Land degradation in the Mediterranean: Findings of the EU-funded MEDCOASTLAND Project

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Is there confusion in the terminology between:

Soil degradation (EU) and/or
Land degradation (FAO) and/or
Desertification (UNCCD) (or dryland desertification)

Where is the link and what could be done?
Land/soil degradation or desertification

**Resource base:**
- Climate
- Biosphere
- Water
- Soil
- Other

**Natural processes**
(i.e. climate change, volcanoes, earthquakes, tsunami)

**Human-induced processes**
Could mitigate (+) BUT could accelerate (-) effects on natural processes

"...'desertification' means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities" -- UNCCD, Article 1

- Inefficiency to maintain economic and ecological functions of land
- Reduction capacity of the land to perform its functions and produce goods and services

**Soil degradation**
Physical, chemical, and/or biological degradation of the SOIL loss of its ability to fulfil its functions (productivity and environmental)
Volcanic eruption ashes of Etna in Sicily covering the Maltese islands
Evolving concepts of land degradation

land - ecosystem functions and services

land

soils

Adopted from Clemencia Licona Manzur, FAO 2005
MEDCOASTLAND PROJECT

WP1 FORUM
Internet based dissemination and communication, networking, co-ordination, International Conference

WP2-S. Kapur
Workshop 1, research review, debate and dissemination on Eco-system based assessment of soil degradation to improve land users concern and prompt actions

WP3-M. Badraoui
Workshop 2, research review, debate and dissemination on Income-product generating soil conservation management

WP4-F.A. Kader
Workshop 3, research review, debate and dissemination on Participatory soil conservation management

WP5-T. Darwish
Workshop 4, research review, debate and dissemination on Guidelines for national and regional policies and management

WP6-S. Sammut
Workshop 5, debate and dissemination on Draft agreement to exchange data and develop regional long-term co-operation

WP7
Retrieval of information

Structure and links among Work Packages

National, Regional, EU research, studies, projects, policies, strategies, other

Input from selected projects for site visits
Network structure. PR = Researcher, PDM = Decision Maker, PA = Association of land / soil users
Participants of the Kick-Off Meeting, Bari, Italy 14-16 October 2002
The MEDCOASTLAND Project

**MAJOR GOAL**

Mediterranean coordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean region with special emphases on coastal areas.

Information Retrieval (around 3,000 files downloaded)

Functional Internet-based Knowledge Database and Forum on LD

Organisation of workshops, publishing proceedings, newsletters

Lay the foundation for continued collaboration even after the life time of the project by signing a Memorandum of Understanding.
MEDCOASTLAND PUBLICATIONS

MEDCOASTLAND PROJECT
Mediterranean coordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zones

Workshop Proceedings
Ecosystem-based assessment of soil degradation to facilitate land users and land owners’ prompt actions.
Adana, Turkey, 2-7 June 2003

Editors: F. Združič, P. Bredač, S. Kapur, and E. Aleša

Workshop proceedings
Promoting participatory management of the land system to enhance soil conservation
(Alexandria, Egypt, 9 - 13 October 2004)

Editors: Pandi Združič and Giuliana Trisorio Liuzzi

Workshop proceedings
Managing Natural Resources through Implementation of Sustainable Policies
Beirut, Lebanon 29-30 June 2006

Editors: Pandi Združič and Giuliana Trisorio Liuzzi

Conference proceedings
Managing Natural Resources through Implementation of Sustainable Policies

Science SOILS
The Final Tester

MEDCOASTLAND PROJECT
Mediterranean coordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zones

Thematic Network
October 2005 - September 2008

MEDCOASTLAND PROJECT
Mediterranean coordination and dissemination of land conservation management to combat land degradation for the sustainable use of natural resources in the Mediterranean coastal zones

Workshop proceedings
Promoting participatory management of the land system to enhance soil conservation
(Alexandria, Egypt, 9 - 13 October 2004)

Editors: Pandi Združič and Giuliana Trisorio Liuzzi

Workshop proceedings
Euro-Mediterranean Conference:
Managing Natural Resources through Implementation of Sustainable Policies

Editors: Pandi Združič and Giuliana Trisorio Liuzzi

Conference proceedings
Euro-Mediterranean Conference:
Managing Natural Resources through Implementation of Sustainable Policies

