

# Land/Soil Civilization and Life



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# A Testament to Human History!

Great civilizations have collapsed because they have failed to prevent the deterioration of the lands on which they live. The contemporary world suffers from the same fate.

Kaynak: M. C. Scholes, R. J. Scholes.  
**Dust Unto Dust.** *Science*, 2013; 342  
(6158): 565

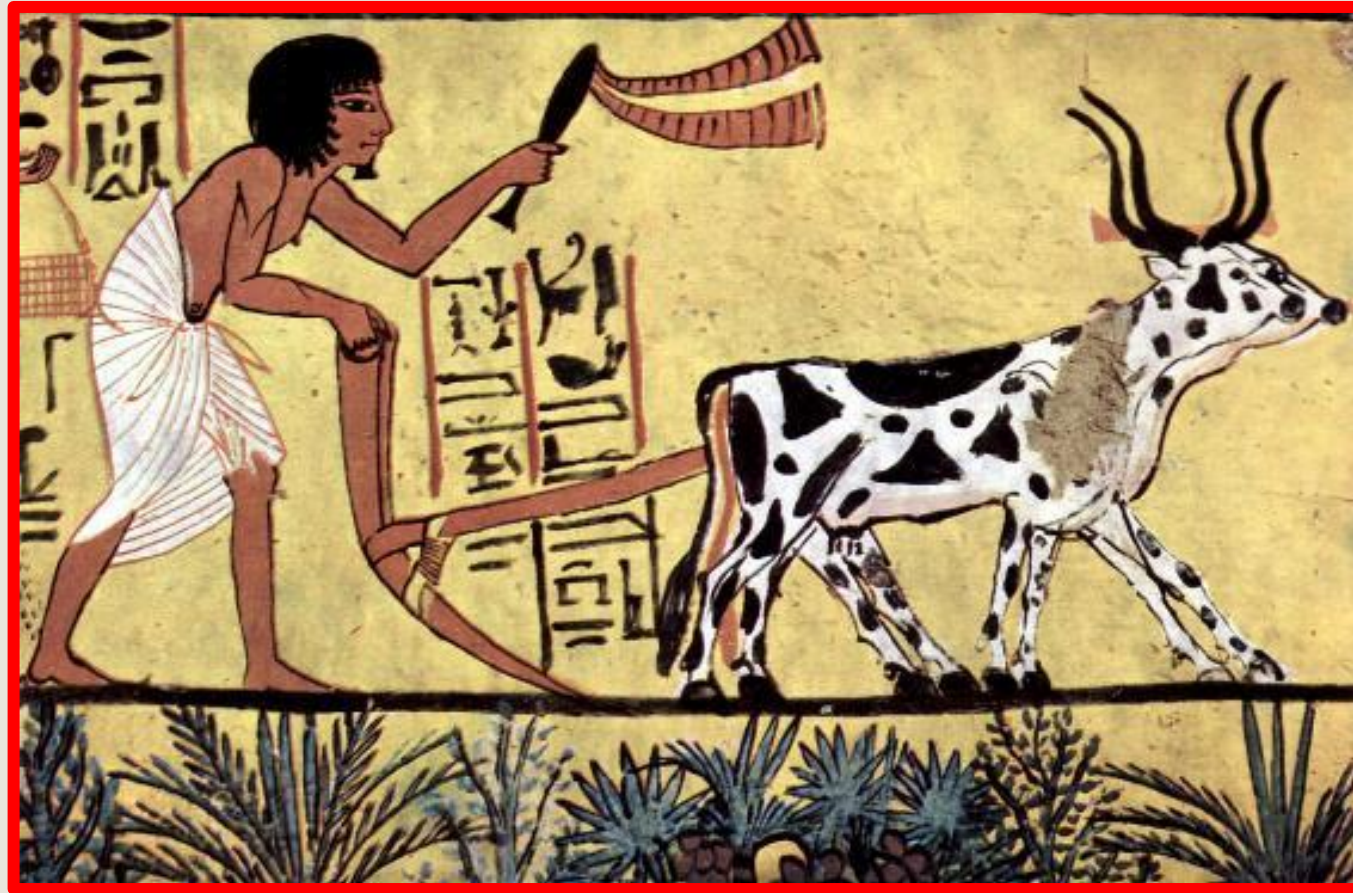


## Human and soil



The historical development of man sheds light on his relationship with the land. With the discovery of fire, mankind, more easily migrating to colder climates, started to use soil and water resources intensively with the increasing population pressure.

## Human and soil



It is scientifically accepted that the effective interaction of human beings with their land and resources in Anatolia began 11,000 years ago (9,000 BC).

11,000 years ago (9000 BC): The earliest recorded date for the construction of Göbekli Tepe temenoi ceremonial structures in southern Turkey is probably the oldest surviving pre-religious site on Earth.



Source: Curry, Andrew  
(November 2008).  
"Göbekli Tepe: The  
World's First Temple?"

10,000 - 9,000 years ago (8000-7000 BC): Northern Mesopotamia, northern Iraq, barley and wheat cultivation begins. They are used for beer, cake and soup at first, and finally for bread. In this period, the planting bar is used in early agriculture, but in the following centuries it is replaced with a primitive plow.



Kiple, Kenneth F. and Ornelas, Kriemhild Coneè, eds., Cambridge World Food History, Cambridge University Press, 2000, p. 83  
"No-Till: The Quiet Revolution" by David Huggins and John Reganold, Scientific American, July 2008, p. 70-77.



Göbeklitepe or Göbekli Tepe is the oldest known social group community in the world, located near Örencik Village, approximately 22 km northeast of Şanlıurfa city center.

Source: [kulturvarliklari.gov.tr](http://kulturvarliklari.gov.tr), "Global Heritage Fund – Göbekli Tepe, Turkey

It is defined as a social (religious) group center, not a settlement. It is understood that the structures here were built by the last hunter groups who were close to agriculture and animal husbandry. In other words, Göbekli Tepe is an important cult center for hunter-gatherer groups that have a highly developed and deepened belief system.

Sources: Excavation Results Meeting (2007), volume 2 Klaus Schmidt, Göbekli Tepe Excavation 2006 Report Sh.: 417, 423.

O. Dietrich, Ç Köksal-Schmidt, J. Notroff, K. Schmidt, First Sanctuaries Then Cities Founded Sh.: 76.



10,000 - 9000 years ago (8000 BC - 7000 BC), barley and wheat farming began in northern Mesopotamia (now northern parts of Iraq).



