**Agreement #2**
**Terms of reference for**
**Monitoring and Data Sharing**

For sustainable development and proper management of the Nubian Sandstone Aquifer System, continuous monitoring of the aquifer should be maintained. In order to observe the regional behavior of the NSAS, monitored parameters of the aquifer should be shared between the concerned countries.

Hence, it is herewith agreed between the four countries sharing the Nubian Sandstone Aquifer System, namely Chad, Egypt, Libya and Sudan, represented by their National Coordinators to monitor and share among them the following information:

- Yearly extraction in every extraction site, specifying geographical location and number of producing wells and springs in each site.

- Representative Electrical Conductivity measurements (EC), taken once a year in each extraction site, followed by a complete chemical analysis if drastic changes in salinity is observed.

- Water level measurements taken twice a year in the locations shown in the attached maps and tables. The proposed monitoring network is subject to changes upon the feedback of the National Coordinators of the concerned countries.

These measurements should be undertaken within the Nubian Aquifer System and the Post Nubian aquifer System.

**Dr. Omar Salem**

Date: 5/10/2000

Director, General Water Authority,
Libya.

**Dr. Taher Hassan**

Date: 5/10/2000

Research Institute for
Groundwater,
Egypt

**Dr. Moussa Terap**

Date: 05 October 2000

Directeur de l'Hydraulique,
Chad

**Dr. Idris Mohamed Idris**

Date: 05 October 2000

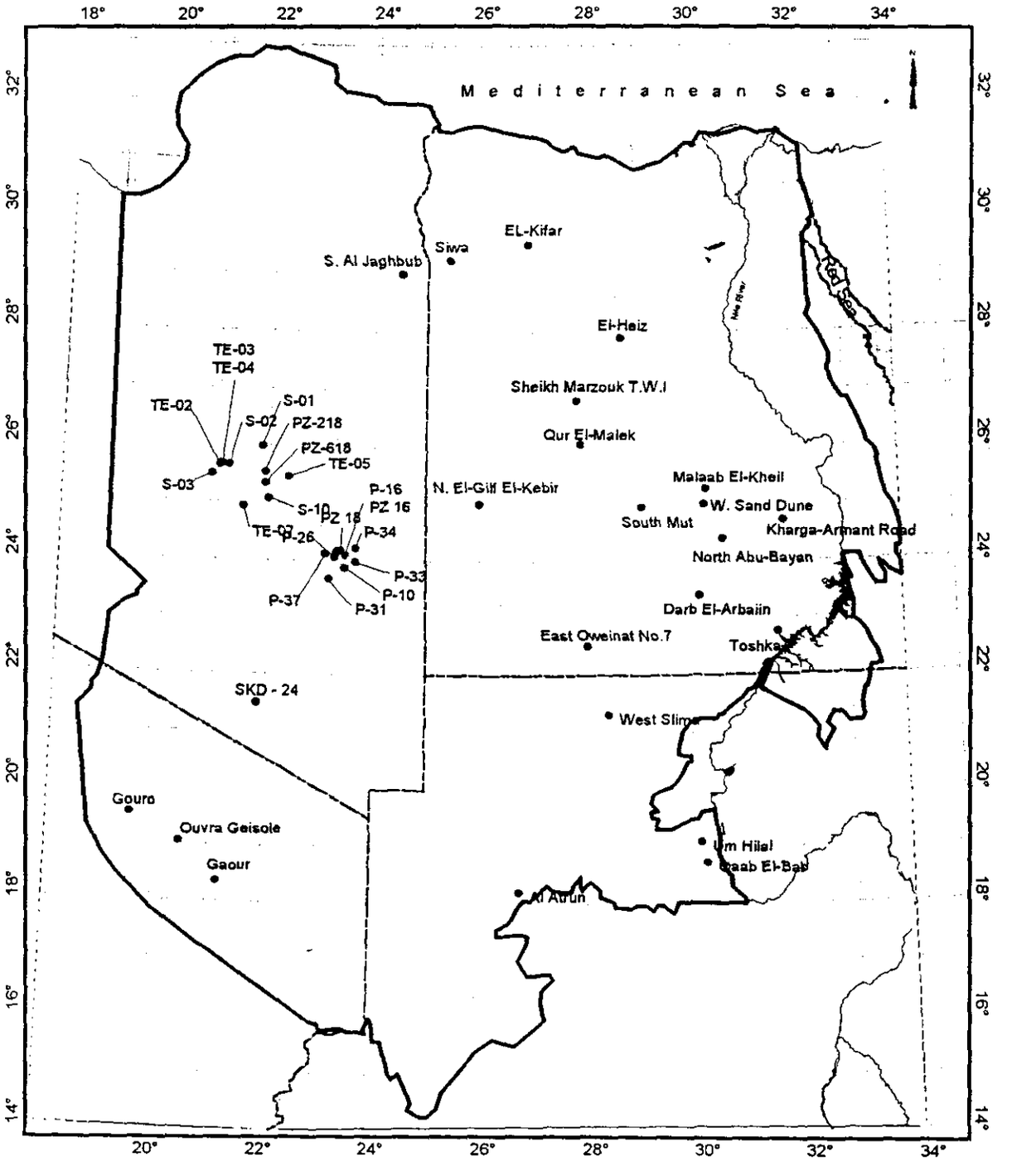
Director, Groundwater and Wadis
Directorate,
Sudan

