

# **Sand dune in Iraq**

## **(( effects and ways of treatments))**



**Dr. fadhil alfarraji**

## **SITE**

**Iraq is located in the northeastern of the middle east , west Asia between latitude (22.0 – 29.5) north and longitudes (38.45- 48.45) east and is bounded on the north turkey , on the east Iran , on the west Syria and Jordan , on the south Saudi Arabia and Kuwait .**

**The area of Iraq 438.416 km<sup>2</sup> , al jazera and north and south badia consist of the total area of Iraq . which divided to :**

- Mountain region in north and the north east .**
- Eastern highlands .**
- Al- gazera between Tigris and Euphrates rivers in north west .**
- Western desert (northern and southern badia ).**
- Alluvial plain .**

## **CLIMATE**

Climate of Iraq is characterized in north and north east part cold wet in winter , in summer dry and warm . in other part , winter cold semi dry summer hot . in general characterized as follows :

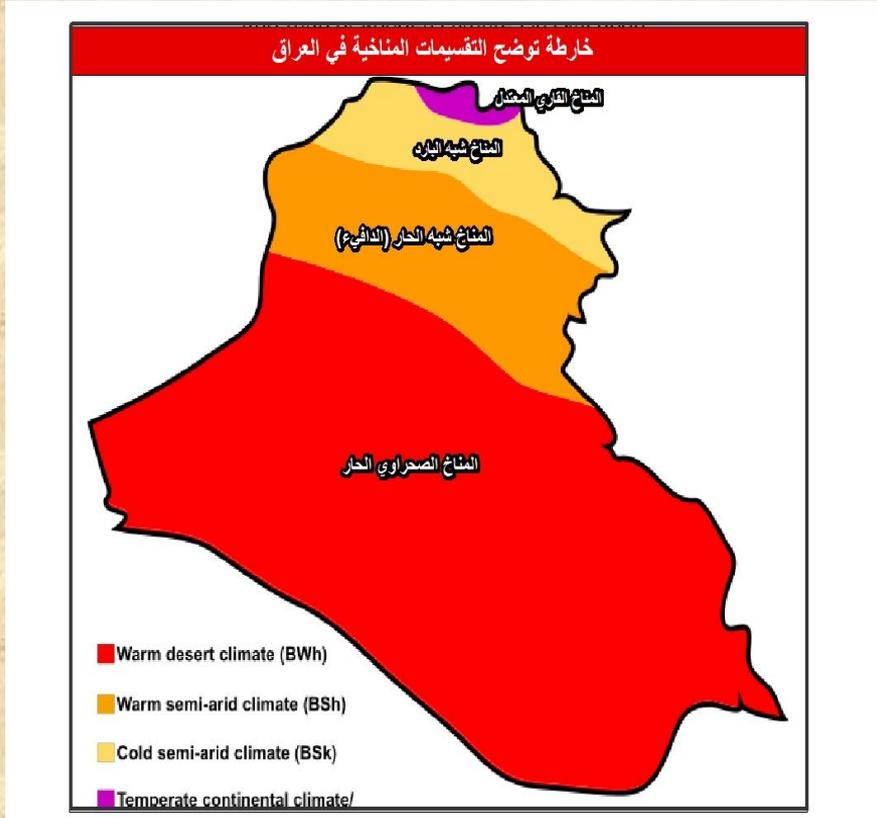
- **high average temperature degree .**
- **Big difference between day and night temperature and between seasons**
- **Low relative humidity .**
- **Big variation in rainfall from 1200 m in up north to 70 mm in down south**
- **Prevailing wind north and north west during dry months .**

## Average of rainfall from 1988-2000

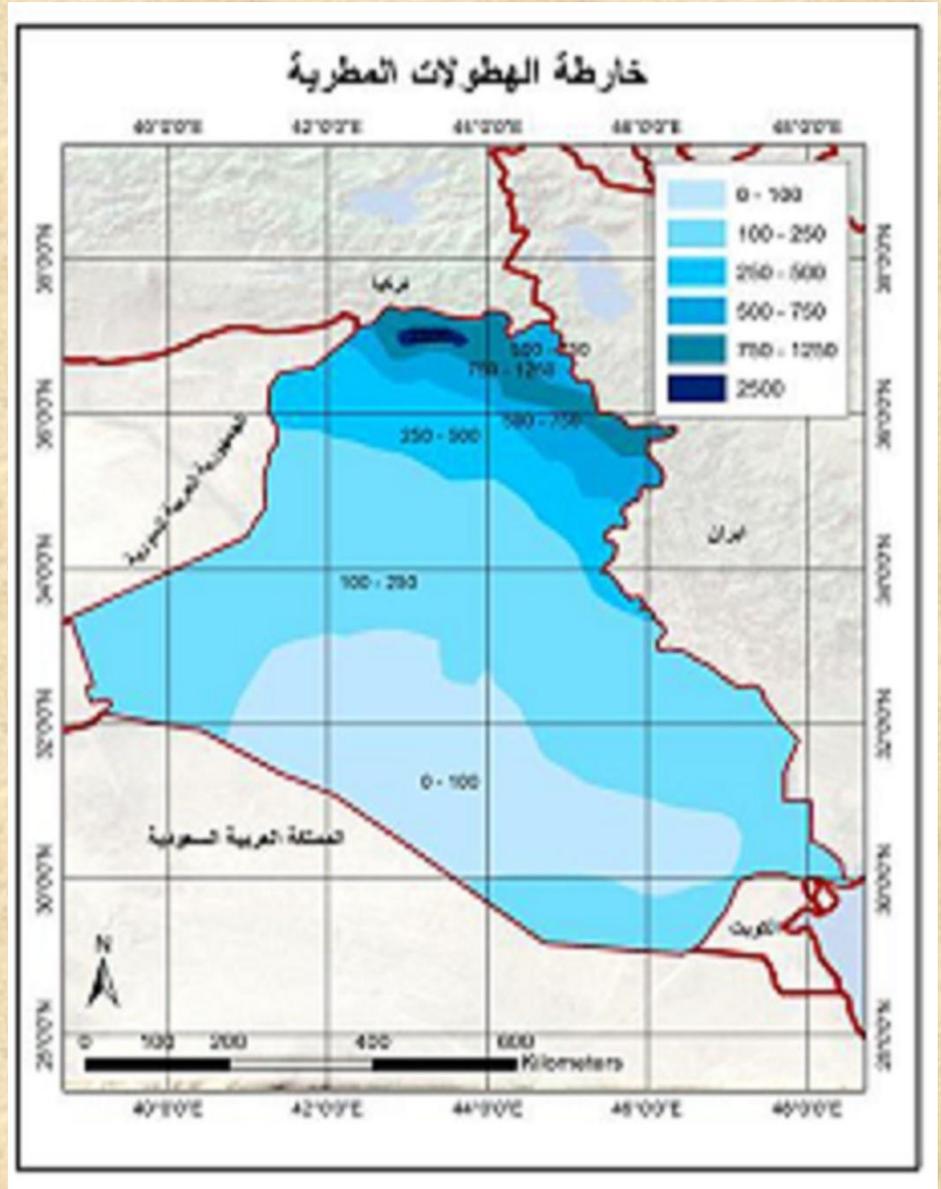
السنة	بصرة	رطبة	بغداد	موصل
1988	105,7	263,6	182,9	594,3
1989	121,4	125,2	145,4	329,3
1990	48,3	96,1	123,8	259,6
1991	247,5	84,1	89,4	405,5
1992	165,2	114,5	88,1	577,1
1993	177,6	130,6	192,5	633,0
1994	153,0	175,4	152,9	439,6
1995	132,3	230,2	96,7	296,2
1996	214,2	133,4	98,0	528,7
1997	232,5	236,9	113,8	360,6
1998	74,2	80,9	115,8	244,8
1999	238,6	62,6	58,5	156,9
2000	130,0	83,4	67,6	233,3

