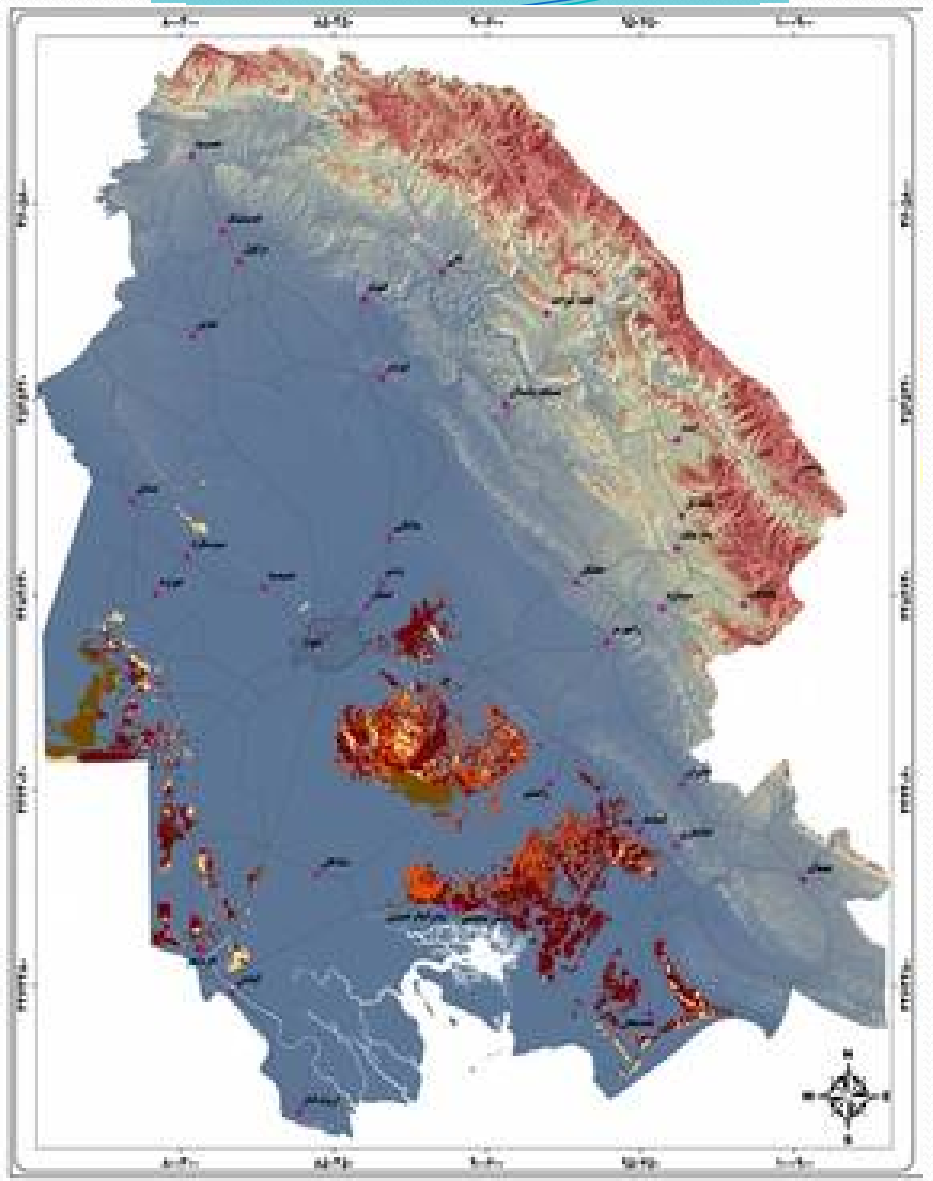
5- soil particle size

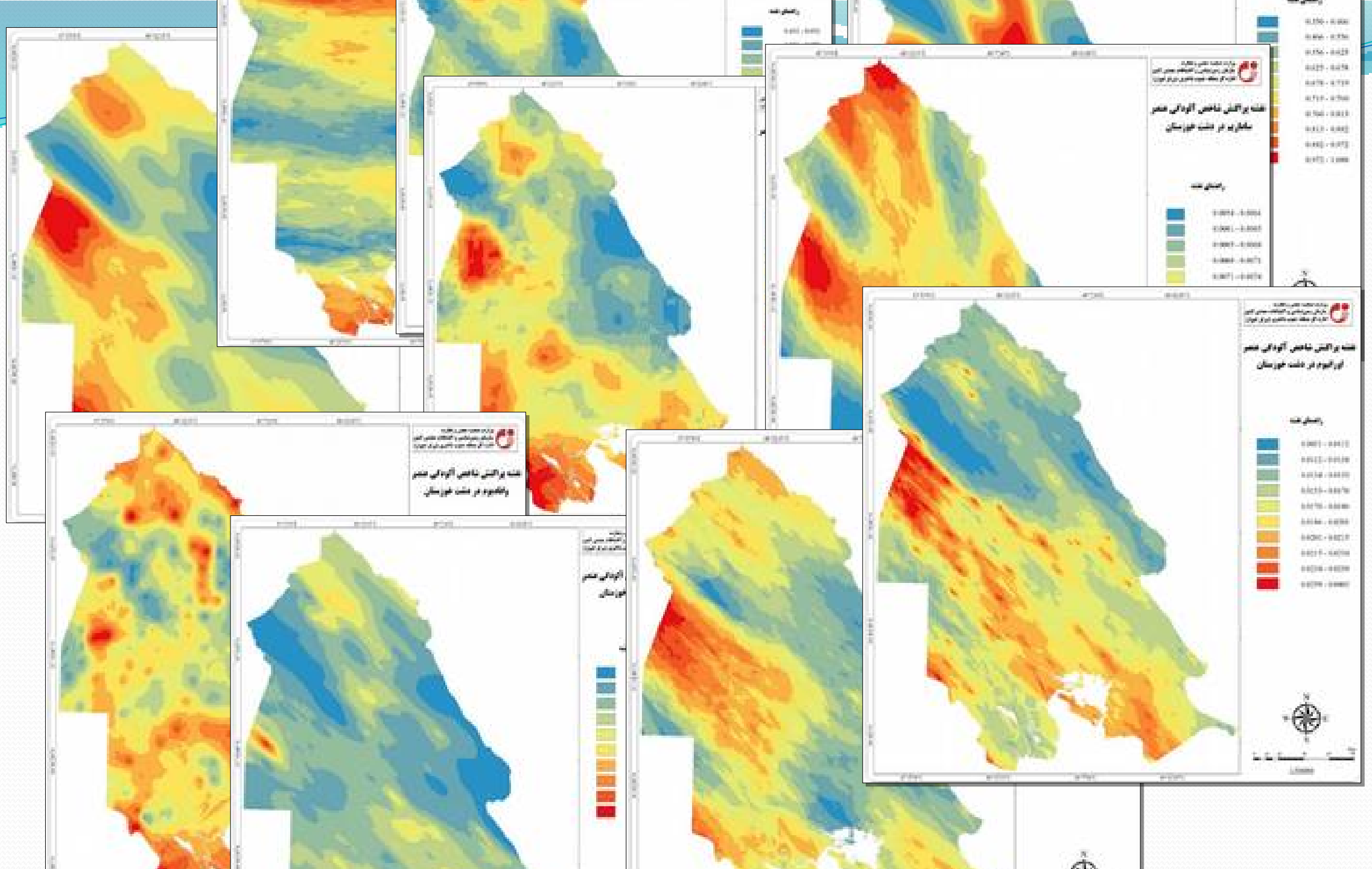
6- wind flower diagram

We applied F-TOPSIS & F-ELECTRE methods for the second project

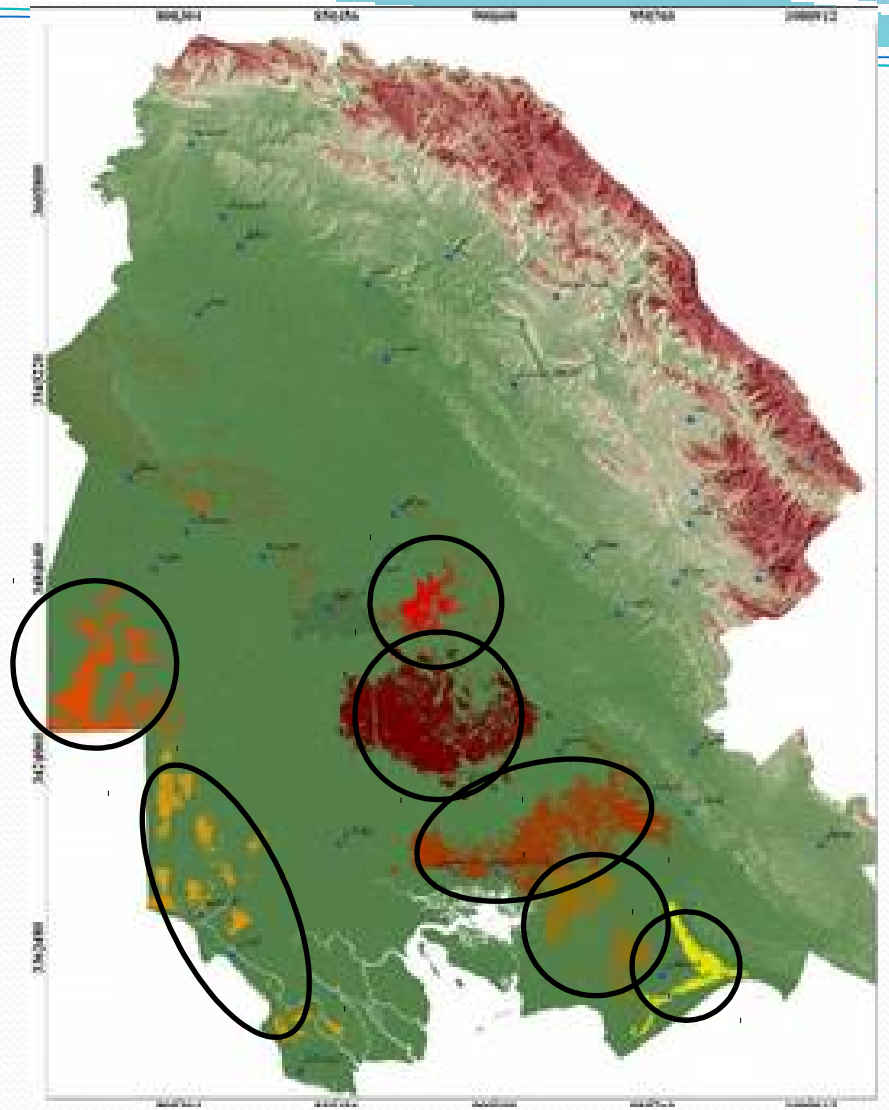








F-TOPSIS



Factors Affecting the Formation of dust sources

Increase of land Surface temperature

Decrease of soil humidity

Destruction of vegetation

Important results

- Ecosystems are very vulnerable in very dry and dry climates.

This vulnerability is more common in the Khuzestan plain for the following reasons.

- Very low slope
- Heavy soil texture
- Groundwater salinity
- Low groundwater depths
- Wetlands, ponds and pastures in Khuzestan province provide moisture and vegetation cover from the above basins.
- The mismanagement of water resources and human manipulation has disrupted the availability of downstream basins to water resources.

