National Water Research Center

Research Stations

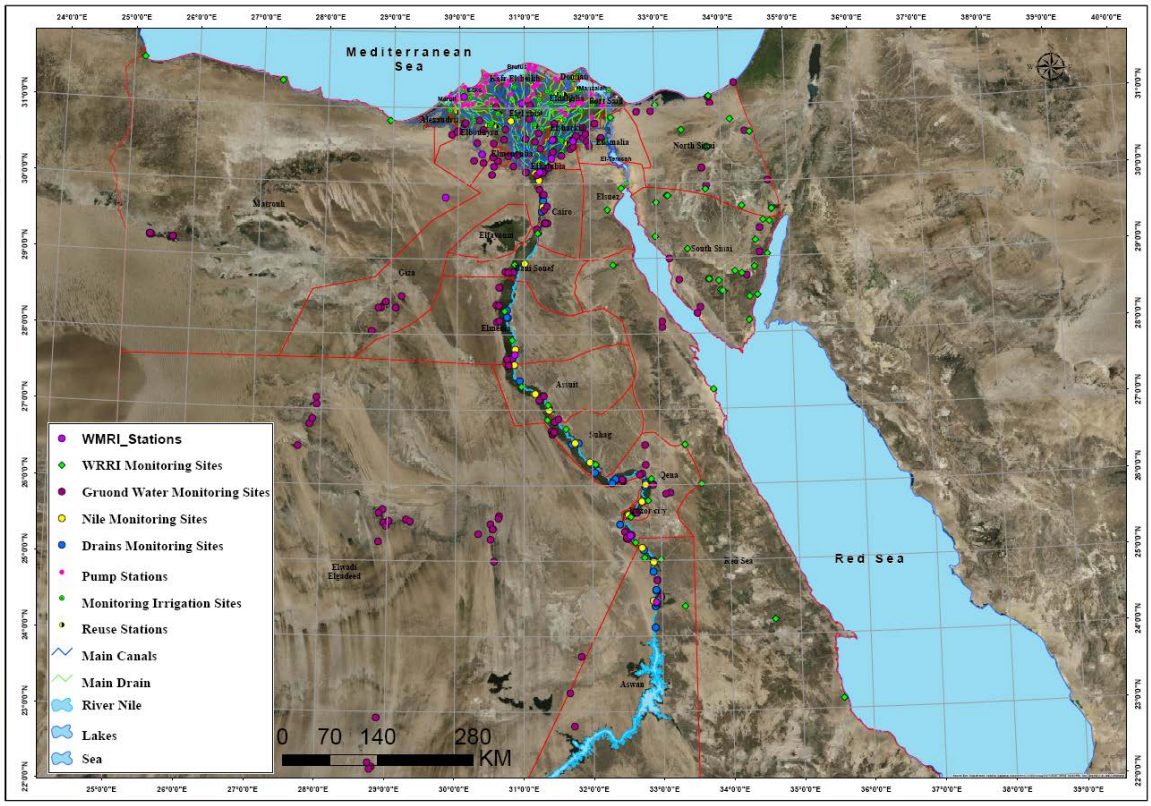
and Monitoring Locations

2020

There are (26) research stations affiliated to seven institutes and units in addition to the Water Studies and Research Complex under the umbrella of the National Water Research Center (NWRC). Their research activities vary, as they support the NWRC research plan.

