

“Water is life. Where there is no water, there is no life. Between these two statements lies the whole history of humanity.” Mohamed Ait-Kadi, GWP TEC

Semana Temática 10:
Nuevas Fuentes de Agua: Reutilización y Desalación
El Agua en el Mundo – Water in the World
Emilio Gabbrielli



Content of the presentation

- 1 Basic facts on water resources
- 2 The need to manage water resources
- 3 The need to develop new water resources
- 4 The case for Desalination and Water Reuse
- 5 A look at the history of Desalination



Mankind took a long time to recognize water as a limited resource and its direct link with sustainable development

Only 1/1000 of all water in the world is available for human use



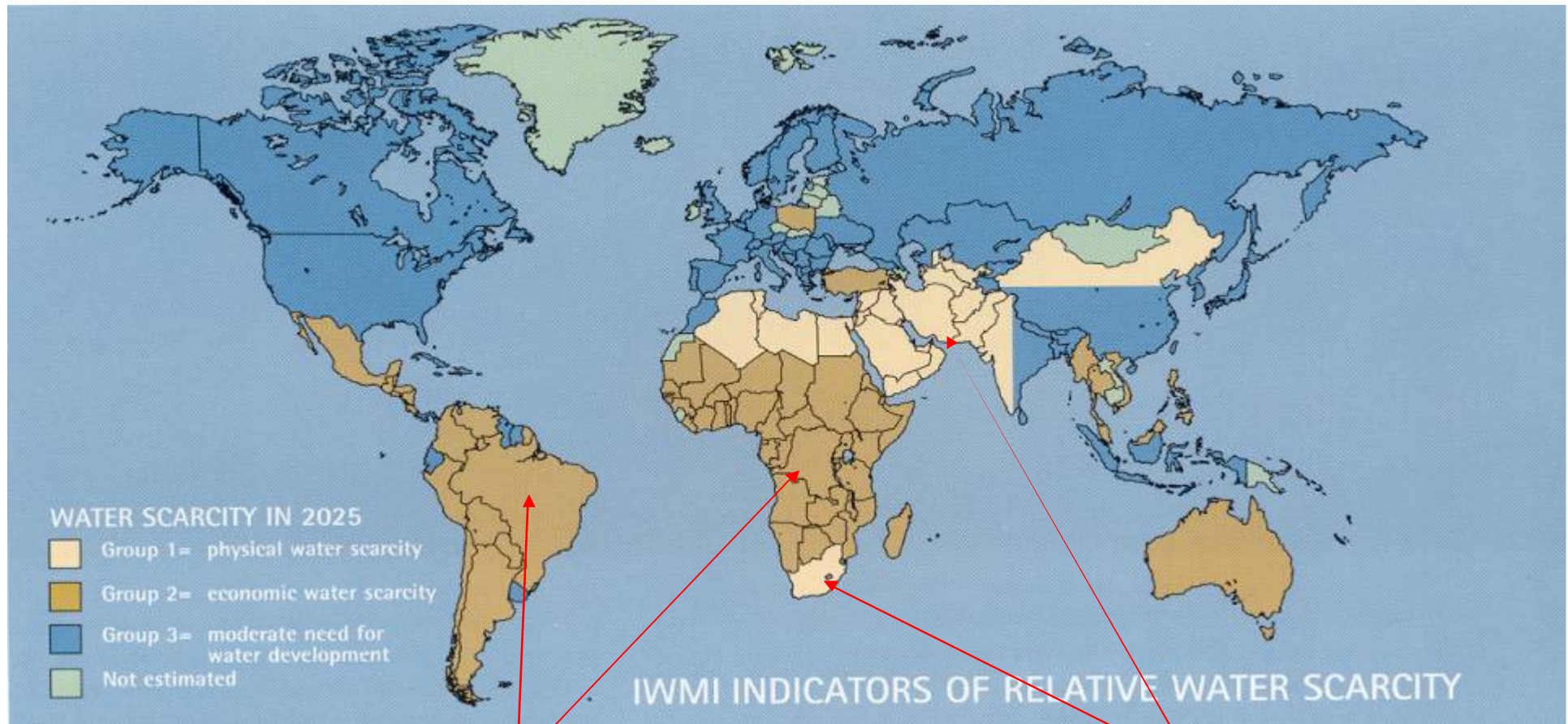
Overall population of the planet
doubled since the 1960s

**AT THE SAME TIME WATER USE
MULTIPLIED BY 6:
SEXTUPLED!**

By 2050 another 2-3 billion people will be
added,

..... but we are already using more
than half of all water available to us!

Water Scarcity in the World (2025 scenario)



“economic” water scarcity:
water development can meet
increased demand

absolute or physical
water scarcity



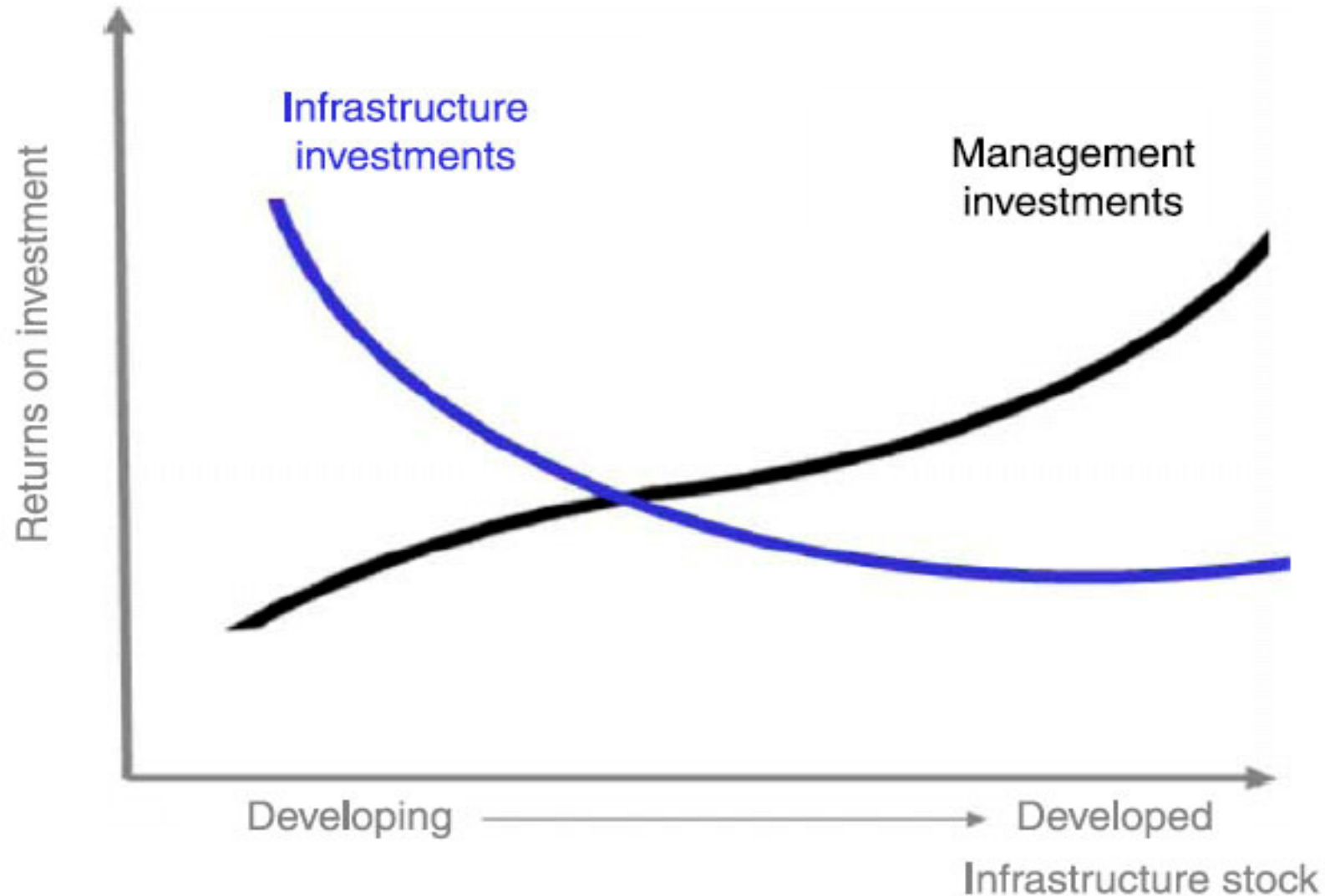
World Summit on Sustainable development - 1992

- Water is a resource, so it needs to be managed.
- New ways to manage water are needed (Dublin, IWRM → the 3 Es)

GWP is a global network. Its Mission: to support countries in the sustainable management of their water resources.



