

Dear reviewers

Many thanks for your deep reading of the manuscript and your thoughtful comments. We have substantially reconfigured the paper and hope that it is now of sufficient quality for acceptance. Please see below for responses to each of the points raised.

Kind regards,
The Author team

Reviewer 1

I have read the article, with great interest. Overall, the article tackles the important but overlooked issue of critically analysing the normative dimensions of the tipping point literature. But there are several ways that the arguments advanced in the paper can be refined. My review comments are thus aimed at helping the authors to do so.

Thank you for your engagement with our manuscript and constructive comments.

Conceptual and theoretical clarity

The authors do a good job of identifying the key issues in the tipping points literature. But the lack of clear definitions makes it difficult to follow their arguments. It could be helpful if the authors clarify the key concepts that they deploy, especially 'negative' and 'positive' tipping points, illustrate distinctions between them, and clarify which concepts are present in the literature and which ones have been developed by the authors.

We have clarified the concepts throughout, referencing the final 'core concepts' paper for the SI, but also extending it for the needs of this paper.

Related, the authors could theorise how their concept of tipping points is different from the one they are critiquing. The authors, for example, argue for the need to use a 'Global South' lens (page 3) - what exactly does this mean, and how do they conceptualise such a lens? Section 3.4 is a good reflection on the empirical material, but the authors need to foreground the discussion through a clear conceptual/theoretical framework. Also, the authors allude to the theoretical framework that is guiding the special issue papers; they should not assume that the reader is familiar with it, so it would be better to summarise it and show how it informs their paper.

With the above comments in mind, I would suggest that the authors include a conceptual/theoretical section to immediately follow the introduction section. That would equip the reader with the appropriate framework against which they can analyse the empirical material and claims.

We have substantiated the conceptual contribution to tipping points, drawing on the clarification from the literature and emphasising our specific contribution in a new section as recommended.

Literature review

While the authors engage with the extant literature, it is not clear how they situate their study. I would suggest a concise but critical review section, where the authors summarise the key aspects of the tipping points literature, identify its shortcomings, and situate their contribution. I will leave it to the authors to decide how they will do so, but it would be useful context for the reader.

We are a bit constrained for space, but have added in a conceptual section that refers to the current literature and clarifies the tipping point literature for the context of this paper (rather than for everything).

Empirical analysis

The authors present a detailed empirical analysis to illustrate their arguments. As such, the analysis could be significantly improved through closer linkage with the conceptual/analytical framework. As is, the analysis is merely descriptive, while it could be more analytical. I would suggest that the authors sharpen the empirical analysis, bringing out very clearly the conceptual/analytic points.

We used the rationale underlying the empirical analysis to define the conceptual framework (this had been developed, but was not written explicitly), so the link between the conceptual contribution and the case studies should now be clear. We have also iterated a lot to get conceptual clarity in the cases as illustrations of our core argument.

Minor comments:

Clearly define positive and negative tipping points

Done

Clearly define what you mean by a 'Global South' lens

Done

Clearly define and distinguish the various types of tipping point targets (e.g. 30x30; net zero etc)

Done

Reviewer 2

Thank you for this interesting, challenging and thorough paper. It has an important message and I wholly support the argument it makes; that equity and justice must be central to any discussions and consideration of Tipping Points, and that assumptions and assertions about tipping points should always be interrogated by questions of who, where, when and how? The discourse on tipping points is fraught with biases and assumptions of universalising, and possibilities of 'solutions' which vastly over-simplify the issues and challenges of unsustainability, inequality and injustice.

We are glad that the overarching argument of the paper comes through as making this constructive contribution, where the aim is to see what from the discourse on tipping points is useful and where caution needs to be exercised. Thank you for your points below that ensured we were a lot clearer about the intention of this paper.

The underlying problem I perceive in the paper is that it is self-contradictory or muddled about whether to engage with tipping point as either a rhetorical construct, scientific concept or policy goal. In the Introduction, the authors almost tie themselves in knots; the argument they present (see lines 75-110) would lead to the conclusion that tipping points – positive, negative, social or otherwise – is a misplaced or inappropriate concept or term. This section (probably after line 100) needs a clearer statement on where the authors stand on this – they clearly ‘buy into’ tipping points as a physical scientific phenomenon, but how comfortable are they with social tipping points, for example? They cite just a few of the arguments made by social scientists against the concept and its use (lines 66-82) but are selective and almost dismissive in their treatment of these. More room for exploring these theoretical critiques in a deeper way. Overall, the arguments this paper makes are not new – they have been well articulated in many literatures about universalising and colonising nature of global environmental discourses around Planetary Boundaries, Tipping Points as well as the climate crisis.

We have much more thoroughly situated our stance on tipping points and been clearer in our language, also in response to reviewer 1’s comments. We feel that there is a need to navigate carefully between what is useful about a tipping points framing and what is not, and what social science can and should contribute to this conversation.

