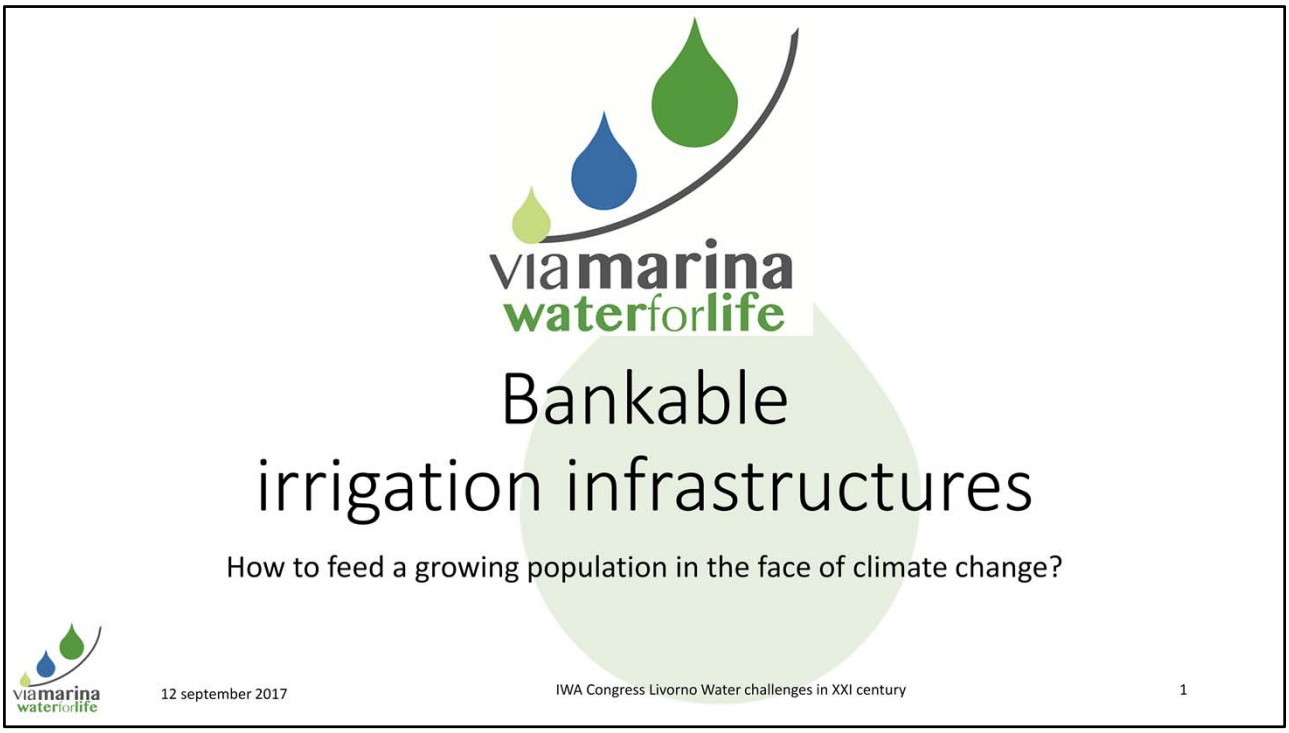
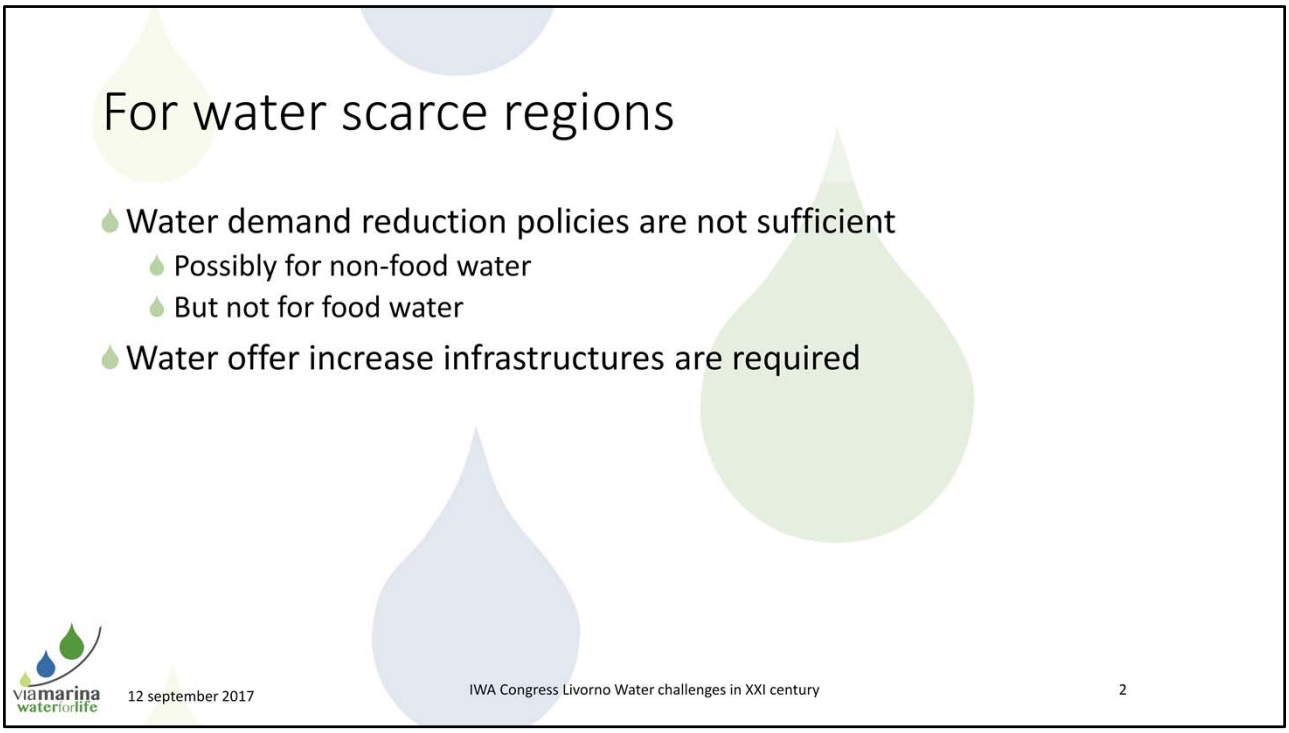


