**Global determinants of yield variability under regenerative farming practices across climate, soil, and topography: A meta-analysis**

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**Cover letter**

To the Editors-in-Chief

Agronomy for Sustainable Development

Subject: Submission of manuscript entitled “Global determinants of yield variability under regenerative farming practices across climate, soil, and topography: A meta-analysis”

Dear Editors,

We are pleased to submit our manuscript entitled “Global determinants of yield variability under regenerative farming practices across climate, soil, and topography: A meta-analysis” for consideration as a Meta-analysis article in Agronomy for Sustainable Development.

Novelty and contribution:

Here we show for the first time, using a globally integrated meta-analysis, how environmental and management factors jointly shape yield responses to key regenerative farming practices (RFPs)—agroforestry, cover cropping, no-tillage, and organic farming—across climatic, soil, and topographic gradients. While previous meta-analyses have focused on individual practices or regional scales, our study combines over 10,000 field comparisons from 906 publications with high-resolution global datasets (SoilGrids, CHELSA, and SRTM). This integration allows us to identify consistent global-scale drivers of yield variability and quantify the contexts where RFPs perform best. The results provide new insight into the environmental determinants of yield outcomes, thereby advancing the design of context-specific sustainable intensification strategies.

Relevance to the journal:

The manuscript aligns closely with the journal’s aims to link agricultural practices with sustainability outcomes, demonstrating how regenerative systems can enhance productivity under biophysical constraints. The study provides actionable knowledge for improving soil health, water use efficiency, and resilience to climate variability—key themes for Agronomy for Sustainable Development.

Compliance with the journal format:

The manuscript follows the format required for meta-analyses:

- Title ends with “A meta-analysis”.

- Combined Results and Discussion section.

- Clear novelty statements in the abstract, end of the Results and Discussion, and Conclusion.

- Word count under 8000 words (excluding references and figures).

- All declarations (funding, data, code, and authorship) included as required.

Suggested reviewers:

To ensure an objective and expert review, we respectfully suggest the following potential reviewers, all of whom are international experts without conflicts of interest:

1. Dr. Ronghua Jian – USDA Agricultural Research Service, USA – [ronghua.jian@usda.gov](mailto:ronghua.jian@usda.gov)

2. Prof. Christian Pittelkow – University of Illinois, USA – [pittelkow@illinois.edu](mailto:pittelkow@illinois.edu)

3. Dr. Yan Peng – Purdue University, USA – [yan.peng@purdue.edu](mailto:yan.peng@purdue.edu)

4. Dr. Bismark K. Adjorlolo – CSIR–Soil Research Institute, Ghana – [b.adjorlolo@csir.org.gh](mailto:b.adjorlolo@csir.org.gh)

Supplementary material:

We include supplementary tables detailing crop group classifications, soil and landform typologies. This approach avoids inserting lengthy lists of abbreviations into the main text, thereby enhancing readability and maintaining a clear narrative flow.

We confirm that the manuscript has not been published elsewhere and is not under consideration by any other journal. All authors have approved the submitted version and consent to its publication in Agronomy for Sustainable Development.

Thank you for considering our submission. We believe this study provides a significant contribution to the understanding of regenerative farming systems and their role in sustainable food production under varying environmental conditions.

Sincerely,

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On behalf of all co-authors

Ozias Hounkpatin