



A global initiative to combat desertification



AGRICULTURAL
UNIVERSITY OF
ATHENS



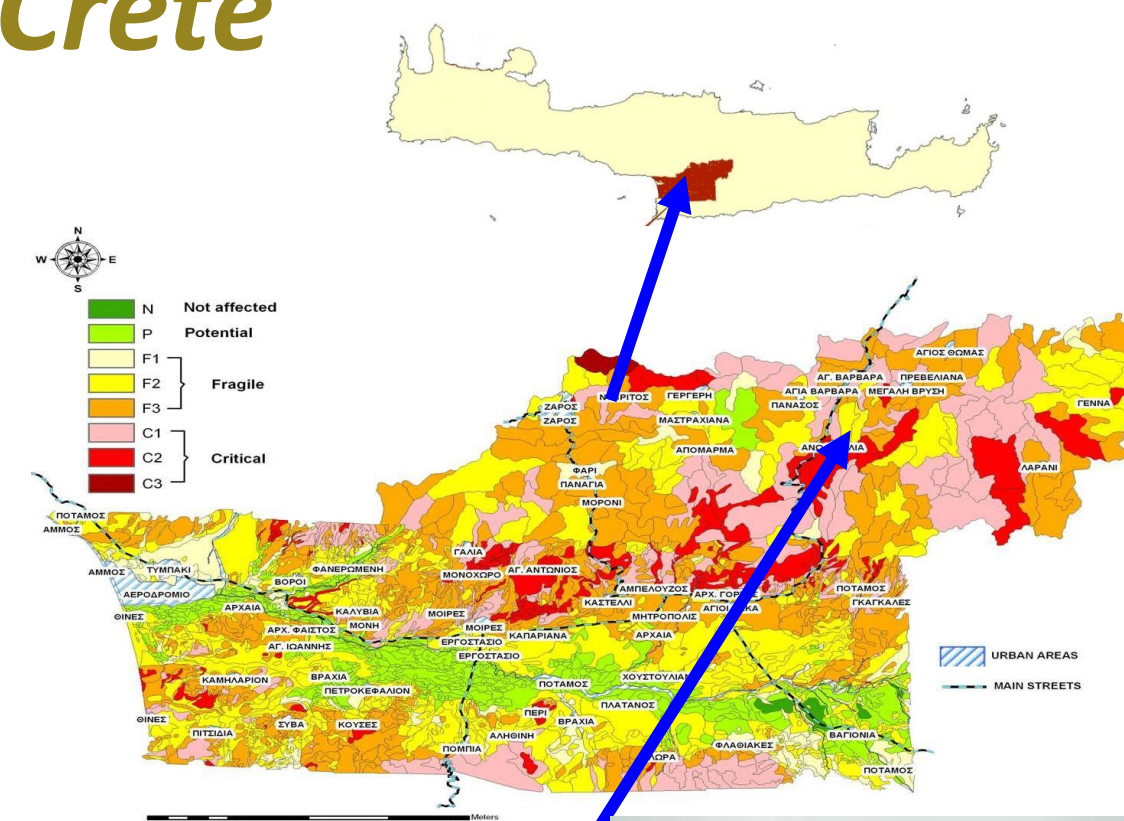
Study Site: Agia Barbara, Crete

Stakeholder involvement:

Stakeholders are very much interested. They have recognize how adversely managed the land. They are very much promised to protect the land even to reforest part of this under the condition that income will be supported by local or governmental administration. The farmer pass every day from the monitoring site since is located nearby to the road. A seminar has been organized in their village explaining the problem of desertification and how to protect the land.

Description of the area:

The location comprises a grazing land. The field is located on a sloping land (slope gradient 23%), moderately deep soil (soil depth 45-60 cm) and prone to surface water runoff erosion. Rills of water erosion are observed in places where runoff water is concentrated. Water stress to the growing plants is also a major issue in the area especially in the south-facing slopes since the soil water storage capacity is relatively low. The average annual rainfall is 970 mm with a rain season period from October to early May. Evaporation is ranging from 1370 to 1570 mm per year.



Wider attention is going to be given after presenting the results of monitoring and organizing visits for officials to the monitoring area to explain the SWC techniques and to provide them with the obtained results

Conservation measures and experimental setup

Experimental setup:

One field has been divided in two parts. One part with two plots under controlled grazing and the other has been subjected to overgrazing (see study site experimental design). At the bottom of each plot there is a small ditch collecting runoff water and leading to a dipping bucket and a sediment trap. An automatic meteorological station has been installed nearby.