Good afternoon to all of you.

I appreciate that it's a bit redundant and hard to speak about feeding the world just after lunch.

So, bear with me for about ten minutes. And, then, at the end of my presentation, you can have a well-deserved snooze.



Water demand reduction policies, ALONE, cannot meet the challenges facing regions that are really water scarce.

These policies have to be implemented, for sure. And, they will highly contribute to solving these regions non-food water problems. Which is crucial!

But, we all know that non-food water constitutes ONLY about 20% of the overall water problem.

Water offer increase infrastructures are also required. Particularly for food water i.e. agriculture. And they will be innovative ones.

The demonstration of these affirmations goes as follows.

Water Security as per U.N. Water

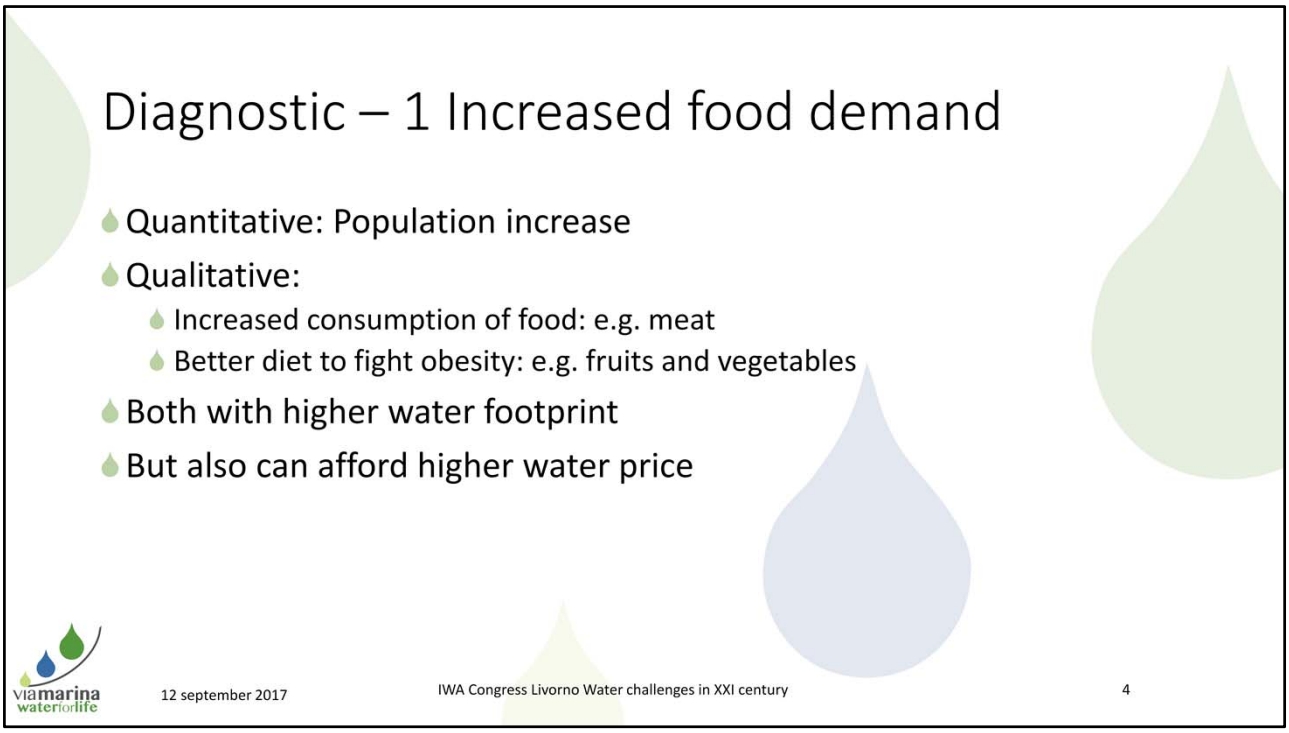
- "*The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining … socio-economic development …, in a climate of peace and political stability*"
- Food – Water Nexus: hence Food Security