Effects of water flow decrease from upstream

Land arid

Destruction of vegetation

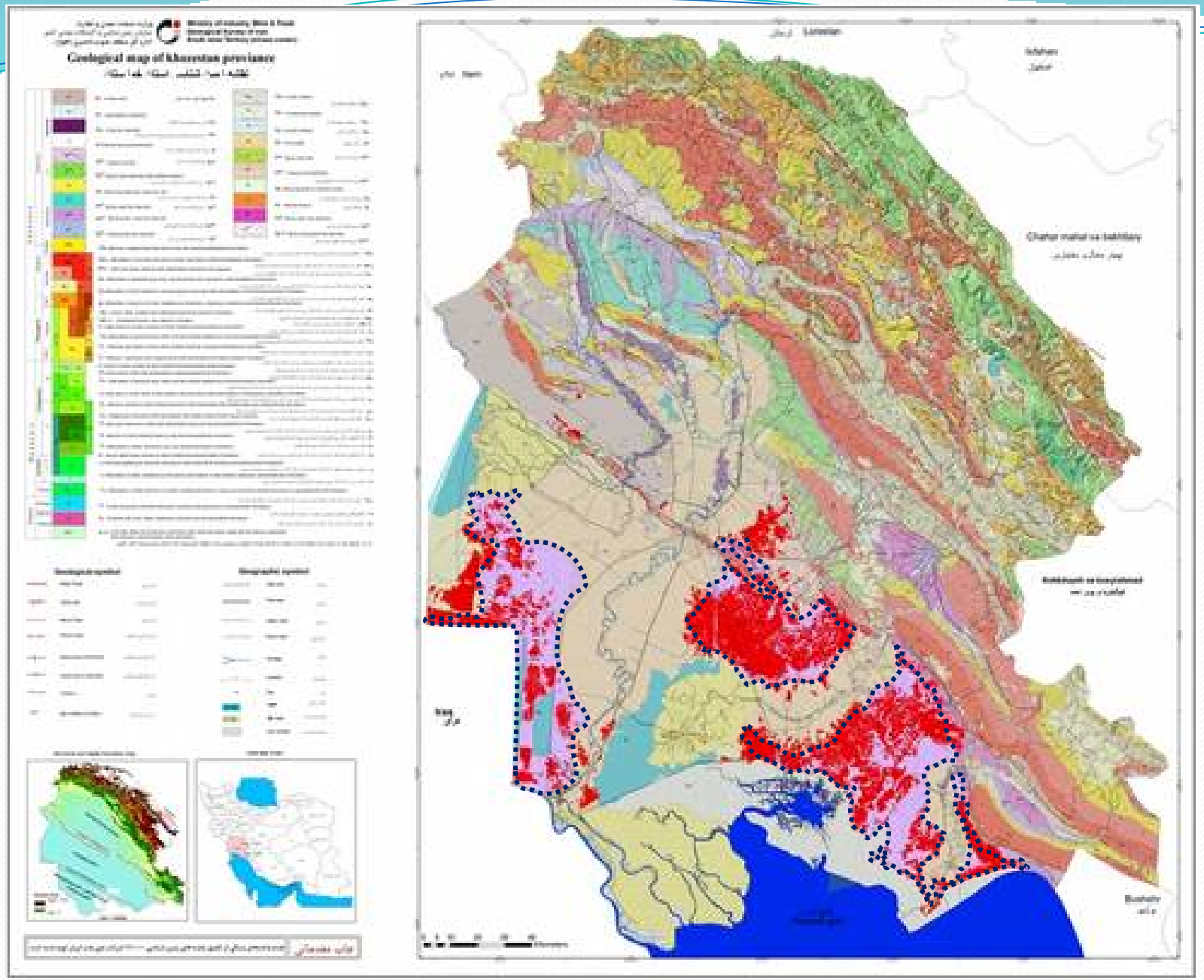
Decrease of soil humidity

Desertification

Surface evaporation and saltation

Underground water saltation

decrease Aquifer feed



These sabkhas are alluvial plains which transformed to salt land due to decrease of water flow.

Identified dust sources are located at these areas.

Current Project

We believed that the combination of the Global climate change and human activities causes to

