

Sustainable Domestic water use in the Mediterranean Regions

SWMED pilot areas in Tunisia:
places, target groups and stakeholders involved

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CERTE

2nd Project Meeting – Tunisia
Steering Committee 27 september 2012

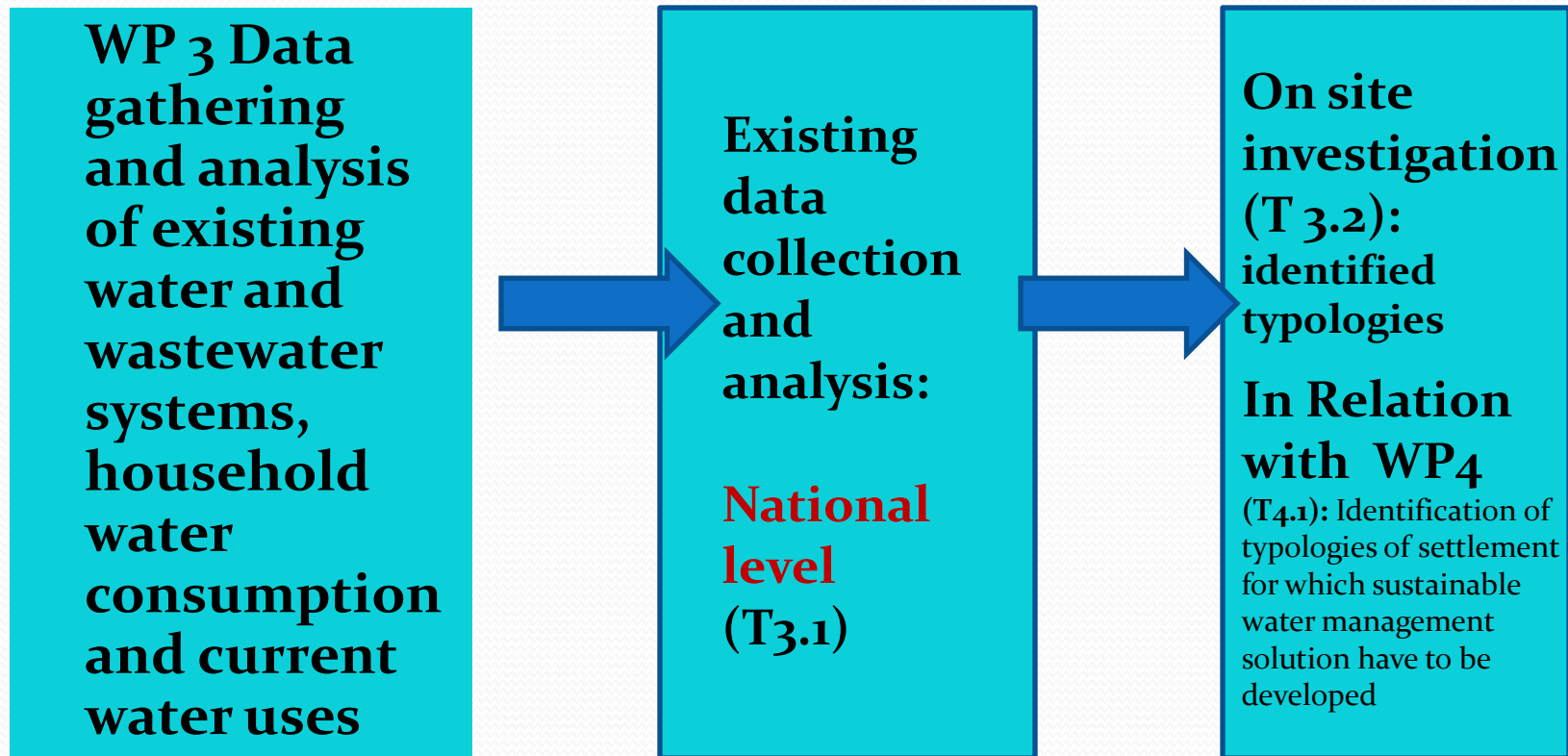


**ENPI
CBCMED**
CROSS-BORDER COOPERATION
IN THE MEDITERRANEAN



SWMED PROJECT – CONTRACT N° 10/2177

WP3



On site Investigation



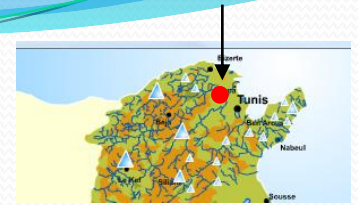
1-Rural settlement with in-house water distribution systems but no sewage system (individual sanitation)

2-Rural village with in-house water distribution systems with partially sewage system and without treatment plant

3-Urban areas with prevalence of multi-floor buildings: in house water distribution systems and sewage systems and treatment plant.