## الاشهر

ك1	ت2	ت1	ايلول	آب	تموز	حزيران	مايس	نيسان	اذار	شباط	ك2	ن
4	5	3	8	16	20	15	18	9	-	2	2	19
-	2	-	1	6	19	14	9	10	1	5	4	19
-	3	-	2	4	5	6	6	2	10	-	-	19
-	2	1	1	10	6	8	3	6	3	2	1	19
-	2	-	-	2	6	2	3	1	1	-	-	19
-	-	-	5	2	-	2	1	-	2	2	-	19
-	-	-	1	14	13	1	1	3	4	1	-	19
-	-	-	1	-	4	3	-	-	3	-	1	19
-	-	-	1	1	4	4	5	-	4	-	-	19
-	-	-	1	1	2	4	3	1	3	-	1	20

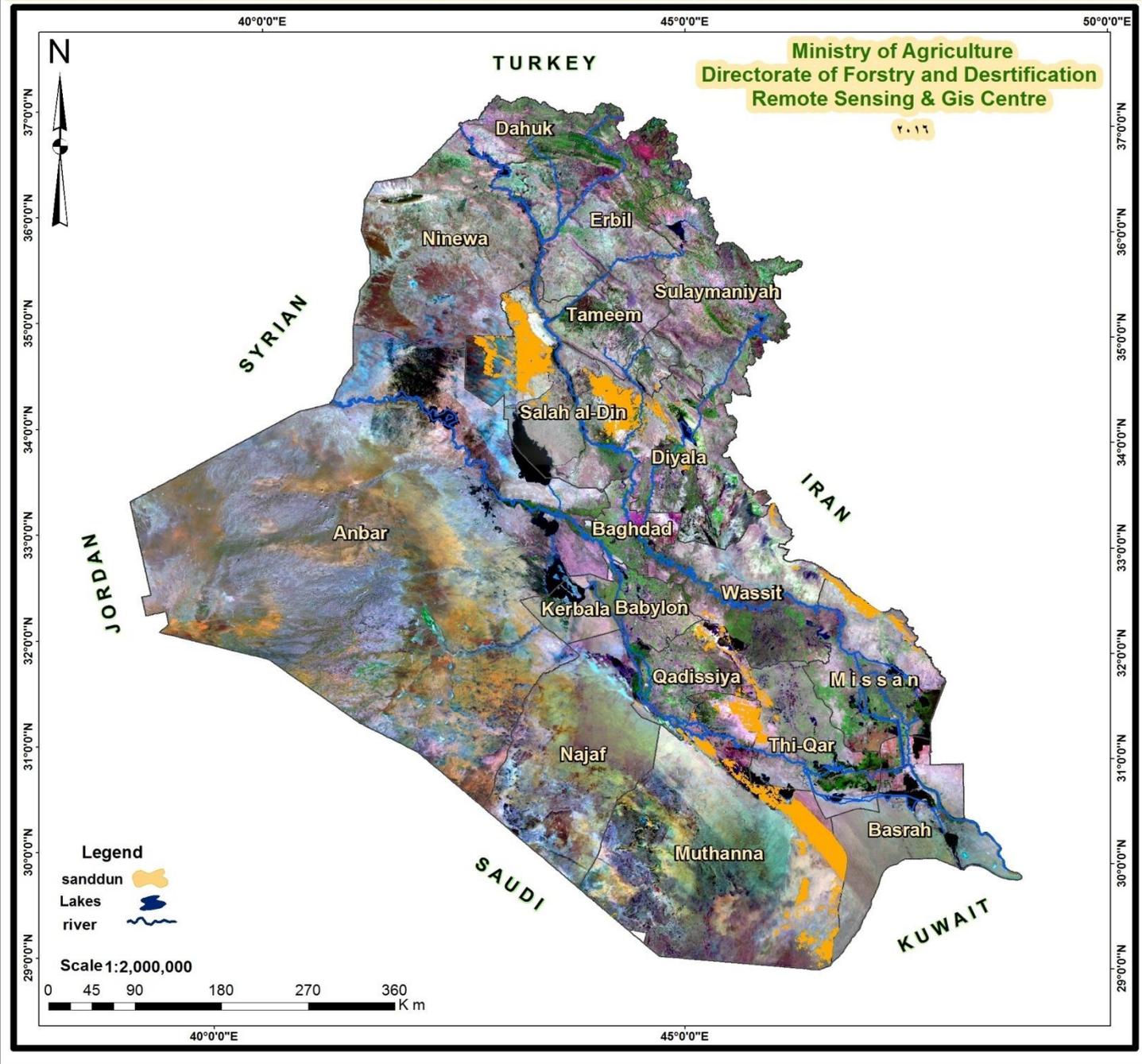


**Climate regions in Iraq**

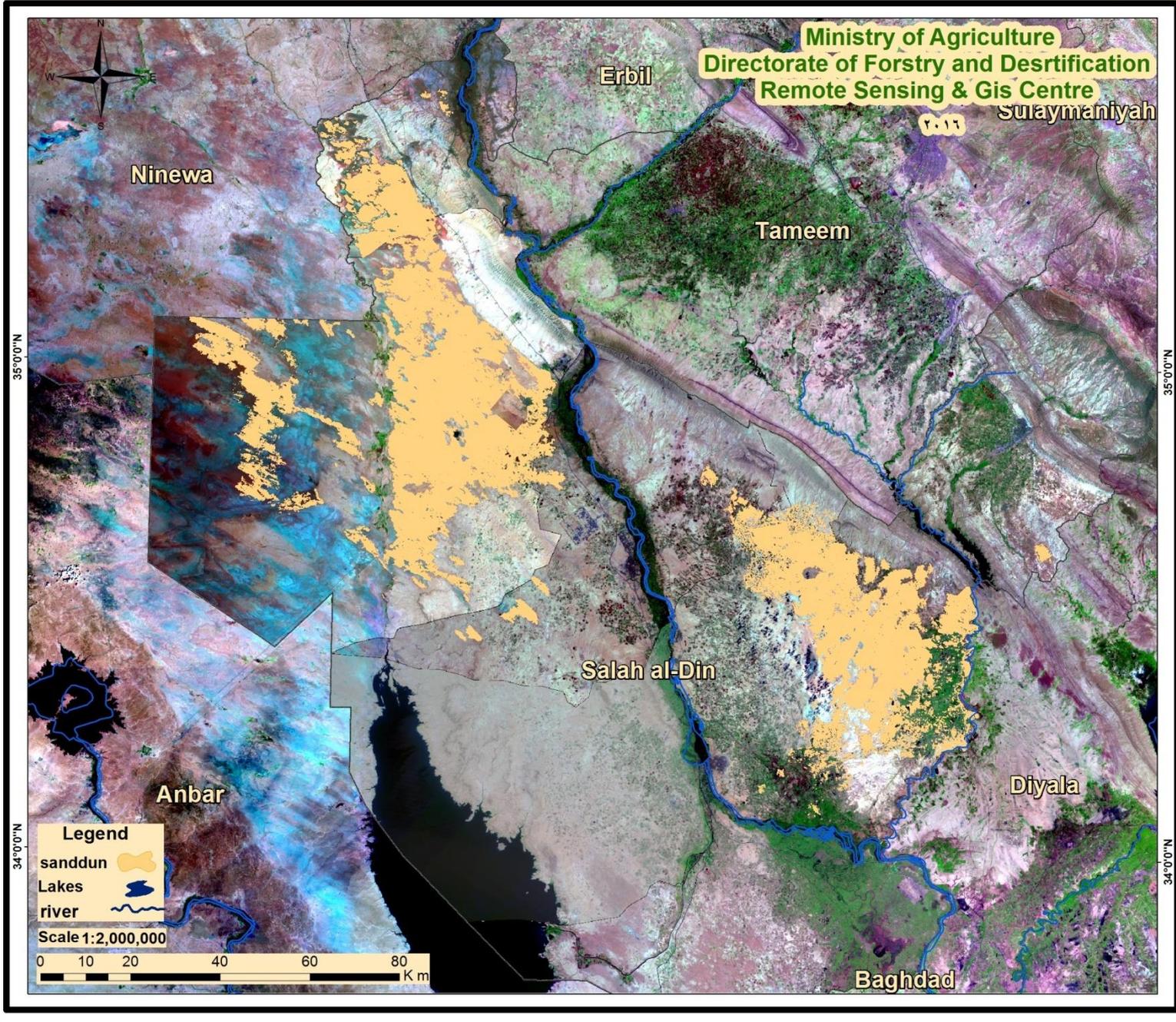


**Distribution of average rainfall in Iraq**

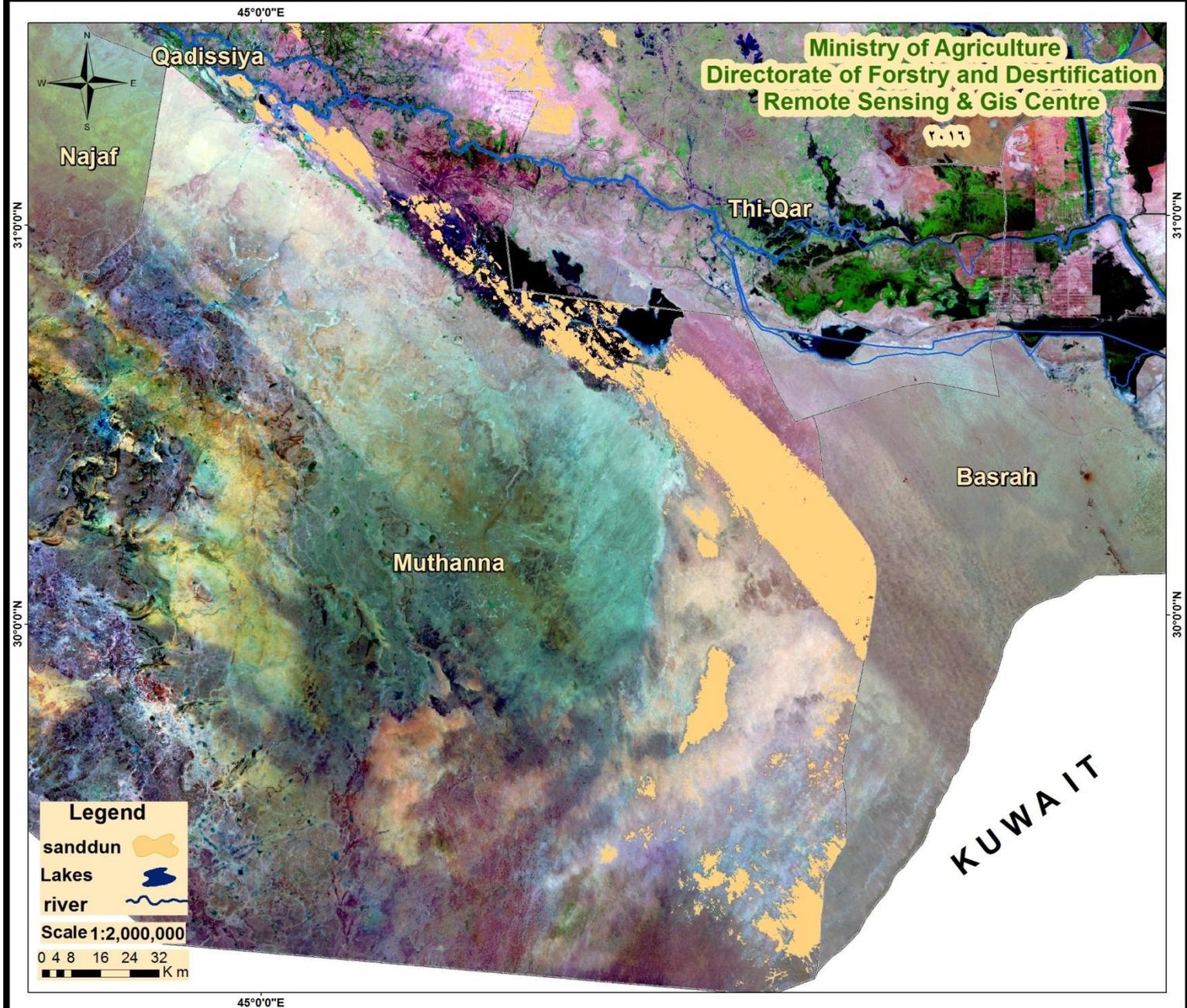
# Active Sand dunes belt in Iraq Landsat 2006



# Active sand dunes