Mesopotamia – Anatolian Civilizations



Fertile Crescent

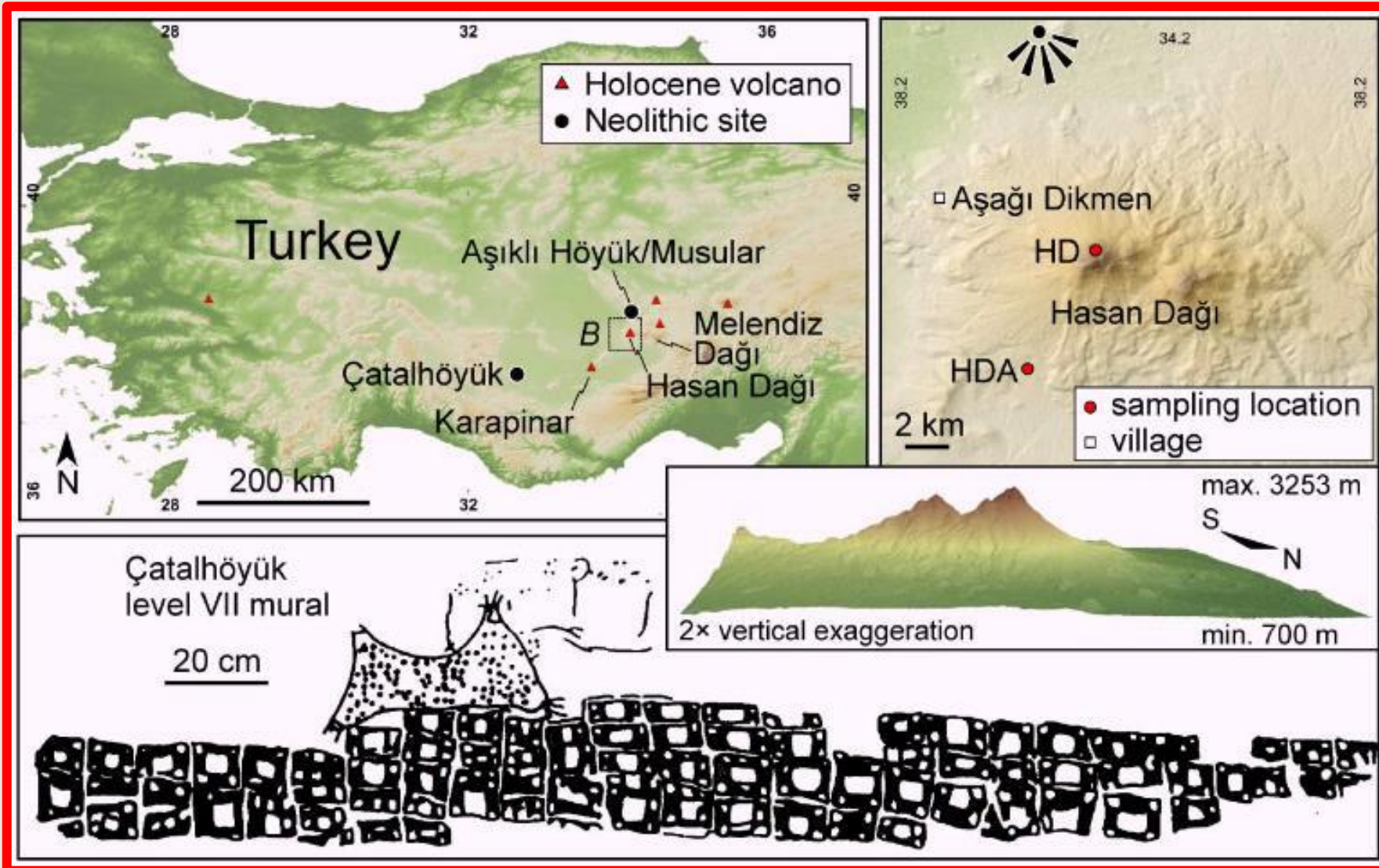
9500 years ago (7500 BC): Çatalhöyük an urban settlement established in Anatolia



Konya Çatalhöyük Neolithic City The First Settlement of Anatolia

Çatalhöyük is located overlooking the Konya Plain, southeast of the present-day city of Konya (ancient Iconium) in Turkey, approximately 140 km (87 mi) from the twin-coned volcano of Mount Hasan.

