



**17th Meeting of COMSATS Coordinating Council,
19-20 May 2014, IRSOT; Tehran, Iran**



Water Researches and Technologies Center (CERTE) Technopark of Borj Cedria Tunisia

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General Director**



Content



Background

Overview of CERTE

Laboratories and Activities

Cooperation

Plan for the future



Background



- In order to promote and to improve National Economy, Technoparks programs were launched ;
- The objective of Technoparks program is to establish a solid relation between Scientific activities and Manufactories ;
- Borj Cedria Science and Technology Park is implemented under this program:
Its main research is :
 - ✓ **Water and Environment,**
 - ✓ **Vegetal Biotechnology,**
 - ✓ **Renowel Energy**
 - ✓ **Materials ;**



Overview of CERTE (1)



- **The Water Researches and Technologies Centre of Borj-Cedria (CERTE)** has been created on 16th of february 2005. It is specialized in Water and Environment field ;
- Missions :
 - Implementation of research-development sustainable projects ;
 - Participation in the development of scientific research and technology in water field ;
 - Contribution to students supervision and researches training ;
 - Valorization of the results in water field ;

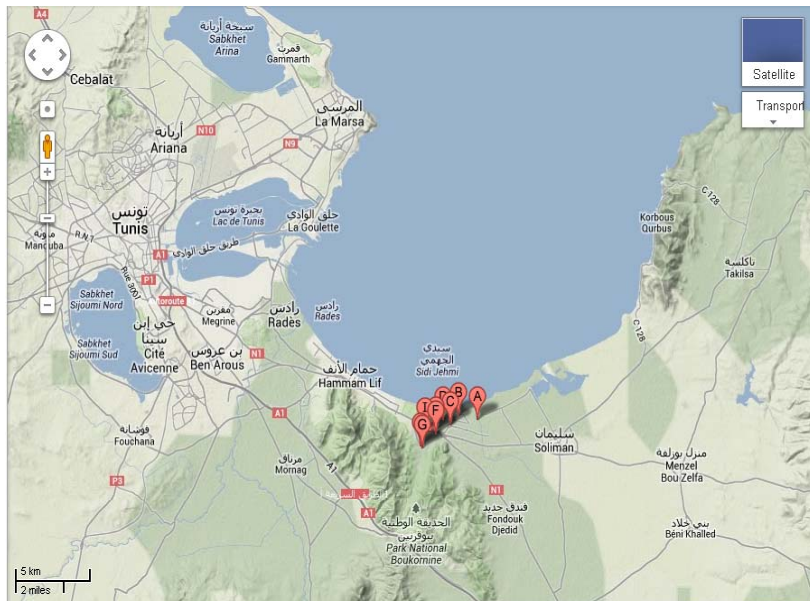


Overview of CERTE (2)



LOCATION

❑ CERTE is one component of the Borj Cedria technopark. It is located 25 km far from Tunis City.

