

Interactive comment on “A social-ecological approach to identify and quantify biodiversity tipping points in South America’s seasonal dry ecosystems” by Kirsten Thonicke et al.

Anonymous Referee #1

Received and published: 7 October 2019

This manuscript “summarize[s] the outcome of [. . .] an interdisciplinary exercise in developing a methodological framework to identify and detect [biodiversity tipping points] for the deforestation frontiers of the Dry Diagonal.” To develop such a framework is an ambitious and important task, and the case study a relevant one. However, I found that there are too many issues with this manuscript to recommend publication in Biogeosciences. To develop a framework as aimed for, both the thinking and the communication of it must be clear and unambiguous, otherwise the paper would just add confusion to the literature. I am sorry to write that I believe that this manuscript does not succeed in its task.

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Here I list some examples of issues around the topic of resilience and tipping points that prevented me from understanding how the authors approach it. Please note that this list is non-exhaustive.

204-206 and 214 Ecological and engineering resilience have exact definitions. The fact that they are described here as “viewpoints” in “describing [a system’s] behaviour” which “focus on” and “allow” things, and as “concepts” that can be “followed”, suggests a lack of understanding or appreciation of this literature.

Indeed, in line 206: Bahn and Ingrisch (2018) – this is not an original reference for engineering and ecological resilience; please refer to Holling (1973). (This is later done in line 234, adding the problem of a lack of structure in introducing resilience. It seems as if different authors added different pieces of text without integrating them.)

218-220 Here the authors try to explain their definition of resilience, but not successfully: a change might lead to a modified ecosystem state, but it is not clear what kind of changes are meant. Also, how could a modified ecosystem state allow a system to have multiple stable states? It must be through feedbacks (see lines 207-208), but this is not clear in the text.

380 “One could also argue that the recovery of biodiversity after an impact is limited and remains below a critical threshold.” I think it is unacceptable that a manuscript proposing a framework about biodiversity tipping points cannot provide clarity on the crucial matter of whether or not biodiversity recovery remains below a critical threshold. If it is up for argument, what is the value of the framework?

381 “Because single or several ecosystem or biodiversity components can contribute or cause tipping. . .” seems important, but is vague and unexplained.

386 What break-points?

409 “With the identified tipping behavior of the EI metric(s). . .” Where has that been done?

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412-413 So, apparently, the authors argue that biodiversity tipping points and disturbance effects are mutually exclusive. This is wrong.

416-417 I am clueless

455-460 I am even more clueless

In general, this manuscript is weakly written. The structure and flow of the text must be improved and the text appears hastily composed. There are grammatical errors, it is jargon- and acronym-laden, and often it is simply too vague (for me). Take, for example, this excerpt from lines 194-200: “The EI concept therefore allows us to adequately analyse the complex impact of NV decline on biodiversity while avoiding pitfalls of focusing solely on a single metric. By systematically exploring how respective EI metrics react to NV decline, the temporal and spatial scales of potential BD-TP can be identified. Because EI metrics can be linked to ES, the impact of BD-TP on (local and regional) livelihoods can be described. However, the societal implications of BD-TP and ES loss are often place and situation dependent. Therefore, to capture the consequences of BD-TP for the SES under study and derive generic insights of relevance for policy and management, detailed, contextualized, case study approaches, e.g. based on policy analysis and local ethnographies, play a critical role.” Such writing is not clear, which is no exception in this manuscript. Therefore, I believe that this work is currently not valuable enough to readers outside the author team for publication.

The text contains sloppy mistakes. Below I list some examples from up to page 5 only. I stopped there because the text further on was even weaker, requiring more fundamental rewriting.

66 The first sentence mentions the Dry Diagonal without properly defining it. It is unclear whether it is limited to the Cerrado and Dry Chaco.

67 Dry Diagonal is singular, so “its biodiversity”

67-68 The statement that habitat losses increase the risk of biodiversity tipping points

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is essential for this manuscript, yet no reference is provided

69 Systems do not have well-being

71 There is no reference for this sentence

94 Why “cf.” – what’s the contrast?

101 Note)(

105 I suppose you mean 2.5 times

110 Pardini is lacking a year

113 “it shares strong similarities in” – unclear what and what share similarities

116 in are

141 t should be at

165 The manuscript contains inconsistencies in the spelling of “south-eastern”

165 Kelvin or degrees Celsius, not degrees Kelvin

206 lists do not have dynamics

207 “van Nes et al. (37, p. 904)” – please fix. Also, I tried to look up this reference in the reference list, but it was absent. Apparently no check of consistency between the text and reference list has been done, so please do so

207 tipping points is plural, situation is singular

220 “the latter criterion” – referring to which list of criteria?

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-221>, 2019.

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