You cannot manage what is not there,
but we need to learn from mistakes from the past
in infrastructure development



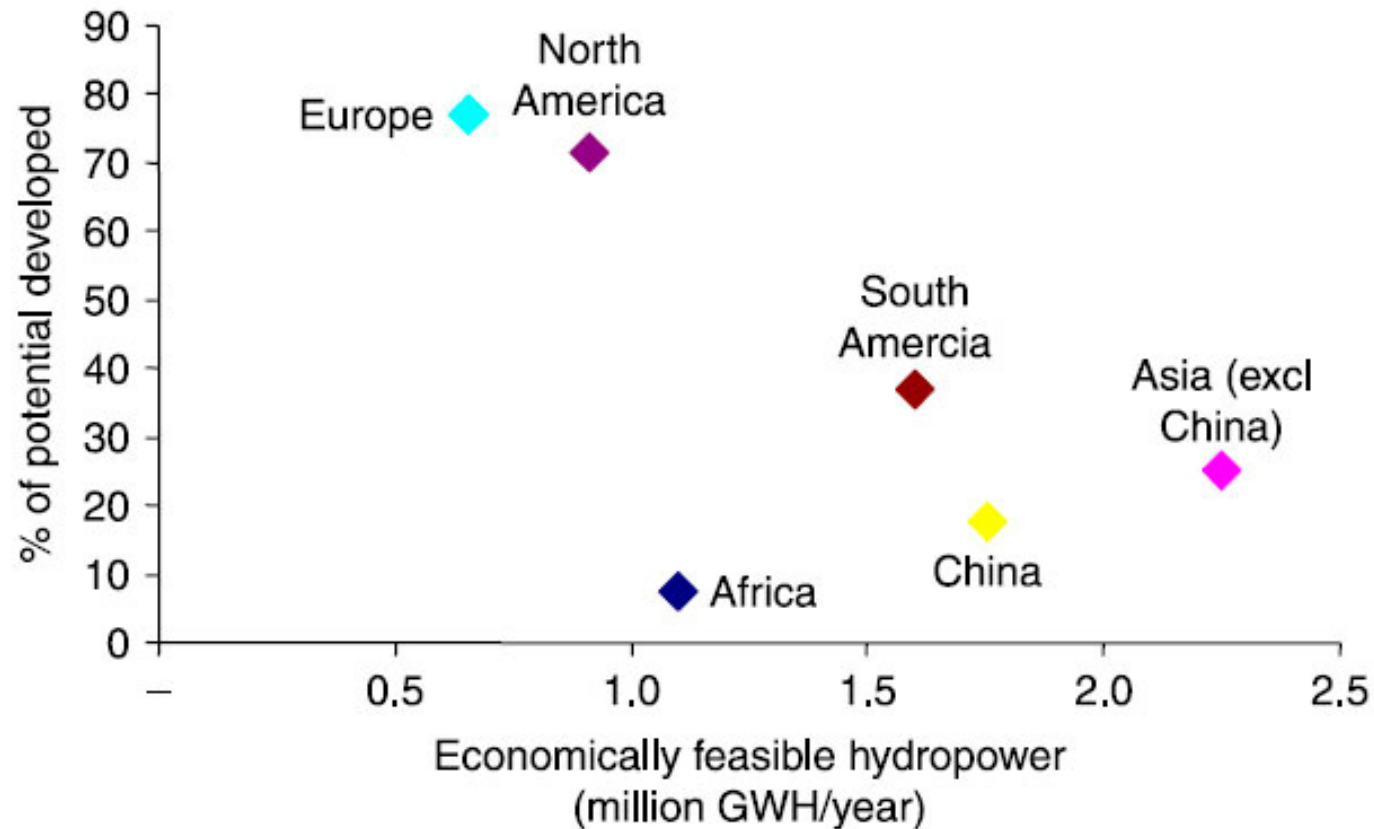
Once infrastructure development is on the table, the real issue is how to finance it:
not an easy answer.

→ Camdessus and Gurria panels

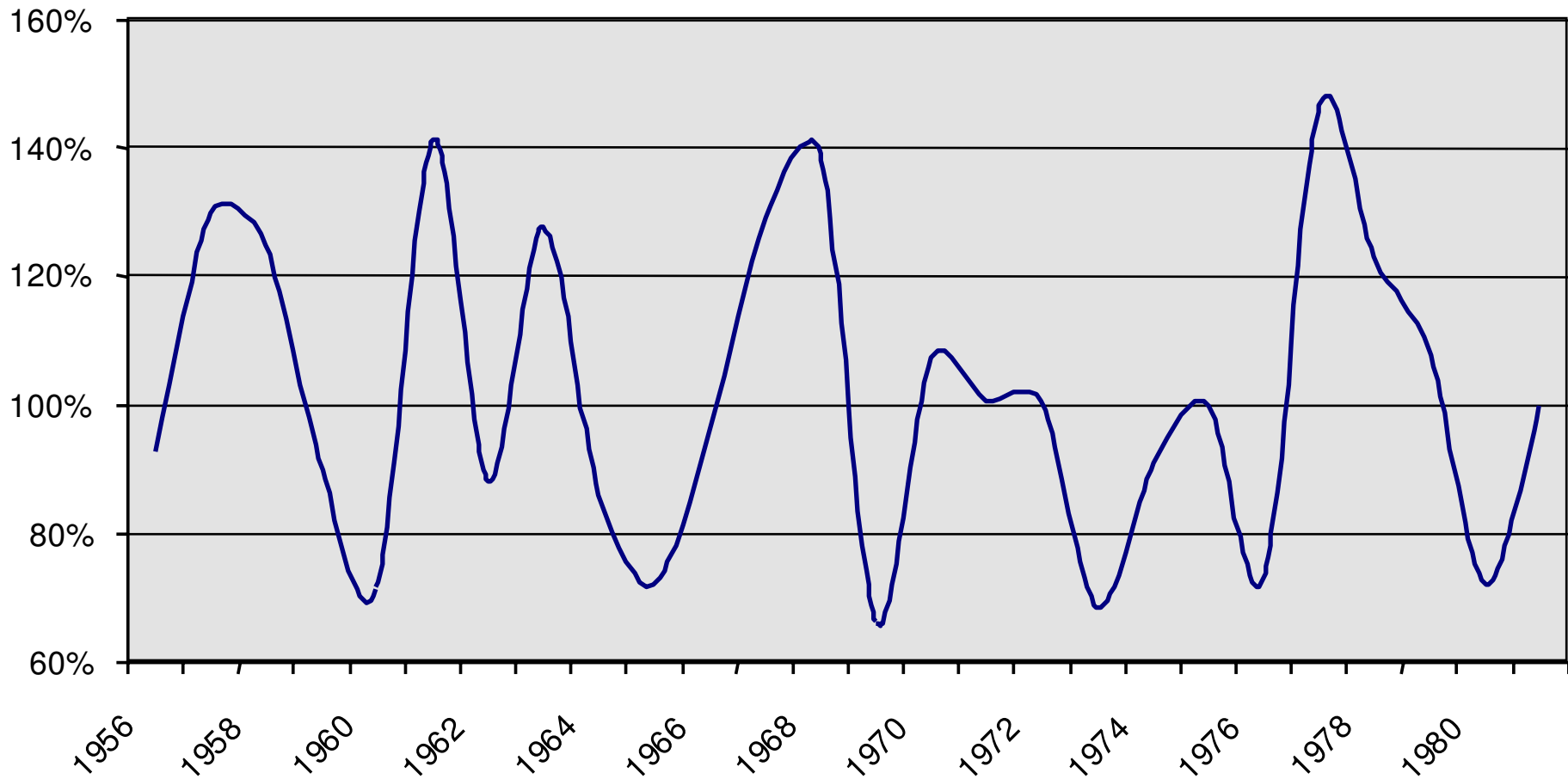
The answer to solving water problems does not lie purely in providing infrastructure ...