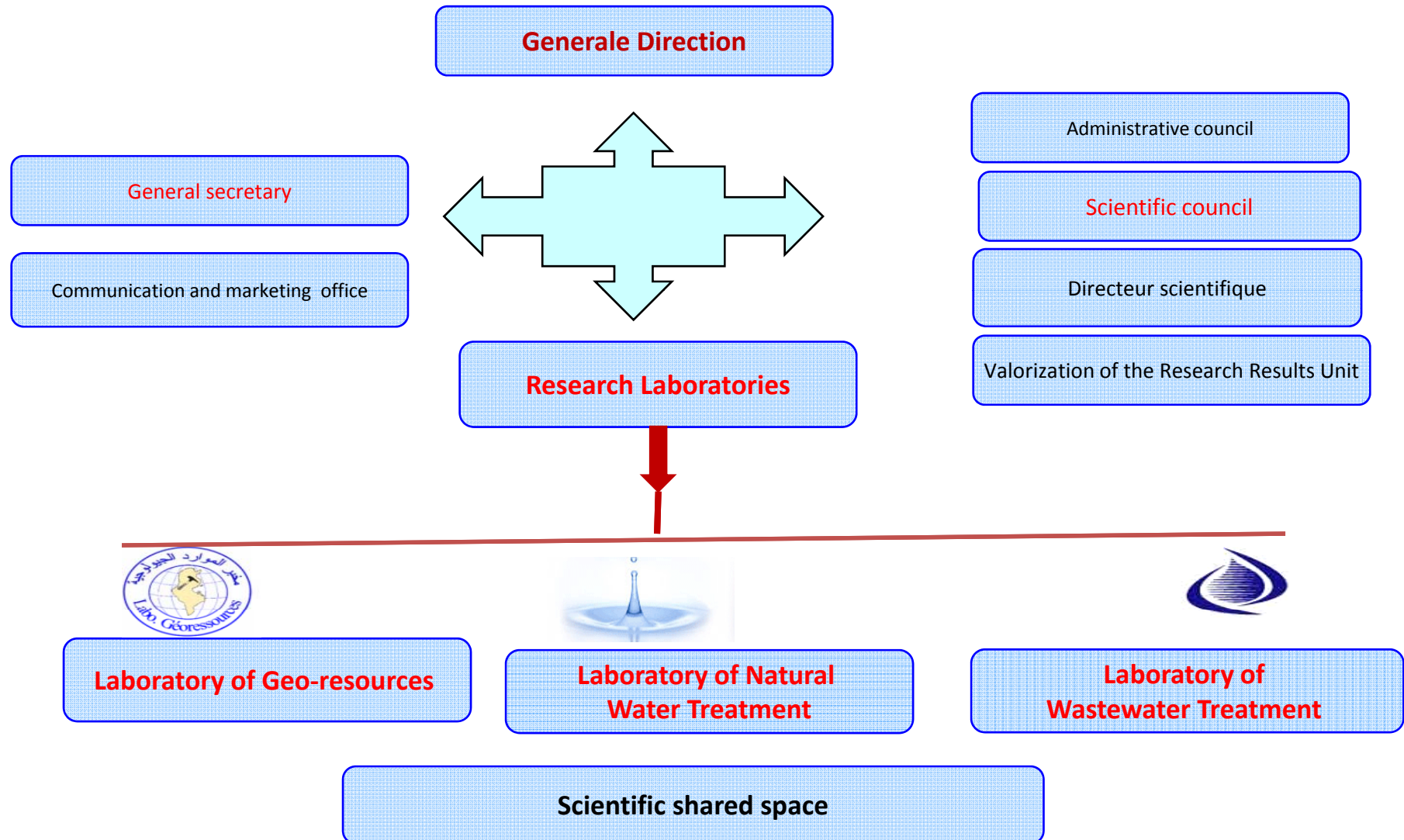




Overview of CERTE (3)