Editors: Pandi Združič and Giuliana Trisorio Liuzzi

Status of Mediterranean soil resources: Actions needed to support their sustainable use.
Tunis, Tunisia 26-31 May 2007

Conference proceedings

Editors: Pandi Združič and Giuliana Trisorio Liuzzi
MEDCOASTLAND PROJECT
2002-2007

Tunis, Tunisia 26-31 may 2007
Lessons learned (I): The problems

- We don’t know the exact quantitative extend of land degradation in the Mediterranean region
- The process is present in both rich and poor countries
- There is much confusion between actual degradation and potential degradation
- Methods of assessment vary
- Often national assessments do not include socio-economic indicators
- There is lack of monitoring systems
- Weak communication within the country or the region
- Political stability of the region and its impact on natural resources: land and water are also at the core of the problems

Source: Gaussen & De Philippis - FAO
Why bothering with LD in the Mediterranean

Risk of Human Induced Desertification

- Land is a very scarce resource and options of cropland expansion are extremely limited, despite this, land is often mismanaged or misused.
- All the countries of North Africa and much of those in the Middle East are water stressed.
- Population pressure: 2020 southern and eastern countries will have 300 M people.
- Attractive tourist destination for around 300 million tourists per year.
- Urbanisation is “swallowing” extensive prime land especially in the coastal zones.
- Costs for ameliorating degraded land are higher than preventing them from degradation.
Salinity build-up
Expansion of greenhouses in Andalusia in Spain

Total land
Arable land

Source: Elaborations of MAI B based on FAO 2001 data
CIHEAM member countries (www.ciheam.org)

Total population (in millions of inhabitants) in 1965 and 2002
**Salinity build-up**

- 64%
- 11%
- 17%
- 4%
- 14%
- 30%
- 1%
- 23%
- 6%
- 15%
- 13%
- 35%

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**Arable land and population trend in the Mediterranean**

Source: Oldeman, et.,al 1991 (GLASOD)

**Human Induced Soil Degradation**

Source: Elaborations of MAI B based on Plan Bleu 2005 data
Main LD factors in the Mediterranean

- Water and wind erosion
- Soil sealing and urbanisation
- Loss of organic matter and biodiversity decline
- Nutrient mining
- Chemical pollution and contamination
- Floods and landslides
- Salinisation
- Overgrazing and vegetation degradation
Annual cost of soil degradation in European Union

Though difficult to estimate, several studies demonstrate significant annual costs of soil degradation to society in the ranges of:

• erosion: €0.7 – 14.0 billion[1],
• organic matter decline: €3.4 – 5.6 billion,
• compaction: no estimate possible,
• salinisation: €158 – 321 million[2],
• landslides: up to €1.2 billion per event,
• contamination: €0.6 – 17.3 billion[3],
• sealing: no estimate possible,
• biodiversity decline: no estimate possible.

[1] This estimate covers only costs of erosion in 13 countries, including the major Member States where erosion occurs. Data is not available for the others.
[2] This estimate covers only the costs of salinisation in three countries, data is not available for others.
[3] An independent study estimated that the costs of soil contamination could amount annually to up to €208 billion. Nevertheless this estimate had a high degree of uncertainty, therefore the intermediate value of €17.3 billion per year was retained.
The Mediterranean region and climate change

What could we expect?
Climate change scenarios and their consequences in the Mediterranean

• The Mediterranean is expected to become drier with prolonged droughts in summer and reduced winter rainfall.

• Heavy rainfall events will be accompanied by flash flooding, urban drainage, erosion, slope stability and groundwater recharge.

• Agriculture production is expected to decline due to shorter growing season, extreme events during development stages, heat stress during flowering, and rainy days during sowing.

• The temperature in the Mediterranean may rise by 0.3-0.7 degree C per decade and summer rainfall may decrease by 15% causing more widespread desertification.

• Climate change thus is expected to have consequences also for the tourism industry.

