

***Interactive comment on* “The carbon budget of South Asia” by P. K. Patra et al.**

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This manuscript describes the carbon balance of South Asia through bottom-up and top-down methods. It synthesizes this information from several previous studies. The manuscript also includes new calculations.

Overall, the scientific significance and scientific quality are rated as very good as the manuscript brings together a diverse set of literature as well as new calculations and presents them in a coherent manner.

The presentation quality of the manuscript is good. Suggestions for improvement are included below.

Detailed comments keyed to the manuscript:

page 13539, line 22. Your unit “TgC-CH₄” confuses me. The methane text beginning

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on p. 13556 did not help. I am unsure if the 37 reported is in Tg C (equivalent to 49.3 Tg CH₄ = 37*16/12(the molecular weight ratio)) or something else?

page 13540, line 4. through wide range -> through a wide range

page 13540, lines 17-18. Chhabra et al., 2009 not in references

page 13540, line 25. Is 64 Mha the total forest plantation area in 2010? Text unclear what 64 pertains to and in what year.

page 13542, line 9. (1994), Rotty (1974). -> (1994), and Rotty (1974).

page 13542, line 16. FAO, 2010 not in references

page 13542, line 18. A reference/location (e.g., URL) for these reports would be useful.

page 13543, line 13. previous two decade. -> previous two decades.

page 13543, line 23. Is “1970-2000” for a period of years? Perhaps, approximately 1970–2000 -> approximately years 1970–2000

page 13544, lines 14-15. Keeling and Whorf, 2005 not in references

page 13546, line 7. Chhabra et al., 2009 not in references

page 13546, line 18. “significant” could imply you did a statistical test which is not indicated. Suggest changing “significant” to “major” or “large”.

page 13546, line 22. trillions of -> trillion (2 occurrences)

page 13547, line 3. Table 2 mentioned here. No previous call to Table 1. Incorporate a call to Table 1 or delete Table 1 from manuscript.

page 13547, lines 9-10. No reference given about forest productivity. Is this an assumption on the part of the authors or is there some data? If an assumption, the text should reflect this, perhaps with the text while the forest -> while presumably the forest. This assumption negates any climate change-induced changes on forest productivity.

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page 13549, lines 8-9. Lele and Joshi (2008) not in references

page 13550, line 6. due open -> due to open

page 13550, line 21. are use to -> are used to

page 13550, line 25. Table 4 mentioned here. No previous call to Table 3. Incorporate a call to Table 3 or delete Table 3 from manuscript. If Table 3 deleted, then references need to be updated with the removal of Hall and Uhlig (1991), Mitra (1992), Ravindranath et al. (1997), WRI (1990), ALGAS (1998), WRI (1994), Haripriya (2003), and Chhabra and Dadhwal (2004).

page 13551, line1. Batin et al., 2009 not in references. Typo?

page 13551, line23. Kucharik et al., 2000 not in references

page 13551, lines 24-25. “This suggests that terrestrial inputs of carbon to the river system of the region can be a significant factor next to the riverine discharge.” poorly written. What is the relationship between “terrestrial inputs of carbon” and “riverine discharge” trying to be expressed?

page 13552, line 4. rivers headstreams -> river headstreams

page 13552, line 4. to atmosphere -> to the atmosphere

page 13552, line 19 and 22-23. The S1 and S2 presented here seem inconsistent with those presented on page 13544 where S1 includes CO2 and climate and S2 includes CO2 only.

page 13553, line 1. The S2 presented here seems inconsistent with that presented on page 13544 where S1 includes CO2 and climate and S2 includes CO2 only.

page 13553, line 6. change is near -> change as near

page 13553, line 9. Riverine -> riverine

page 13553, line 9. period -> periods

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page 13554, line 17. inversion -> inversions

page 13555, line 8. show -> shows

page 13557, line 11. Chhabra et al., 2009 not in references

page 13557, line 27. closing -> close

page 13558, line 5. The uncertainty estimate is broad enough to allow positive fluxes (i.e., sources), thus is taken -> is probably taken

page 13559, line 8. agreements -> agreement

page 13559, line 11. those -> that

page 13561, line 11. TENDY -> TRENDY

page 13562. Chhabra et al. (2009a) not in text

page 13563. Fekete et al. (2010) not in text

page 13564. Kucharik et al. (2010) not in text

page 13564. Lele and Joshi (2009) not in text

page 13573, line 16?. Patra et al. (2011) not in references

page 13575, figure 1 caption. It would be useful to modify the caption to include the scale of the vegetation classes; it appears to be 1 degree.

page 13575, figure 1 caption. The source of the vegetation data displayed should be mentioned in the caption.

page 13576, figure 2 caption. The source of the data displayed should be mentioned in the caption.

page 13579, figure 5. I do not see items 7 and 8 called out in the figure, yet they are listed in the footnotes.

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page 13579, last line. defer -> differ

page 13580, Figure 6. I am unsure why you have fossil fuel net trade in red (or displayed at all). Major imports and exports of fossil fuels from this region is well known and already reflected in national fossil fuel CO₂ emissions taken from Boden et al. (2011).

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