

# **Benefits of using landscape bioengineering with respect to conventional engineering solutions, and its relation with the climate changing, in the slopes stabilization.**

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## **Abstract**

The theoretical benefits of using landscape bioengineering, based in the technical capability of living plants with respect to conventional engineering solutions, are well known to the technicians working in the sector.

In 2016, we were commissioned to study an alternative solution for the stabilization of a slope of relevant dimensions, of a residential plot in the urban area of Madrid, for which a conventional engineering project, specifically an anchored concrete wall, almost 60 m long, was already planned and defined.

Finally, the promoter opted for the alternative solution proposed with bioengineering, and the work was completed in 2017.

The access to both well-defined solutions, and supported by geotechnical studies that guaranteed their technical viability, allowed us to carry out a concrete scientific study to compare the key aspects of each one.

Specifically, the following parameters of each of the two options have been calculated and compared:

- Carbon footprint
- Total economic costs, and of each one of the execution alternatives by chapters: labor, machinery, materials, etc.
- Future costs of maintenance and useful life of each solution
- Valuation of environmental services during their useful life:
  - o Service as an ecosystem
  - o Index of biodiversity
  - o Capacity as a CO2 sink