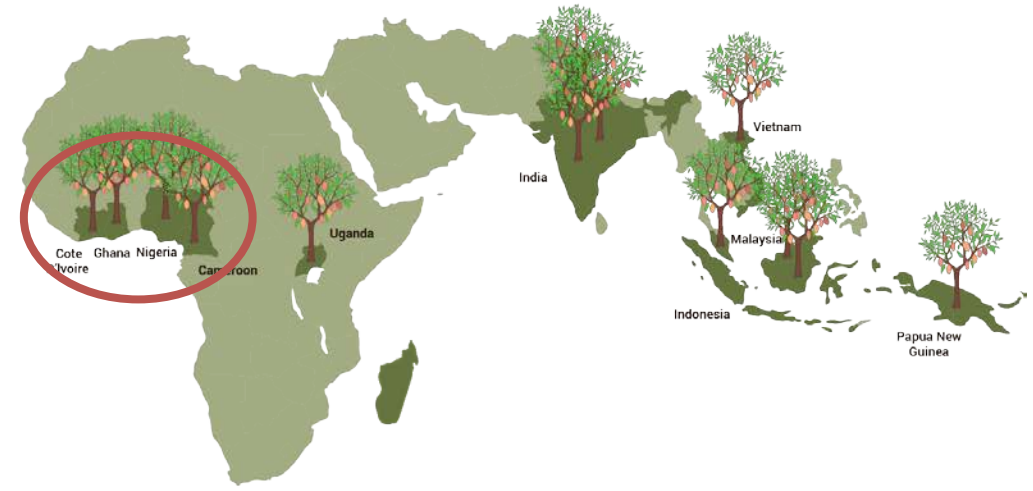


Optimizing cocoa agroforests

Wilma J. Blaser



Challenges for cocoa cultivation



West Africa 70 % of global production

Challenges for cocoa cultivation



Low productivity



Deforestation

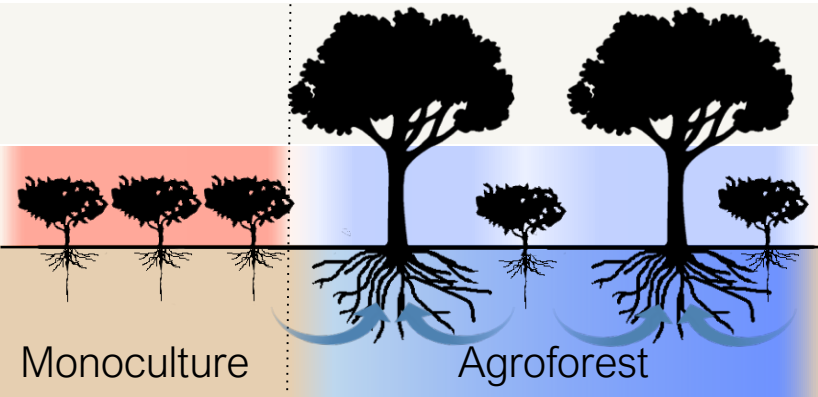