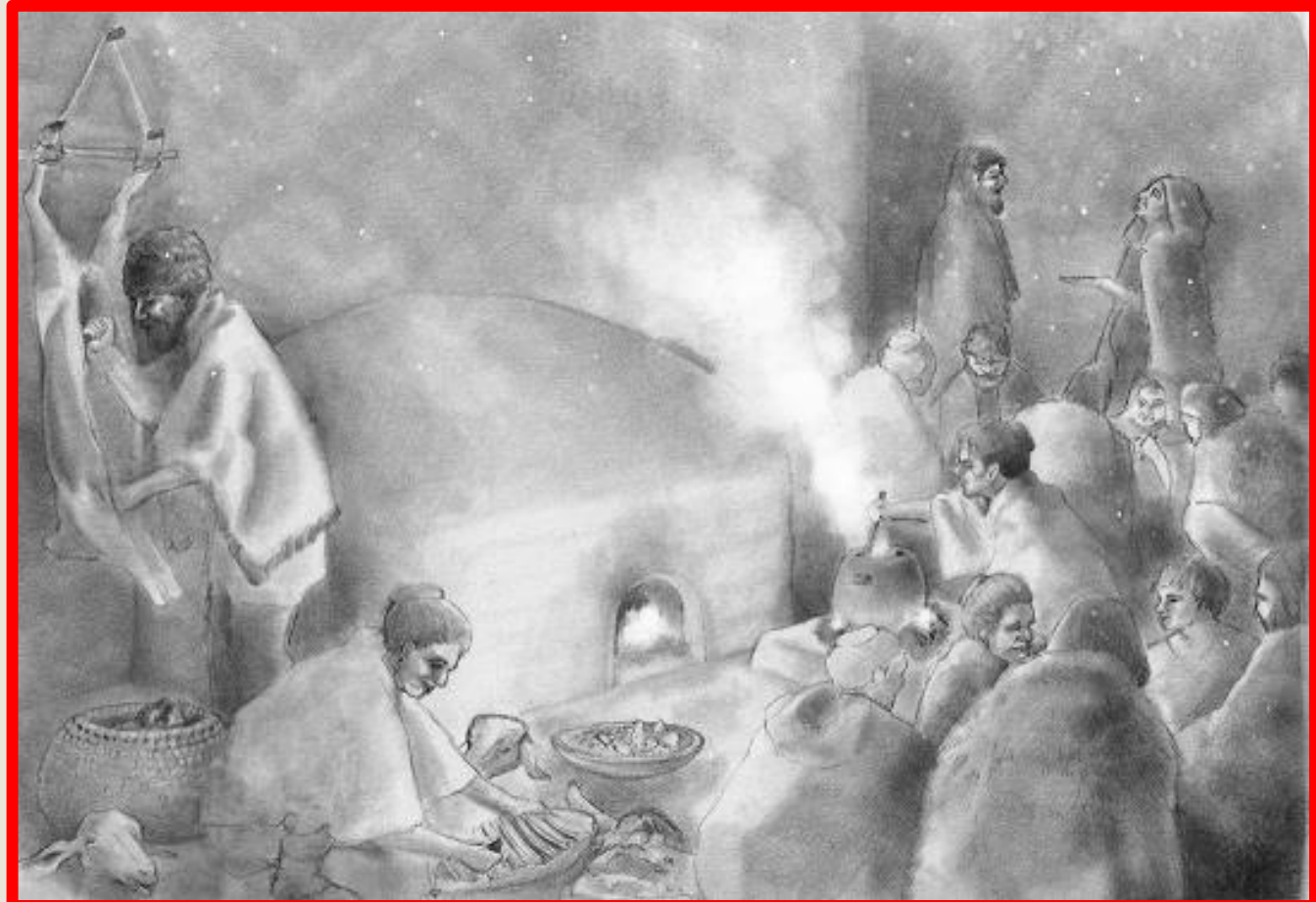
# Anatolian Civilizations



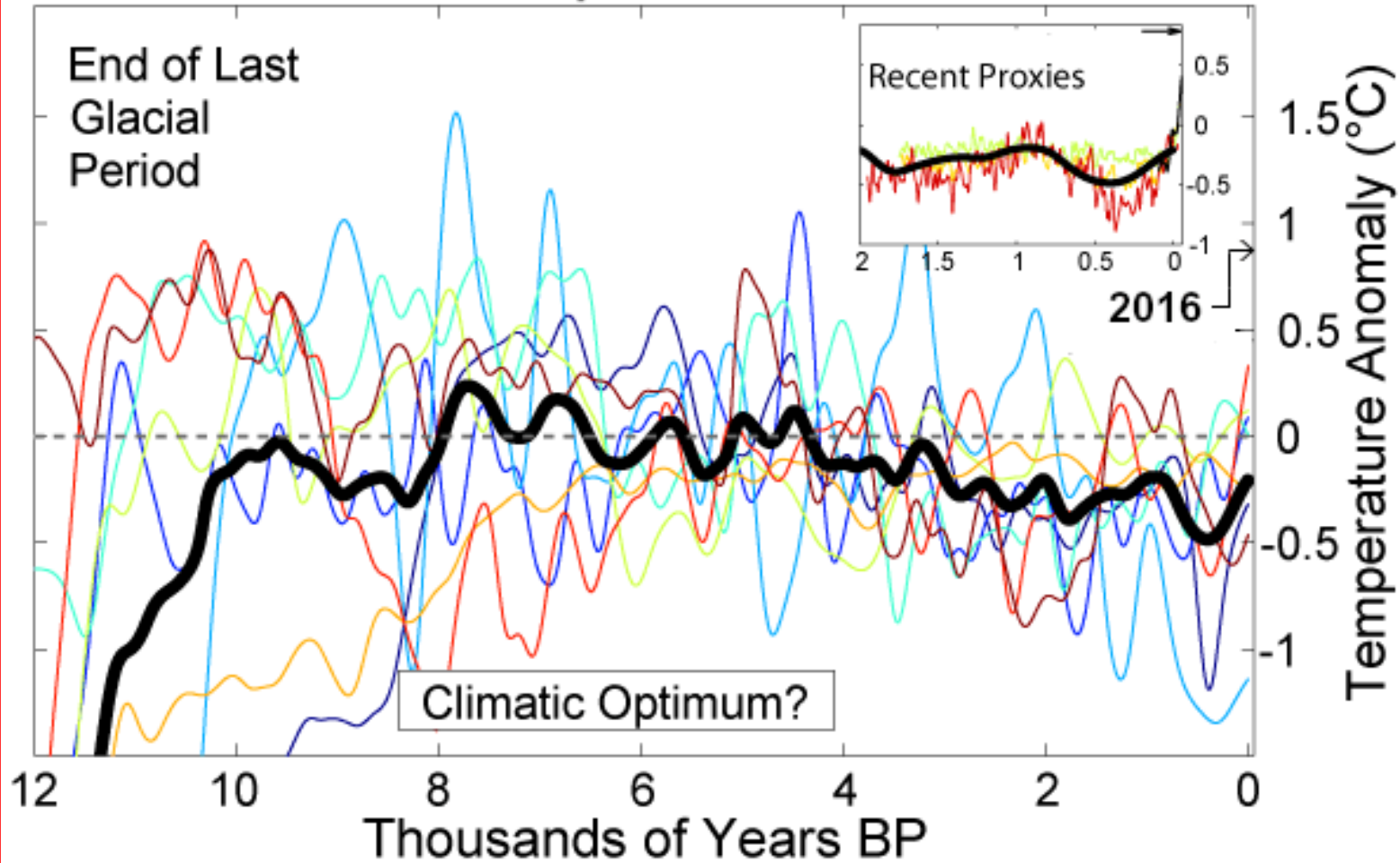
Çatalhöyük was discovered by James Mellaart in 1958 and the first excavations were made between 1961-1963; It is accepted as the first settlement in human history (7500 BC). A total of 13 building levels were unearthed during the excavations.

# Anatolian Civilizations

It is estimated that the population of Çatalhöyük is 5000 – 7000.



# Holocene Temperature Variations

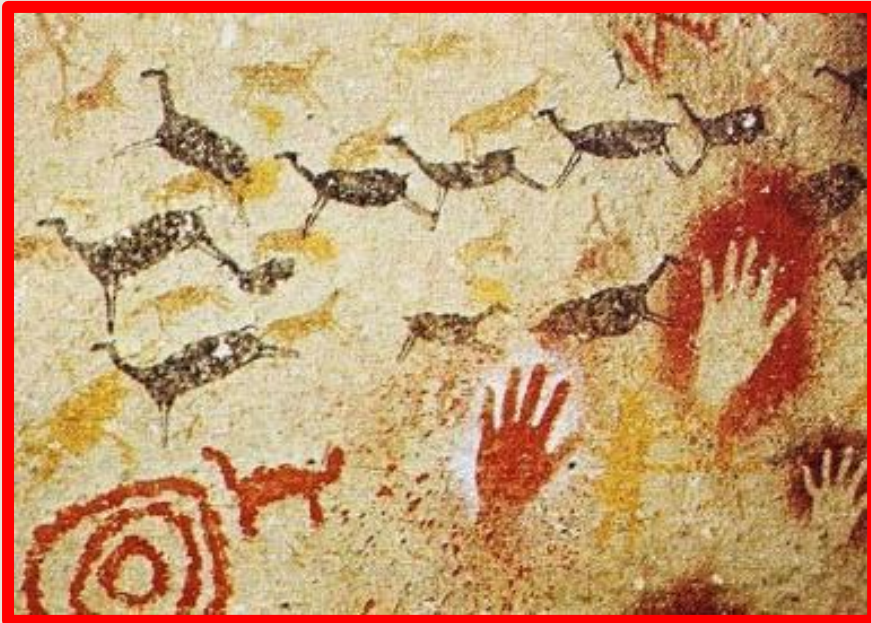


8,200–8,000 years ago:  
8.2 kiloyear event: The sudden drop in global temperatures caused by the final collapse of the Laurentide Ice Sheet, which led to drier conditions in East Africa and Mesopotamia.