Structure of organization

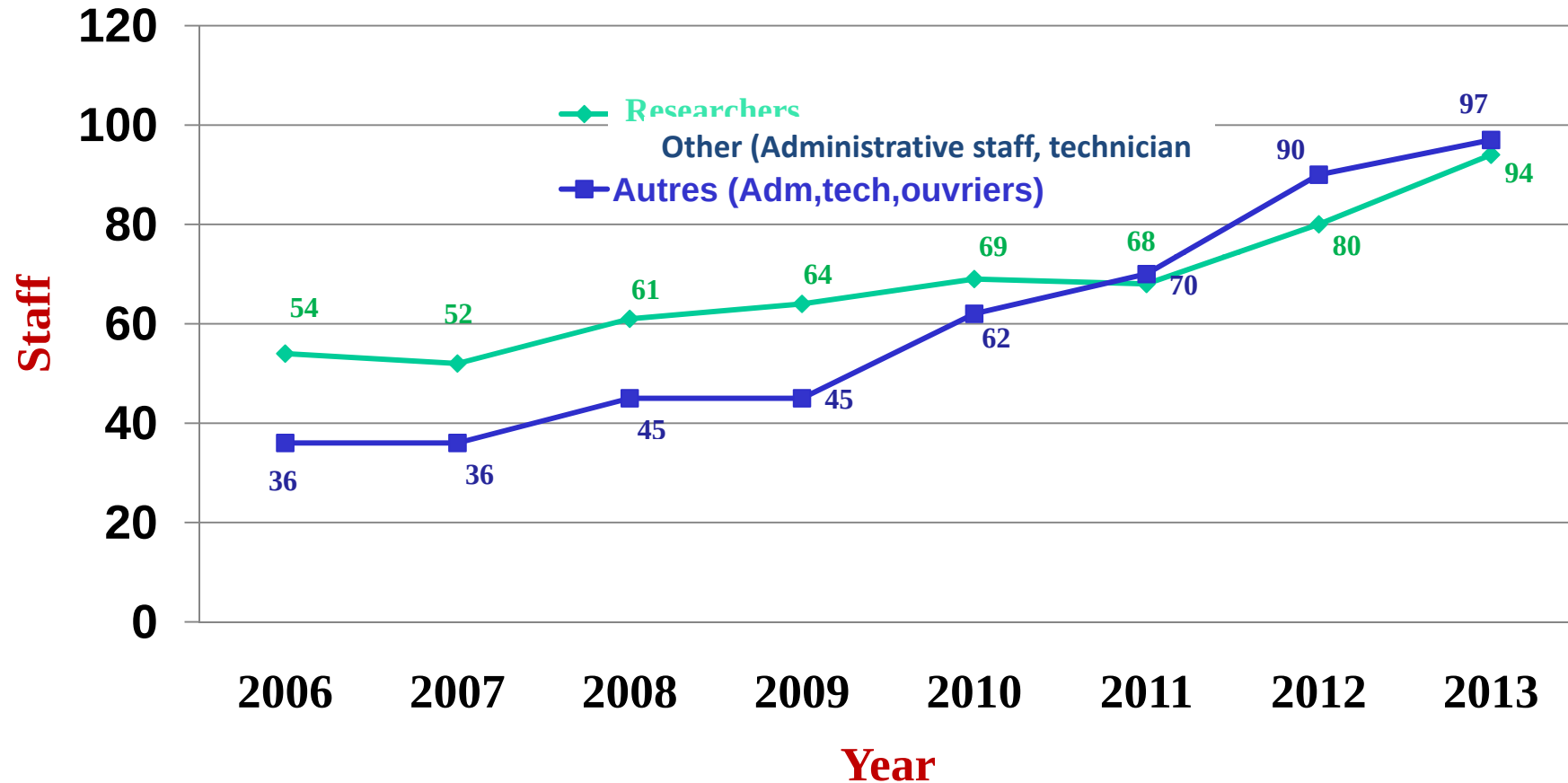




Overview of CERTE (4)



Staff Evolution 2006-2013





Laboratories and activities



CERTE

Geo-resources Laboratory

Natural Water Treatment Laboratory

Waste Water Treatment laboratory

Pilot Station for waste water treatments

- Geologic and geophysic Reservoir aquifers ;
- Study of artificial refilling of water tables hydrogeology, hydrology, geochemistry ;
- Water management of Basins-aquifers and Dams
- Geographic Information Systems and Decision making tools ;

- Water quality aspects ;
- Scaling of drinking and irrigation system and gaz pollution treatment ;
- Membrane process treatments of brackich and industrial waters
- Desalination process ;

- Wastewater Treatment is the treatment of liquid effluents and urban and industrial water ;
- Microbiological Analysis and treatment of waters ;
- Physic and Chemistry treatments and reuse of urban and industrial waters ;