belt in Salah al-Din landsat 2006



# Active sand dunes belt in South of Iraq Landsat 2006



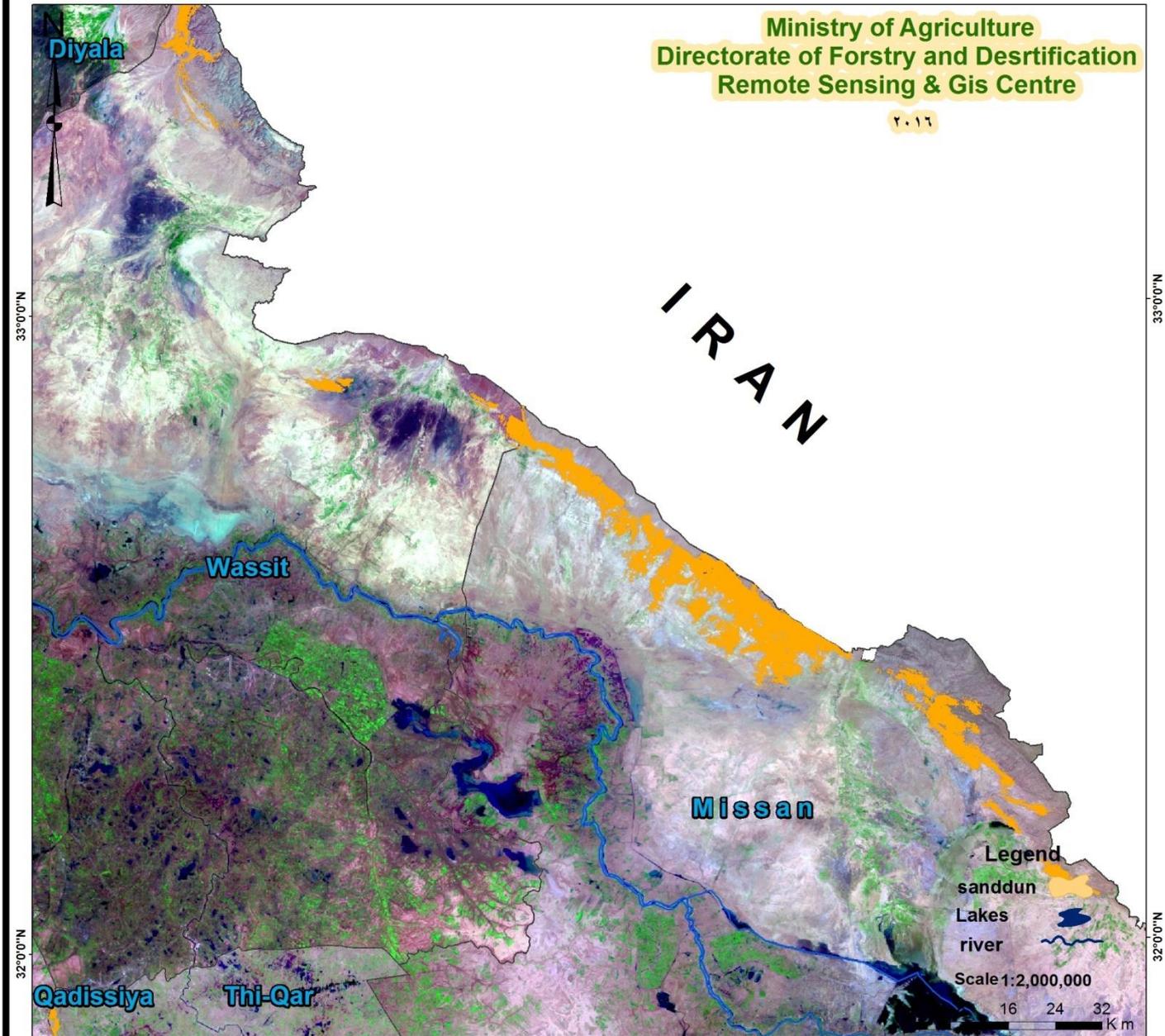
1990  
South of Iraq



# Active sand dunes belt in Missan landsat 2006

Ministry of Agriculture  
Directorate of Forstry and Desrtification  
Remote Sensing & Gis Centre