Climate change

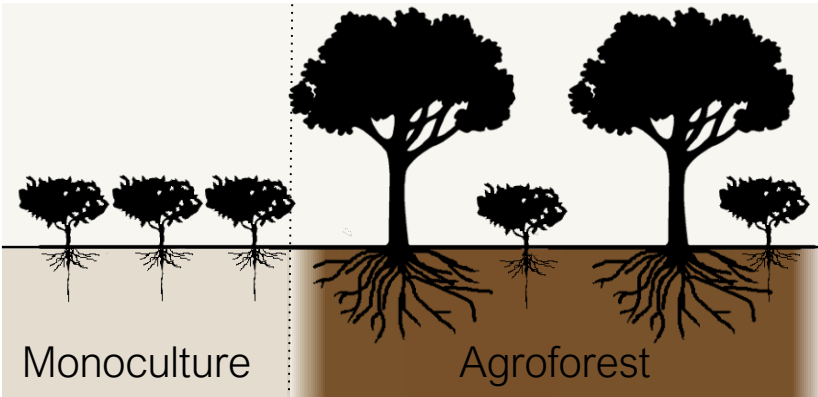


Agroforestry

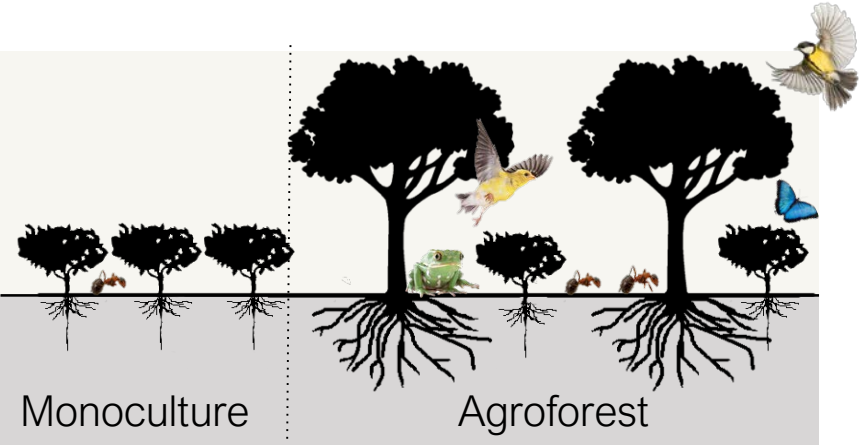
Climate adaptation



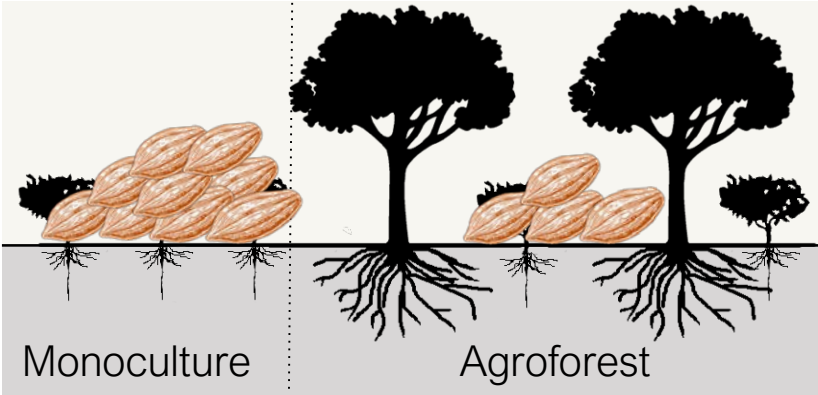
Climate mitigation



Biodiversity conservation



