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Secretariat**

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**Conference Services**

**Fifteenth OSCE Economic and Environmental Forum - Part 1:  
“Key challenges to ensure environmental security and sustainable development in the  
OSCE area: Land degradation, soil contamination and water management”  
Vienna, 22 - 23 January 2007**

**Session IV  
Environmental security and sustainable economic development**

Please find attached the presentation by the keynote speaker, Dr. Jose Luis Rubio, European Society for Soil Conservation, Research Centre on Desertification, University of Valencia, Spain: *Implications of land degradation on socio-economics aspects and environmental security.*

The 15<sup>th</sup> OSCE Economic and Environmental  
Forum  
Vienna, 22-23 January 2007

IMPLICATIONS OF LAND DEGRATION ON  
SOCIO-ECONOMIC ASPECTS AND  
ENVIRONMENTAL SECURITY

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Centro de Investigaciones sobre Desertificación-CIDE(CSIC) Valencia, Spain

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- Soil is the base of civilizations
- From the soil comes 90% of food
- Soil performs crucial ecological functions (water cycle regulator, GHG regulation...)
- Soil-Land degradation implies serious environmental, economic and social cost

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THE FIVE SECURITY SECTORS (Buzan, 1998)

<u>SECTOR</u>	<u>ACTORS</u>
Military	The all society
Political	Governments, administratives bodies, official representatives, ...
Economic	Entrerprises, banks, corporations, ...
Societal	Civil society, associations, ...
<i>Environmental</i>	The all society

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## ALIVE MEDIUM



Soil as an interface: The living skin of the Earth

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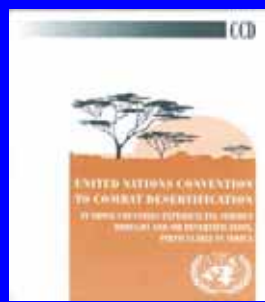
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- EU Strategy on Soil Protection-SFD
- UN Convention to combat Desertification (UNCCD)



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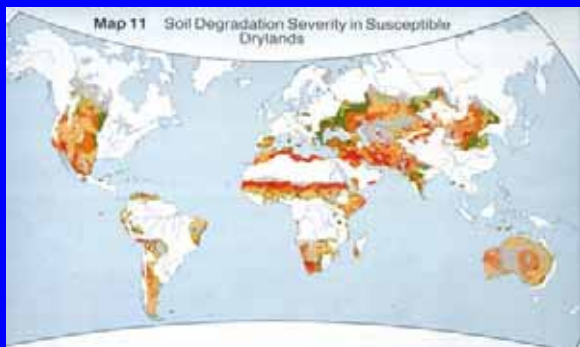
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## Aridity Map




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## Regional Implementation Annex for the Northern Mediterranean. Annex IV

- Semi-arid climatic conditions affecting large areas, seasonal droughts, very high rain
- Poor and highly erodible soils, prone to develop surface crusts
- Uneven relief with steep slopes and very diversified landscapes
- Extensive forest coverage losses due to frequent wildfires
- Crisis conditions in traditional agriculture with associated land abandonment and deterioration of soil and water conservation structures
- Unsustainable exploitation of water resources leading to serious environmental damage, including chemical pollution, salinisation and exhaustion of aquifers
- Concentration of economic activity in coastal areas as a result of urban growth, industrial activities, tourism and irrigated agriculture

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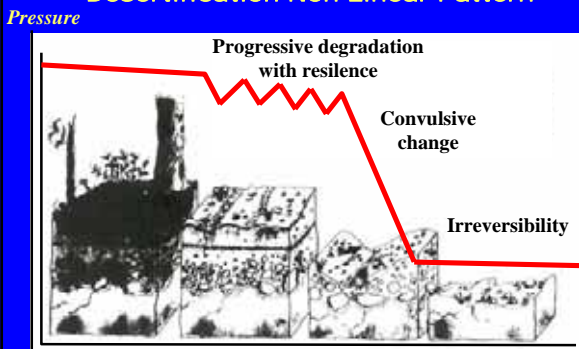
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## Desertification Non Linear Pattern




