University Hassan II - Mohammedia

Faculty of Science in Ben M'Sik – Casablanca

Laboratory of Ecology and Environment

الفلاحة الحضرية
الدار البيضاء

Urban Agriculture Casablanca

Wastewater in the Peri-Urban Area of Great Casablanca (Morocco): Status Quo, Treatment and Potential Reuse in Urban Agriculture

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International Symposium / Re-Water Braunschweig
21. & 22. November 2011

Future Megacities
Megastädte von morgen

الفلاحة الحضرية
الدار البيضاء
Urban Agriculture Casablanca

General framework: UAC Project

Urban Agriculture as an Integrative Factor of Climate-Optimised Urban Development, Casablanca / Morocco

http://www.uac-m.org

German-Moroccan research project funded by the German Federal Ministry of Education and Research (BMBF) within the megacity research program.

Urban Agriculture Casablanca is a research and development project with a main project phase of five years duration (04/2008 – 03/2013).

Responsables du projet et Partenaires

Federal Ministry of Education and Research

Projektträger im DLR

Agence Urbaine de Casablanca

Finance par le Ministère fédéral de l'Éducation et de la Recherche de l'Allemagne (BMBF)

Casablanca ?

<u>Casablanca is spread over a surface</u>:

- **Form arcs oriented northeast - southwest.**
- **More than 150 Km²**
- **Maximum length: 30 km,**
- **Maximum width: 15 km.**

More than 4.5 million inhabitants or more than 15% of the population of Morocco

More than 2400 industrial units (50% of Moroccan industry)

<u>Urbanization</u>

- 15,000 hectares urbanized or a rate of 200 to 300 ha / year.

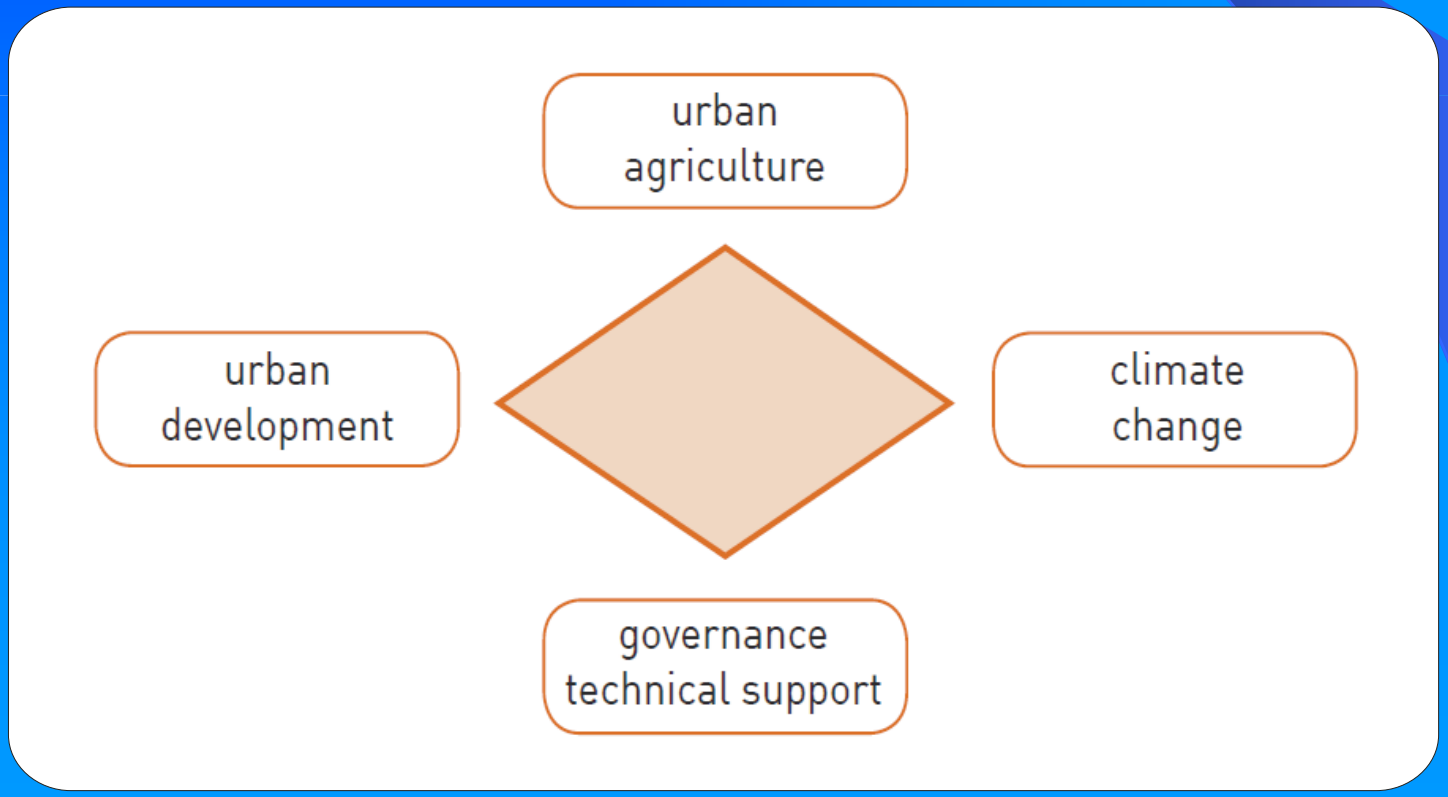
- For a population of over 5 millions inhabitants in 2027.

Description and Objectives of the UAC project

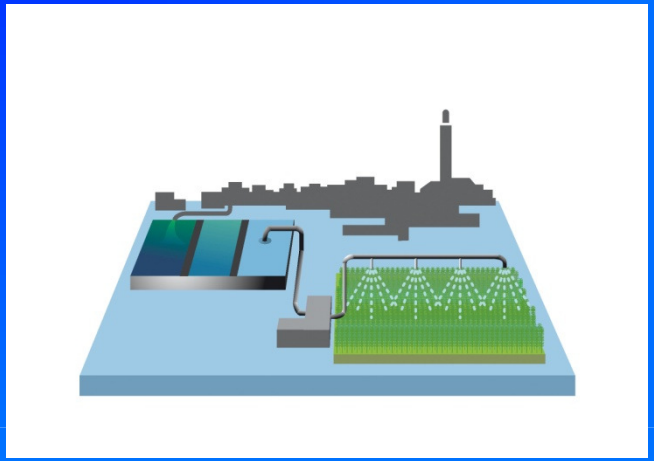
The project focuses on peri-urban agriculture in the development of the future megacity Casablanca and its adaptation to the impacts of climate change.

