Conférence Parmenides IX – GID-CIHEAM – Bari – octobre 2021
Gestion durable des bassins versants méditerranéens face aux impacts des changements sociétaux et climatiques

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Le dessalement de l'eau de mer et la gestion conjointe des ressources en eau pour une gestion soutenable des bassins versants – Cas du Souss Massa au Maroc

Résumé

Le bassin hydraulique du Souss-Massa constitue l'une des régions les plus riches et les plus dynamiques du Maroc avec une diversité d'acteurs et d'usages d'eau. L'agriculture est toutefois le moteur essentiel de la demande en eau à l'échelle de la zone, grâce notamment au développement des cultures de maraîchage primeur, destiné essentiellement à l'export. La poursuite de ce développement doit impérativement relever le défi majeur qui réside dans le déséquilibre entre l'offre et la demande en eau et une surexploitation de la nappe de Chtouka, qui enregistre un déficit de plus de 90 Mm3 par an. Les mesures prises jusqu'à présent pour enrayer la surexploitation de cette nappe sont largement insuffisantes pour garantir un développement durable.

Conscients de ce constat, les différents partenaires, impliqués par la gestion des ressources en eau dans ce bassin, se sont mis d'accord pour coordonner leurs actions afin de remédier à cette situation préoccupante. Il s'agit d'un modèle innovant, qui combine :

(i) la construction d'une unité de dessalement de l'eau de mer de 400.000 m3/j en partenariat public privé pour sécuriser l'irrigation des cultures à haute valeur ajoutée existants dans la zone de Chtouka sur 15 000 ha et substituer ainsi une partie des prélèvements d'eau de la nappe, et

(ii) la mise en place d'un contrat de gestion de la nappe de Chtouka avec une reconnaissance globale des puits existants (régularisation d'ensemble) et une gestion par des quotas de prélèvements d'eau par hectare.

Ce contrat de gestion de la nappe s'est appuyé sur l'implication de l'ensemble des usagers et la mobilisation d'un partenaire privé pour l'équipement des puits par des compteurs en télé relève et le suivi des prélèvements d'eau souterraine par rapport aux quotas. Ce qui permettra de maintenir l'irrigation dans cette région dépendant fortement de l'agriculture tout en préservant la nappe souterraine.

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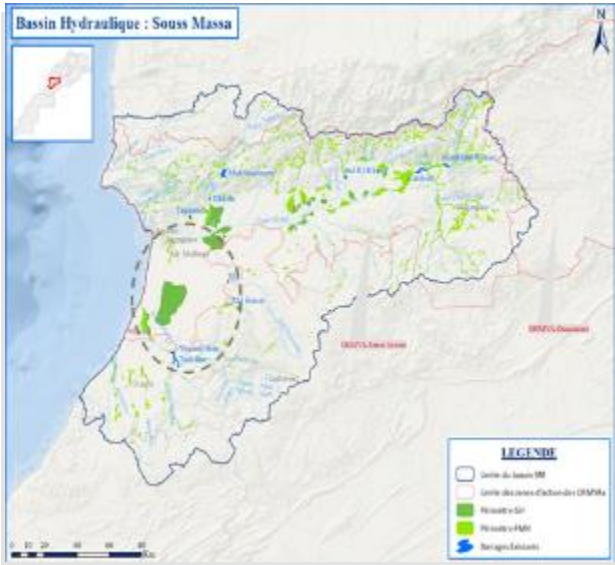
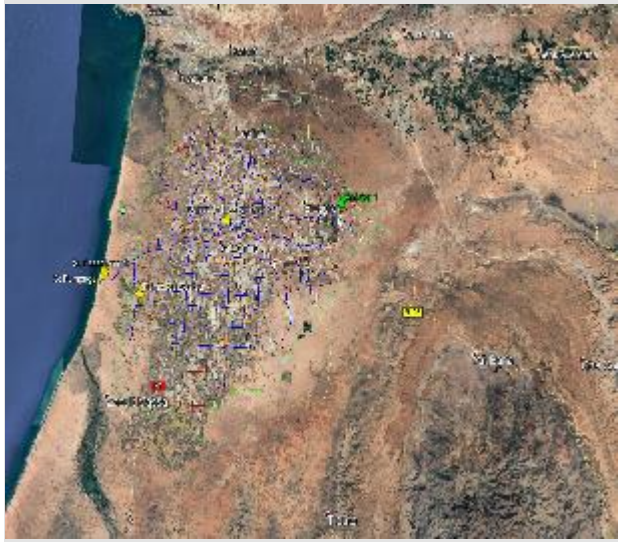
Seawater desalination and joint management of water resources for a sustainable river basin management