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## Desertification

### Double rupture:

- Provision of goods and benefits from natural systems
- Ecological functions and regulations

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### DESERTIFICATION versus ENVIRONMENTAL SECURITY

- Water scarcity and/or water contamination
- Reduction on agricultural food production
- Increase on flooding consequences
- Vulnerability to effects of droughts
- Increase of forest fires and their consequences
- Susceptibility to severe landslides and slope collapse
- Rupture of the ecological functions of the land
- Loose of human lives

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Lack of perception  
Scarce societal awareness !!

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- Implications with climate change
- Water resources
- Forest fires
- Socio-economic impacts
- Migrations

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### Mediterranean Basin

- Temperature increase 2-6.3°
- Rainfall decrease
- Increase in evapotranspiration
- Increase in the range of variability
- Increase of extreme climatic events
- Drought incidence

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### GENERAL TREND OF SOIL ARIDIFICATION

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## Soil structure, a crucial property

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## Soils: EMISSIONS versus SINK

- Water vapor
- CO<sub>2</sub>, CH<sub>4</sub>, Nitrogen oxides
- Trace elements
- Aerosols and dust

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## DESERTIFICATION - CLIMATIC CHANGE

- Soil plays a crucial role in the climatic regulating systems of the Earth
- Land degradation/desertification processes affect directly these regulating systems
- The warming trend can not be effectively mitigated without a global policy for the adequate use of the land including combat land degradation

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## Soil Degradation-Water scarcity

### Negative Water Trends

Permanent increase in demand

Reduction in precipitation (drylands)

Loose of soil regulating capacity

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1. Pessimist Scenario (UN): 7.000 millions of people in 60 countries will suffer water scarcity by 2050

2. “Optimist” Scenario (UN): 2.000 millions of people in 48 countries will suffer water scarcity by 2050

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UNICEF: 2025 more than half world population will suffer water scarcity

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## Salinisation



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## Water stress



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## Droughts



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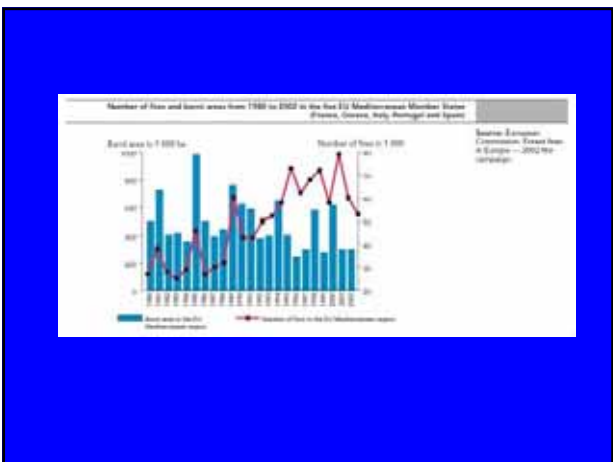
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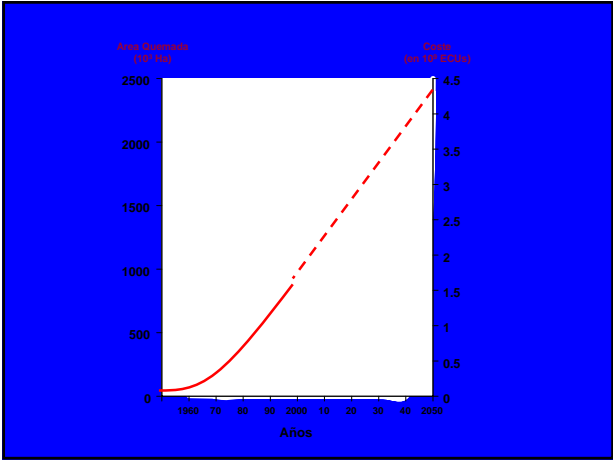
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## FOREST FIRES – – DESERTIFICATION RISK



