Landscape features

Impact: Soil erosion

Reference 20

Wei, W; Chen, D; Wang, LX; Daryanto, S; Chen, LD; Yu, Y; Lu, YL; Sun, G; Feng, TJ 2016 Global synthesis of the classifications, distributions, benefits and issues of terracing EARTH-SCIENCE REVIEWS, 159, 388-403. 10.1016/j.earscirev.2016.06.010

Background and objective

For thousands of years, humans have created different types of terraces in different sloping conditions, meant to mitigate flood risks, reduce soil erosion and conserve water. Despite the long history, the roles of and the mechanisms by which terracing improves ecosystem services (ESs) remain poorly understood. To summarize and discuss the multiple effects of terracing practices on ecosystem services (ESs) and human welfare. Here, the results on soil erosion and soil water conservation are reported.

Search strategy and selection criteria

Three key words (i.e., land terracing, terracing, and terrace) were used to search the existing literature from two sources: Web of Science and Google Scholar. The latter served as a supplemental tool to elicit more information. 1) Only recorded research articles that focused on man-made terraces while articles focusing on terraced landscapes formed by non-human forces (e.g., geological terraces) were removed from the database.

Data and analysis

Scattered and frequency-distribution diagrams were generated based on the values of δ (the key indicator used to quantify terracing benefits) for each ecosystem service. Similarly, the causes responsible for negative values were classified and plotted using bar chart and pie mapping methods based on the number of negative reports.

Number of papers	Population	Intervention	Comparator	Outcome	Quality score
300	Human-made terraces world wide (including crops of rice, grain, coffee, potato, viticulture or ancient cultivation)	Terraces	No terraces	Metric: Run-off; soil erosion; Effect size: Inverse of the ratio of the considered metrics in the intervention to the considered metrics in the control	44%

Results

- Results suggested that terracing can play a positive role in minimizing erosion and soil loss as indicated by the mean δ ± SD for soil erosion control. The mean efficacy of terracing in controlling erosion was 11.46 ± 26.83 times higher than that of the control (though not statistically tested).
- Results showed that the mean ± SD value of δ for run-off was 2.6 ± 4.66, indicating that the efficiency of terraced sites on reducing runoff was greater (though not statistically tested) than that of non terraced slopes.
- NA

- NA
- NA

Factors influencing effect sizes

- NA : NA
- NA : NA
- NA : NA

Conclusion

This global synthesis suggested that diverse terracing practices played a positive role in ecosystem services provisions, particularly erosion control, followed by runoff reduction. Reviewers’ note: We labelled the results as uncertain due to the lack of statistical testing.