THE EXPERIENCE OF CYPRUS IN LANDSCAPE CHARACTER ASSESSMENT

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This is a follow up to the presentation given at the *Tenth Council of Europe Meeting of the Workshops for the Implementation of the European Landscape Convention*. As such, it will retrace the steps already taken to integrate landscape into the planning system of the country and provide an overview of what is planned for the immediate future. The main premise on which these efforts are based is that for policies aimed at landscape protection, management and planning to be effective, a supporting mechanism must first be developed and validated, through a holistic and interdisciplinary approach. In the case of Cyprus, the existing spatial planning system described at the Évora Workshops, can provide the required efficiency, transparency and citizen participation for the successful integration of landscape considerations into spatial planning.

The first steps in landscape mapping: developing the supporting mechanism

A prerequisite to the development of such as a supporting mechanism is the implementation of landscape identification and character assessment. Thus, one of the first steps undertaken, in collaboration with stakeholders, was a programme of work to initiate the mapping of landscape character across the whole Island. As a result, the Landscape Mapping Group based at the University of Reading in the UK was invited to lead a workshop to demonstrate how the interdisciplinary process of landscape character assessment is put into practice. According to the Reading team, this entails a number of distinct stages:

- **Characterisation**, to define landscape character types, followed by
- **Evaluation** of landscape character types emerging from the previous stage, followed by
- **Decision-making**, in response to the pressures affecting each of the different landscapes

The first stage of characterisation includes the identification or mapping of areas of distinctive character and the description of their key characteristics, involving four steps, the first of which is to define the scope of the study – to determine the scale and level of detail of the assessment and the resources required. The scope of the landscape mapping project was determined following a discussion between all stakeholders involved. Given the availability of resources, the decision was made to first concentrate on mapping the natural character of the landscape at a regional level scale. The mapping was supported by a reconnaissance level field survey to develop a meaningful classification of visually significant attributes to define draft "landscape character types" for Cyprus. The assessment of visual and cultural associations to fully define landscape character areas was left for a second phase of work, to be carried out at a more appropriate local scale.

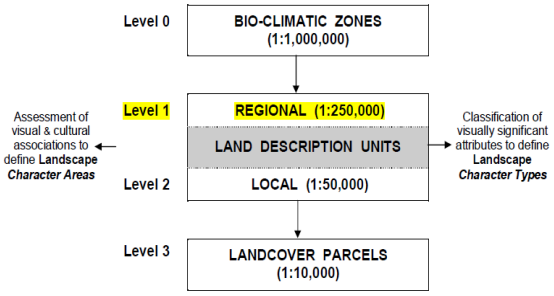
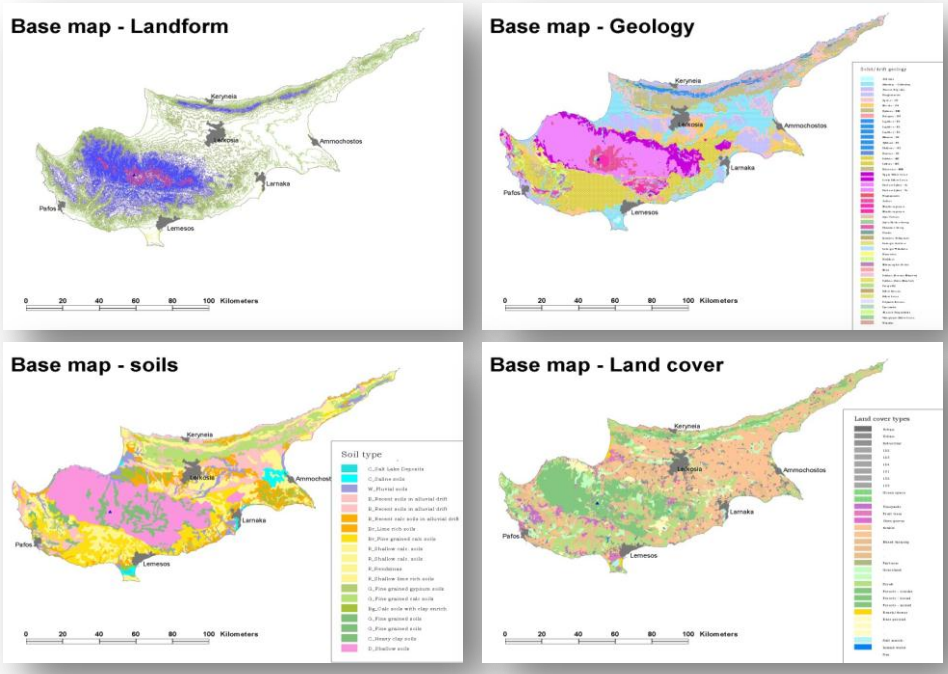