1-Increased of Soil degradation

2- Wind erosion

3- Desertification

4- Nutrients destruction required by plants

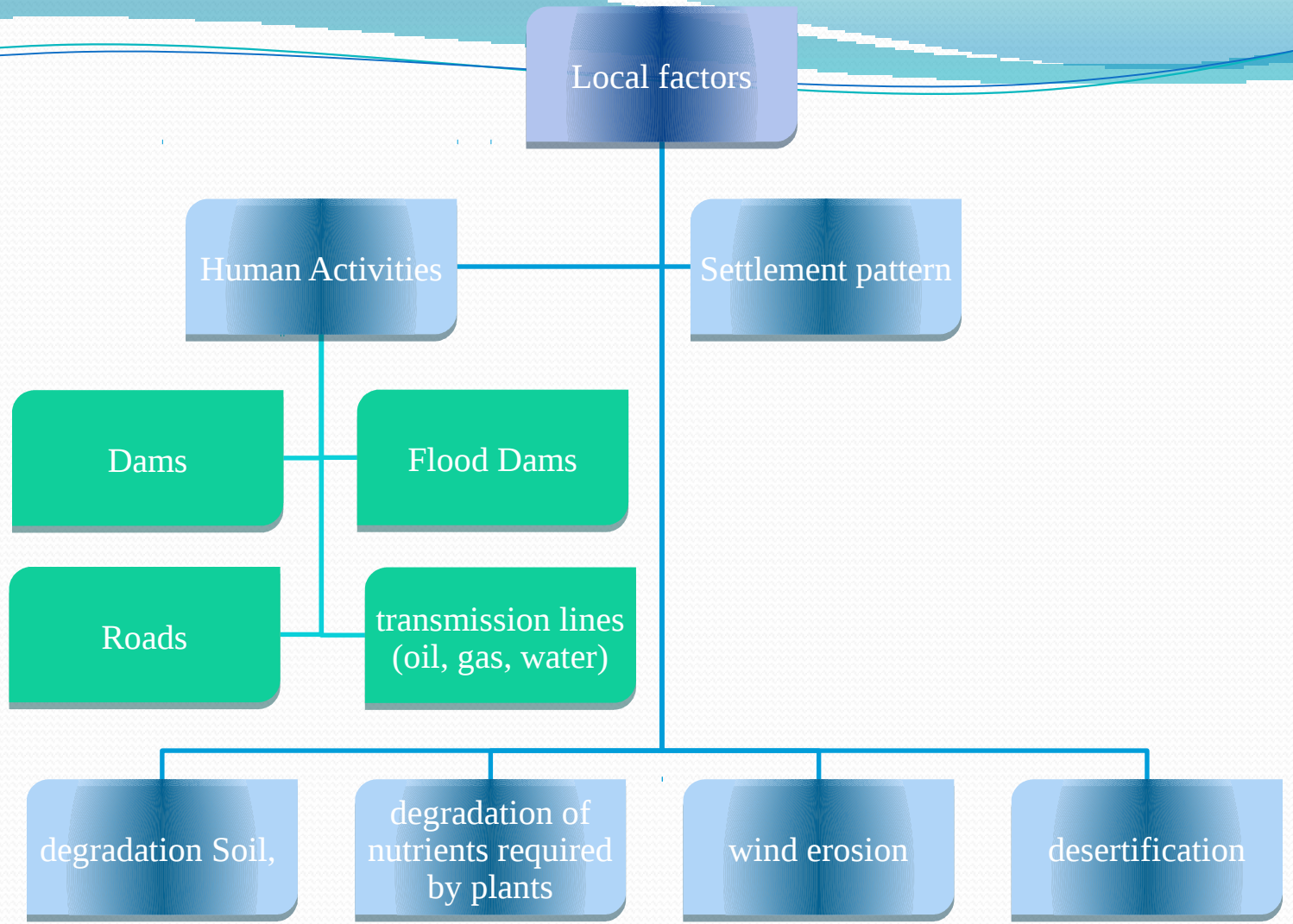
These factors exacerbate dust storms.

Human activities such as

1- Dam construction

2- Roads construction (in the farmland drainages)

which causes to drying of down stream lagoons which could be the most important factor to extend the dust sources.


Local factors
Human Activities
Settlement pattern
Dams
Flood Dams
Roads
transmission lines (oil, gas, water)
degradation Soil,
degradation of nutrients required by plants
wind erosion
desertification

Road Access to Oil Facilities, Southeast of Ahwaz :