Urban agriculture is key to the development of space, food security of the city, the water management and reuse, energy efficiency and other topics of sustainable development.

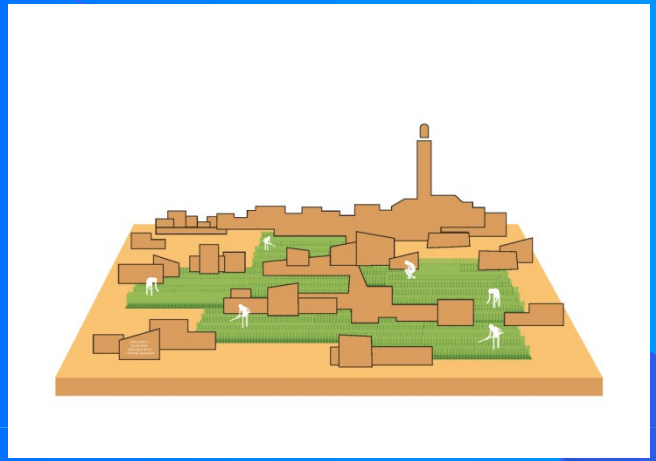
The project places the three dimensions of agriculture, urban development and climate change together in a new perspective framework.



The research project is not limited to academics and research, but is also visible due to the implementation of 4 PILOT PROJECTS,
which experiment with the synergies between agriculture and activities of the city