**Dr. Mohamed Bakhbakhi**

Date: 5/10/2000

Regional Coordinator,
NSAS Programme,
CEDARE.

# Nubian Sandstone Aquifer System Programme




**Regional monitoring network in the Nubian Aquifer**

LEGEND

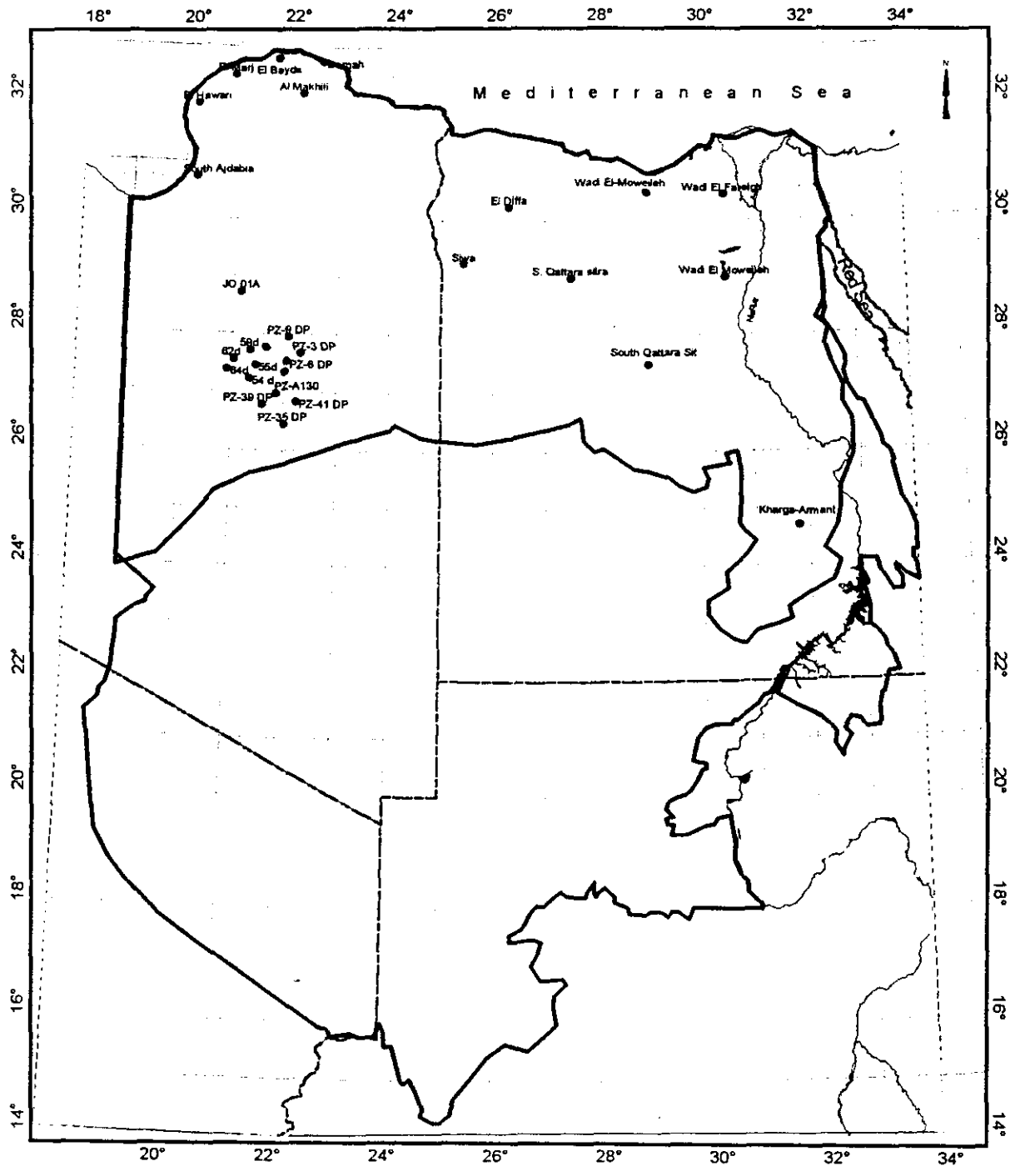
- Existing Wells
- Recommended Wells

200 0 200 400 Kilometers

IFAD

CEDARE

# Nubian Sandstone Aquifer System Programme




**LEGEND**

**Regional monitoring network in the Post Nubian Aquifer**

- Existing Wells
- Recommended Wells

200 0 200 400 Kilometers

# Proposed Regional Well Monitoring Network

## (A) NUBIAN SYSTEM AQUIFER

### I. Egypt

#### 1.1. Exiting Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | EL-Kifar | 26.936 | 29.531 |
| 2 | El-Heiz | 28.720 | 27.900 |
| 3 | Sheikh Marzouk T.W.I | 27.856 | 26.824 |
| 4 | Qur El-Malek | 27.925 | 26.062 |
| 5 | South Mut | 29.096 | 24.946 |
| 6 | Malaab El-Kheil | 30.321 | 25.270 |
| 7 | West Sand Dune | 30.279 | 24.989 |
