

Cocoa crop modelling for avoided deforestation

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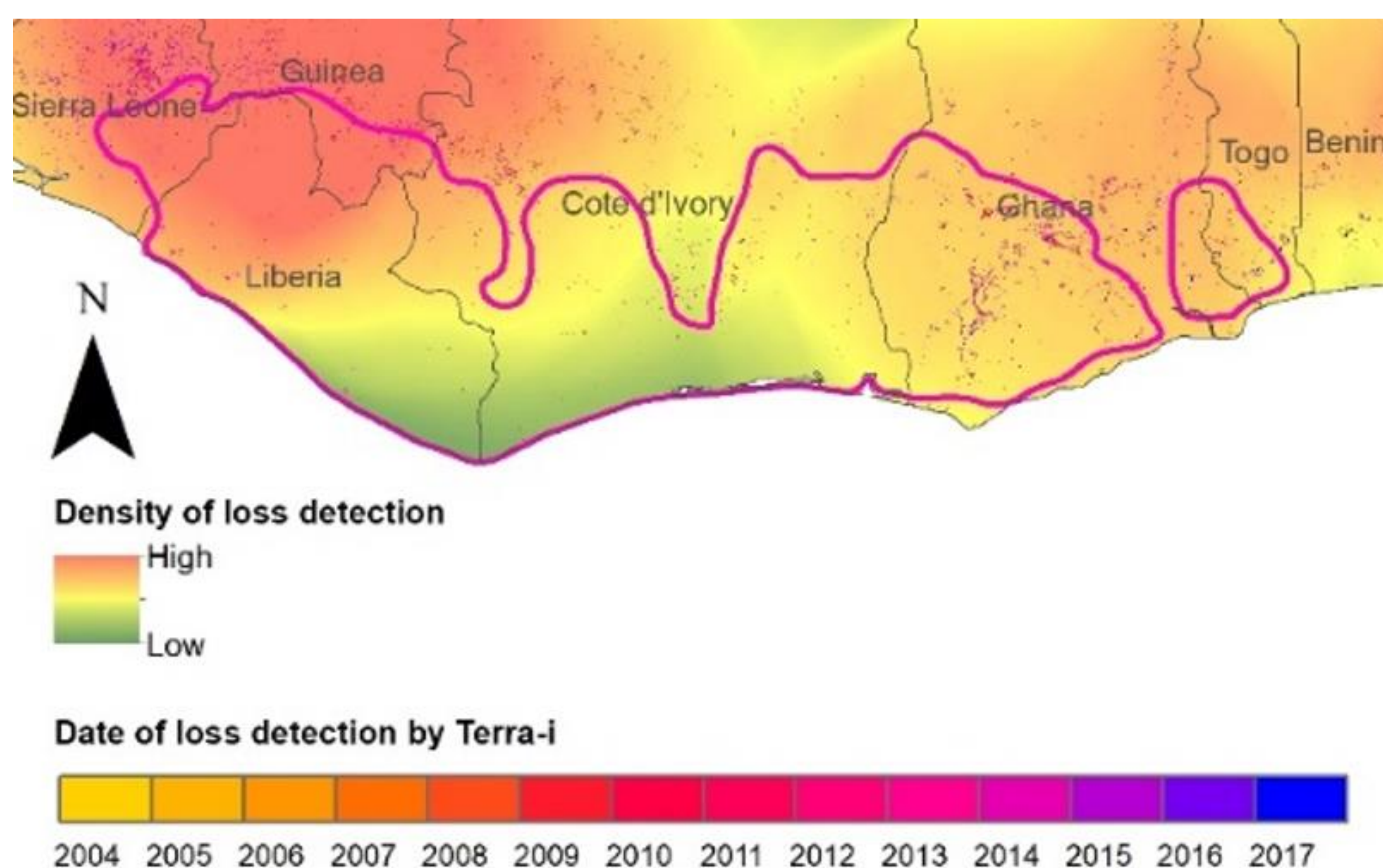


Abstract

We aim to understand how current climate affects cocoa production in West Africa and explore potential impacts of climate change by using a crop modelling approach. This will allow for identifying climate change adaptation pathways and guide landscape scale decision making needs for sustainable intensification and avoided deforestation