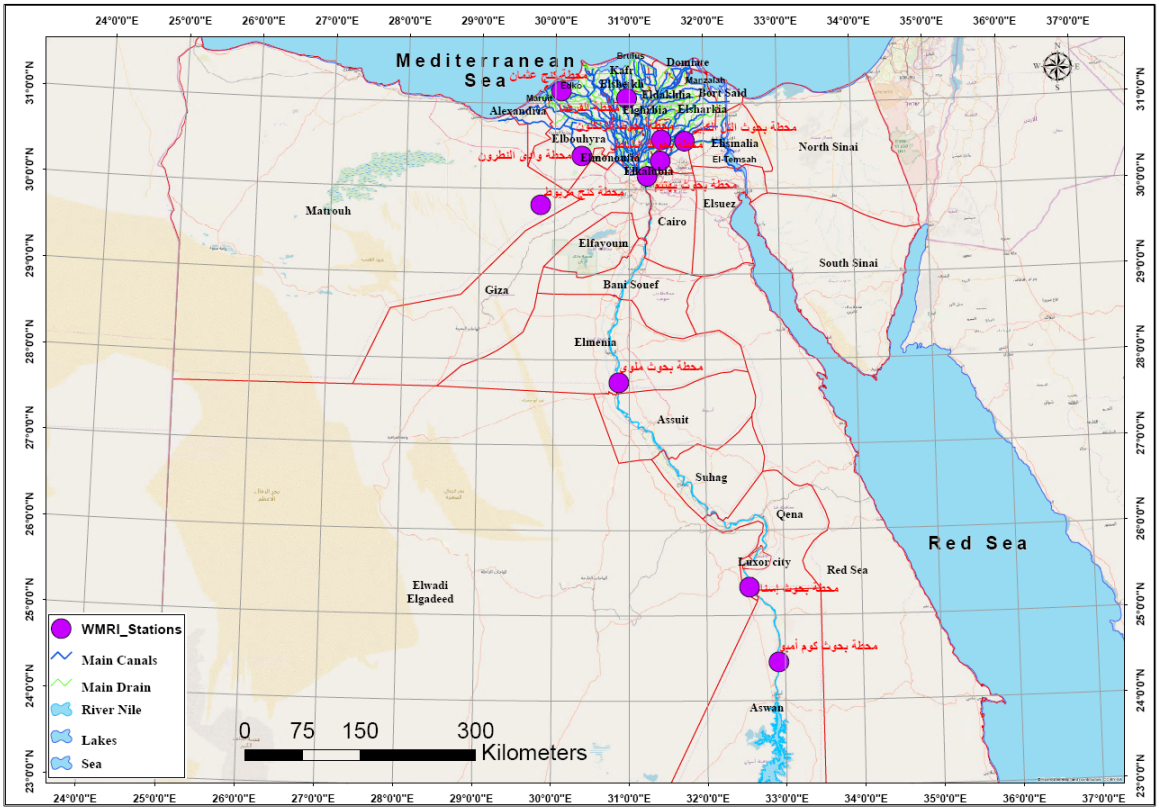
1. Carrying out marine measurements at the Egyptian coastal line.
2. Salt water desalination studies.
3. Fish farming, control of aquatic weeds, and production of biogas from aquatic weeds.
4. Reuse of drainage water for irrigation.
5. Experimenting sub-surface drainage systems.
6. Studying the crops water requirements and evaluating the modern irrigation systems.
7. Conducting experiments for artificial charging of groundwater.

Under the umbrella of the NWRC, Its Institutes have monitoring locations besides the research stations cover the whole country as seen in the below geographical map..



1- Water Management Research Institute

The institute has 12 research stations, as seen in the below geographical map, cover Nile valley of Egypt with varied climate and soil conditions. In general, the purpose of the stations is experimenting the water requirements of different crops under different irrigation systems prevailing in the research regions.



1-1 El-Tal El-Kabeer station (East Delta region)

Station location	At Qantara and Hawis Al-Salihiya, before the city of El-Tal El-Kabeer. The area of station is 9 acres and mostly is sandy soils.
Purpose of station	• Studying the water requirements of different crops under the different irrigation systems prevailing in the region.

- Representing research experiments of dense sandy soils in the area.

Most research activities

- Adaptation of Wheat cultivation under the climate changes.
- Modern Irrigation Experiments for Fruit Cultivation (especially Mango in East Delta)

1-2 El-Zankalon station (East Delta region)

Station location

At 7 kilometers west of the city of Zagazig. The area of the station is 9 acres and has heavy clay soil

Purpose of station

- Studying the water requirements of the prevailing crops in the region.
- Increasing the farmers' awareness through seminars to apply water saving methods.
- Representing research experiments in the old lands.

Most research activities

- Pilot studies for the application of the drip irrigation system to Rice cultivation.
- Rice cultivation experiments under controlled irrigation.
- Studying the effect of water accounting on the water management system.
- Controlled drainage at different levels of field drainage in collaboration with Drainage Research Institute.

1-3 Enshas station (East Delta region)

Station location

At Enshas city, El-Sharqia Governorate. The area of the station is 43 acres and has sandy clay soil.

Purpose of station

- Studying the water requirements of field crops, vegetables and fruits in sandy soil.
- Evaluating the modern irrigation systems technically and economically.

Most research activities

- Adaptation of Wheat cultivation under the climate changes.
- Vegetables cultivation with modern irrigation systems.

- Greenhouses experiments.
- Citrus trees experiments.

1-4 Al-Qarada station (North Delta region)

Station location	At the main entrance Al-Qarada village, Kafr El-Sheikh Governorate. The area of the station is 3 acres and has clay soil.
Purpose of station	• Studying the water requirements of the various prevailing crops in the region, as well as estimating the economical water duty for such crops. • Conducting experiments for reusing drainage water in irrigation. • Applying drip irrigation system experiments in old lands to expand in using it instead of using surface irrigation.
Most research activities	• The effect of water stress during the different growth stages on some characteristics and water productivity of the Rice crop. • The effect of using different methods and dates of cultivation on the water requirements of the Wheat crop. • The comparison between using drip irrigation system with other irrigation systems for the Rice crop.