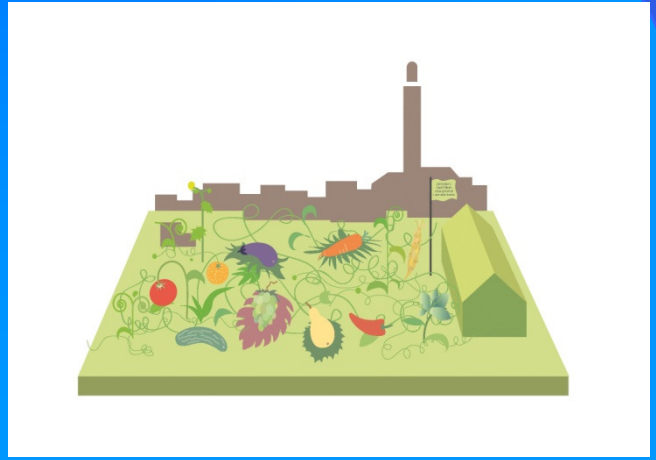


Industry



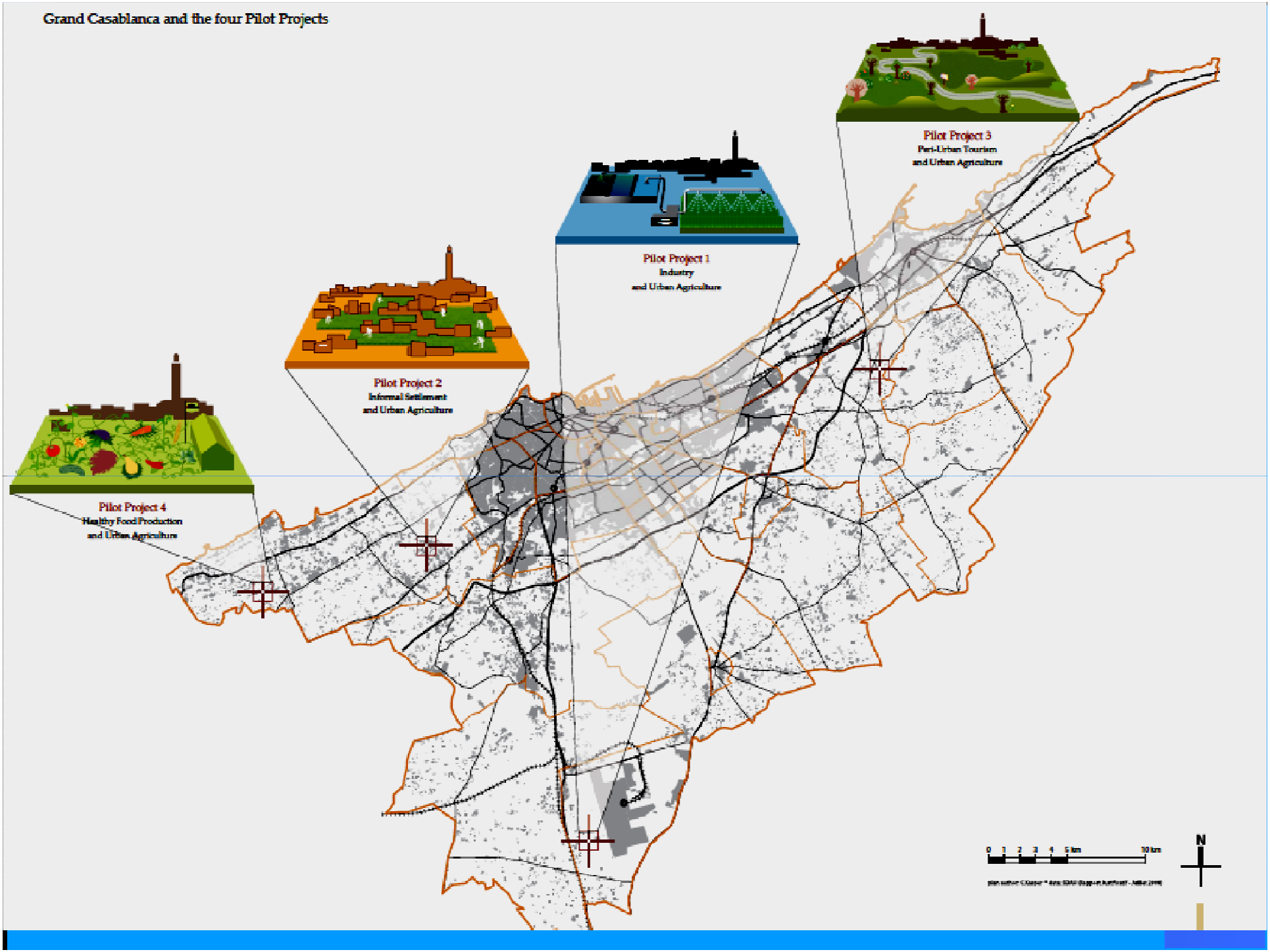
Informal settlement

Tourism



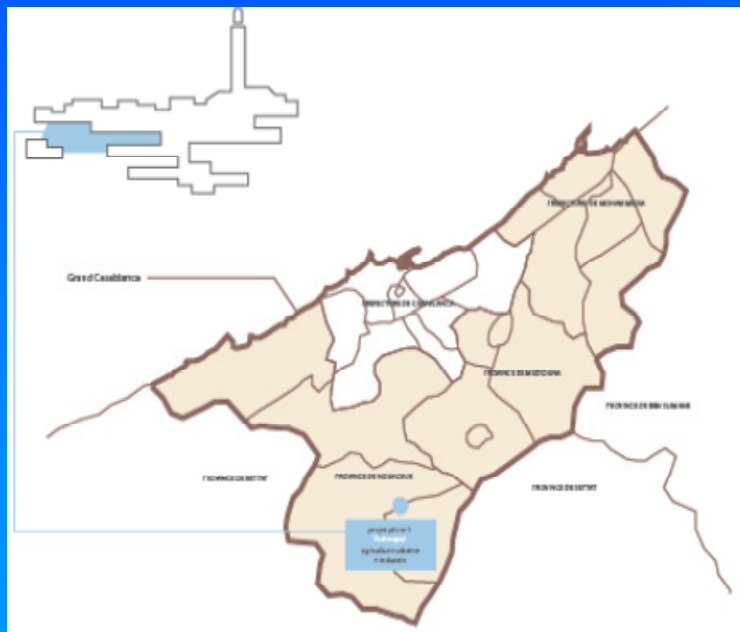
Organic production

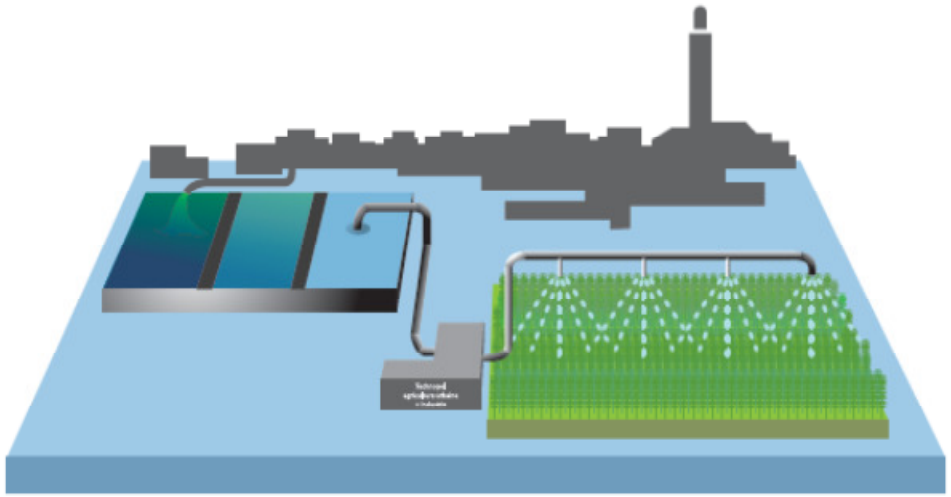
Grand Casablanca and the four Pilot Projects



Pilote Project 1 « Agriculture and Industry»

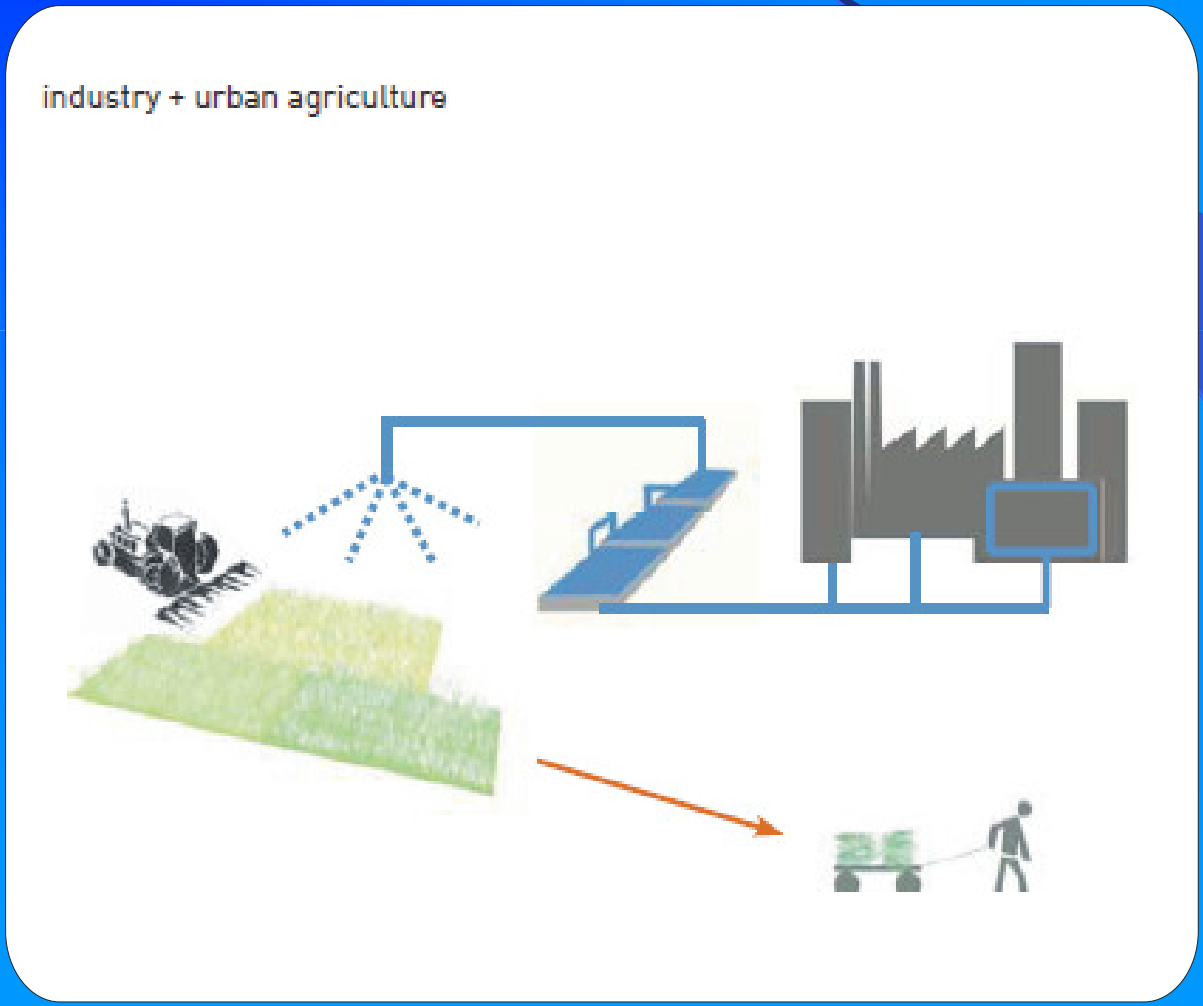
(In the area of Mohammed V Airport)