Case study of the Souss Massa river basin in Morocco





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THE SOUSS MASSA BASIN FACES A REAL WATER DEMAND MANAGEMENT PROBLEM DUE TO SOCIO-ECONOMIC DEVELOPMENT, DIVERSITY OF WATER USES AND CLIMATE CHANGE.

The area's economy is based mainly on three sectors : agriculture, fishery and tourism.

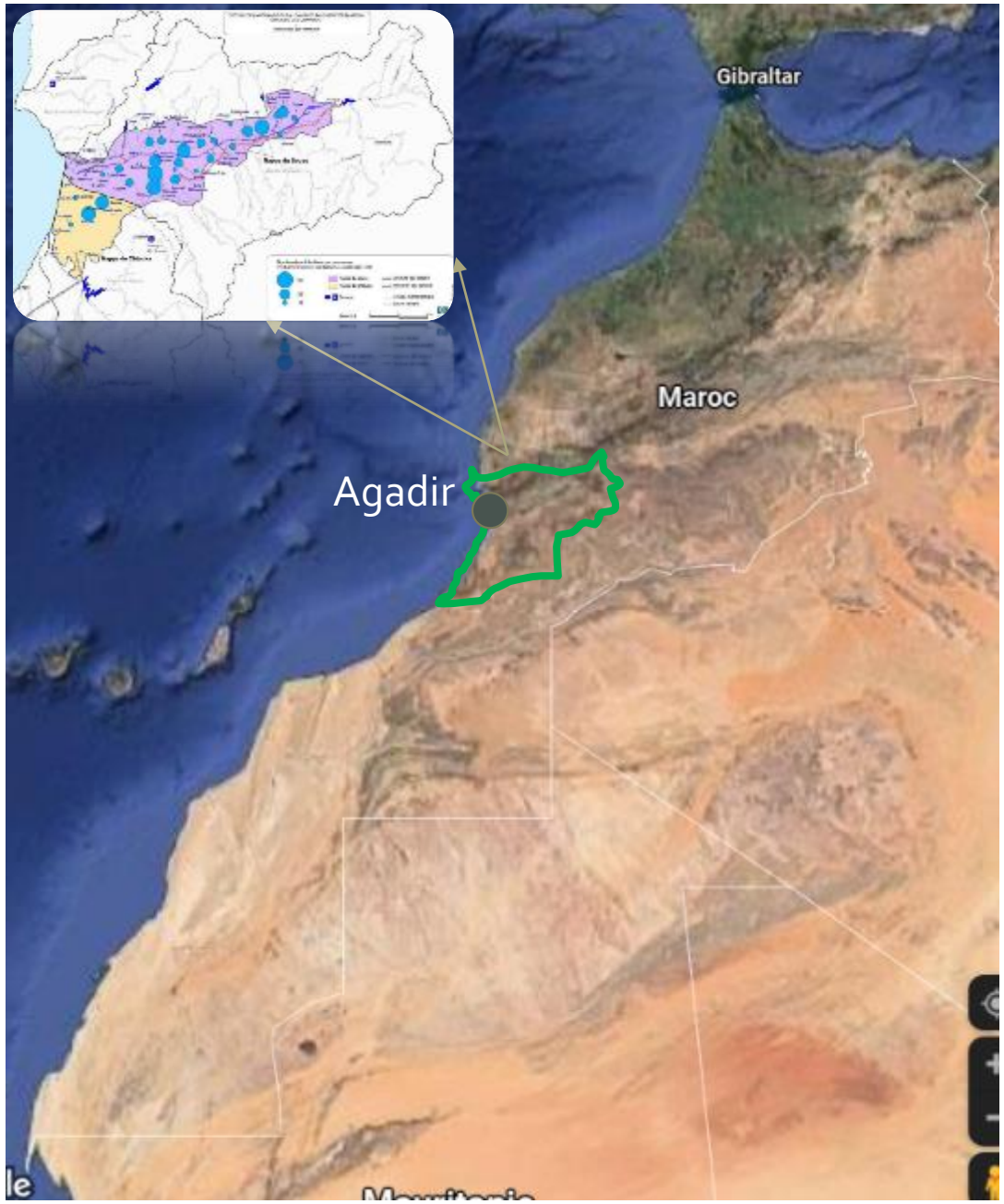
- Agadir Urban Cluster is growing rapidly due to its high touristic potential
- Modern agriculture characterized by the development of greenhouse vegetable crops intended primarily for export

