Cambridge Conservation Initiative

UNIVERSITY OF CAMBRIDGE Department of Zoology

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Agricultural strategies and conservation interventions to reconcile food production and biodiversity conservation in India

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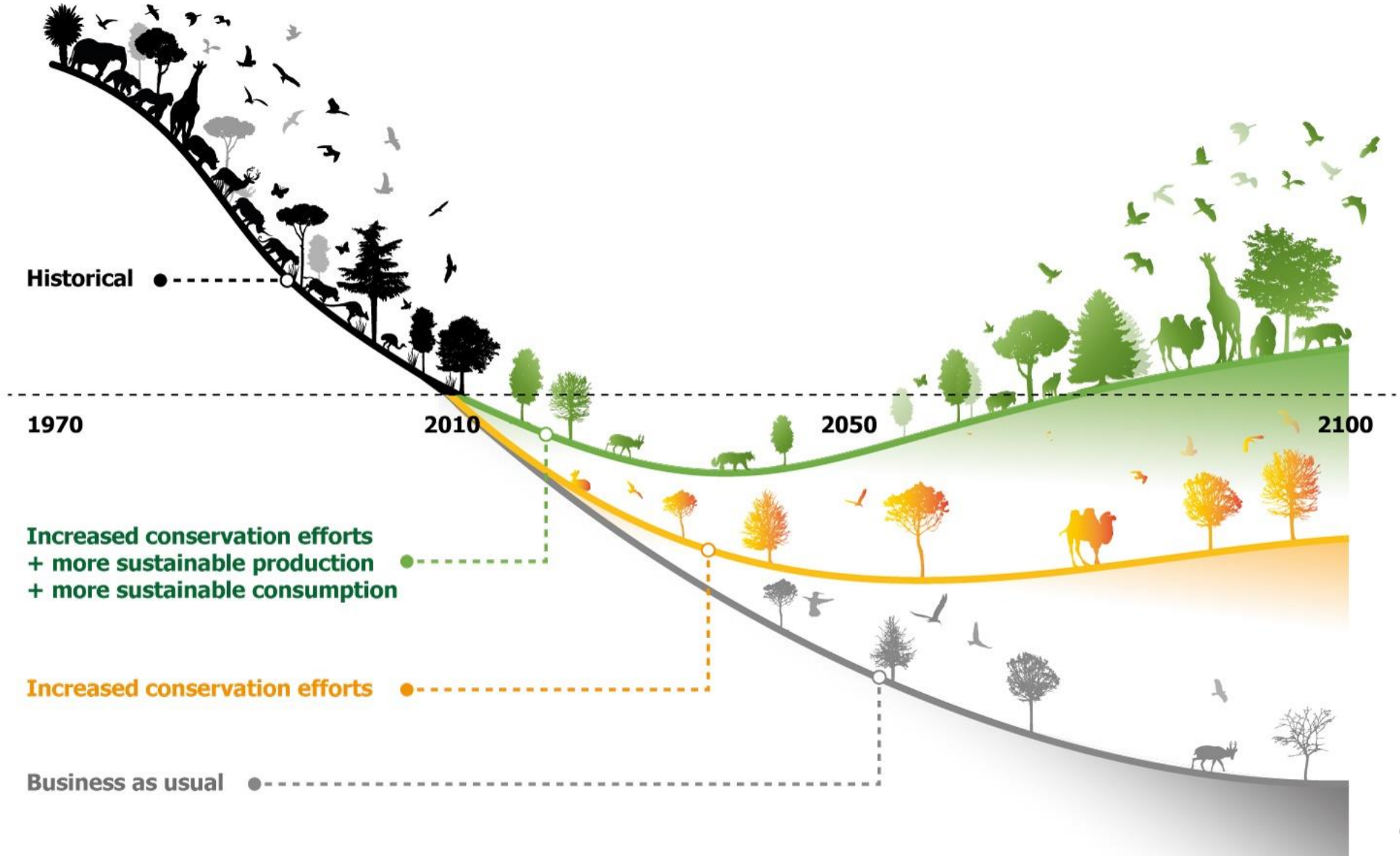
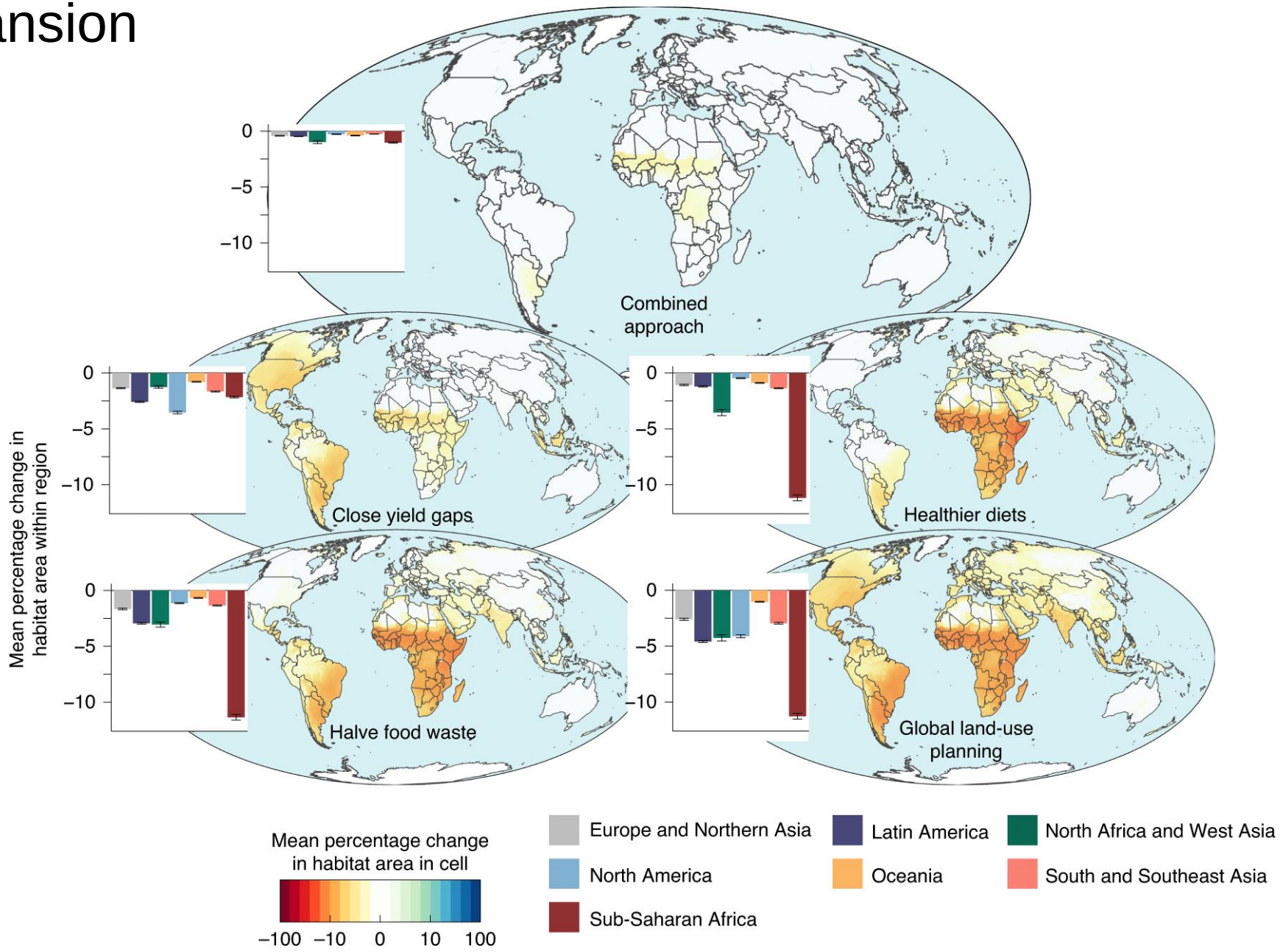
Ambitious conservation efforts combined with **food system transformations** mean that over two thirds of future biodiversity losses could be avoided