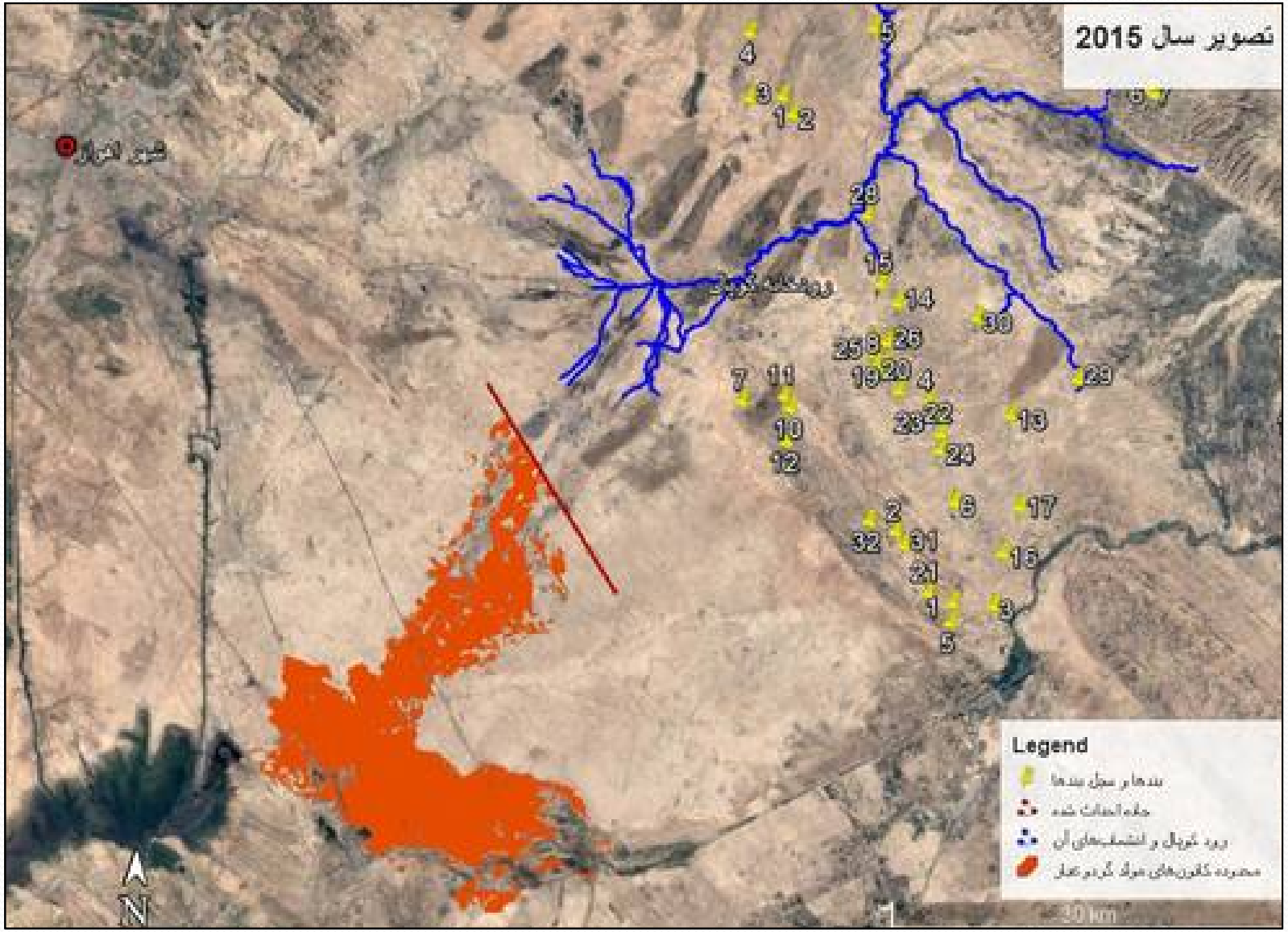
Sattelite Landsat ETM :**Summer 1999**

- Extension of rangeland on the two sides of the sandy road in the south of Crete