Agricultural production



Soil fertility, disease, alternative products



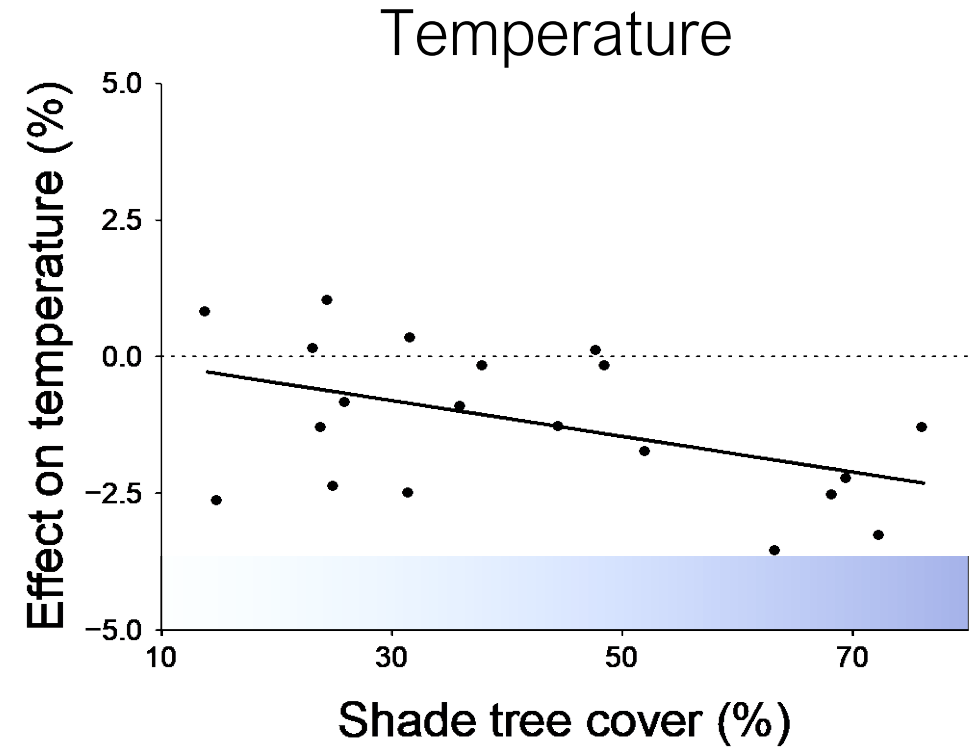
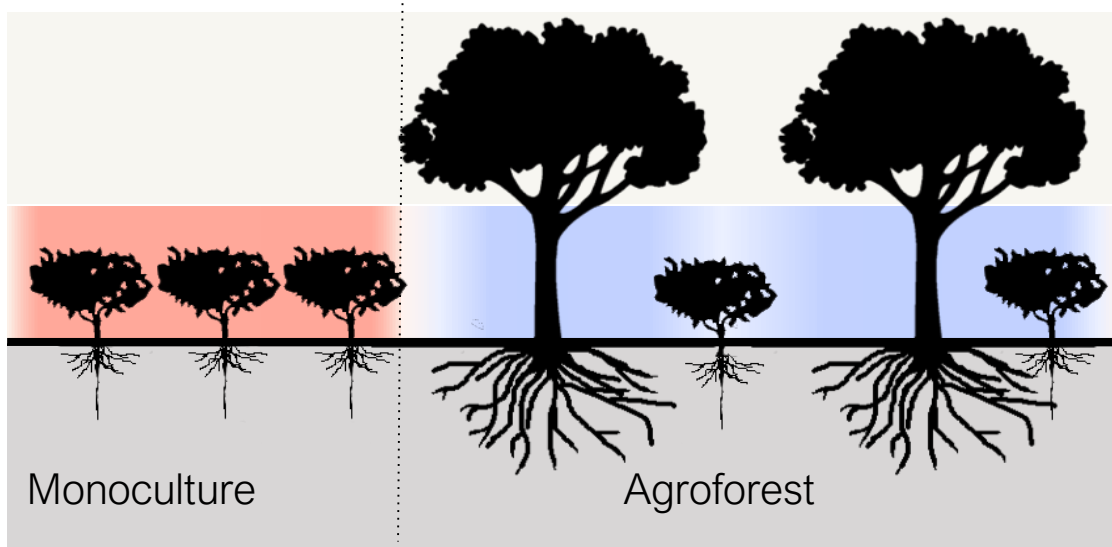
Costs and benefits are likely mediated by the level of shade

How much shade should we have in an agroforest?