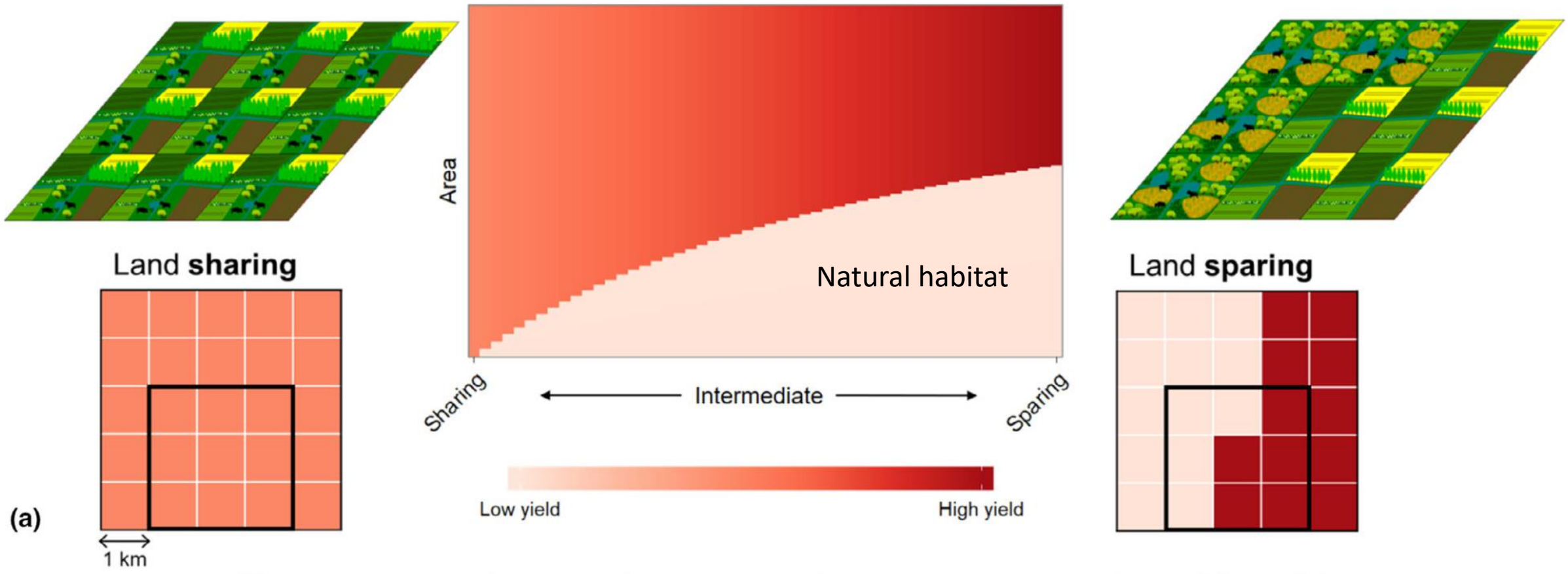
ère et al., 2020

Policies to limit future habitat loss driven by agricultural expansion



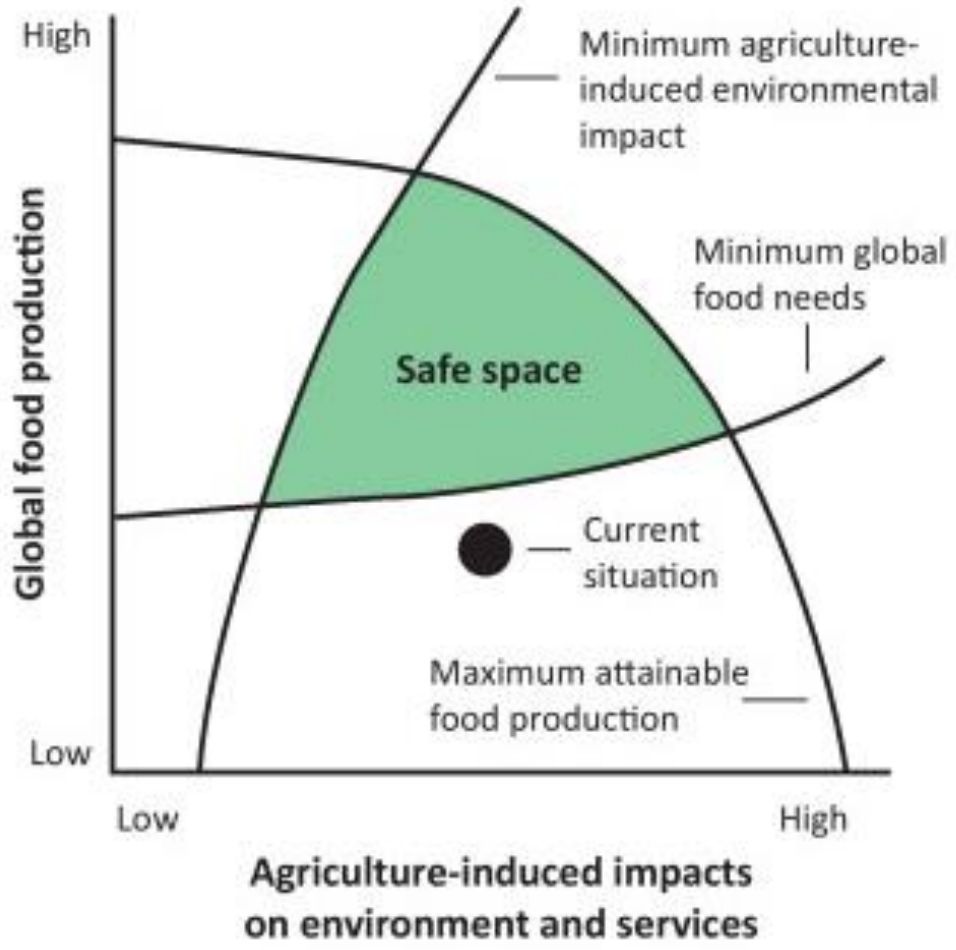
Williams et al 2021

Spreading vs concentrating the impact of food production



Balmford, 2021

Ecological intensification may allow for win-win scenarios



Bommarco, Kleijn, and Potts, 2013

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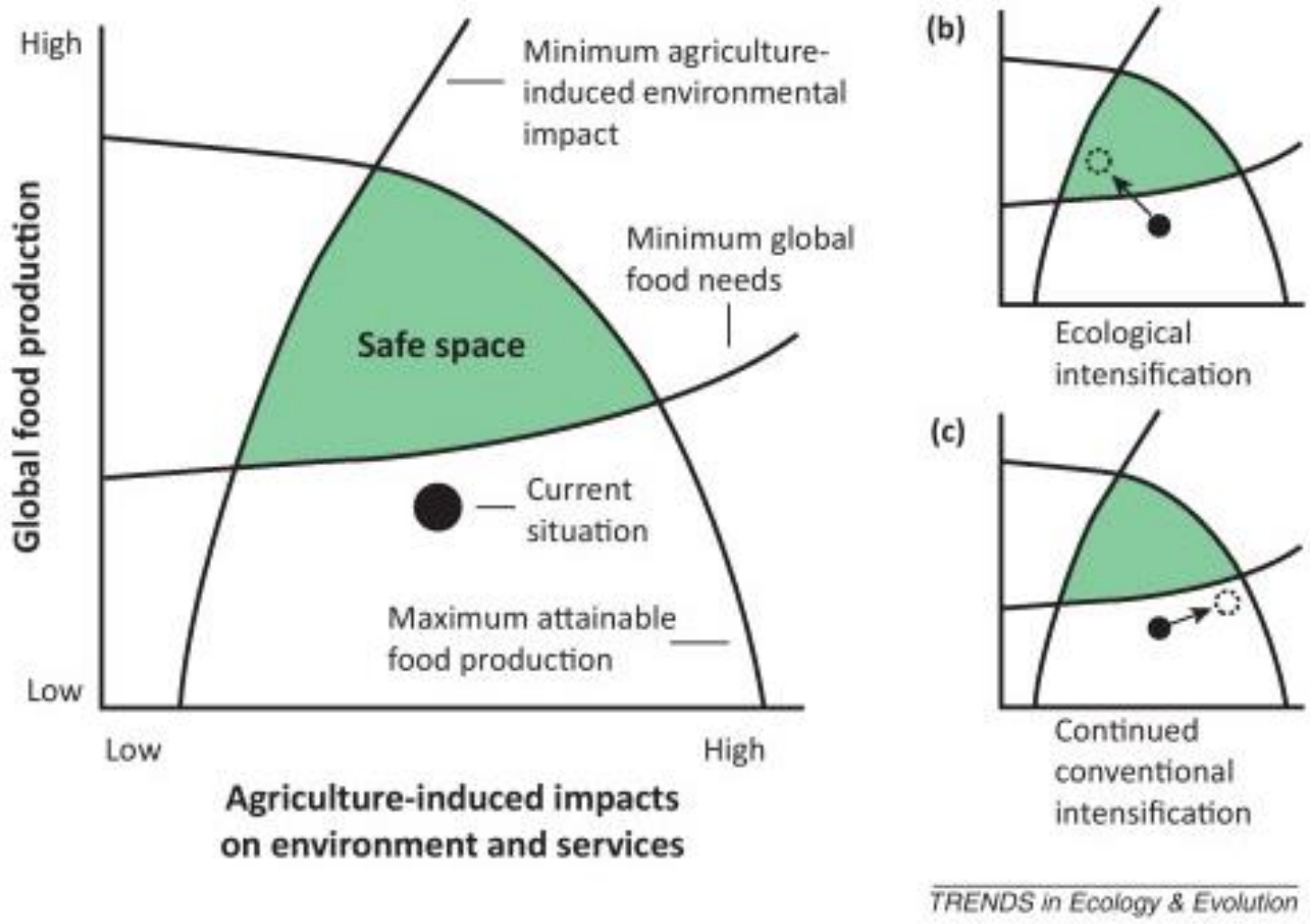
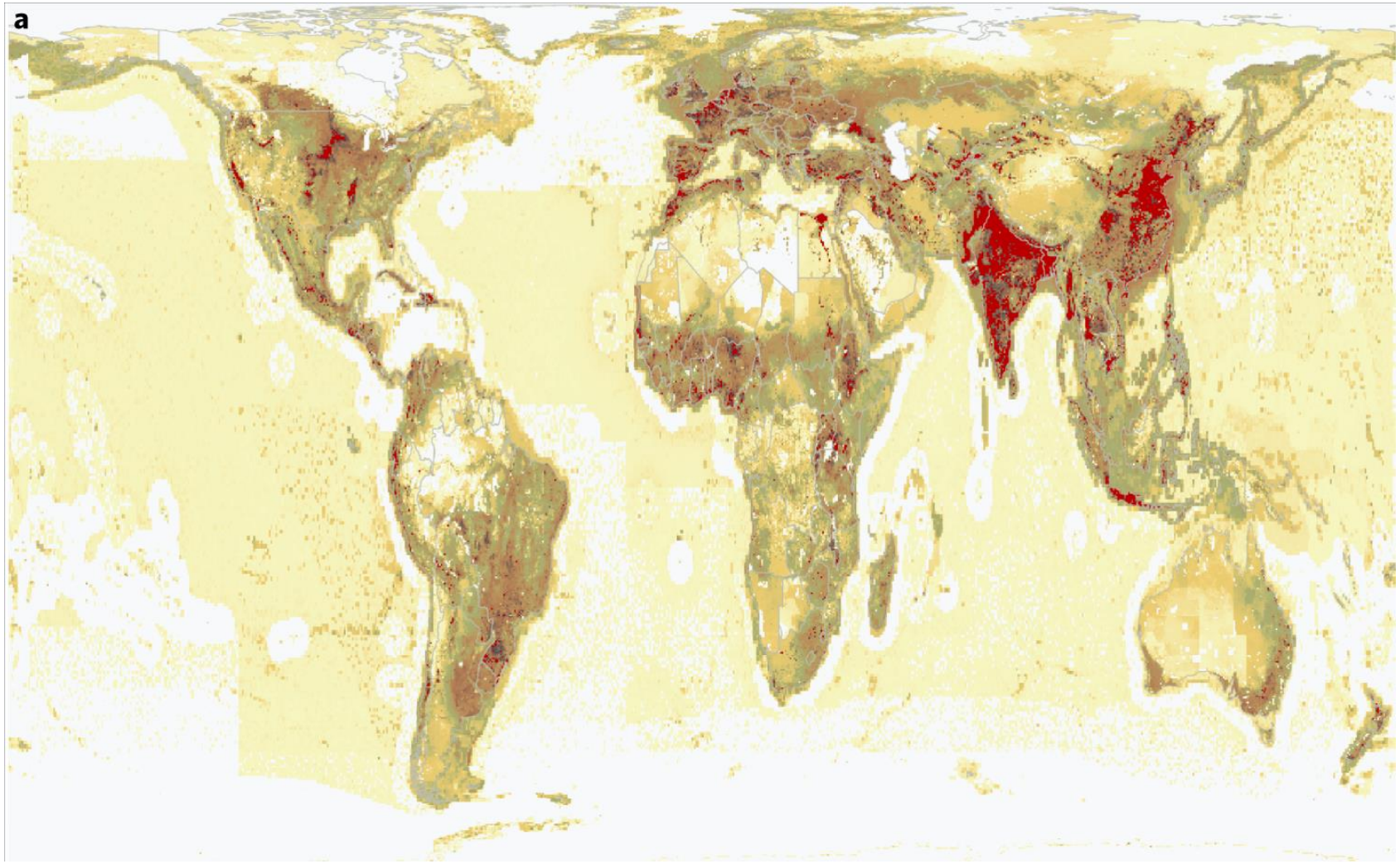