- Steep slopes
- Shallow (skeletal) soils
- Vulnerable soils
- Repeated fires
- Fire-torrential rain

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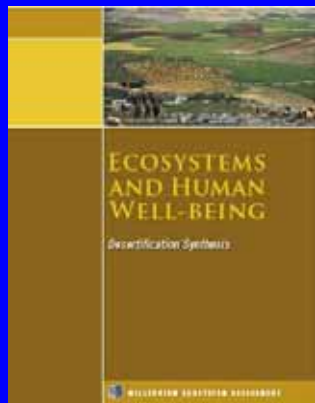
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“People are  
integral part  
of  
ecosystems”

MEA, 2005



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### Human Systems

#### Sensitive Systems

- Water resources
- Agriculture, forestry, fisheries
- Human settlements
- Industry, energy, financial services

#### Vulnerabilities

- Food and water security
- Incomes and livelihoods
- Human health
- Infrastructure

Soil loose its buffer capacity



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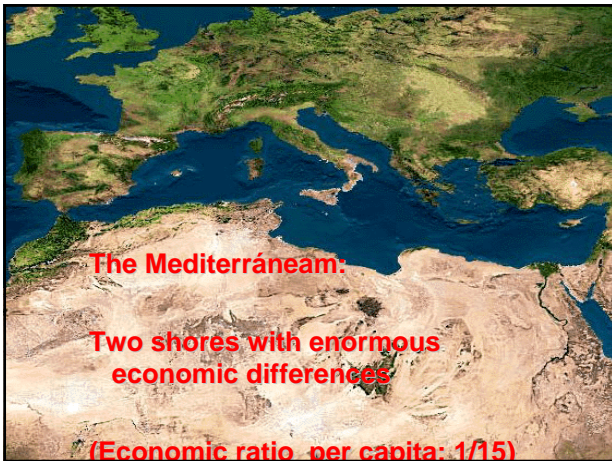
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## Some Antecedents

- I International Symposium on Desertification and Migrations ( Almeria 1994)
- The Almeria Statement on Desertification and Migrations
- Claims on the links between desertification, drought and migration by UNCCD (H.A. Diallo), scientists and representatives of international organizations
- "Security and Environment Linkages in the Mediterranean" by H. G. Brauch et al., Springer, 2003
- NATO Workshop in Valencia (Dec. 2003) and book: " Desertification in the Mediterranean Region: A security Issue" (W.G.Kepner, J.L.Rubio et al., Springer 2006)
- Panel on Global Interactive Dialogue on land degradation/desertification and their impact on migration and conflicts, CRIC-3 of UNCCD Bonn, May 2005
- First Global International Studies Conference, including several workshops related to desertification and conflicts, Istanbul August 2005
- II International Symposium on Desertification and Migrations ( Almeria October 2006)

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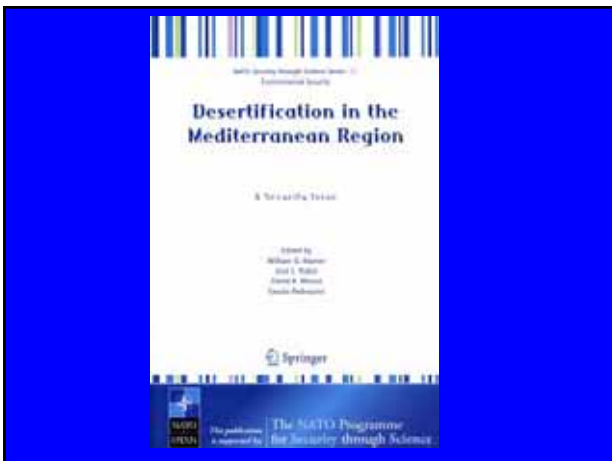
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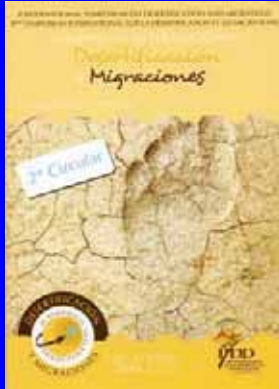
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## ALMERIA 2