Here you have the official definition of Water Security, well-known to all of you.

For the purpose of my demonstration, the important words here are "socio-economic development".

Which leads to Food Security via the Food – Water Nexus.

Not only in the limited meaning of ensuring the basic human needs. But also, and maybe more importantly, with the greater ambition of agriculture development.



First of all, we are about to face an important increase in demand for food.

Not only in quantitative terms to cope with the upcoming 2.5 billion supplementary human beings, i.e. about a 1/3 increase.

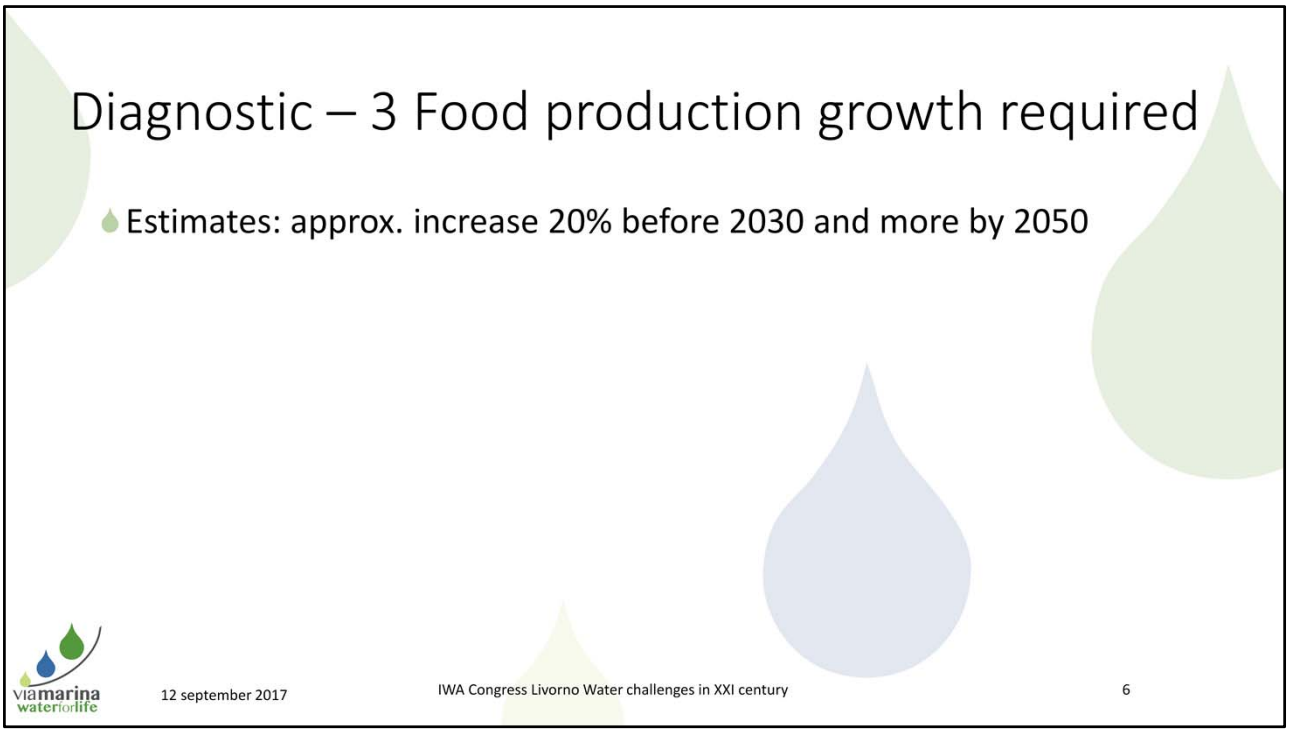
But also in qualitative terms: meat, fruits and vegetables, due to a welcome increase in well-being.