Intensive agricultural practices in this area require considerable water resources due to the semi-arid climate..

Recently, this area suffers from a recurring water shortage:

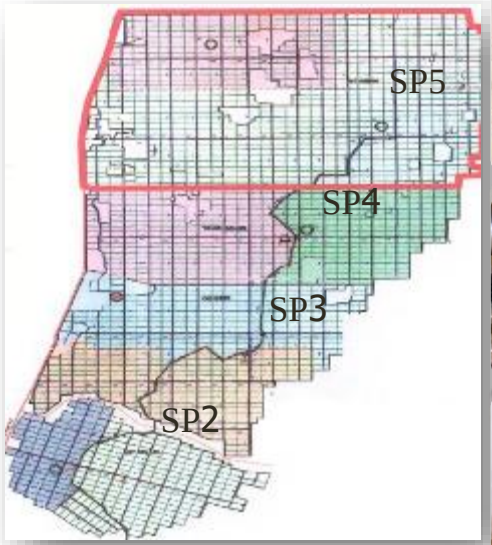
- Surface water (Youssef Ben Tachfine dam) becoming increasingly irregular and in a sharp decrease;

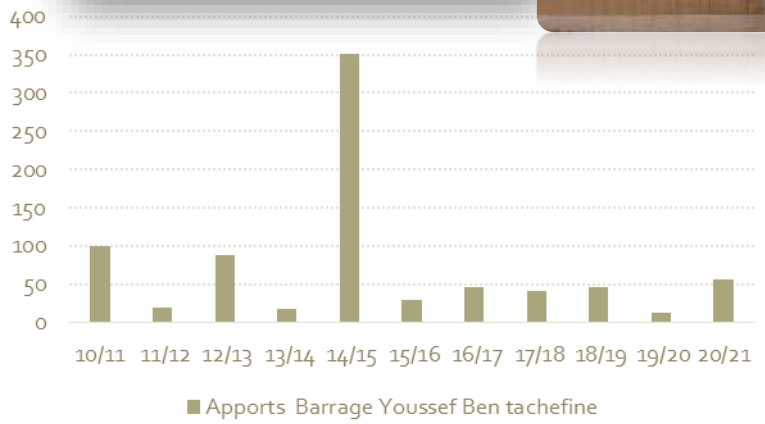
- Groundwater (Chtouka aquifer) exploited beyond its renewable potential, leading to a continuous drop in its level