1-Rural settlement with in-house water distribution systems but no sewage system (individual sanitation): Chorfech 24 (Part 1)

Chorfech



24 Km in the NW of Tunis



Location: ARIANA
(Urbanisation 90,8%, water supply 99,9%, Sanitation 90,5%) 2011
Name: Chorfech 24 (Part 1)
Hab: 180, 2020: 262
House: 39

Target groupe:
Habitants
Water and Sanitation actors
in rural area

350 habitants, 50 houses

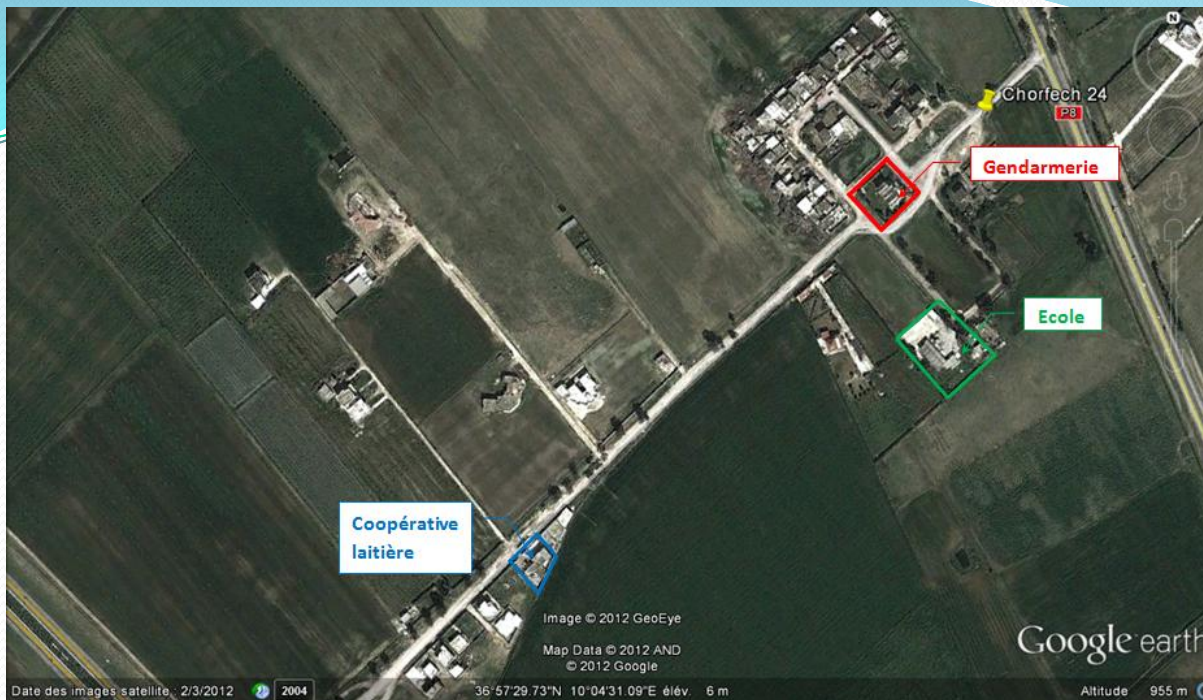
Division of Chorfech 24 in two parties

WWTP: Flow 17 m³/day
Septic tank + CW (H-V-H)

Stakeholders Involved:
ONAS, SONEDE, Local
authority



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PROGRAMME



Survey :

- Water origin, consumption and sanitation
- Water Domestic equipments and use frequency
- Social situation and information in habitants (Nb)
- House area
- Rainwater harvesting, water reuse
- Irrigation and/or livestock
- Public building
- Industriel building

Example of collected Datas (Analysis ongoing)

House Characteristics			
Repartition based on type %		Repartition based on area, %	
Individual	59,26		
Semi collective	40,74	<300 m2	0
100% de propriété		Between 300 and 500 m2	81,82
Repartition based on room number		Between 500 and 1000 m2	3,03
		>=1000	15,15
1 room	0	Equipment, Average	
2 rooms	17,14	Tap water	2,9
3 rooms	51,43	shower	1,0
4 rooms	20	WC+flushing	1,0
5 rooms and more	11,43	Access to Washing machine%	97,4
Number of House	39	There is no use of water saving equipment	

Potable water consumption			
Average m3/year/household global	256	Average l/day/hab global	164
m3/year/household domestic	176	Average l/day/ hab domestic	129
total (m3/year)	9746	interval	50-250

Characteristics Household

Average Nb hab	4,3		
Average Age	34	Data available, number	10
Breakdown by professional category %		unemployed person, retired	7,89
Senior manager	2,63	Daily or seasonally worker	7,89
Worker, tertiary	18,42	Permanent worker	2,63
craftsman	10,53	Public service	47,4
Worker, industry	2,63	Total Population	167

Agricultural Data

House Number	4	Water source	2 SONEDE and 2 Madjerda
		Consumption, SONEDE, m3/year/household	24
Type	fruit trees, fodder shrub	Consumption, Madjerda, m3/year/household	216
Irrigation type	Drop by drop	Concerned house	1/3/26/29

