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I International
Conference on Research
for Sustainable Development
in Mountain Regions

Book of Abstracts



**I International Conference on Research for Sustainable
Development in Mountain Regions: Book of Abstracts**

Title: I International Conference on Research for Sustainable Development in Mountain Regions: Book of Abstracts

Editors: Centro de Investigação de Montanha (CIMO)

Published by: Instituto Politécnico de Bragança
Campus de Santa Apolónia 5300-253 Bragança, Portugal
<http://www.ipb.pt>

ISBN: 978-972-745-214-9

URI: <http://hdl.handle.net/10198/12135>

Cover design: Atilano Suarez, Serviços de Imagem do Instituto Politécnico de Bragança

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Instituto Politécnico de Bragança, Portugal
2016

Sy10006

Soil electrical resistivity profiles in terraced areas: methodological approaches and application to the Douro vineyards, Portugal

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Terracing is an important method of soil erosion control and water conservation. Terraced vineyards are very common in the Douro region. The modern terraces are cutted into the mountainsides using earth moving equipment; they are separated by tall earth banks. Electrical resistivity tomography (ERT) is widely used in vineyard surveys; however most of the ERT surveys are conducted on uneven terrain where topography effects may produce misleading anomalies. Therefore, it is very important to understand the topography effects to remove them during interpretation of the model. In summary, there are two ways to remove the topography effect: the modelling approach, and the resistivity incorporating topography. The results presented in this study are derived from data collected in a vineyard located in Peso da Régua-Portugal (N - 41° 09' 587 W - 7° 45'989). The 2D resistivity tomography was obtained using ABEM Lund Imaging system and a multielectrode wenner array with 21 electrodes and 0.5 m interelectrodes separation. The wenner array is commonly used in profiling methods because it is more sensitive to vertical changes than to horizontal changes in subsurface resistivity and it is better adapted to subhorizontal geological structures. The inversion software Res2Dinv was used to calculate resistivity sections, the apparent resistivity data from the 2D survey were inverted using a least-square method to obtain a pseudo-resistivity 2D- including topographic variations, with finite-element method that incorporates the topography into the modelling mesh used. The used type of topography modelling was distorted finite-elements grid with damped distortion. The soil resistivity profile which is expected in this type of terraces, with low resistivity values in the toe of the slope corresponding to higher soil water content. So it is remarkable the incorporation of topographic data for the correct interpretation of the resistivity measurements obtained with the ERT.

Acknowledgments

This work was supported by Spanish Ministry of Economy and Competitiveness (project CGL2013-47814-C2).