



**The Abdus Salam
International Centre for Theoretical Physics**



1867-14

College of Soil Physics

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Desertification: research priorities in drylands 1

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College on Soil Physics 2007

DESERTIFICATION


***Research priorities to promote sustainable
development in drylands***

Donald Gabriels

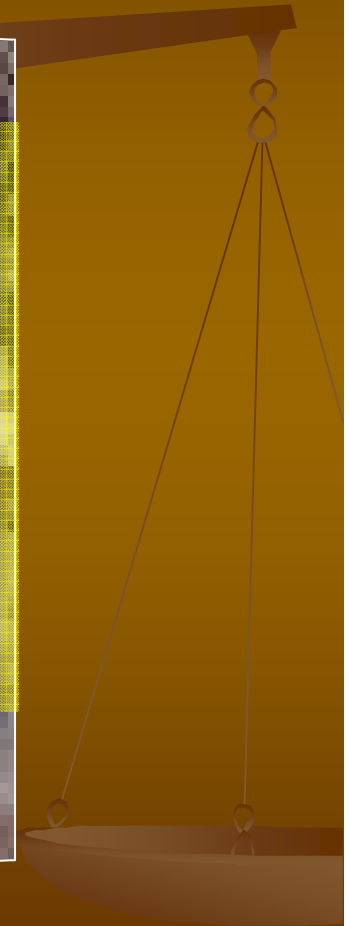
***Department of Soil Management
International Center for Eremology
Ghent University, Belgium***



DRYLAND ZONES



Hyper-arid zones
(deserts = ecosystems)
Arid zones
Semi-arid zones
Dry sub-humid zones



DESERTIFICATION

The Earth Summit (UN), Rio de Janeiro, (1992)
defined

and

The General Assembly of UN (UNCED, Paris, 1994)
approved the *definition of DESERTIFICATION* :

*Desertification is **land** degradation in arid, semi-arid and dry sub-humid areas resulting from **climatic** variations and **human activities**'*

■ FACTORS TO CONSIDER IN RESEARCH

- **CLIMATE:** variations in temperature, rainfall, wind
- **DRYLANDS:** definition and delineation, aridity indices
- **HUMAN ACTIVITIES:** effects on resources, soil degradation
vegetation (biodiversity)