Fig. 1: Defining the scope of landscape characterisation, phase 1.

In the second step, data was collected and analysed. This stage involved a review of all relevant scientific reports, existing mapped information and other data sets to sub-divide Cyprus into a series of "Land Description Units," which are the building blocks of the landscape and they form the framework on which all subsequent description, classification and evaluation is based. The desk study involved expert analysis of digital map data within a GIS, combined with an understanding of landscape elements that define its character. The systematic analysis of map overlays enabled broad patterns to be distinguished and mapped, leading to the collation of all the relevant, readily available information onto a series of simplified map overlays.



Source: Warnock, Griffiths and Vogiatzakis, 2008

Fig. 2: Thematic map overlays showing landform, geology, soils and land cover input.

The third step comprises the field survey, where data was collected to validate and describe the visual character of each of the "Land Description Units" defined by the desk study. A number of reconnaissance field visits were undertaken to explore variations in the character of landscapes. During these visits, the University of Reading team was accompanied by Greek Cypriot and Turkish Cypriot NGO specialists in ecology, geology, forestry and heritage. More than 100 points were sampled and key landscape features recorded, including dominant vegetation communities; landform; and geology. A field photograph and GPS were also recorded at each point of observation.

The final step was to classify and describe the character of each landscape type. A critical component of landscape character assessment is the amalgamation of individual "Land Description Units" into *Landscape Types*. Landscape Types share similar natural and cultural patterns and are described according to their shared character attributes. From the analysis carried out by the Reading team, based on available information and field observations, seventeen broad landscape types (excluding large urban areas) have initially emerged. These were recorded on index cards and discussed during a stakeholder workshop. Here we see two examples of the distinct landscape types "Mountain Forest" and "Cultivated Low Hills:"

Source: Warnock, Griffiths and Vogiatzakis, 2008

Fig. 3: Selection of photographs collected during the field survey.

The result of this exercise was the preparation of the first landscape type map of Cyprus, which, although significant in many ways, still lacked an adequate consideration of cultural elements. It was, nevertheless, useful in two important ways; first, to raise awareness among stakeholders on landscape characterisation procedures, and, second, to create landscape-specific datasets for the first time.

Mountain Forest. A heavily wooded, largely unsettled, highland landscape associated with steeply sloping, high (mostly above 500 m) mountains, found typically on resistant volcanic (e.g. Troodos massif) or metamorphic (e.g. Pentadactylos range) geology. Prominent rocky features (cliffs,

Cultivated Low Hills. An undulating, sparsely settled and cultivated landscape of low hills (below 500 m), with patches of shrubby semi-natural vegetation.

Source: Warnock, Griffiths and Vogiatzakis, 2008

Fig. 4: Examples of the distinct landscape types "Mountain Forest" and "Cultivated Low Hills."

Following this general orientation, the mapping of the cultural landscape of Cyprus was undertaken in 2010 by the Laona Foundation with the assistance of the Cyprus Environmental Studies Centre and with financial support from, among others, the Department of Town Planning and Housing. As it was found that no historic or cultural maps of the required level of detail were available, it was decided to proceed with the mapping of cultural landscape elements in order to provide this missing input to the overall

process. The key objectives were to map settlement patterns, specifically clustering and compactness, and agricultural field patterns, as far as their shape, size and regularity are concerned. The methodological approach and results can be summarised as follows:

Clustering of settlements was approached using nearest-neighbour analysis, where the average distance of each settlement from its 3 nearest neighbours becomes a measurable, mapped parameter. Striking variations in the spacing of settlements were thus revealed, from a virtual absence in parts of the Island, to areas with more than one village every kilometre, as well as areas with relatively even spacing of settlements at every 4 to 8 km. Dense settlement clusters appear to occur wherever there is a higher density of reliable water sources combined with land suitable for agriculture. Statistical analysis showed a strong correlation between the number of springs per 5-km^2 grid and the number of settlements there. The principal types of clusters can be summarised as

- Clusters linked with extensive groups of springs (Type 1), such as on limestone plateaux dissected by valleys, which have frequent occurrence of springs
- Clusters centred on one or more large springs (Type 2)
- Linear clusters along river valleys with permanent flow (Type 3), where remarkably high densities are reached in some cases, with a string of villages almost touching one another down the side of a river; here settlements tend to be on the higher river terraces or valley sides, where there is no risk of flooding but still with easy access to water
- Linear clusters following spring lines spanning several valleys (Type 4), often corresponding with a geological boundary, where permeable rocks overlie impermeable ones and where springs are relatively abundant, in what is known as a "spring-line"

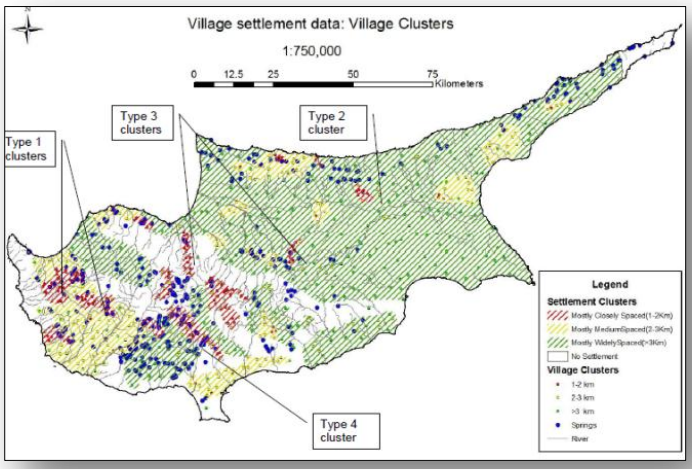


Fig. 5: Village clusters (Symons and Vassou, 2011).

The influence of water supply is clearly a major factor in the evolution of settlement patterns, although other factors, such as soil quality, relief and geology also have a strong influence.

Compactness of settlements was evaluated based on the 1975 Cyprus topographical map at the scale of 1:100,000, which shows distinctly the dense core area of a settlement and the surrounding scattering of less dense buildings. One of the surprises of this study was the considerable geographical variation in the *compactness* of settlements. A broad hypothesis is that settlements with a single main historical water source, whether a spring, a chain-of-wells or a single communal well, will tend to have remained compact in structure, since people had to carry water to their homes by hand or by pack animal from

that supply point. By contrast, other settlements made use of individual wells for their water supply, so that houses could be built further from each other without inconvenience, perhaps closer to their fields or flocks. A well can be sunk anywhere with a suitably high water table, such as the alluvial deposits of a river valley. There are some indications that the above relationship holds true in many cases. The largely compact villages of the southwest foothills of the Troodos massif (Area 1) were mainly dependant on a village spring, whilst the loose-knit villages of the Carpass peninsula (Area 2) or the Famagusta "*terra rossa*" area (Area 3) were ground-water dependant with scattered wells.

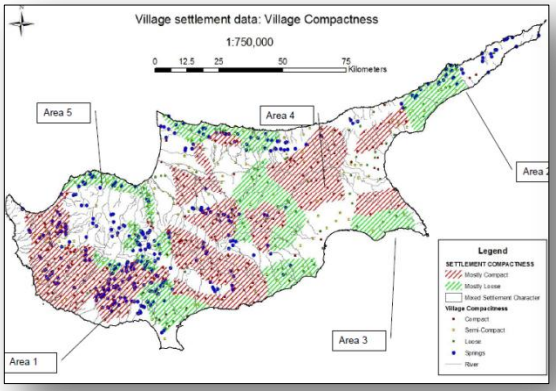


Fig. 6: Village compactness (Symons & Vassou).