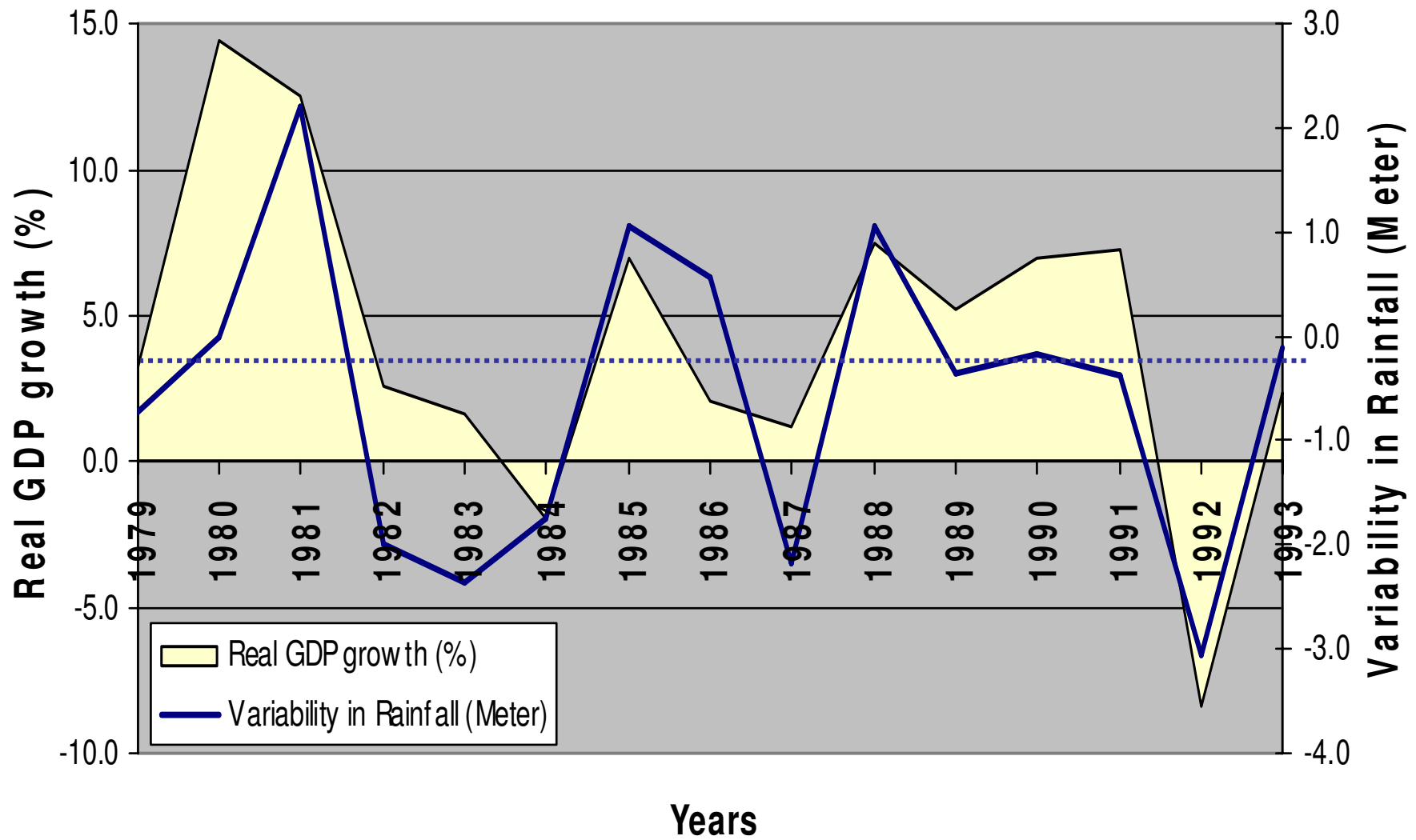
... but you need the infrastructure



Infrastructure is also needed to manage climate change and adation: Kenya's rainfall variability



Zimbabwe: rainfall and GDP growth

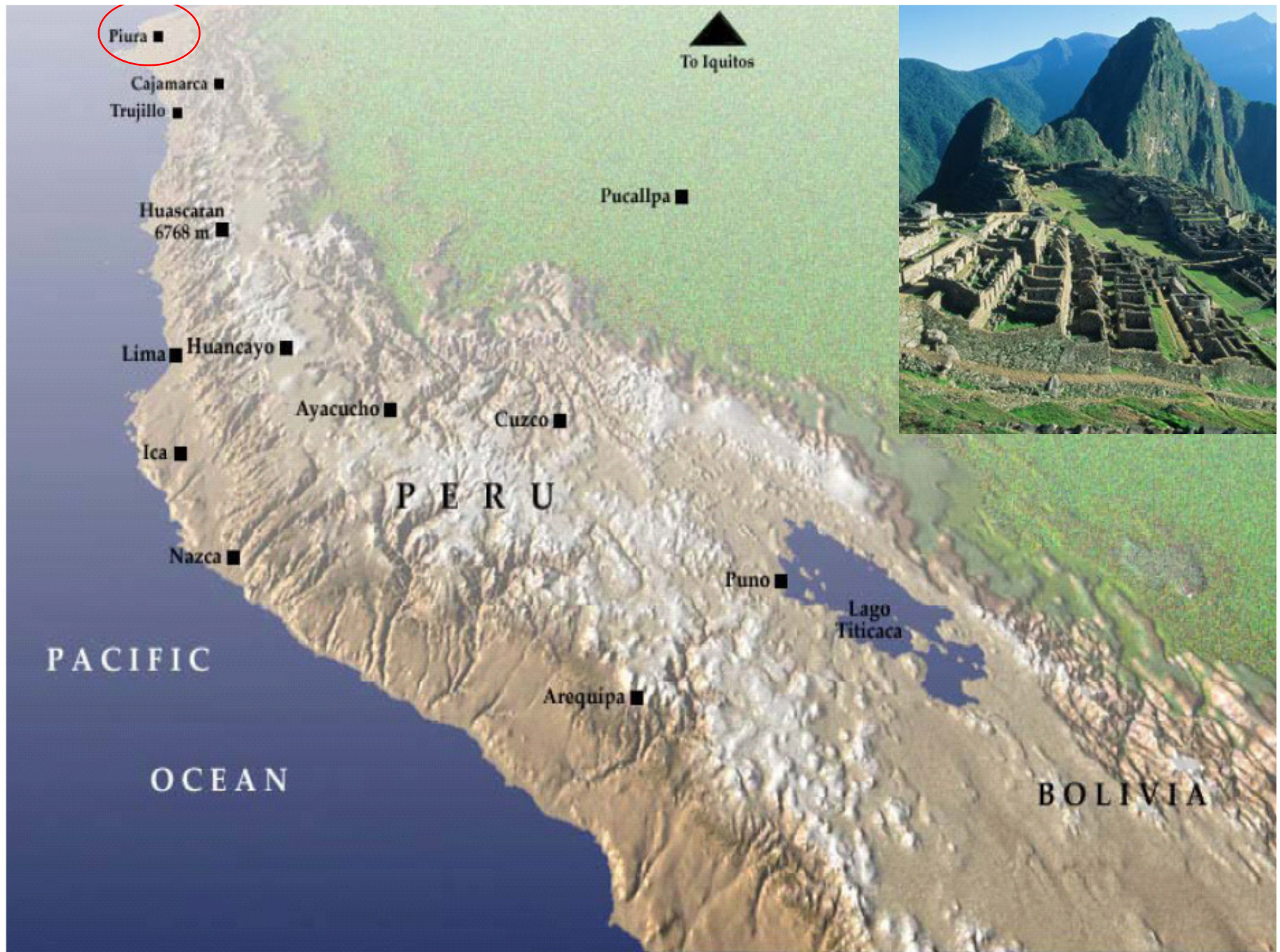


Summarizing:

