Modern Land Terracing Results in Highly Negative Landscape Impacts

Spanish researchers have recently analysed the environmental and landscape impacts of new terracing systems, which strongly rely on heavy earth moving machinery. The results suggest that this land transformation produces huge material displacements, thus resulting in the loss of the original soil profiles and in a rapid reshaping of the terrain. Modern land terracing methods, usually undertaken with minimal landscape planning, have been encouraged since 2000 by the introduction of the EU Council Regulation policy for restructuring vineyards.

One of the most distinctive features of the landscape in many Mediterranean mountain regions is agricultural terraces. They play an important role in soil conservation by reducing the slope of the cultivated land and therefore run-off. During the last 50 years, land levelling and terracing have played an important role in European Agriculture. In some countries such as Hungary, Italy, Portugal and Spain, terracing and land levelling operations have concentrated on vineyard cultivation. The EU Common Agricultural Policy, through the vineyard restructuring and conversions plans, has encouraged the expansion of vineyards and the application of new terracing methods. The new terraces are not constructed in the traditional manner using human labour and stone walls. Their construction relies on heavy earth moving machinery. The possible problems and impacts associated with the new terracing methods have not been widely studied.

Spanish scientists have recently analysed several aspects of modern land terracing systems in a mountain region traditionally devoted to vineyards, the Priorat region in Catalonia. In particular, researchers studied the land use changes and rates of change during the last two decades, in order to determine the magnitude of the environmental and landscape dynamics problem. They assessed the changes to the terrain’s morphology caused by land terracing (volumes of soil displaced, slope morphology and slope degree changes), and evaluated the cost of the restructuring operations, mainly land terracing, subsidized by the EU policy for vineyard restructuring.

The results suggest that new terracing methods displace large amounts of earth materials, approximately 5,437 m$^3$ par hectare, and result in important and rapid landscape transformations. Indeed, the figures associated with mechanised terrace construction fall within the range of catastrophic natural mass movements. Moreover, they result in the loss of original soil profiles due to the detachment and displacement of huge amounts of soil particles and rocks.

The cost of land terracing represents 34% of the total cost of starting a new terraced vineyard in the studied area. Between 1998 and 2003, this activity accounted for approximately €1.95 million, 50% of this cost was subsidized by the EU through the EU regulation policy for vineyard restructuring (for plantations started after 2000). This encouraged vine growers in the Priorat region to create new plantations, significantly increasing the transformation rate from 7.5 ha per year between 1986 and 1998 to 36.1 ha per year in the 1998–2003 period.

According to the authors, land transformation has been undertaken with minimal landscape planning and soil conservation practices are largely ignored in the construction phase. The researchers argue that the negative impacts could be minimised if engineering projects for correct terrace construction were demanded and monitored by the authorities in charge of monitoring the subsidy process.

The current study provides new insights regarding the possible negative environmental and landscape impacts of new land terracing mechanised methods. Furthermore, it highlights the importance of EU agricultural subsides and policies in the expansion of new terraced vineyards utilizing heavy machinery.


Contact: j.martinez@macs.udl.es

Theme(s): Agriculture, soil

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To cite this article/service: Science for Environment policy*: European Commission DG Environment News Alert Service

*European Commission DG ENV
News Alert issue 40
October, 2006