Partners

Our study was done in a globally significant cocoa growing region in Ghana, West Africa. Along a gradient of shade-tree cover (0-80%), and separately under focal shade trees of three shade-tree types (with different economic uses), we measured factors related to:

- agricultural production
- climate-change adaptation
- climate-change mitigation
- biodiversity conservation

Therefore, how can we implement agroforests with: 1) shade-tree cover; and 2) shade-tree types that maximize benefits while minimizing costs?

Shade-tree cover: Agroforests can optimize the trade-off between agricultural yield and the provisioning of other ecosystem services at shade levels around 30% cover.

Shade-tree types: Timber trees are an ideal choice because they compete less for light and water, resulting in smaller negative effects on yields for the same level of shade-tree cover.

Conclusions

Agroforests with shade-tree cover around 30%, and agroforests that prioritize timber trees, will yield better outcomes for smallholder cocoa producers and for the environment than full-sun monocultures.