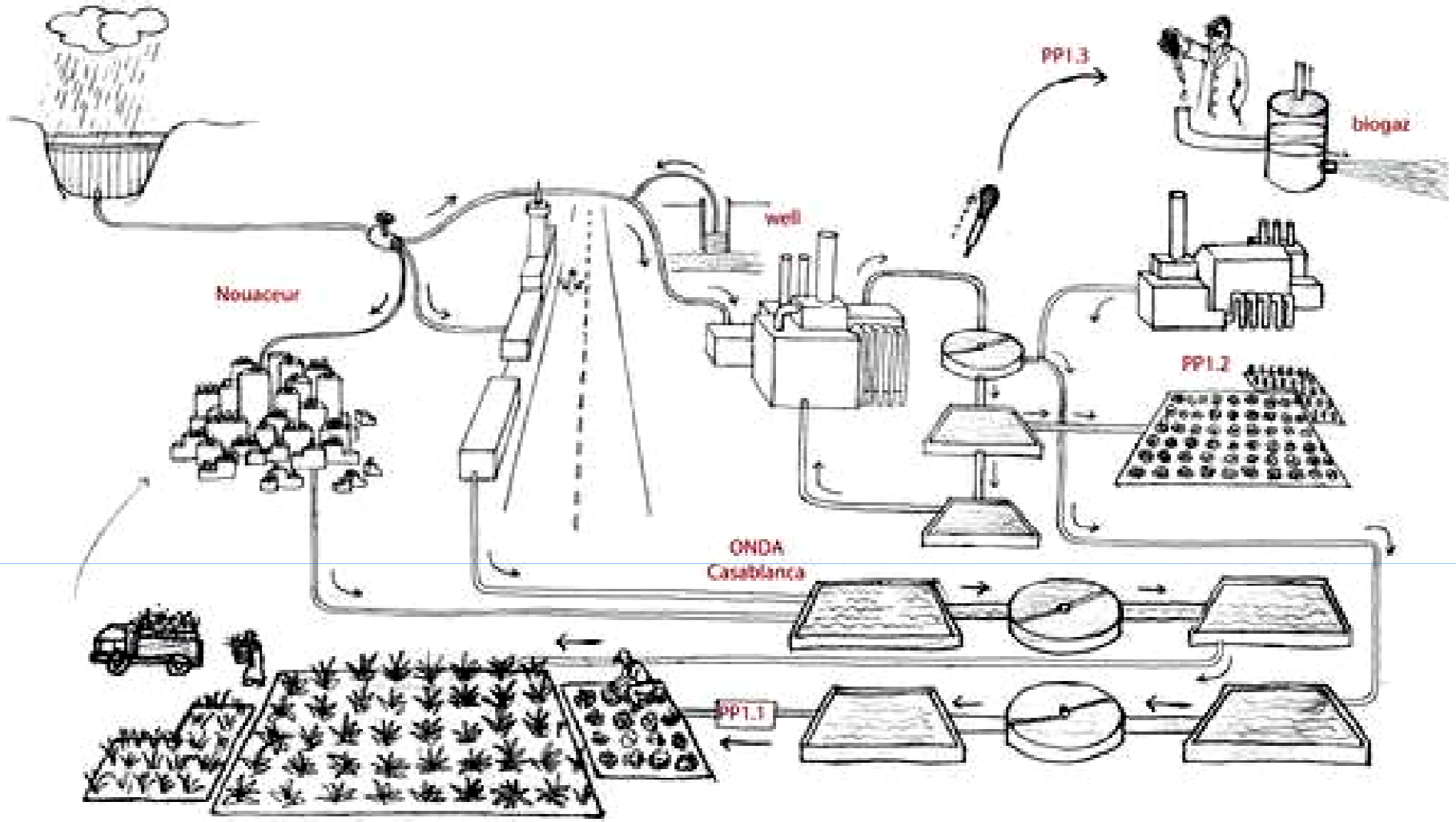




Overall objective

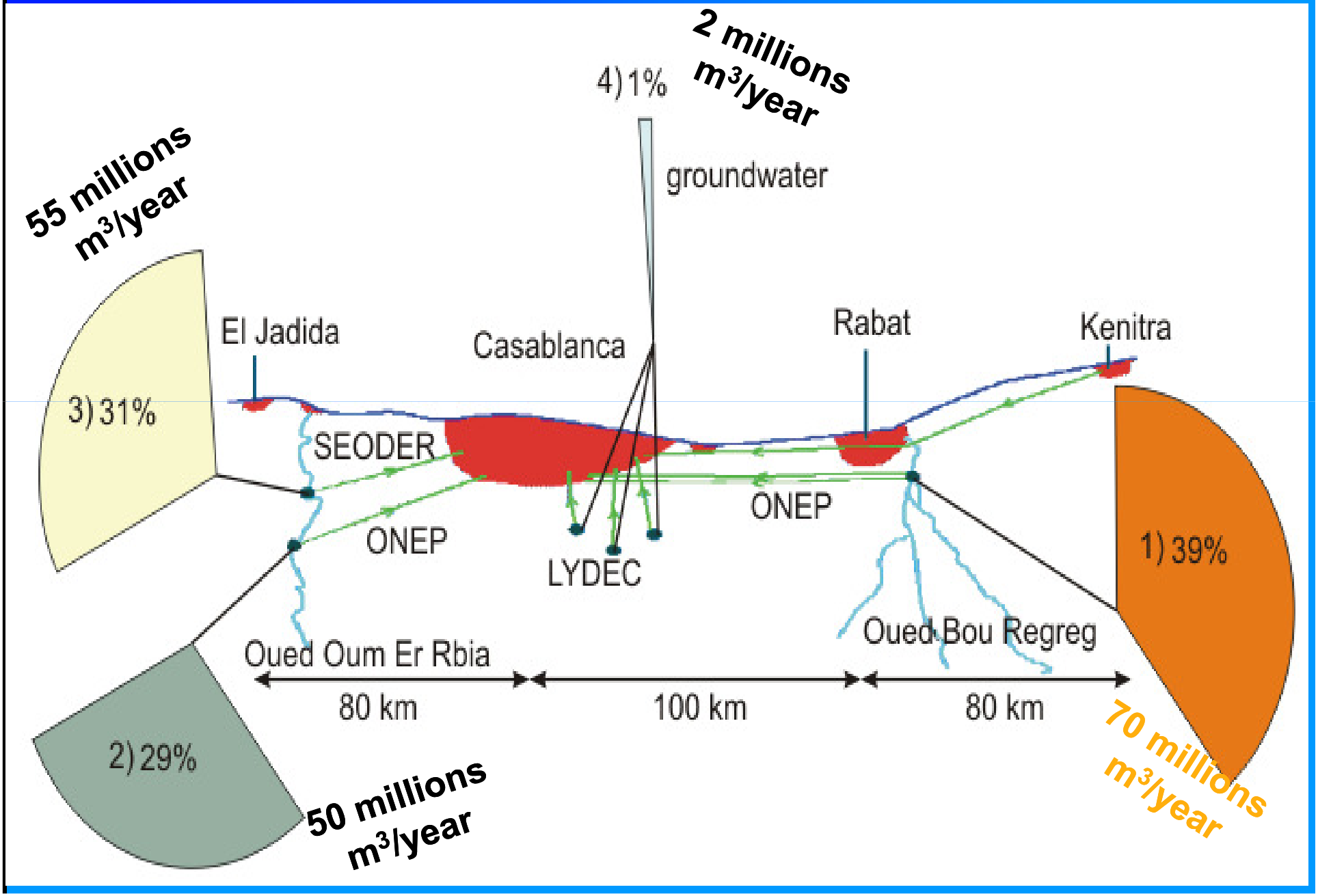
Demonstration of successful forms of coexistence between industry and urban agriculture by optimizing the use of water in various industrial processes and treatment and reuse of wastewater in agriculture.