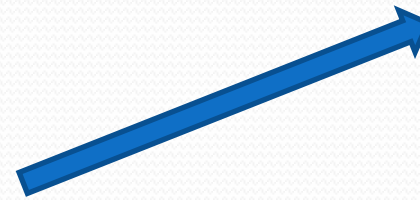
Animal data

Nb of « Elevage »	9	Water origin	SONEDE
Nature	bovine (mainly dairy cattle) and sheep	Total consumption m3/Year	1328
Nb animal	19 dairy cows, 92 sheep, 22 bovine	Concerned houses 14/17-2/18-2/19-2/21/23-2/12/2/6	
Permanence	8 permanents and one in summer and the approach of Eid		

School of Chorfech

SWM Options

- Rainwater harvesting : Toilet Flushing
- Black water: Septic tank + H CW, gardening (drop by drop)
- Potable water (SONEDE): Drinking
- Dry Urinals (collect of Urine)
- Water metering (SONEDE, rain water use)



Monitoring, Example (analysis ongoing)

(n=6) paramètres	Septic tank E1			Septic tank E2			Septic tank E3			Out put CW E4		
	Min	Moy	Max	Min	Moy	Max	Min	Moy	Max	Min	Moy	Max
pH	7,41	7,66	8,1	7,72	7,84	8,23	7,78	7,92	8,27	7,55	7,74	8,22
CE	2,72	3,03	3,27	2,51	2,87	3,14	2,4	2,75	3,05	1,5	2,12	2,64
MES (mg/L)	840	1141	2140	390	573	690	200	418	570	10	81	180
DCO (mgO ₂ /L)	320	1153	3640	80	420	880	160	400	800	80	153	320
DBO ₅ (mgO ₂ /L)	300	475	1000	140	196	270	40	95	140	4	17	40
PO ₄ ³⁻ (mg/L)	21,61	41,48	85,01	15,44	42,82	88,71	11,65	27,35	63,4	0	4,79	9,4
NH ₄ ⁺ (mg/L)	171,42	223,65	287,72	191,87	220,62	253,57	163,12	181,37	198,85	17,72	71,42	125,62
NTK (mg/L)	271,6	282,52	291,2	260,4	279,4	296,8	232,4	270,29	285,6	26,88	81,01	146,16
NO ₃ ⁻ (mg/L)	0,15	0,69	1,43	0,17	0,34	0,56	0,1	0,23	0,38	0	0,28	0,74
NO ₂ ⁻ (mg/L)	0,06	0,08	0,12	0,03	0,07	0,12	0,02	0,05	0,08	0,01	0,37	0,8

