

## ***Interactive comment on “Soil indicators to assess the effectiveness of restoration strategies in dryland ecosystems” by E. A. C. Costantini et al.***

**Anonymous Referee #1**

Received and published: 5 January 2016

**OVERALL COMMENT:** The manuscript is very interesting and valuable. Its content presents a review of indicators to make progress on vegetation survival and to highlight site potentiality in a context of dry lands, however, the readability might be notably improved. For instance, the term “restoration” includes “human components” (social and economic) that I do not think they were well-developed in this work. The objectives included into the Introduction are not suitable to the structure. I suggest that the manuscript was focused on environmental indicators, particularly i) on its description, ii) spatial patterns (distribution and scale) and temporal implications to make progress on vegetation survival and to highlight site potentiality iii) interactions and discussion of their applications. A Figure to illustrate the structure of the review would be appreciated by readers.

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**DETAILED COMMENTS:** 1. Abstract: I think you have to change the order of the paragraphs. The last one must be the second one because you include you outcomes and later you must describe them.

2. Please, in the lines 17-18, page 3647, you mention "socio-economic evaluation and participatory approaches", however, these points were not reviewed into the manuscript, please, clarify this sentence or justify it (otherwise, it is not appropriate).

3. Introduction: Please, review my general comment, the objective is not suitable or it is too ambitious for the final content, particularly, you mentioned ecosystem functions, but there is no much information about them in the manuscript. You can see that the following topics were not dealt (only a brief paragraph in the page 3668): Gas Regulation, Climate Regulation, Disturbance Regulation, Water Regulation, Soil Retention, Nutrient Regulation, Waste Treatment and Assimilation, Pollination, Biological Control, Barrier Effect of Vegetation, Supporting Habitats, Soil Formation, Food production, Raw Materials, Biomass, Water Supply, Genetic Resources, Provision of Shade and Shelter, Pharmacological Resources, Cultural Functions and Landscape Opportunity.

4. In the pages 3649-3650, I suggest highlighting two points: the first one, the importance of economic-social-and environmental triangle associated to the development and the land use management; the second one, the constriction of drylands areas for vegetation survival which might limit site vocations and use objectives as in short as in long term.

5. The chapter 2 must be included into the Introduction. In my opinion is convenient to include the description of general characteristics of drylands in this first part (in the beginning).

6. As for the chapter 2.1. I do think that must be the result of the analysis of indicators. I mean, the vegetation survival depends on critical factor/indicators that you must explain before. The experiences you presented would be good as a discussion where you discriminated the best species for different environmental conditions (indicators). In my

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opinion, the most important ideas of this part were water residence time in soils and the impact of root density as key aspects interacting with other environmental indicators to choose appropriate species. Please, write in italics the scientific names of species.

7. I suggest that Chapter 3 present the environmental indicators: 3.1. Climatological indicators (please, include the mean annual precipitation; 3.2. Topographical indicators (you mentioned in the page 3655); 3.3. Soil indicators (Hydrological/Chemical/Biochemical/Biological). 4. Landscape Function analysis: temporal and spatial patterns. 5. Discussion: interactions and applications.

8. The chapter 5 is interesting, Why don't you mention specific connectivity indices too? Are there optimum spatial distributions or guidelines for different objectives or managements and species (trees versus herbs)?

9. Please, review my overall comment and substitute the chapter number for 4.

10. In the Chapter 6, I missed the discussion about the indicators described in the previous analysis in a global way. I think you need to explain: i) what is WOCAT; ii) why did you chose it to explain the impacts of SLM; iii) in what degree, environmental indicators presented were used.

11. In page 3668, line 22, correct "through".

12. In Conclusions, where the ecosystem services were dealt? See also overall comment.

13. In Table 6, include the complete name of LFA, please.

14. In Figure 1,3 and 4, include the complete name of SLM, please.

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Interactive comment on Solid Earth Discuss., 7, 3645, 2015.

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