Bommarco, Kleijn, and Potts, 2013

India has one of the greatest environmental pressures imposed by food production

Proportion of global cumulative environmental pressure (disturbance, excess nutrients, freshwater use, and GHG emissions) from all foods



Environmental pressure

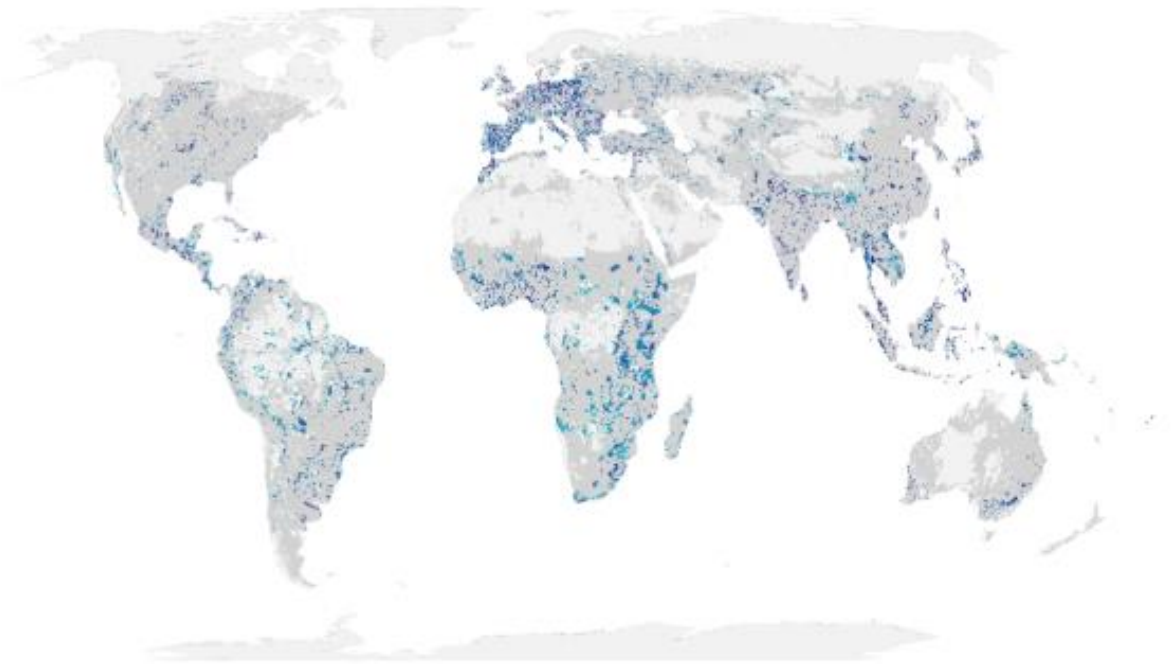
High

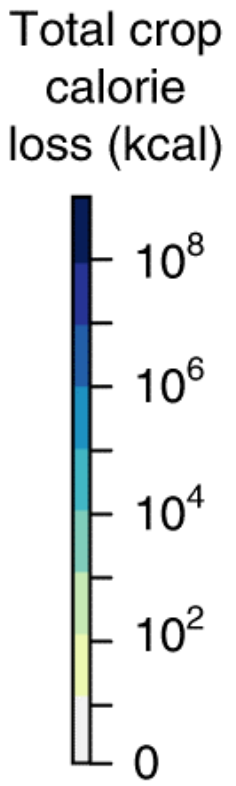
Low

Halpern et al. (2022)

