

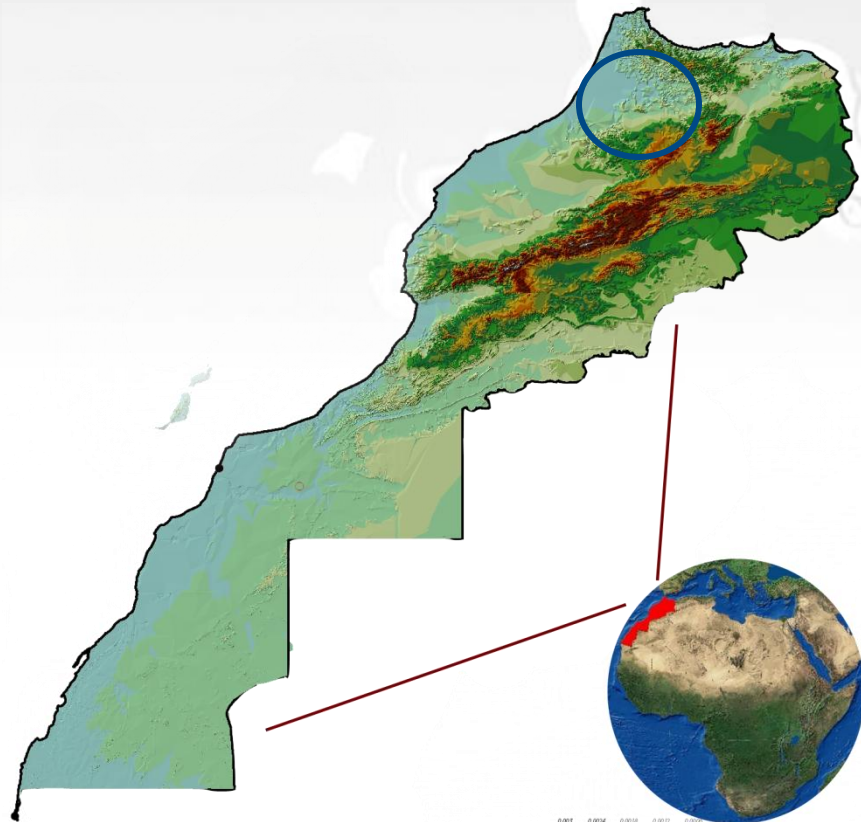
Overview on water Resources and Irrigation In Sebou watershed, Morocco

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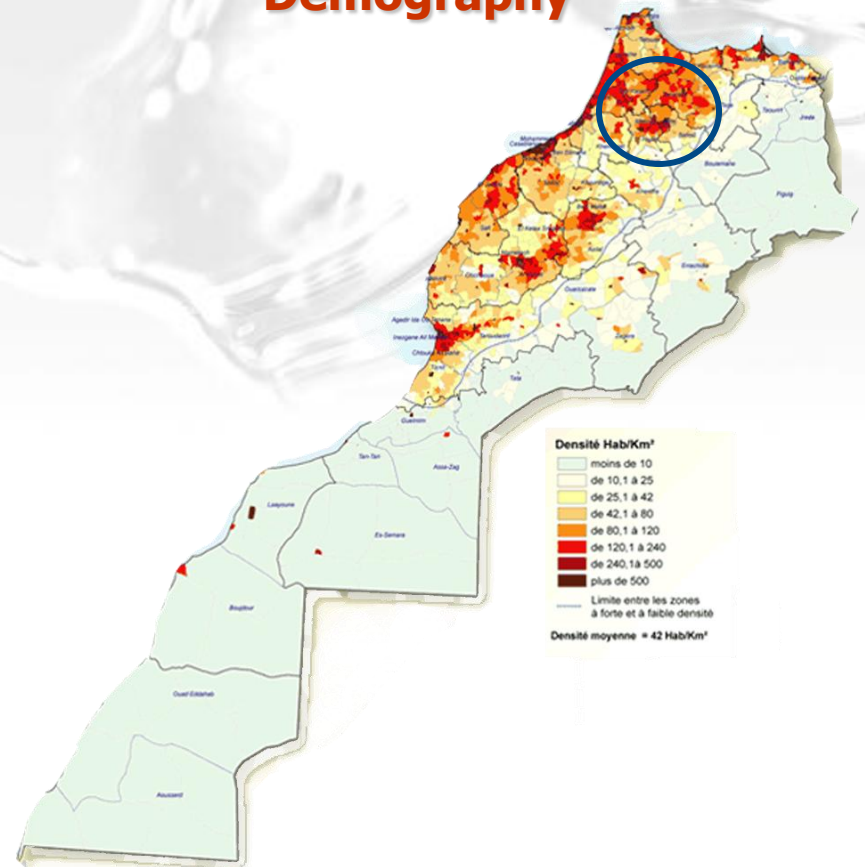
Homepage: <http://sites.google.com/a/usmba.ac.ma/lahcen-benaabidate/>

