

GLOBAL SOIL PARTNERSHIP

Technical Workshop “Managing Living Soils”

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LAND AND SOIL RESOURCES OF THE MEDITERRANEAN AND THEIR IMPACT ON FUTURE DEVELOPMENT OF THE REGION

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CIHEAM

Was established in 1962 under the auspices of OECD and the Council of Europe with original membership of France, Greece, Italy, Spain, Portugal, Turkey and ex-Yugoslavia.

At present CIHEAM brings together 13 member states Albania, Algeria, Egypt, Lebanon, Malta, Morocco, Tunisia in addition to France, Greece, Italy, Spain, Portugal, Turkey



Main activities of CIHEAM

- Training
- Research
- Cooperation
- Knowledge Dissemination

IAMB: areas of scientific excellence

Integrated Pest Management of Mediterranean fruit trees

Mediterranean Organic Agriculture

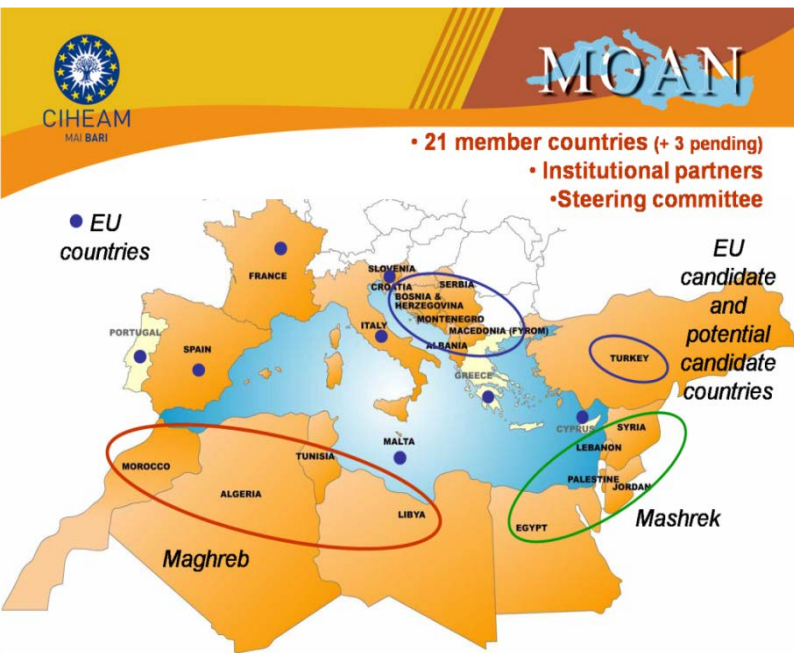
Land and water resources management

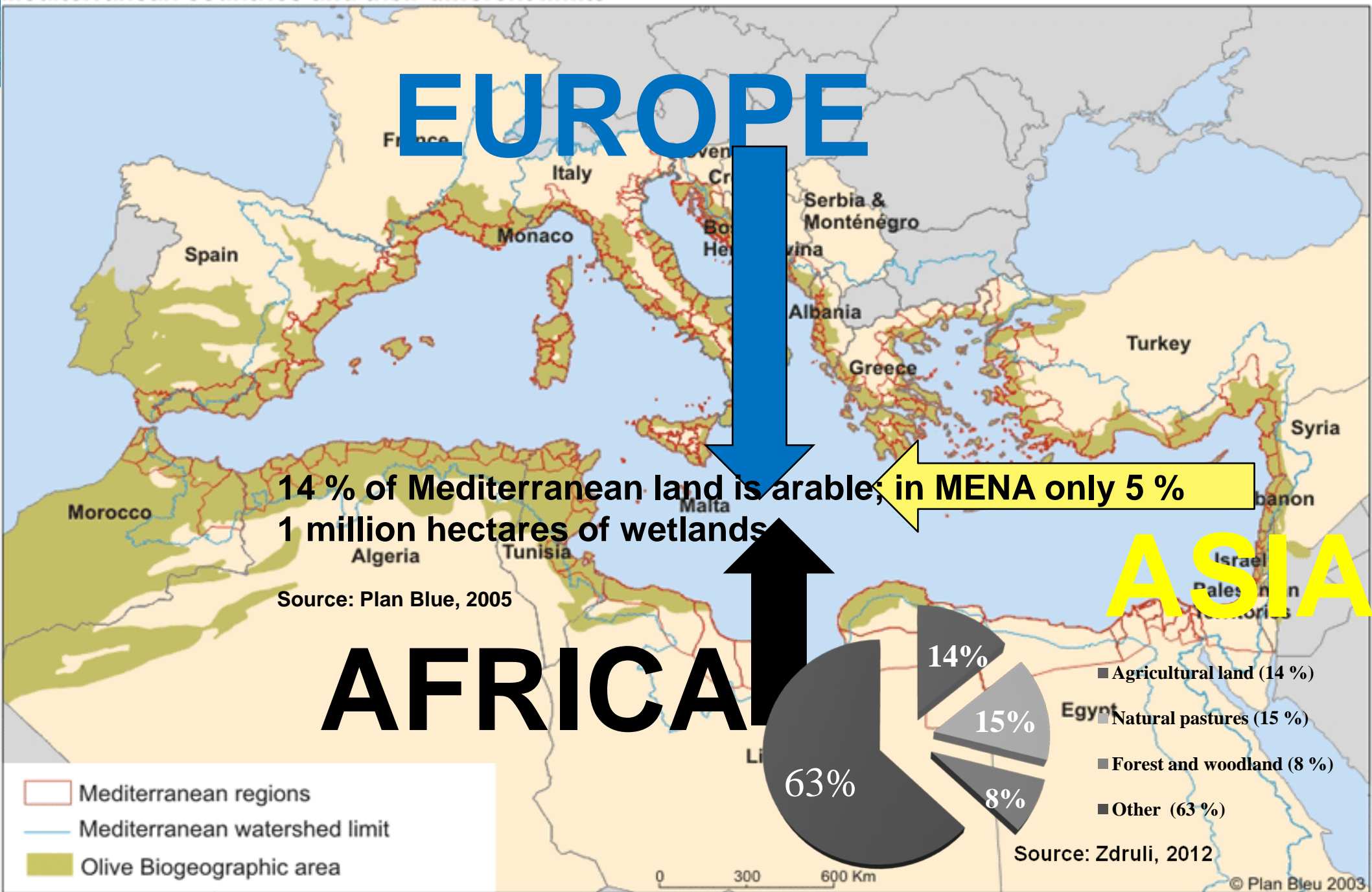