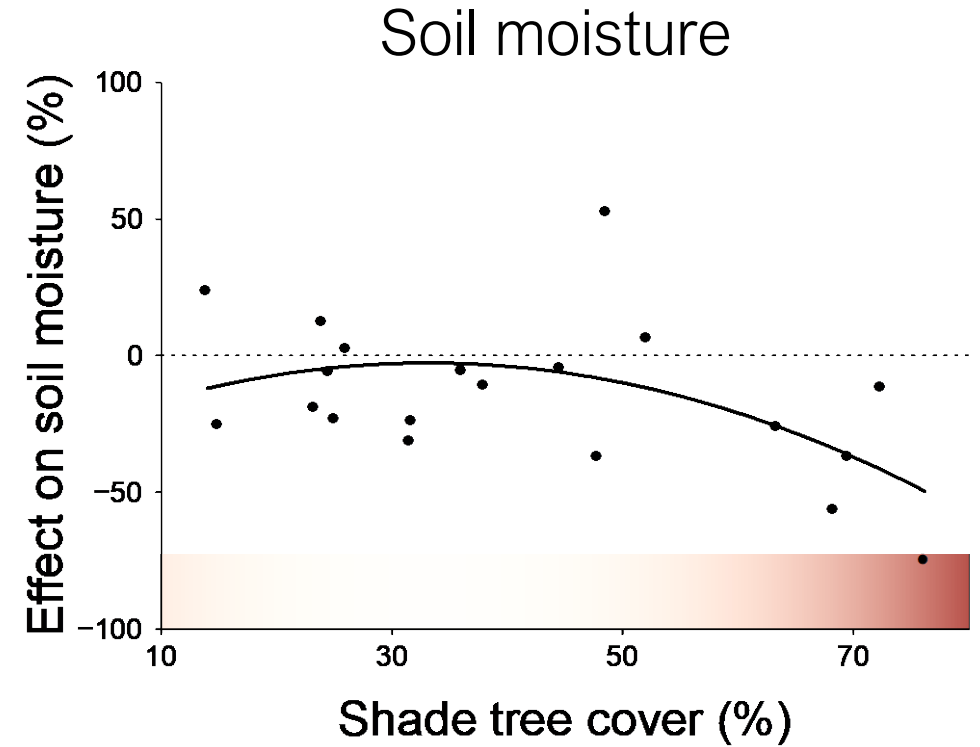
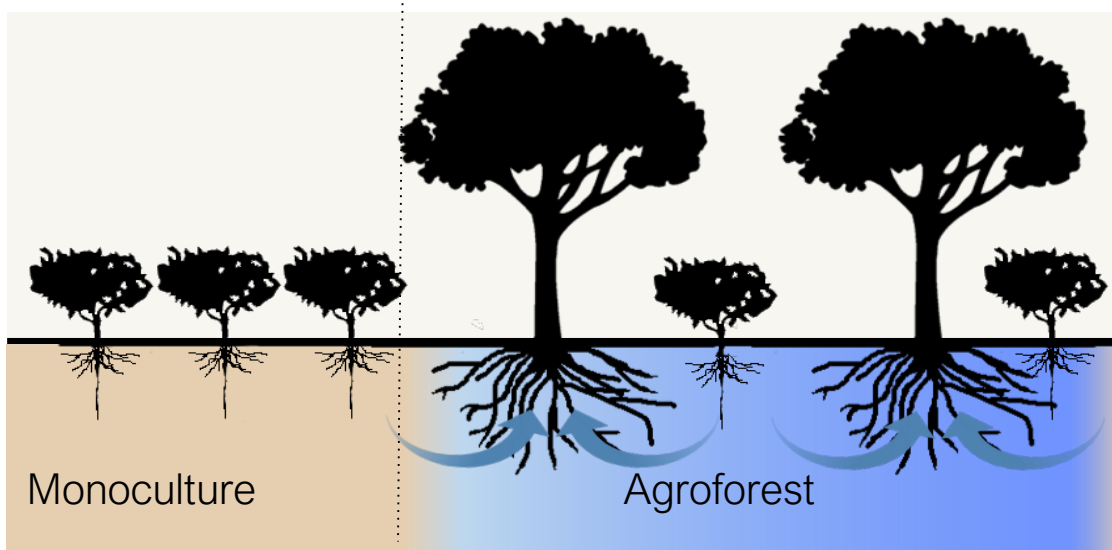
Evaluate trade-offs and identify optimal shade cover