Geography

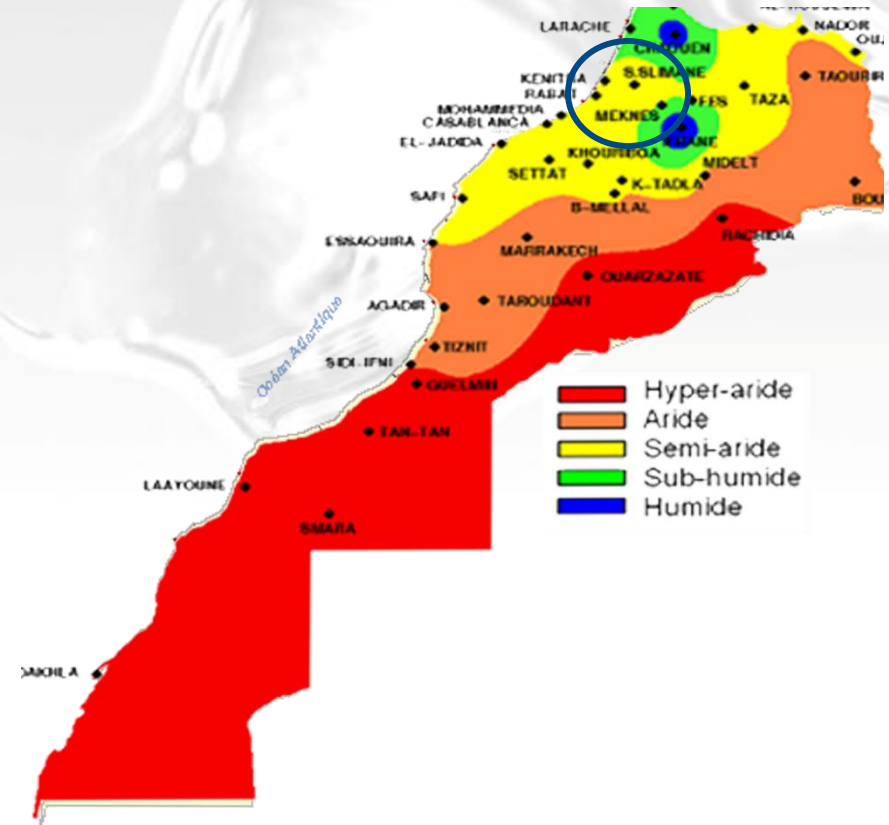
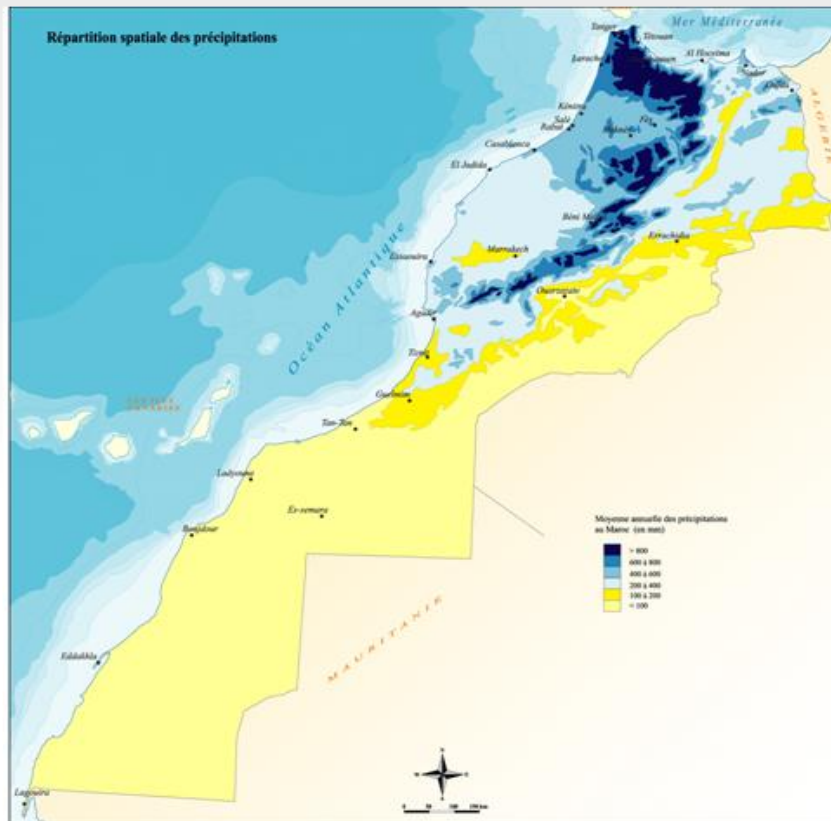


0.007 0.0024 0.0018 0.0012 0.0006

Demography



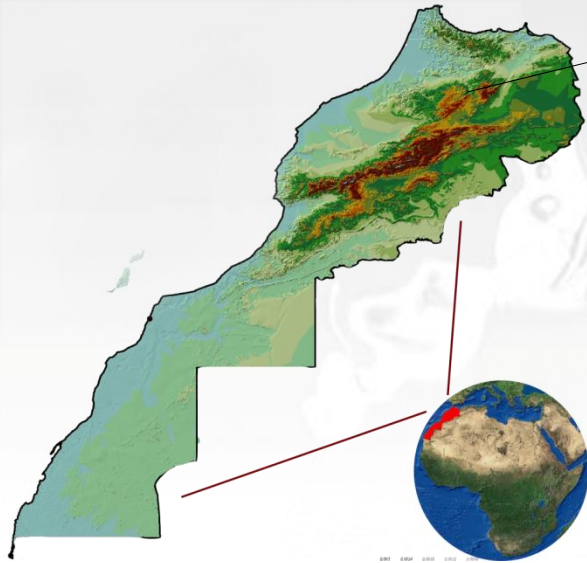
CLIMATIC CONTEXT



✓ Climate mainly semi-aride to aride (except the Northern part)