| 8 | North Abu-Bayan | 30.626 | 24.386 |
| 9 | Toshka Observation No. 4 | 31.643 | 22.739 |
| 10 | East Oweinat No.7 | 28.033 | 22.500 |
| 11 | One of Siwa Observation Wells | 25.430 | 29.250 |

#### 1.2. Recommended New Observation Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | Darb El-Arbaiin | 30.170 | 23.400 |
| 2 | Kharga-Armant Road | 31.800 | 24.700 |
| 3 | North El-Gilf El-Kebir | 26.000 | 25.000 |

### II. Libya

#### 2.1. Exiting Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| | Kufra | | |
| 1 | P-6 | 23.277 | 24.135 |
| 2 | P-10 | 23.451 | 23.890 |
| 3 | P-16 | 23.463 | 24.109 |
| 4 | P-20 | 23.322 | 24.179 |
| 5 | P-26 | 23.256 | 24.073 |
| 6 | P-31 | 23.153 | 23.690 |
| 7 | P-33 | 23.670 | 23.977 |
| 8 | P-34 | 23.657 | 24.215 |
| 9 | P-37 | 23.084 | 24.116 |
| 10 | PZ-6 | 28.033 | 22.500 |
| 11 | PZ 10 | 25.430 | 29.250 |
| 12 | PZ 16 | 23.463 | 24.109 |
| 13 | PZ 18 | 23.374 | 24.193 |