1-5 Bahtim station (South Delta region)

Station location	At Bahtim, El- Qalyubia Governorate, 12 km from Cairo. The area is 2 acres and has clay soil.
Purpose of station	• Studying the water requirements of crops under the surface irrigation system and drainage problems and the impact of these on the yield. • Representing the south delta region regarding the water quality and soil type.
Most research activities	• Supervising the application of modern irrigation systems to Landscape in the new urban communities.

- Study to measure the percentage of carbon dioxide from the plant and its effect on water requirements.

1-6 King Othman station (West Delta region)

Station location	At the entrance of King Othman city, El-Beheira governorate. The area of the station is about 3 acres and has heavy clay soil.
Purpose of station	• Studying the water requirements of the prevailing crops in west delta region. • Studying the rain fed agriculture in compare with irrigated agriculture and supplementary irrigation. • Studying the reuse of drainage water in irrigation. • Representing the old clay soil of the west delta region.
Most research activities	• Supplemental irrigation experiments using the contribution of groundwater and controlling the levels of drains. • Calculation of water requirements for Rice crop in areas with high water table.

1-7 King Mariout station (West Delta region)

Station location	At King Mariout road, El-Beheira governorate. Has area of 9 acres and lime soil.
Purpose of station	• Studying the reuse of drainage water in irrigation. • Studying the supplementary irrigation. • Representing the lime soil of the west delta region.
Most research activities	• Study the supplementary irrigation of wheat crop using rain. • Experiments to monitor the effect of salts on trees.

1-8 Wadi Al-Natroun station (West Delta region)

Station location	At the entrance of Wadi Al-Natroun city, El-Beheira governorate. The area of the station is 118 acres and has sandy soil.

Purpose of station	• Conducting researches and studies on consumptive use and water requirements of crops in sandy lands. • Evaluating the optimal irrigation system. • Using of unconventional energy sources in the management and operation of irrigation systems. • Introducing appropriate new technologies in the use of low-quality water for irrigation and assessing it environmentally, economically and socially.
Most research activities	• Maximizing the utilization of groundwater in fish farming and agriculture with modern irrigation systems in sandy soil. • Evaluating the application of the optimal method for the sub-surface irrigation system in sandy soil. • Studying effect of magnetic treatment on the yield of some crops with different tolerance to salinity.

1-9 Shakshook station (Middle Egypt)

Station location	At the shore of Qaroun Lake, El-Fayoum governorate. The area is 2 acres, old salty soil with high saline water.
Purpose of station	• Water balance of Qaroun Lake. • Salt balance of Qaroun Lake. • Representing the areas of controlled irrigation with high saline water.
Most research activities	• Monitoring and measuring evaporation rates of Qaroun Lake. • Studying the low water quality to benefit from mixing irrigation.

1-10 Mallawi station (Middle Egypt)

Station location	At Mallawi city, El-Minya governorate. The area of the station is 1 acre and has silty clay soil.
Purpose of station	• Studying the water requirements of the prevailing crops in middle Egypt.

- Carrying researches in collaboration with Agricultural Research Center.

Most research activities

- Increasing the water and economic returns of the Sugarcane crop under different crop intensities.
- Appropriate irrigation systems for Soybean crop in Middle Egypt

1-11 Abiouha station (Middle Egypt)

Station location: At El-Minya city, El-Minya governorate.

Purpose of station

- Determining the consumptive use of different crops.
- Studying the effect of using different methods and dates of cultivation on water requirements.
- Evaluating the optimal the irrigation system.

Most research activities

- Joint studies with the agricultural administration in El-Minya

1-12 Esna station (Upper Egypt)

Station location: At the entrance of Esna region, Aswan governorate. The area is 10 acres, old clay soil.