Saving half of the world's land surface for nature reduces food production

Saving 50% globally





Mehrabi, Ellis, and Ramankutty, 2018

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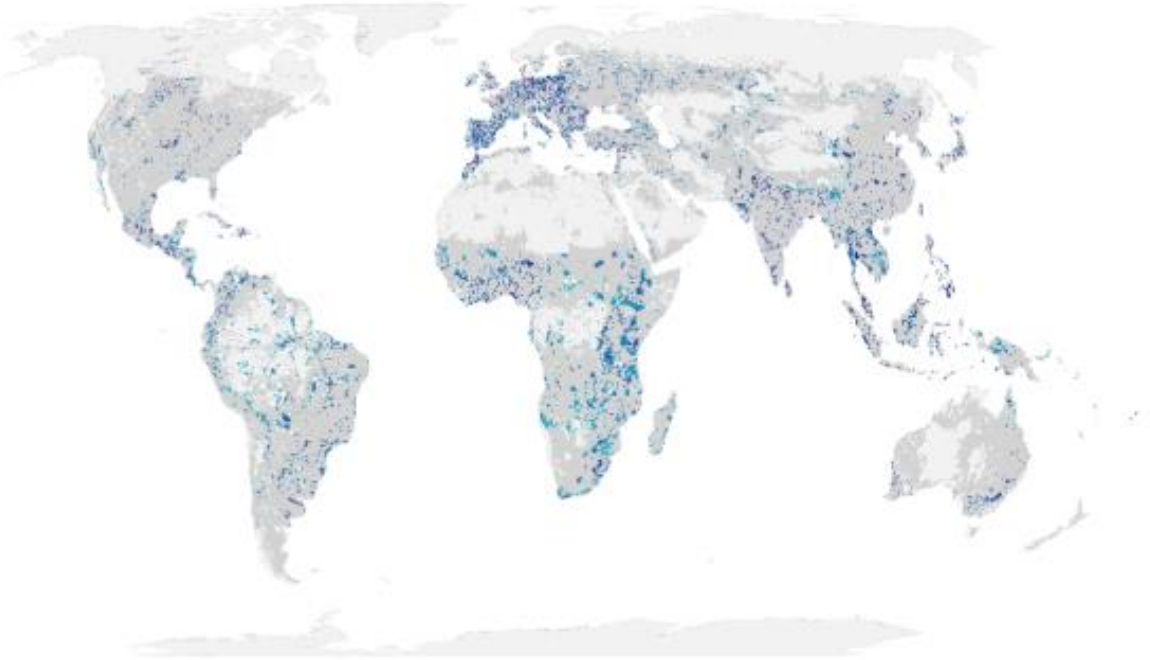
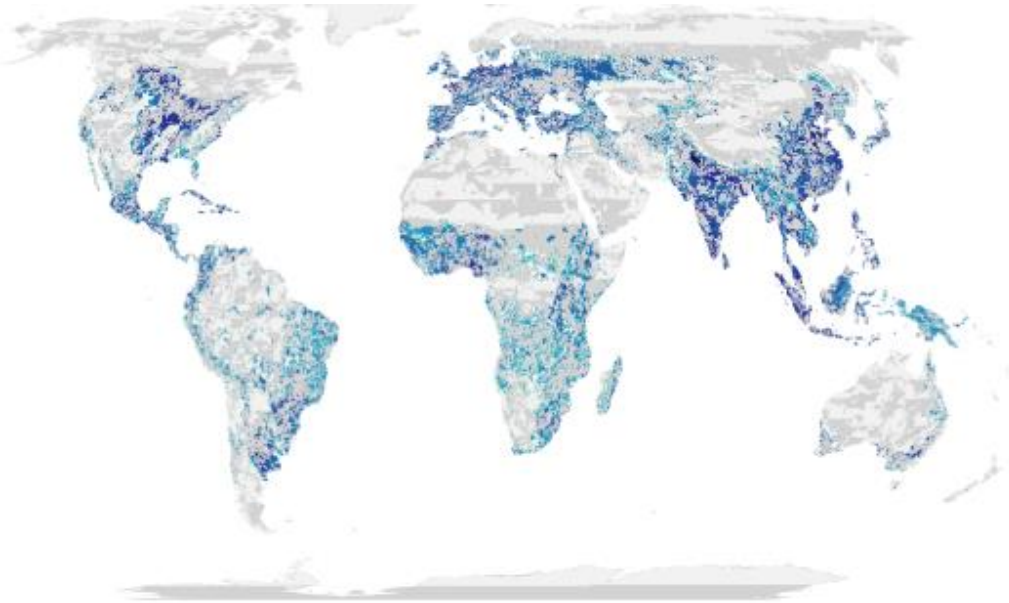
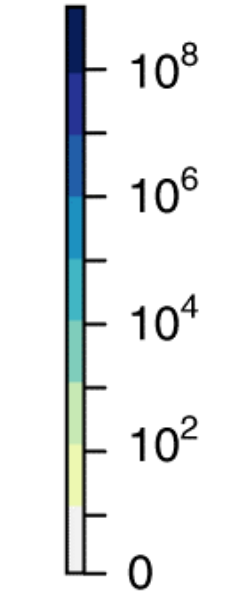


Saving 50% in every ecosystem





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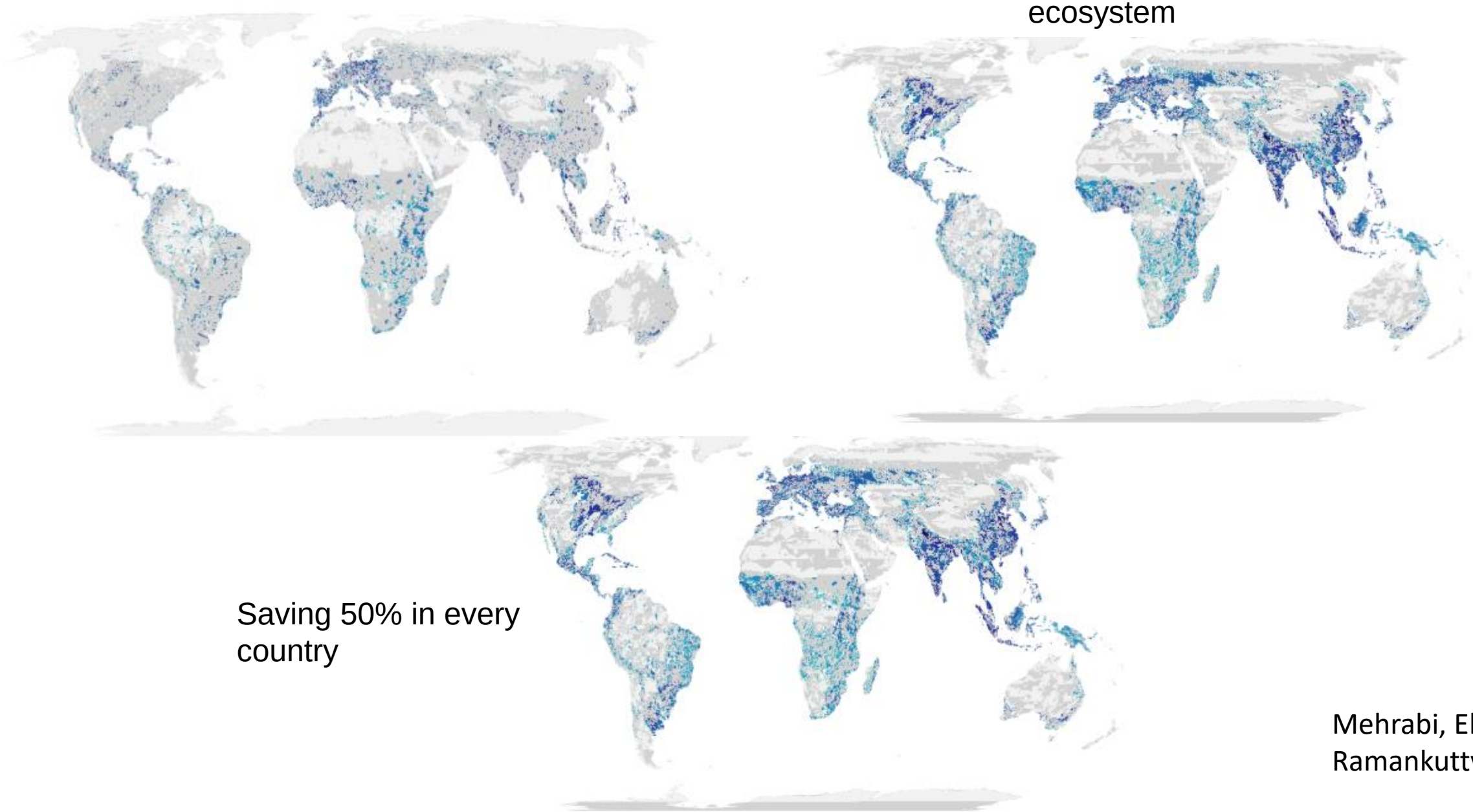
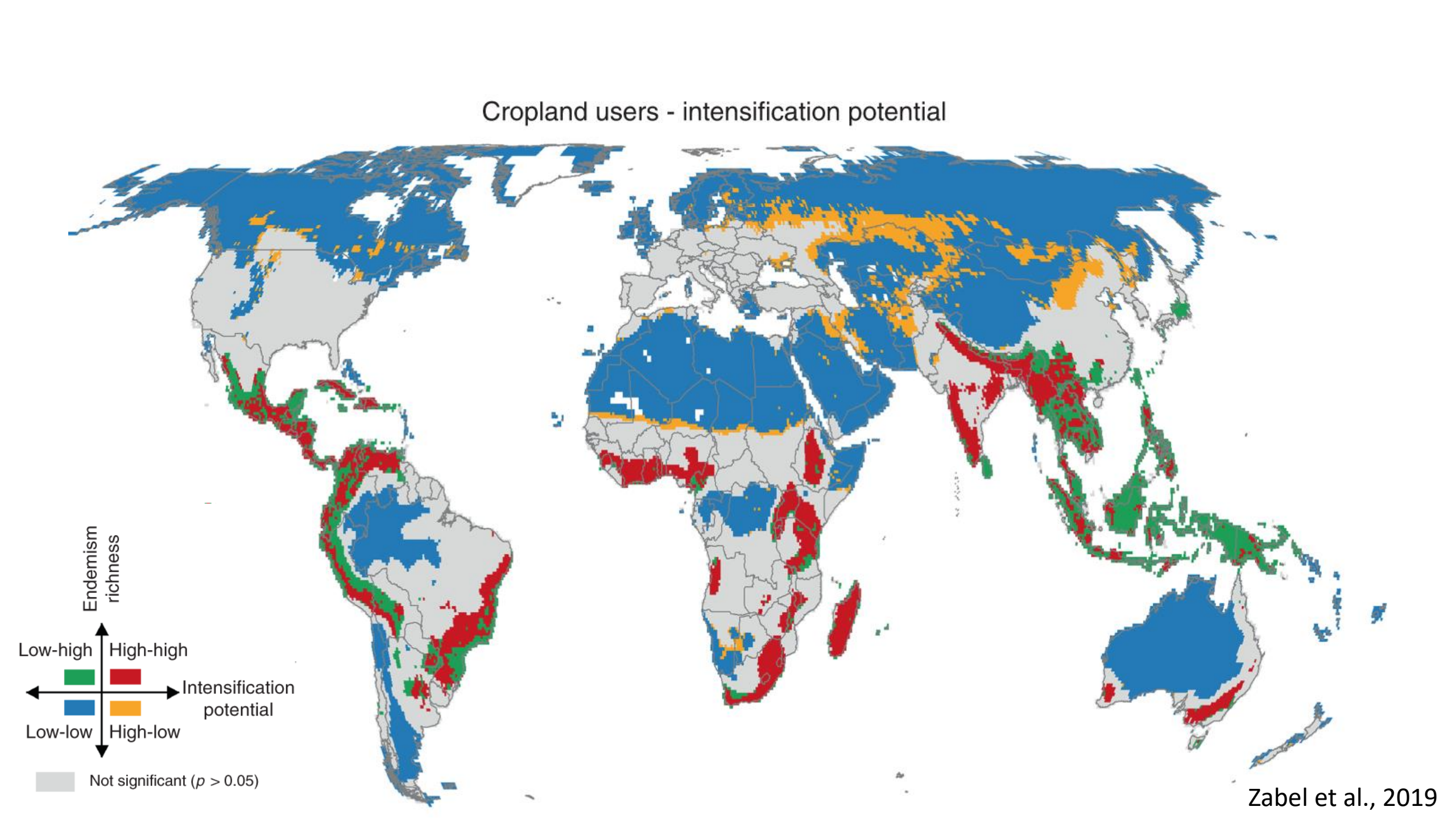


