

The background image shows a vast, flat, light-colored landscape, likely a geothermal field. In the center, there is a large, shallow pool of water. Several smaller pools and steam vents are visible in the distance, with wisps of white steam rising from the ground. The sky is a pale blue with a few scattered white clouds. The overall scene is desolate and natural.

**THE 70° GENERAL ASSEMBLY AND INTERNATIONAL SCIENTIFIC CONGRESS
OF
THE WORLD FEDERATION OF HYDROTHERAPY AND CLIMATOTHERAPY
(FEMTEC)**

"Status, proposals and strategies for health care and local development"

Ischia Porto (Naples - Italy) 15 – 20 october 2017



"La veille technologique au service du développement territorial"

Technology watch for territorial development

Presented by : OUESLATI Rzig (General Manager of ONTH - Tunisia)



" La veille technologique est l'observation et l'analyse de l'environnement scientifique, technique et technologique pour en déduire les menaces et les opportunités de développement "

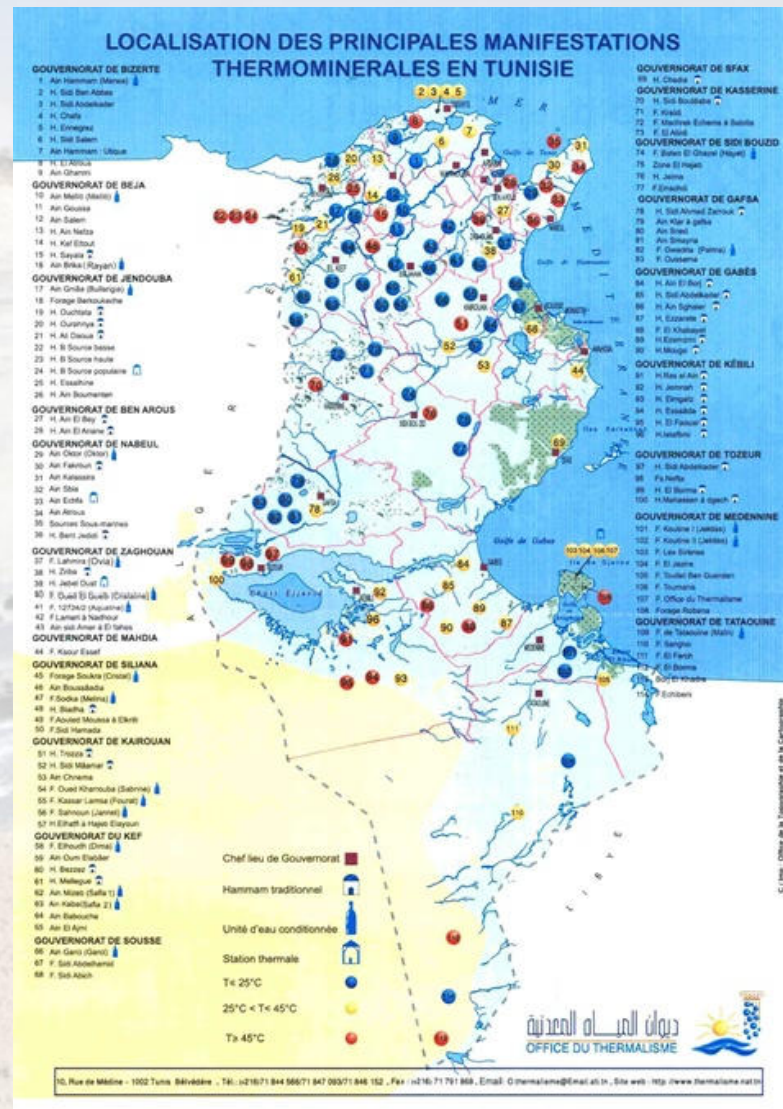
- Jakobiak, 1992 -

**The technology watch
is
the observation and the analysis
of
scientific, technical and technological environment
to deduce
threats and opportunities
for
Development**

- Jakobiak, 1992 -

Given its geographical situation, the generosity and hospitality of its people, which have long been recognized, Tunisia is a rotating platform open to all countries of the world





Tunisia has an important potential in thermomineral waters and has a very advantageous disposition of a coast that allow it to diversify its curative and tourist products.

After the latest census, there are about 114 thermominerals manifestations (natural spring and well) distributed throughout the territory. This number increases as new recognition and discovery progresses.

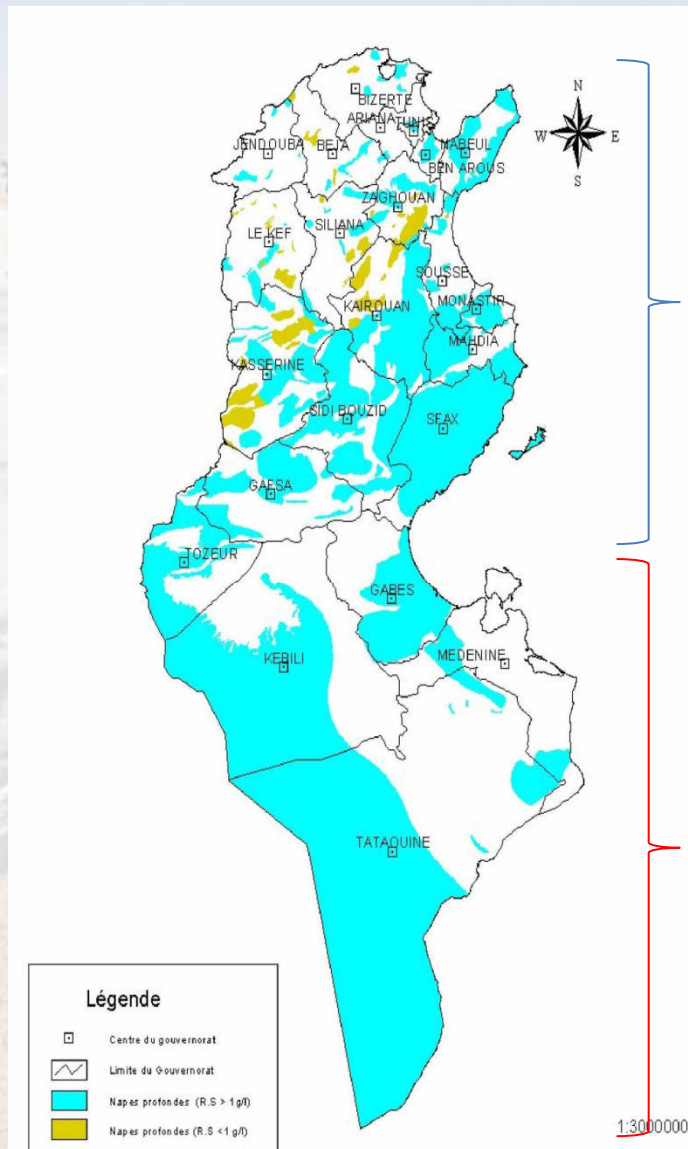
HYDROTHERMAL POTENTIAL IN TUNISIA

Annual available ground-water storage = **262 million m³**

Annual Outflow in thermalism = 150 l/s

Annual Outflow in agriculture = 20 000 l/s

ONLY 10 % of available ground-water storage
is exploited for **Thermalism**



Map of deep water-table in Tunisia

Northern Tunisia

- Available potential (thermal water): 355 l/s
- **Exploited potential** (thermalism): **25 %**
- Chemical facies: sodic chloride water
- Dry residue: from 0.8 to 55 g/l
- Temperature: from 30 to 73°C
- pH: from 6.10 to 7.60

