

Interactive comment on “Soil bio-engineering for risk mitigation and environmental restoration in a humid tropical area” by A. Petrone and F. Preti

Anonymous Referee #2

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General Observations

This is an original contribution, especially due to the rarity of studies related to the theme in Latin America. However, the study is lacking in some aspects to achieve a scientific level. Original methodological questions (during the experiment's installation phase) do not permit arriving at safe conclusions. The authors need to better describe the methodology and improve the discussion of results to take better advantage of the information raised. The economic analysis, as conducted, lacks justification.

Specific Comments

The methodology used does not permit a comparison between the studies' results.

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The data do not come from a controlled experimental situation, but rather from plants developed in the studies. This does not permit any analysis of data from a methodological point of view. There is no known number of repetitions. The conditions for each plant are different, and there is no statistical design. Nevertheless, it still needs a better description of data taking conditions and methods: site's exposure, weather-climate information, type of substrate (soil), data collection periods, etc. The authors also fail to describe what exact type of material they used for initial vegetal propagation: stakes? what sizes? what age? how, planting inclination and proportion? Although the study does not originally have a statistical design, within these limitations, the presentation and analysis of gathered data could be expanded and better presented.

In item 2.5, “Monitoring and statistical analysis”, the authors state that shoot diameter (but they do not explain where this diameter was taken) is directly related to development of the root system. An affirmation like that must be confirmed and justified through citations of other studies where this was observed. This relationship is not so clear and unanimous in the references. Besides the diameter of the shoots' base, the number of shoots also plays a role. The average diameter of the shoots' base is not very related to the root system. A variable that is also part of the number of shoots, such as: the sum of the shoots' cross-sectional area has a relationship that is much more explanatory and related to the root system and plant vitality.

In item 2.6, the authors say the economic sustainability of the interventions is important. In other words, the studies should have a justifiable cost. Most certainly, low cost is needed for these studies to actually be used in developing countries. However, the authors do not explain the technical, social or scientific importance when comparing costs between Nicaragua and Italy. An analysis that compared the costs for this type of intervention with the costs of a traditional intervention (both in Nicaragua) could provide more useful information than a comparison with costs in Italy. Or, it would be even more useful to conduct economic analyses that demonstrated that this type of intervention has costs compatible (or not) with Nicaragua's economic reality. This idea

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could be worked on when analyzing intervention costs compared to local economic indexes, such as: average income, sums invested by public authorities in works with the same objective, or in palliative measures or recovery of damages resulting from a lack of interventions.

Terms such as “satisfactory”, “very bad”, “good” etc. always need a justification. Why satisfactory? Why very bad? Why good? Affirmations like these given an idea of subjectivity, so they should be avoided or supported by information (citations) that backs them up.

Technical Corrections

Cite the scientific name of vegetal species in the text in a complete manner, at the least the first time they appear. Complete botanical names should make reference to the nomenclator. For example: *Erithrina fusca* Lour. / *Gliricidia sepium* (Jacq.) Steud

Scientific and common names are used alternately in the text and figures. This makes it difficult for the reader. Sometimes, in the very same sentence (page 5153) a comparison is made between two species referring to one by the common name and the other by the scientific name (“...is the one between Madero negro and *Tabebuia roseal*...”). I suggest the authors make reference to the scientific x common synonymy at the beginning of the text and then adopt a standard, always referring to the plants by the same name, in the text, graphs, tables and figures.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 5139, 2009.