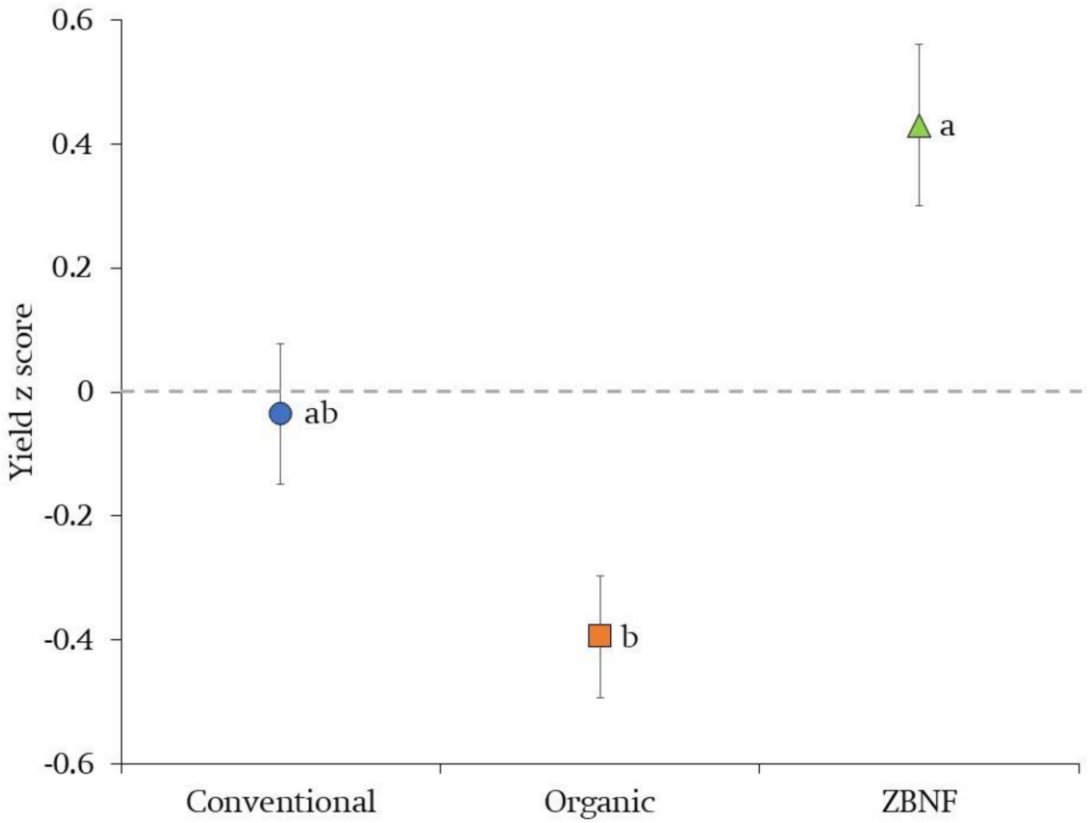
Saving 50% in every country

Mehrabi, Ellis, and Ramankutty, 2018

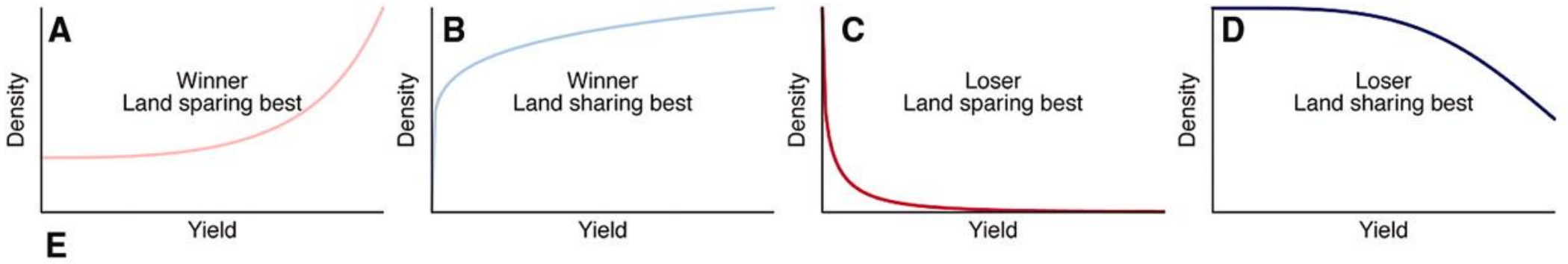


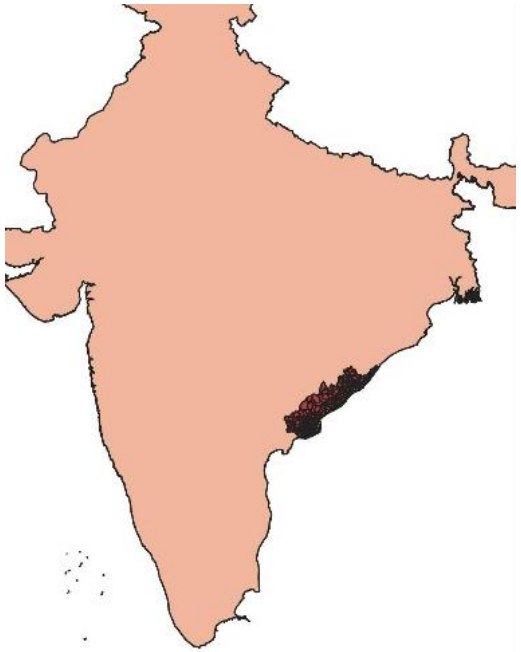
Zabel et al., 2019

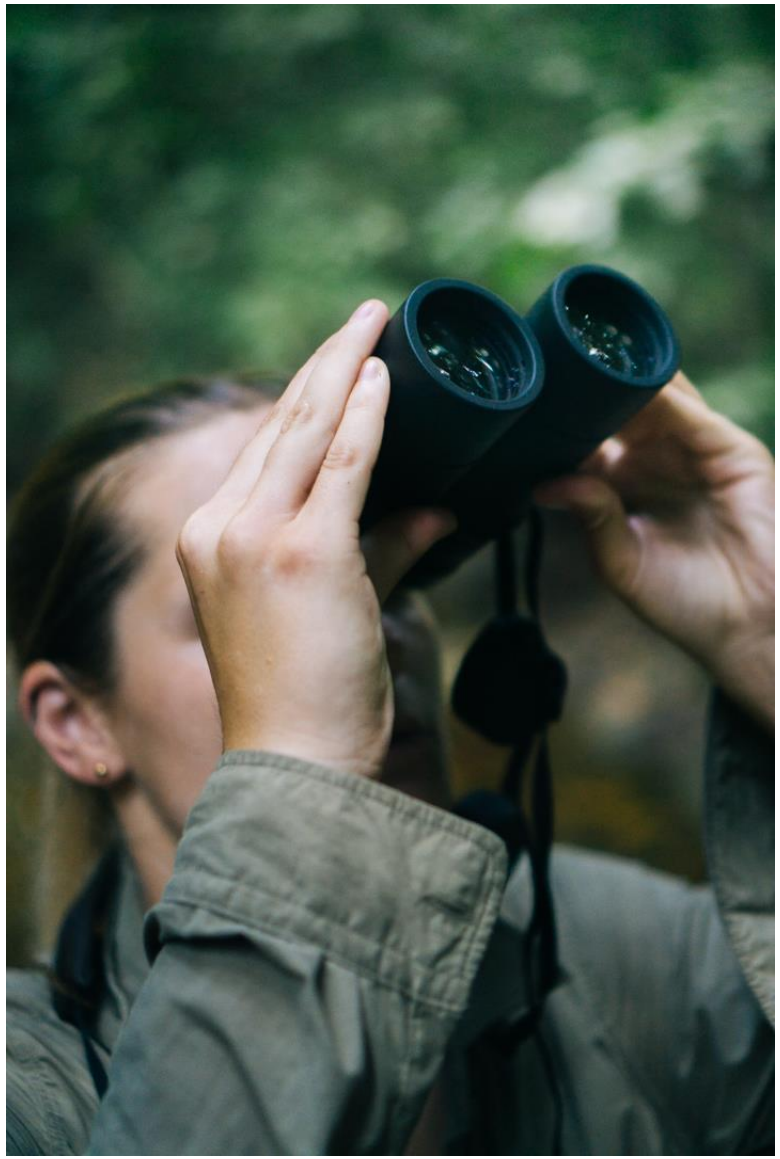
Zero-budget natural farming (ZBNF) – ecological intensification in SE India