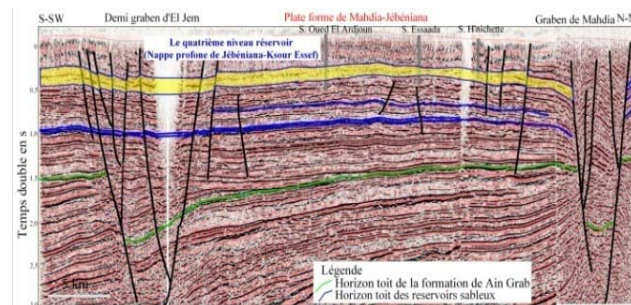
Laboratories and activities

Geo-resources Laboratory programs and researches



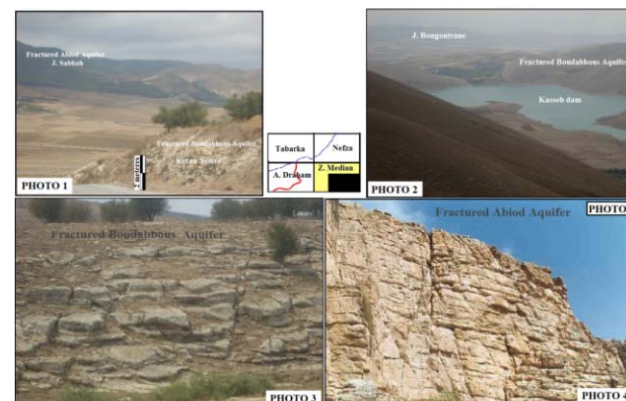
1 Underground water resources management.

2 Hydrogeologic and hydrochemical characterization of the deep aquifers



3 Water management of Basins-aquifers and Dams.

4 Geologic and geophysic Reservoir aquifers





Geo-resources Laboratory Equipment

- Atomic Adsorption,
- Gas Chromatography (GC)
- Liquid Chromatography (LC)
- Ion chromatography (IC)
- HPLC MS/MS
- HPLC ionic
- UV Visible
- Equipments for cartography and mapping: GIS,
- Equipments for monitoring of the aquifers and groundwater,



Natural Water Treatment Laboratory programs and researches

Characterization and removal of scaling problems and hardness of water.

1



2

Desalination of breach water and sea water by RO

Drinkable water

3



Gaz treatments H_2S and CO_2

4





Natural Water Treatment Laboratory Equipments

- Infrared spectroscopy
- Potentiostat/Galvanostat
- Atomic Adsorption
- Equipments for monitoring and analysis of natural water (physical-chemical)
- Equipment for field survey (GPS, ...)