TUNIS DECLARATION 2006

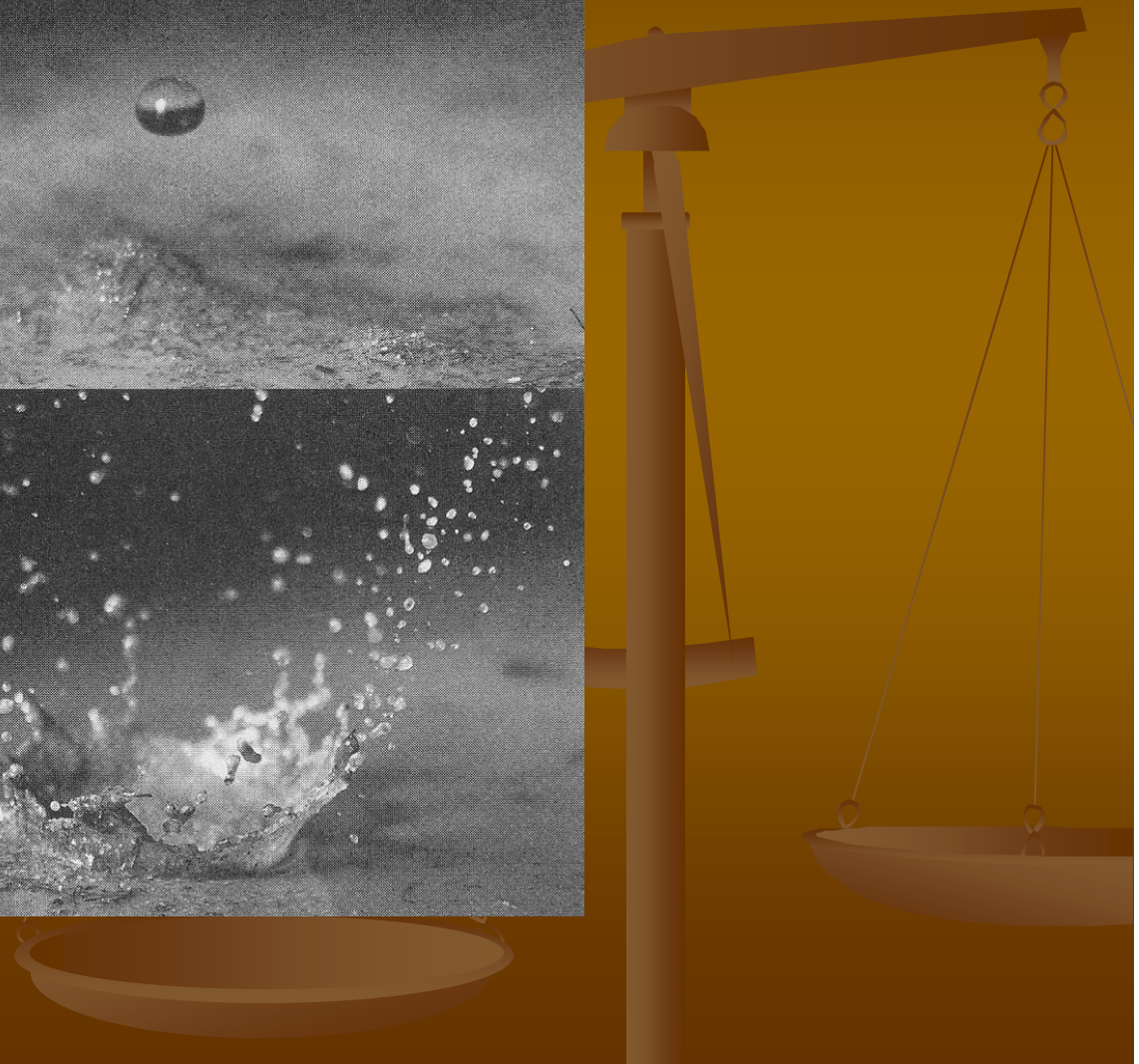
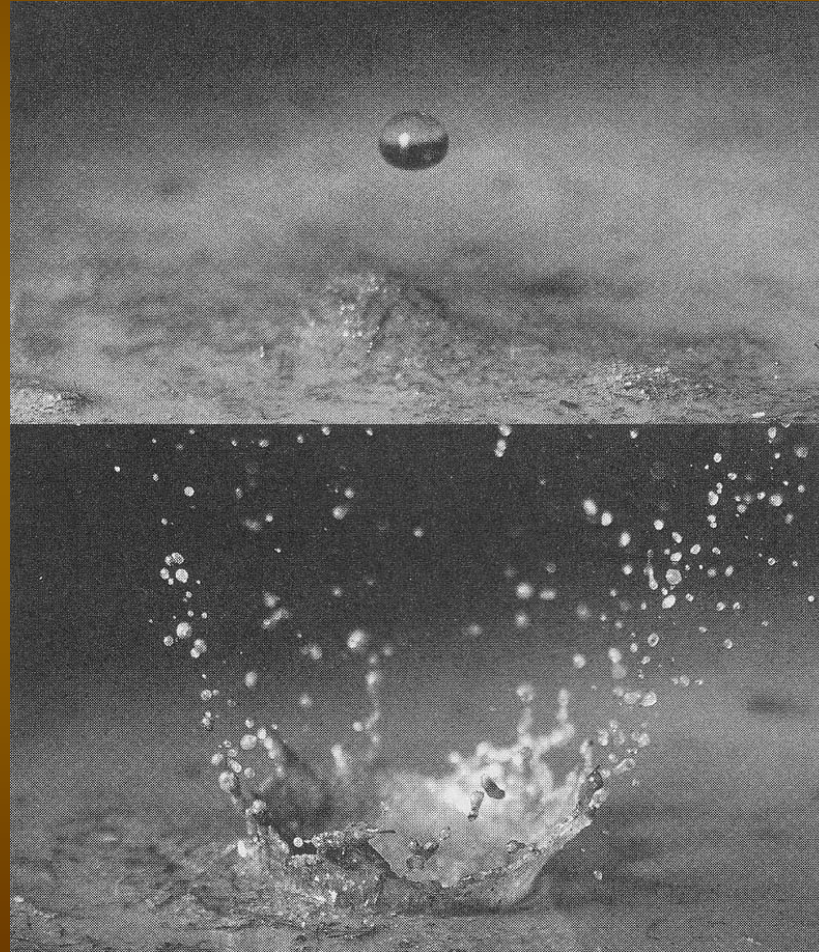
**UNESCO Scientific Conference:
THE FUTURE OF DRYLANDS
Tunis , June 2006**