# Anatolian Civilizations

The following findings have been identified as a result of archaeological studies and investigations in Çatalhöyük:

- Destruction of forests
- Large-scale burnings (land clearances?)
- Erosion (destruction of protective soil cover)
- Large-scale overgrazing (livestock)



# Roman Period



Mediterranean region (~ 500 BC (2023 + 500 = 2523 years ago))

# Roman Period



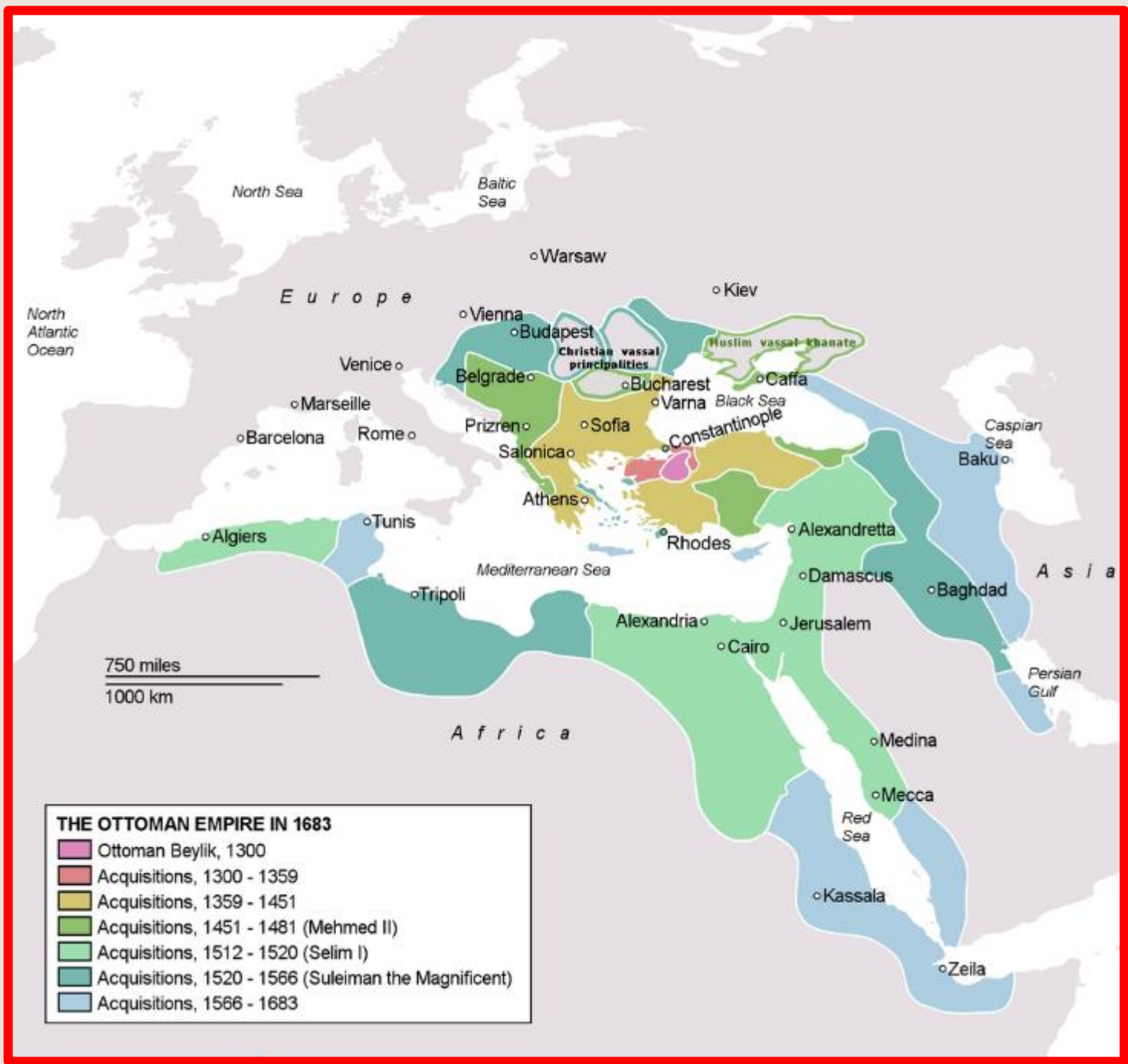
Forest clearances in the Mediterranean region: a history of climate change (forest cover transition of temperate humid climate to that of arid climate)



# Roman Period



Deep rich topsoils formed under the temperate humid climate zone forest cover now lie at the bottom of the Mediterranean!



# Ottoman Empire Land Acquisitions (1300 – 1683)

# Ottoman Period



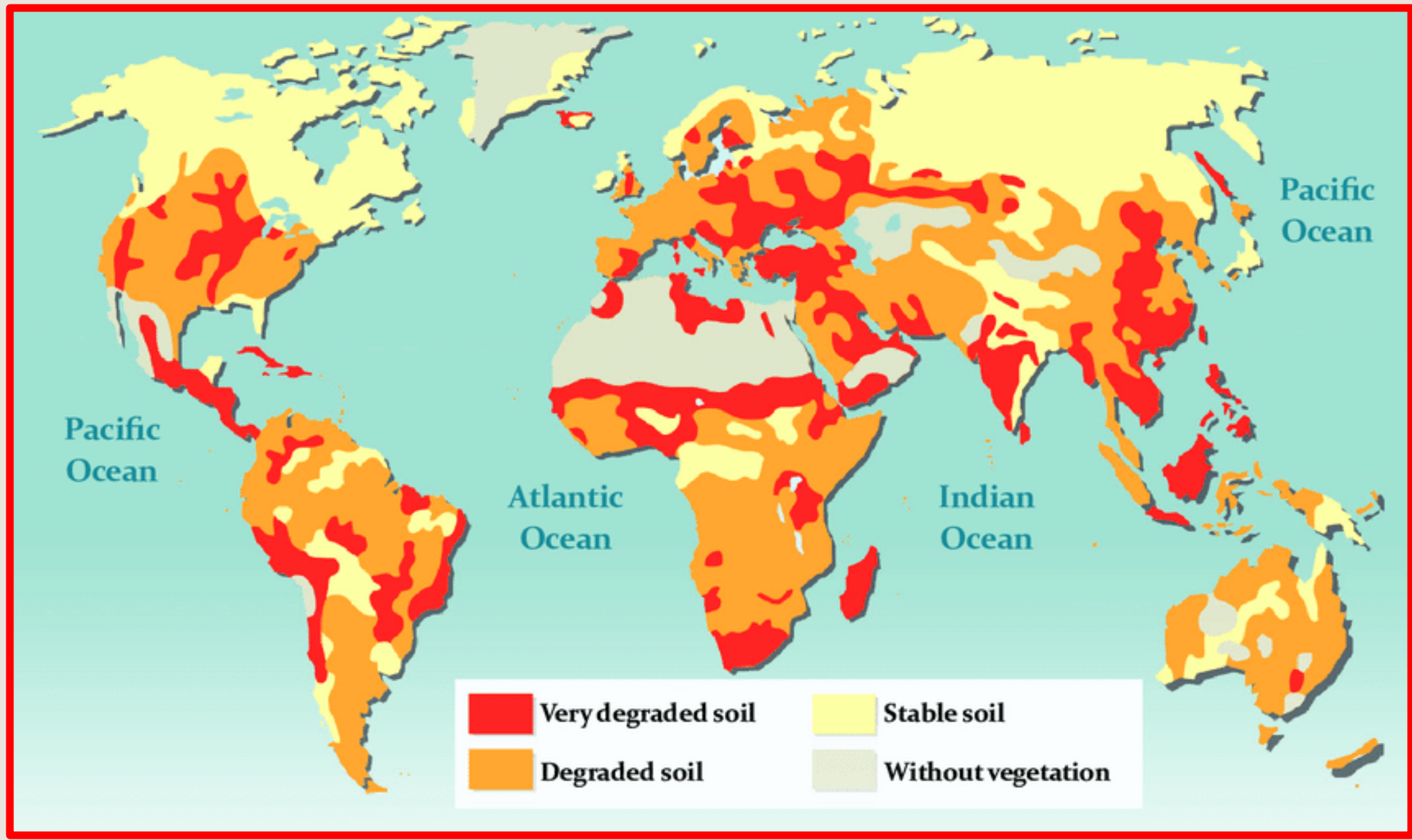
As a result of the extensive land/land disturbances during the Roman period, the majority of Ottoman lands included desert and arid climatic steppes!