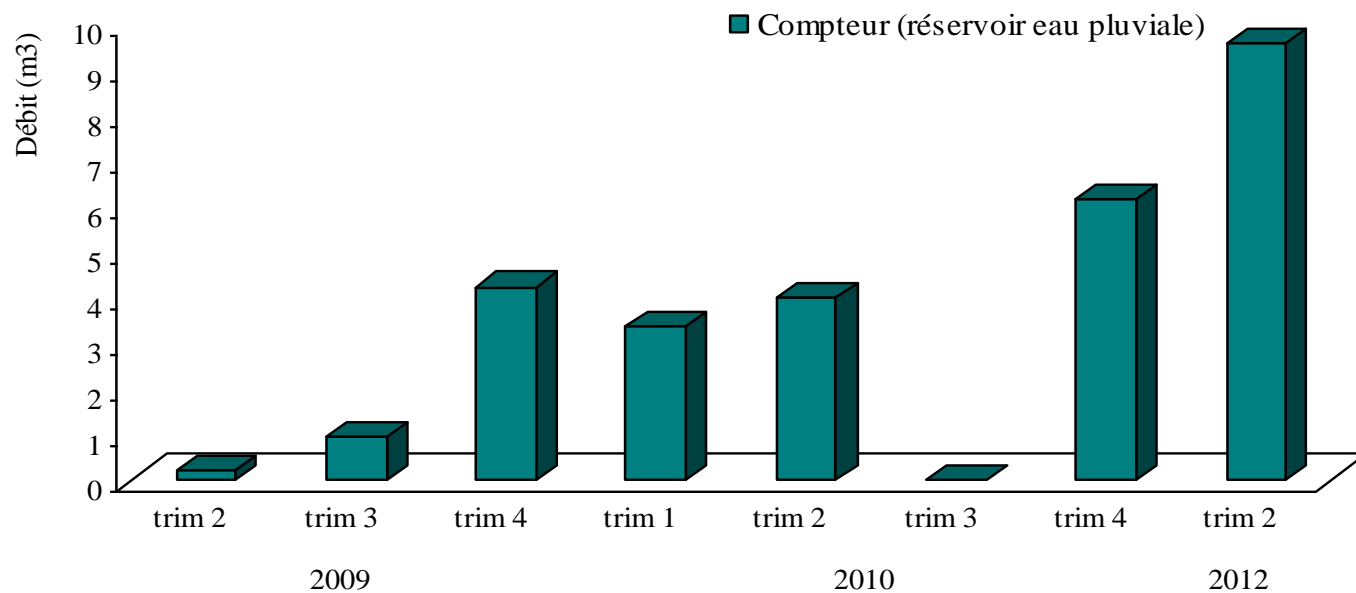
+ bacteriological analysis

Black water, 2012

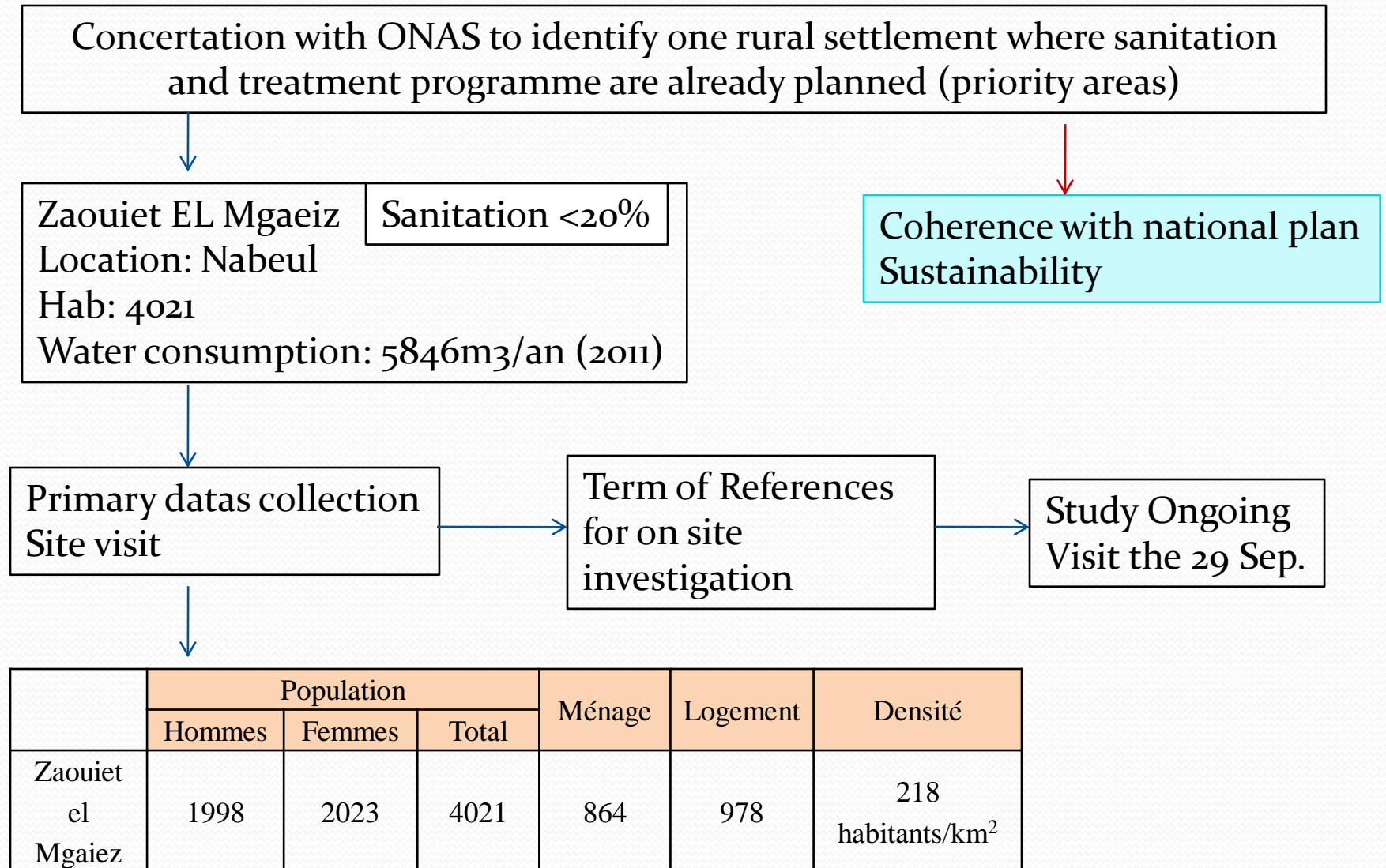
Water consumption

SONEDE	(2005) m ³	(2006) m ³	(2007) m ³	(2008) m ³	(2009) m ³	(2010) m ³	(2011) m ³	(2012) m ³
Débit spécifique (m ³ /j)	1,808	1,405	1,267	DND*	0,901	0,616	0,919	
Consommation (l/j/élève)	17,8	9,8	6,29	DND*	7,9	5,6	8,3	7,3

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2-Rural village with in-house water distribution systems with partially sewage system and without treatment plant