Purpose of station

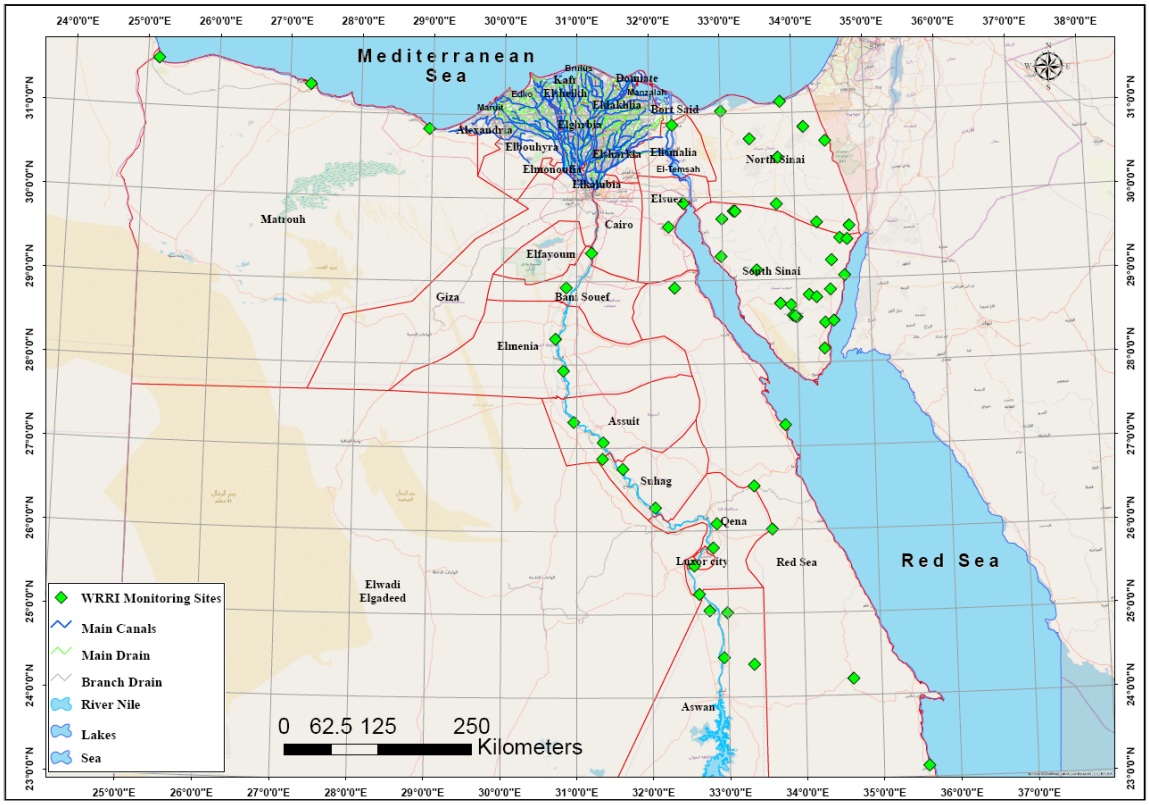
- Studying the water requirements of the prevailing crops in the region.
- Evaluating the modern irrigation systems technically and economically.
- Representing the soil of Upper Egypt and carrying experiments for the appropriate crops to the region.

Most research activities

- Studying the cultivation of traditional crops (Wheat - Beans) under drip irrigation systems.
- Studying the use of modern irrigation systems for different crops.

2- Water Resources Research Institute

The Institute has one main research station at At El-Wadi village, Al-Tur, South Sinai governorate. The purpose of the station is monitoring the groundwater levels and correlating them to the periods of rainfall that feed the groundwater aquifers in terms of quantity and quality. In addition to the cultivation of some crops, appropriate to the existing water quality. Besides the research station, the institute has meteorological monitoring stations cover Nile valley, Sinai Peninsula and coastal zones of Egypt as seen in the below geographical map.



2-1 Hydrological experimental research station

In the context of the research line of the two institutes, a cooperation agreement between the Water Resources Research Institute (WRRI) and the Water Management Research Institute (CMRI) has been carried out to take advantage of experiences in increasing the efficiency of using the available water resources in cultivation of some field

crops and trees to study the yield maximization and increasing the water use efficiency in Al-Tur area, which is characterized by climatic and environmental conditions differs from the valley and delta regions. The main most research activities in the station are as follows;

- Study of groundwater in the area.
- Study the water quality and the crops suitable for it.

3- Coastal Research Institute

The Institute has four research stations located at the shore line of the marine coast of the Mediterranean and red seas. The general purpose of the stations are as follows;

- Carrying out all marine environmental measurements.
- Monitoring of the shoreline changes of some areas in Alexandria.
- Carrying out the environmental measurements of the marine depositions.

3-1 Abu Qir station

Station location	At the shore of Mediterranean Sea, next to Abu Qir General Hospital, Alexandria governorate
Specific Purpose of station	Follow up all marine stations of the Coastal Research Institute.

3-2 Ras El-Bar station

Station location	Next to the sports hall, El-Jerbi, Damietta Governorate
Purpose of station	Carrying out marine studies in Damietta and Ras El-Bar coastal areas.

3-3 Rashid station

Station location	At Rashid tower, Rashid city, El-Beheira governorate.
Purpose of station	Carrying out marine studies in Rashid coastal area.

3-4 El-Burullus station

Station location	At Al-Qashhah, Al-Boughaz, El-Burullus tower, Kafr El-Sheikh governorate
Purpose of station	Carrying out marine studies in El-Burullus coastal area.

4- Channel Maintenance Research Institute

The Institute has two main research stations at the Nile delta. The main purpose of the stations is experimenting for the most environmental channel maintenance techniques, advantageous design of open channels and, weeds control.