• Due to sea level rise Italy alone may lose 6 per cent of its territory while half of Europe’s coastal wetlands may disappear.

http://www.cru.uea.ac.uk/projects/mice/
Why bothering with LD

Soil sealing and urbanisation

Barcelona coastal conglomerates

Maltese coasts

Maltese islands

Cairo

Soil erosion and sea eutrification

Salinity build-up
Europe by night

Pressures on coastal areas

50-70% of Mediterranean population lives within 60 km from the coast

Expansion of greenhouses in Andalusia in Spain

Drastic changes of land use
Planet Earth seen from space
Salinity build-up

Expansion of greenhouses in Andalusia in Spain

Pressures on coastal areas

50-70% of Mediterranean population lives within 60 km from the coast

LACOAST PROJECT: land cover changes in coastal zones (10 km) for the period 1975-1990

LACOAST PROJECT: land cover changes in coastal zones (10 km) for the period 1975-1990

Land cover changes in coastal zones (10 km) for the period 1975-1990

Spain
Italy
Belgium
France
Ireland
Netherlands
Germany
Denmark
LACOAST findings

- expansion of irrigated agriculture against rain fed agriculture
- conversion of pastures to arable land
- loss of wetlands for harbour development
- expansion of build-up areas (30 % increase for Portugal, Spain and Corsica, Sardinia and Sicily)
A crucial question:

“What is wrong in using the land for infrastructure development instead of cultivating crops or maintaining natural conditions?”

The answer is clear: the artificial cover of land largely disrupts the ecosystem functions and the natural exchange cycles of nutrients, water and gas fluxes with direct consequences on biodiversity, ground water equilibrium and ecosystem stability.
Ecological corridors are fragmented by roads, railways, dams, and urban sprawl, which partition Natura2000 sites from other sites and ecosystems. In addition to losses of habitats, species trend to be isolated and therefore endangered.

Effect of artificialisation of land cover on nature protection

Legend

- Natura 2000 sites

Landscape Natural Potential

- Urban morphological zones, pc
- High natural potential: 100

Total urban sprawl

- 2% - 5%
- 5% - 10%
- More than 10%

Roads

Source: EEA/Corine land cover 1990-2000/ Land Accounts Project Provisional results
Coastal urbanisation and sealing

Barcelona coastal conglomerates

The Tevere River draining at Thyrenian Sea at the place called Lido di Roma in western part of Italy

Photos: P. Zdruli, 2002 and 2006
Coastal urbanisation and sealing

Photos: P. Zdruli, 2002 and 2006
How long it will take to “cement” Malta?

Source: University of Malta, 2004
Human interventions on the territory

Rocky soil

Man made soil
Human interventions on the territory

Grape cultivation in man made soils in Apulia, southern Italy
Un sustainable human interventions on the territory

Effects of the devastating storm on October 2005 in the Province of Bari, Apulia Region
Lessons learned (II): Responses

- International community did not ignored the Region. EU alone for the period 1995-2005 has spent 11 billion Euros in the Mediterranean Partner Countries (several projects) following the Barcelona Convention agreement signed in 1995

- The Convention paved the way for the creation of the Mediterranean Commission on Sustainable Development and the endorsement of the Mediterranean Action Plan

- In July 2008 in Paris will be launched the Mediterranean Union initiative

- UN Agencies, World Bank, IFAD and Governments of rich countries have also provided considerable support

- National Governments have played their part (many good examples from Morocco, Tunisia, Egypt, Syria, Turkey, etc)

- Policy drafting for integrated sustainable rural development and natural resources management to enhance capacity and institution building, local staff training and education including gender issues and involvement of local communities
Lessons learned (III): Impacts

• Vary between countries
• Depend on direct involvement of decision makers
• International community should not be considered only as donor but also as local/national stakeholder
• Assure continued collaboration
• Respect for local traditions
• Valorise traditional technical knowledge and indigenous crops
• Careful selection of technology transfer
Lessons learned (IV): Future outlook

- Promote income generating activities and integrated rural development
- Find a good balance between bottom up and top down decision making
- Fight corruption, move away from politics to sustainable policymaking
- Polices and guidelines should be IMPLEMENTED
- Promote the societal approach of stakeholder involvement and responsible participation
Does everything goes wrong?
MEDCOASTLAND PROJECT
West Noubaria Rural Development Project, Egypt

Drip irrigation/fertigation along the Desert Road
Cairo, Alexandria in Egypt

Gender issue

Adana Mayor in Turkey showing results of reforestation project

Cactus and artiplex cultivation in Marrakech, Morocco
MEDCOASTLAND PROJECT
Management of sloping lands through terracing
Thank you for your kind attention

5th International Conference on Land Degradation
www.iamb.it/5ICLD

Conference theme
Moving ahead from assessments to actions:
Could we win the struggle with land degradation?

Valenzano, Bari, Italy
18-22 September 2008