This increased demand for food has two facets:
- on one side, higher water consumption;
- and, on the other side, the capacity to pay a higher price for water.

At the same time, we are faced with the disastrous consequences of Climate Change:

Yield increases seen in some regions and for some crops are more than compensated by larger decreases in other regions and for other crops.

The same occurs with surface reduction. Moreover, it is not of much comfort for an African or South American farmer to know that there is now newly available land in Siberia.



The combined consequence of these two converging negative phenomena is the following:

Basically all experts (for instance OECD, FAO) coincide on the projection that we require a growth in food production by over 20% before 2030 and much more by 2050.

Diagnostic – 4 Irrigated land increase required

- Indeed:
  - Arable land adequately rain-fed cannot cope
  - Deforesting tropical areas not desirable
- Thus, over 40 million hectares of supplementary irrigated land required
- Putting to work marginal land through irrigation: unavoidable
- ⇒ Agricultural water consumption increase: 15% before 2030 and more by 2050
- i.e. approximately 250km^3 per year, or 8000 m^3 per second

Where can we grow these supplementary crops?

Well, arable land now adequately rain-fed is basically already fully producing today.

And, we're already observing the dramatically negative consequences of deforestation in tropical regions.

So, we need to find about 40 million hectares of supplementary irrigated land in surfaces which are today unproductive.

Which will require an increased provision of agricultural water of over 15% before 2030 and much more by 2050.

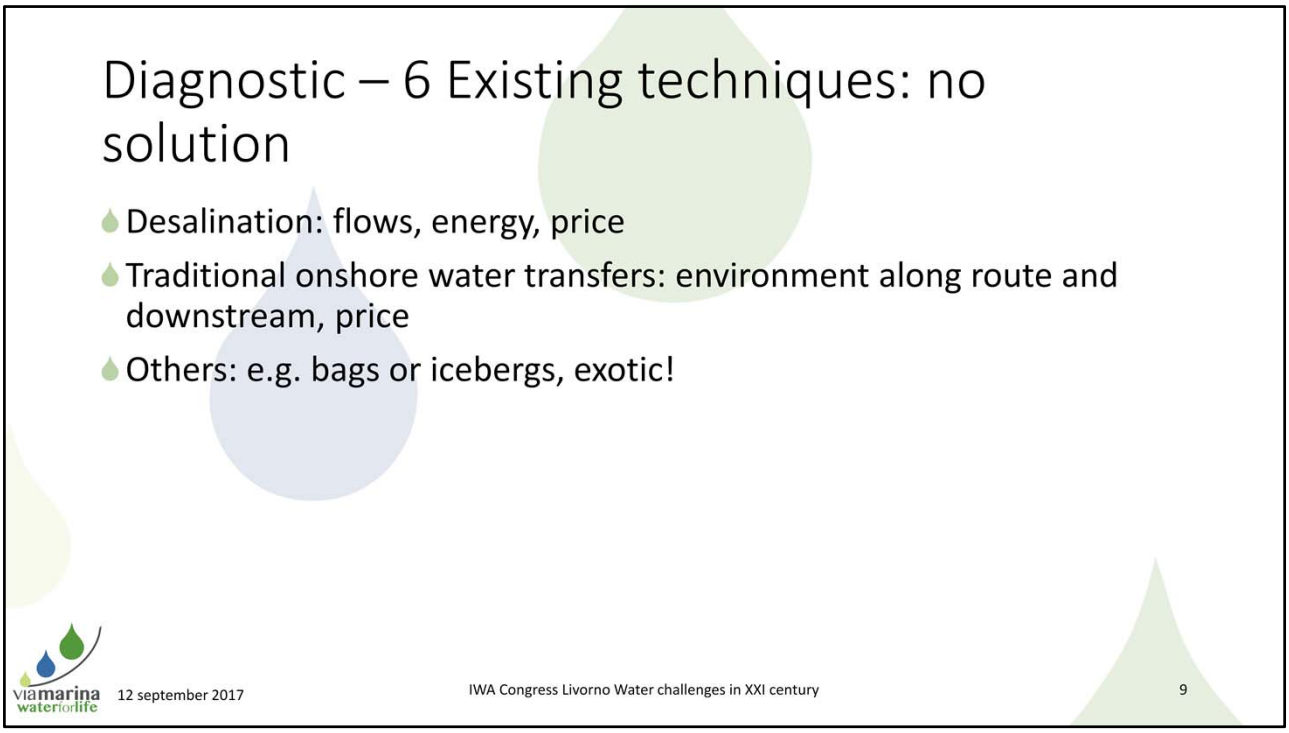
This means new water provision of approximately two hundred and fifty cubic kilometers per year i.e. about eight thousand cubic meters per second.