4-1 Delta Barrage station

Station location	At Gazeret El-shaier, upstream of the Delta Barrages
Purpose of station	Carrying out studies to find out the best technical solutions in the fields of maintenance and design of open channels and weeds control and management.
Most research activities	• Reuse of wastewater from fish farms in aquaculture. • Studying of improving the quality of fish farms water using Zeolite. • Investigation for most feasible maintenance techniques upstream covered channels. • Weeds control using advanced scale technology. • Utilizing of weeds to produce Biogas. • Maximizing the utilization of the water unit in fish farms (using Tilapia fishes).

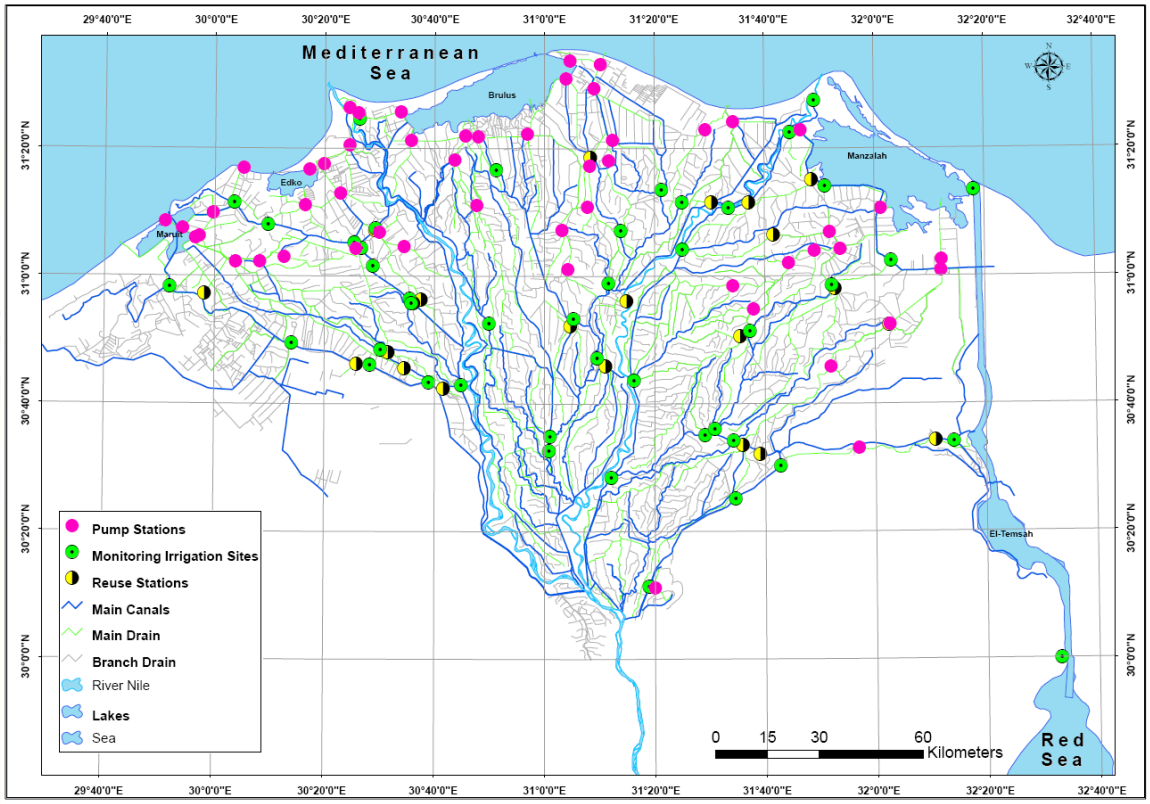
- Maximizing the hydraulic performance of weeds screens in open channels.

4-2 Bahtim station

Station location	Nearby Bahtim village, Cairo Alexandria Agricultural Road, North Cairo.
Purpose of station	Experimenting for biological weeds control.
Most research activities	Raising fish breeds and electing future mothers for Carp fishes.

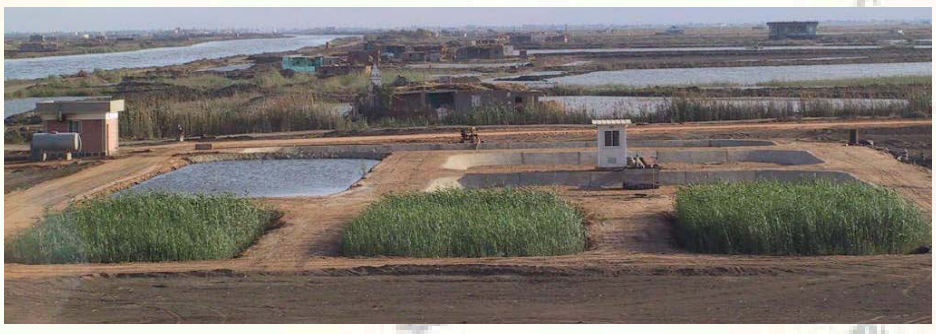
5- Drainage Research Institute

The Institute has two main research stations one at the north of the east Nile delta and other at north Saini peninsula. Both are experimenting, in general, for the drainage water practicing for reuse. Besides the research stations, the institute monitor the water quality of the canals and drains of the delta of river Nile at fixed monitoring locations as illustrated in the below map.