Sattelite Landsat 8

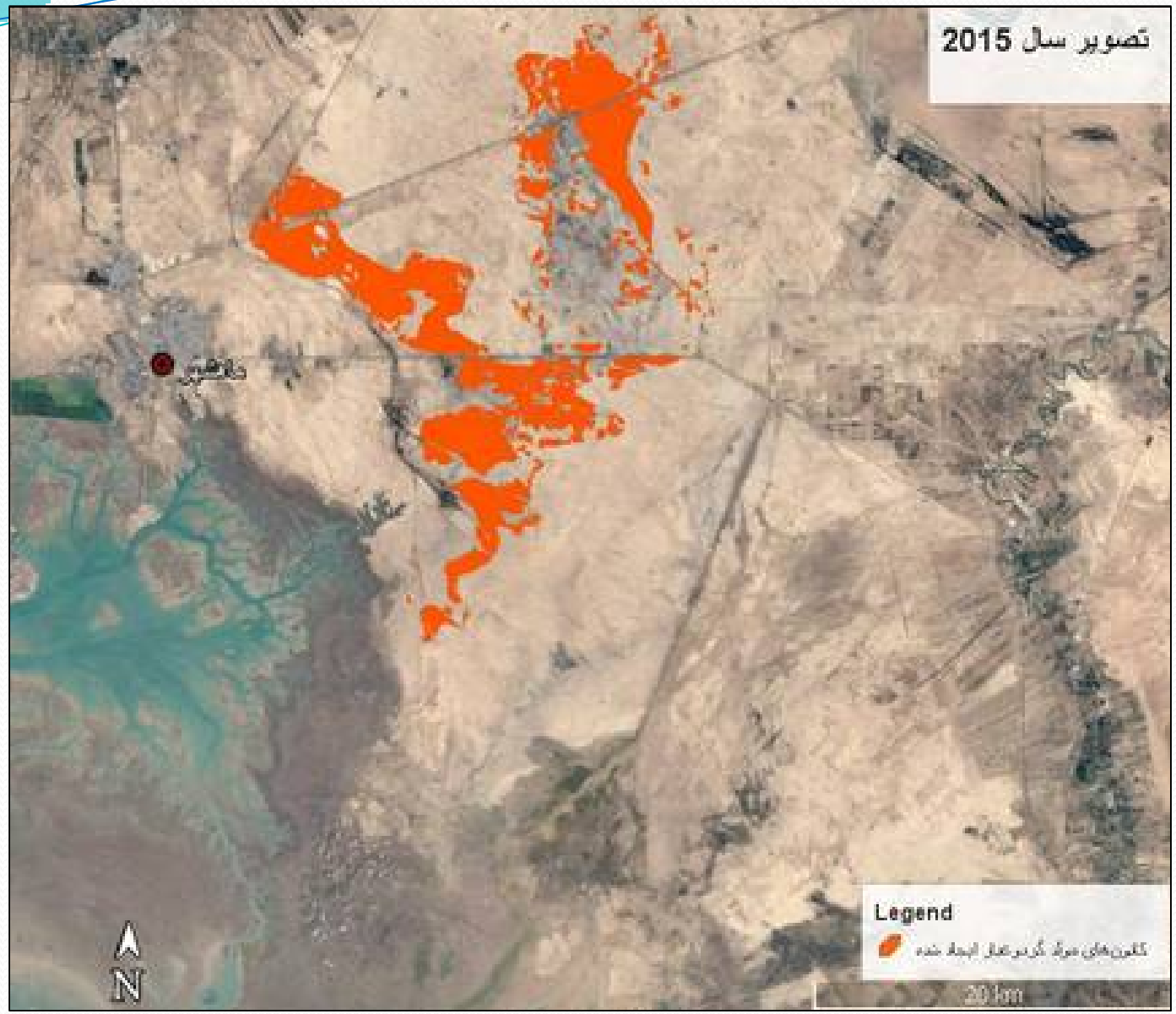
- **Summer 2014**
- Destruction of rangeland lands at the bottom of the road and dust source formation

Multi-dimensional images review: Changes in down of copal river :