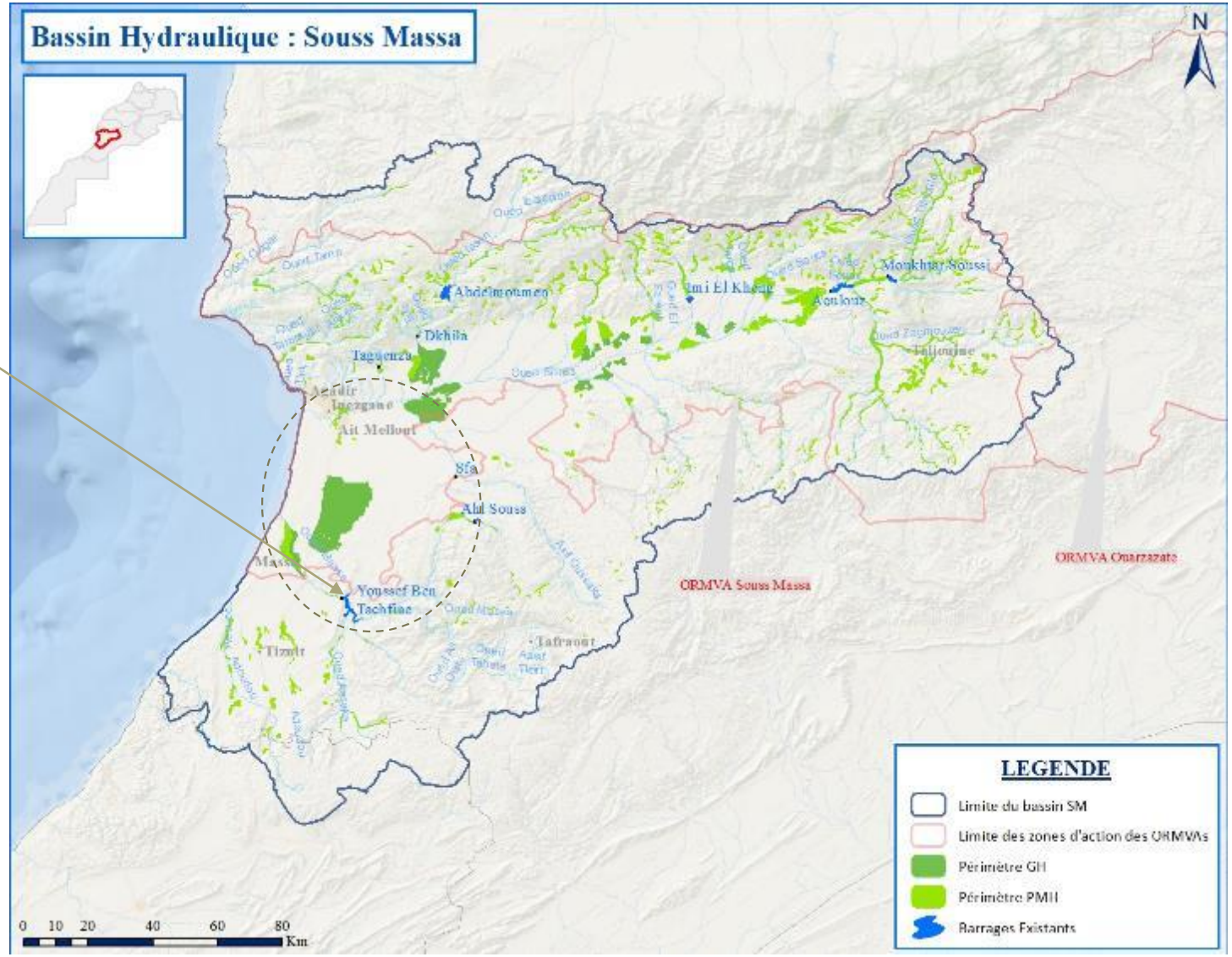


CURRENT WATER RESOURCES USED FOR IRRIGATION - CHTOUKA ZONE

1. **Surface water** (Youssef Ben Tachfine dam): highly irregular and decreasing inflows
   + irrigation network on 18,000 Ha







CURRENT WATER RESOURCES USED FOR IRRIGATION - CHTOUKA ZONE

2. Groundwater (Chtouka aquifer) exploited beyond its renewable potential

The Chtouka aquifer shows a deficit of more than 60 million m3 per year due to its overexploitation :