Let me stress that ALL anticipated productivity and savings gains have been duly factored into ALL those projections.

However, no geographical problem whatsoever to find this supplementary agricultural surface.

Indeed, first, we can find it by enlarging traditional irrigation regions. And then, by putting to work totally barren areas through irrigation. That's called: Green the desert!

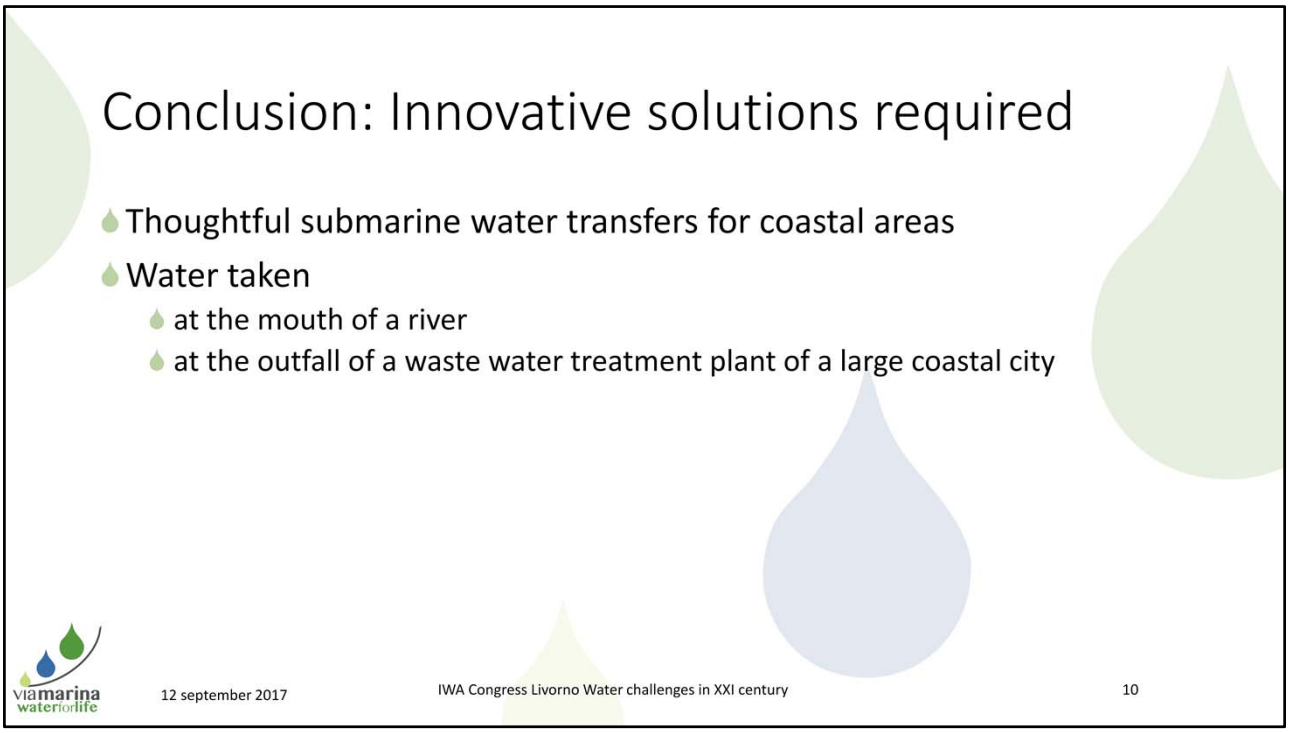
The only requirement is to make enough water available right there.



But, existing water provision techniques are of no help to attain this objective.