Sustainable agriculture and rural development



CIHEAM
IAM BARI

**NETWORKING AND
RESEARCH
In 2012:
90 projects!!!!**







WRB Soil Map of the Mediterranean at 1:1,000,000 scale

Pollution has no political borders

**Volcanic eruption ashes of Etna in
Sicily covering the Maltese islands**

**Slide prepared by Prof. Louis F. Cassar,
International Environment Institute of Malta**



Where are much of the Technosols in the Mediterranean?



The CATENA process

Bare
rock

Leptosol

erosion

Regosol

Forest fires

Luvisol

Vertisol

Gully erosion

deposition

Cambisol

Rill and sheet erosion

Fluvisol

River bank erosion

Gleysol

Nutrient mining

Soil sealing



The quest for land and competing interests



The quest for land

Natural shallow soil under natural pasture



Man made soil (Anthrosol)

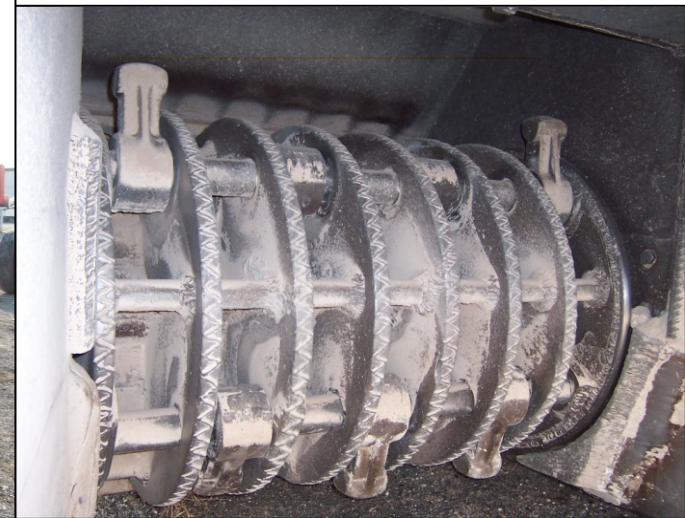


Some 20,000 ha of natural pastures are converted to agriculture use in Apulia region alone