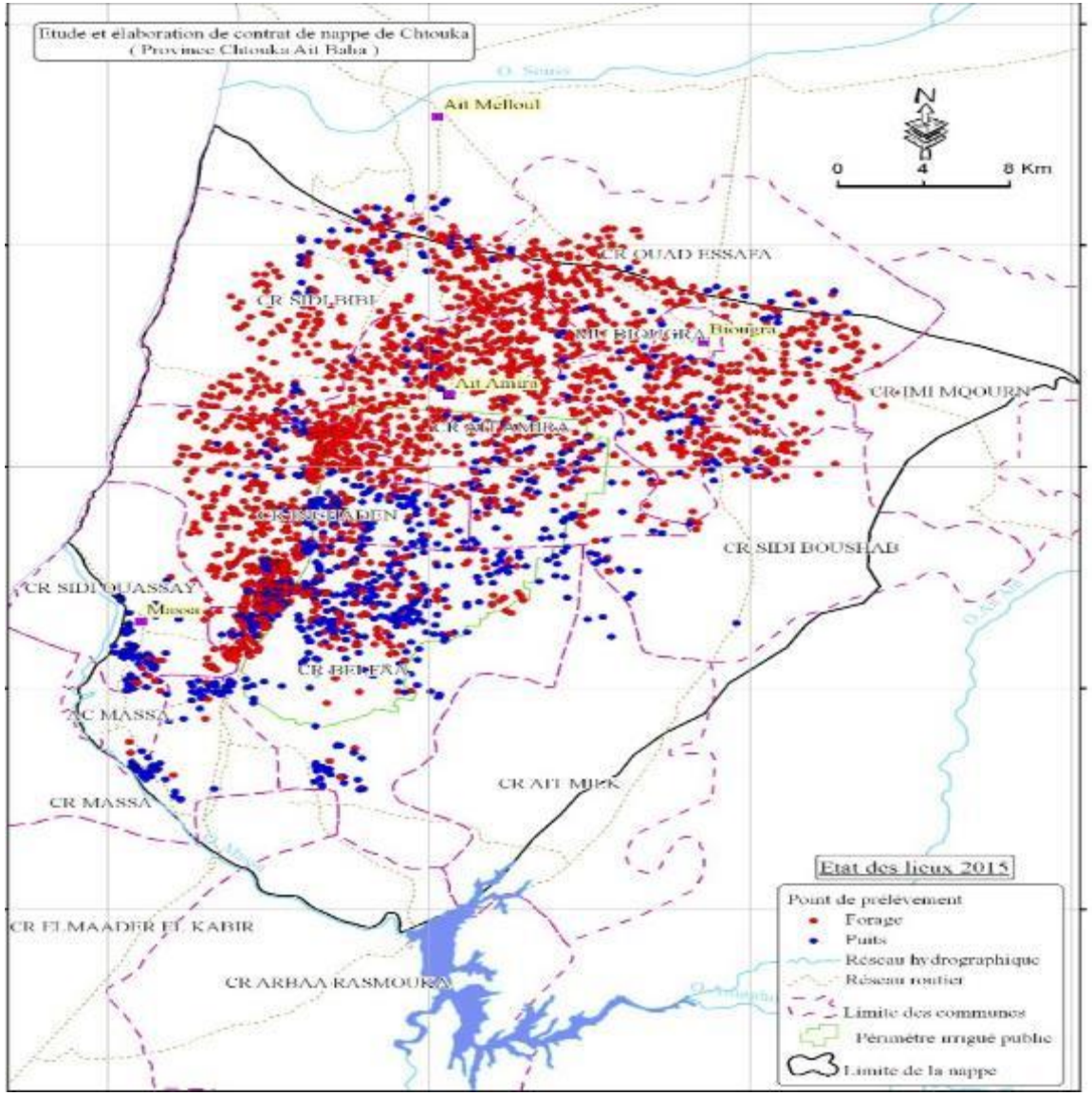
- major risk for the continuation of agricultural activity;
- risk of marine intrusion in the aquifer :
- risk of investments and job losses.

The measures taken so far to curb the overexploitation of this aquifer are largely insufficient to guarantee sustainable development.

THE CHTOUKA AQUIFER, AN ENDANGERED RESOURCE BUT COMMITTED FARMERS!

