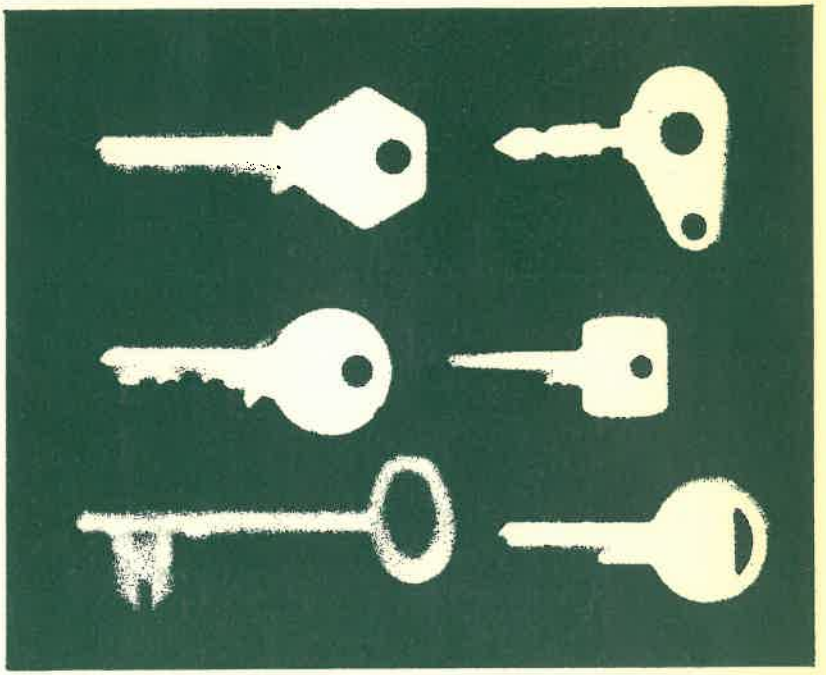
KEY CONCEPTS IN LANDSCAPE ECOLOGY

PROCEEDINGS OF THE 1998 EUROPEAN CONGRESS OF THE INTERNATIONAL ASSOCIATION FOR LANDSCAPE ECOLOGY



EDITED BY
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ISBN 0 9524263 5 8

Printed in Great Britain by Colin Cross Printers Ltd, Garstang

CONTENTS

Using remote sensing in landscape patterns evaluation

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Abstract

This project aims at recognising characteristic patterns of land cover (landscape systems) in the Northeast of Portugal (Bragnça) by applying a clustering procedure based in neighbouring analysis of remote sensing data. As an attempt to assess the evolution of this mountainous territory, information theory and ancillary maps were used to evaluate and interpret the results.

Following a generalised and recommended procedure for land cover and natural resources discrimination with remote sensed imagery, extracts of four multispectral images SPOT (2 dates by 2 areas) were unsupervised classified into land cover classes. Spatial GIS features allowed creating sets of images representing the neighbour intensity of each class. Two ordination methods (CA and PCoA) and two clustering techniques (Twinspan and IndVal) were applied to identify indicator images (land cover classes). The use of arithmetical operations between indicator images allowed a spatial representation of the segmentation of this territory. Parameters derived from information theory were used to compare results with ancillary information.

The described process discriminates a first segmentation level separating landscape systems by their land use intensity (agriculture vs. forestry) which shows a remarkable coherence with relief and temperature. A second segmentation level separates agricultural systems within agricultural areas, and vegetation type within forested areas, which is in coincidence with soils and lithology. Some cultural explanations are discussed for the observed differences between areas (adaptation to environment factors) and between dates (boundaries between landscape systems) . Changes in agrarian policy and social context seem to be important in determining recent changes of landscape patterns.