## II. Libya

### 2.1. Exiting Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| | **Tazerbo** | | |
| 1 | TE-02 | 21.034 | 25.663 |
| 2 | TE-03 | 21.064 | 25.681 |
| 3 | TE-04 | 21.070 | 25.688 |
| 4 | TE-05 | 22.363 | 25.466 |
| 5 | TE-07 | 21.500 | 24.931 |
| 6 | S-01 | 21.839 | 26.007 |
| 7 | S-02 | 21.195 | 25.680 |
| 8 | S-03 | 20.875 | 25.503 |
| 9 | S-10 | 21.965 | 25.076 |
| 10 | PZ-218 | 21.910 | 25.550 |
| 11 | PZ-618 | 21.910 | 25.360 |

### 2.2. Recommended New Observation wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | South Al Jaghbub | 24.500 | 29.000 |
| 2 | SKD - 24 (El Kufra Basin) | 21.850 | 21.500 |

## III. Sudan

### 3.1. Exiting Observation Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | Al Atrun | 26.750 | 18.200 |
| 2 | Qaab El-Bab | 30.225 | 18.717 |
| 3 | West Slima | 28.420 | 21.320 |
| 4 | Um Hilal | 30.133 | 19.092 |

## IV. Chad

### 4.1. Exiting Observation Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | Gouro | 19.570 | 19.530 |
| 2 | Ouvra Geisole | 20.492 | 19.050 |
| 3 | Gaour | 21.186 | 18.356 |

## (B) POST NUBIAN AQUIFER SYSTEMS

### I. Egypt

### 1.1. Exiting Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | One of Siwa Observation Wells | 25.430 | 29.250 |

### 1.2. Recommended New Observation Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| 1 | El-Diffa Western Plateau | 26.300 | 30.250 |
| 2 | South Qattara Sitra Area | 29.000 | 27.500 |
| 3 | Wadi El-Moweileh (South Wadi El-Rayan | 29.000 | 30.500 |
| 4 | Kharga - Armant Road | 31.800 | 24.700 |
| 5 | Wadi El-Fareigh | 30.500 | 30.450 |

### II. Libya

### 2.1. Exiting Wells

| # | Well Name | Location Coordinates | |
|---|---|---|---|
| | | long. | lat. |
| | **Sarir North** | | |
| 1 | PZ-3 | 22.310 | 27.675 |
| 2 | PZ-6 | 22.046 | 27.533 |
| 3 | PZ-9 | 22.090 | 27.948 |
| 4 | PZ-15 | 21.652 | 27.770 |
| | **Sarir South** | | |
| 1 | PZ-33DP | 22.008 | 27.344 |
| 2 | PZ-35DP | 22.016 | 26.450 |
| 3 | PZ-39DP | 21.606 | 26.786 |
| 4 | PZ-41DP | 22.250 | 26.836 |
| 5 | PZA130/01 | 21.863 | 26.980 |
| | **Sarir West** | | |
| 1 | 54d | 21.340 | 27.228 |
| 2 | 55d | 21.456 | 27.460 |
| 3 | 59d | 21.340 | 27.717 |
| 4 | 62d | 21.035 | 27.550 |
| 5 | 64d | 20.910 | 27.380 |
| | **Jalu/Awjlah** | | |
| 1 | A-01-A | | |
| | **Jabal Al Akhdar** | | |
| 1 | PZ-3389 (El-Hawari) | 20.200 | 32.000 |
| 2 | PZ-3489 (El-Marj) | 20.900 | 32.500 |

## 2.2. Recommended New Observation Wells

| # | Well Name | *Location Coordinates* | |
|---|---|---|---|
| | | **long.** | **lat.** |
| 1 | El Bayda | 21.750 | 32.800 |
| 2 | Al Makhili | 22.260 | 32.200 |
| 3 | Darnah | 22.630 | 32.875 |
| 4 | South Ajdabia | 20.220 | 32.733 |