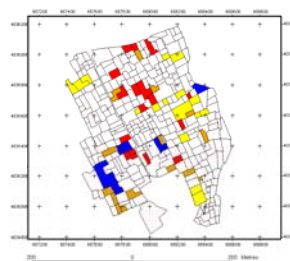
1



2



3



4





WasteWater Treatment Laboratory Equipments

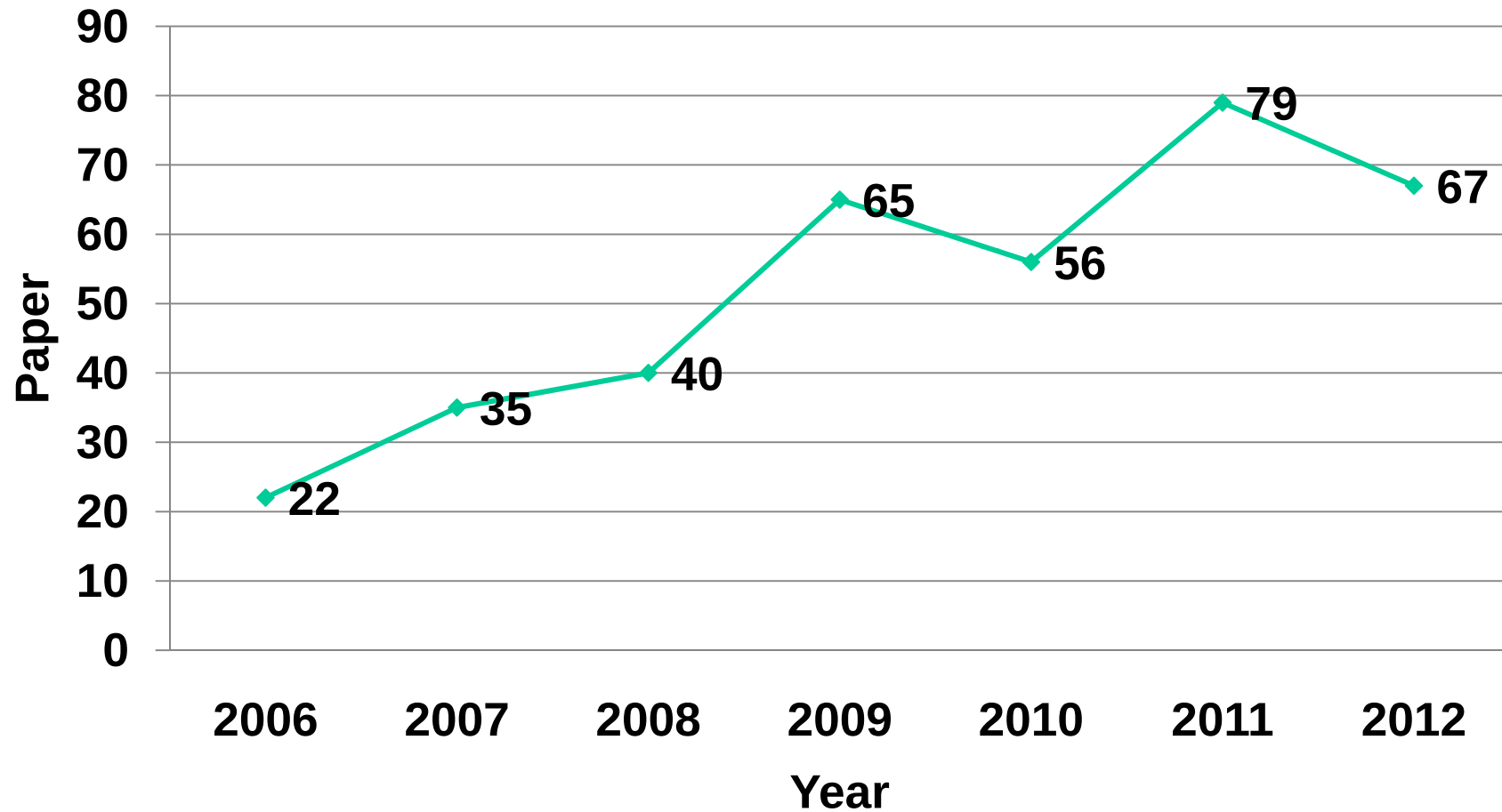
- **Equipments for monitoring and analysis of wastewater (physical-chemical (pH, COD, BOD, Nitrogen, Phosphate... and microbiological (Coliform, E. coli, Salmonella,...)**
- **Equipments for sampling of water and wastewater in the field**
- **GC-MS, UV-Visible, Atomic Absorption, HPLC, Ion chromatography (IC)**
- **Flame Photometer ;**
- **Chemical engineering Hall for experiments and lab-pilot plant,**
- **Gradient PCR.**



Laboratories and activities



Scientific papers evolution (2006-2012)



