

# WEBINAIRE

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## SOLUTIONS BASÉES SUR LA NATURE – NBS – POUR LE TRAITEMENT ET LA RÉUTILISATION DES EAUX USÉES ET DES BOUES D'ÉPURATION EN MÉDITERRANÉE

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### Potential for water reuse in the Mediterranean region



This is a presentation beyond the classical approach

No figures / numbers: You can find it in a lot of publications. No need to repeat common knowledge

For sure you attended many meetings or read several papers where used to be this numerical approach



# Main features which governs the present reuse conditions



# Specific present features of the Mediterranean basin

- Focal point for the CC negative variations
  - Less water
  - More concentrated rain (more storms)
  - Reduction of fresh water long-term reserves  
(glaciers, groundwater disappearing)
- High population density in the seaside
- Clear differences North-South (economic and social)
- Immigration pressure
- Deforestation



# Additionally, the present reuse conditions in the Mediterranean are mainly (that)

Most affected by the Climatic Change

Natural water reservoirs are disappearing (glaciers, soils, wetlands, ...)

An overexploitation of water resources (both Surface and Groundwater)

Changing rules and regulations

Lack of social acceptation

Lack of political willingness

Quite only engineering in the basis of the projects

Lack of knowledge of reuse conditions & circumstances



All the indicated requires additional resources, but

- **Rainwater harvesting** reduces runoff and recharge
- **Ecological flow reduction** is **not acceptable**
- **Greywater use/reuse** reduces the amount of water reaching the WWTP / increases concentration of pollutants

- **Reclaimed (waste)water use** reduces river flows and increases the energy necessary for advanced treatments + some ecology-related problems

**CONTRADICTIONS?**



In any case, with reuse :

Mainland groundwater recharge is reduced /  
compromised and it is worst in the small  
islands

Rivers / aquifers become disconnected

Then, less natural regulation

Great changes in the theoretical water cycle



Some main “activist stakeholders” defend, among other, that

- Reuse should be limited to the coastline
- Reuse for certain activities should be limited (e.g. golf irrigation)

Apart

- The present users think they are acquiring water rights
- Some limitations must have great environmental impacts



# More

Considering all the previous, it seems that the future of wastewater reuse has to be dealt with an holistic point of view; i.e. within a nexus approach

One of the present disfunctions is to simplify the approaches by reducing them to hydraulic engineering, accompanied sometimes by agriculture and health



Nevertheless,

There are several differences in terms of “first-hand” water availability all around the basin

Several regions are producing high amounts of vegetables, fruits and the like

Many places are devoted to tourism



... and also important

- Health constraints
- Analytical work and data exploitation
- Relationships with the other water resources (i.e. global management of water resources)
- Considerations in relation to Ecology in its several aspects
- Relationships with urban water supply
- Real political willingness
- Interactions with the end-users
- Overexploitation



## Additionally, other features under discussion

- Relationships with the climate change
- Brand new rules, regulations and recommendations, as well as international documents on the subject (ISO, WHO et alia)
- Most adequate treatments, including the possibility to use NBS
- Subsidies either legal or not, and other economy-related aspects



Conditions are changing in the North side of the Mediterranean (new EU rules in effect June 2023) “copied” from Australia, New Zealand, etc.

Not common approaches in the South (reuse in Morocco, Algeria and Egypt)

Well developed in part of the East side (Israel, Jordania)

Political instability in some countries

EPA, ISO et alia are also important actors



Can you add something?

Like the following?



Development of some characteristics (the ones I like / know the most)



## Economy

Theoretically, a cost-benefit analysis should determine if reuse is logical from the Economic point of view (for the end-user)

Nevertheless, there are quite “legal” ways to make reuse feasible; i.e. open or hidden subsidies

The selected treatments must consider its adequacy in terms of economy

Economy of the control & bureaucracy: who pays for it (see next)



## More on Economy

Not only the treatments suggested / compulsory must be considered, but other economic “inputs” should be included:

- Distribution expenses
- Analytical costs and the interpretation of results
- Technical assistance
- Who pays the civil servants tasks?
- Bureaucracy (farmer’s associations / cooperatives?)
- R & D (universities, research centers or private)



# Technology

Hard?