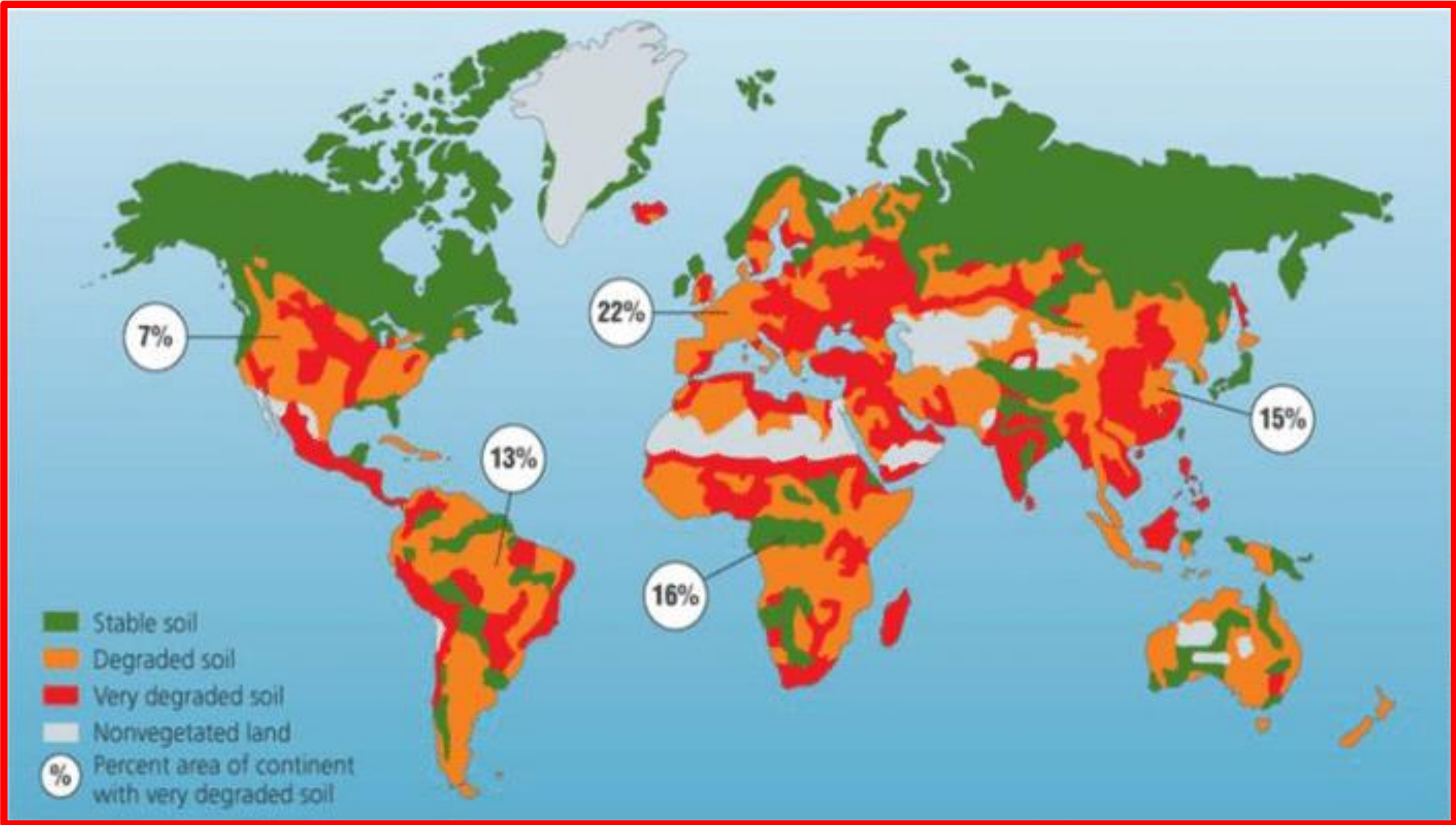
## Ottoman Period

Even in Anatolia, a large part of the lands consisted of rugged steppes, and economic relations of production based on soil (agriculture and grazing) were not sustainable in heavily degraded lands.

The GLASOD estimate of global land degradation 1997 Soil degradation: Global Assessment of Human-induced soil degradation