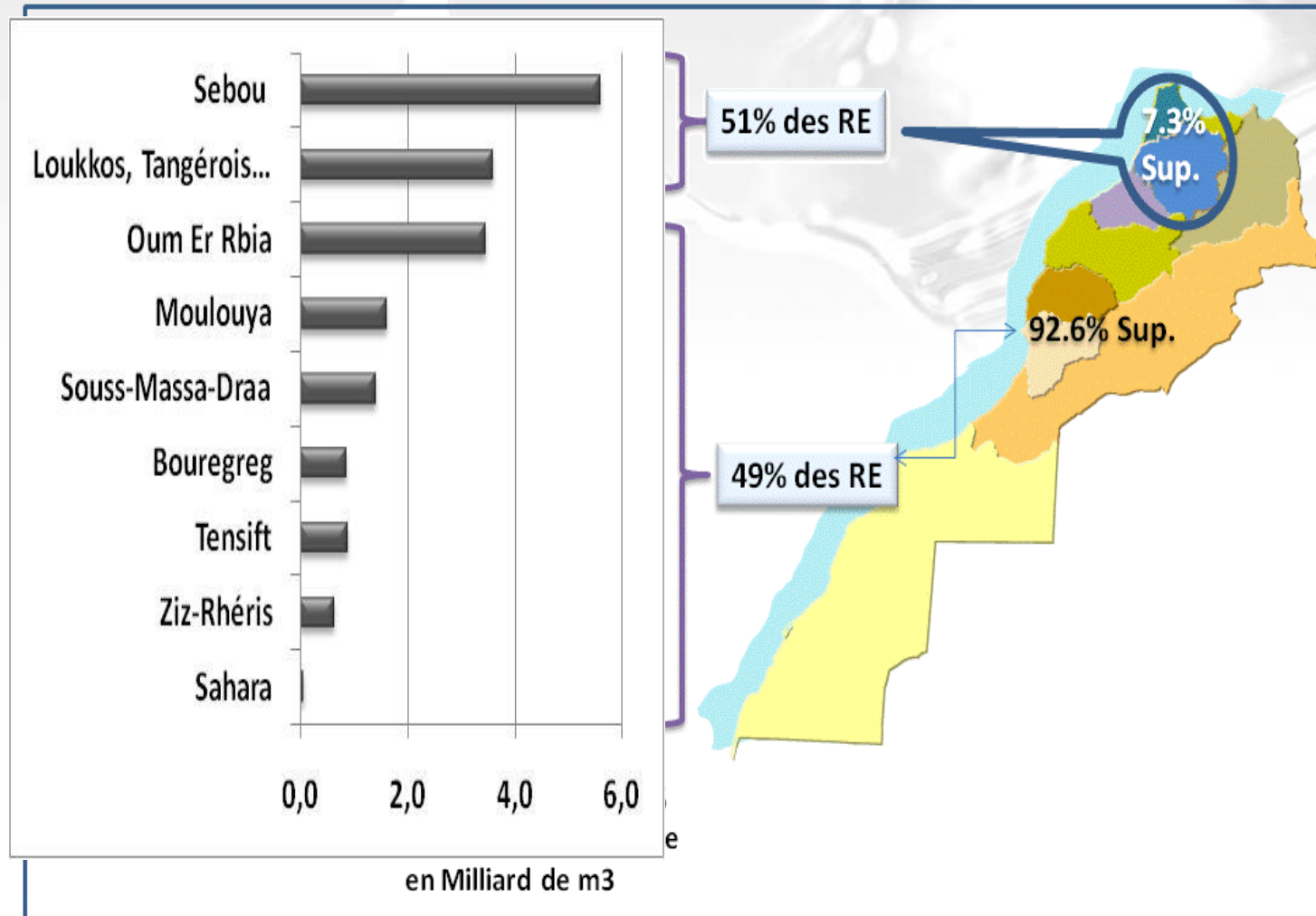
✓ Alternance of high rain sequences and severe drought sequences: surface water storage: Dams policy.

OROGRAPHIC PRECIPITATION (ATLAS CHAIN)

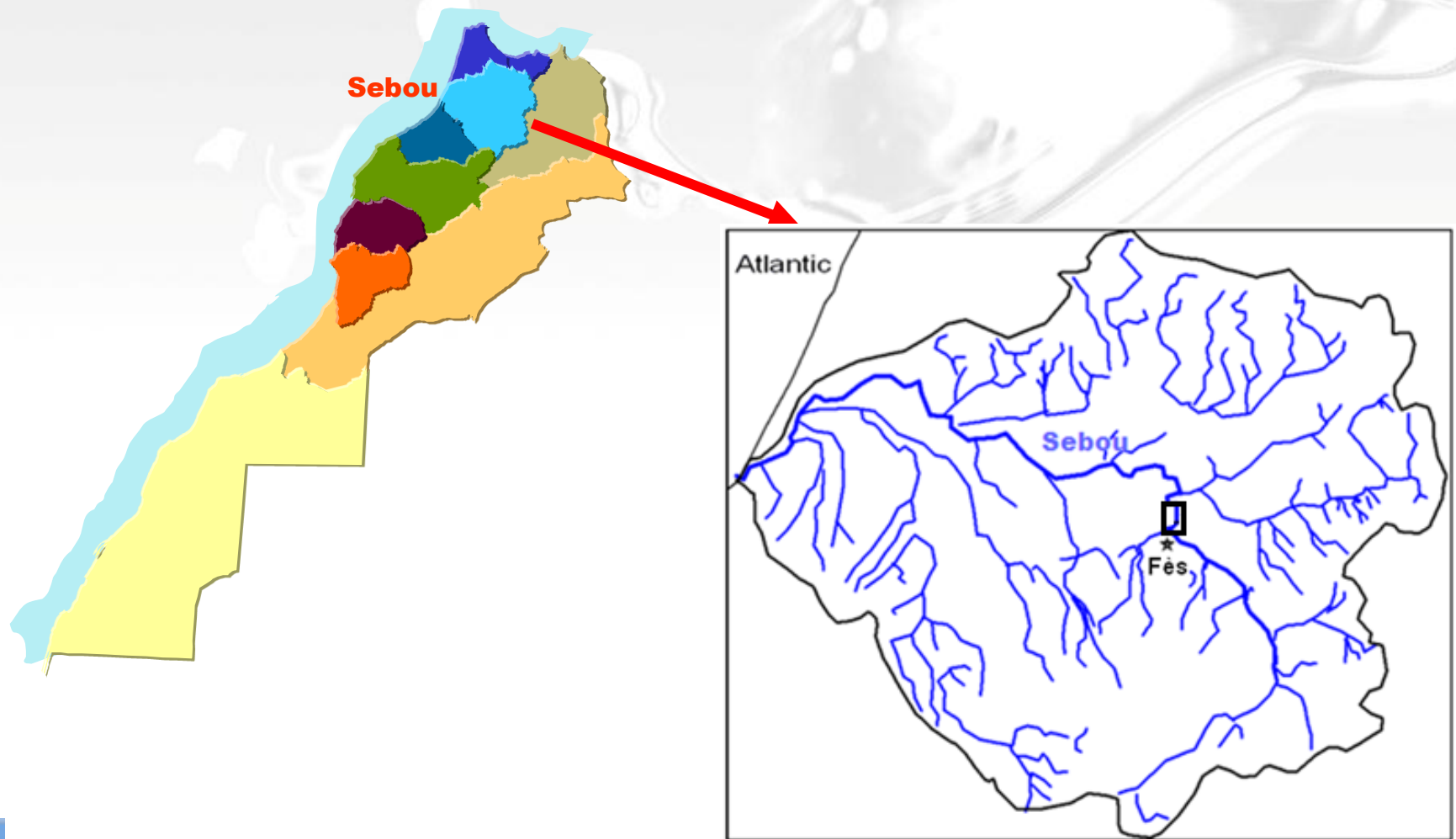


SURFACE WATERS

Watershed authorities



Sebou watershed hydrographical network



Surface waters in the Sebou

Total area	40 000 km ²
Annual average rain	600 mm
Surface water storage	5600 Mm ³ /y
Total capacity of dams	5836 Mm ³
Regularized volume	2600 Mm ³ /y
Regularization rate	46%
Discharge in the sea	1500 Mm ³ /y