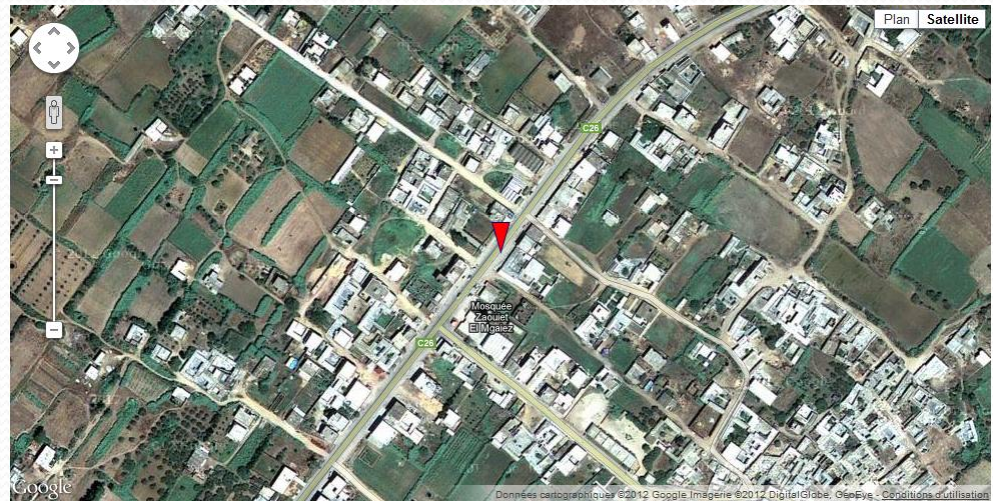
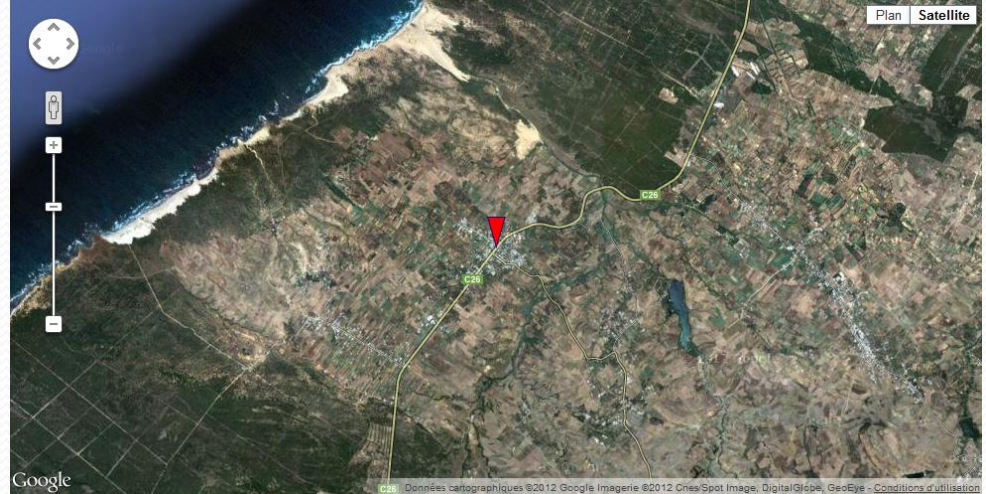


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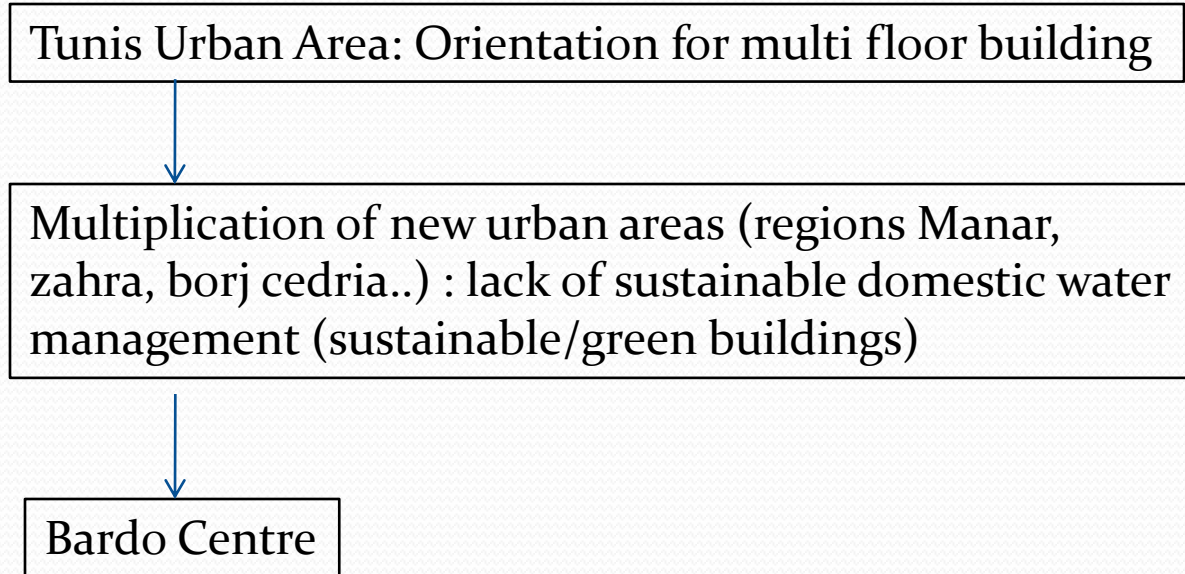
Target groupe:
Habitants
Water and Sanitation actors
in rural area

Stakeholders Involved:
ONAS, SONEDE, Local
authority, NGO



Coherence with H2020 programme

3-Urban areas with prevalence of multi-floor buildings: in house water distribution systems and sewage systems and treatment plant.