۲۰۱۶



**Effect of active  
sand dunes due  
to its movement**

Railway lines affected by sand movment

کٺبان رملیه تغطي سکه حديد  
بغداد بیجي موصل

# Roads lines affected by sand movment



## Roads lines affected by sand movment



# Fuel steation affected by sand movment



# Irrigation gate way affected by sand movment



**Main drainage canal affected by sand movement**



## Irrigation canal affected by sand movment



**Useing  
Mechinal and Biological  
metheds in sand dunes fixation**

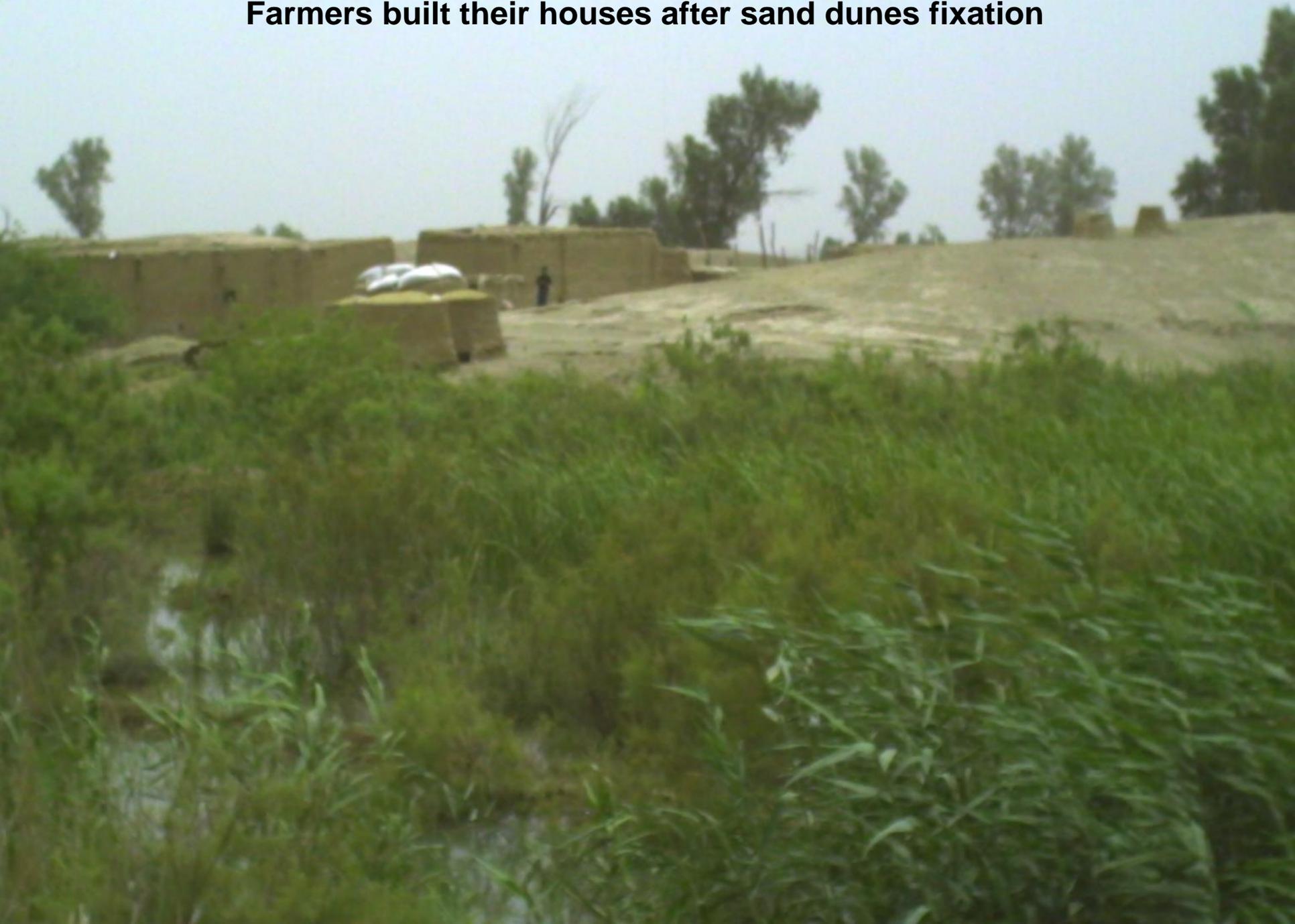


**Covering dunes by heavy soil**



Neutral vegetation (Tamarix articulata , prosopis spp) grow densely after two years from covering dunes

**Farmers built their houses after sand dunes fixation**





Planting long cutting of Tamarix artiulata on the active sand dunes in Salah al din cevernorate