It remains true that often there is problem of lack of governance rather than water scarcity itself,

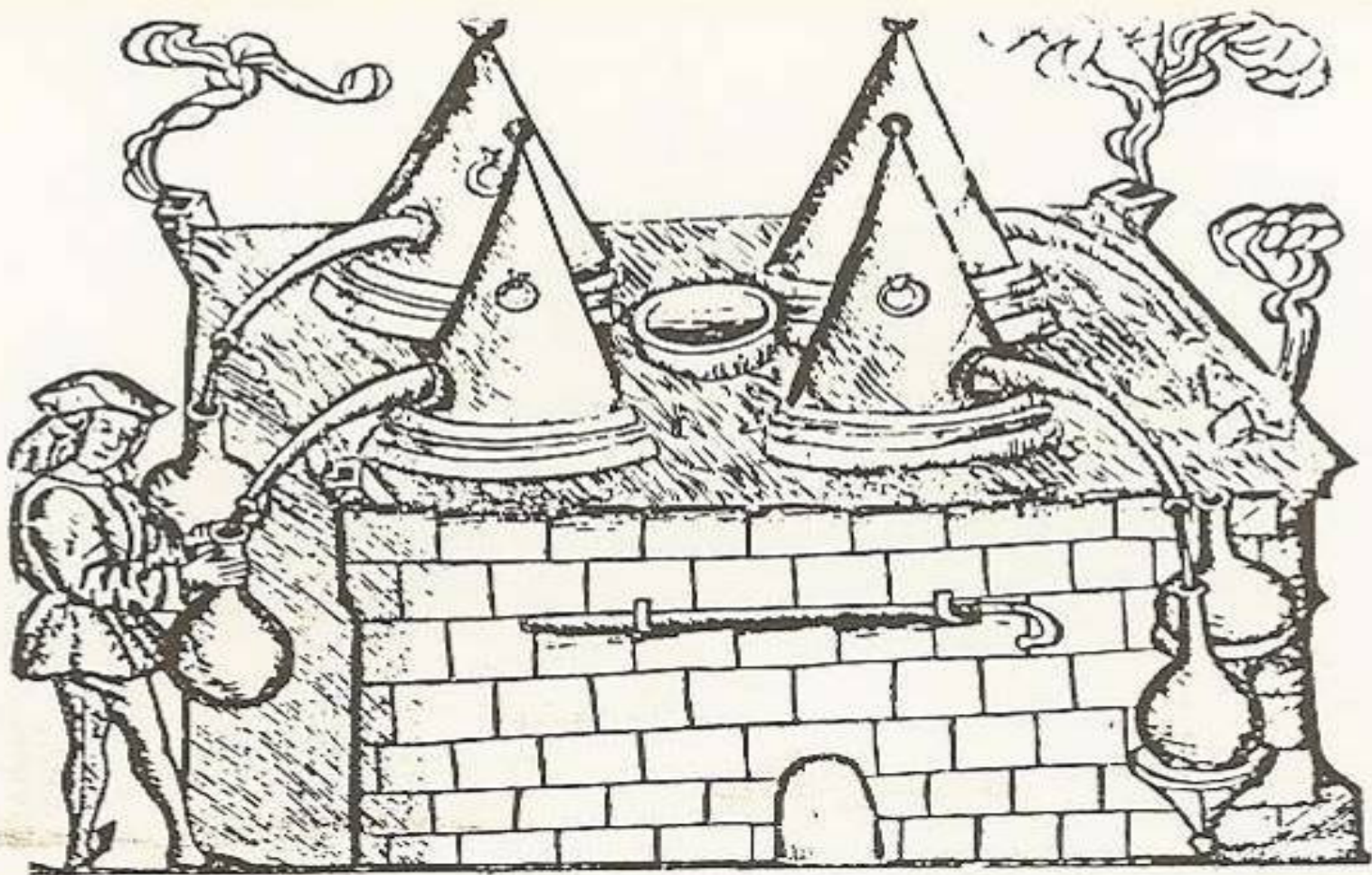
→but the water crisis issue (both in quantity and quality) is real, with great threats to food production, urban supply (mainly the poor) and industrial development.

... and coming to desalination, often "raw demand" has been/is the main mover for development.

