EXPO ZARAGOZA 2008

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THE GROUNDWATER INTENSIVE USE SILENT REVOLUTION:PROS AND CONS

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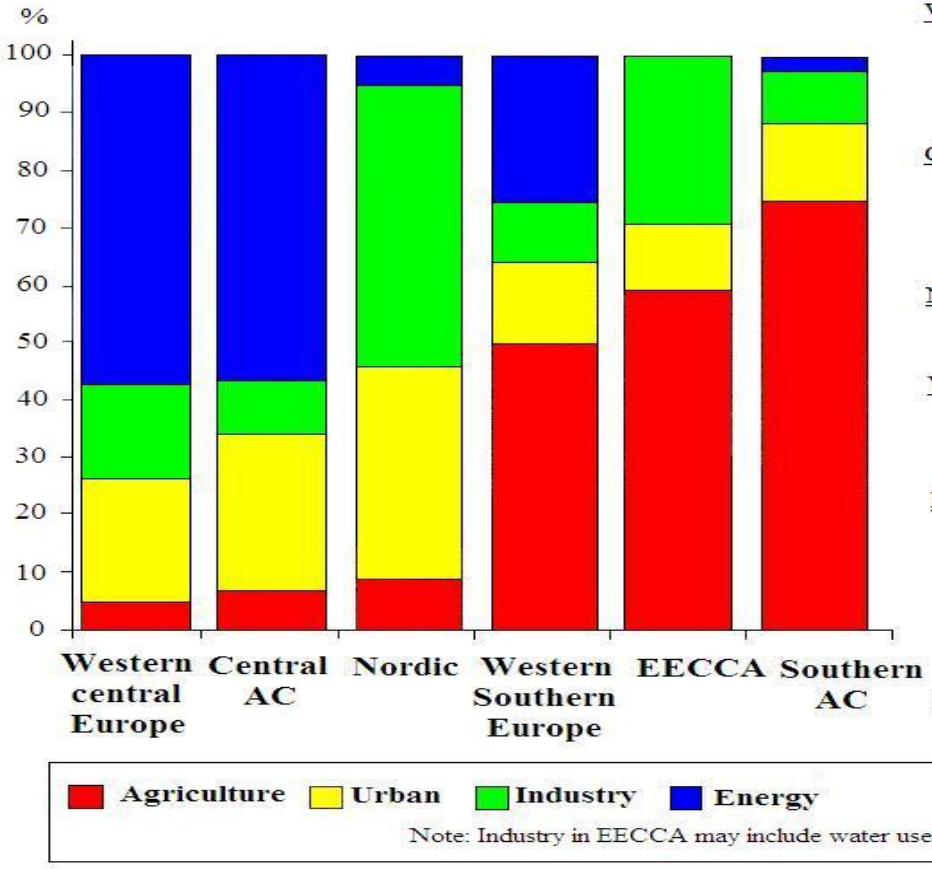
- Comment the pros and cons of groundwater intensive use
- Assess the driving forces of the silent revolution

2. THE FACTS (I)



Western Central:
Denmark, Germany, Belgium, U.K., Ireland, Austria, Luxembourg, Switzerland, The Netherlands, Liechtenstein.

Central accession countries:
Poland, Czech Republic, Estonia, Lithuania, Latvia, Romania, Slovakia, Hungary, Slovenia, Bulgaria.

Nordic:
Finland, Swden, Norway, Iceland.

Western Southern:
Spain, France, Greece, Italy, Andorra, Portugal, San Marino, Monaco.

EECCA:
Kazakhstan, Turkmenistan, Tajikistan, Kirgyzstan, Ukraine, Russian Federation, Belarous, Uzbekistan, Republic of Moldova, Armenia, Azerbaijan, Georgia.

Southern accession countries:
Cyprus, Malta, Turkey.

Sources: Eurostat new Cronos, EEA questionnaire (2002); Aquastat (FAO), 2002 for EECCA countries.

2.- THE FACTS (II)

- **Current global irrigation annual uses (with illusory accuracy)**
- **Surface water about 3,000 Gm^3**
- **Groundwater about 1,000 Gm^3**

2.- THE FACTS (III)

- Global economic value of crops.
- Probably groundwater irrigation value is higher than surface water irrigation value.
- Hydrological and economic efficiency is always higher in groundwater irrigation.