Nature based?

Other?

WHICH ONE?

- There is an specific answer for every site, which depends on the size and local conditions
- At present, the ecological climate (sometimes fundamentalist) divert / govern solutions
- But also...



## Selection of technologies for secondary and advanced treatments

There are some indications that the treatment plants' managers feel more comfortable using “hard” instead of “soft” technologies

It seems to be a matter of management capacity to operational problems

The soft technologies need “biological” instead of “engineering” answers



# The role of NBS

- Less concrete / cement
- Use the nature (less energy)
- Many real successes but not so much benefits on the construction
- It seems that large companies do not like those approaches (either implementing and maintaining)
- Then, it is a site by site fight to implement it

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# Tourism

- Summertime tourism is a main activity in many areas of the basin
  - High quality (golf, upper class resorts ...)
  - Mass / cheap tourism
  - Cruises
- Higher demand when resources are very scarce (summertime):
  - no / scarce rain /droughts
  - high temperatures



- Activists against tourism, irrigation (golf, maize...)
- Increase of local vegetables demands



## Health

There is a complicated relationship among the reuse side (agriculture, engineering, resources management)

Apart from the analytical tasks and the capacity to interpret them and detect the possible mistakes / inadequacies; other aspects must be considered



The number and types of required analysis is increasing in an exponential way

- Physical (SS, EC, microplastics
- Chemical (classical, microcontaminants, endocrine disruptors...)
- Biological (microbiology & parasitology)

Plus

Toxicology, agriculture impacts, vegetal physiology, soil science et alia



## Other

You can easily develop the rest of conditions / aspects by yourself

But I wish to add a few aspects I like, before defining / guessing the future (potential?)



## Politics / politicians

The first time I heard a politician saying how fantastic reuse is, was in 1975...

... and them still say it

Is there a real willingness to launch reuse?

Is there a real management truth?

Reuse is usually started from the bottom...

... and sometimes there is a reaction from above

Reuse is a political gun?



## Reality

When resources are scarce, reuse is accepted if

- the economic development depends on it (Múrcia, Spain over 90%)
- there is a political willingness / vision (Israel)
- for historical reasons (Paris, German towns ...)

The farmers intercept untreated wastewater for irrigation (many places)



## More reality

Rules and regulations seem sometimes to have been issued by reuse enemies

After years of research without success, new teams and firms are appearing, using the gained knowledge (scruples?)



# Communication / Formation / Information

- Not so easy as it seems
- The target audience?
  - + End-users, schools, civil servants, health professionals, neighbours
- Advertising
- Professionals



## Discussion & conclusions

Not all the aspects have been dealt with (no time)

High inertia

Feasible transportation / distribution



# Is there a bright future for reuse?

You are free to answer, but in the present context:

- Climate Change is making the present resources unsafe in many places (especially in the Mediterranean)
- Farmers do not rely on the whole thing
- There is a need to develop additional uses for reclaimed water and find how to return it safely to the environment



- It is hard to deal with the health considerations
  - + Hazard and risk approaches are difficult to understand and apply
  - + It seems more an academic approach than an applicable approximation to the real world
- The Mediterranean is a promised land for reuse



- The new regulations are increasing the costs of reuse control
- Hazard and risk calculations must be perfectly implemented / The zero risk do not exist
- Indirect potable reuse is a reality, but potable reuse is expected in the short term
- Please, less bureaucracy



- Who can interpret and apply all the results and make the risk calculations. Is there a unique specialist on it?



Nevertheless, and apart from the indicated, I feel that reuse will have a bright future in the Mediterranean: high potential

When all the wastewater management systems and treatment plants are implemented, legal reuse will increase



Thanks a lot for the invitation and for  
your attention



Traitement des eaux usées et des  
boues résiduelles par filtres plantés  
et usage agricole durable