LE BARDO

Population	68 976
Rate of Growth	-0,34%
Nb of household	177999
Average household size	3,95
Water supply rate	99,90%
Connexion rate to sanitation system	98,40%
Bath room rate	67,10%
Average density habitants/km ²	10011
Nb Household	19594

Water consumption per activity (mille m3)	
Domestic	2743,4
Industry	5,1
Sanitation system	
Nb Subscribers	18837
WWTP(charguia)	-
Pumping station	0
Network	87965
Rain water (sabket Sejoumi)	

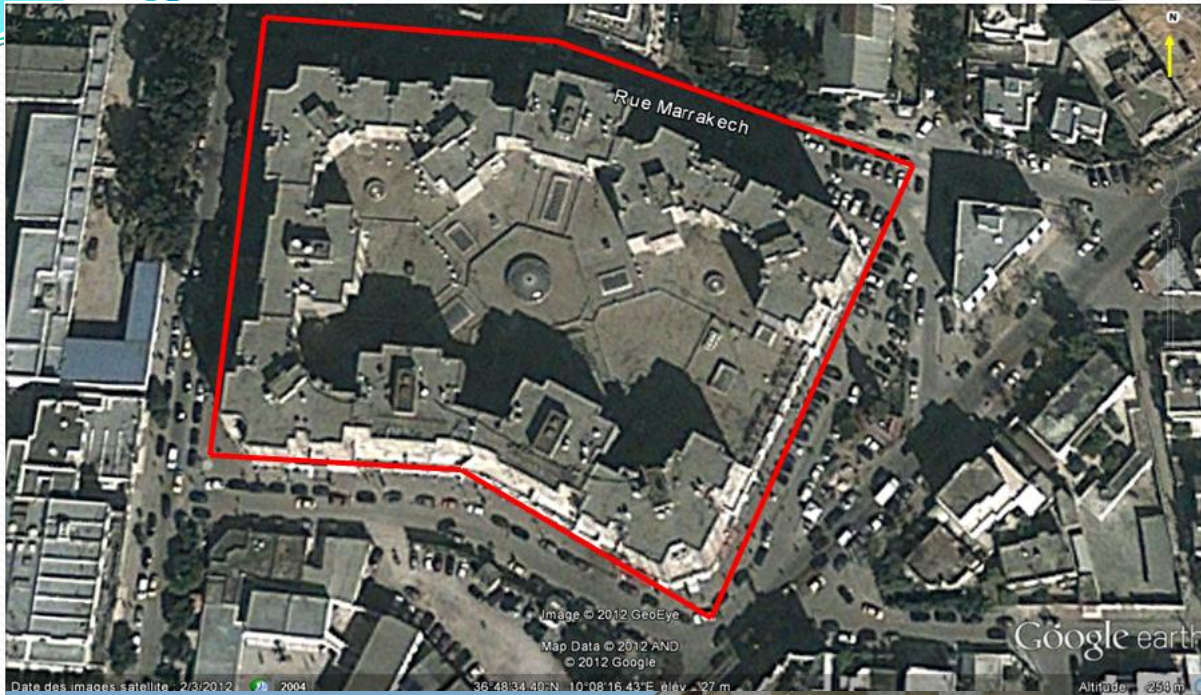
2004-2008



Target group:
Habitants
Water and Sanitation actors
in urban area, Architect,

Stakeholders Involved:
ONAS, SONEDE, Local
authority, Syndic

BARDO Centre



Building: M +5 floors
10 Buildings
Small stores
Supermarket
Offices (doctor, lawyer,...)
Inside commercial area

Primary data collection

Survey: N° 5 to N°10



Nb Dr. Offices: 46, Answer: 8
Nb Stores: 26, Answer: 14
Nb apartments: 80, Answer: 9
Water consumption during august:
1 store 146l/day
2 doctor offices (70-300l/day)
6 apartments (300-700l/day)

Examples of Datas: (ongoing analysis)

Characteristic of household			
Size of household		Average number	
3 room	37,5	Tap	4,22
4 room	50	Shower	1
5 room	12,5	WC (+ flushing)	1,44
Average size	3,75		
Air conditionner %			77,7
		Washing machine rate %	8
Yes	88,89	Air conditionner, average number	2,13
Discharge %		Nb of clothes washing/week	3,38
Natural system	40	Nb of cleaning/week	4,67
Cleaning	40	Average area m ²	145
network	20	Average household size	3,5

Commercial consumption (Shops)		Consumption Offices		Consumption Hab	
Average consumption		Average consumption		Average consumption	
m3/an	227	m3/an	68,5	m3/an	189
m3/an/m ²	1,3	l/day/user	47	l/day/hab	173
l/day/user	104				