Climate adaptation



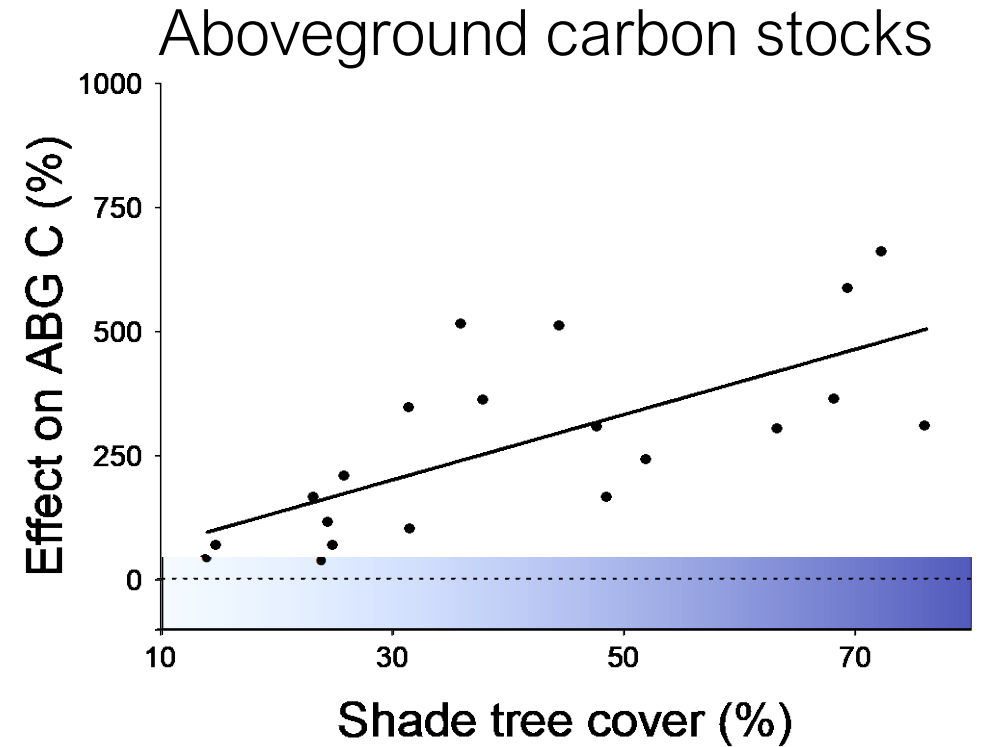
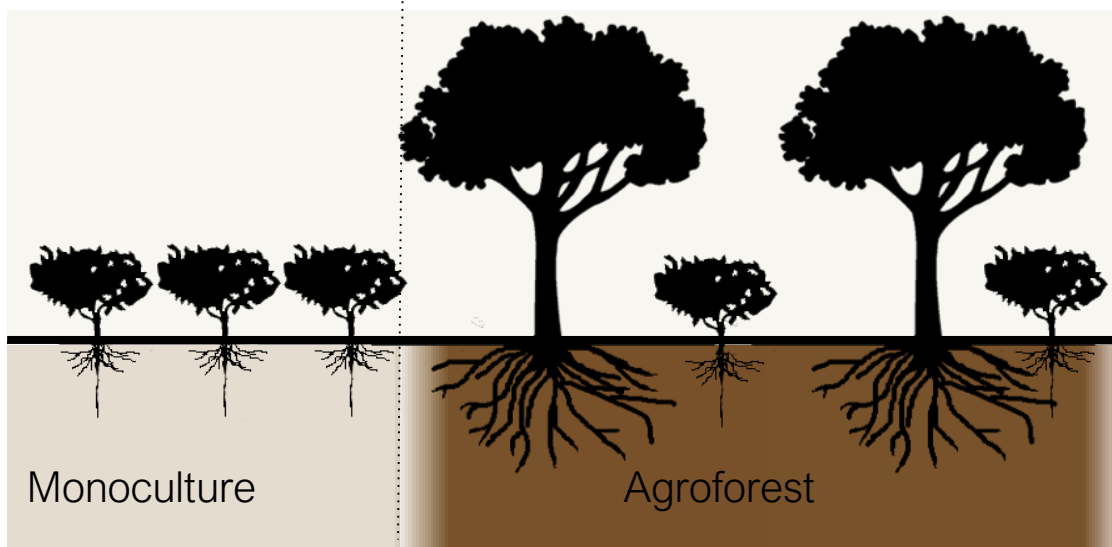
Increasing buffering effects on temperature