Rocky soil



Man made soil (Anthrosol)



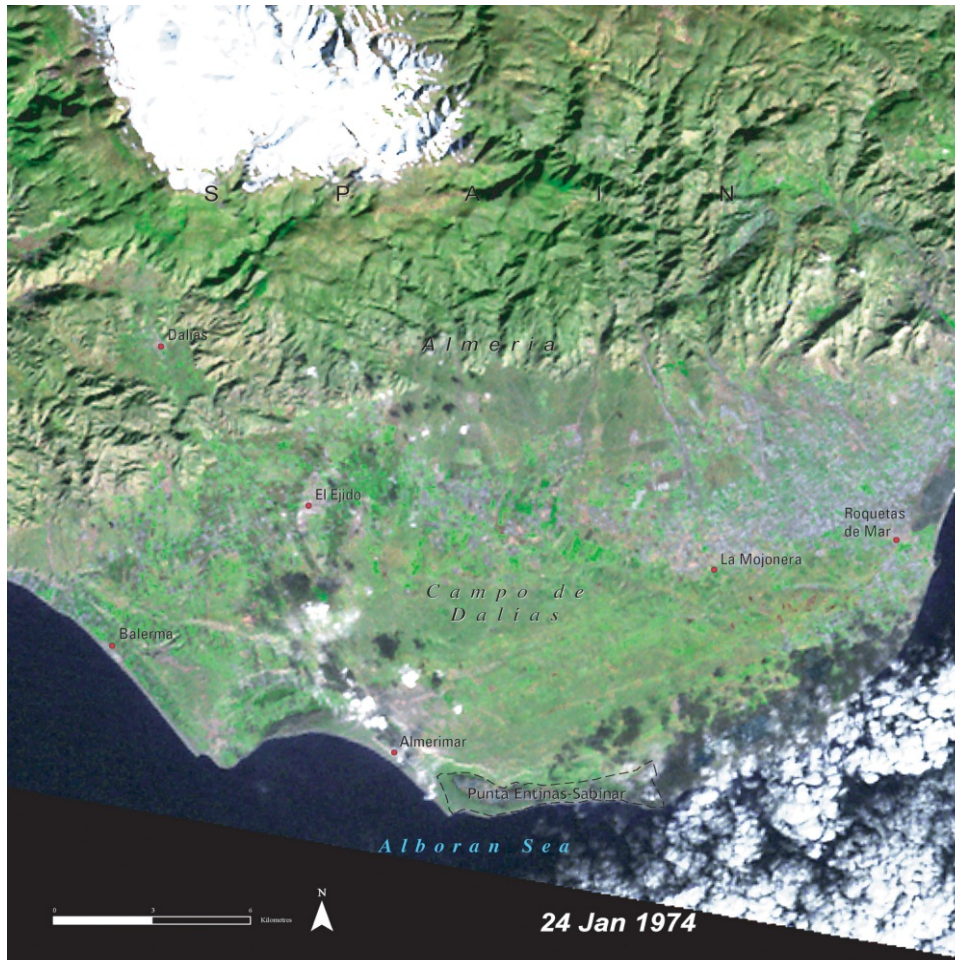
Grape cultivation in man made soils (Anthrosols) of Apulia, southern Italy



Human induced pressures in coastal zones: agriculture impacts
and land use changes in the region of Andalusia, Spain between
1956 and 2004