Materials and Methods

- Connecting the SUCROS-Cocoa model (Zuidema et al. 2005) with spatially variable climate and soil data to calculate water limited yield for the main cocoa growing areas in West Africa
- Mapping cocoa areas based on 40 indices derived from Sentinel satellite data using deep learning algorithms
- Monitor forest gain and loss using Terra-i system



Results

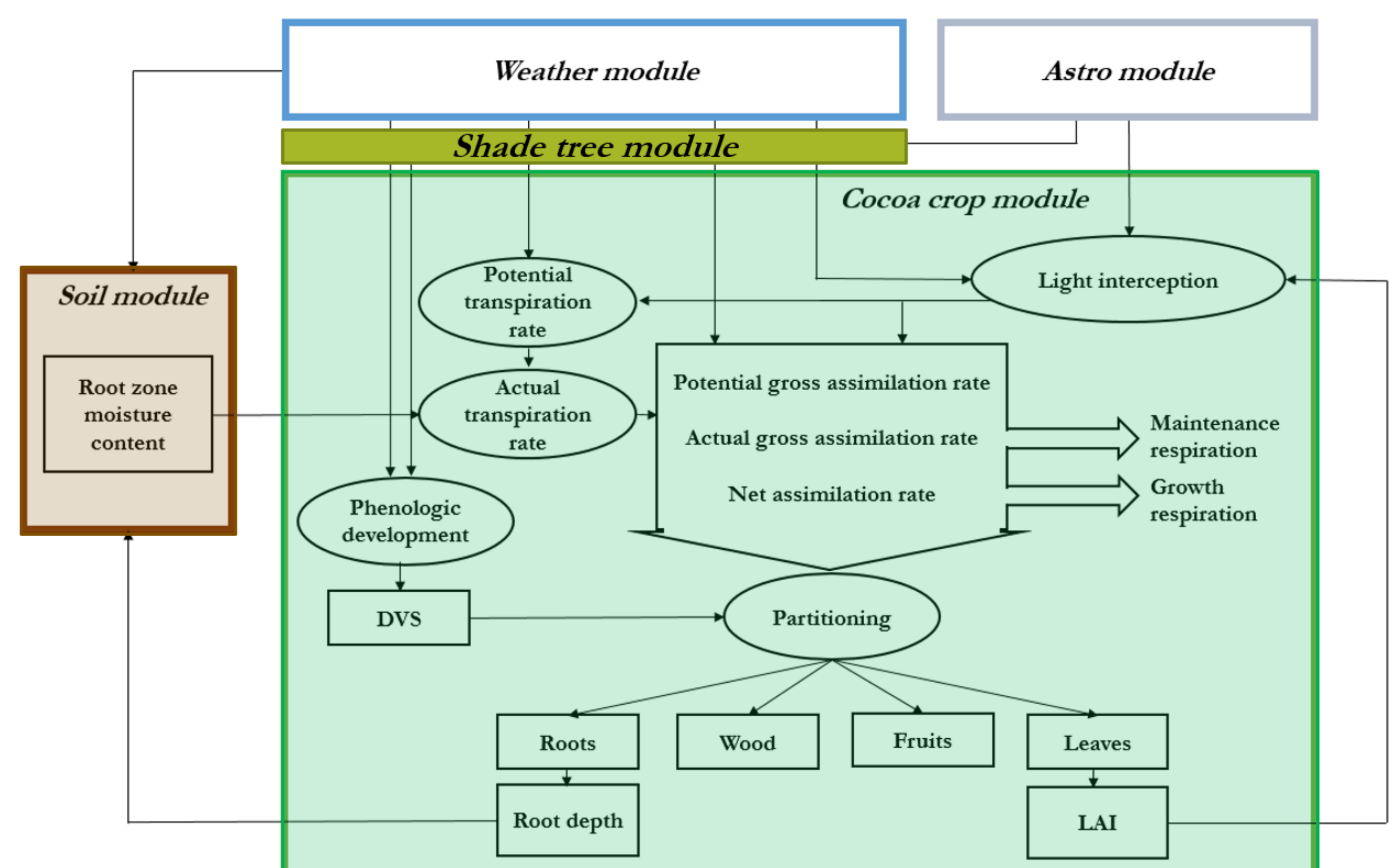
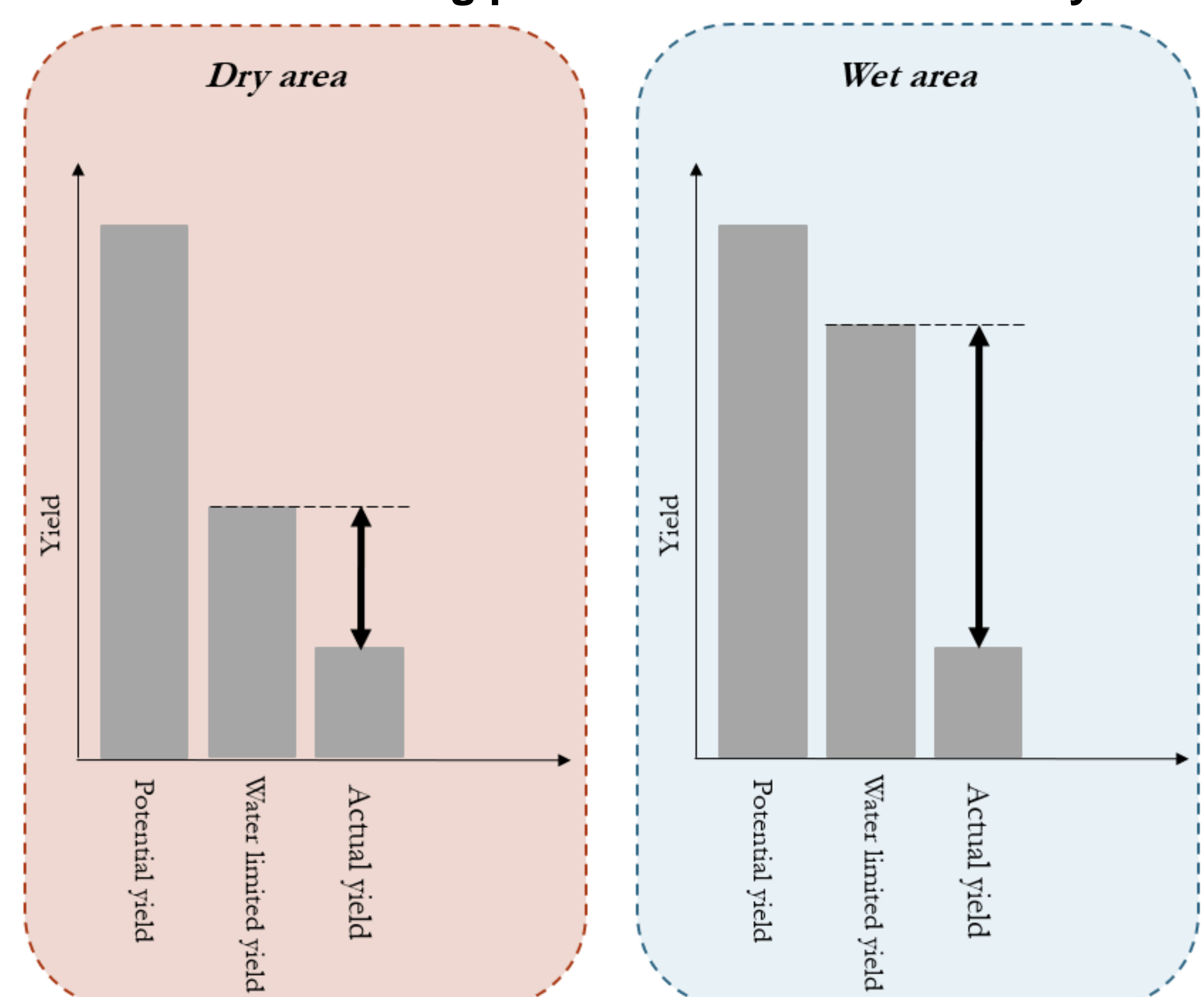


Figure 1: Cocoa crop model linked with spatially variable climate and soil data for calculating potential and water limited yield.



Discussion

This research will provide insights on:

- Where is cocoa currently grown?
- Where is the highest potential for yield increase today and in a future climate?
- Which forests are at highest risk due to cocoa production
- Guidance on sustainable intensification

References

Zuidema P., Leffelaar P., Gerritsma W., Mommer L., Anten N. (2005) A physiological production model for cocoa (*Theobroma cacao*): model presentation, validation and application. *Agricultural Systems* 84:195-225
www.terra-i.org