5-1 Al-Manzala station

Station location	At Al-Manzala Lake is located at the eastern end of the Nile Delta between the cities of Damietta and Port Said.
Purpose of station	Preserving the ecosystem, supporting sustainable development and the participation of residents of the region and non-governmental organizations through research, training and capacity building, and presenting the project as an inexpensive alternative to treat drainage water to reuse it.
Most research activities	• Carrying out researches related to treatment and reuse of drainage water including: • Low-cost treatment (Algae and Wetlands) and study of related elements to increase their efficiency. • Re-use of drainage water in agriculture and fish farming. • Using Charcoal to increase the treatment efficiency. • Using Gated Pipes in irrigation with drainage water.

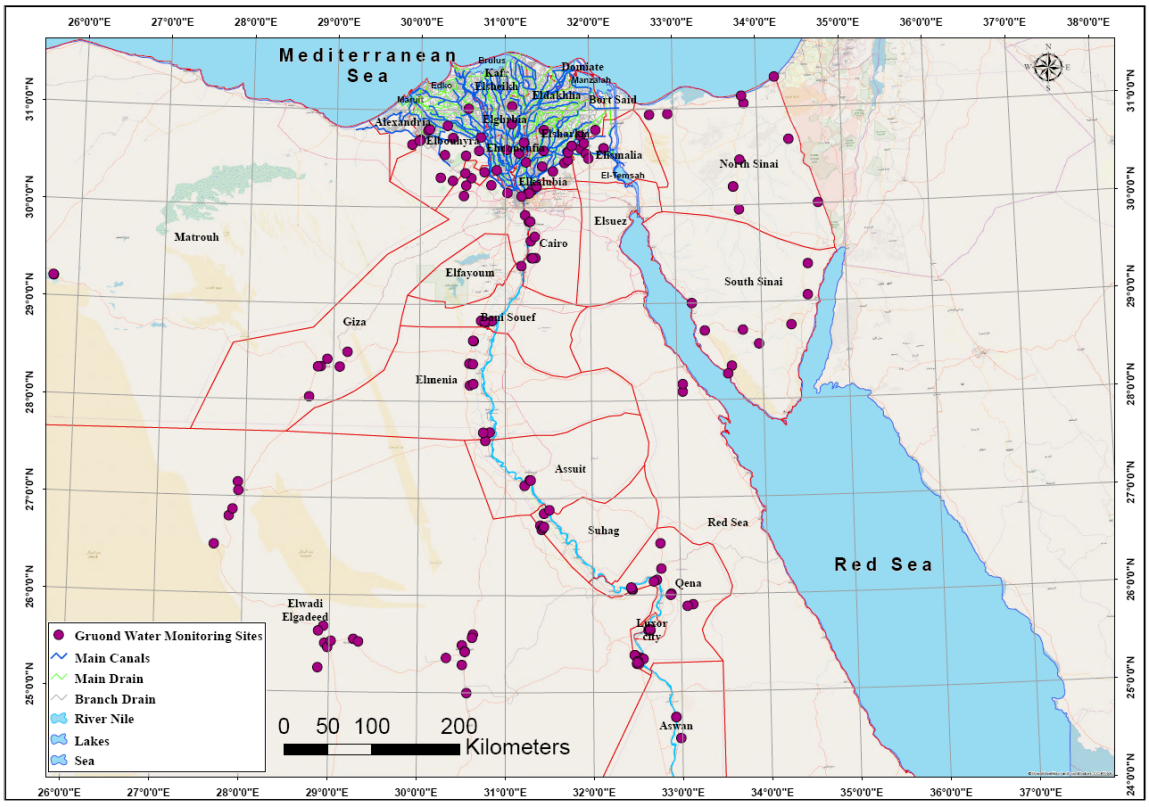


5-2 Pilot farm in Sahl El-Tina (North Sinai)

Station location	At southeast of Sahl Al-Tina area, North Sinai.
Purpose of station	• Recommending for the optimum irrigation and drainage for similar areas in Sahl Al-Tina. • Setting specific future scenarios to maximize the benefits of the development projects in Sahl Al-Tina. • Implementing the appropriate extension process for farmers and investors in the area.
Most research activities	• experimenting various drainage systems in the lands of Sahl Al-Tina. • Experimenting different irrigation systems in the lands of Sahl Al-Tina. • practicing for the appropriate crops, irrigation and drainage methods for Sahl Al-Tina area and north of Sainai.