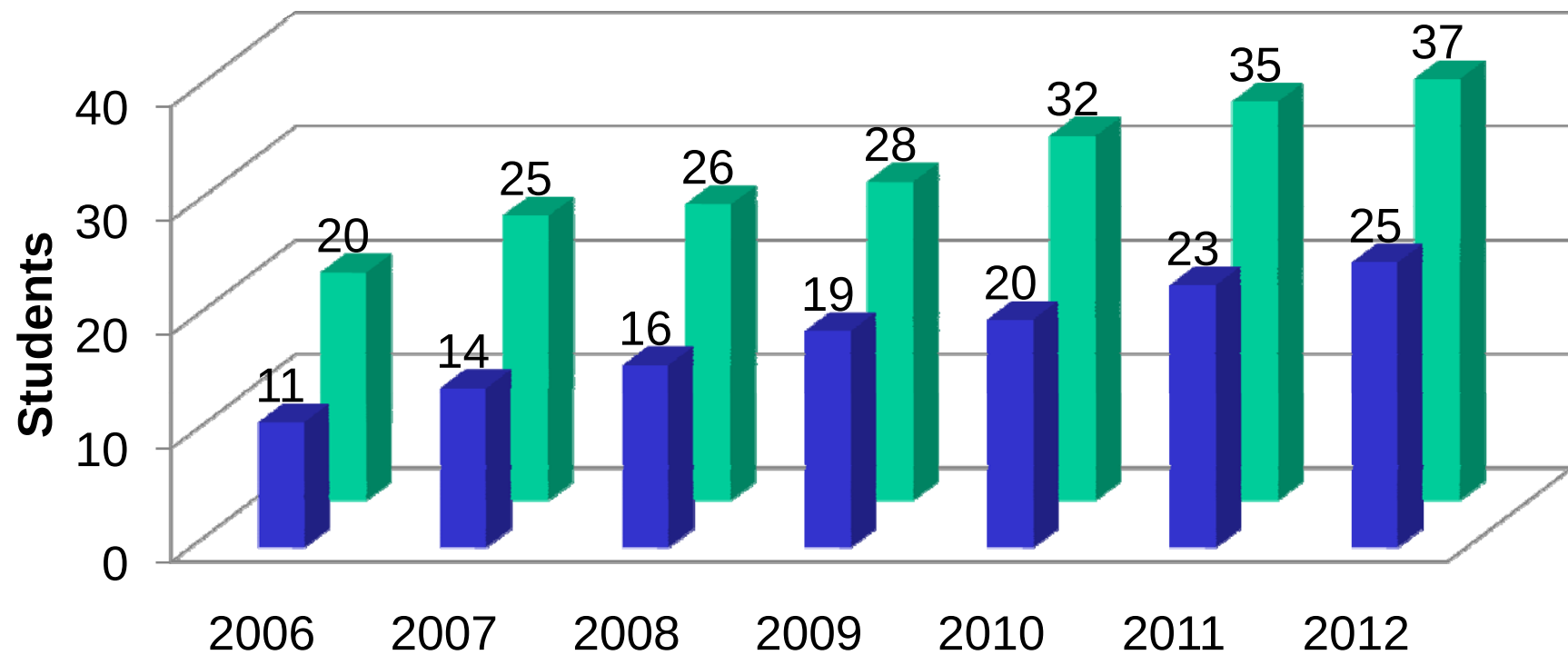


Laboratories and activities



Students supervision and graduation

■ PhD
■ Master





Laboratories and activities

Patents



	Patent Title	Registration
1	Désulfuration des effluents gazeux issus des stations de traitement de gaz ou d'épuration.	19898 du 21/01/2009
2	Procédé de lutte contre l'entartrage des eaux potables.	19963 du 20/05/2009
3	Method for detection of active non-cultivable bacteria using eyric bacteriophageand evaluation of bacteriological quality of treated water.	0228 du 04/06/2009
4	Utilisation d'une souche de Streptomyces pour la production d'enzymes hydrolytiques.	TN2011/0194
5	Développement d'un procédé eco-technologique pour la production des microorganismes et des molécules à partir des non consommables des boissons sucrées.	TN2011/0555
6	Développement d'un procédé écologique pour l'adsorption de dioxyde de carbone du sulfure d'hydrogène sur les fibres de Stipa tenicissima.	TN 2012/0346
7	Bio production des microorganismes cultivés sur du gel d'Aleo vera.	TN 2012/0602
8	Enhancement of tertiary water treatment system based on the remanent activity of phages.	TN 2012/0226
9	Use of phages to reduce and to prevent an eventual virulence factors expression by pathogenic bacteria in combination with a conventional water disinfection process.	TN 2012/0227
10	Développement d'un procédé Eco Technologique à base du gel d'Aleo vera pour la biofloculation des boues dans les stations d'épuration des eaux usées.	TN 2012/0339