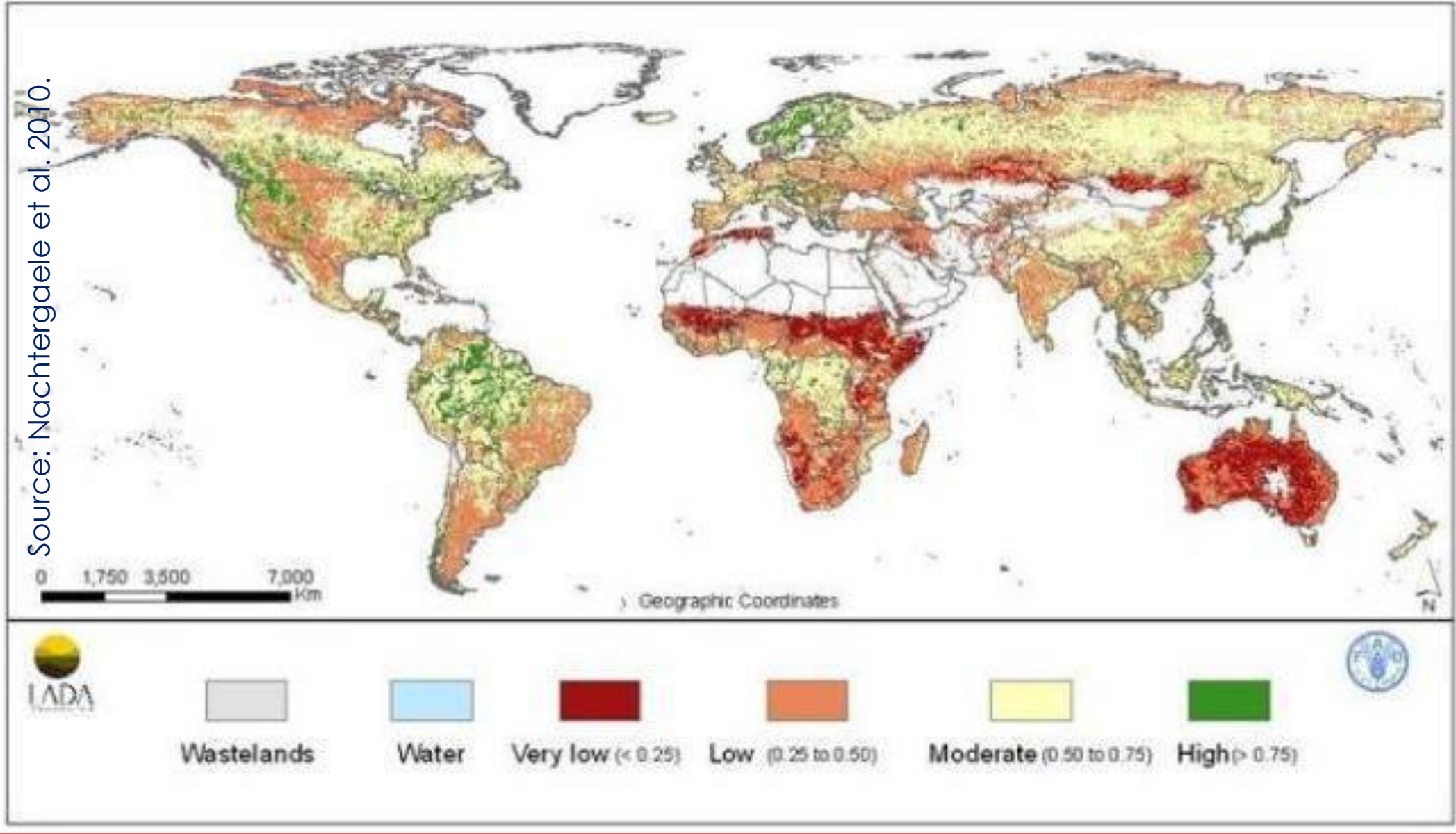


(GLASOD, 1997)



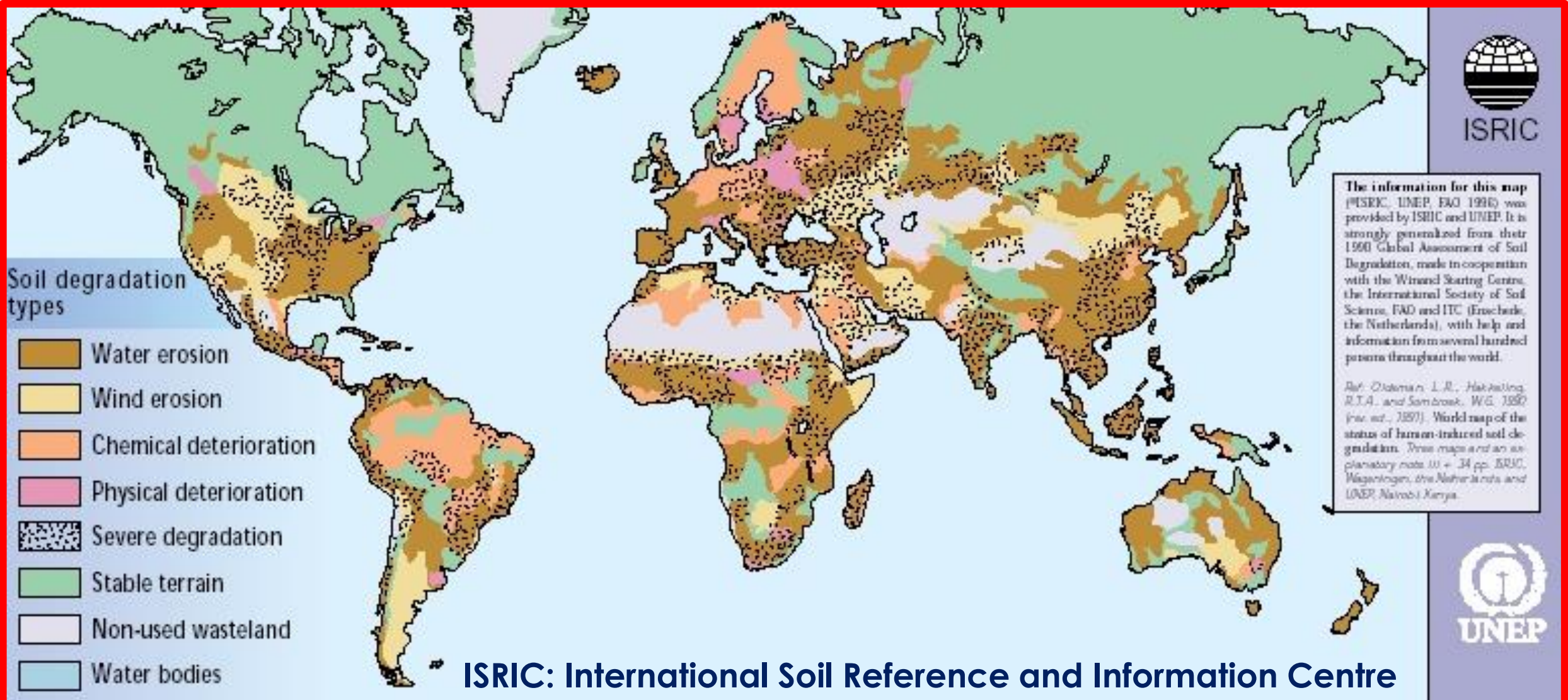
# Inheritance

Source: Nachtergaele et al. 2010.



Ecosystem services status index, GLADIS

**ISRIC** — World Soil Information, legally registered as the International Soil Reference and Information Centre, has a mission to serve the international community as custodian of global soil information. It is striving to increase awareness and understanding of soils in major global issues.