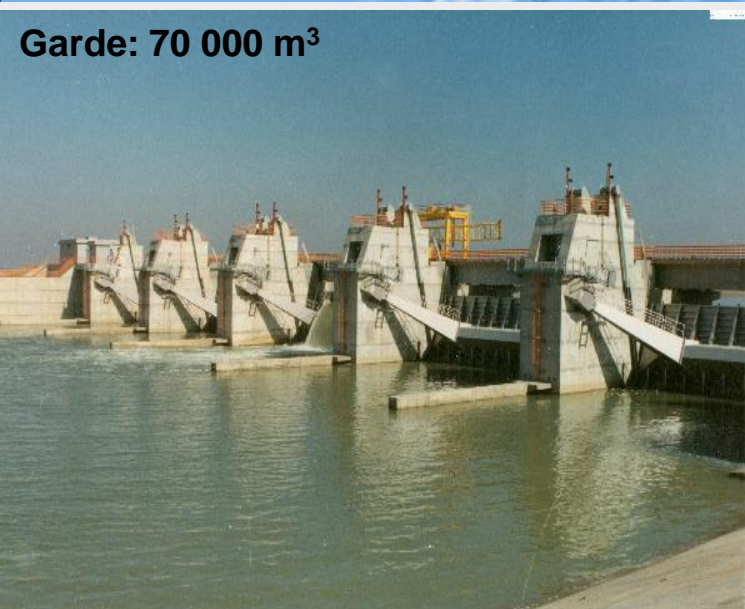
Source: DRPE, 2014

Surface water storage

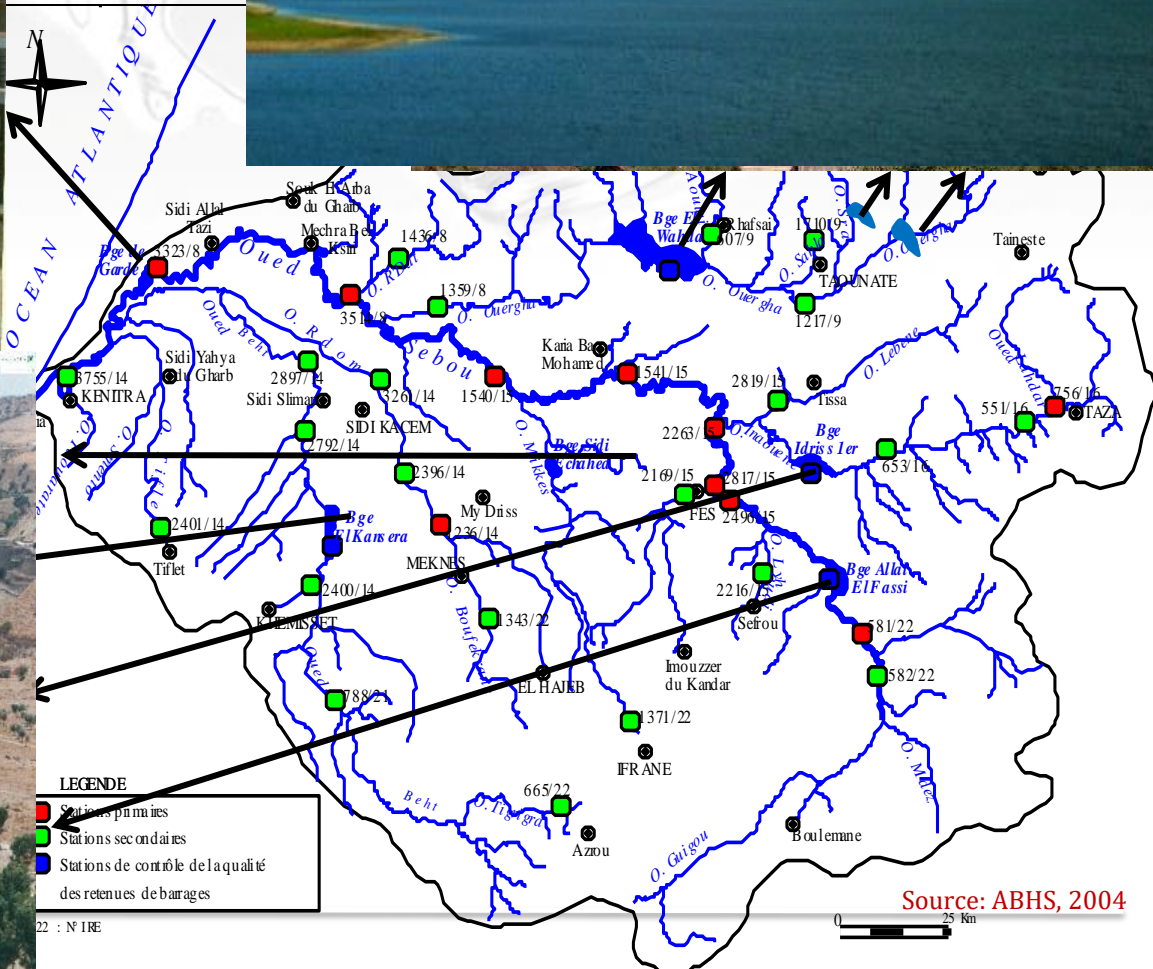
Al Wahda: 3713.8 Mm³



Garde: 70 000 m³



Idriss 1st: 1156.8 Mm³

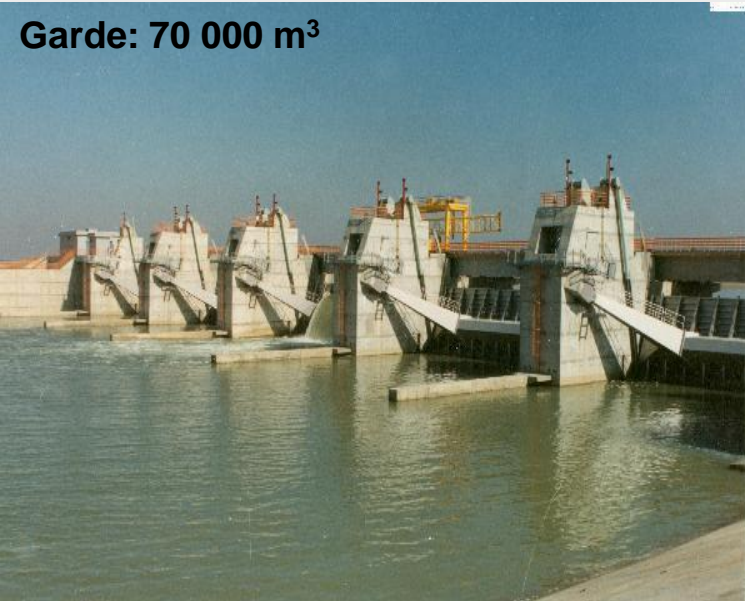