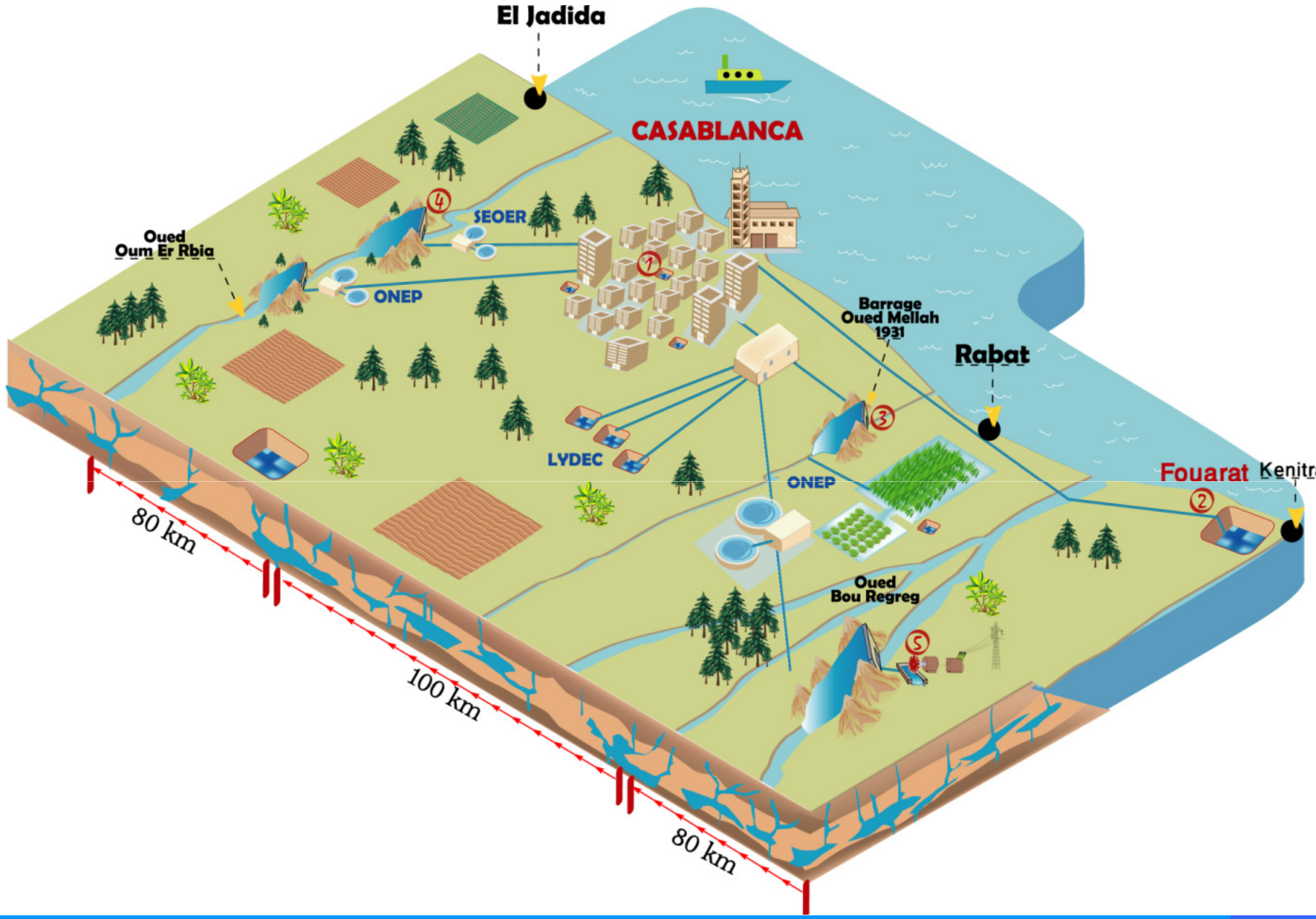




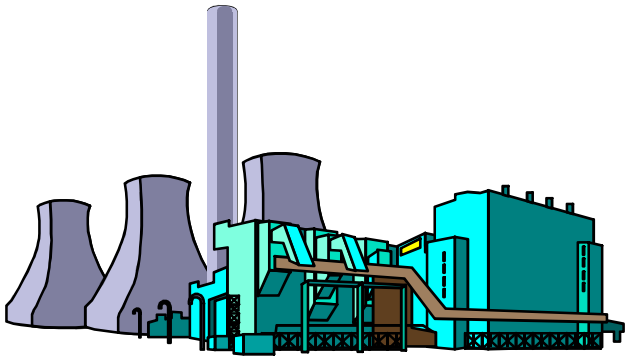
The idea of the project is to use treated wastewater from industrial sites either for neighboring agricultural production or for industrial purposes within the companies (closed water loops). The PP is located at the "Aeropole" industrial park (120 ha) near the "Mohamed V" international airport.

