

5 We would like to thank the reviewer for the positive feedback and for acknowledging our efforts in addressing the concerns raised during the previous round of revisions. We have carefully addressed the remaining points, as outlined below, and our point-by-point responses are provided below. The referee's comments are *italicized*, our new/modified text is highlighted in **bold**.

Response to Referee

10 *1. At several places, you write 'atmospheric chemistry' but it is not clear whether you mean 'atmospheric composition' or 'chemical processes in the atmosphere' - or both. Please be more specific where possible.*

15 Thank you for your suggestion on clarifying the use of "atmospheric chemistry" in our article. We have revised the text to specify whether we are referring to "atmospheric composition", "chemical processes in the atmosphere", or both, depending on the context. For the use of "atmospheric chemistry" in the title and some summary sentences, we have retained the term, as it conveys the broader meaning intended. When both senses are intended or when the use of the term is intended to be more general, we also retain the use of "atmospheric chemistry".

20 L16 P1 "With that, we highlight important knowledge gaps that warrant more extensive research, and argue that we scientists need to provide a more detailed, process-based understanding of the impacts of agriculture and food systems on atmospheric chemistry, **including both chemical composition and processes**, especially as the importance of emissions from other fossil fuel-intensive sectors is fading in the face of regulatory measures worldwide."

25 L32 P2 "Such momentum gathered is arguably also a promising development for air quality managers and policy makers worldwide, because agriculture and food systems are major sources of various short-lived chemical species that shape ~~atmospheric chemistry~~ **chemical composition and processes in the atmosphere, which in turn** contribute to air pollution."

30 L68 P3 "All these findings highlight the importance of agriculture and food systems in shaping atmospheric ~~chemistry~~ **composition and chemical processes, as well as** air pollution and the associated public health and ecosystem impacts."

L97 P3 "Below is not meant to be a comprehensive review but is intended to highlight the key understanding, as well as the lack thereof, of the effects of agriculture and food systems on atmospheric **composition and chemical processes**."

35 L177 P6 "Another limitation is ... in agricultural NH₃ emissions on atmospheric ~~chemistry~~ **composition**, as NH₃ typically peaks within several days after fertilizer application (Nelson et al., 2019)."

L242 P9 "The significant roles that agriculture and food systems play in shaping **chemical processes in the atmosphere** are increasingly realized."

40 L344 P12 "Finally, beyond NH₃ and NO_x, agricultural emissions of HONO are also important for atmospheric chemistry **by affecting chemical processes in the atmosphere**, mostly because of its photolysis product, hydroxyl radical (OH), the primary oxidant in the troposphere, which is heavily involved in PM_{2.5} and O₃ chemistry (Oswald et al., 2013)."

45 L480 P17 “However, the SDGs are not meant to be standalone objectives, ... agricultural and food-system contributions to atmospheric chemistry, **including both the composition and chemical processes of the atmosphere**, is indeed crucial to help stakeholders achieve SDG 2 in synchrony with other SDGs, especially SDG 3 “Good Healthy and Well-being”, SDG 13 “Climate Action”, SDG 14 “Life Below Water”, and SDG 15 “Life on Land”, but also various others more indirectly.”

50 2. 1. 29: *‘managers’ misspelled.*

Thank you for bringing this typo to our attention. We have corrected the spelling of “managers” accordingly.

55 L 29–31 P2 “Such momentum gathered is arguably also a promising development for air quality ~~mangers~~ **managers** and policy makers worldwide, because agriculture and food systems are major sources of various short-lived chemical species that shape atmospheric chemistry and contribute to air pollution.”

3. 1. 543: *You may want to add ‘aquatic’ here as well.*

60 Thank you for this valuable suggestion to further enhance the sentence by including “aquatic” to comprehensively address the impacts of agricultural and food systems on both terrestrial and aquatic ecosystems. We have revised the sentence accordingly to better reflect the broader environmental impacts.

65 L 556 P19 We therefore opine that, in consideration of the substantial impacts of agricultural and food-system emissions on atmospheric chemistry, air pollution and subsequently on terrestrial **and aquatic** ecosystems, we as a society ... become economically, socially and environmentally sustainable.