Our starting point is that tipping points are part of a mathematical theory to understand change in nonlinear systems (bifurcation or catastrophe theory introduced in the late 1800s). As such, tipping points are critical points at which a system qualitatively changes behaviour from one configuration to another. We argue that from the mathematical point of view, it does not matter if the system is ecological, social, political, cellular, etc; the theory is still successful at achieving explanatory power of a wide range of social and natural phenomena. Social scientists have used (even before climate ones) tools from bifurcation theory to understand purely social phenomena such as poverty (1950s), segregation (1970s), emergence of cooperation, or political polarisation to name a few examples. We do not disagree on the useful and successful applications of tipping points in the social sciences. Our main point, however, is that when used in the context of climate science or ecological phenomena the attribution of positivity or negativity to the critical transitions are a subjective and often misleading call. It reveals norms and expectations that reproduces the status quo e.g. colonial and power relationships of natural resource exploitation and human inequality. To be clear, we do not claim that tipping points concepts in the social sciences are per se misused. We propose that the tipping point concept has the potential to be misused in any

science when the colonial and justice aspects of it (who wins and who losses) are ignored.

As with all of these conversations, there are diverse views and we have now acknowledged that we cannot do justice to every argument out there and have specified that we contribute from a particular perspective. Overall, we think that whilst these arguments are not new, they are new in the discussion on tipping points and we want to highlight these discussions. If there is specific literature that you think we need to specifically refer to that we have missed, please do let us know. We do not want to be dismissive of the work already in this space, but wanted to provide specific input from scholars only from the South or BIPOC communities. We now have a positionality statement to this effect too.

I find the case studies interesting, but I want to know more about why they were chosen and a more systematic treatment of the lessons learned from them. How can the authors justify these choices? Each is a massive issue and the subject of extensive scientific research – how do the authors avoid ‘cherry picking’ findings? Each of the case studies reads like it is written by a different author, in a slightly different style and voice. Each is in danger of being highly selective. What process was undertaken to avoid them being biased – or not? Inevitably it is difficult not to read these cases as being superficial. I would favour more interrogation of the political economy underpinning how policy and action have been developed in each area and a more overtly historical perspective. The presentation and emphasis on case studies risks undermining one of the central issues of the paper – that structural and systemic change is necessary to overturn grave injustices and to decolonise systems of exploitation and to tackle underlying or root causes of environmental destruction and social marginalisation. Without a more analytical and explicit consideration of scale and cross-scale dynamics, the paper is in danger of falling into the trap of suggesting community-led action can address all the problems – it becomes the ‘solution’ or silver bullet. Scale needs to be considered more systematically in these cases. Furthermore the paper should look at a wider literature – outside of the immediate tipping points genre and at the very rich critiques of ‘community based conservation’, carbon offsets, ‘fortress conservation’, development from the past 2 decades or more.

I’m not sure that we agree that case studies cannot point to the need for systemic and structural change, rather it is exactly through these examples that these become apparent and this is why the specific cases were chosen- also based on the expertise of the author team, which is now explicitly acknowledged. Also, the cases can be framed specifically from a tipping points perspective, rather than just any sustainability or development interventions of which there are many and also many critiques. We have now included a clearer rationale for the selection- that as experts from the South, these are some of the (many) concerns that we encounter in our work and that can be related to tipping points as they play out in various ways

(‘positive’, ‘negative’, etc) . Each case study could be a paper in itself with a full literature review, but as they are illustrative, we cannot supply all of the literature, especially all the critiques that exist and so we focus on the potential tipping aspects as this is the focus of the paper and the special issue. I’m not sure that there is ever a way to avoid certain biases when dealing with cases studies- and is any analysis ever 100% comprehensive? Here we use these examples- as examples, which we state clearly- to illustrate our argument and that is how they should be read. I’m not sure that classifies as ‘cherry picking’ findings...

We had provided references to key critiques on community based conservation, carbon offsets, and fortress conservation and have included some more, but we believe that the central argument is to unpack these cases with tipping points in mind and so prefer to focus on what contributes to the core argument of the paper rather than being distracted into a discussion of everything that is currently unsustainable and inequitable.

The conclusions could be made much stronger and harder hitting – where do the authors actually stand on tipping points? What has to happen conceptually/theoretically; scientifically/analytically; policy/implementation; politically/socially for equity and justice to be meaningfully incorporated? Can tipping points really reflect these concerns and be re-moulded to serve decolonial science and action? This is the big question, and it seems the authors have invested a lot in tipping points and are very much wedded to the notion. Perhaps time to retreat from tipping points – in more ways than one?

I’m not sure whether it is fair to say that the authors are wedded to the notion of tipping points, and we think that the whole point is to open this up for discussion and to see what can be done usefully, what cannot be done and what perhaps shouldn’t be done. Can or should Western scientific notions of tipping points serve a decolonial agenda? Perhaps it cannot, but it should at least be aware. We have endeavoured to make the conclusions much stronger and to contextualise them in the context of what this manuscript is trying to argue and advocate. However, as we make clear in the conclusions, there is probably a need, at least from our perspective, for a more humble science that doesn’t pretend to be able to answer all of these questions in a single paper.