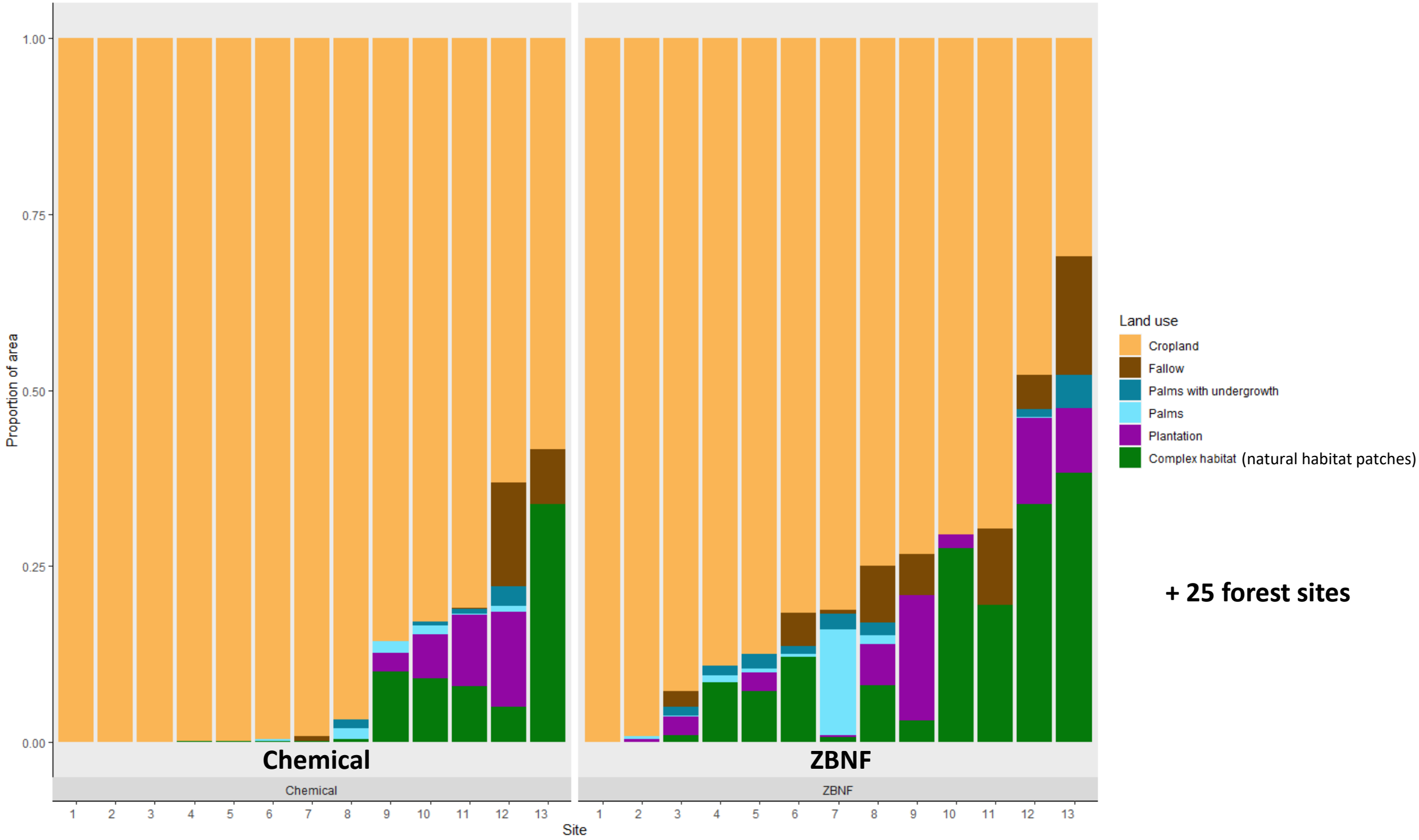


Duddigan et al., 2022


A
Winner
Land sparing best
Density
Yield
B
Winner
Land sharing best
Density
Yield
C
Loser
Land sparing best
Density
Yield
D
Loser
Land sharing best
Density
Yield
E

