General comments

The authors modified a dynamic-vegetation-model aDGVM then applied it to the South-Asia. After evaluating the simulation results under the historical climatic conditions, the modified model was forced by predicted climates and CO_2 trends, predicting major changes in geographical distribution of vegetation occurs by the end of the 21st century. A sensitivity test (i.e. comparing simulation results of four combinations of two CO_2 scenarios and two climate change scenarios), authors concluded that South Asia will likely to function as carbon sink during the 21st century due to the CO_2 fertilization effect. I evaluate that the manuscript is within the scope of the journal and it meets a basic scientific quality, however, authors need to address following items before publication.

Major concerns

(1) In the modification of aDGVM, a well-known functional relationships of leaves were introduced: SLA (specific leaf area) negatively correlates with Na (leaf nitrogen content per unit area), and Na positively correlates with Vcmax (maximum carbo-hydroxylation rate of Rubisco per unit leaf area). I should note that there is also a negative and strong correlation of SLA with leaf longevity (Wright et al. 2004), and actually, this correlation is much more intense than for the correlation of SLA with Na. Discounting the negative correlation between SLA with leaf longevity in the current model should favor higher SLA than for actual circumstances in nature. Author have to discuss how this discounting can skew the simulation results at least.

Wright, I. J., et al. (2004). "The worldwide leaf economics spectrum." Nature 428(6985): 821-827.

(2) Although the model was forced by various climatic variables, the manuscript only states influences of air temperature and precipitation. As authors themselves mentioned importance of VPD (vapor pressure deficit) on the transpiration rate in the manuscript (lines 406-409), other climatic variables controls the simulation. Accordingly, analysis and discussion how changes in other climatic variables influenced the results would be added. Besides, geographical distributions of all climatic variables, those are employed in the simulation, would be presented in the manuscript for both means of base-line-period and predicted trend during the 21st century.

(3) To quantify water use efficiency (WUE), authors scaled transpiration rate by leaf biomass (section 2.9). It's unusual. WUE is generally defined as carbon gain per unit water loss (i.e. photosynthesis rate per unit transpiration rate), because transpiration

can be regarded as inevitable water lose during CO_2 uptake through stomata for photosynthesis (Lambers et al., 1998). If authors use WUE of their definition, they need to clarify its underlining reason.

Lambers, H., F. S. Chapin, and T. L. Pons (1998), Plant Physiological Ecology, Springer, New York.

Minor concerns

Line 15. "eCO_2"
This term should not be used before its definition.

Lines 70-72
I could not understand this sentence.

Lines 74-75. "potentially disruptive effect of increasing CO_2 on natural vegetation"
It's a misleading phrase. As authors repeatedly mentioned in this manuscript, higher atmospheric CO_2 enhances photosynthesis rate and water-use-efficiency for C_3 plants, although no major influences would be happed for C_4 plants. Disruptive effects of higher CO_2 can be expected only if we consider other factors such as lower leaf-cooling-effect due to lower transpiration rate.

Lines 81-82, "resulting from environmental filtering applied to traits of modeled plant individuals"
I could not understand this phrase.

Lines 156-164
Values for parameters should be presented.

Line 184-185
Due to the large inter-annual variability of precipitation, I cannot see apparent climate trends in the figure S1. Because predicted trends in precipitation considerably differ among regions of the South Asia (Figure S2b), it would be meaningless to discuss predicted trend of average precipitation over South Asia.

Line 185. "Western Ghats"
Line 262. "Brahmaputra basin"
Will you provide approximate longitude and latitude of this region?

Lines 191-198. Section 2.5
Geographical distributions of soil types and elevation would be presented. A table of soil properties of each soil type is also required. Also, please add explanation how elevation controls the simulation.

Line 200. "four different scenarios"
Immediately after this term, an explanation would be needed that the four scenarios is the combination of two climate assumptions and two CO_2 assumptions.

Lines 224-225. "simulated vegetation stands (1 hectare)"
It means that the simulation unit of the aDGVM is 1 hectare? But, all forcing data and validation data were converted to 0.5 degree, and all simulation results were presented at the 0.5 degree resolution. Please add explanation.

Lines 230-231
Each tree can have multiple stem in the aDGVM? Need some explanation in the model description part of the supplemental material.

Lines 231-233
I could not understand this sentence. Please rewrite.

Line 271. "changes"
This word would be better to be replaced by "increasing trends".

Line 290. "grassland"
It would be better to be replaced by "grasslands", which contain both C_3 and C_4 grasslands.

Lines 335-336
Phrase "until 2090s" or "by 2090s" would be inserted somewhere in this sentence.

Line 399. "resulted"
It would be better to be replaced by "coincided with".

Tables S1 and S2

Units are missing.

Figure S5
No definition for the abbreviation “GRBM”.

Figure S3, S4, S6, and S8
For convenience of readers, captions of these figures might be better to be replaced by "Same as the Fig * except RCP8.5".

Typos

Line 116
Year is missing for "Gillard et al."

Line 129. "Spack"
It would be replace by "S_{pack}". Unit for S_{pack} should be also presented.

Line 171 "C_4 grasses"
"C_3 grasses"

Line 181. "Wm^2"
"W/m^2"

Line 314. "Ebiome"
It would be replace by "E_{biome}".