Source: P.I.C. INTERREG IIIB Western Mediterranean,
DesertNet Project



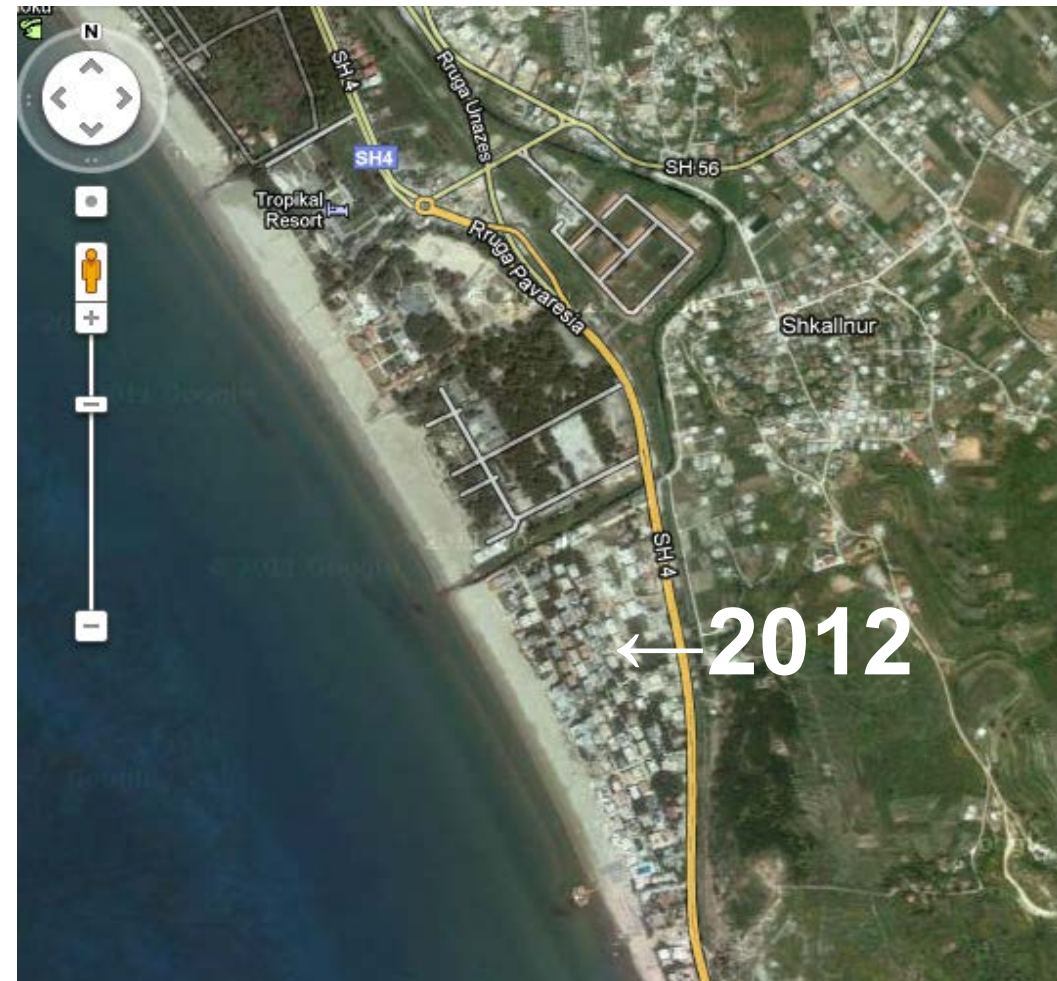
Drastic land use changes in the Campo de Dalias in Andalusia, Spain over a 30 years period show expansion of greenhouses at the expense of grazing and rain-fed agriculture. The process has been followed by extensive groundwater pumping to meet irrigation water needs

Spain is the largest exporter in the EU for fresh fruits and vegetables

MOST CRITICAL LAND DEGRADATION PROCESSES

- **Soil sealing**
- **Erosion (water and wind)**
- **Salinisation/Alkalinisation**
- **OM and soil fertility decline**

Loosing arable land to urbanisation in Albania (Technosols)



How long it will take to “cement” Malta?



Technosols of Malta

Less than half million people welcome 1.2 million tourists annually!!!



Soil sealing in the Mediterranean: a new form appears

Some facts:

40 % of the Mediterranean cost is sealed, by 2050 will be 50 %

Every 3 seconds the EU losses to sealing an area equal to one football field size or 275 ha per day. Greater Cairo area today (20M people) is ten times bigger than in 1950. 140,000 ha of fertile lands in Algiers were sealed until 2001.

For the period 2000-2010 Italy lost to sealing more than 300,000 ha, Lebanon 30,800 ha and Turkey 827,007 ha.



Solar panels replacing millenary olives in the Apulia Region, Southern Italy!!!!!!