3.- THE CAUSES OF THE SILENT REVOLUTION (I)

- **Mindset (hydroeschizofrenia) of most high level water decision- makers.**
- **50 centuries versus 50 years**

3.- THE CAUSES OF THE SILENT REVOLUTION (II)

- **Modern technology (drilling rigs and pumps) allow to millions of farmers to abstract cheap groundwater and easyly.**

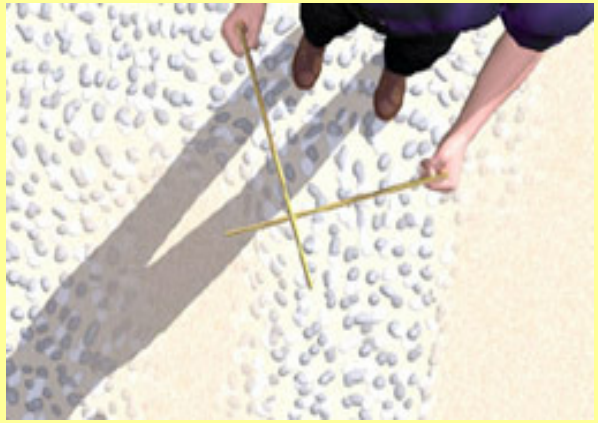
3.- THE CAUSES OF THE SILENT REVOLUTION (III)

- **Groundwater resources are usually resilient to drought. When there is a dry spell farmers with GW irrigation make more profit.**
- **They can be developed individually.**
- **GW intensive development has been driven by the market, except in very poor countries, with susbsistance livelihoods.**

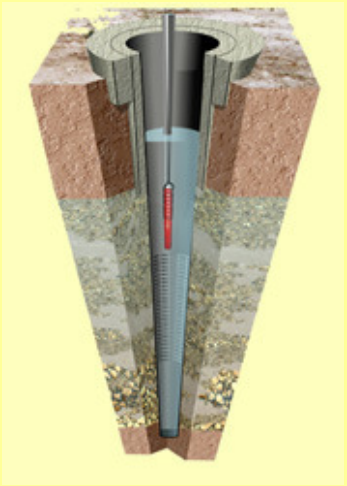
3.- THE CAUSES OF THE SILENT REVOLUTION (IV)

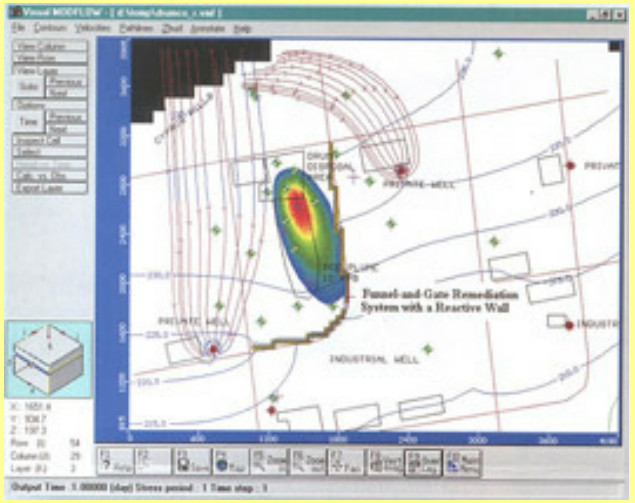
From the dug-well
to the deep borehole.

From the water wheel
to the pump.

