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**Interactive comment on "Negative trade-off between changes in vegetation water use and infiltration recovery after reforesting degraded pasture land in the Nepalese Lesser Himalaya" by C. P. Ghimire et al.**

**M. van Noordwijk (Referee)**

M.vanNoordwijk@cgiar.org

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As others have stated this is an impressively comprehensive empirical effort on a topic that remains a major challenge at the interface of public-policy discourse and hydrological quantification. My only comments are that authors might be more explicit in the fundamental assumption for much of this work that rainfall is not influenced by land cover change – this is verified at the scale of paired catchments but might not hold at wider landscape scale. Stating the assumption in the introduction and returning to thepoint in the discussion will further increase the value of this study, which I read with interest.

*Reply: We thank Dr. van Noordwijk for the compliment and interest in our paper. With regard to the suggestion to include any effect of (large-scale) reforestation on landscape-scale precipitation, we hesitated to include this aspect originally, precisely because of the contentious nature of the topic as well as the lack of empirical evidence for such an effect. We will come back to this point when addressing comment #2 below.*

**Specific comments and suggestions**

(1) p3439 1. Introduction 1st sentence: The sentence is a bit difficult, Please split up in parts. There had been serious debate on this in the 1920'/'30's. A 'political ecology' interpretation of that debate between foresters and engineers is provided by: Galudra, G., & Sirait, M. (2009). A discourse on Dutch colonial forest policy and science in Indonesia at the beginning of the 20th century. International Forestry Review, 11(4), 524-533.

*Reply: We have broken up the sentence and have included several references to the long-term nature of the debate, including that in Indonesia as per the Reviewer's suggestion (also referred to by Bruijnzeel, 2004) (lines 73-77).*

(2) p3439 line 15. Somewhere here you might allude to a central assumption in these discussions of "hydrology given rainfall": if rainfall does respond to land cover at a scale above that of a paired catchment experiment, conclusions may need to be reconsidered. A number of recent analyses challenge the assumption of 'no effects'.

*Reply: Rather than introducing the impact of reforestation or deforestation on rainfall at larger scales at this point in the paper we have added a qualifier regarding observed changes in water yields across scales from small catchment areas up to large river basins of*

*which several examples are given (lines 86-89). The rainfall issue is introduced in lines 161-177 just before zooming in on the Himalayas and revisited in Section 4.3 (lines 720-729).*

(3) 3440 line 9. This discussion might include reference to increased drainage of landscapes by roads etc that tends to coincide with loss of forest cover and soil changes. This point tends to be missed in reforestation efforts that often further increase drainage, rather than block surface pathways for water

*Reply: Yes, this is a valid point as roads not only act as rapid conduits for overland flow towards streams but may also intercept subsurface stormflow from upslope. We have included roads and other impervious surface areas in lines 106-108 and touch upon this aspect again in Section 4.1 (lines 627-630).*

(4) 3443 The central question probably was: "Does current reforestation ... restore..." This informs a discussion on whether it "could" if differently designed/implemented.

*Reply: Actually, when the project was conceived, we were unaware of the poor state of the reforestation in Central Nepal. Rather, we aimed at following up the initial improvement in hydraulic conductivity ($K_{fs}$) demonstrated 12 years after the pine trees were planted (Gilmour et al., 1987). By revisiting their sites after 25 years an observation of improvement in 'real time' would be obtained. Instead, conditions had worsened so much by over-intensive usage of the forest in the meantime that $K_{fs}$ in the 36-year-old stand were poorer than at 12 years after reforestation (Ghimire et al., 2014). It would therefore not be appropriate to rephrase the central question as proposed by the Reviewer although we have added an indication of the time frame as per the request of Reviewer #1 (line 222).*

(5) 3456 "As long as rainfall intensities remain below the surface Kfs threshold for overland flow to occur, soil water reserves are being recharged." missing something like "independent of the surface Kfs value"

*Reply: With all due respect, we do not see the added value of adding such a qualifier because the statement will remain true anyway. At the same time, advanced surface degradation and therefore a corresponding reduction in surface intake capacity, will limit the amount of water left for percolation into the soil after which further movement is dictated by subsurface $K_{fs}$ values.*

(6) 3457 line 3: Root turnover has been found to be an important contributor to macroporosity as well. In some situations surface sealing (slaking) dominates over soil macroporosity effects per se, but any litter (soil cover) can rapidly reverse this, while macroporosity takes more time to get back.

*Reply: This is a valid point. In view of the expectedly long time involved in creating macropores via root mortality we have added a reference to the role of soil insects as well as root turnover (lines 624-625).*

(7) 3460 line 15. Maybe worth repeating the 'rainfall effects' caveat here.

*Reply: A brief discussion of possible effects on rainfall has been added here including a discussion of the Himalayan setting (lines 720-729).*

**Cited references**

Ghimire CP, Bruijnzeel LA, Bonell M, Coles N, Lubczynski MW. (2014). The effects of sustained forest use on hillslope soil hydraulic conductivity in the Middle Mountains of Central Nepal. *Ecohydrology* 7, 478–495.

Gilmour DA, Bonell M, Cassells DS. (1987). The effects of forestation on soil hydraulic properties in the Middle Hills of Nepal: A preliminary assessment, Mountain Research and Development, **7**(3), 239–249.