Erosion: a natural and human-induced process



Natural historical geological erosion in Eastern Turkey



Reservoir sedimentation in Tunisia



Gully erosion in Spain and Albania

Natural gully erosion in Calabria, Italy locally described as “calanchi”



Consequences of the earthquake in Emilia Romagna, Italy 29 May 2012



Salinity extend in the Mediterranean

Egypt: 1 million ha

Italy: >1 million ha

Morocco: 350,000 ha

Spain: 3,4 million ha

Algeria: 1 million ha

Tunisia: >150,000 ha

Libya: > 1,5 million ha

Syria: 125,000 ha

Turkey: 2 million

Greece: 600,000

Albania: 15,000 ha

TOTAL: ~10,140,000 ha

The quest for water

Mediterranean has 60 % of water scarce population countries in the world with less than 1,000m³/person/year

(Plan Blue 2008)

**64 % of water region wide is used by agriculture,
82 % in Southern and Eastern countries
and above 50 % in the Northern countries**

13 % of water is used by tourism industry (300 M visitors/year)

56 % of water needs in Malta derive from desalinisation (similar for Cyprus and Israel)

Food chain increase the use of virtual water

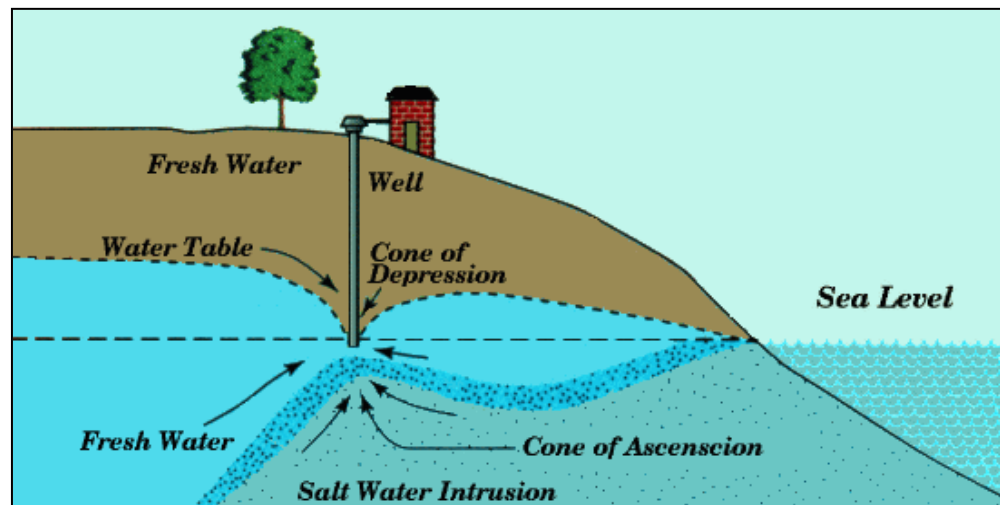
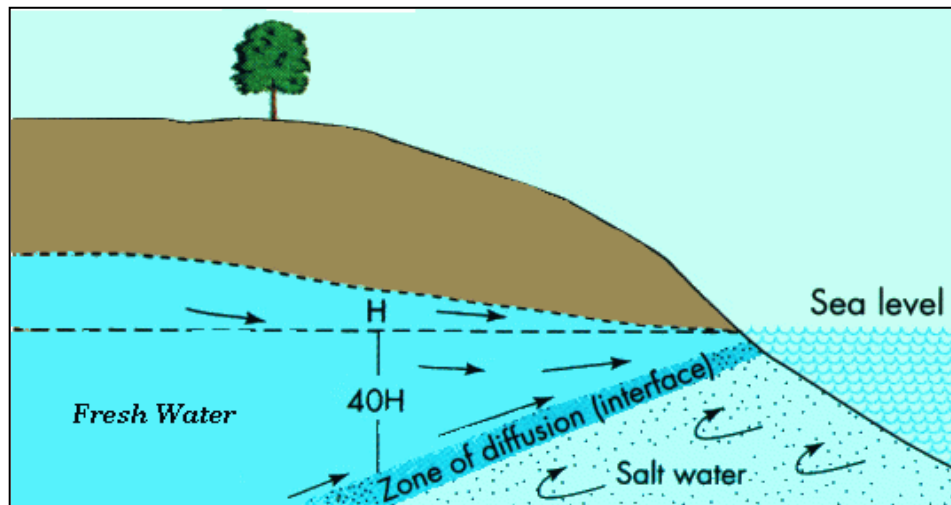
Climate change will worsen the situation!!!