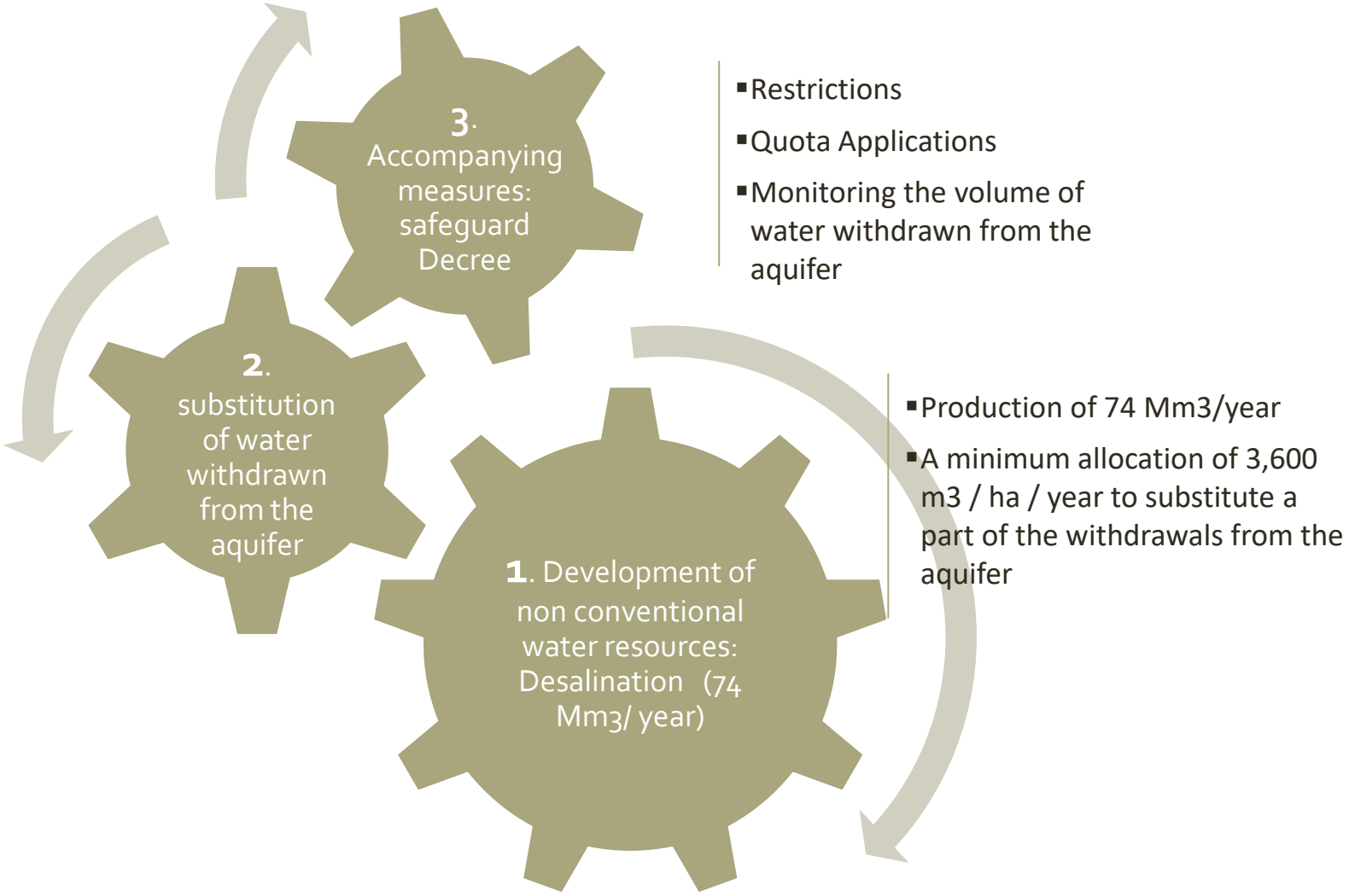
لنحافظ جميعا على شتوكة
SAUVONS CHTOUKA

Development of groundwater intake points



SOLUTION: INNOVATIVE MODEL FOR JOINT MANAGEMENT OF CONVENTIONAL AND NON-CONVENTIONAL WATER

- The Chtouka project was initiated by the State government at the request of farmers and their associations, it is made up of two pillars:
  - the production of desalinated water for the irrigated perimeter, replacing the amount of water over-withdrawn from the aquifer.
  - the safeguard of the aquifer by the establishment of an aquifer safeguard Decree;



PPP DESALINATION PROJECT AND IRRIGATION IN THE PLAIN OF CHTOUKA

Public Private Partnership project, with a production capacity of 400,000 m3 / day divided between agriculture (200,000 m3 / day) and drinking water (200,000 m3 / day), the purpose of the project is to :