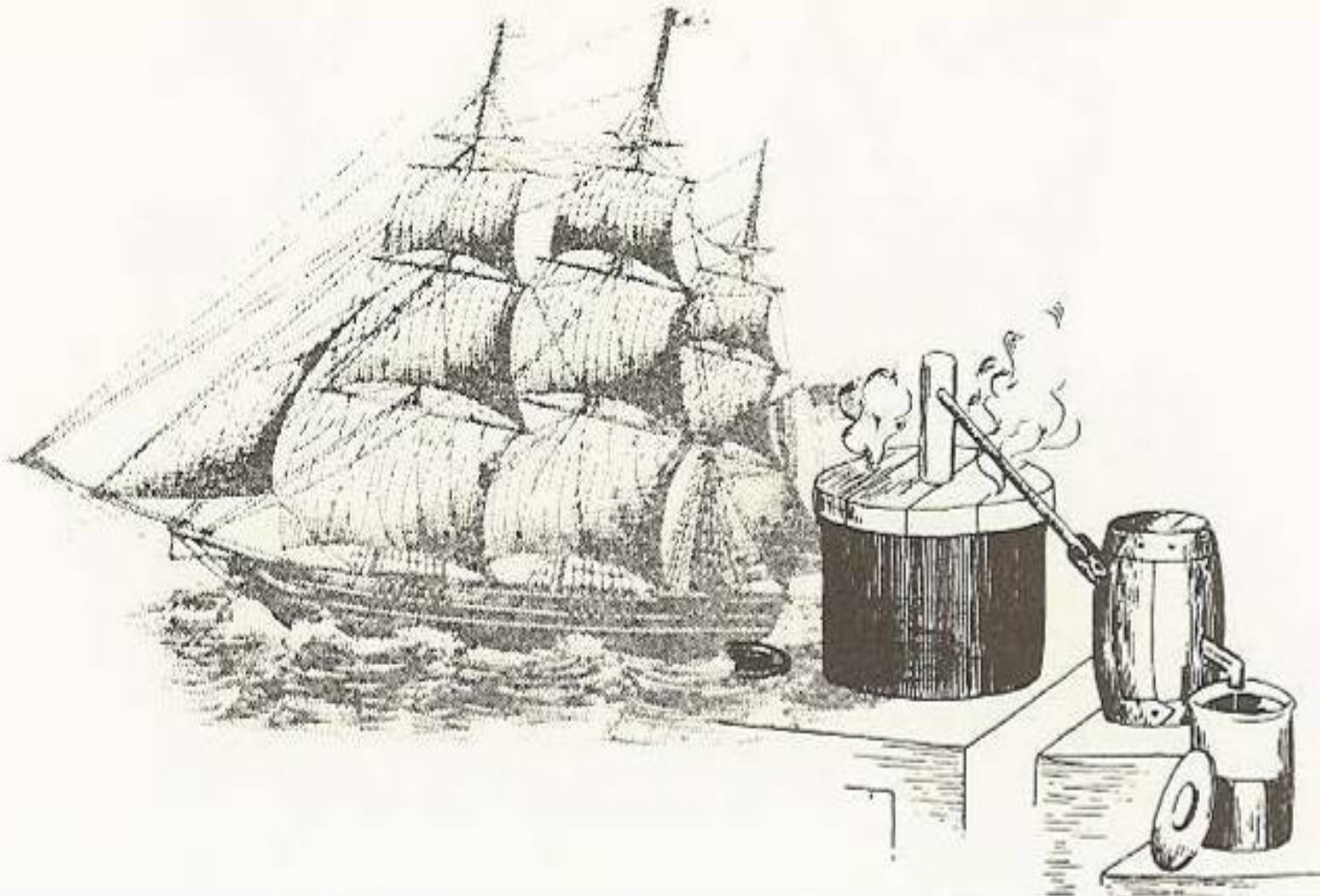


Desalination processes were known in ancient times





Evaporator used on sailing ships

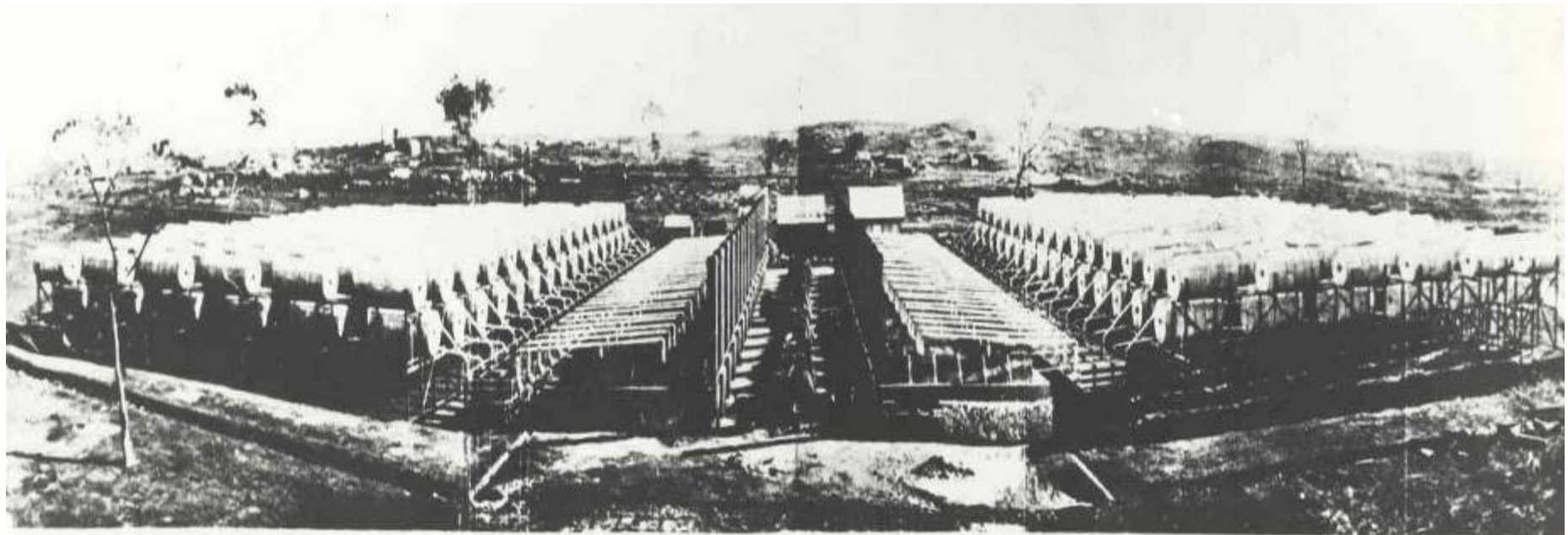


Use of desalination in AUSTRALIA is over 100 years old.



The 1894 gold-rush in the interior of Western Australia was hindered by lack of fresh water. Desalination by evaporation with equipment used on-board ships was already used.

Mammoth Water Condenser at Coolgardie, 1896

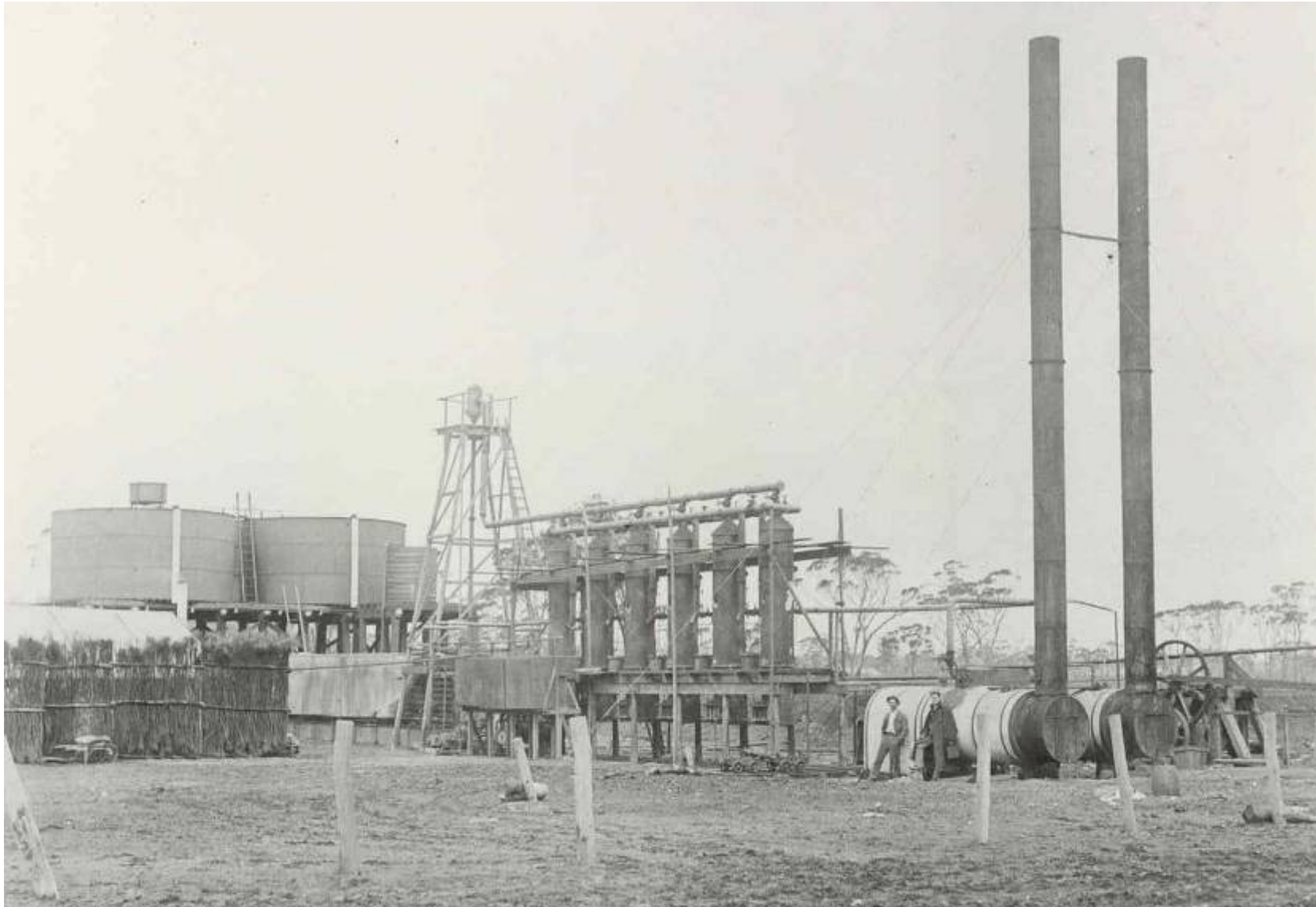


Mammoth Water Condenser.