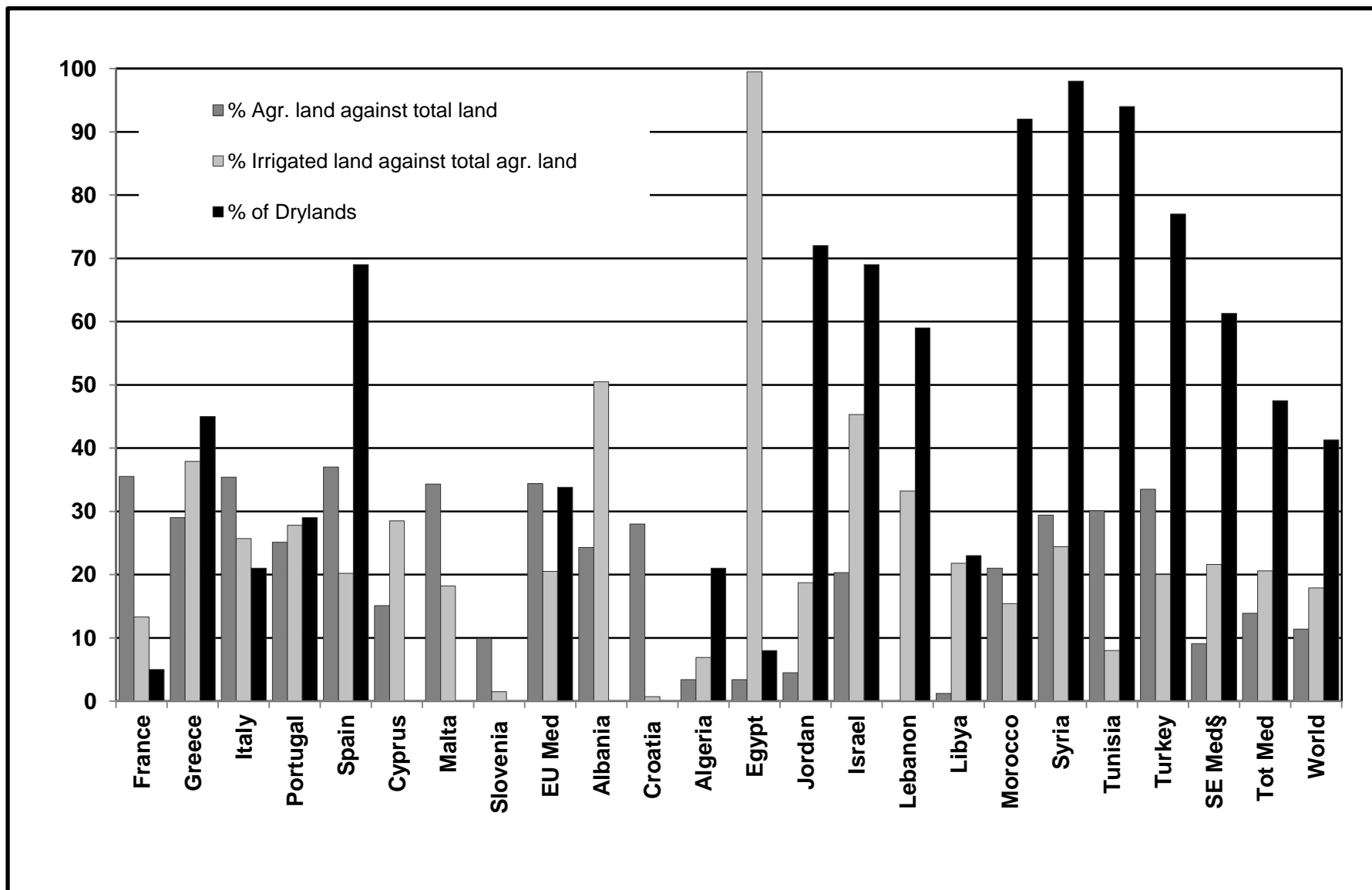
H₂O???

The quest for water: where is it?