Desalination produces limited flows that are not commensurate with agricultural requirements. And. its cost is way above what even the most profitable crops can afford to pay. That's why basically nowhere around the world, desalination is used for agriculture.

Traditional onshore transfers suffer from the same cost impediment. And also, they cause many prohibitive environmental impacts, both along their route and more importantly downstream their catchment point. That's why no major onshore water transfer has been implemented over the past decades in any country environment conscious.

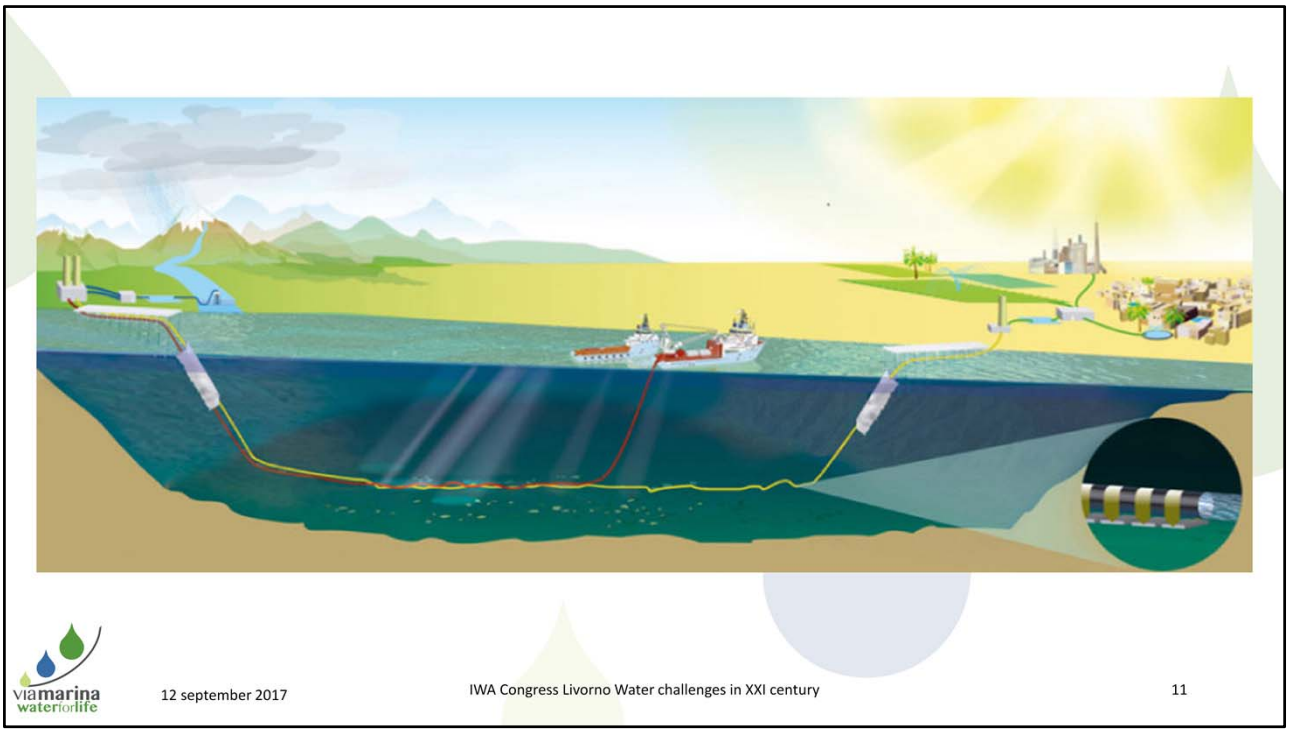


The logical conclusion of all this reasoning is that the only solution will consist in submarine water transfers for the benefit of coastal areas. A new type of infrastructure which I call submarine rivers.

These submarine rivers can deliver water taken from two different sources:
- Either fresh water at the mouth of a river
- Or wastewater at the outfall of a treatment plant of a large coastal city after the required upgrade for reuse in agriculture.

These submarine rivers are at the same time:
- Technically viable
- Politically acceptable
- Environmentally sustainable, and
- Economically competitive

There are plenty of potential projects all around the world which are currently under consideration for a soon to come construction. And, I welcome new ideas from you all, in any place in need that you may know.



This picture illustrates what such submarine rivers will look like.