Surface water storage

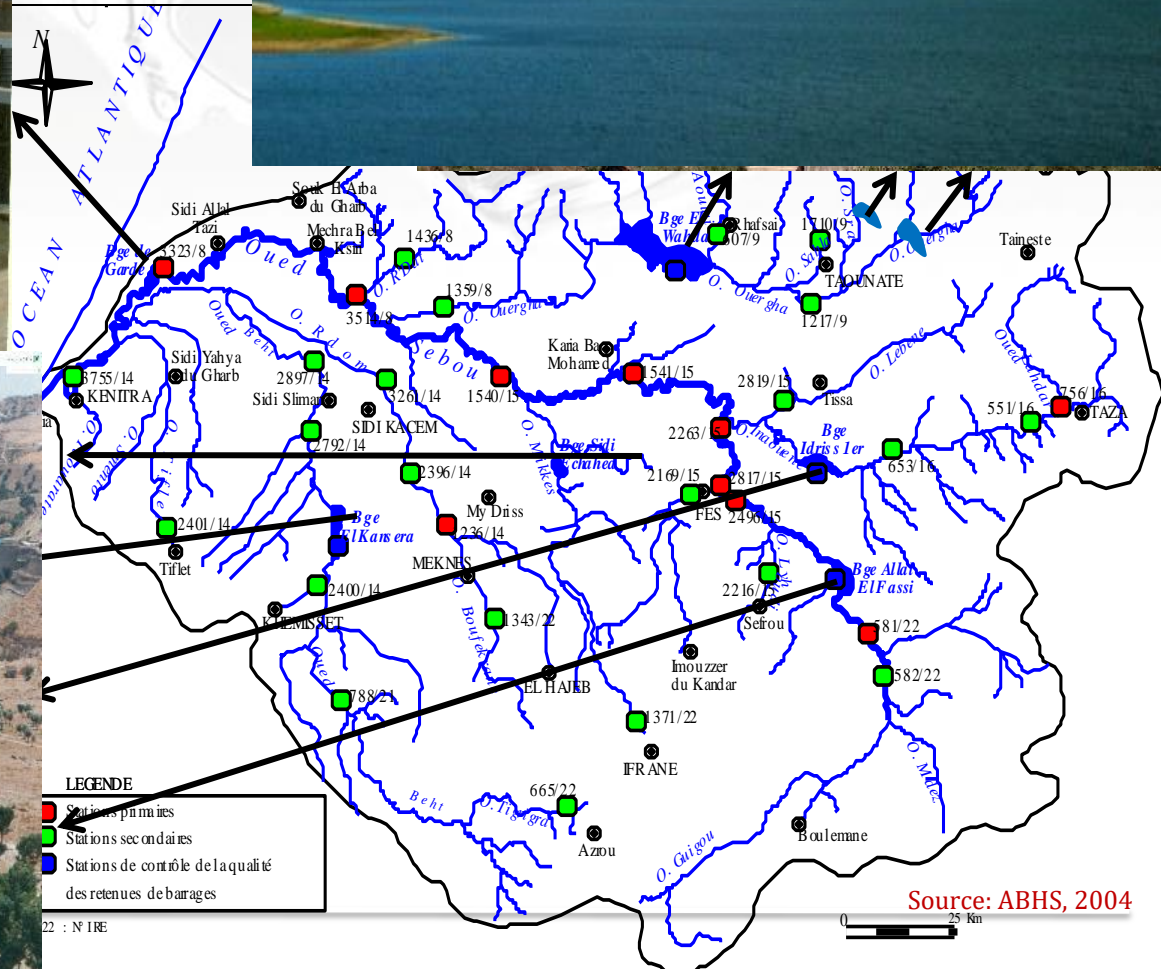
Al Wahda: 3713.8 Mm³



Garde: 70 000 m³

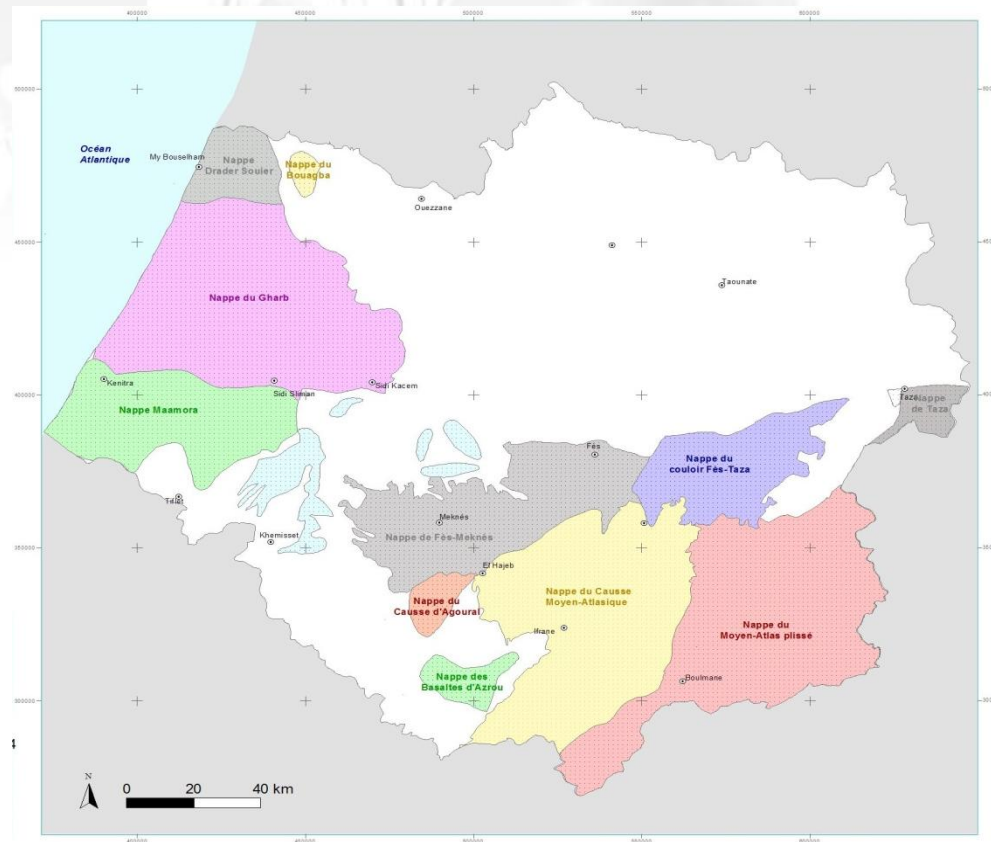


Idriss 1st: 1156.8 Mm³



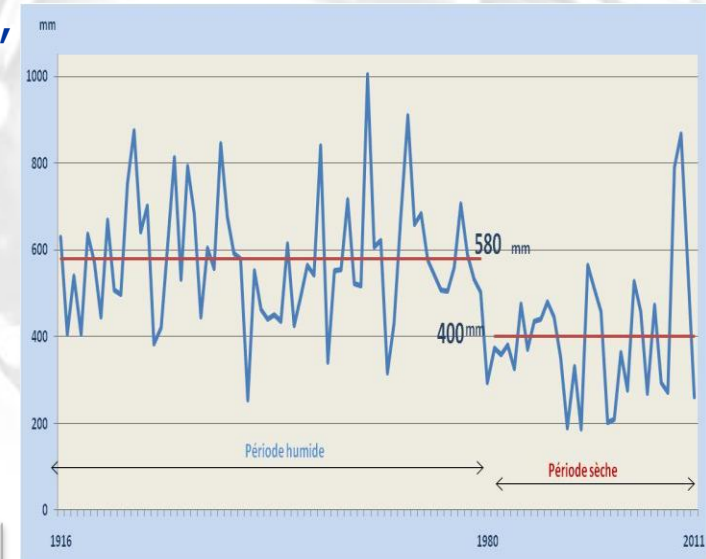