Climate adaptation



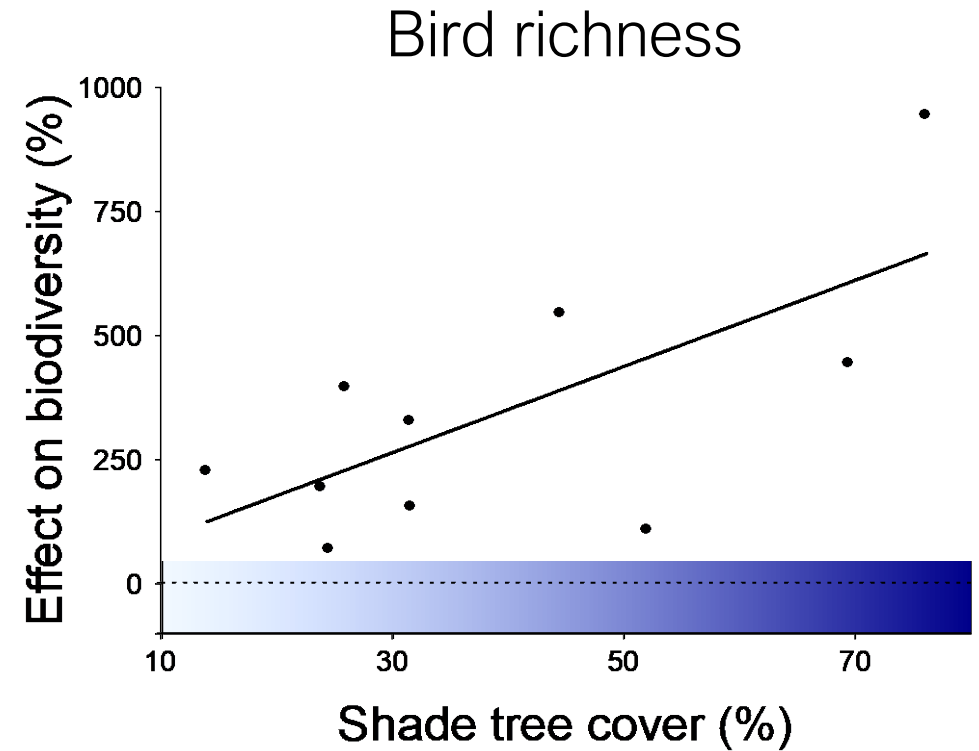
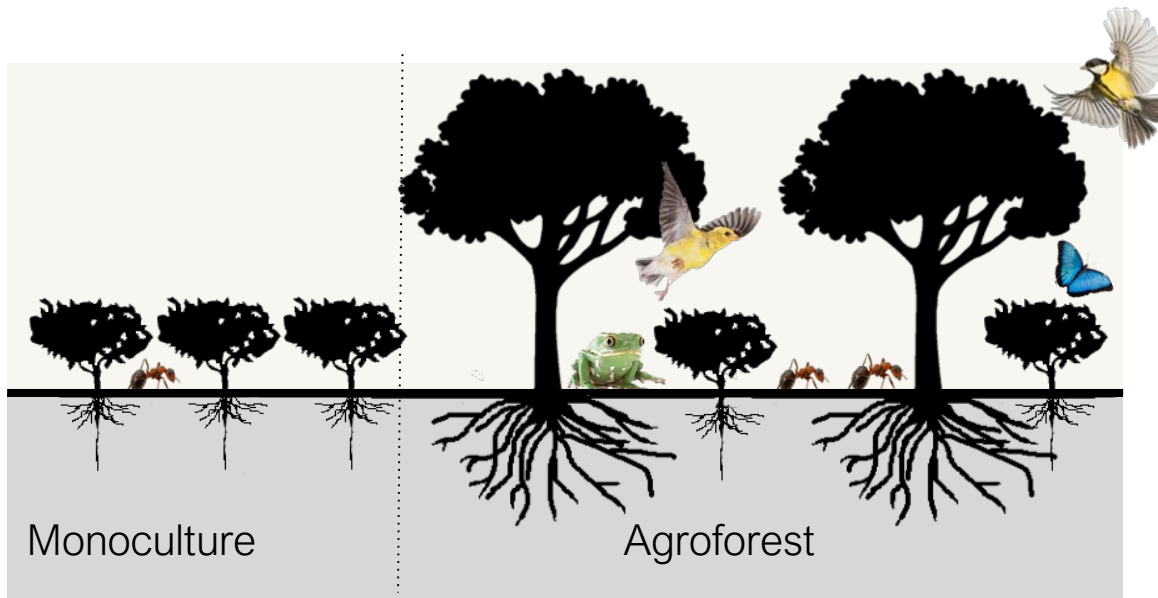
Increasing negative effects on soil moisture