before

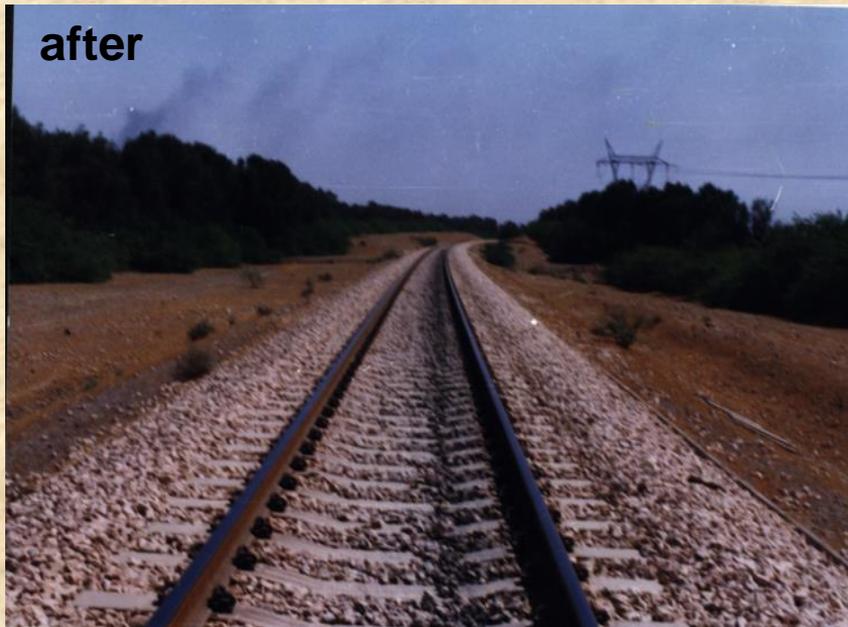


کۆنەن رملیە تەغی سکه حەدی  
بەغداد بیجی موصل

before



after



after



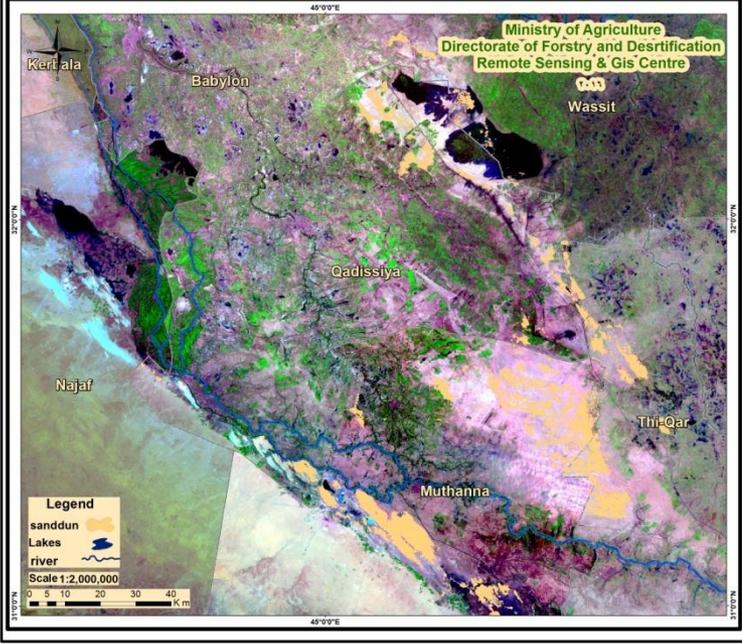
**before**



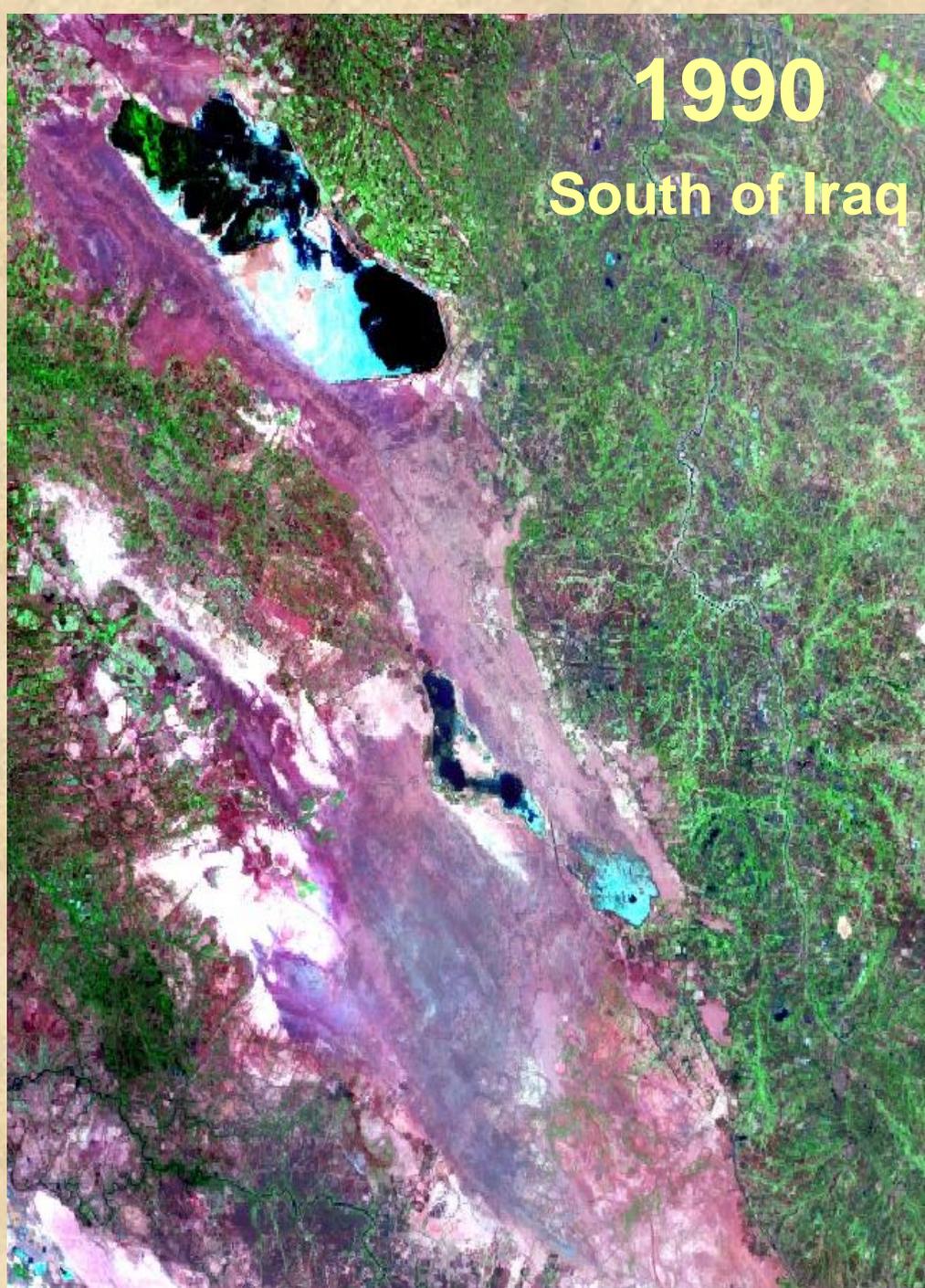
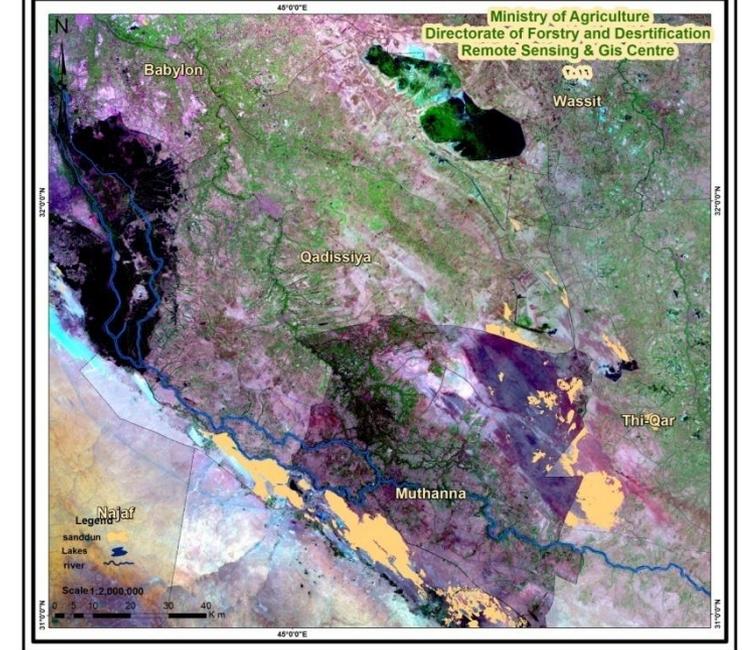
**after**