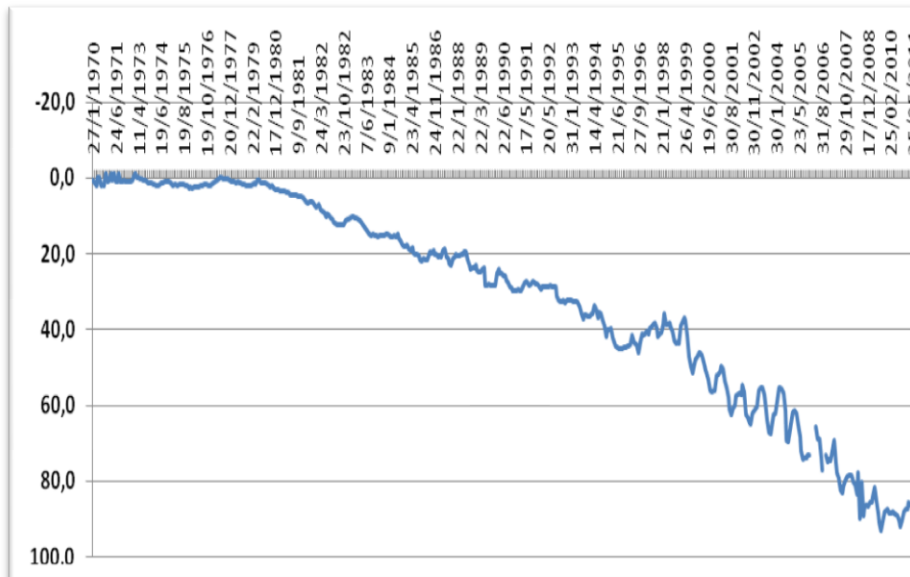
Main aquifers

Sebou is the most important Moroccan watershed regarding groundwater budget, with up to 1020 Mm^3 of mobilized waters which represent about 25% of controlled groundwater in the country.