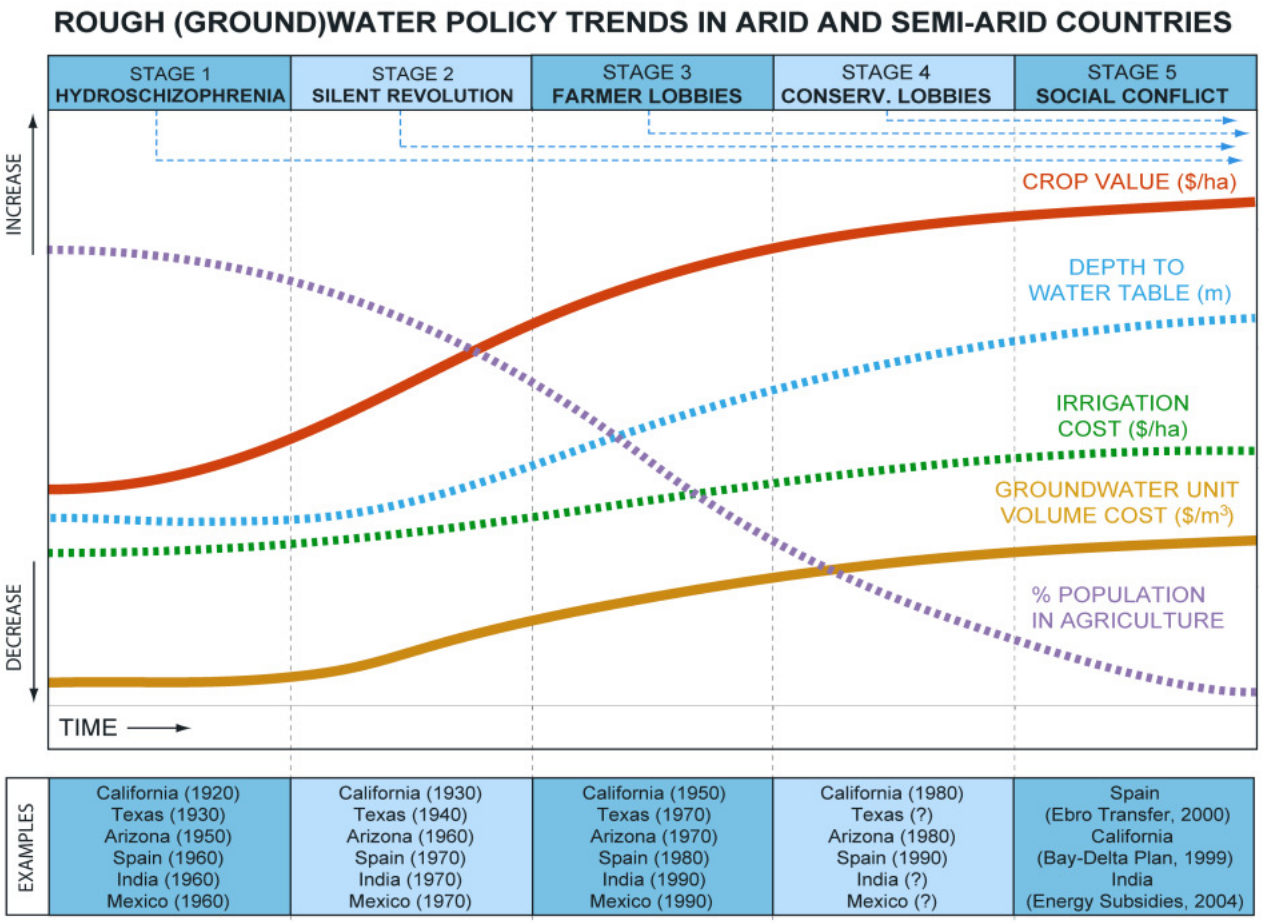


From the water-witches
to Hydrogeology.





4.- EVOLUTIONS AND TRENDS (I)



4.- EVOLUTIONS AND TRENDS (II)

- Groundwater management requires different institutions that those for surface water management, where a "lord of the gate" exists.
- Usually "command and control systems" do not work with groundwater users.
- Indian federal report (september 2007) on the potential way to solve the indian gw chaos:the solution is not the spanish way (declaration of public dominion).

5.- CONCLUSIONS (II)

- Groundwater is a crucial resources to achieve the goals:

  "more crops and jobs per drop" (developing countries).

  "more cash and nature per drop" (industrialized countries)

5.- CONCLUSIONS (II)

- Groundwater development is less prone to corruption (smaller investments, shorter time frame for implementation).
- The “command and control” approach does not work.
- Groundwater management needs an approach “botton-up” with groundwater user associations.