6- Groundwater Research Institute

The institute has three research stations for artificial groundwater aquifer recharge. The three stations are located over different groundwater aquifers in Egypt. The main purpose of them is experimenting for recharging groundwater and measuring the groundwater levels in wells and gravity charging basins. Besides the research stations, the institute monitors the water quality of the groundwater aquifers at fixed monitoring locations as illustrated in the below geographical map.



6-1 Artificial charging station in Al-Bustan

Station location	Al-Bustan, Wadi Al-Natroun, El-Beheira governorate.
Purpose of station	• Maximizing the utilization of excess water at the ends of the open channels and charging it in the groundwater.

6-2 Artificial charging station in Abu Simbel

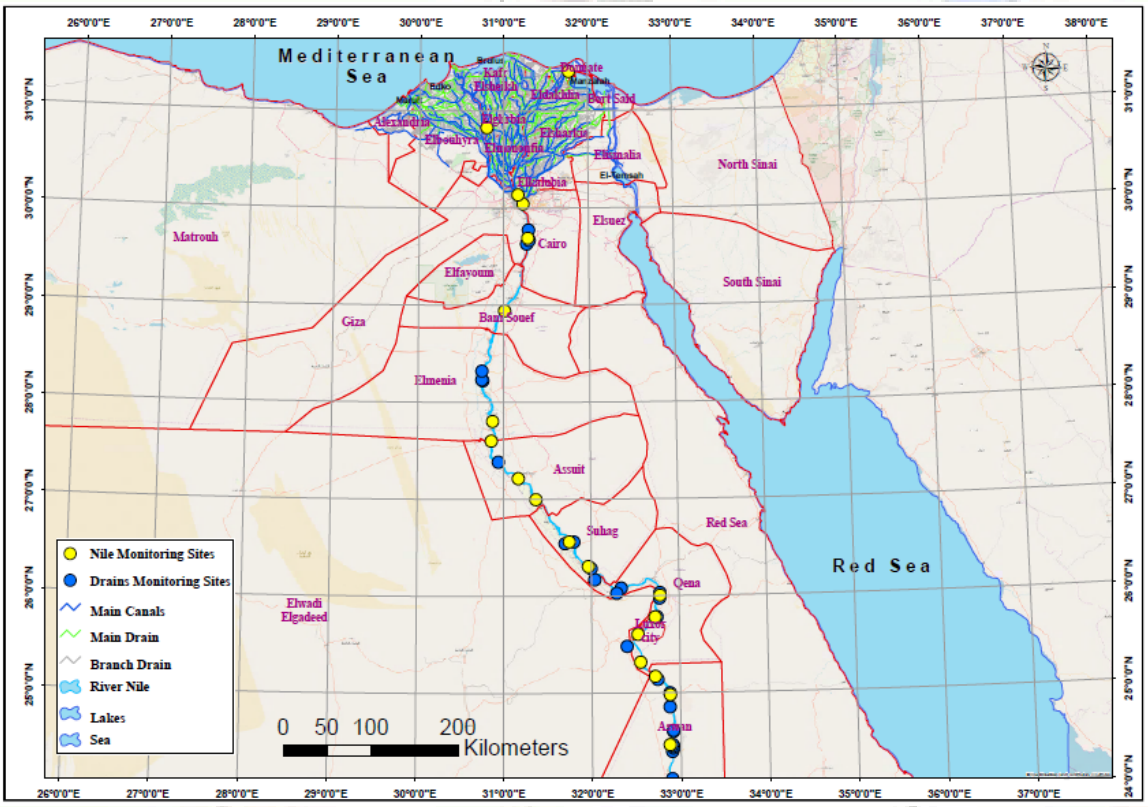
Station location	Abu Simbel, Aswan governorate.
Purpose of station	• Maximizing the utilization of the high water levels in Lake Nasser during flood period and charging it in the groundwater.

6-3 Artificial charging station in Borg El-Arab

Station location	Borg El-Arab, Alexandria governorate.
Purpose of station	• Maximizing the utilization of excess water at the ends of the open channels and charging it in the groundwater.

