

## ***Interactive comment on “Hydrologic feasibility of artificial forestation in the semi-arid Loess Plateau of China” by T. T. Jin et al.***

**Anonymous Referee #1**

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The impacts of large scale reforestation practices on ecosystems are not well understood. It is critical to quantify the hydrologic impacts of vegetation cover change at multiple scales.

The researchers conducted a regional scale (>30 sites) study in the arid Loess Plateau region Northern China with a aim to link environmental factors and forest recovery processes to soil moisture in multiple layers. They found that 1) Soil moisture was influenced mostly by regional precipitation; 2) In relatively high rainfall areas, plantation forests caused an increase in soil moisture content, and 3) In drier areas, plantation forests cause soil 'dry up' prior to age 20.

Soil moisture is rather dynamic and this nature makes regional comparisons difficult unless soil moisture is monitored continuously over time. It is unclear how the researchers

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teased out the effects of event rainfall on soil moisture sampling. A dry region can experience a wet period. Soil antecedent soil moisture conditions are needed to be considered for cross site comparisons, especially for this type 'snap shot' comparison exercise.

The authors concluded that soils under plantation forests had higher soil moisture. The authors attribute this observation to that forest soils had higher soil water holding capacity and water retention capacity. Do you have soil physical property data to support such claim? Even they do, would the higher evapotranspiration rates (compared to croplands or grasslands) from forests result in lower soil moisture and runoff? Would it be possible that the observed higher soil moisture in forests was due to the fact that the forests were located in a higher rainfall areas? A multivariate analysis is warranted to tease out the causal effects of climate change vegetation cover.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 653, 2011.