PRIORITY ISSUES for

dryland research

- 1. conservation of cultural and biological diversity**
- 2. integrated management of water resources**
- 3. education and knowledge sharing**

WATER is THE issue



**Traditional versus modern
technology/ knowledge**



Traditional versus modern technology/ knowledge







'Traditional technology should go hand in hand with modern knowledge and so will modern technology go with traditional knowledge'





4. assessing dryland ecosystem dynamics

5. agriculture and pastoralism

Rainfed farming :water harvesting techniques

Question? Surface area of terrace



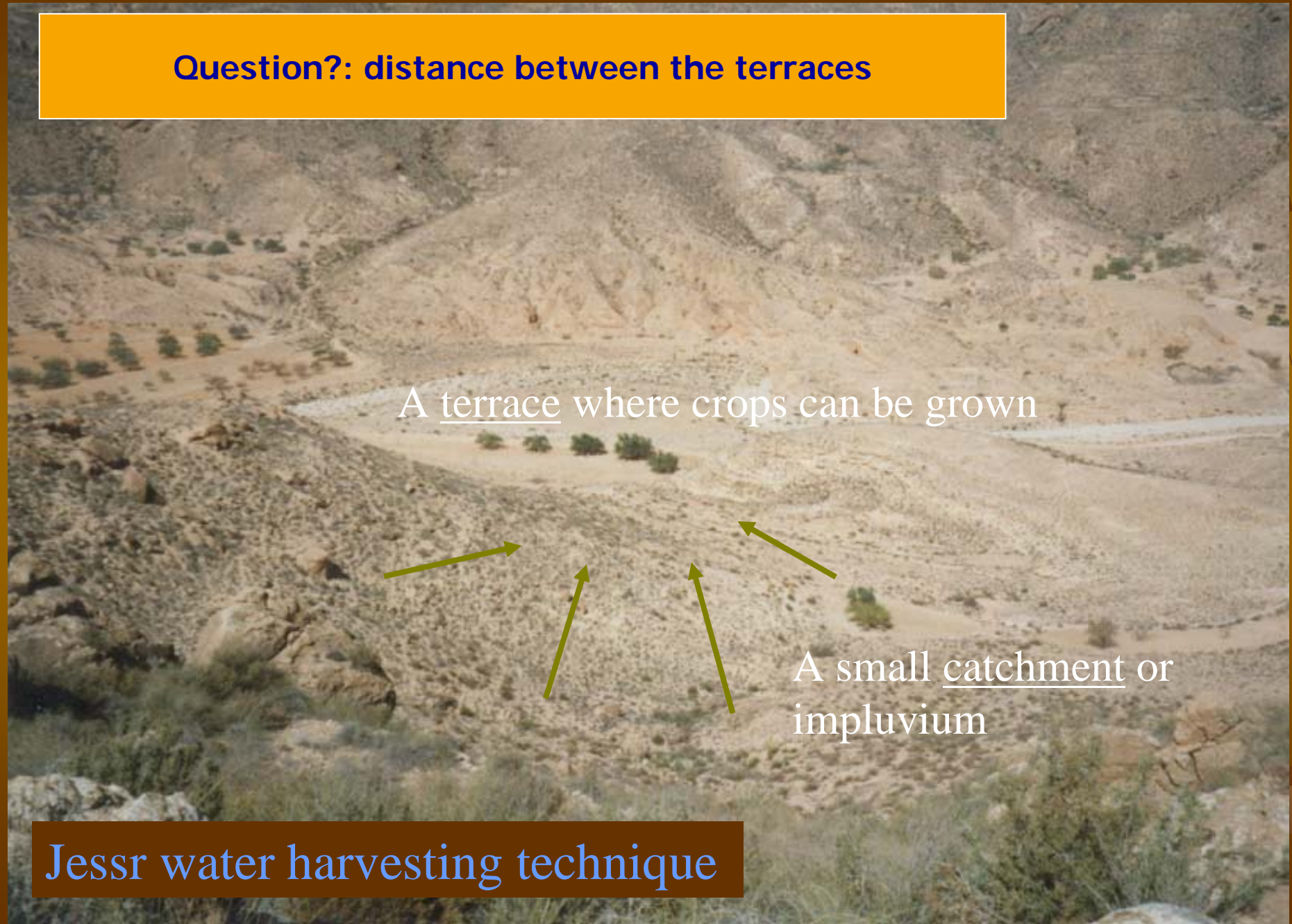
Rainfed farming in southern Tunisia using water harvesting techniques