7- Nile Research Institute

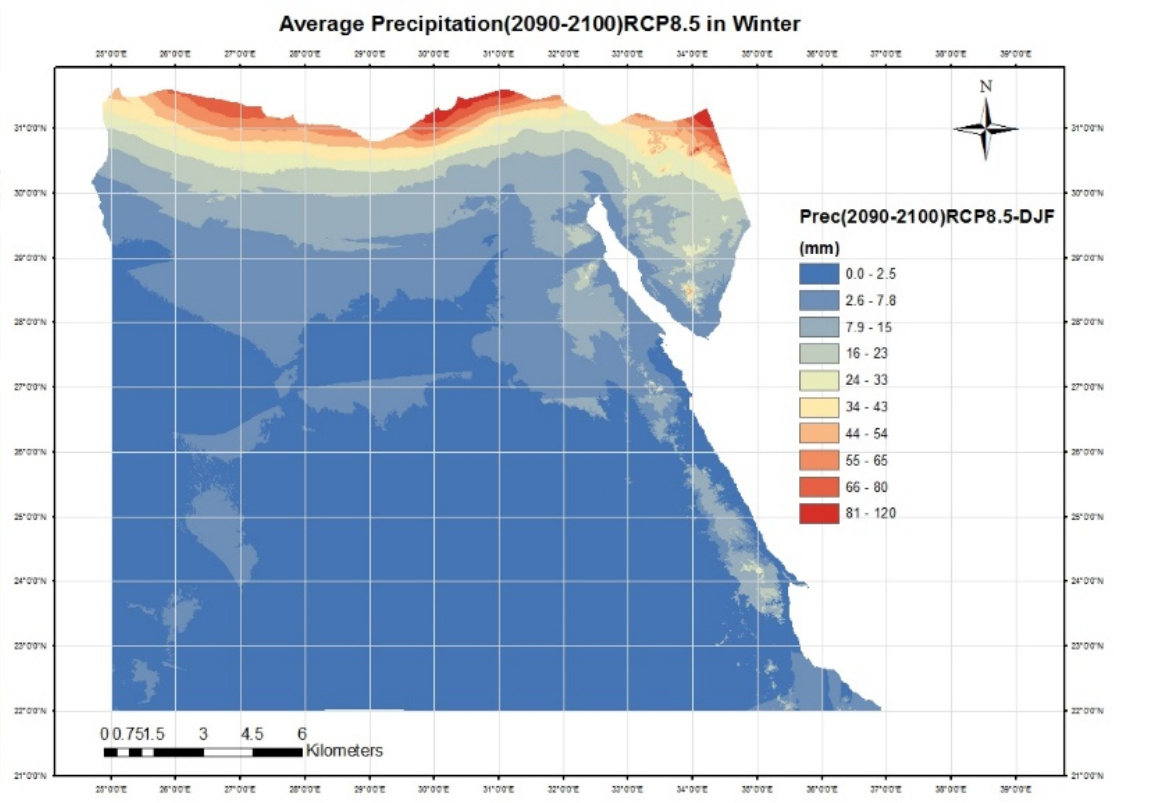
The institute monitors the water quality of the Nile river and branches at fixed monitoring locations as illustrated in the below geographical map. The number of sites on the Nile main stem and its two branches is 69, where water is sampled twice a year (winter and summer campaigns).



8- Environmental and Climate Change Research Institute

ECRI has a modern laboratory for real time weather monitoring and climate change assessment. The laboratory has a set of forecasting models, like Weather Research and Forecasting (WRF) Model in addition to other models, to predict and assess weather and catastrophic events, up to 15 days forecasting. In addition, different Regional Climate Models (RCMs), like RegCM4 and PRECIS, that simulate climate projection till 2100 in high accuracy.

The laboratory is equipped with high performance display and visualization tools; and has a modern climatic database from three main sources. These sources are: real time monitoring from meteorological stations around remote areas; telemetry system around Nile River and the main canals; and certified website data like WMO and CRU.



9- Strategic Research Unit

The unit has the most recent research lab in the NWRC. The main purpose of the lab is experimenting for the saline water desalination in the context of the environmental conservation.

9-1 Sea & Brackish Water Desalination Lab

Station location	Strategic Research Unit, El-Qanater El-Khairiah.
Purpose of station	Carrying out researches to estimate the operational requirements of a seawater desalination plant (labor, chemical additives, and energy requirements) in addition to low pressure pre-filtration units and high pressure water desalination units and link these to the required water quality.

10- National Water Research Center

The NWRC headquarter has one research station at northern side of Abu Simbel town by six kilometers with an area of 135 acres, of which about 120 acres of agricultural research station experimental farm to serve Toshka project in the South Valley.

10-1 Water Studies and Research Complex

Purpose of station

- Studying the framework of the agricultural development in Toshka.
- Providing technical solutions to problems raised during the development process.
- Conducting research activities for agricultural horizontal expansion.
- Proposing indicators for measuring performance progress of irrigation, drainage and ecology.
- Studying the growth and yield of crops grown under varies irrigation system and different soil moisture levels.
- Maximizing water use efficiency (WUE) for higher yields per unit of irrigation water applied.
- Measuring the evapotranspiration, water requirements and water use efficiency for crops grown under varies irrigation system on the newly reclaimed soils in Toshka.
- Finding the best empirical equations which can be used on the newly reclaimed soils in Toshka and estimate the crop factor Kc.
- Developing of available irrigation method to maximizing it is efficiency.