

CASCADE STUDY SITE 6: Peyia, Paphos, Cyprus

Responsible partner: CUT

1. General information

Cyprus is the third-largest island in the Mediterranean Sea, with a maximum length of about 225 km and a total area of just over 9,000 sq km. Much of the land is a flat, treeless plain, bordered on the north and south by mountain ranges. Cyprus has a typical Mediterranean climate, with hot dry summers and low winter precipitation. Annual rainfall averages less than 500 mm.

2. Geographical description

The area of interest is concentrated in the Pafos District area in Cyprus and consists of the Peyia area and Randi Forest (located between Pissouri-Petra tou Romiou and Koukليا village) which are characterized as drylands. Both areas are characterized by rapid land development in the coastal areas while in the hilly parts overgrazing is apparent. The main vegetation types of the two areas are shrubs and grasses, while overgrazing has prevailed mainly from unmanaged private goats and sheep farming. The overgrazing has resulted in degradation of the areas which can be considered as irreversible and which has led to the migration of land-owners, who are not necessarily land-users, out of the area to the coast.



Figure 1. The location of the three study sites in the Peyia area.

Two sites in Peyia and one in Randi forest (in the vicinity of Pissouri and Koukليا) have been selected. The terrain is hilly with shrubs and herbs. As the land is not suitable for agriculture, it is used for livestock, in particular goats. However, land use changes have resulted in overgrazing. As a result of over-grazing and the dry climate on the island, vegetation has significantly diminished in the area.

The soil type of both sites is Calcaric Regosols, which is characterized by a deep brown colour. Regosols are found in areas where soil has been eroded to the extent that the underlying unconsolidated materials come near to the surface, or where soil formation has not played an important role, e.g. in desertified regions. They are soils of medium and fine textured materials, having no distinctive horizons other than an ochric horizon at the surface (20-30cm). The soils are typically medium to heavy, with a clay content around 25% and a mud content of 40-50%. In the valleys and on hills with a slight inclination of 15-20%, deeper soils (Colluvium) are present, with are heavier, with a clay content of 30-40% and a mud content of 50%. The soil is very rich in free calcium carbonate, with 60-70%. Almost all the soil in Cyprus is alkaline (pH 7,0 - 8,5) as it is rich in exchangeable cations, mainly calcium and magnesium. Due to the dry and hot conditions of Cyprus, organic matter in the surface soil is low, approximately 1 to 2%. The soil in the arid hills of Cyprus is particularly vulnerable to erosion, especially where the plant cover is degraded or have undergone reduction of the organic matter.

At the two Peyia sites, the Government of Cyprus has allocated permits to licensed shepherds to allow grazing for 320 animals. However, the actual number of animals belonging to licensed shepherds that are grazing in the Peyia forest number 919. Also, there are 3,910 animals belonging to non-licensed shepherds that are grazing at the Peyia site. In total, there are 4,829 animals grazing in an area that is licensed by the Government for only 320 animals. The amount of land allocated in the Peyia forest for grazing is between 740 to 1,330 hectares, which is approximately 56% of the Peyia forest.



Figure 2. Semi-grazed area near Peyia.

At the Randi Forest site (between Koukليا and Pissouri), the actual number of animals belonging to licensed shepherds that are grazing in the Randi forest number 3,702. In addition, there are 1,240 animals belonging to non-licensed shepherds that are grazing at the Pissouri site. In total, there are 4,942 animals grazing in an area that is licensed by the

Government for only 576 animals. The amount of land allocated in the Randi forest for grazing is between 800 to 1,108 hectares, which is approximately 72.2% of the Randi forest.



Figure 3. Grazed area at the Pissouri site.

3. Main ecosystem(s) in the study area, and functions/services they provide

The dominant flora species in the area include *Cistus creticus*, *Genista fasselata*, *Bromus* species, *Olea europaea*, *Onopordum cyprium*, and *Cupressus sempervirens*.



Figure 4. Onopordum cyprium.

4. Ecosystem dynamics

5. Proposed experiments

The main objective is to examine and assess the existing overgrazed areas, the seasonal changes in vegetation and soil and suggest possible strategy to avoid similar scenarios of overgrazing. Indeed this can be achieved with stakeholder's involvement to identify grazing habits (meetings, open seminars, workshops). Further overgrazing and consequently further degradation of the specific areas can be avoid and this would be crucial and beneficial for the environmental and social cohesion of areas as a whole.

6. Relevant end-users of knowledge in the region / country

Ministry of Agriculture Natural Resources and Environment, Water Development Department, Peyia Municipality, Agricultural Research Institute

7. Anticipated activities and workshops with stakeholders

8. Past and on-going projects on ecosystem functioning, thresholds, and related aspects

On-going

- Marie Curie ITN 'Smart Management for sustainable Human Environment'
- Estimation of Evapotranspiration in irrigated crops using satellite remote sensing and wireless sensors
- Monitoring air pollution in Cyprus using satellite remote sensing and GIS and micro-sensor technology
- Integration of satellite remote sensing, GIS, modelling and wireless-sensor network for monitoring and determining irrigation demand in Cyprus.
- Development of an experimental System for Mapping of Lobesia Botrana Population in Cyprus using automated traps and wireless communication and Positioning Systems

Past

- Use of Earth Observation for sustainable development in Skiathos Island, Greece
- Use of Satellite Remote Sensing & GIS for managing quarry areas in Cyprus
- Assessing land cover using satellite remote sensing for sustainable land use in Skiathos and Skopelos Islands in Greece.
- Sustainable Development of Paphos District Area
- Investigating the potential of using satellite remote sensing techniques for monitoring water quality and irrigation demand in large dams in Cyprus

9. Key references about ecosystem dynamics in the study area or wider spatial setting

Hadjimitsis, D.G. , Clayton C.R.I., Themistokleous K. and Papadopoulos P., Integrated Control of some Agricultural Production using Satellite Remote sensing in Cyprus, Annual Conference 2004 RSPSoc 2004 in Aberdeen 'Mapping and Resource Management', (2004)

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