Southern Tunisia

- Available potential (thermal water): 200 m³/s
- **Exploited potential** (agriculture/thermalism): **10 %**
- Chemical facies: calcic sulphated / sodic chloride water
- Dry residue: from 2.2 to 8 g/l
- Temperature: from 28 to 83°C
- pH: from 6 to 7.5

OFFICE ATTRIBUTIONS

The National Office of Thermalism and Hydrotherapy is responsible for proposing development programs in the bottled water and hydrotherapy sector (thermalism + spa + thalassotherapy) by suggesting the necessary measures to revitalize regions rich in natural resources.

Due to the wealth of Tunisia's natural potential and the effects' reinforcement of the regional economy, the hydrothermalism knows unmatched development.

OFFICE ATTRIBUTIONS

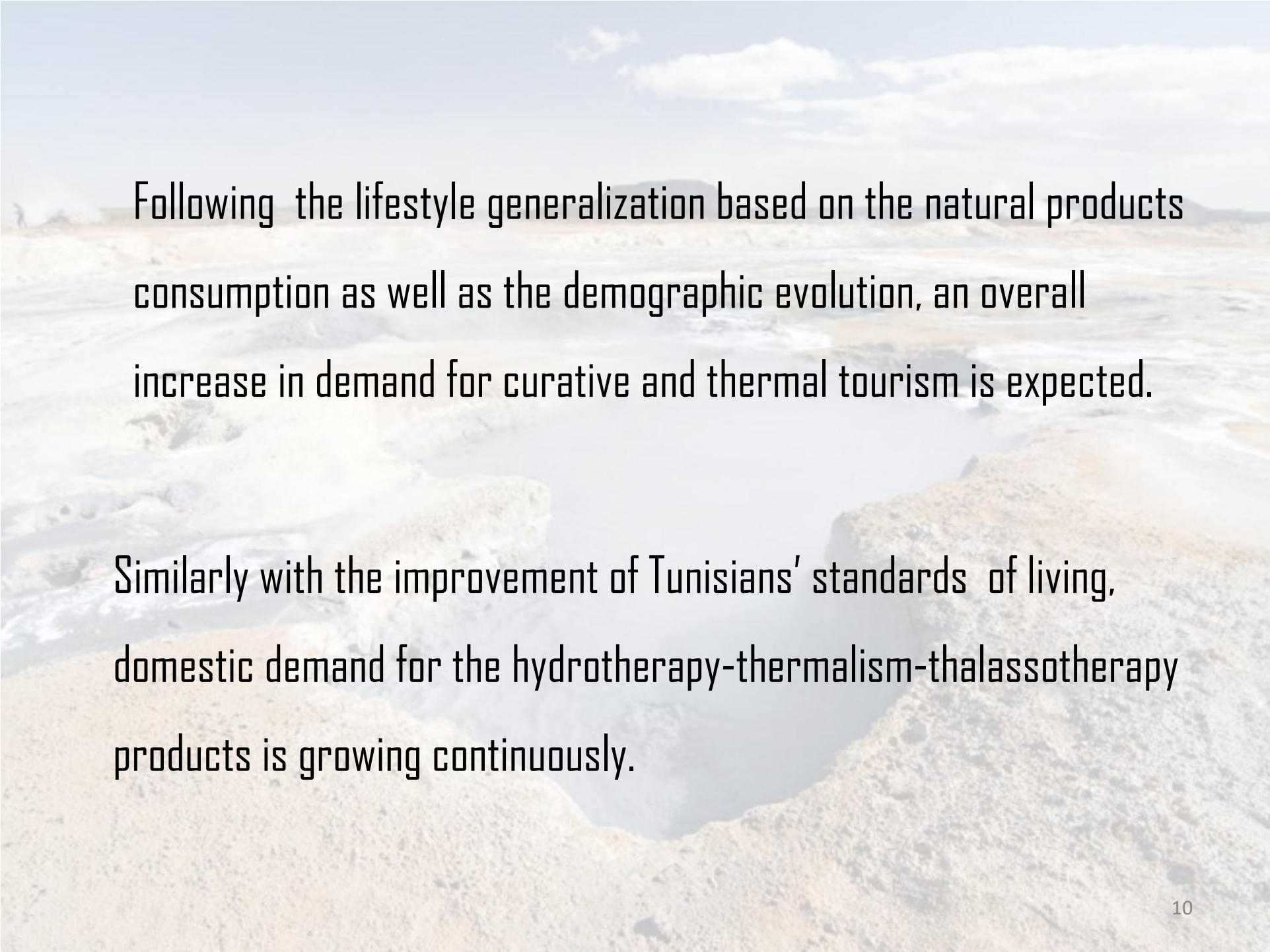


Studies and framing

**Promotion and
development of sector**

**Encouragement
of investment**

**Quality control of the Thermo-mineral
and Hydrotherapy products**



Following the lifestyle generalization based on the natural products consumption as well as the demographic evolution, an overall increase in demand for curative and thermal tourism is expected.

Similarly with the improvement of Tunisians' standards of living, domestic demand for the hydrotherapy-thermalism-thalassotherapy products is growing continuously.



As a result, international trends in demand for curative and thermal tourism are based on:

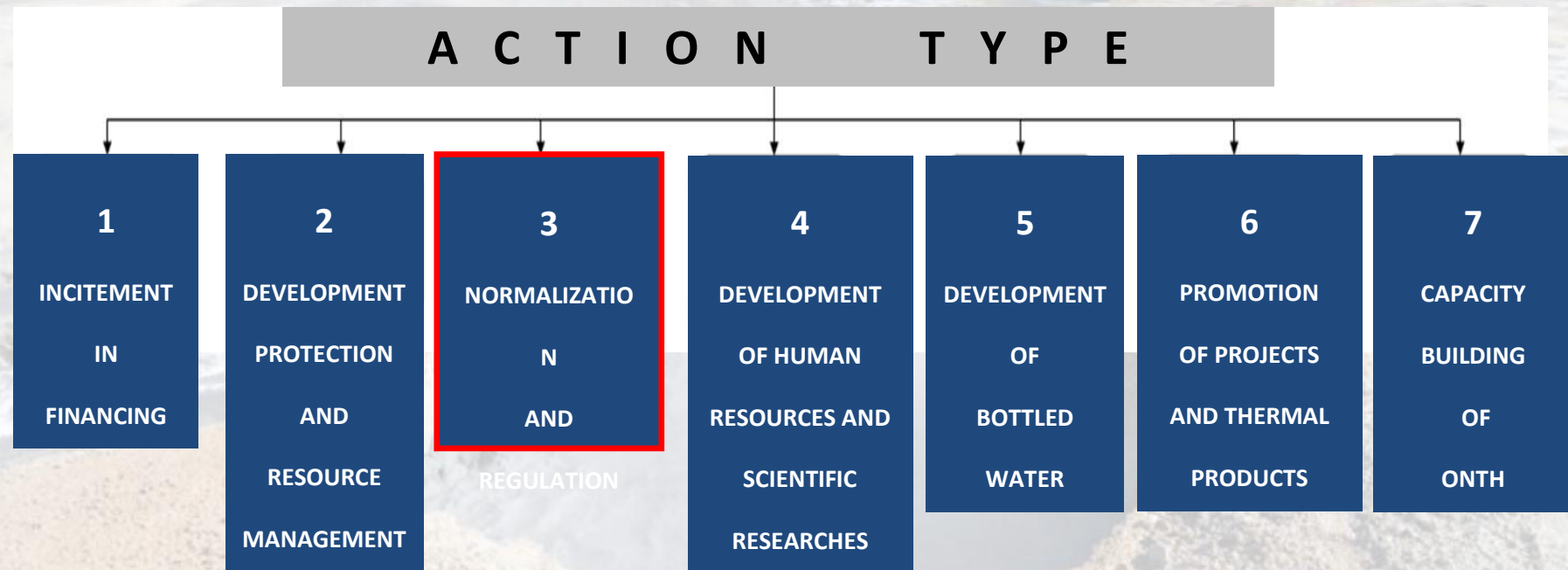


QUALITY criteria that are increasingly emphasized.



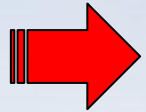
INNOVATION & DIVERSIFICATION of products that will be more appreciated.

To achieve the development goals of curative and thermal tourism, ONTH propose a plant of actions for **territory development** by following seven strategic axis for intervention:



Today, we will look at the third action about **normalization** and **regulation**, thus involving the work of **TECHNOLOGY WATCH**;
whose main challenges are :



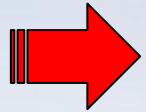


ANTICIPATION

By field works

- Verify and validate SANITARY ZONE OF WELL PROTECTION before the project starting.

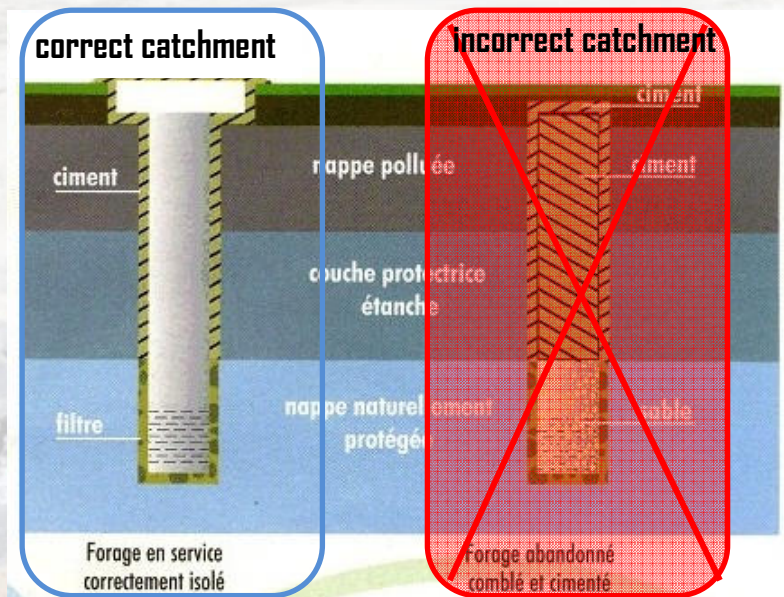




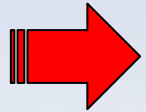
ANTICIPATION

By field works

- AN ELECTRICAL INVESTIGATION OF THE BOREHOLE is required



→ In order to have a correct catchment



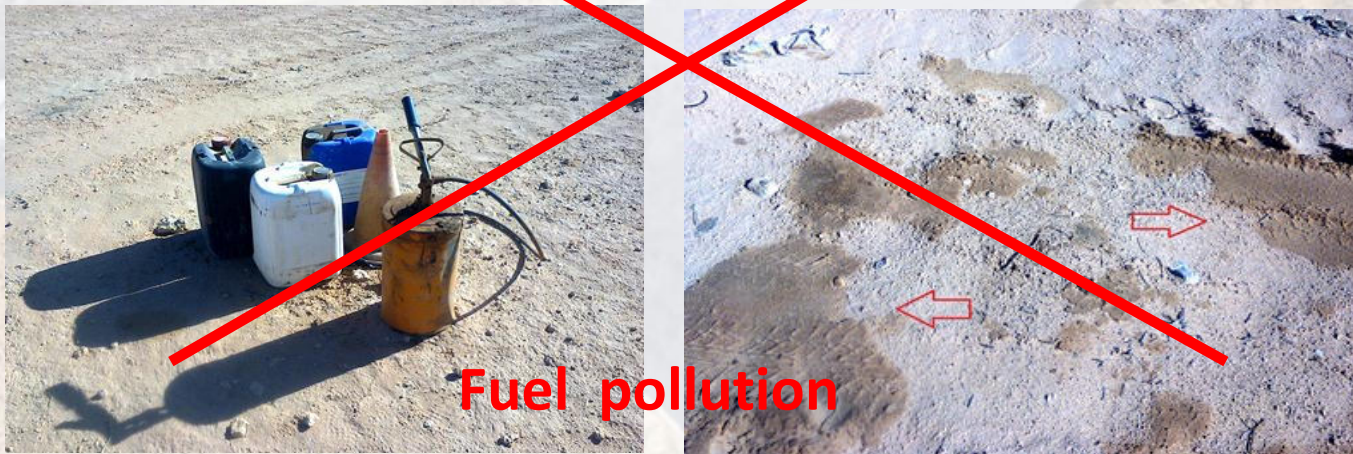
ANTICIPATION

By field works

- In the sanitary zone, don't allow any activities that could be a factor of pollution to the natural resources.

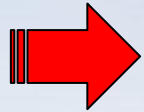


Quarry



Fuel pollution

- Don't allow the waste-water to be thrown into the environment of the bottling unit.



ANTICIPATION

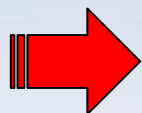
By office studies

- Master plan
for land reserves.

