

## ***Interactive comment on “Ecological restoration and soil improvement performance of the seabuckthorn flexible dam in the Pisha Sandstone area of Northwestern China” by F. S. Yang et al.***

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Reply to the anonymous referee #1:

At first, we are pleased to see the interactive comments by the anonymous referee. However, we don't agree with many viewpoints of the comments except for any few individual views. As mentioned by this referee, the ecosystem is a very complicated system. The restoration of a regional ecosystem is also very complicated and the restoration course is very slow and long. It is impossible to thoroughly collect and observe all data over many places in the whole ecosystem area in some short period. The area covers an area of 16,700 km<sup>2</sup>. In addition, the referee must have not well

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known the Pisha Sandstone area of the Loess Plateau of China. The area is the concentrated source area entering into the Yellow River of China as mentioned in the introduction of this manuscript. The seabuckthorn flexible dam is a new concept proposed by the Chinese famous expert in soil and water conservation. Moreover, the SFDs (the seabuckthorn flexible dam system) is such a system composed of many respective SFD. We have unceasingly observed plant growth, sediment retention and deposition, sediment grain size composition, soil nutrients, soil moisture contents, the vegetation coverage within the selected gullies and biodiversity, since we planted the studied SFDs in spring 1996. The data of soil moisture is from 1996 to 2010, and the sediment retention and deposition data is from 1997 to 2005. These data span 9 years and 14 years, is it a long observed data? We don't want mention the other data in this manuscript. We thought the author didn't carefully read the manuscript at all. If the referee is a very proficient expert or scholar or good scientist specializing in ecology or ecosystem recovery, we don't believe that the referee do not understand some contents and information such as description of the study area and typical gully, introduction of sampling method, choice of sampling locations, recognition of discussion on the results, etc.? We think our data in many years are enough much. The referee thinks our sampling time should be the same on many studied aspects or items. Actually, it is impossible in practice. Sediment deposition and retention effects are clearly found in the gully in the flooding season not dry season. However, the sampling and measurements of the plant growth, soil moisture, soil nutrients, and vegetation coverage and biodiversity are all conducted any time of each year. And our monitoring period is a very long spanning several years even over ten years. Hence, the observation and data measurements are unceasing in the monitoring period. So, it is impossible that the observation data are required to be measured or observed at the same time. The referee says to us “Ecology is the scientific analysis and study of interactions among living organisms and their environment. You would like to restore the food chains, increase biodiversity, restore the ecological balance of the area, etc. Use the proper term. You cannot improve soil, you would mean soil quality.” Indeed,

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ecology is the scientific analysis and study of interactions among living organisms and their environment. This is right. However, the restoration of a certain ecosystem is so easy? Can some ecosystem be restored in a short time? It is well known as the restoration of some ecosystem generally needs several decades or even a century or over a century. The interactions among living organisms and their environment are also very complicated and synthetical. It cannot be explained clearly in such a short time or with an article. The interactional mechanism of the living organisms and their environment is not the emphasis in this paper. The referee requires us to restore the food chains, increase biodiversity, restore ecological balance of the area, and etc., nevertheless, the current ecology status of the area is extremely poor, and the ecological restoration of this area does not come to the step. In this area, the current ecological restoration is limited to the gully because the soil moisture content within the gully bed is good. After our many years of study, we think the ecosystem restoration of this area should be conducted from the gully to slope progressively, because the soil quality of this area is very poor. And the erosion module is up to 30,000 ton per km<sup>2</sup> per year actually, so the surface erosion is very intense. In this paper, the soil improvement means the soil improvement in quality. The term is not any problem in China. And, we want to explain to the referee that our monitoring items are many, so our sampling and measurement methods are also different and not the same time as described in the section of material and methods of this manuscript. The methods used in this MS are generally common ones by ecologists or soil and water conservation experts. We think that the sampling and measurement method for every item is clear in this manuscript. Here, we don't want to make much more explain. In the introduction section of the MS, we have described the concept of the SFD and SFDs, the background of the research, and monitoring items and our aims in detail. In the results and discussion section, our discussion and explain on the result of each monitoring items has also been included and reflected in each sub-section in this subtitle of the "results and discussion", which needs the referee to carefully read and think them. After reading through the comments by the referee, we feel the

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referee always want to ask the other scholar or researcher to study the ecological restoration or ecosystem recover from his/her viewpoint or perspective or according to his/her views. However, we think the studying way should be multi-diverse for the given scientific issue from different perspectives. Additionally, we suppose the referee knows little about the Pisha Sandstone area of Northwestern China. So, we can understand these inappropriate or plausible views the referee has made. Within the so vulnerable area in China or even in the world, the ecological environment can be greatly improved with the seabuckthorn plant, we think it is a great success. At present, the report on the ecological restoration or ecosystem recover of the Pisha Sandstone area is very rare up to date. Of course, our research has also some deficiencies. We will continuously accumulated observation data to further complete the study we have made previously. Thank you for the comments by the referee.

Please also note the supplement to this comment:

<http://www.solid-earth-discuss.net/6/C1204/2014/sed-6-C1204-2014-supplement.pdf>

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Interactive comment on Solid Earth Discuss., 6, 2803, 2014.

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Figure 1 Herbageous vegetation in the Pisha Sandstone slope.



Figure 2 Geomorphology of the Pisha Sandstone area (very bare and lonely )

**Fig. 1.**

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Figure 1 The initial vegetation recover in the gully slope within the Pisha Sandstone area



Figure 2 The current vegetation status within the study Pisha Sandstone gully

**Fig. 2.**

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