

## **Reply to Referee#1 (R. ANDRES)**

Thank you very much for very carefully reading the manuscript and providing us with useful suggestions to improve the clarity of the paper. Please find our detailed replies (in black) to your specific comments (in grey).

Detailed comments keyed to the manuscript:

page 13539, line 22. Your unit "TgC-CH<sub>4</sub>" confuses me. The methane text beginning on p. 13556 did not help. I am unsure if the 37 reported is in Tg C (equivalent to 49.3 Tg CH<sub>4</sub> = 37\*16/12(the molecular weight ratio)) or something else?

This unit is now defined in Materials and methods (section 2.7) as "Methane fluxes are given in the units of TgC-CH<sub>4</sub>, by accounting for the mass of carbon atoms in CH<sub>4</sub> (1 TgC-CH<sub>4</sub> is equivalent to 16/12 Tg of CH<sub>4</sub>)".

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

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

These corrections are made

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

64 mha plantation refer to 2010. Corrections incorporated in text.

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

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

These corrections are made

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

Links to the websites inserted with access date

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

These corrections are made

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

This reference is updated to Keeling et al. (2001) following the SIO website

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

It should have been 2009a – correction made

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

Used 'large' in the revised version.

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.

Corrections incorporated for "trillion" and Table 1.

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.

These results are based on FRA (2010). Citation given.

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, line 1. Batin et al., 2009 not in references. Typo?

page 13551, line 23. Kucharik et al., 2000 not in references

Suggested corrections are made. A call to Table 3 is given (line 6, p.13549; BGD).

Battin spelling corrected, Kucharik et al. (2010) - year corrected.

page 13551, lines 24-25. "This suggests that terrestrial inputs of carbon to the river system of the region can be a significant factors next to the riverine discharge."

Poorly written. What is the relationship between "terrestrial inputs of carbon" and "riverine discharge" trying to be expressed?

The sentence is now modified as "This suggests that terrestrial inputs of carbon, along with the riverine discharge, are the most significant factors in total riverine transport of carbon."

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

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

These corrections are done

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.

Sorry about the confusion. We have corrected this in Section 2.5, at the end of para 1.

S1: changes in CO2 only

S2: changes in CO2+climate

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

page 13553, line 9. Riverine -> riverine

page 13553, line 9. period -> periods

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  
**Corrections for these comments incorporated**

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.

**Information added**

page 13579, figure 5. I do not see items 7 and 8 called out in the figure, yet they are listed in the footnotes.  
page 13579, last line. defer -> differ  
**The last two bars correspond to these two items. Typo corrected**

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 CO<sub>2</sub> emissions taken from Boden et al. (2011).

What we have shown earlier in section 3.1 for fossil fuel emissions is due to total consumption statistics, not the net trade. Because India is a net importer, that net imports are indeed already taken into account in the terrestrial fossil fuel emission numbers as the reviewer has pointed out. Because the diagram attempts to present a general framework for terrestrial and non-territorial fluxes, we think it is important to have the net traded carbon embedded in fossil fuels.