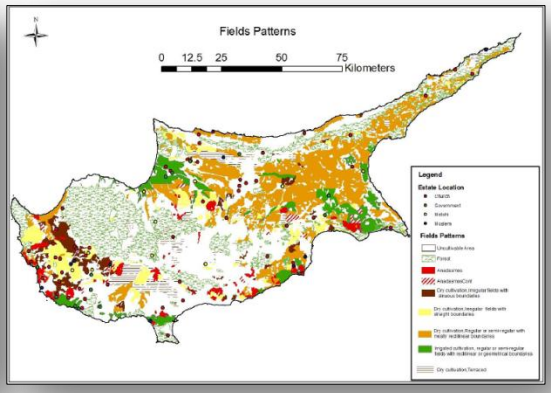


Fig. 7: Field patterns (Symons & Vassou).

Field Patterns were analysed from satellite imagery with the help of cadastral maps. Areas of distinctive field pattern over one square kilometre were mapped as polygons, on the basis of field size, shape and regularity, as well as whether irrigated or not. It was found that although some of the major factors determining field patterns are likely to be physiographical (topography, soil type); there may also be historical factors. In an effort to throw some light on these an attempt was made to show, on the same map, the locations of major church estates, *chiftliks* (part of the Ottoman field management system inherited from earlier medieval fiefs), commercial estates etc. This was also identified as an area where further research is desirable. The objectives of mapping key human-influenced aspects of the Cypriot landscape, which have been missing from the data sources available to the ongoing process of landscape character assessment have thus been successfully achieved. However, there is great scope for investigation, particularly in relation to the influence of water sources on settlement patterns and the influence of land ownership (especially the size of holdings) on field patterns.

Fig. 8: Types of field patterns, as analysed in the Symons and Vassou Report (2011).

The second phase of landscape character assessment

More recently, efforts have concentrated in starting the second phase of the Cyprus landscape mapping project. The first step was to proceed with the processing of first level maps to produce a second level cartographic base (at the scale of 1:50,000) with the introduction of cultural landscape data, including the missing data just described, and the integration of all map layers. This task was undertaken by the Laona Foundation, co-funded by the Ministry of the Interior at 65%. As the second phase of the mapping project continues to produce results, more detailed and specific provisions will gradually be incorporated into spatial plans through their reviewing process.

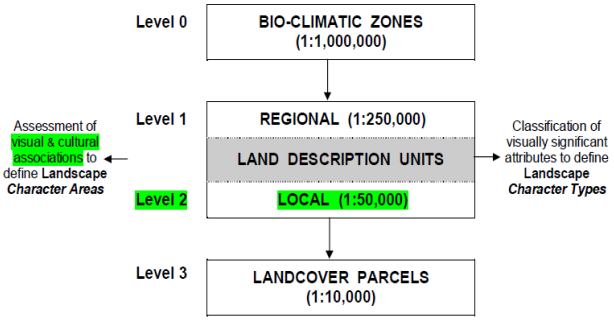


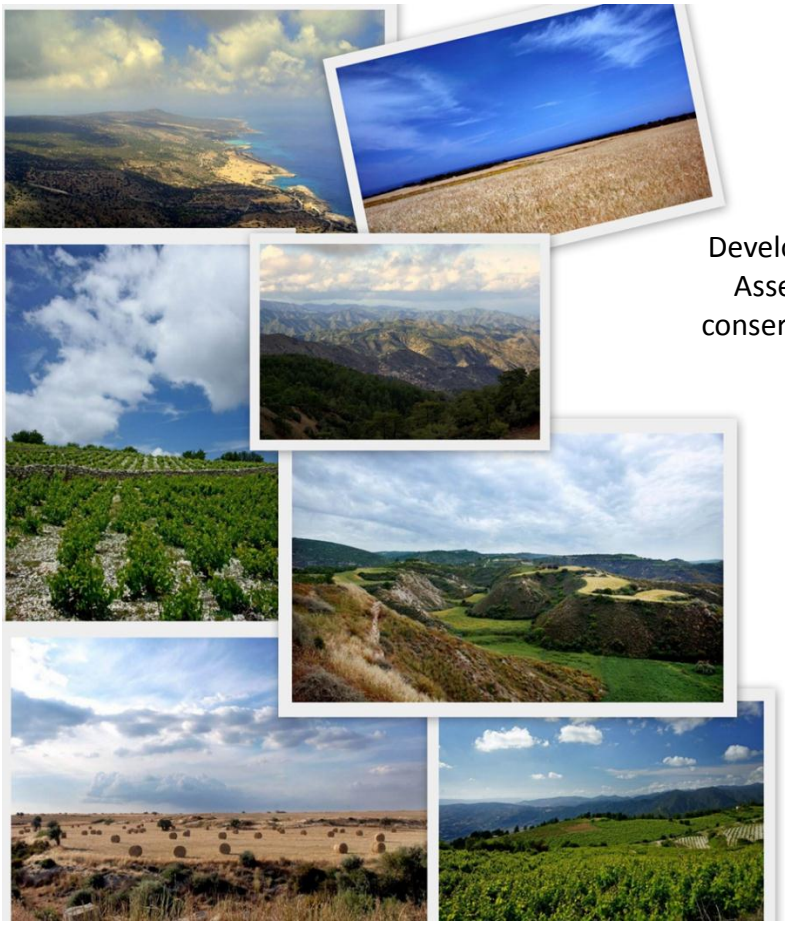
Fig. 9: Defining the scope of landscape characterisation, phase 2.