RÉPUBLIQUE TUNISIENNE
MINISTÈRE DE LA SANTÉ PUBLIQUE
OFFICE DU THERMALISME ET HYDROTHERAPIE

ELABORATION OF MASTER PLAN FOR LAND RESERVES
NECESSARY FOR THE DEVELOPMENT
OF THERMALISM PROJECTS





ANTICIPATION

By office studies

- Urban development plans
for the thermal zones

Republique tunisienne

Ministère du Commerce, du Tourisme et de l'Artisanat

Compagnie de Développement du Grand Korbous

ÉTUDE D'ACTUALISATION ET DE MISE EN CONFORMITÉ DES ÉTUDES D'AMÉNAGEMENT DU GRAND KORBOUS



PHASE II – Version Définitive

VOLUME I – Décembre 2005



COMETE Engineering

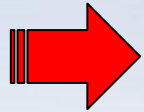
Tel : 71 70 78 00 – 70 79 00/ Fax : 71 70 72 00

e-mail : dg@comete.com.tn

Immeuble COMETE, Avenue Hedi Karay

1082 – Tunis Mahrajene

Web: www.comete.com.tn



ANTICIPATION

By office studies

- Strategic study in different sector :
spa, thalassotherapy and thermalism,

OFFICE NATIONAL DU THERMALISME
ET D'HYDROTHERAPIE

OFFICE NATIONAL DU THERMALISME
ET D'HYDROTHERAPIE

Etude portant sur le
fonctionnement et
les perspectives de
développement du
secteur des soins par
l'eau douce Spa en
Tunisie

Rapport de la Phase 2 : Réflexions sur l'amélioration des
performances des centres SPA - Version minute

25 Avril 2016

Réalisé Par :

FICOM
Fédération Interprofessionnelle des Centres d'Hydrothérapie et de Thermalisme

Office National du Thermalisme et de l'Hydrothérapie

Phase 3 : Programme d'actions de mise à niveau du
secteur de la thalassothérapie en Tunisie :
« Synthèse du rapport »

Samet Pour le Consulting et le Développement

Adresse : 22, Rue Emir Abdelkader - 1082 Bab el Bhar - Tunis - Tunisie
Tel : +216 71 287 627 / 99 212 652 Fax : +216 71 286 922 - E-mail : samet@samet.com

REPUBLIQUE TUNISIENNE
MINISTRE DU TOURISME
OFFICE DU THERMALISME

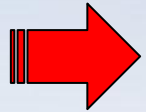
ETUDE STRATEGIQUE DU SECTEUR
DU THERMALISME EN TUNISIE
A L'HORIZON 2016

RAPPORT PHASE 3
VERSION PREDEFINITIVE

Décembre 2005

IDEACONSULT
MAROCCO STUDY

ECO-RESSOURCES

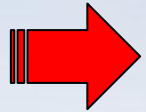


IMPROVEMENT

- The flow



By Drilling works

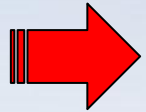


IMPROVEMENT

- The flow



By catchment works of thermal water

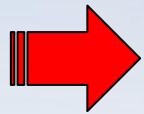


IMPROVEMENT

- The flow



By storage of thermal water

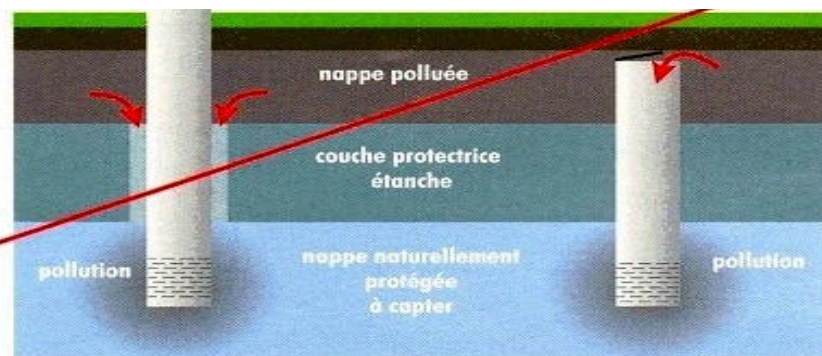


IMPROVEMENT

- The quality:

Mixing of table waters

→ Avoid this kind of technical failure



Forage en service
pas ou mal cimenté

Forage abandonné
sans précautions

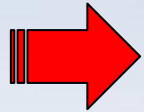


Forage en service
perforé

Forage perforé et
abandonné sans précautions

Strainer welding oxidation





CREATIVITY

→ ORIGINAL STUDIES AND WORKS:

REPUBLIQUE TUNISIENNE

MINISTÈRE DE LA SANTÉ

OFFICE NATIONAL du THERMALISME
et de l'HYDROTHERAPIE



10, rue de Méline 1002 Tunis

APPEL D'OFFRES N° / 2017 :

20*02

Pour la réalisation:

Etude d'ingénierie géologique nécessaire au tracé et aux travaux
d'une galerie accédant à la fissure soufflant les vapeurs thermales
du Hammam Trozza

- Gouvernorat de Kairouan"

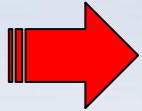


VOLUME I



Grotto blowing thermal vapor

Geological Engineering Study for gallery work accessing
to the crack blowing a thermal steam at Jebel Trozza



CREATIVITY

REPUBLIQUE TUNISIENNE

MINISTÈRE DE LA SANTÉ

OFFICE NATIONAL du THERMALISME
et de l'HYDROTHERAPIE



10, rue de Médine 1002 Tunis

APPEL D'OFFRES N° / 2017 :

30*02

Pour la réalisation:

Des études de conception des ouvrages de captage et de stockage
des eaux thermales au niveau de la Baie de Kalassira à Korbous

(Ain Kalassira et Sources sous-marines)

-Gouvernorat de Nabeul-



VOLUME I



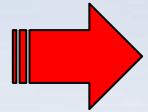
Underwater thermal springs

Study of the collection and storage of underwater thermal springs

— ANNEXES

DIRECTION DES ETUDES ET DES PROGRAMMES

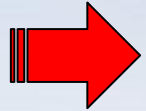
Mars 2017



MANAGEMENT of resources

By building construction for collecting and storage of thermal springs.