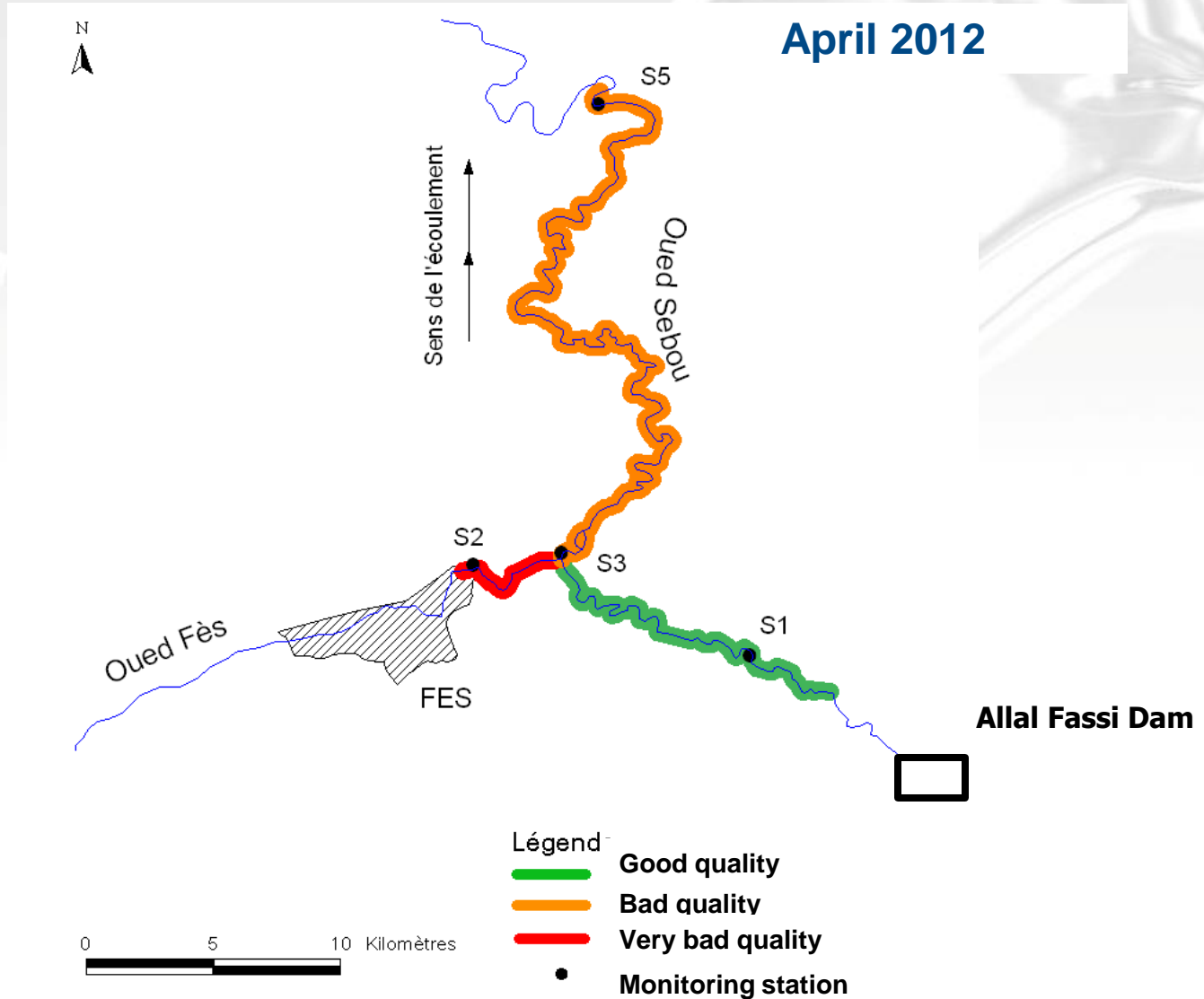


Problems and constraints

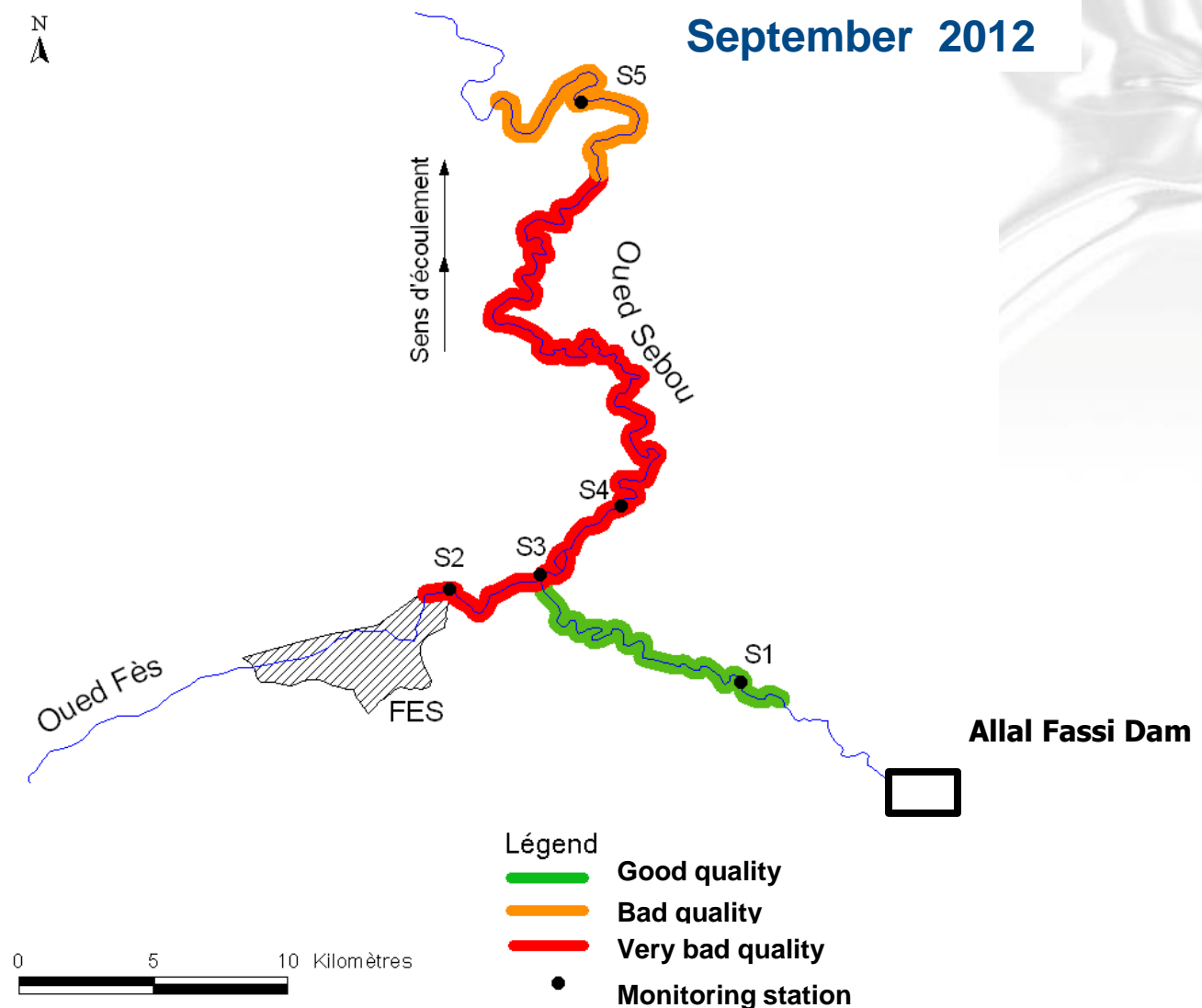
- Irregularity of water resources (time and space),
- Over-exploitation of groundwater,
- Sediment problems in Dams,
- Large water losses in the sea
- **Pollution.**