Climate mitigation



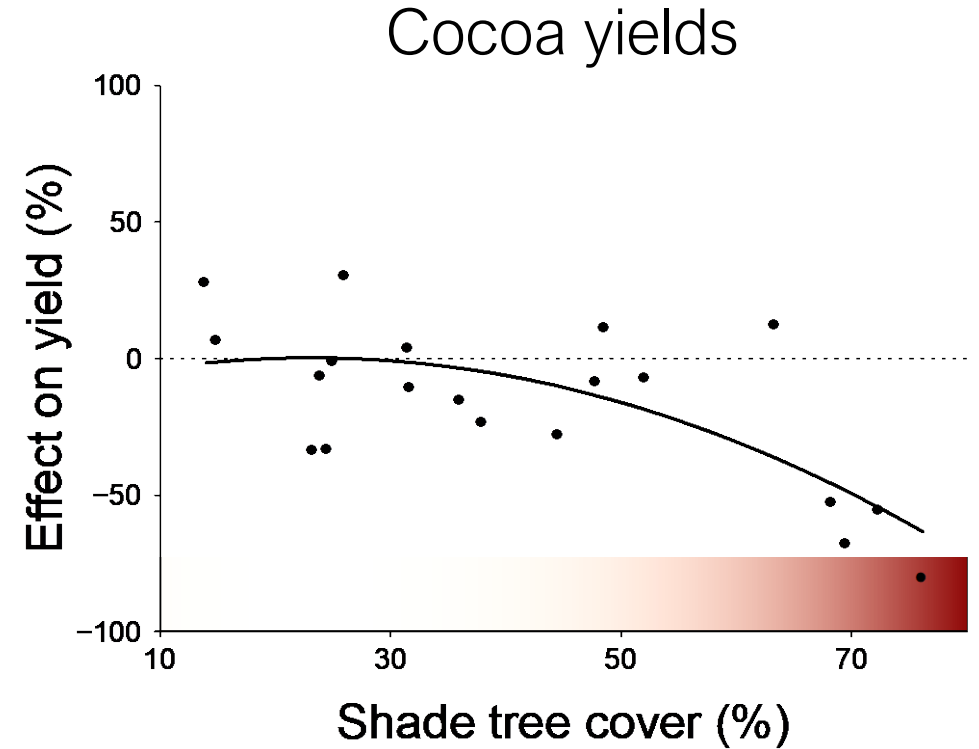
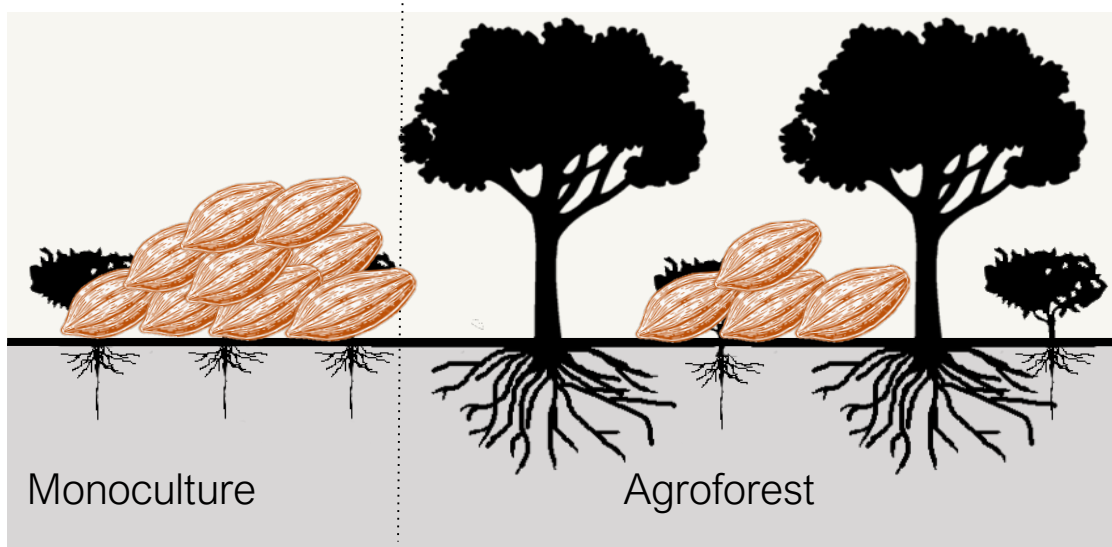
Large positive effects on aboveground carbon stocks