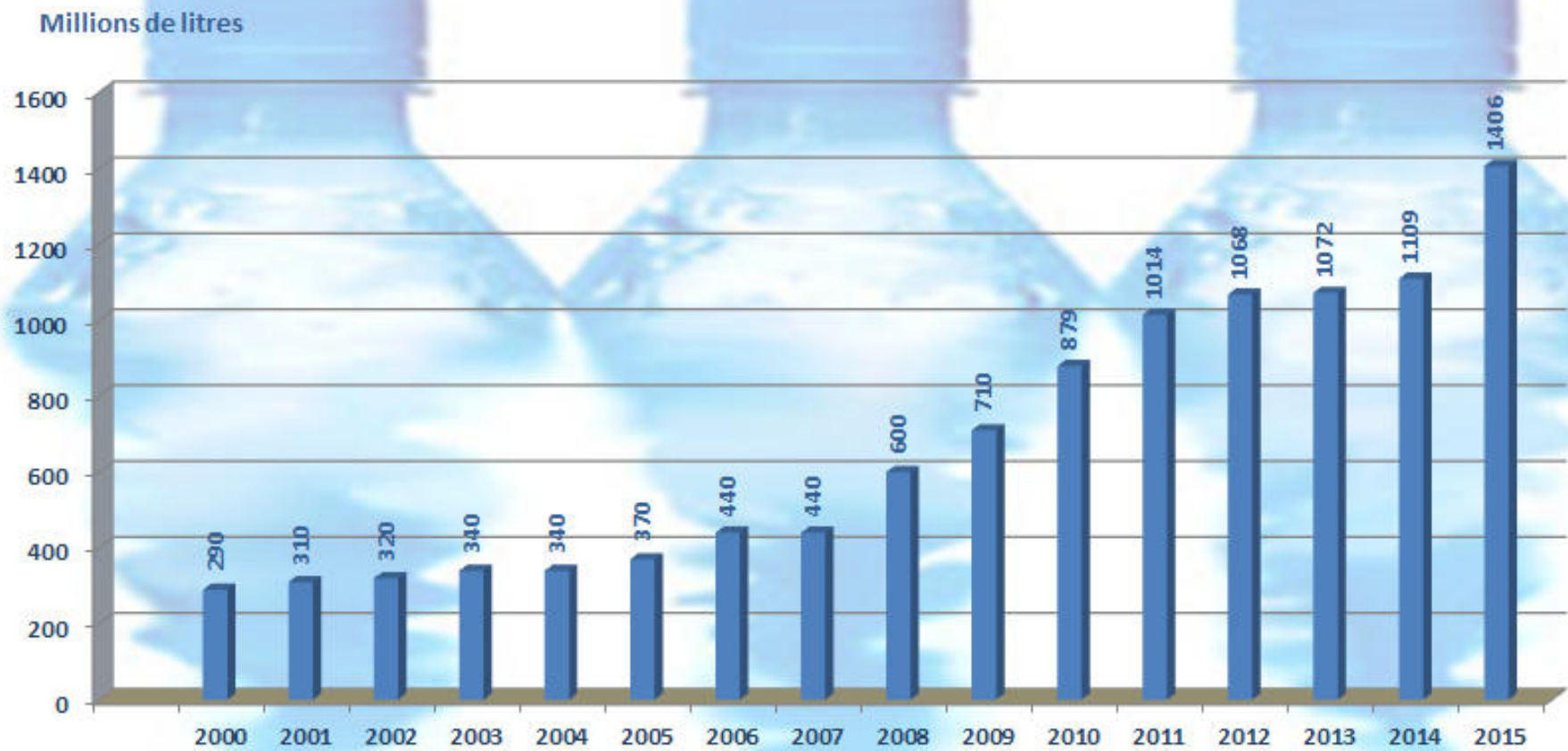
MANAGEMENT of resources

→ rationalize the exploitation flow by the study of the real needs in thermal water for centers and hammams.

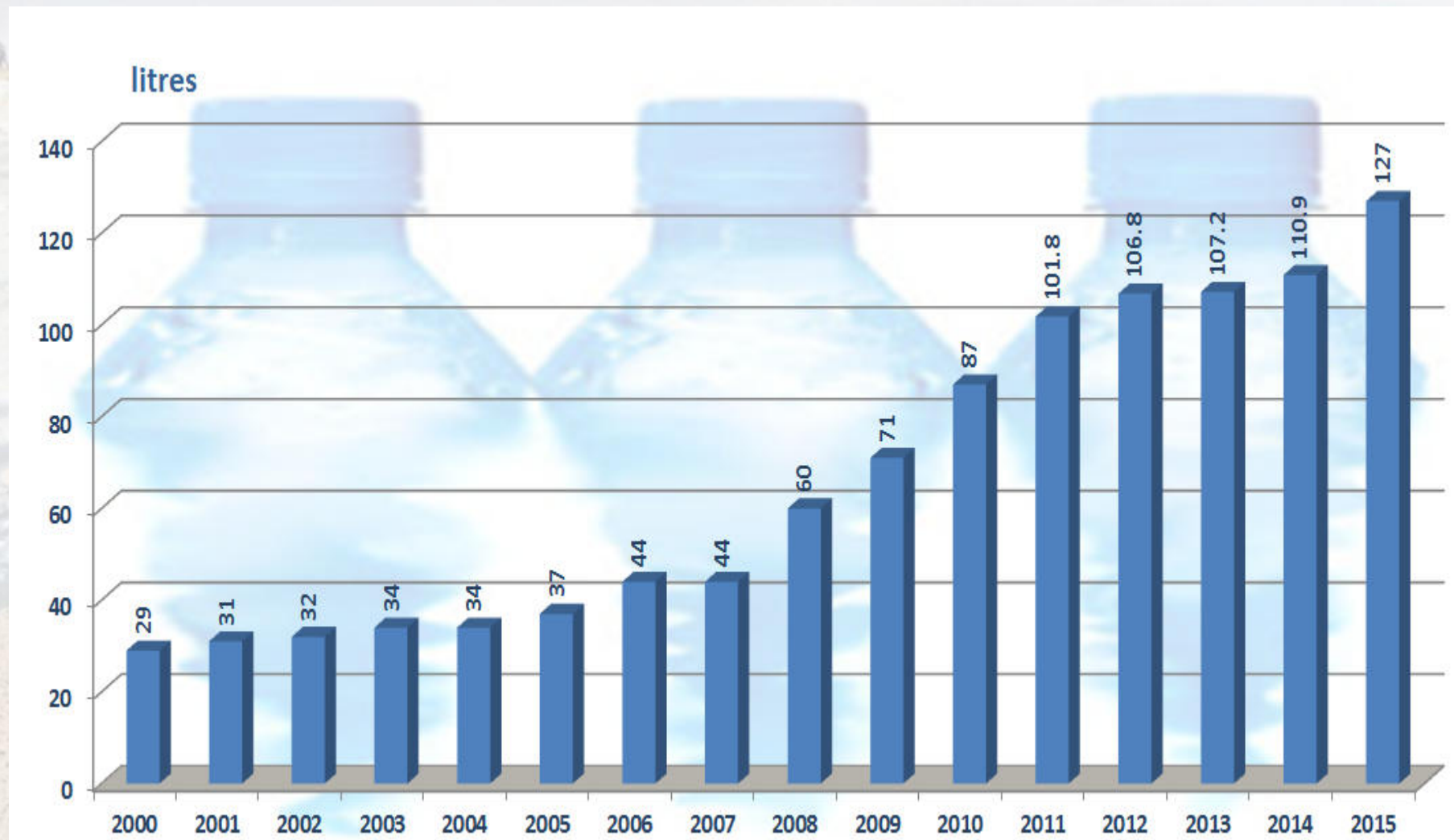
→ avoid the excessive water exploitation by the study of the drilling catchment program.