Laboratories and activities



Agreement signed :

-11 National Research programs :

- **Geo-resources Lab : 3 programs**
- **Natural Water Treatment Lab : 4 programs**
- **Waste Water Treatment lab : 4 programs**

- 08 International Research programs :

- **3 projects financed by UE**
 - **SWMed (Sustainable Domestic Water Use in Mediterranean Regions)**
 - **ENPI_CBCMed**
 - **Climb (Climate Induced Changes on the Hydrology of Mediterranean Basins)**
- **2 Collaborative Research Agreement with Morocco**
- **1 Collaborative Research Agreement With ARENA University of Tsukuba, Japan**
- **1 Collaborative Research Agreement With Algeria**
- **1 Collaborative Research Agreement with Spain**
- **1 Collaborative Research Agreement with Egypt**

- 03 Previous International Cooperation with UE

- **CB-WRMED**
- **ZERO M**
- **ELMAA**





- **Other Activities**

- Organization and participation in scientific events ,
- Workshops and seminars training ;
- Memberships of Scientific Association and reviews ;





Laboratories and activities



Visit of COMSATS' delegation December 10th, 2013





Laboratories and activities



CERTE Opening Day February 25th, 2014





Collaboration (1)



National Collaboration

Universities and Research center

STBJ
INRGREF
INAT
ENIT
ESAM
INSAT
FS (sfax)
ESIER (Madjez El Bab)
ENIG(Gabes)
FS(Tunis)
ISSTE(Gabes)
FLSH
FSB
ESSTE (Borj Cedria)
ANPR

National Companies

The National Society for Water
Exploitation and Distribution (SONEDE)
The National Office of Thermalism (ONT)
The Tunisian Company of Petroleum
Activities (ETAP)
National Office of Mines (ONM)
Gafsa Phosphates Company (CPG)
National Office of Sanitation (ONAS)
Regional Office of Ministry of Agriculture
(CRDA)
General Directorate of Water Resources
(DGRE)
National Agency for the Protection of
Environment (ANPE)
The National Agency for Waste
Management (ANGED)



International collaboration

The main collaboration are :

- Japan: University of Tsukuba.
- European Union: France, Italy, Spain, Belgium, Greece, Austria, Portugal, Germany, UK, Turkey, Malte.
- Mediterranean and African countries : Morocco, Algeria, Egypt, Niger, Jordan,...





Plan for the future



CERTE should to be as a hub, radiating collective knowledge and regional economic development opportunities. Therefore, it is planning to :

- Improve and to develop laboratories activities
- Arrange equipped Conference rooms to host international and national events organized by CERTE and its partners;
- Construct Guest houses for CERTE guests (researchers, PhD students);
- Increase the National, Regional and International networking and the visibility ;
- **CERTE** can be a focal point of COMSATS in Arabic and African Countries.

A photograph of a black pipe discharging a large volume of water into a pool. The water is captured mid-air, creating a dynamic splash. The pool's surface is dark and reflects the surrounding greenery. In the background, a dense line of trees is visible under a clear sky. Overlaid on the center of the image is the text "Thank you for your attention" in a large, multi-colored font with a white outline. The colors of the letters follow a rainbow gradient: 'T' is purple, 'h' is red, 'a' is orange, 'n' is yellow, 'k' is green, 'y' is blue, 'o' is purple, 'u' is red, 'f' is orange, 'o' is yellow, 'r' is green, 'y' is blue, 'o' is purple, 'u' is red, 'r' is orange, 'a' is yellow, 't' is green, 't' is blue, 'e' is purple, 'n' is red, 't' is orange, 'i' is yellow, 'o' is green, 'n' is blue.

Thank you for your attention