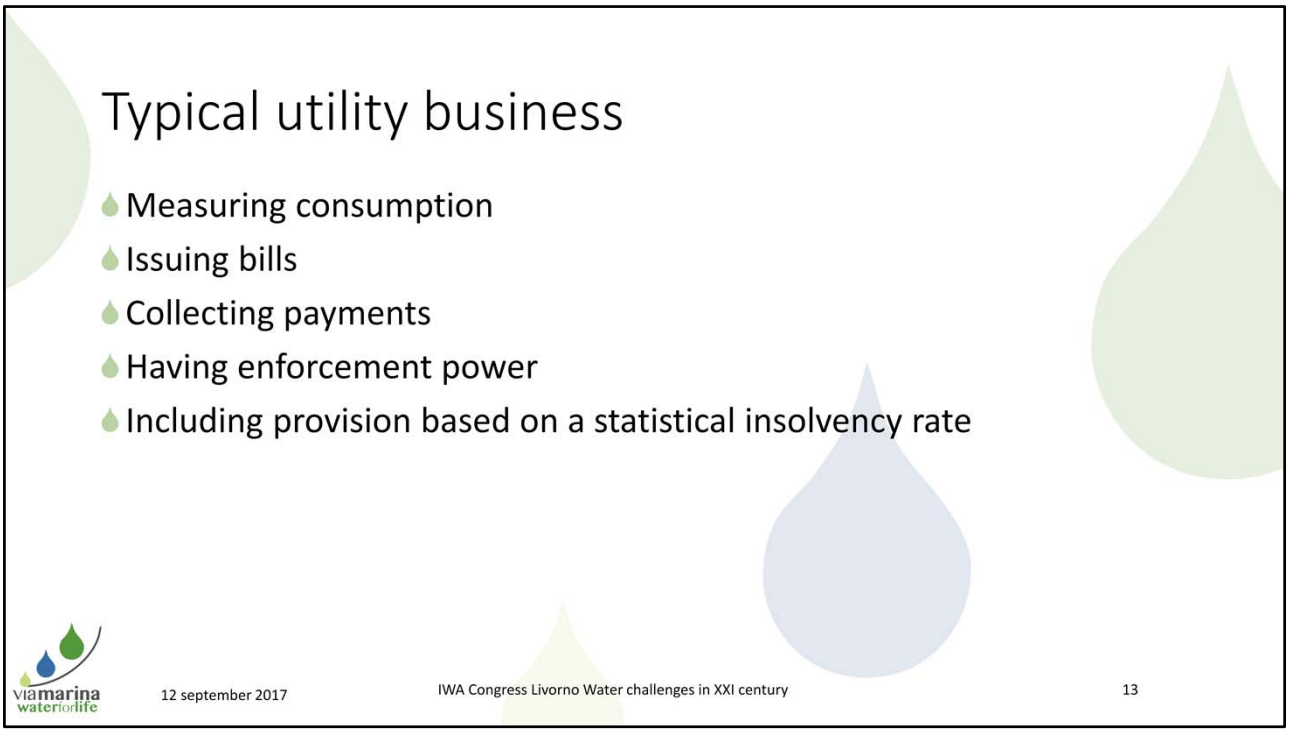
Financial constraints

- How to recover CAPEX and OPEX of those large infrastructures?
- Well known traditional reduced capacity/willingness of farmers to pay for water
- Large number of users/customers

Now, the question is how to finance both the construction and the operation of those large infrastructures?

Indeed, agriculture small financial productivity implies a limited capacity to pay for water.

Moreover, farmers are not used to pay for water, which is often considered as a gift of nature.