DEVELOPMENT RESULTS
OF
BOTTLED WATER

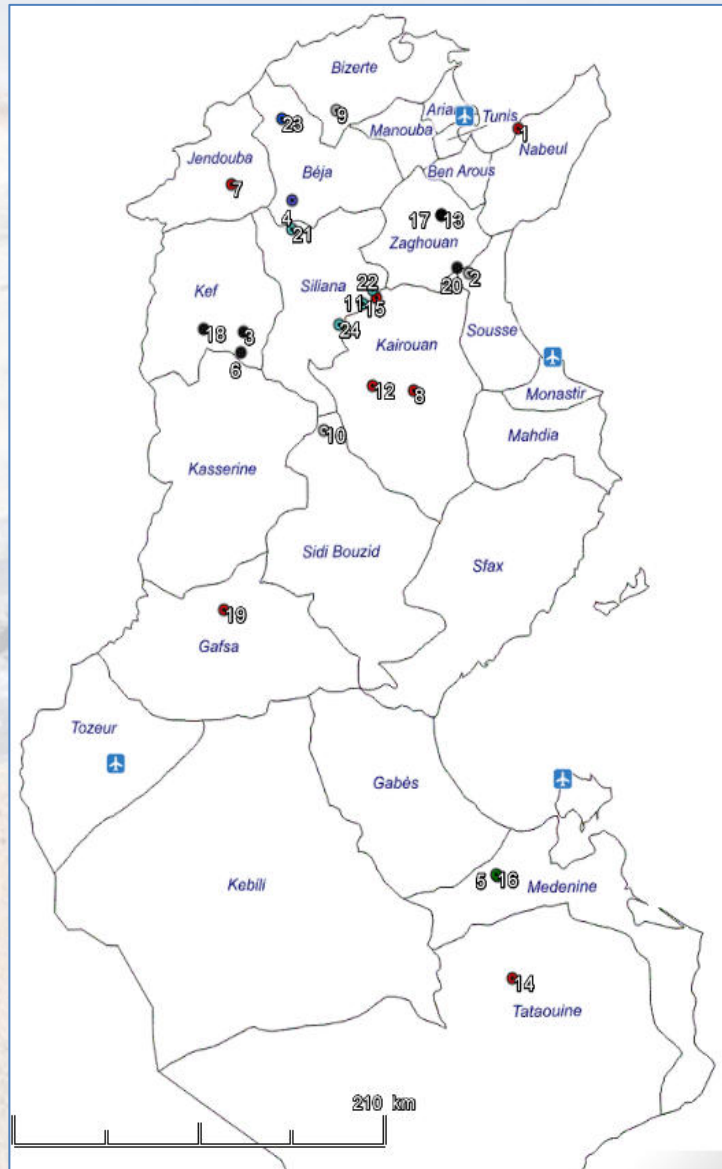
Evolution of the annual sales of bottled waters in million liters (2000-2015)



Evolution of individual consumption of bottled water in liters (2000-2015)



Geographical distribution of bottled units



1963	1968	1977	1989	1990			
1994	1996	2001	2002	2004	2007		
.....2009	2009	2014	2015	2015	2016		

**DEVELOPMENT RESULTS
OF
THERMALISM**

HAMMAM TYPE



HAMMAM TYPE 550 m² (coût 800 000 dinars)



HAMMAM TYPE 300 m² (coût 215 000 dinars)



Costs of investment in thermalism (hammam and center)

Projets	Nbr	Investing cost overall	Job created number
Registered thermalism investment : ✓ Thermal Towns ✓ Thermal Centers ✓ Thermal Hammams	25	1 060 millions DT ~ 365 000 000 Euro	5 400 (directs and indirects)
1. investment project	6	26 millions DT (9 000 000 Euro)	275 (directs)
2. Investment projects in progress	7	90 millions DT (31 000 000 Euro)	517 (directs)
3. investment projects in the study phase	12	940 millions DT (323 000 000 Euro)	4500 (directs)

Complexe écologique et thermal à Beni Mtir Gouvernorat de Jendouba (NW tunisien)



- ✓ **Projet** : Construction d'un complexe touristique à H.Essalhine
- ✓ **Promoteur** : Faiez ROUISSI
- ✓ **Superficie** : 2,4 hectares
- ✓ **Composantes du projet** :
 - Une station thermale,
 - Une station de remise en forme,
 - Des résidences pour hébergement collectifs,
 - Des résidences pour hébergement individuels,
 - Des bungalows,
 - Un centre sportif, un centre culturel, des espaces verts,
 - Des aires de parking, des aires de promenade et de repos.
- ✓ **Coût du projet** : 6 millions dinars
- ✓ **Réalisation du projet** :
 - 1^{ère} tranche : 9 Chalets, salle polyvalente, locaux communs
Coût : 3 millions dinars
 - 2^{ème} tranche : Station Thermale, 9 chalets
Coût : 3 millions dinars

Projet d'investissement d'une ville thermale el Khbayet Gouvernorat de Gabès (sud tunisien)



✓Projet : Construction d'une ville thermale à El Khbayet

✓Promoteur : Société Marina

✓Superficie : 240 hectares

✓Composantes du projet :

- Une station thermale,
- Hôtels et casino,
- Résidences pour hébergements individuels et collectifs,
- Un terrain de golf, un centre sportif, un centre culturel, des espaces verts,
- Des aires de parking, des aires de promenade et de repos.

✓Coût du projet : 600 millions dinars



Projet d'investissement d'un village touristique et thermal à Bent Jididi Gouvernorat de Nabeul (NE tunisien)



- ✓ **Projet** : Construction d'un centre thermal à Hammam Bent JDIDI
- ✓ **Promoteur** : Zied JDIDI
- ✓ **Superficie** : 50 hectares
- ✓ **Composantes du projet** :
 - Une station thermale,
 - Un hôtel 4 étoiles,
 - Des résidences pour hébergement collectifs,
 - Des *résidences* pour hébergement individuels,
 - Des bungalows,
 - Un centre commercial,
 - Un centre sportif.
- ✓ **Coût du projet** : 60 millions dinars
- ✓ **Superficie couverte** : 8937 m²



Projet d'investissement d'une station thermale à Hammam Mellègue Gouvernorat du Kef (NW tunisien)