Subsequent activities of this phase are envisaged to include field verification of the integrated cartographic base, collection of comments and feedback on the draft second level map from all concerned stakeholders, as well as awareness raising activities and debates and dissemination activities for the presentation and publication of the final second level map. Although some valuable time has inevitably already been lost due to the spiralling situation of the economy, the good news is that a new project proposal has just been approved by the European Commission.

The project comes under the European Neighbourhood and Partnership Instrument for the Mediterranean Sea Basin Joint Operational Programme and is scheduled to commence this autumn. As a cross-border cooperation activity between nine partners from Cyprus, Greece, the Lebanon and Jordan, over the next two years, it promises to provide much more than the minimum results originally sought. Its main objective is the development of Landscape Character Assessment as a tool for effective conservation of natural heritage in the Eastern Mediterranean. The partners include the *University of the Aegean* and the *Mediterranean Institute for Nature and Anthropos* from Greece, the *American University of Beirut* and the *Society for the Protection of Nature* from the Lebanon, as well as the *German Jordanian University* and the *Royal Society for the Conservation of Nature* from Jordan.

The Cypriot partners (the *Laona Foundation for the Conservation and Regeneration of the Cypriot Countryside*, as the project coordinator, the *Open University Cyprus*, and the *Department of Town Planning and Housing* of the Ministry of the Interior, as a project associate) will review and complete recently compiled spatial data sources, work on drafting Land Description Units and validate them in the field, recording landscapes' visual and ecological character, condition and sensitivity threats, as well as conduct interviews of local communities to take the island's landscape character assessment one level further. Other anticipated outcomes include:

- Development and field verification of a best-practice methodology for landscape character assessment and landscape character mapping in the Eastern Mediterranean basin
- Implementation of a landscape character assessment training programme to produce experts
- Creation of a series of landscape character maps at the scale of 1:50,000, including cultural, ecological and physiographic patterns – these will cover the whole of Cyprus (9,000 km^2) as well as pilot areas of the Lebanon, Jordan and Greece (each 4,500 to 5,000 km^2)
- Development of a risk assessment tool from conceptual risk assessment models based on algorithms of spatial data on parameters such as landscape value, risk severity, protection needs
- Development of a decision support system for planning and conservation decision makers, documented through a relevant user manual and tested through a decision makers' workshop
- Introduction of an innovative participative process from early mid-eastern traditions of the commons, adapted to a contemporary context, and its pilot application in two cases per country
- Preparation, testing, evaluation and dissemination of a tertiary level training package
- Capitalisation activities to ensure the long lasting sustainability of the project, including dissemination and outreach, networking, integration of landscape character assessment into national policies and setting up of permanent structures – the East Mediterranean Landscape Observatory and the Informal Landscape Network



The MedScapes Project
Development of Landscape Character Assessment as a tool for effective conservation of natural heritage in the Eastern Mediterranean

Photos: Nathanael Andreou
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