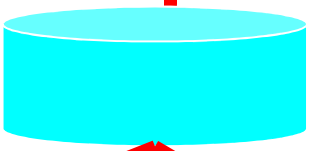
Potable water in Casablanca




El Jadida
CASABLANCA
SEOER
Oued
Oum Er Rbia
ONEP
Barrage
Oued Mellah
1931
Rabat
LYDEC
ONEP
Fouarat
Kenitra
Oued
Bou Regreg
80 km
100 km
80 km

Wastewater and sanitation in Casablanca



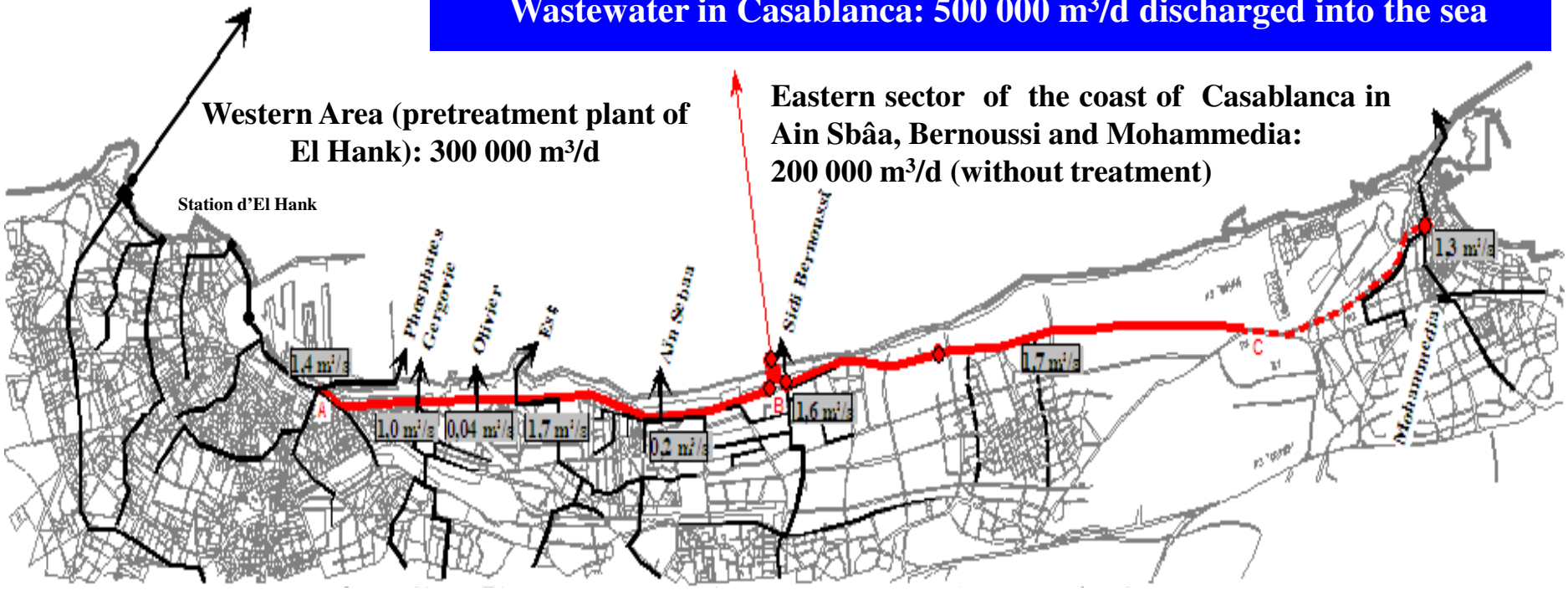


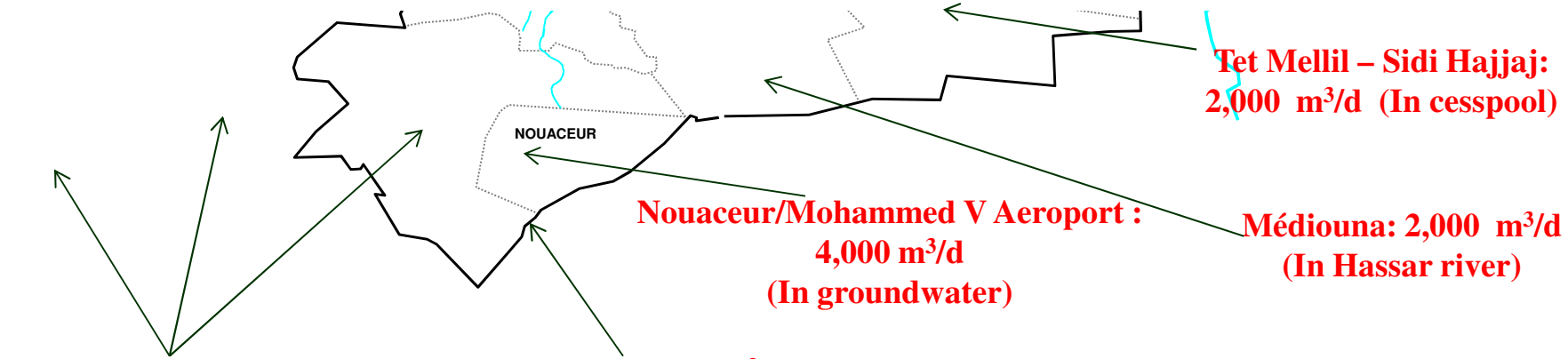
3,700 km of sewerage network

26 outlets
- 11 for Wastewater
- 15 for rainwater

- About 50 pumping stations
- 1 wastewater pretreatment plant with a pipeline to the sea (3.6 km)
- 39 storm water basins (500,000 m^3)

Wastewater in Casablanca: 500 000 m³/d discharged into the sea





Tet Mellil – Sidi Hajjaj:
2,000 m³/d (In cesspool)

Nouaceur/Mohammed V Aeroport :
4,000 m³/d
(In groundwater)

Médiouna: 2,000 m³/d
(In Hassar river)