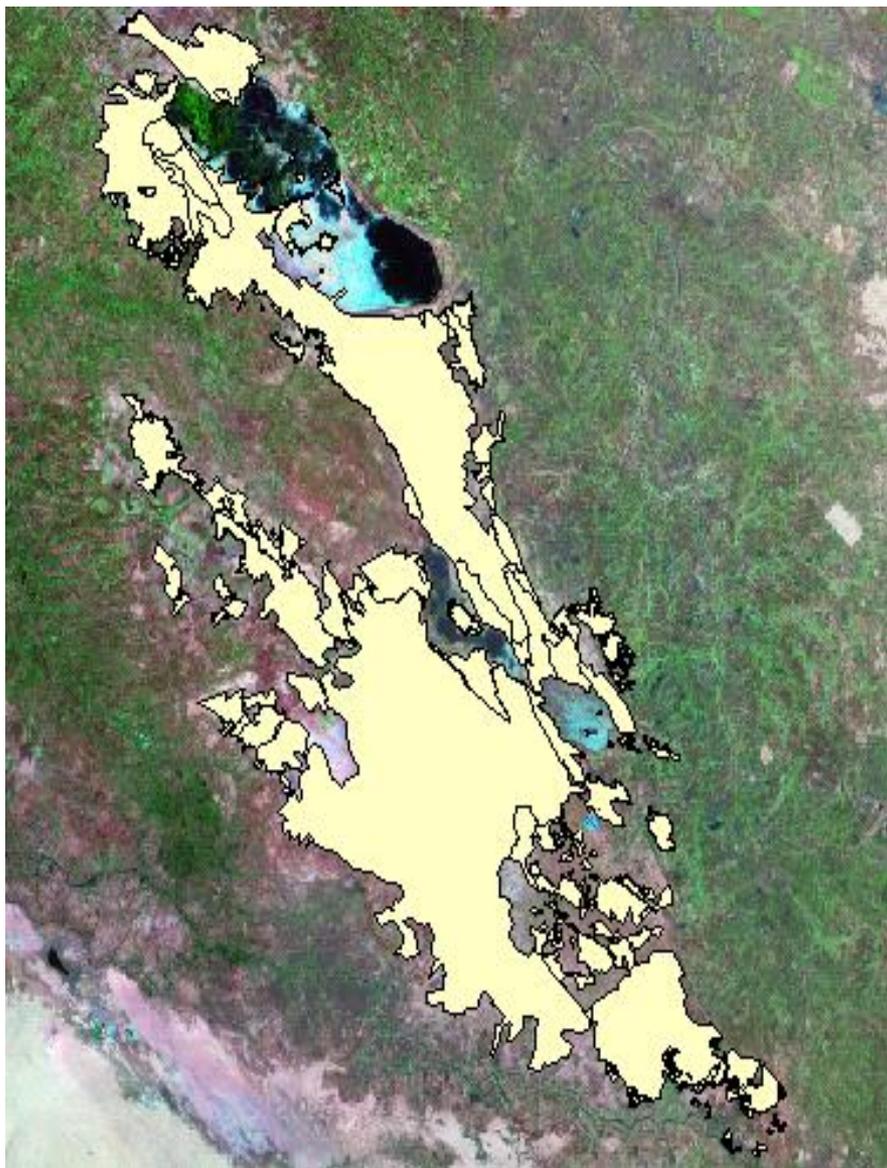
### Active sundduns belt in South of Iraq Landsat 2006