# Formation



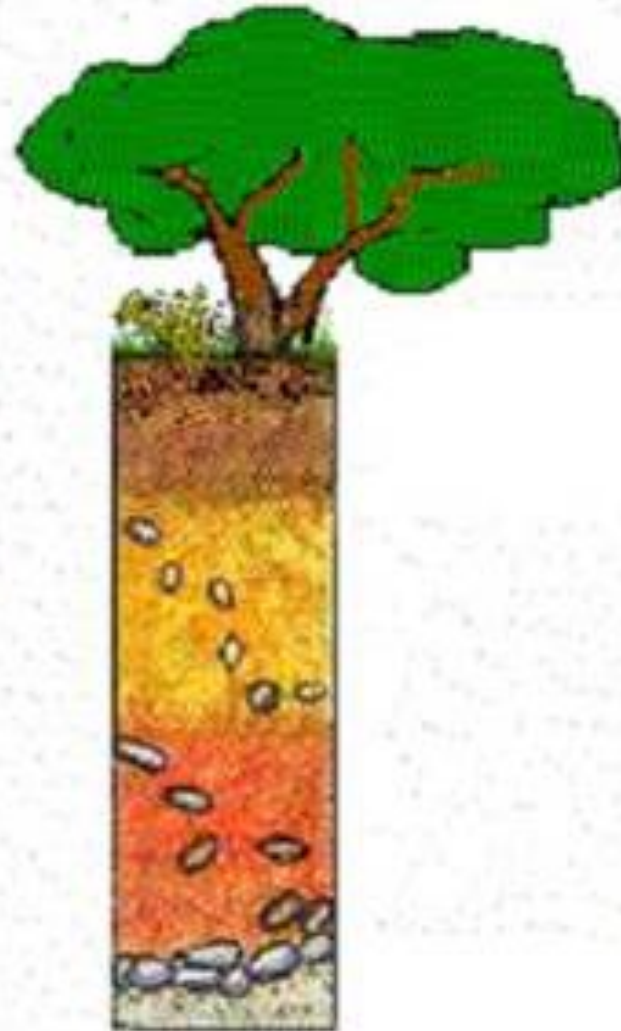
Rock



Young Soils



Mature Soil



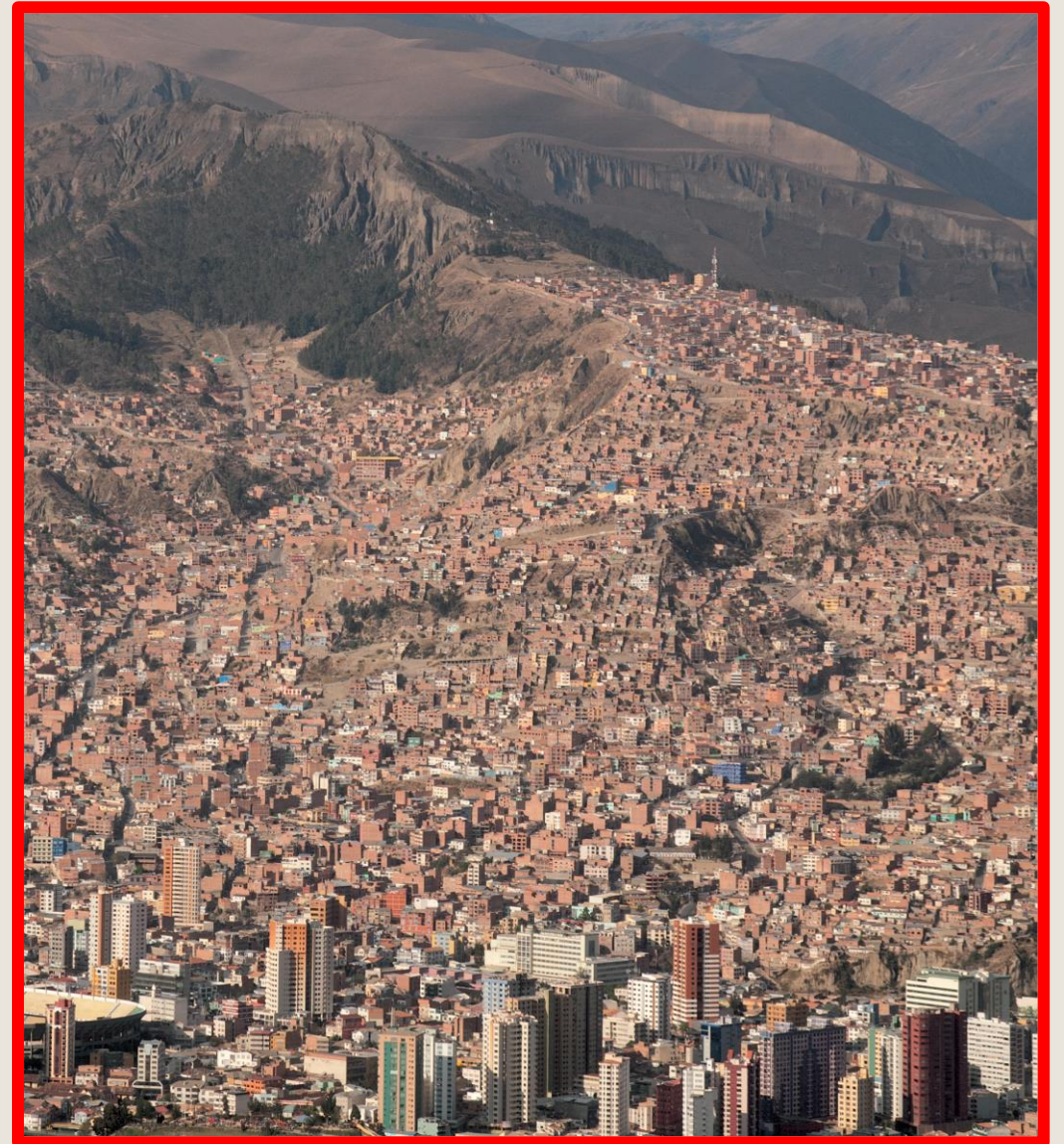
# Erosion



Desertification is a progressive loss of soil fertility, through the destruction of the structure and composition of the soil, which doesn't permit good agricultural productions, or the existence of a vegetation with varied natural species.

# Causes of Land Degradation

1. Deforestation
2. Population growth
3. Urbanization
4. Contamination and Waste Dumps
5. Climate Change
6. Unsustainable Soil Management Practices



# Types of Soil Degradation

1. Erosion
2. Organic Matter Loss
3. Nutrient Imbalance
4. Acidification
5. Salinity (Sodification)
6. Pollution
7. Biodiversity Loss
8. Sealing
9. Compaction
10. Impermeability and flooding