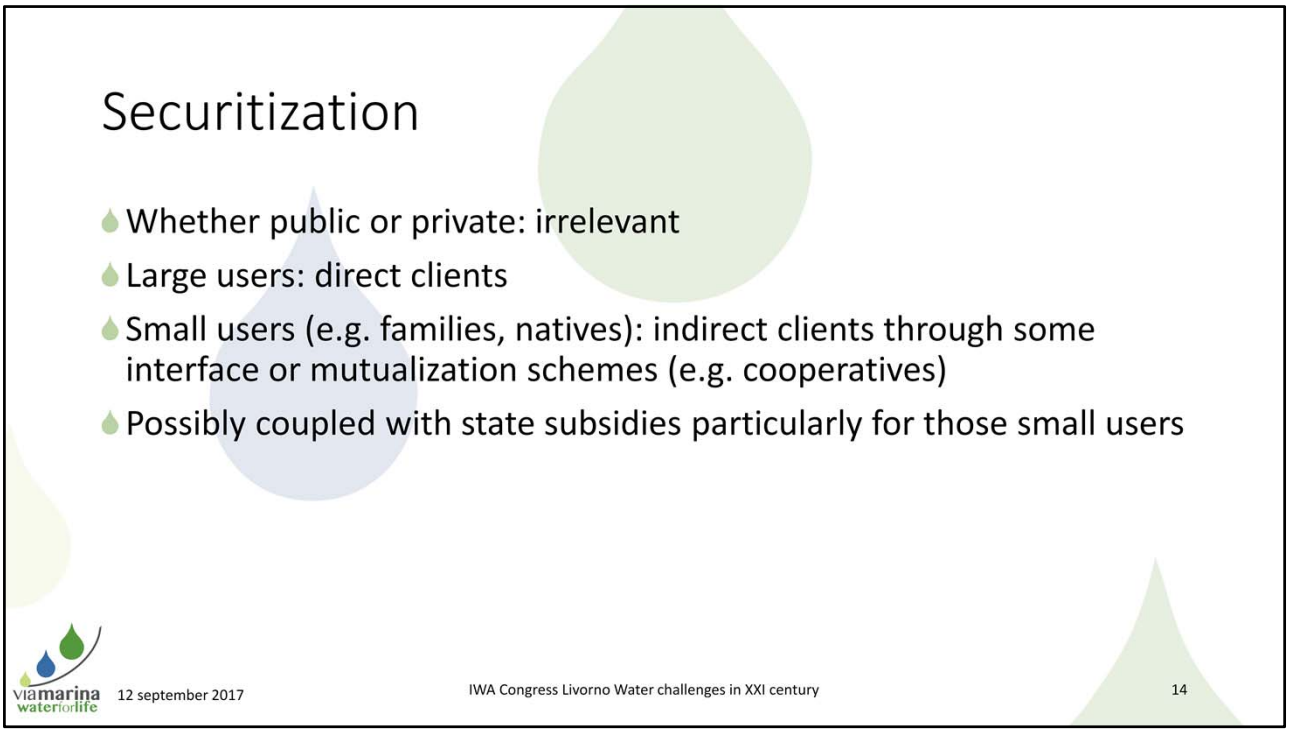


Well, these problems will be solved in a manner equivalent to what occurred with the introduction of many different kinds of utilities in many places all around the world over the twentieth century:

- We transitioned from candles and wood to electricity and gas at home. And we had to pay for it.
- We transitioned from walking to a well or a spring for our water to having a tap in our kitchen or in our bathroom. And we had to pay for it.
- We transitioned from crossing rivers on foot through a ford to using bridges. And we had to pay for it.
- We transitioned from driving in small roads to large highways. And we had to pay for it.

Exactly the same is going to happen for agriculture. We cannot rely any longer only on free water given by nature. We'll have to pay for the service of having water brought to new fields in order to grow imperiously needed supplementary crops.

Some new kind of utility will build those new infrastructures. It will put a meter at the entrance of these new fields. It will request payment for the new water consumed. If we don't pay, we'll be subject to some kind of legal punishment. And the price we pay will cover the loss caused by the insolvents.



This new kind of utility could be indifferently public or private or most probably mixed through some kind of Public Private Partnership. This is totally irrelevant, as its operation will be substantially similar in either case.

Most probably, this utility will access the larger customers directly and the smaller ones indirectly through some kind of interface, which could have some governmental support, for example:
- cooperatives,
- associations of canal users,
- whatever …

In some cases, the price charged to some categories of customers could be somehow subsidized through some governmental scheme, for instance:
- families,
- natives,
- whatever ….

Governments will probably accept to play a part in some kind of Public Private Partnership for plenty of good reasons:

Indeed, these new infrastructures will generate an important social and economic development:
- GDP growth,
- employment,
- exports and the related foreign currency,
- fiscal revenues
- etc.

Those infrastructures will yield a healthy social profitability and a quick financial payback.

And also, other qualitative and environmental benefits.

These new infrastructures will be essential elements of Territorial Planning and Regional Development strategies.

More importantly, they will strongly contribute to attaining the objective determined at the beginning of my presentation: ENSURING FOOD SECURITY.

I trust that I have now sufficiently proved what I stated at the beginning of my presentation.

New and innovative irrigation infrastructures, like submarine rivers, are required for solving food security issues all around the world.

These new infrastructures can be made profitable. Therefore they are bankable. They can be financed.

Hence, there is absolutely no reason whatsoever why we couldn't start building them right away!

Download the Presentation

Here you've the QR Code for downloading my presentation, if you want to flash it now on your cell phone.

Thank you very much for your kind attention.

Now question time.