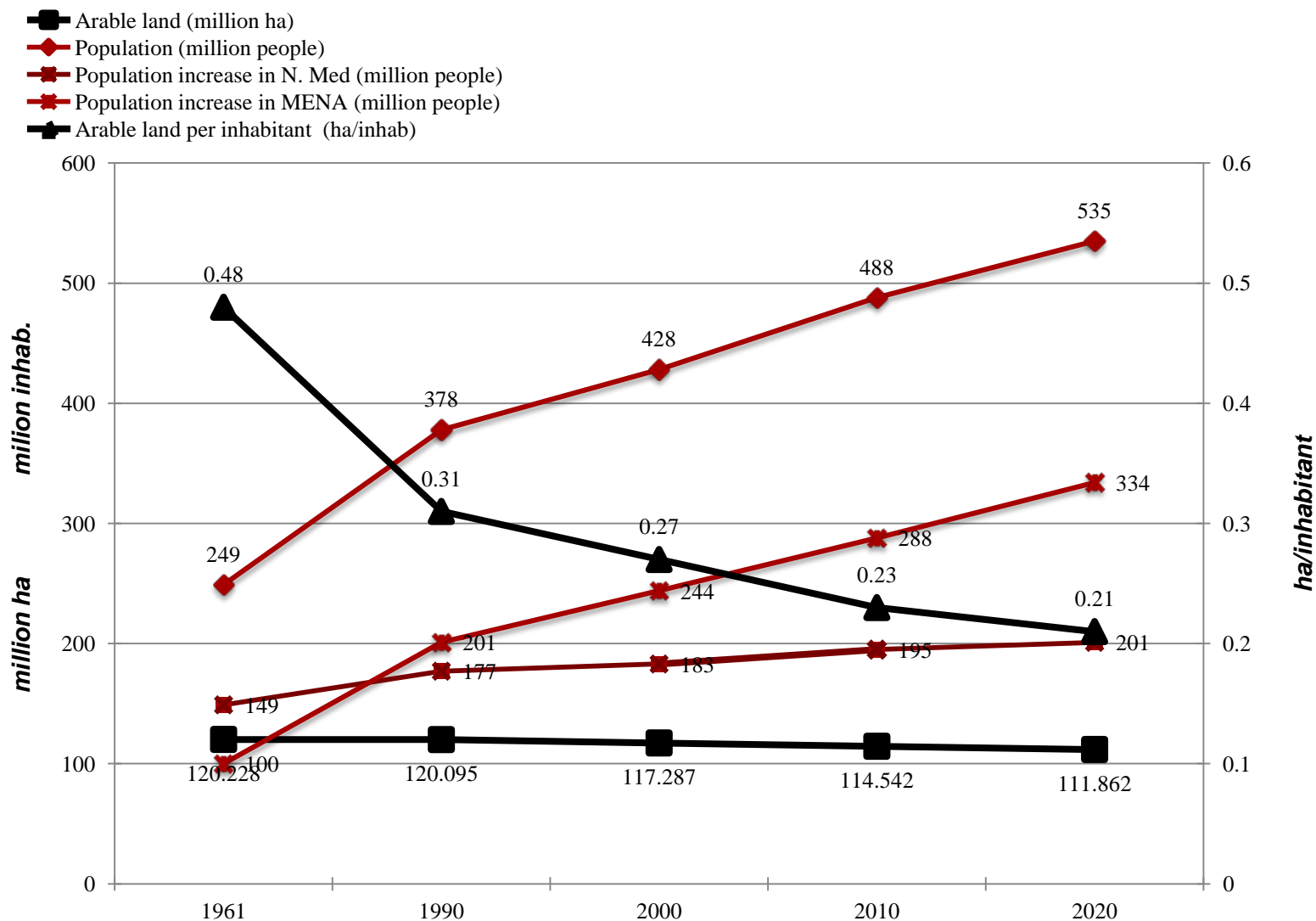
Groundwater over-pumping in the coastal zone brings to seawater intrusion and salinity built up in the soil surface as it is evident in the coasts of Italy, Spain, Greece, Albania, Egypt, Turkey and elsewhere



Distribution of arable land, irrigated areas and drylands in the Mediterranean



What future for the Mediterranean region?



Is there hope?



Terraces in Syria, Morocco and Albania



The “power” of fence
Three forms of soil management in one single place. Sardinia, Italy, 2011

Endorse Sustainable Land/Soil Management

SLM can increase productivity
Improve water use efficiency
Optimize nutrient cycles
Increase SOM
Mitigate climate change
Enhance vegetation cover
Increase food security

**Healthy soils produce healthy food
and promote a healthy environment**



Halophyte crops : Atriplex



Strip contour farming



Cover crops



Conservation agriculture and no-till



Thank you!
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There are 10,000 funnel shaped hollows called “zocos” in Lanzarote, the Canaries Islands, of Spain, each of them containing a grapewine that grows on rich volcanic lava derived nutrients. A horseshoe shaped wall protect the grapes from the winds while volcanic granules absorbs moisture during the night to feed the plants