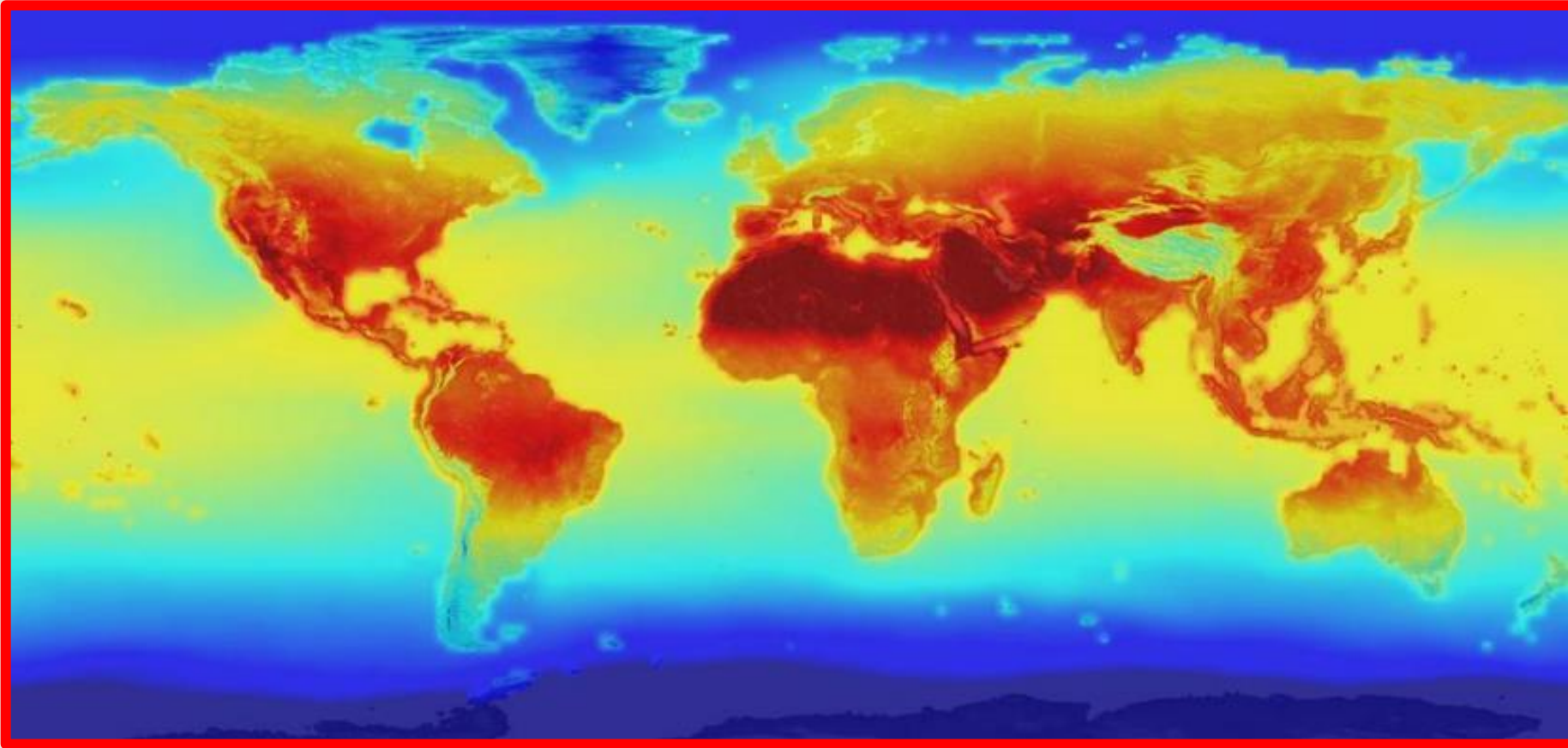
# Consequences of Soil Degradation



1. Water scarcity
2. Food and Nutritional Insufficiencies
3. Rapid Climate Change
4. Poverty and Social Insecurity
5. Migration
6. Loss of Ecosystem Services



# Consequences of Soil Degradation (Climate Change)



An estimated two-thirds of all terrestrial carbon stores from soils and vegetation have been lost since the 19th century through land degradation.

When soil is degraded, soil carbon can be released into the atmosphere, along with nitrous oxide, making land degradation one of the biggest contributors to climate change.

# Consequences of Soil

## Degradation

(Migration & Social Instability)

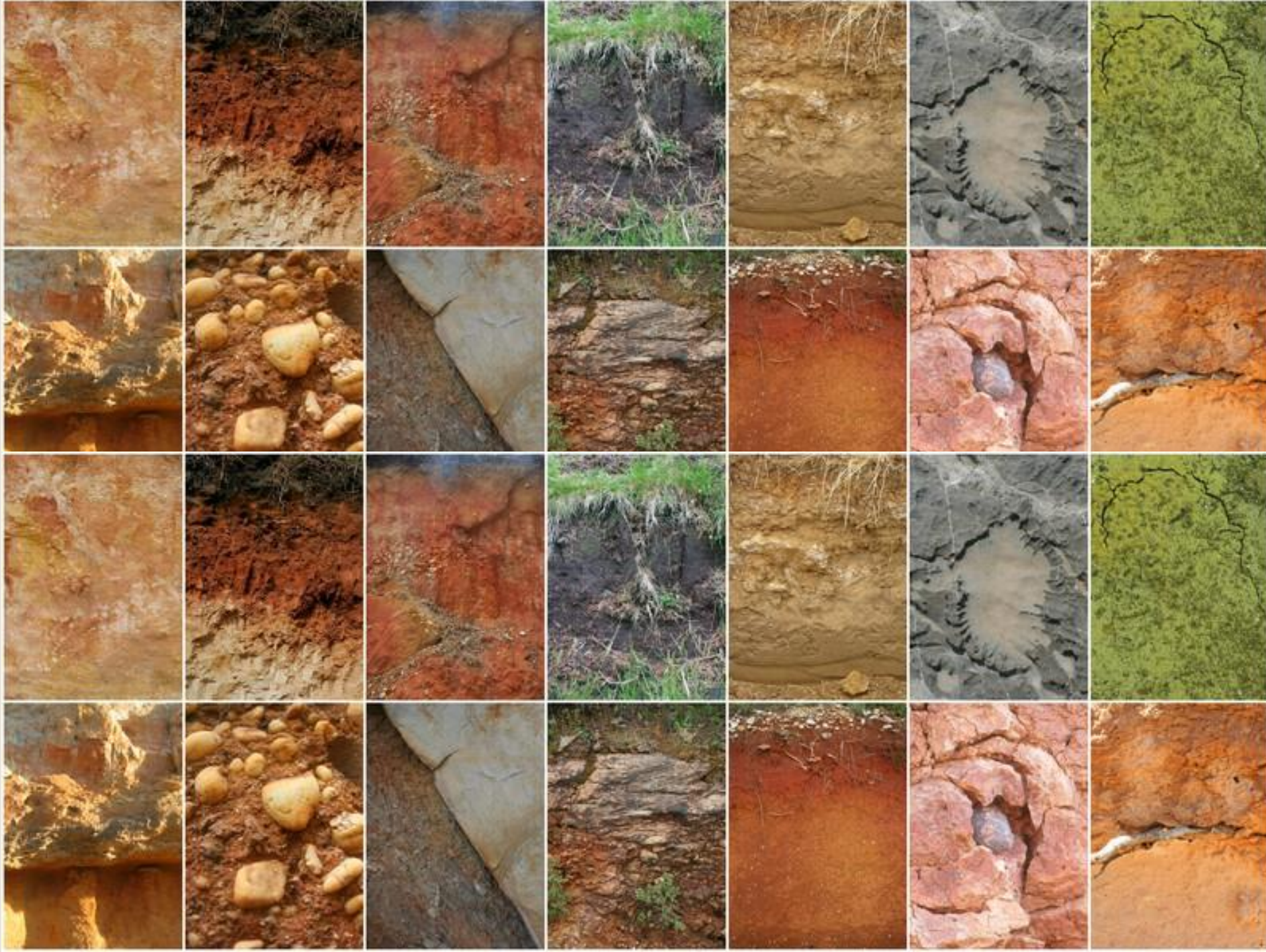


As degraded land becomes less productive - through deforestation, overgrazing, flash floods or drought - people, many of them poor farmers, are forced to migrate to cities or abroad.

“Decreasing land productivity also makes societies more vulnerable to social instability – particularly in dryland areas, where years with extremely low rainfall have been associated with an increase of up to 45 percent in violent conflict”

Solution:

# Sustainable Soil/Land Management (SSM/SLM)







## Solution: Sustainable Soil Management

8. Investigation and evaluation of soil conditions
9. Increasing soil organic matter
10. Conservation of soil with vegetative cover
11. Wise use of soil nutrients
12. Reduced tillage
13. Crop rotation
14. Erosion reduction / prevention
15. Proper waste management
16. Wastewater treatments

**Thank you**

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