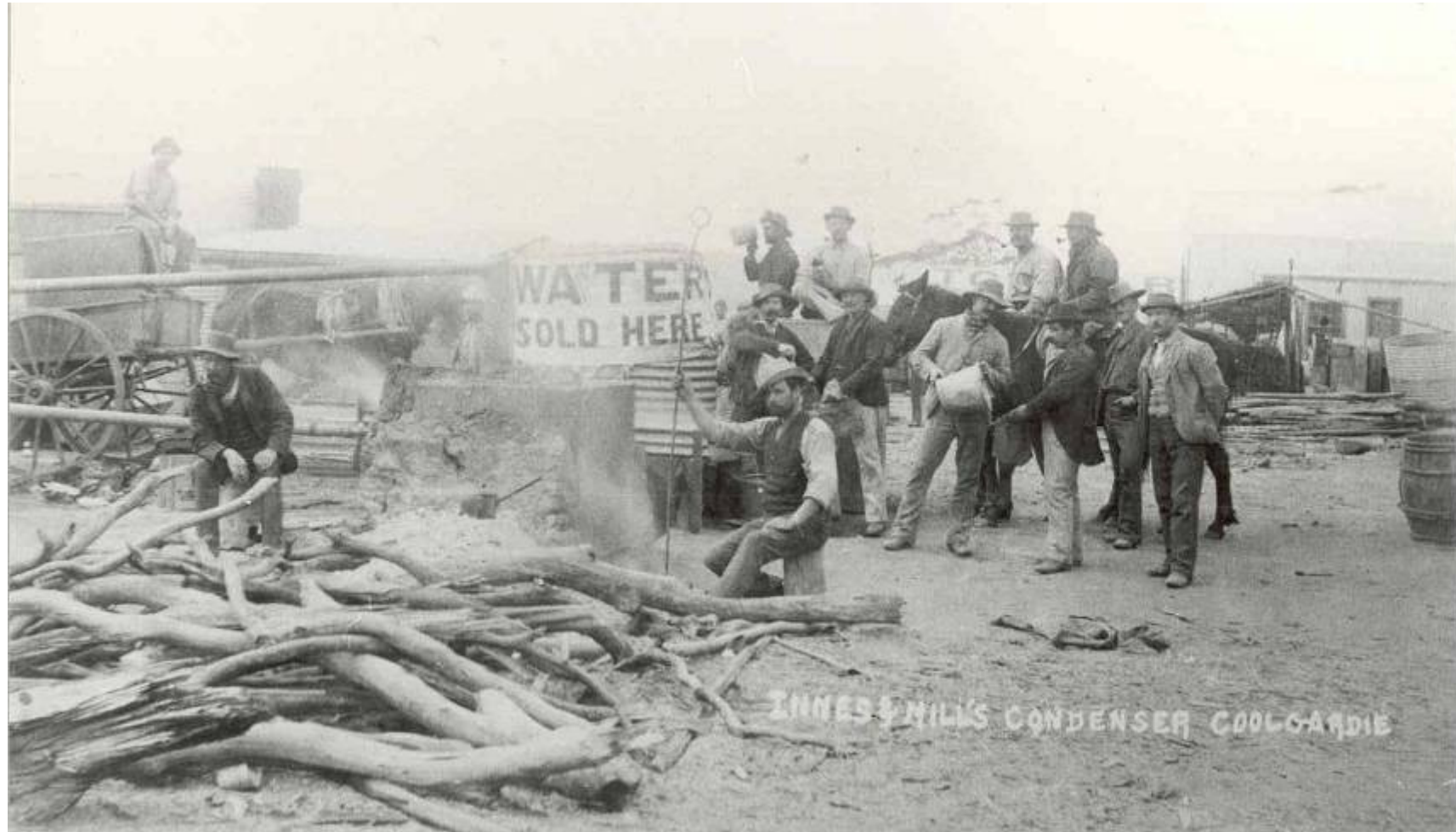
Designed by W. M. Quirk, M.E.

Constructed by the Western Australian Government at Coolgardie. This Condenser can produce 100,000 gallons of fresh water per day, consuming 120,000 gallons of salt water and 100 tons of wood fuel.

Coolgardie Johnson's Condenser, c1898



Condenser at Coolgardie, c1895



Going back to desalination in a Water Stressed world

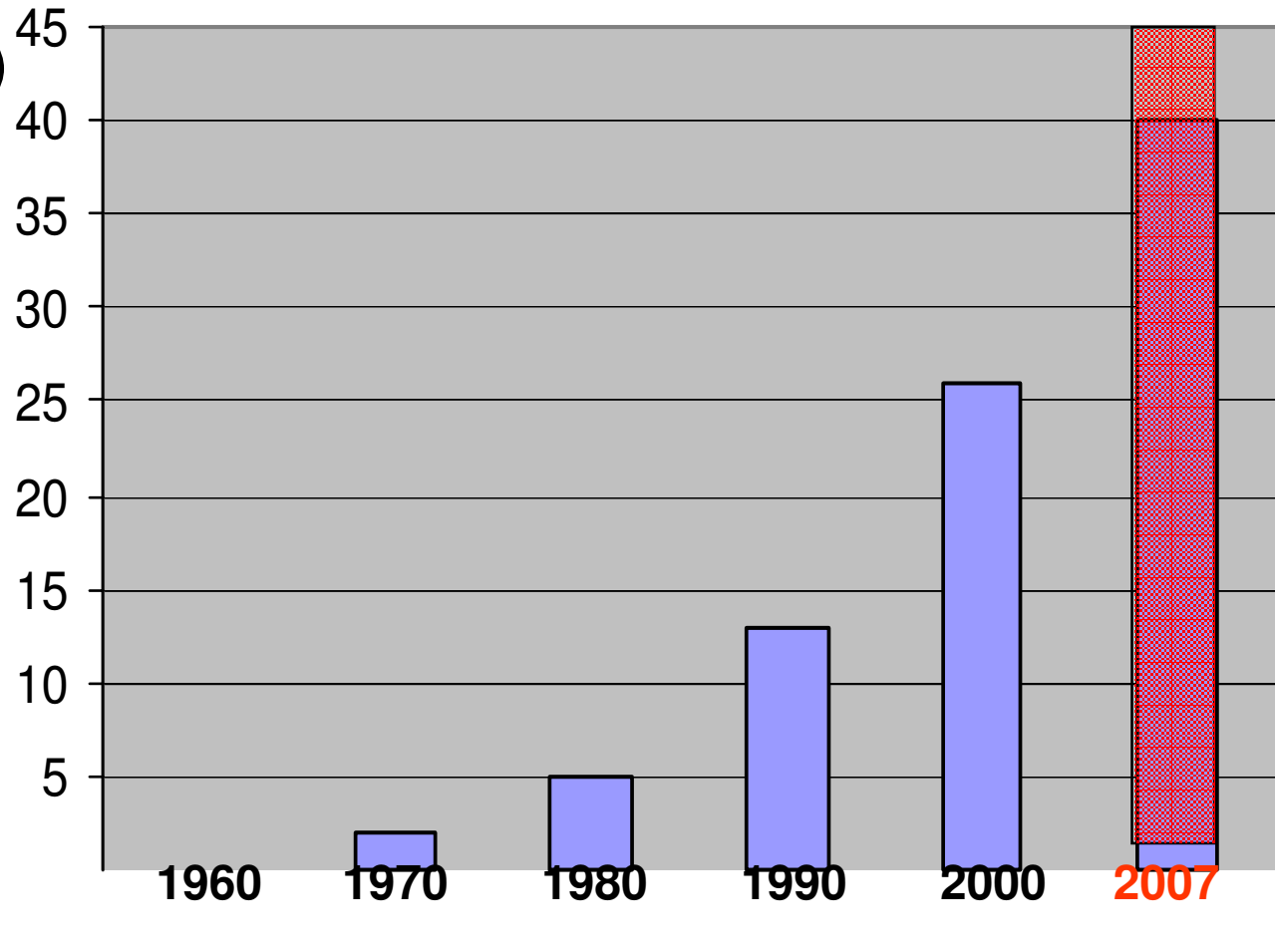
**Global installed
capacity (M m³/day)**

NOTE:

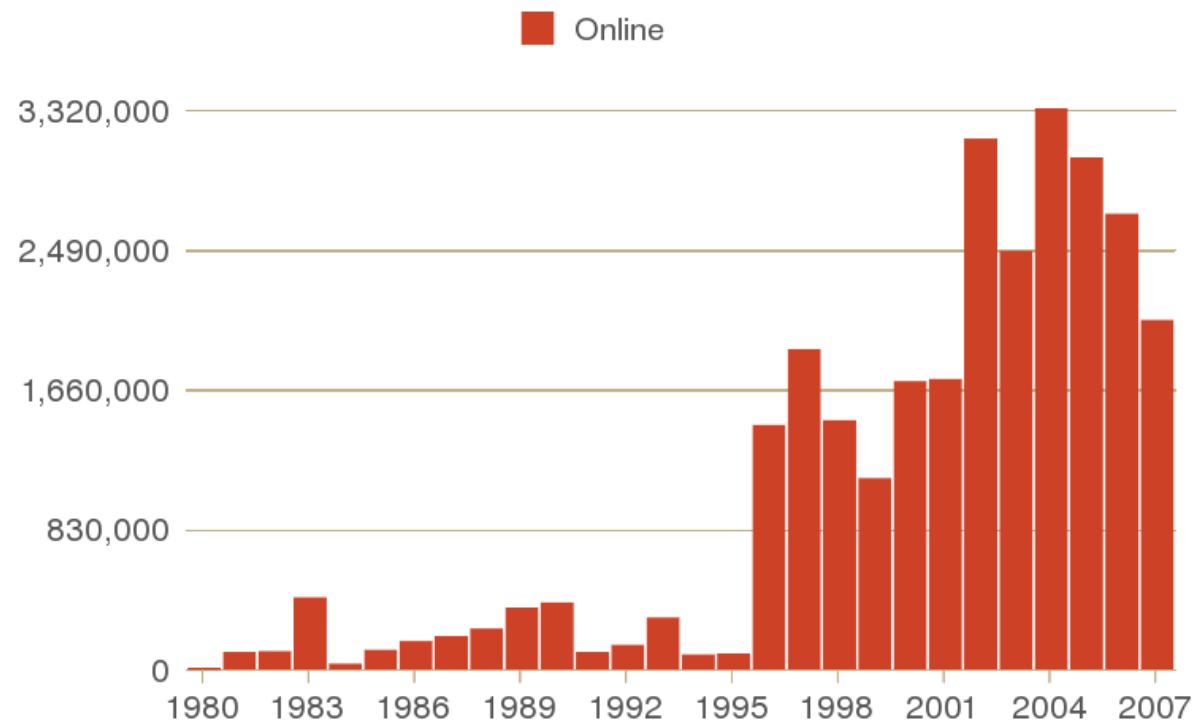
45 Million m³/day
(of which 2/3 on line)

= **over 500 m³/sec**

= more than the
average flowrate
of Seine (France)
or 10 times that
of the Thames (UK)



Annual new online capacity (m3/d)

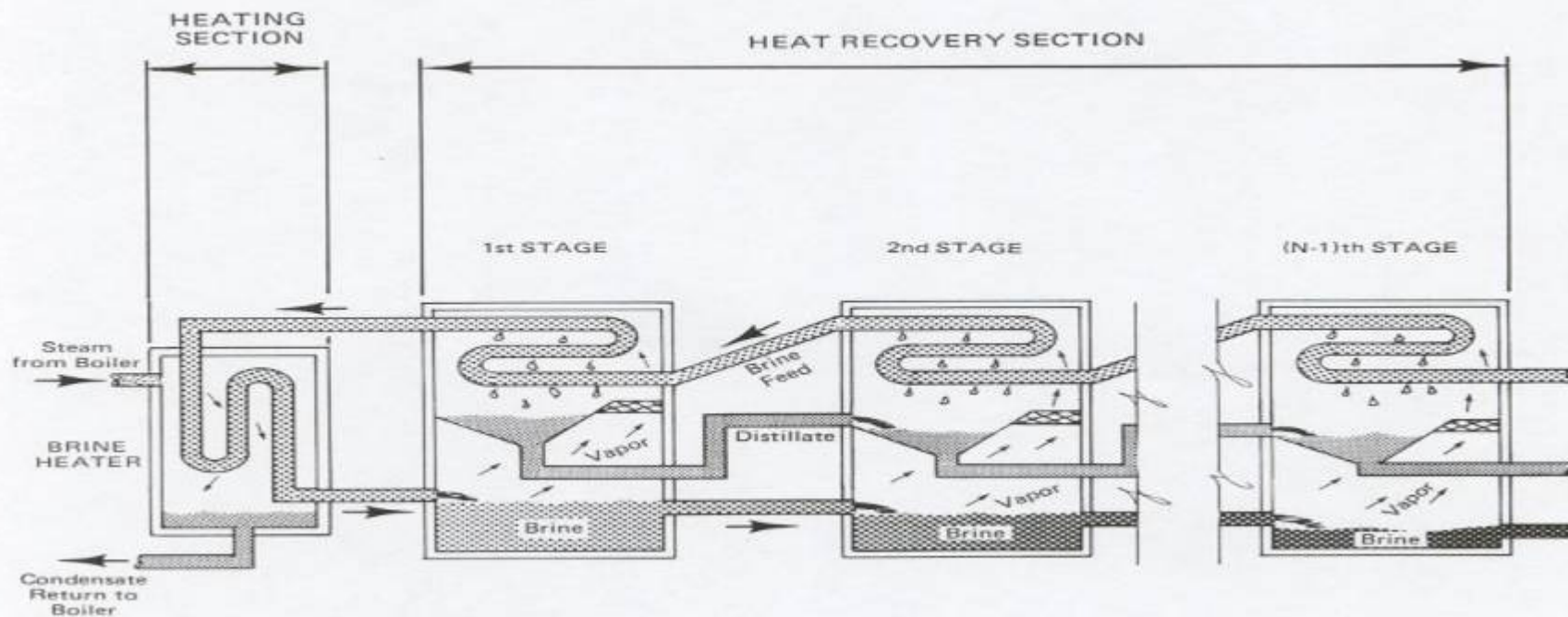


Source: DesalData.com

Decade 1950-1960

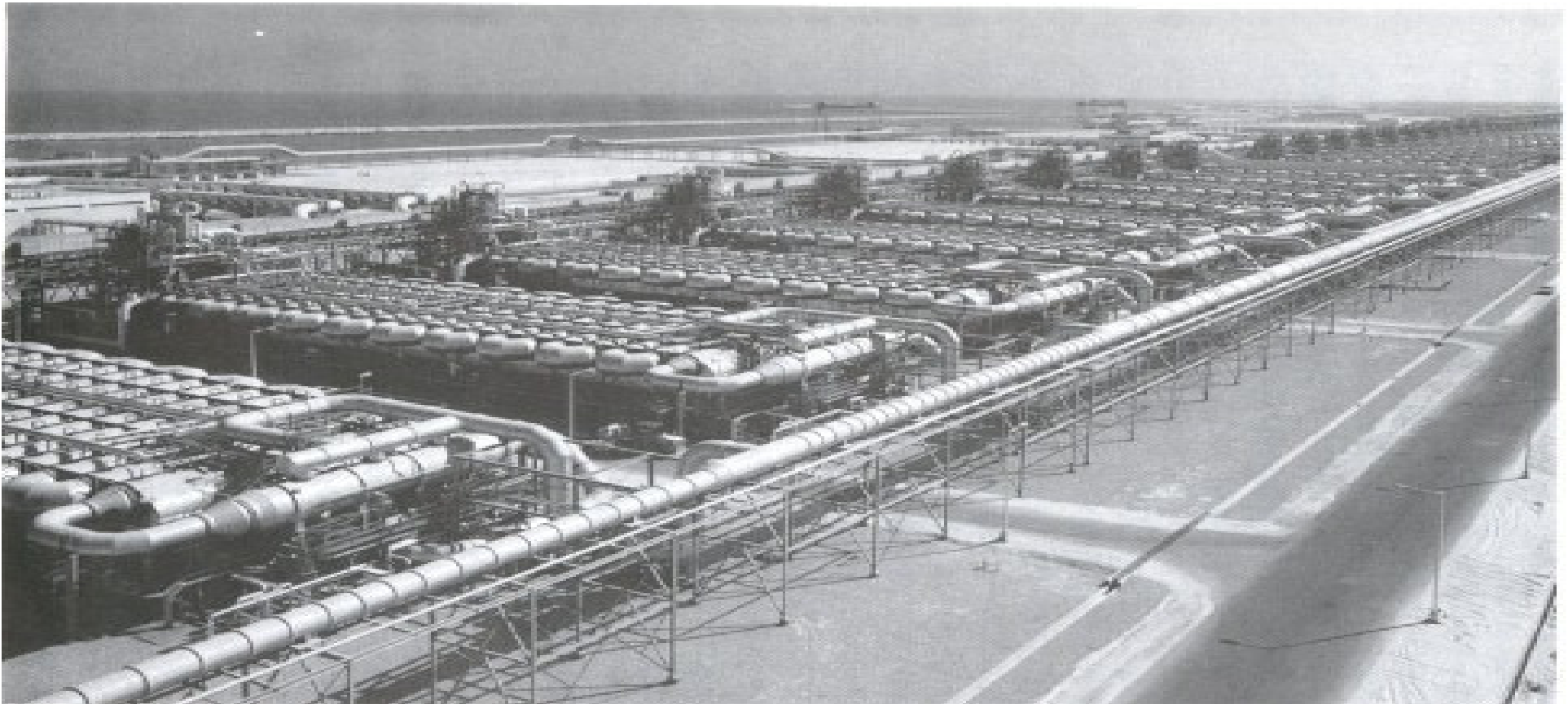
- ❑ Infancy of large scale desalination
- ❑ Installed production reaches 100,000 m³ /day
- ❑ Only evaporation processes
- ❑ In 1957 Dr. R. Silver patents the MSF concept