- ✓ **Projet** : Construction d'une station thermale à Hammam Mellègue
- ✓ **Promoteur** : Belgacem ATAFI
- ✓ **Superficie** : 5 hectares
- ✓ **Composantes du projet** :
 - Une station thermale,
 - Un hammam thermal,
 - Un centre de rééducation fonctionnel,
 - Des résidences pour hébergement collectifs,
 - Des résidences pour hébergement individuels,
 - Des aires de parking, des aires de promenade et de repos.
- ✓ **Coût du projet** : 4.7 millions dinars

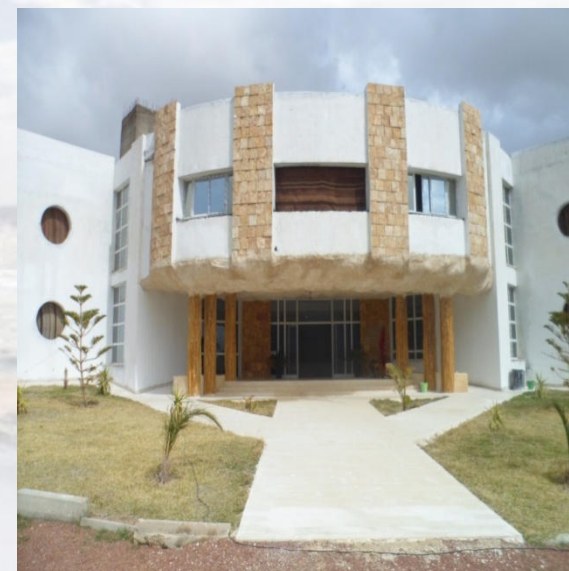
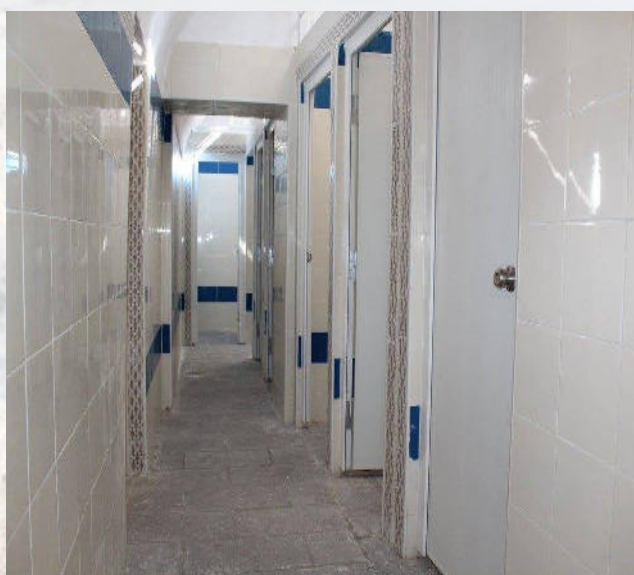




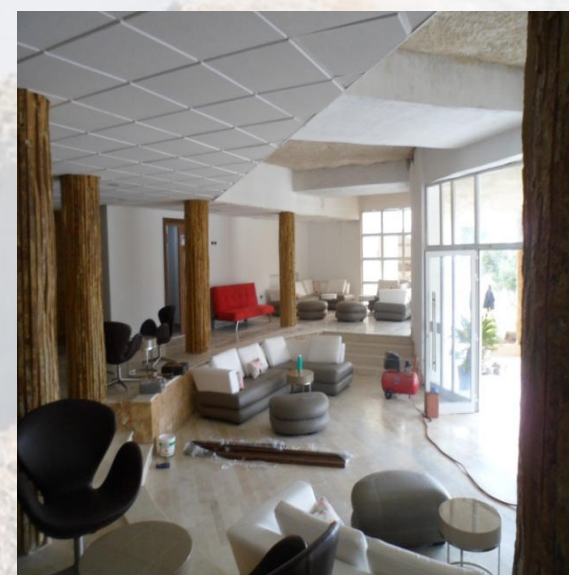
**HAMMA EL BALSEM
A HAMMET GABES**



**HAMMAM ZRIBA
A ZAGHOUAN**



**STATION
THERMALE CHAAMBI
A KASSERINE**





**STATION THERMALE
A AIN OKTOR KORBOUS**

DIRECTION DES ETUDES ET PROJETS



**CENTRE THERMAL
A BNI MTIR JENDOUBA**



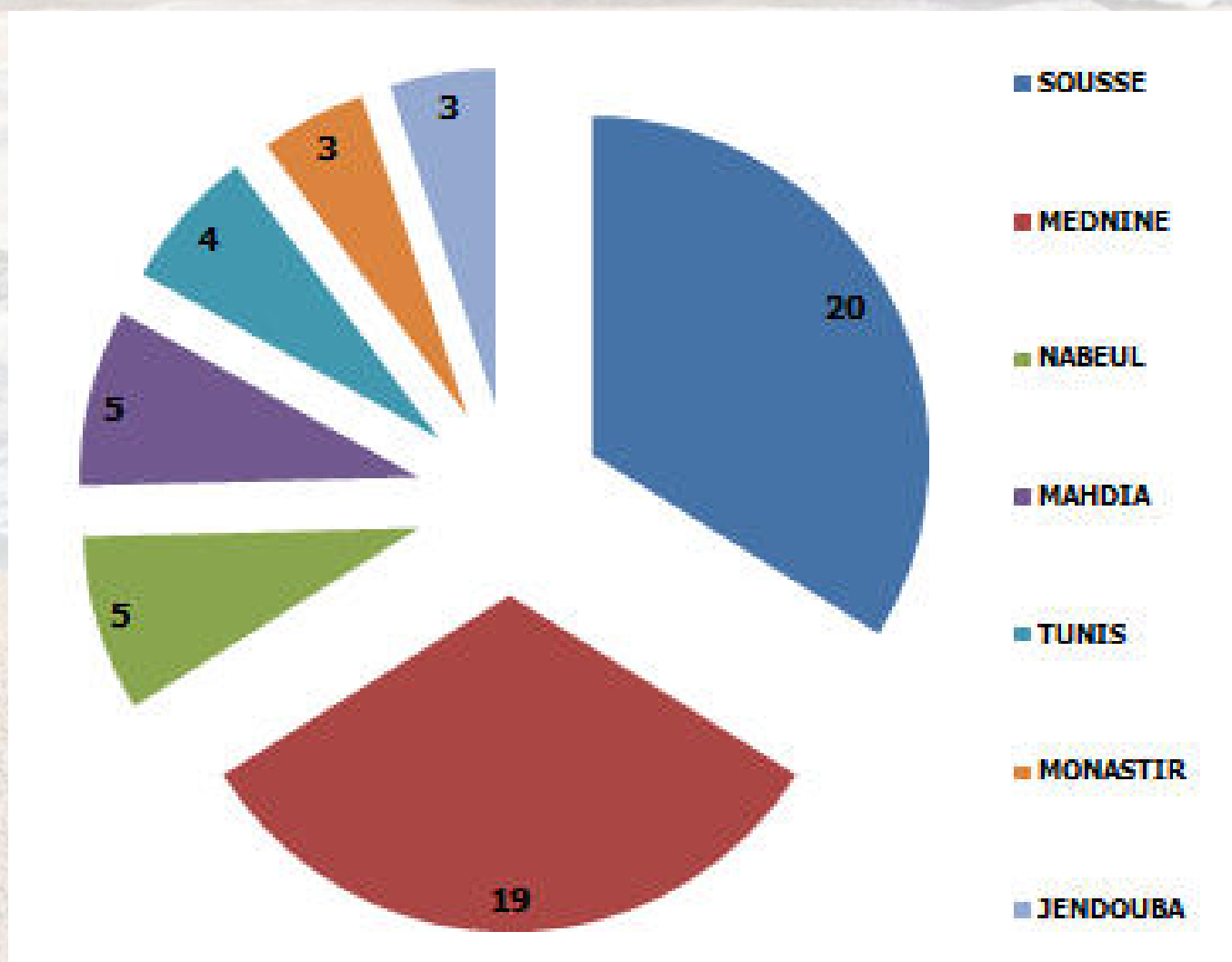
**CENTRE THERMAL
A SIDI AHMED ZARROUK
GAFSA**