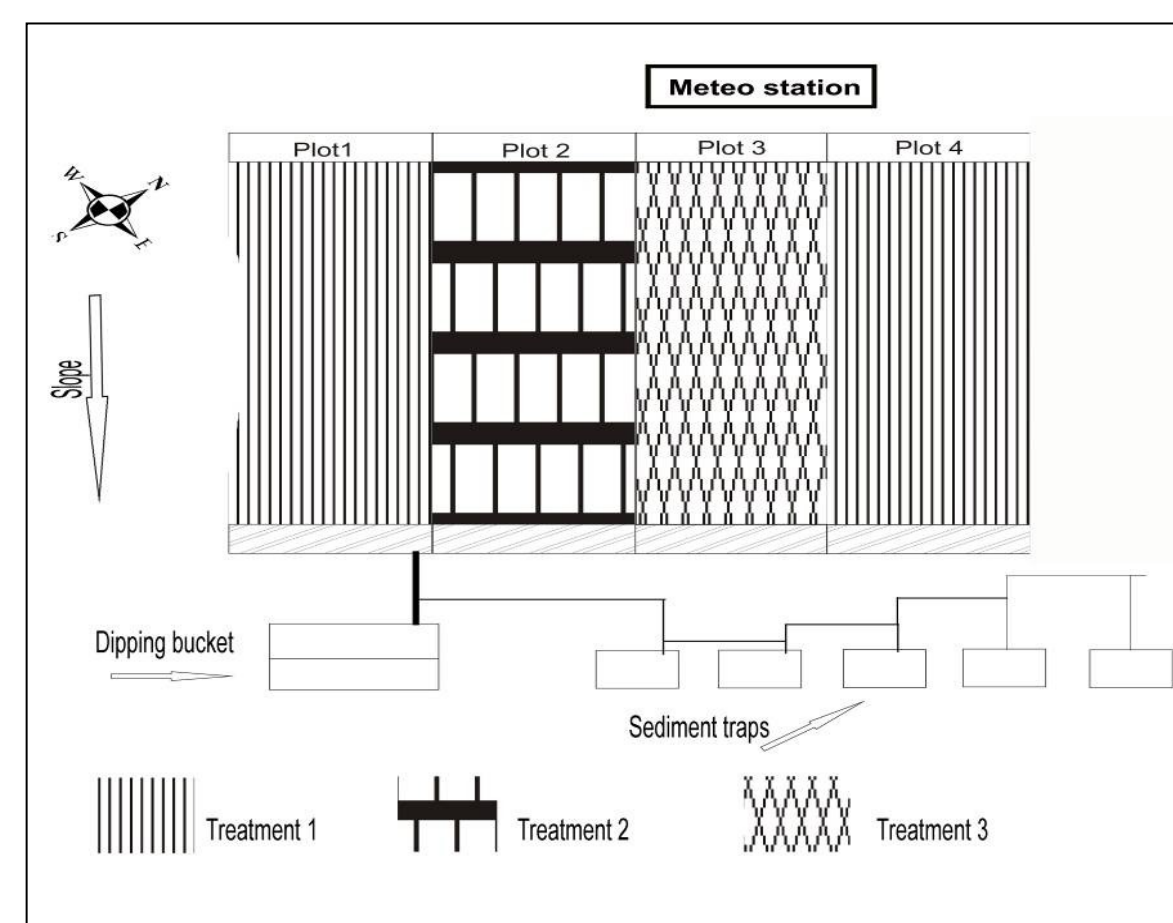
Expected effects:

Controlled grazing will reduce surface water runoff and sediment loss. Furthermore, soil water conservation, organic matter content, and structure stability will be enhanced.

Monitoring activities

- **Continuous meteo measurements by an automatic station:** rainfall, wind speed, air temperature, relative humidity, net solar radiation.
- **One time soil measurements:** texture and stoniness, organic matter, saturated hydraulic conductivity, porosity, Ksat, and bulk density.
- **Repeated visual monitoring supported by digital photography:** Regular soil surface assessment, plant cover, erosion features.
- **Repeated measurements:** soil moisture, soil temperature, sediment loss every rainfall event, surface water runoff, soil shear strength, and soil compaction.
- **Agronomical activities by stakeholder:** Number of animals grazing, period of grazing etc.
- **Yield assessment:** Total milk production in kg/ha, general impression by stakeholder, comparative assessment with regular practice.

Study site experimental design



Important results

- **Measurements** have been conducted from middle of middle of December 2008 to end of September 2009.
- **Total rainfall** for the above period reach 569.8 mm with two major events with maximum rainfall intensity 31.2 and 50.4 mm/h (Fig. 1).
- **Four major surface water runoff events** occurred (Fig. 2). There was a change in total runoff and sediment loss: Sustainable grazing (SG)=14.7 mm, 76.8 kg/ha; unsustainable grazing (NSG)=23.5 mm, 123.2 kg/ha.
- **Soil moisture** at 20 cm 40 cm depth (Fig 3) was affected by land management practices with higher soil moisture content in the NSG practice.
- **Soil temperature** at 10 cm depth was higher in the NSG (Fig 4). The average soil temperature for the above period was 18.7 °C, and 16.3 °C for the NSG, SG, respectively.
- **Soil compaction** (Fig 5), shear strength values were higher the NSG.
- **Plant cover** change with time with average 75.1% and 88.5%, for NSG and SG, respectively (Fig. 6).