3-STAGE MSF (Multistage Flash Evaporator)



Decade 1960-1970

- ❑ Desalination via MSF technology takes off
- ❑ Installed production reaches 1,000,000 m³ /day
- ❑ RO membranes become available (end of the decade)



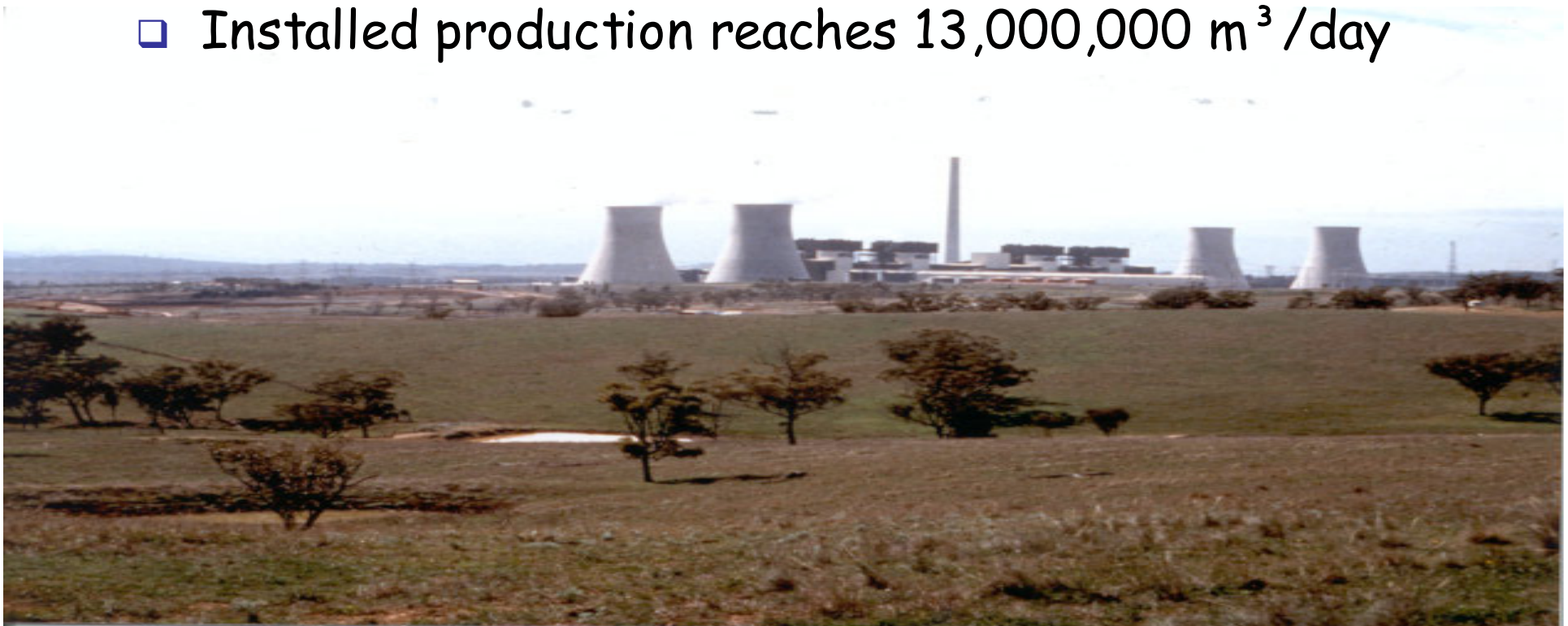
Decade 1970-1980

- ❑ MSF technology reaches maturity and unopposed commercial success (material selection and scale protection solved)
- ❑ Dual purpose plants
- ❑ Installed production reaches 5,000,000 m³ /day
- ❑ RO takes off (brackish first, sea water end of decade)



Decade 1980-1990

- ❑ RO technology reaches maturity (pretreatment and membrane protection solved)
- ❑ MSF and RO share the sea water market
- ❑ RO dominates the brackish water market
- ❑ Installed production reaches 13,000,000 m³ /day



Decade 1990-2000

- ❑ Environment issues - Reuse
- ❑ Installed production reaches 26,000,000 m³ /day
- ❑ Installed capacity doubles in the decade



2000 +

- **DESALINATION HAS STOPPED BEING A “NO OTHER OPTION” SOLUTION**
- **It already provides above 1% of fresh water used worldwide**
- **It is a mainstream water supply option and can be produced at costs competitive to other alternatives**

SOME KEY ISSUES

- Energy consumption and efficiency
- Environmental issues
- Cost of water produced
- Price of water for different uses
- Sustainability
- Choice of technology
- National water resources policy
- Water quality
- Reliability of water and energy supply

.....

International Desalination Association

dubai
call for papers

*IDA World Congress on
Desalination and Water Reuse
November 7-12, 2009*

Desalination for a Better World

In 2006 200 people from over 100 countries met at GWP annual event: water as peace



The 1966 flood in Florence

The miracle: The Angels of Mud





THANK YOU!

ABSTRACT

- Semana Temática 10: Nuevas Fuentes de Agua: Reutilización y Desalación
- El Agua en el Mundo – Water and the World
- Emilio Gabbrielli

- Abstract

- Mankind took a long time to recognize water as a limited resource and its direct link with sustainable development. While world population has doubled in 3 decades, water consumption has increased six times in the same period and over half of available fresh water resources are already committed.
- Reuse and development of new water resources have become essential. This must be accompanied by a more efficient use of water in all sectors, in particular in agriculture, which is by large the greatest user.
- The world is struggling in finding effective and equitable policies to manage surface and ground-water resources, as well as the development of new water supplies such as desalination, which are essential to sustainable development.
- The key challenge is to ensure that every human being has access to a minimum quantity of water which can safeguard the right to a healthy and dignified existence, while optimizing the usage of the resource for securing food, sustainable development and a healthy environment.
- The lack of financing in the water sector remains a critical issue to face such a challenge. The solution of the problem of water scarcity cannot be solved exclusively through technical advancements or increased financial availability. However, the rapid progress of new technologies such as those based on membrane separation and their decreasing costs, offer tools which, if properly implemented, can contribute to the successful implementation of sustainable water resource management policies.