### Thematic Topics:

-Environmental problems generated by migrations dynamics

-Interactions between desertification and migrations. Case studies

Political responses: Land management and cooperation to the development aid

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## RECOPEN EL 'PASAJE' EN EL DESIERTO Y OFRECEN DISTINTOS DESTINOS Ya hay 'líneas regulares' de pateras y cayucos a Canarias

Las mafias que se dedican a reclutar inmigrantes para trasladarlos a España tienen su propio catálogo de ofertas de viaje. Salen a buques en autobuses, hasta el desierto del Sahara



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## Economic Evaluations of LD-Desertification Impacts

- Erosión: 15 billons €/año in EU
- Forest Fires in Spain: 10.000 millions € (1990-2005) (MMA)
- Salinización: 11 billons €/año
- Cattle-raising (degra. pasture land): 23.000 millions \$ in 1990

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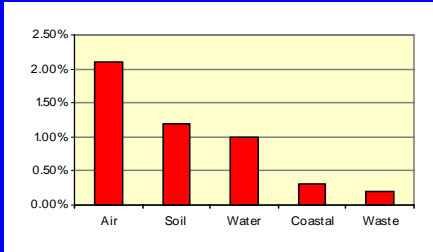
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**Total Damage Costs**  
**10-19 billion (mean estimate 14.5 billion)**  
**3.2-6.4 % of GDP (mean estimate of 4.8%)**  
**Sherif Arif, World Bank**

Annual cost of environmental degradation by environmental categories (mean estimate as % of GDP)




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## Perspectives Society and decision makers

- Desertification is visualized as something far away in time and distance
- Societal values. Economist driven society
- Important increase on environmental sensibility
- Important increase on knowledge and information
- Lack of transmission of information to decision makers for the needed actions

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## The Cost of inaction

- Increasing the impacts and consequences of desertification (climate change, water scarcity, food security)
- Increasing poverty and instability
- Increasing migration and social conflicts
- Increasing illegal activities and the cost of controlling clandestine migration
- General aggravating trend (a Time Bomb?)

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## SOME CONCLUSIONS

- ⇨ Desertification is a serious and increasing environmental issue in Europe affecting approximately 10% of the total European land
- ⇨ Desertification menace the all biospheric potential of the affected area that could finally collapse
- ⇨ Land Degradation-Desertification processes affects Environmental and Societal Security
- ⇨ The aggravating trends demands a better and stronger societal involvement and perception
- ⇨ There is a need of a better desertification appraisal and a need of a stronger cooperation and coordination between European affected countries which could be achieved through Annex IV and V of UNCCD, EU, OSCE and other international organizations

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Thank you for your attention!



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## VALORACION DE LOS COSTES DE DESERTIFICACION-DEGRADACION AMBIENTAL

Los costes por los perjuicios han de incluir:

- Impacto en los recursos naturales (ejemplo: impacto en los ecosistemas, deforestación).
- Impacto en la salud humana y la calidad de vida (mortalidad, pérdidas de valores recreativos, etc.)
- Impacto en las actividades económicas y/o productivas.
- Externalidades de difícil valoración económica (regulaciones ecológicas)



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## OTROS COSTES

- Destrucción de habitats*
- Alteración de flujos migratorios*
- Registro arqueológico-cultural*
- Aumento de emisiones de gases que aceleran el efecto invernadero*
- Alteraciones microclimáticas*
- Perdida de biodiversidad y del banco de genes*
- Incidencia de enfermedades exóticas*
- Valoración estética y psicológica del paisaje*
- Derecho a un entorno natural saludable*