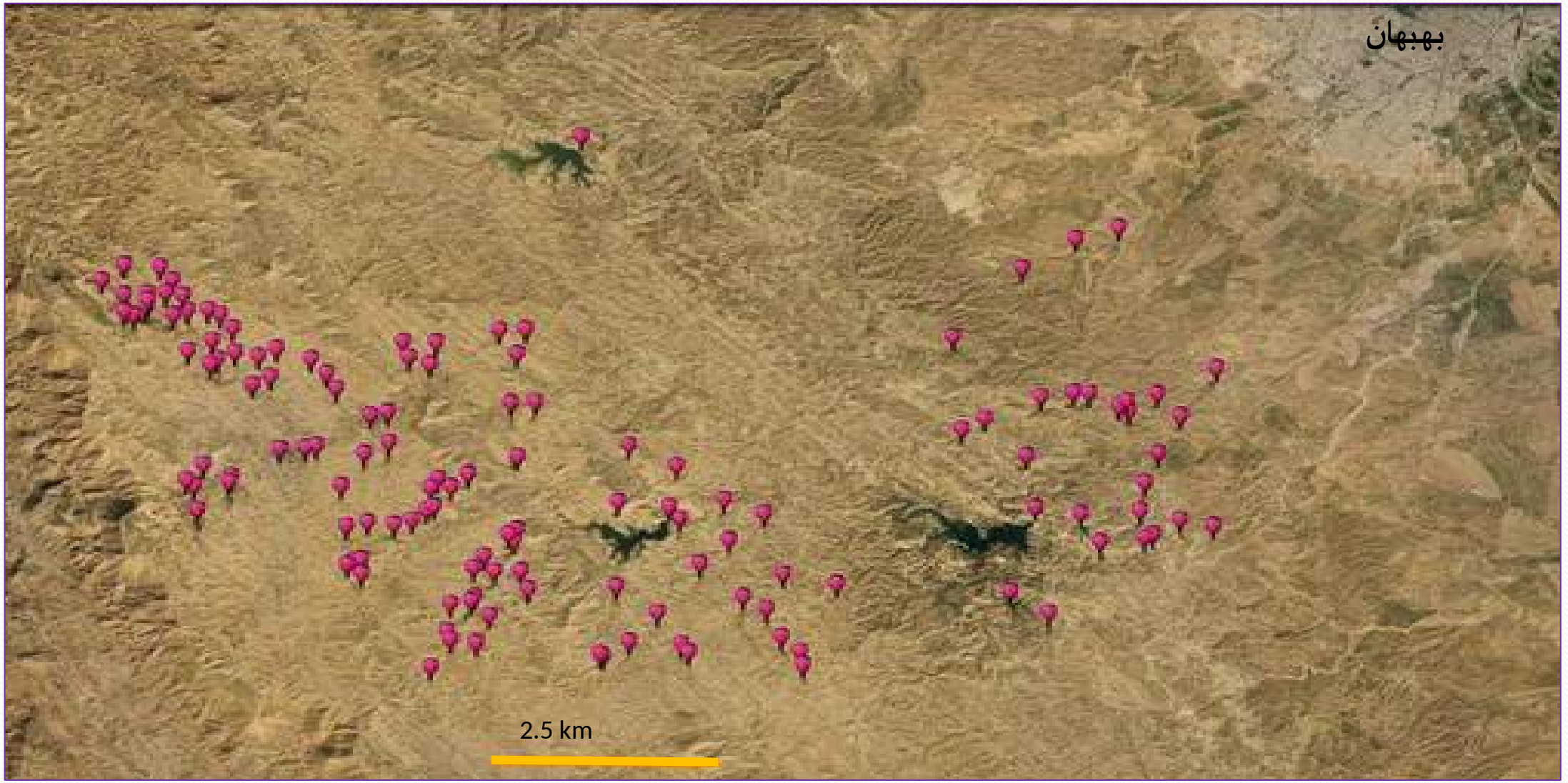
hectares of the direct 27,200 affected areas of the Kopal River .have become dust source

: Multi-dimensional Images: Changes in the East of Mahshahr



Establishing 13,700 hectares of focal areas in the direct affected areas of the Surgical River Floods

Dike constructed in the southwest of Behbahan (Surgical Basin) to control the flooding in the city



Current project

In the third stage of the project, we are looking for areas where the vegetation has changed. We are going to want to identify areas where poor vegetation in downstream areas is due to manipulation in the highlands. have extended it. Therefore, we are following two goals:

Goals

1. Review vegetation changes, especially indigenous plants and this desert shrubs, which play a very important role in stabilizing the sand dam and preventing dust production.
2. Review of the dam, floodplains and roads constructions in the upstream areas which has prevent the water flows toward downstream and causes to desertification.

Suggestion methods:

1- Supervise Classification

2- Classification by artificial intelligence

3- Change Detection


Thanks for your kind attention