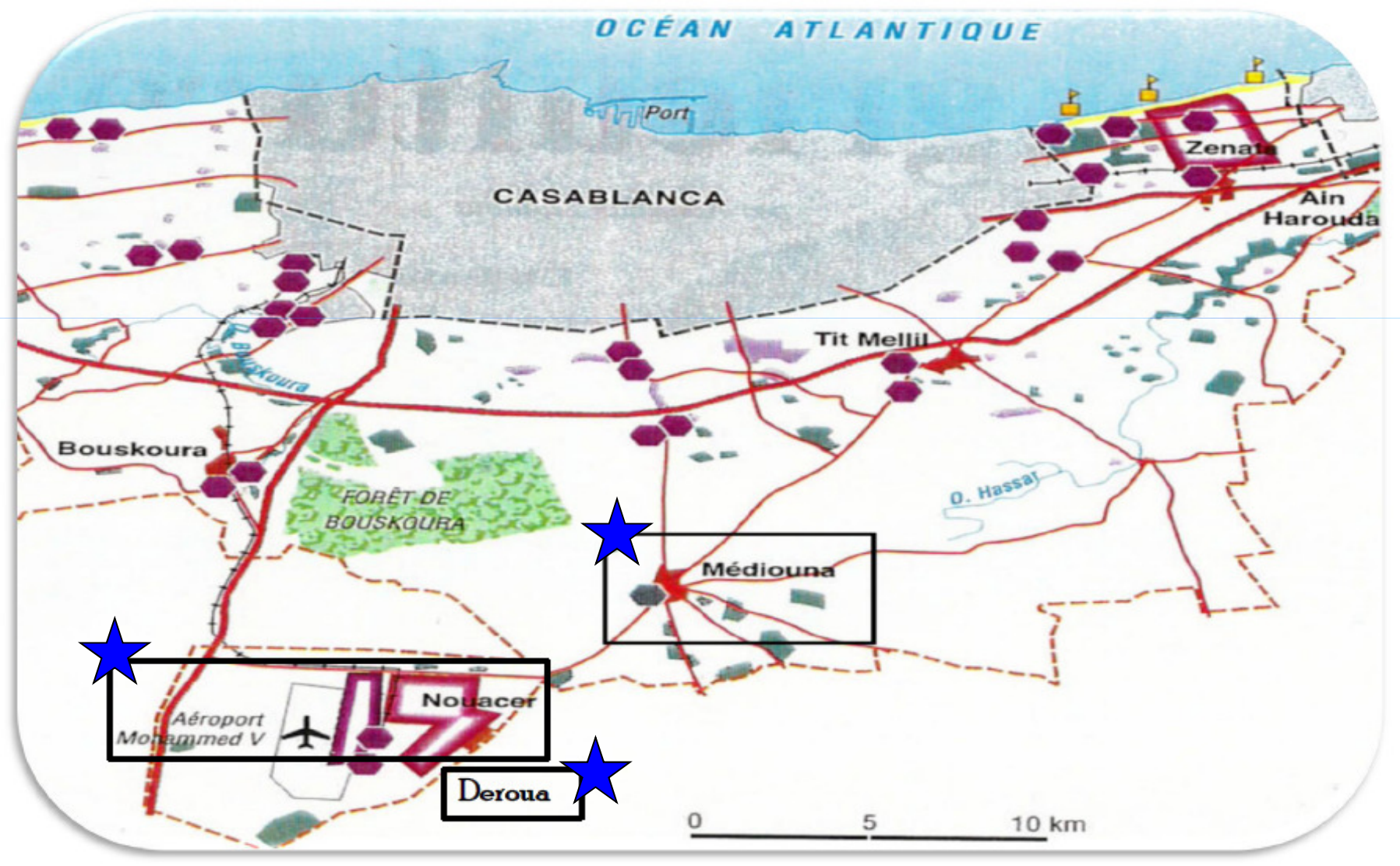
Others: Douars, Hammams,..etc
About 2,000 m3/d
(In septic tanks / cesspools)

Deroua: 2,000 m³/d
(lagoon traetment plant)

Wastewater in peri-urban Casablanca: More than 10,000 m³/d discharged (groundwater and rivers)

The study areas

Three peri urban areas of Casablanca have been the subject of our study including: The area of the airport Mohammed V and the towns of Deroua and Médiouna.



Methods and techniques of measurement and analysis used

Measurement methods and analysis used are summarized in the following table:

Parametrs	Material and method used (Reference and measurement uncertainty)
Temperature (°C)	Thermometer or temperature probe for Multiparametr CONSORT C535 (1/10)
pH (pH unity)	pH metre Type Hanna HI 8014 (1/100)
Oxygene disslved (mg/l)	Oxymeter WTW Type Oxi 330/SET (1/10)
BOD_5 (mg/L)	AFNOR, 1999; NF T 90-101
COD (mg/L)	AFNOR, 1999 , NF EN ISO 8467
SS (mg/L)	AFNOR, 1999; NF EN 872
Nitrogen TNK (mg/L)	AFNOR, 1999; NF EN 25663
TP (mg/L)	AFNOR, 1999; NF EN1189

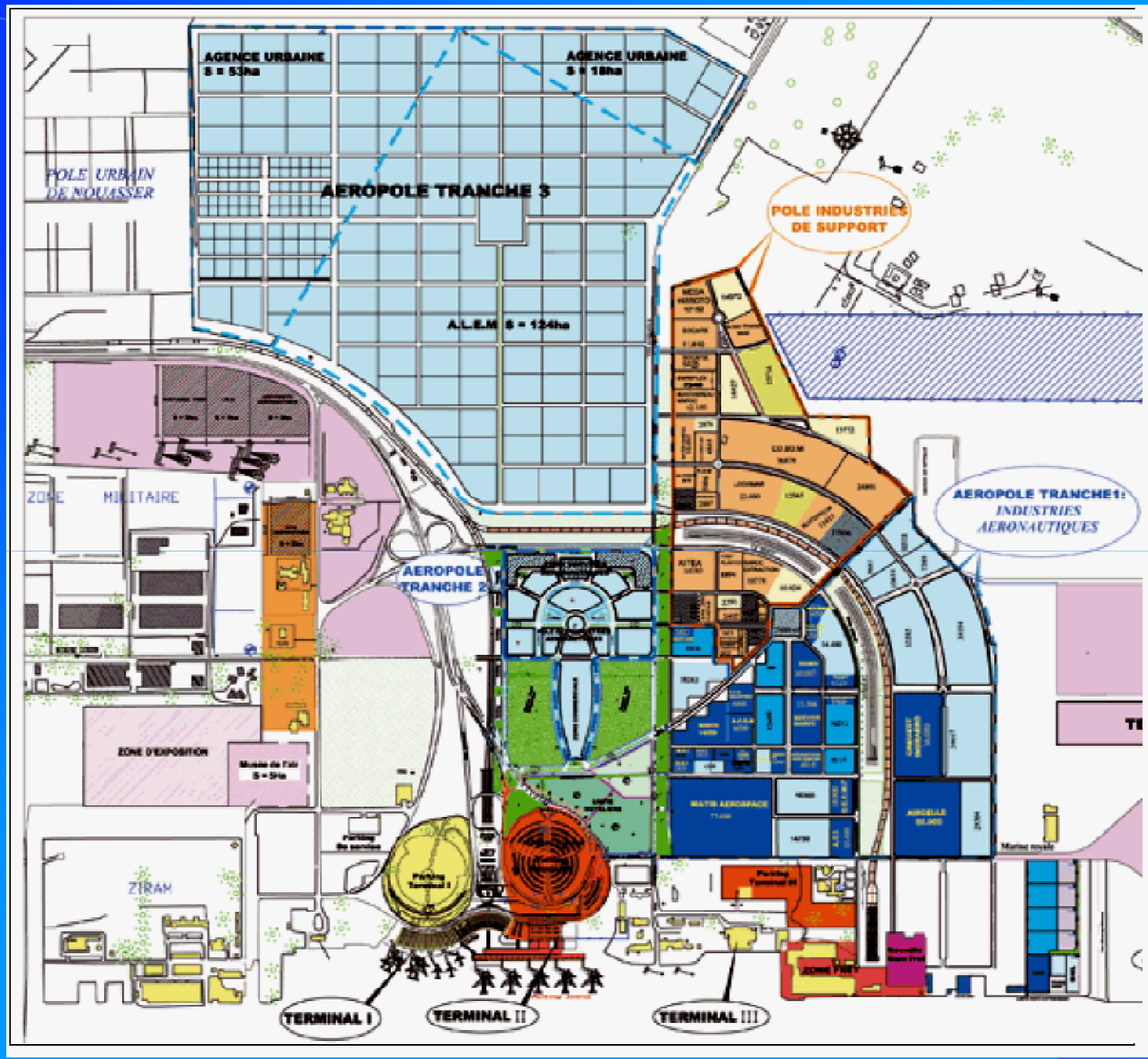
1- The area of the airport Mohammed V / Nouaceur