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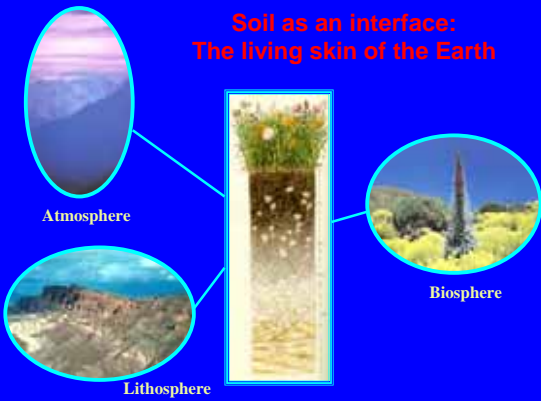
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### Soil as an interface: The living skin of the Earth



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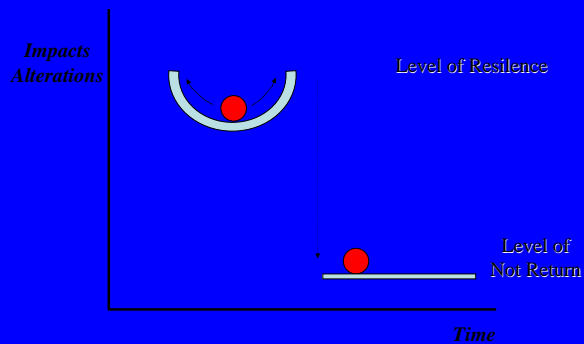
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### Desertification Non Linear Pattern



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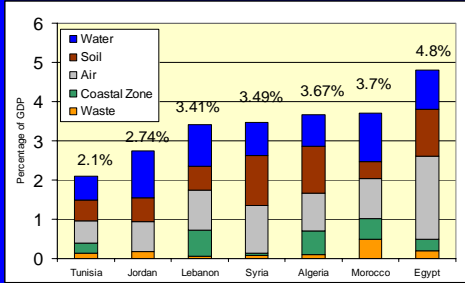
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**The Cost of Environmental Degradation  
An Indicator for Environment Sustainability  
Environmental Category: Percentage of GDP**




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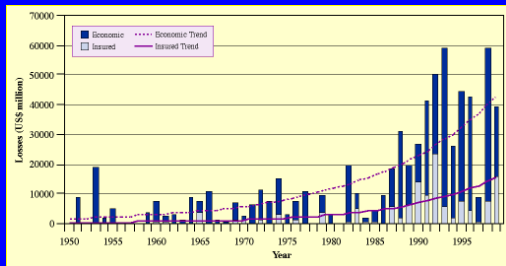
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**Catastrophic weather-related losses  
increased 10-fold from 1950s**




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**WATER SCARCITY-  
DESERTIFICATION**

- Globally affecting 2 billions people
- Scarcity in drylands: 1,2 m3/person/year
- 3,1 millions persons (90% children) dye in 2004 by malalties related to water
- From 1950 water consum has sextuplicated
- Overspread conflicts
- Negative perspectives

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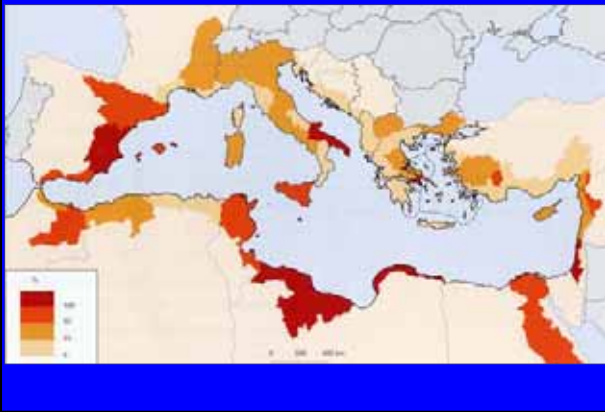
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### Present Exploitation Index of Water Resources



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### Some Facts

- UE (380 millones): 10 millions of inmigrants
- Spanish inmigrants regularization (May 2005): 800.000 persons
- Present number of inmigrants en Spain: ¿1.900.000?
- Canarias: 1.400? dead persons in last 6 months
- Clear worsening trend

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### Landslides