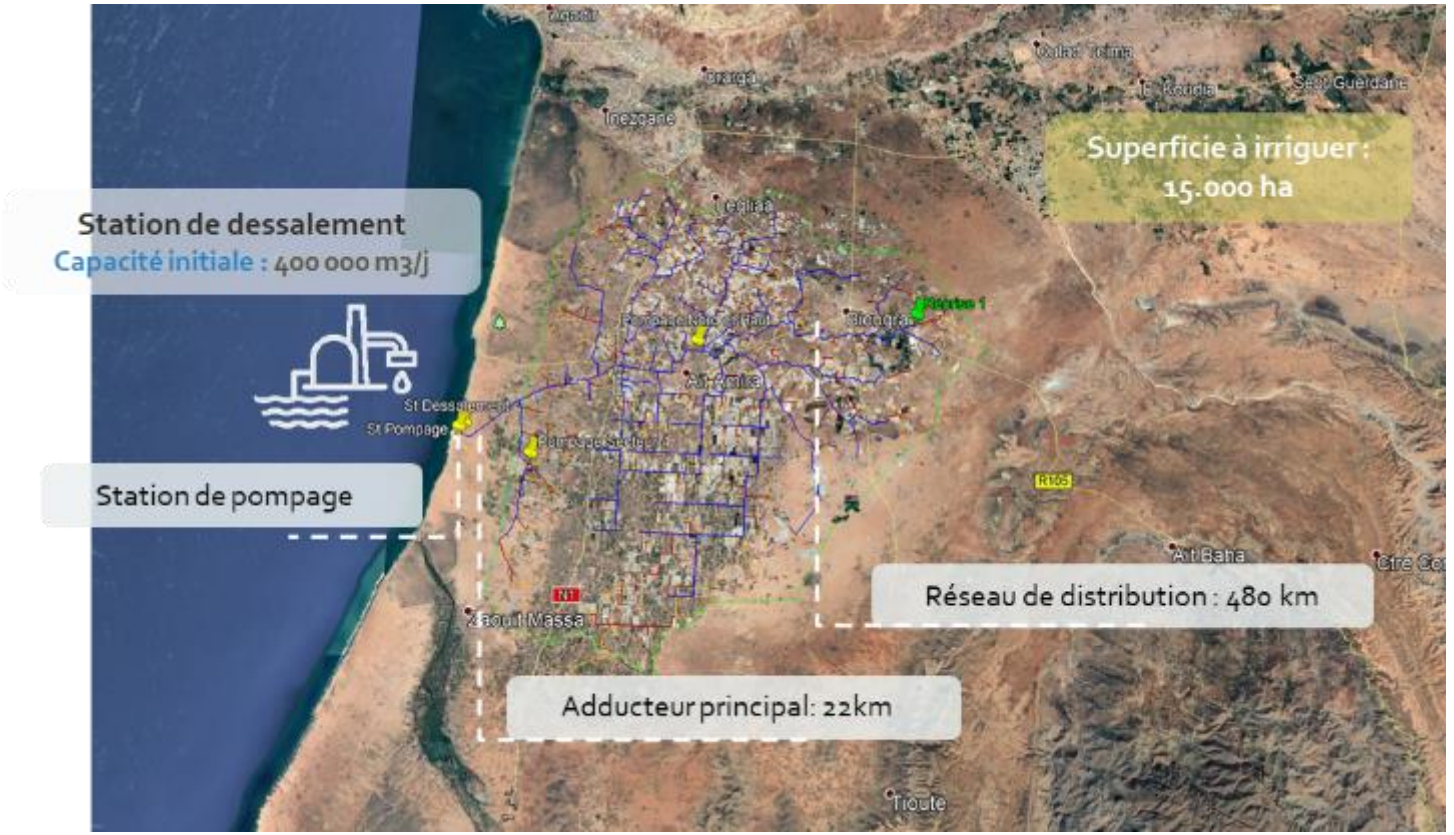
- protect and preserve the Chtouka aquifer;
- Irrigate 15,000 ha in the Chtouka perimeter;
- Secure the drinking water supply for Agadir;
- Reduce water production costs through mutualization of drinking and irrigation water .