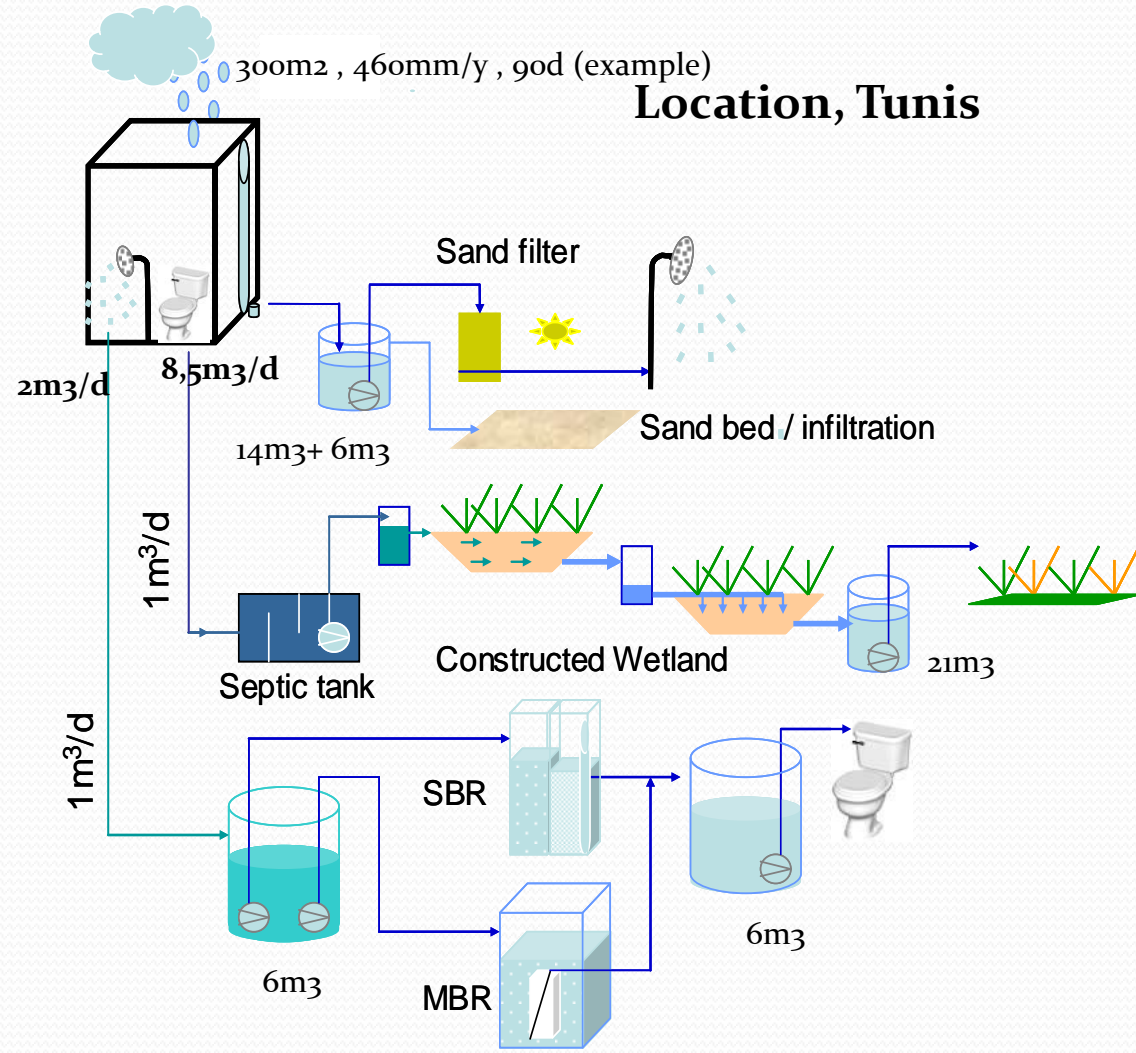
WP6: Dissemination among households, water utilities and construction companies of best practices tailor-made for each local situation and definition of policies to promote them