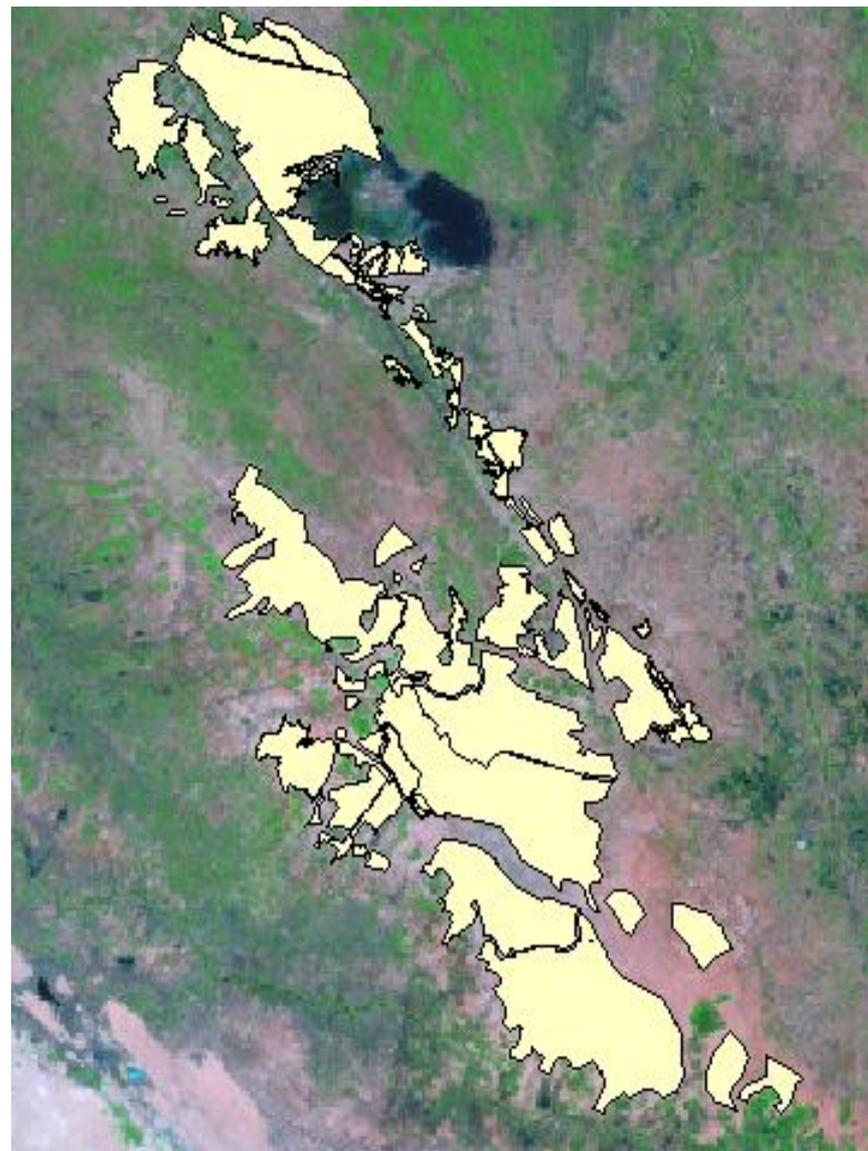
### Active sundduns belt in South of Iraq Landsat 2013



1990



2001







## Water harvesting activities





## Desert Oases



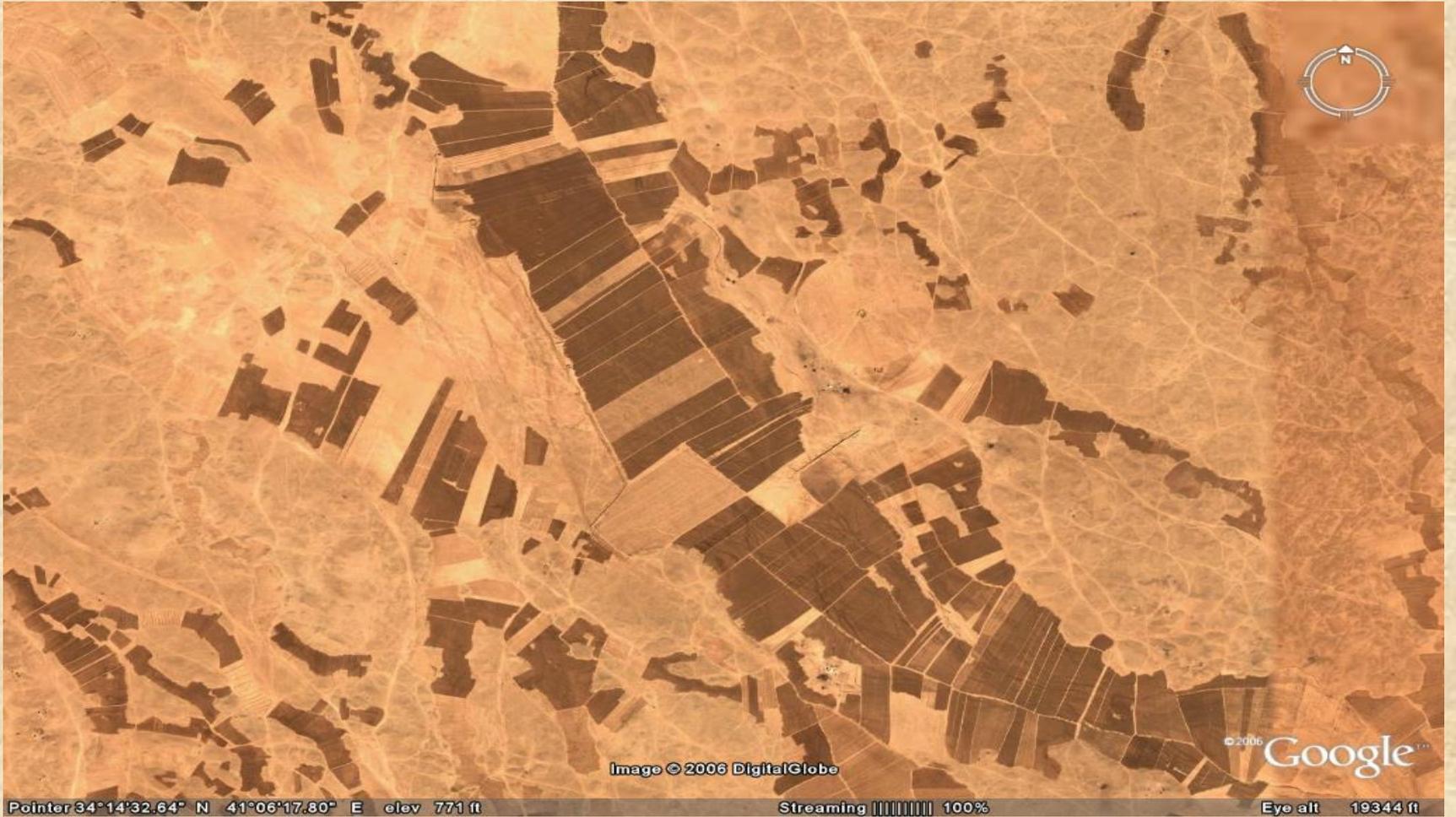


## Nurseries



# Misuse activates





زراعة الفيضات في الصحراء الغربية بالاعتماد على مياه الامطار الذي ادى الى تدهور الغطاء النباتي  
(الجزء الاسفل من الصورة)/محافظة الانبار طريق القائم -عكاشات الطبيعي