**DEVELOPMENT RESULTS
OF
THALASSOTHERAPY**

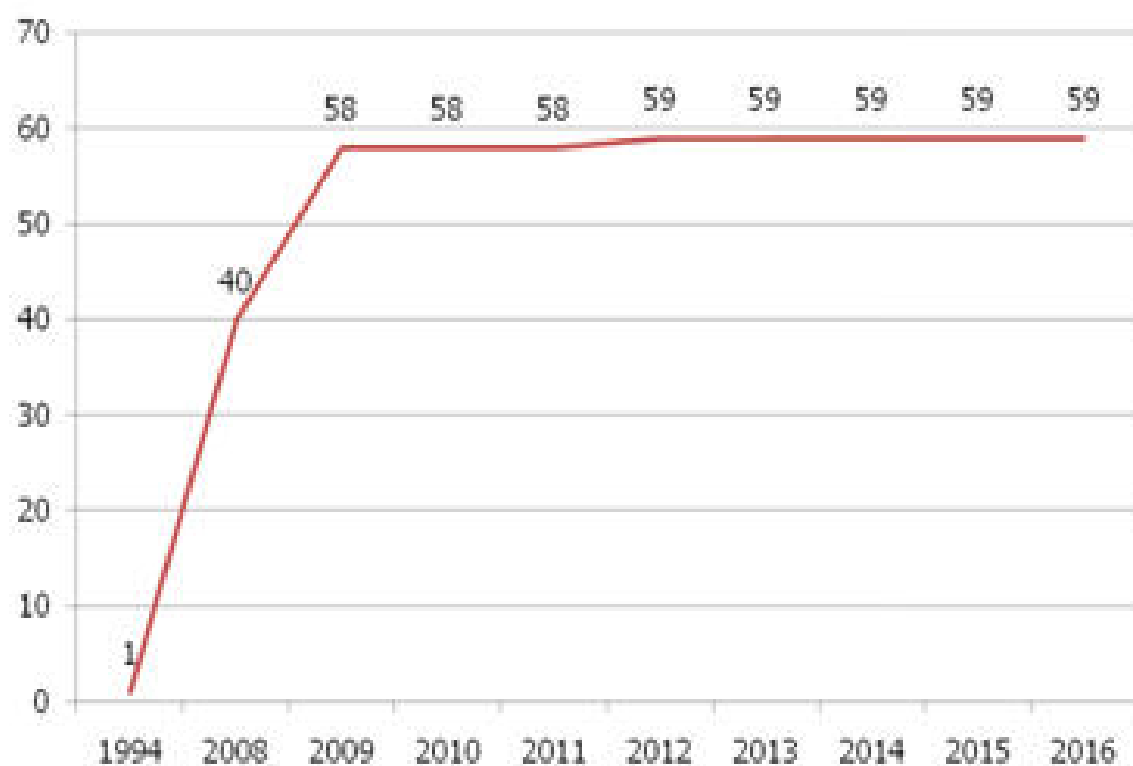
59 thalassotherapy centers / 7 governorates

→ 6 700 curistes/day



1994	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	40	58	58	58	59	59	59	59	59

Historic development number of thalassotherapy centers



THERMES MARINS DE CARTHAGE - TUNIS -



THALASSA NAHRAWESS PALACE - HAMMAMET NORD -



THALASSO EL HAMBRA - HAMMAMET SUD -



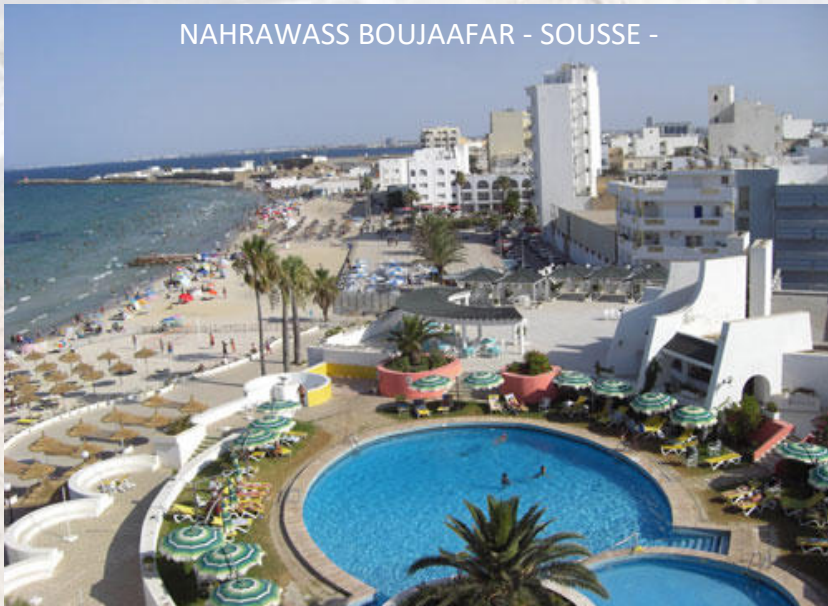
EL MAHARI BEACH - TABARKA -



MOVENPICK - SOUSSE -



NAHRAWASS BOUJAAFAR - SOUSSE -



THALASSO NOUR PALACE - MAHDIA -



YADIS THALSSO - DJERBA -



LES DUNES - DJERBA -



ULYSSE THALSSO - DJERBA -



MAYA CESAR THALSSO - DJERBA -



ALKANTARA THALASSA - AGHIR -



MAYA ROYAL THALASSO - MONASTIR -



LES SIRENES - DJERBA -



ELYSSA THALASSO - MONASTIR -





**THANK YOU
FOR YOUR
ATTENTION**