Desalination Plant:

- intake structures
- Two supply lines (1 100 m)
- Reverse osmosis unit
- Reservoir and Pumping Station for the desalinated water

Irrigation network :

- 5 Pumping Stations
- Reservoirs
- 22 km of supply lines
- 491 km of distribution network
- 1 500 irrigation hydrants



ACCOMPANYING MEASURES: AQUIFER SAFEGUARD DECREE

- To secure the demand for desalinated water, and prevent farmers from using cheaper groundwater resource, the Ministry of Agriculture has negotiated an **agreement with professional organizations** representing farmers to define the conditions of access to the aquifer and obtain concessions needed from the farmers for the success of the project

Multi-Step Approach:

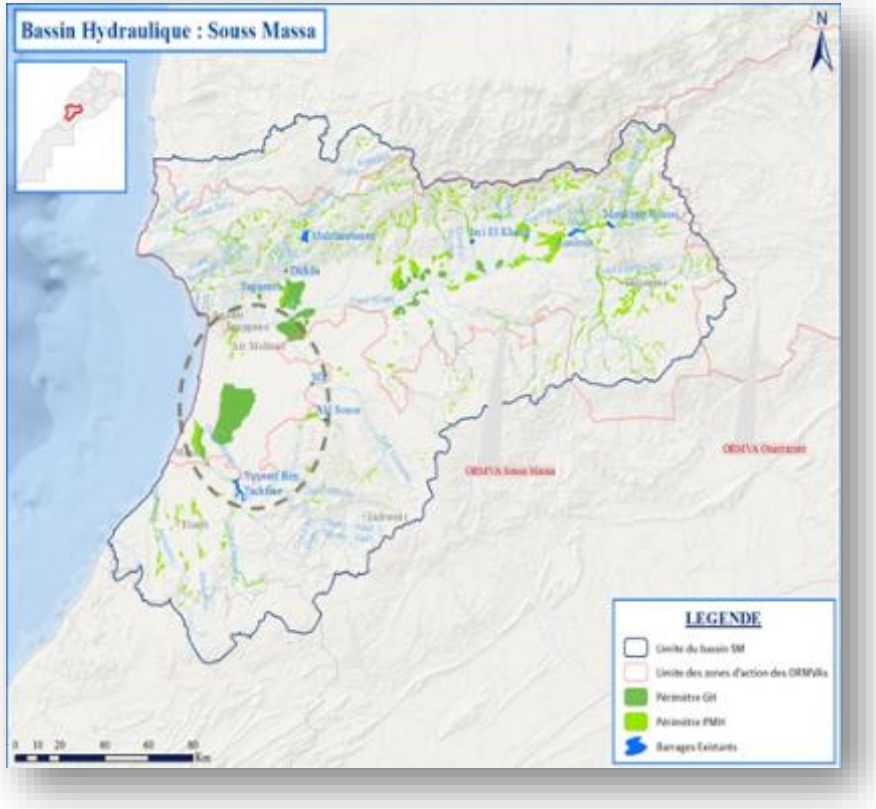
- Water shortage state declaration and the definition of the safeguard perimeter in the Chtouka area,
- Exhaustive census & Regularization of all wells in the area
- Setting of Quota & Groundwater Management Rules;
- Equipment of all wells by smart and connected water meters to measure withdrawals and warn users of the risk of exceeding the quota;
- Updating of the groundwater withdrawal quota each year;
- Annual fees.

Private Partner

- Equipment of wells by water meters
- Monitoring of groundwater withdrawals (Quotas)
- Control and reporting of infractions
- Maintenance of equipments

INNOVATIVE MODEL FOR JOINT MANAGEMENT OF CONVENTIONAL AND NON-CONVENTIONAL WATER FOR SUSTAINABLE MANAGEMENT OF WATER RESOURCES

- **3 Types of stakeholders: Public partners / Private partners / professional organizations of farmers**
- **3 Types of water resources:**



1. Dam water :
- Uncertain and irregular allocation.
- Strong restriction + annual quota

Supplier: ORMVA SM (Public)

2. Desalinated water:
- Guaranteed allocation
- Subscribed allocation

Supplier: Private Partner 1

3. Groundwater:
- Guaranteed allocation.
- Maximum annual allocation calculated according to the state of the aquifer.

Control & regulation: Private Partner 2 + delegating authority

Thank you for your attention