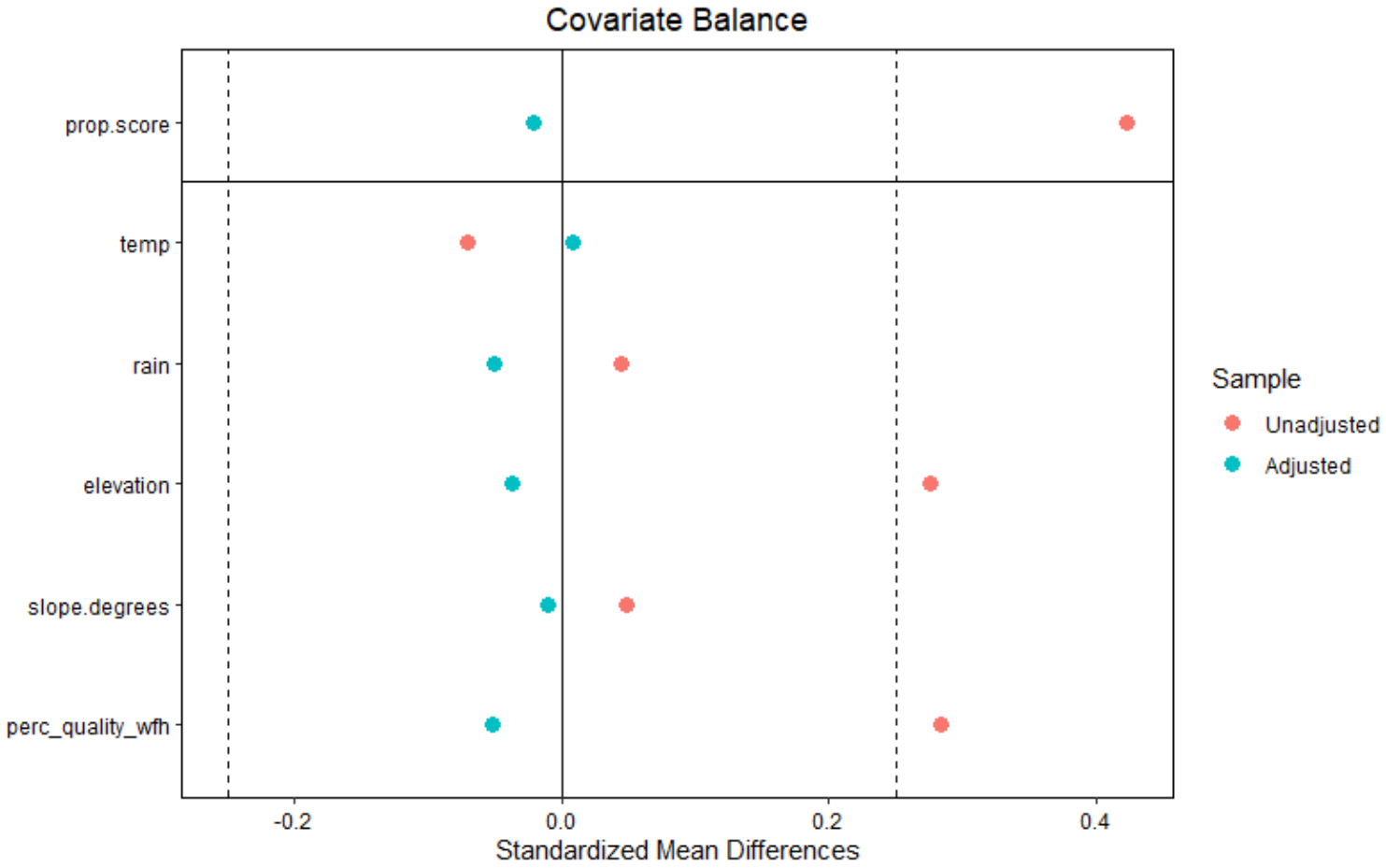




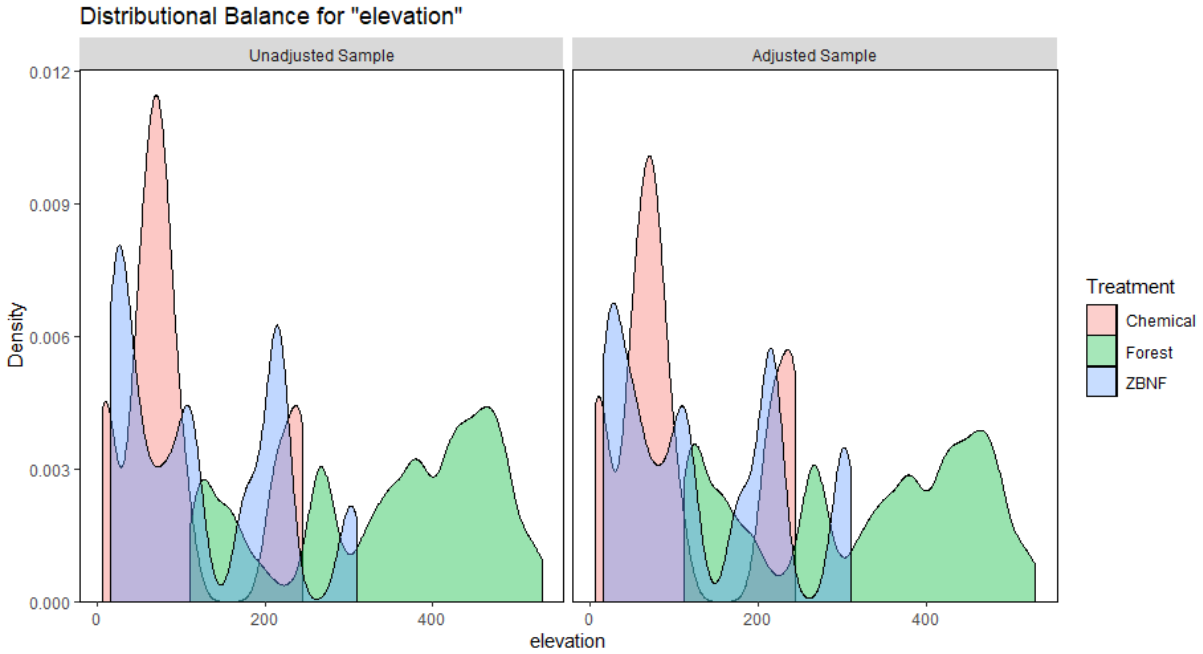


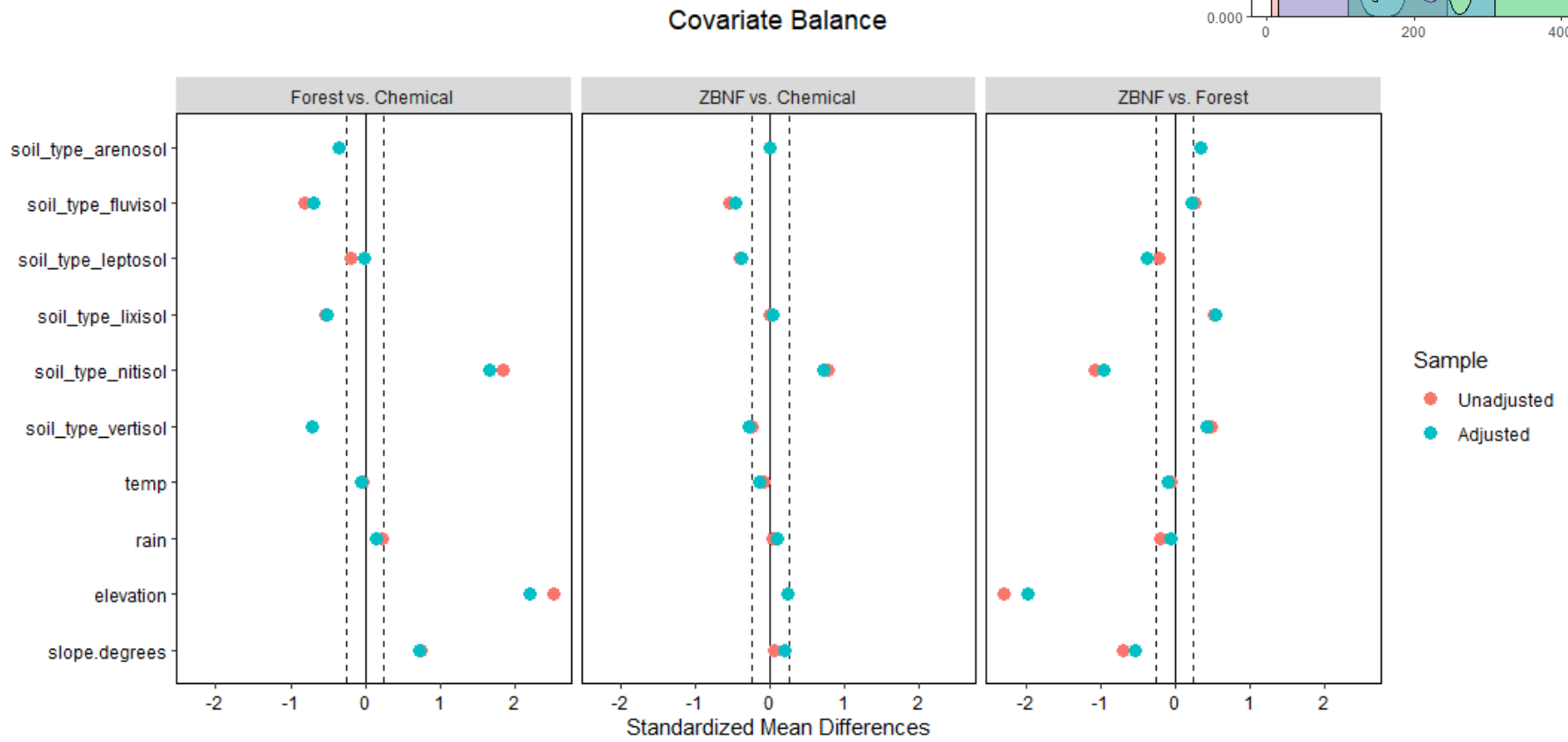
+ 25 forest sites

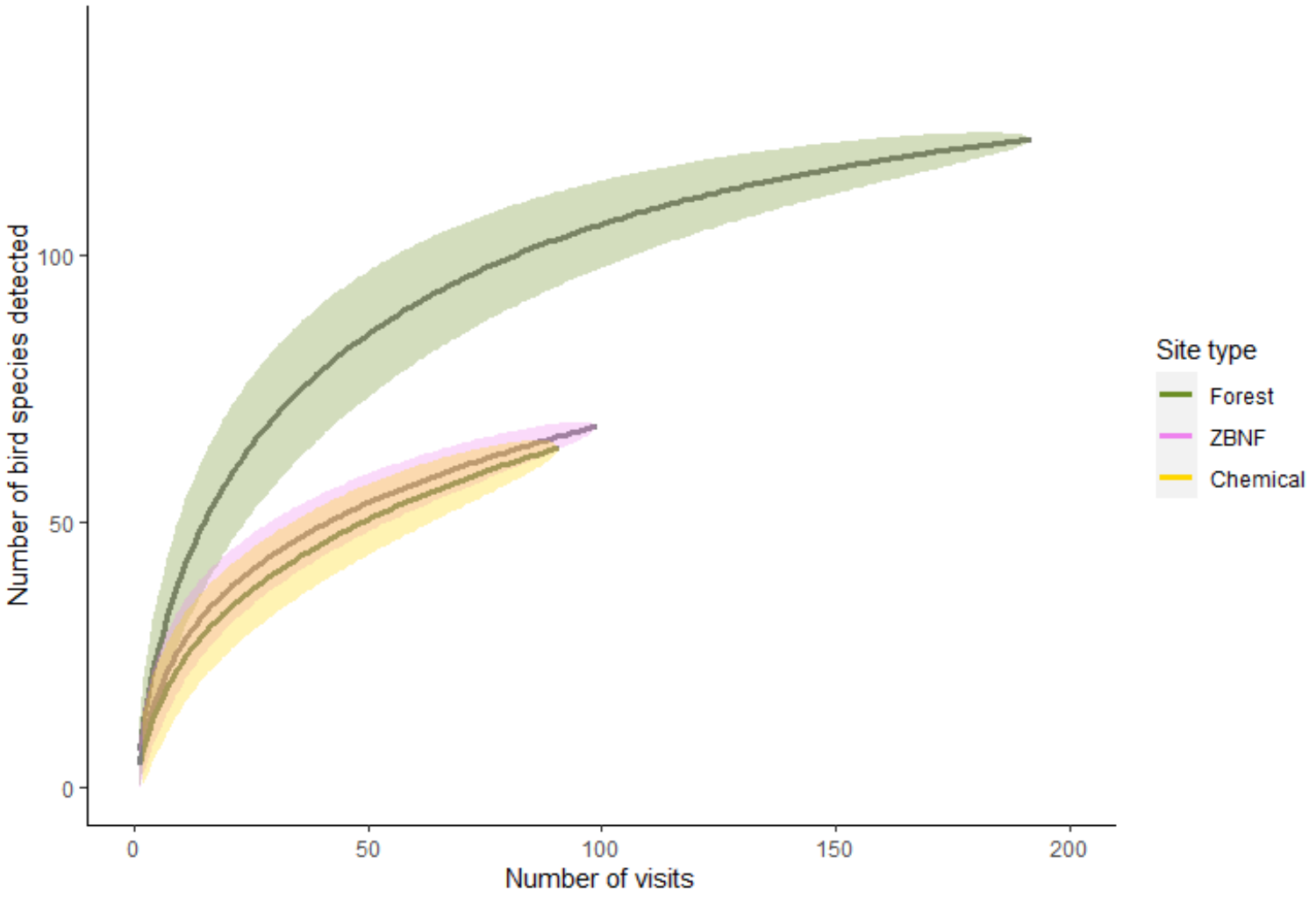
ZBNF & Chemical farming sites



Forest, ZBNF & chemical farming







Forest: 122 species

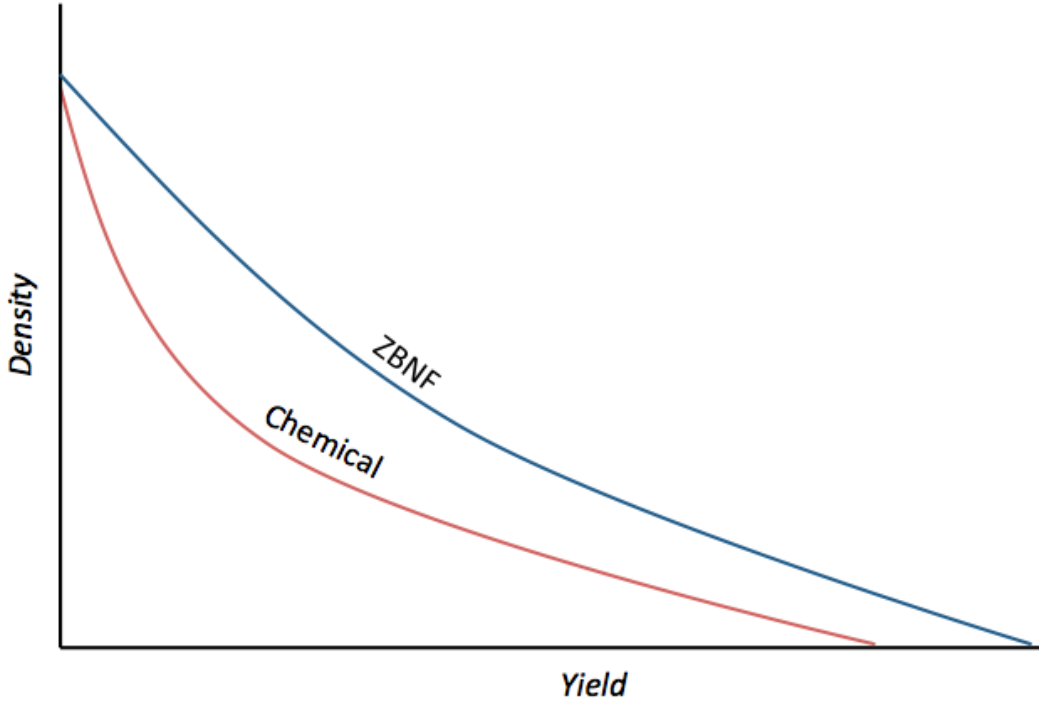
ZBNF: 68 species

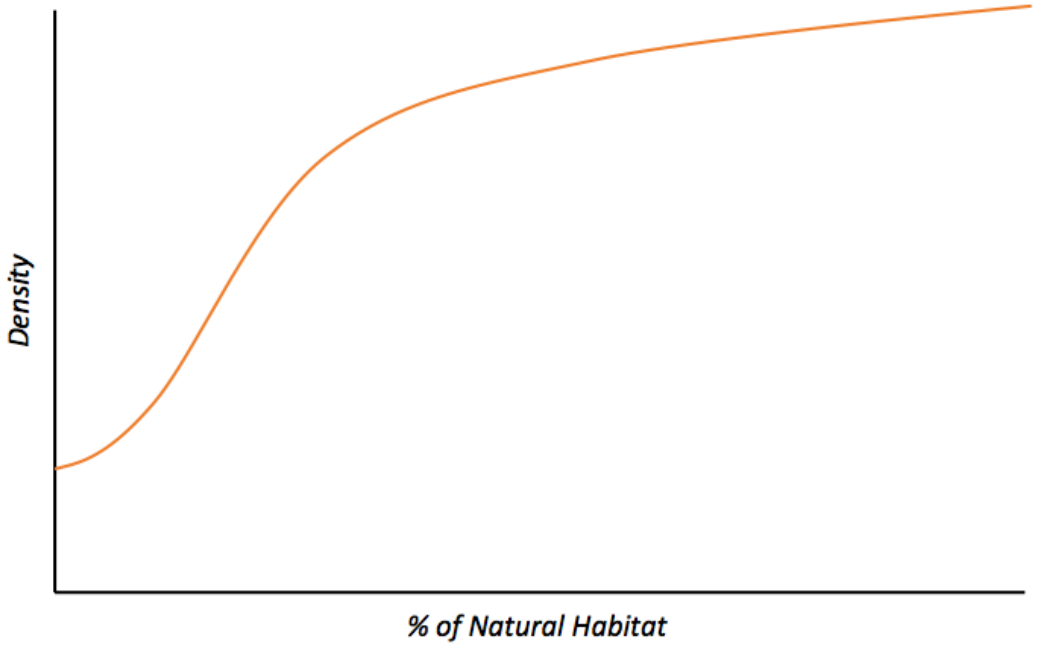
Chemical: 64 species

Species shared:
Forest & ZBNF: 48 species

Forest & chemical: 42 species

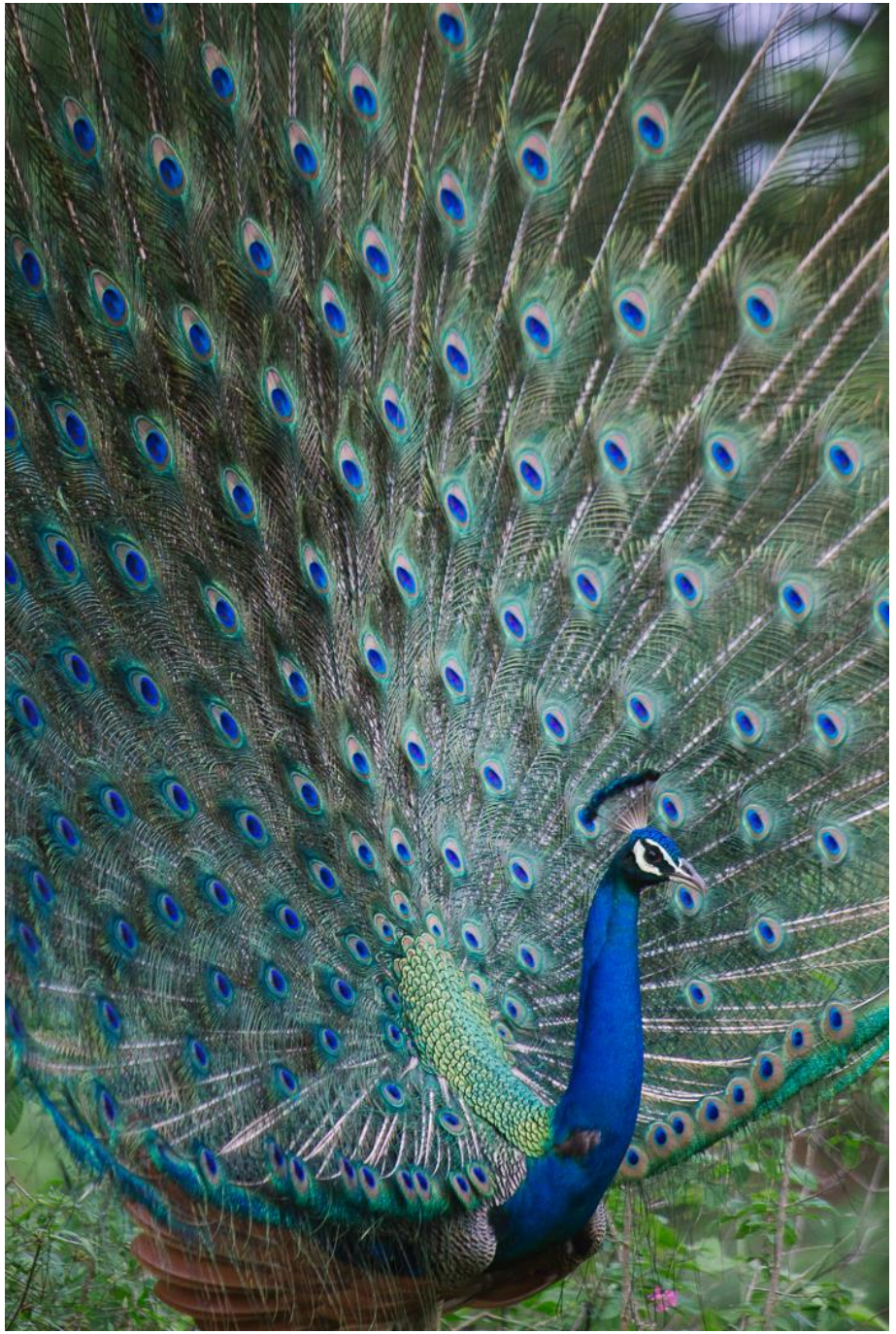
ZBNF & chemical: 48 species


Density
ZBNF
Chemical
Yield


Density
% of Natural Habitat

In Conclusion

- Changing **what, where, and how food is produced** is critical if we want to halt biodiversity loss
- **Stopping agricultural expansion** will be particularly important and requires **increasing yields** sustainably on existing farmland
- In order to assess **farming-system wide** biodiversity implications we need data on crop **yield** and on species **abundances** in agricultural sites as well as in natural ecosystems



Questions?