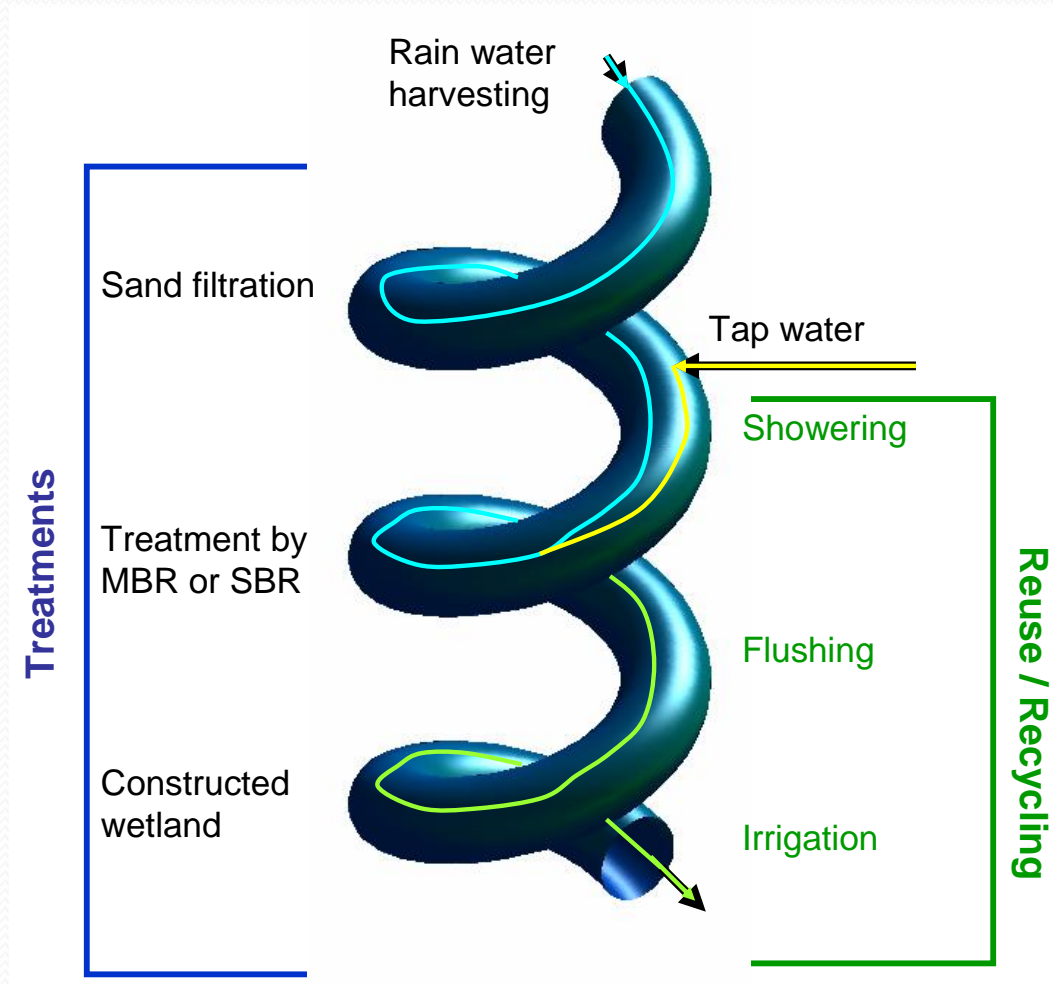
Task 6.4 Creation in MED countries of a SWM house

1- CERTE- TDC

www.zero-m.org

- Student Housse
(3 floors, 212 students)
- Joint areas for: Hand-Washing, showering and toilet
- Separate Grey/black water discharge
- Floor 600m²





Photos



TDC will be part of ***SWM house***, where it will be possible to see examples of different SWM techniques and solutions, in order to display how is possible rationalizing water use both at private and community level.

The TDC (CERTE) will be used as laboratory for monitoring the water quality (raw and treated) coming from the TDC itself (urban wastewater) and from the rural settlement of Chorfech. This monitoring will provide the necessary data for the project.

Ongoing Actions:

TDC diagnosis for optimisation plan

Raw water s qualities monitoring

SWM house: identification of suppliers for consultation and location

Exploration of other techniques to implement: solar photocatalysis



2- 5000 water saving kits to be freely distributed to citizens and visitors of SWM houses. The kit will be composed by 2 low consumption taps and one flow reducer for the shower and one information leaflet in the local language.

Ongoing action: Concertation with SONEDE to make this operation more informative and sustainable : to target public building.

Coherence with water saving strategy

Synergy? Complementarity?

Standard Project, Priority 2 Promotion of environmental sustainability at the basin level

Measure 2.1 Prevention and reduction of risk factors for the environment and enhancement of natural common heritage, 10 projets

Title	Leader	TN Partner Demonstration site
De l'expérimentation à la diffusion de l'Ecolabel en Méditerranée (ShMILE 2)	Chambre de Commerce et d'Industrie Nice Côte d'Azur (France, ProvenceAlpes-Côte d'Azur)	CITET, INORPI
Management of port areas in the Mediterranean Sea Basin (MAPMED)	University of Cagliari	Fac. Sc. Tunis
AQUA KNOWledge and Innovation transfer for water saving in the mediterranean basin AQUAKNIGHT	Institute of Communication and Computer Systems (Greece, Sterea Ellada)	SONEDE , COMETE Eng.

Strategic Call: *solar energy* (6 projects out of the 19 selected), followed by *sustainable tourism* (5 projects), *waste treatment* (3 projects), *agro-food industry* (2 projects), ***integrated coastal zone management*** (2 projects) and ***water management*** (1 project). www.enpicbcmmed.eu

Synergy? Complementarity?

5 projets

SWIM Demonstration Projects Title	Leader	TN Partner Demonstration site
Adaptation to Climate Change of Mediterranean Agricultural Systems (ACLIMAS)	CIHEAM-IAMB, Italy	INAT (Capbon, Manouba, Saida, Mhamedia, Grombalia – North-Eastern Tunisia)
Innovative Means to Protect Water Resources in the Mediterranean Coastal Areas through Re-injection of Treated Water (IMPROWARE)	Italian Ministry of the Environment, Land and Sea (IMELS) - Italy	ONAS (Korba)
Network of demonstration activities for sustainable integrated wastewater treatment and reuse in the Mediterranean countries (Sustain Water MED)	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Jordan)	ONAS (Medenine)
Récupération de l'eau et techniques agricoles sur les terres arides : un modèle intégré et durable dans les régions du Maghreb (SWIM-WADIS MAR)	University Sassari, Italy	IRA (Medenine)



MERCI

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