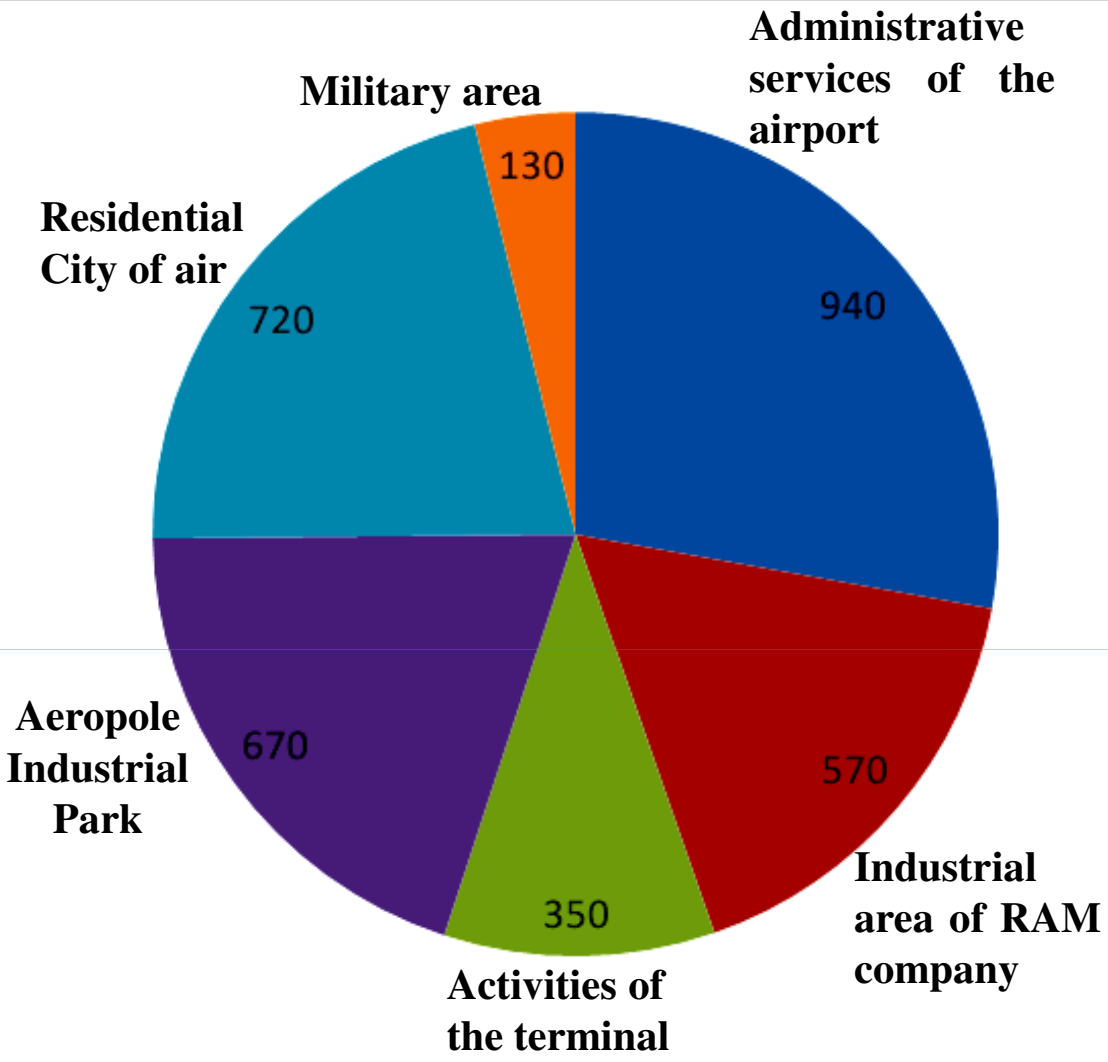
- It is located almost 30 km south-east of downtown Casablanca.

- It includes:
- A residential area with a population of about 8000 inhabitants .

- The airport infrastructure (terminals, various buildings, military barracks..)

- An industrial park (Aeropole) hosting approximately sixty companies (commerce, engineering, metal industries, food and pharmaceutical, electronic and electrical and special chemicals.





Overall distribution of potable water consumption (in m^3/d) at the Mohamed V airport in 2009 (Data provided by ONDA, 2010)

TOTAL:
3380 m^3/d with a maximum of 3800 m^3/d recorded in August.

In addition to potable water, some companies of the industrial park aeropole and other activities use well water approximately: 1200 ou 1500 m^3/d.

The total volume of water consumed at the airport area is on the order of 4500 m^3/d (maximum: 5000 m^3/d).