Question?: distance between the terraces

A terrace where crops can be grown

A small catchment or
impluvium

Jessr water harvesting technique



Capacity building of Latin-American and Caribbean centre of excellence for arid zone water management (Central Chile)

Question??: dimensions of infiltration canals



Runoff in small watersheds of Cape Verde



Prosopis juliflora plantation

Runoff in small watersheds of Cape Verde

Water Harvesting Technique in Cape Verde

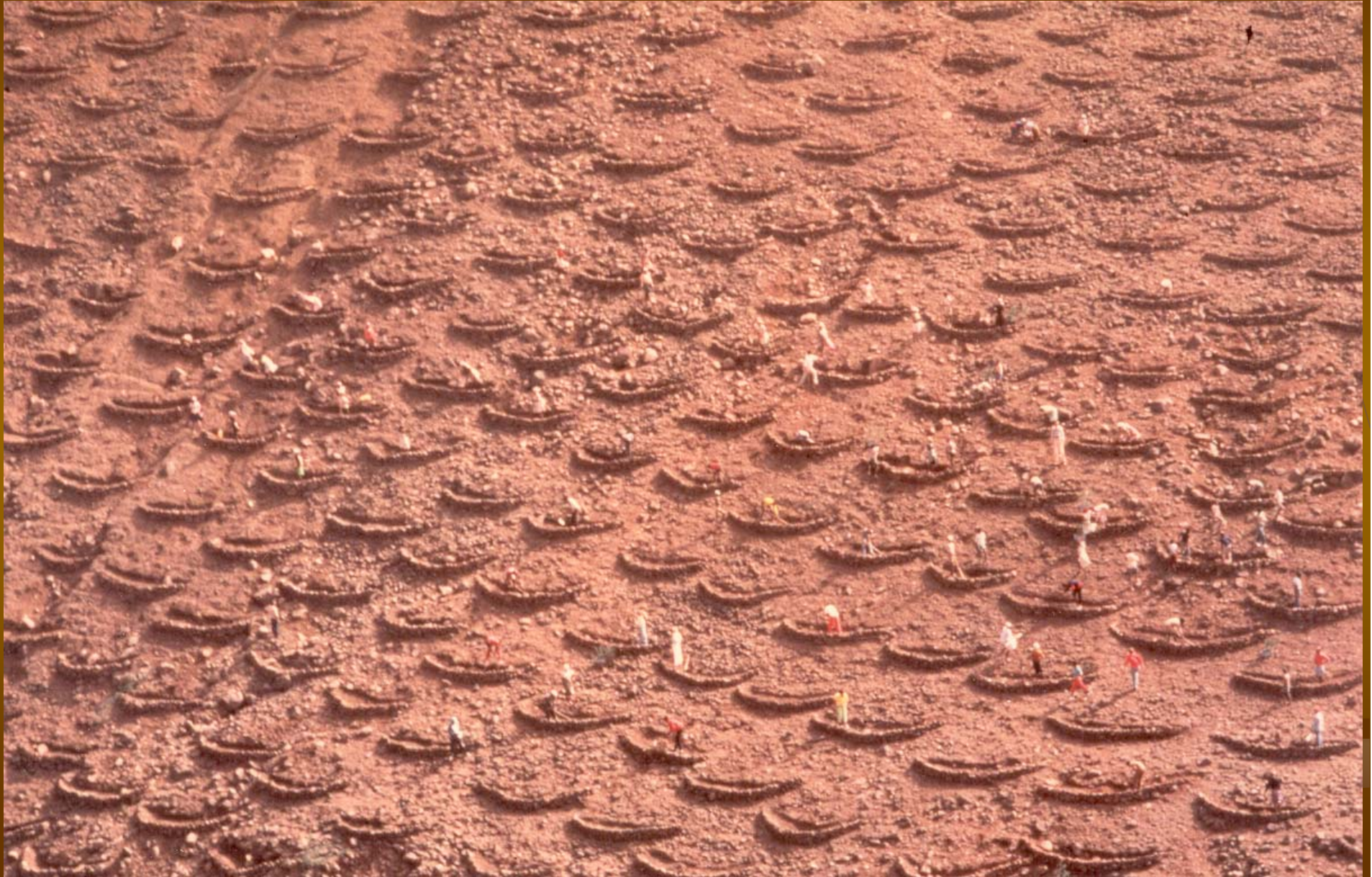


Runoff in small watersheds of Cape Verde



Runoff in small watersheds of Cape Verde

Water Harvesting Technique in Cape Verde



PASTORALISM

Question?: goats or sheep





PASTORALISM





6. coping with natural and man-made disasters

7. global change

Question?: manmade or natural??



Runoff in small watersheds of Cape Verde

Question?: extreme events in drylands



Runoff in small watersheds of Cape Verde



Runoff in small watersheds of Cape Verde





8. reversing environmental degradation

9. costs of 'inaction'

Wind erosion control



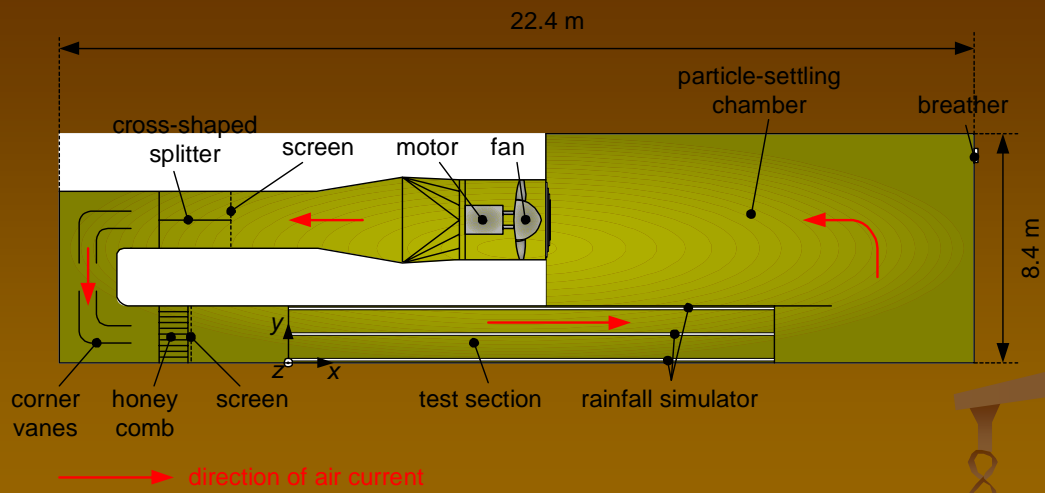
Wind erosion control



Wind erosion control



Wind erosion control



Wind erosion control

Question?: dimensions of screen



Wind erosion control

Question?: distance of barrier from road



Wind erosion control



Wind erosion control



Wind erosion control





10. renewable energies

11. ecosystem services and their trade offs.

Reforestation to combat
human-induced desertification



Reforestation and charcoal production in Cape Verde



Charcoal production in Cape Verde



Charcoal production in Cape Verde



DECLARATION

- Active involvement of women and children in research, innovation and education



An aerial photograph of a vast agricultural field, likely in a developing country, showing a dense grid of small, raised, crescent-shaped beds. Each bed contains soil and some have small plants or seedlings. Numerous people are scattered across the field, working in the beds. The overall scene depicts a large-scale manual agricultural operation. In the center of the image, there is a bright yellow rectangular box containing the text "THANK YOU" in bold, blue, capital letters.

THANK YOU