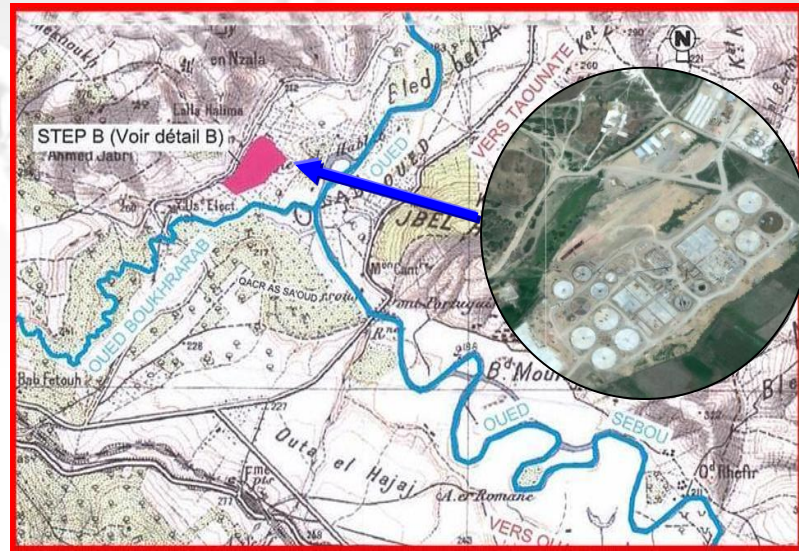
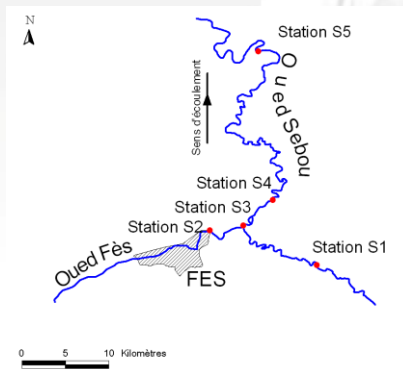
Variation of surface water quality (high water)



Variation of surface water quality (low water)



The WWTP in Fez



- Global cost: 1,104. Mdh,
- Works begin: 15 February 2010,
- Works end: 31 December 2013,
- Starting: 1 January 2014.

Performance of the WWTP in 2015

		janv-15	févr-15	mars-15	avr-15	mai-15	juin-15	juil-15	août-15	sept-15	Moyenne
Débit moyen (m3/j)		70872	96910	36087	41422	73257	95934	102564	91259	79336	76405
ENTREE moyenne (mg/l)	DCO	1226	1177	1556	1329	1377	1146	1082	1049	1001	1216
	DBO5	626	503	608	495	474	439	452	429	481	501
	MES	434	504	497	540	540	421	431	419	494	476
SORTIE moyenne (mg/l)	DCO	193	102	107	103	102	112	104	107	113	116
	DBO5	19	11	12	13	14	16	18	18	18	15
	MES	55	11	16	22	20	23	19	26	27	24
Rendement épuratoire moyen %	DCO	84	91	93	92	93	90	90	90	89	90
	DBO5	97	98	98	97	97	96	96	96	96	97
	MES	87	98	97	96	96	95	96	94	95	95

RADEEF, 2015

Agriculture in Sebou

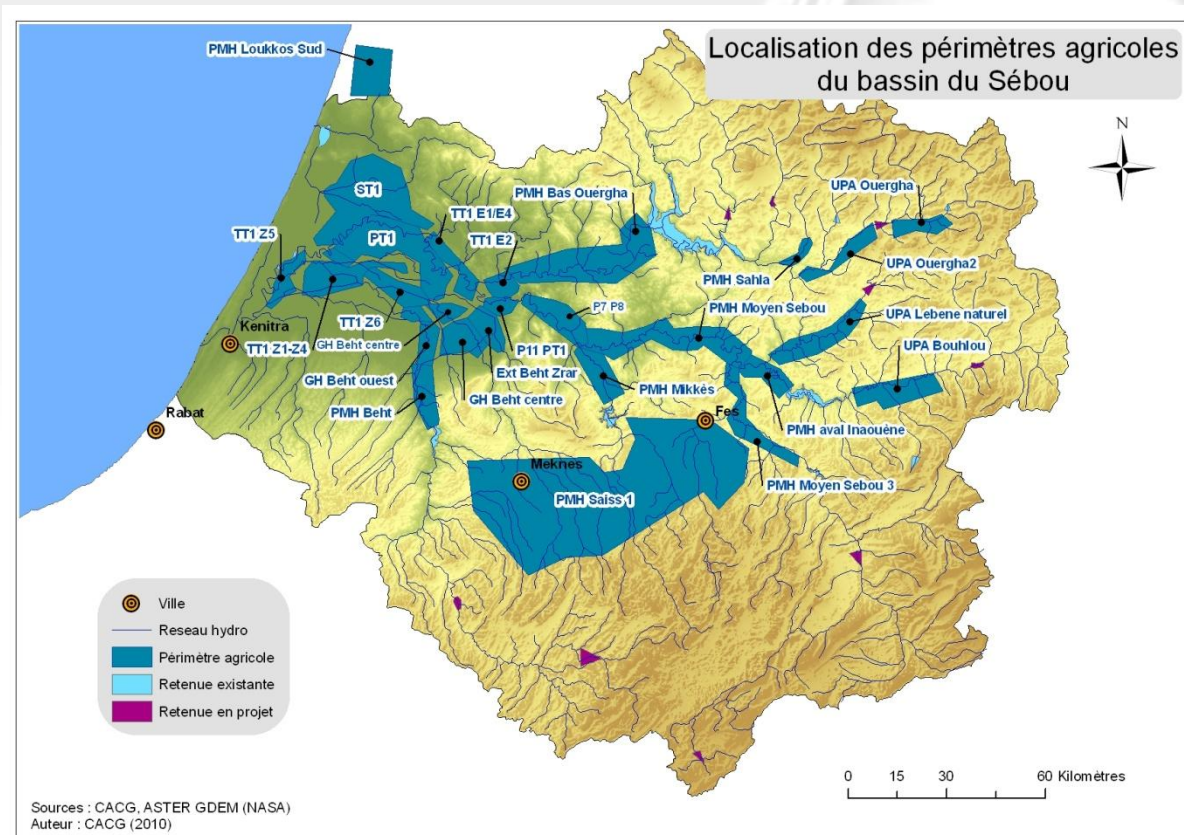
Sebou watershed: the most important area regarding agriculture vocation with up to 20% of the useful irrigated area in Morocco (1 800 000 ha).

Diverse soil occupation:

- ✓ Large dominance of cereals (60%)
- ✓ Fruit plantation (14.4 %),
- ✓ Vegetable crops (6.6 %),
- ✓ Industrial agriculture: Beet and Sugar cane (4.2 %),
- ✓ Olive trees (3.6 %),

Etc...

Irrigated areas in Sebou watershed



Thank you