Biodiversity conservation

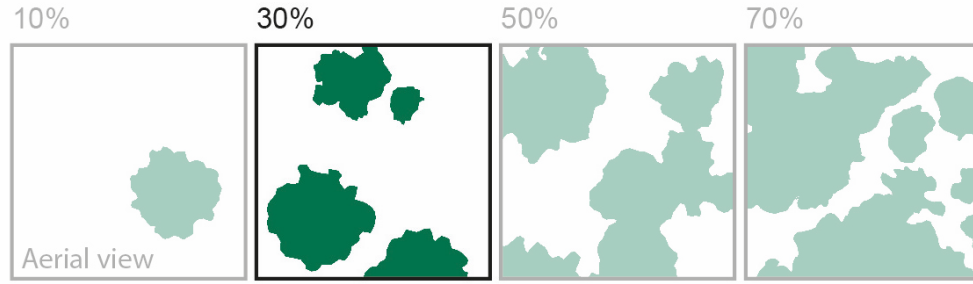
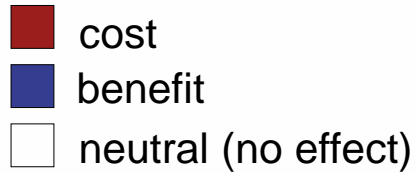


Increased biodiversity with increasing shade tree cover

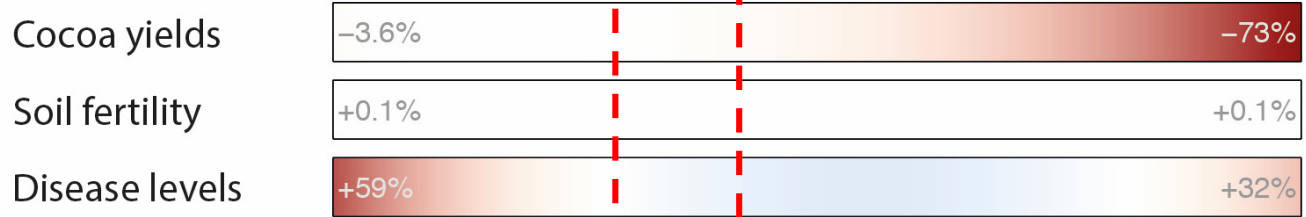
Agricultural production



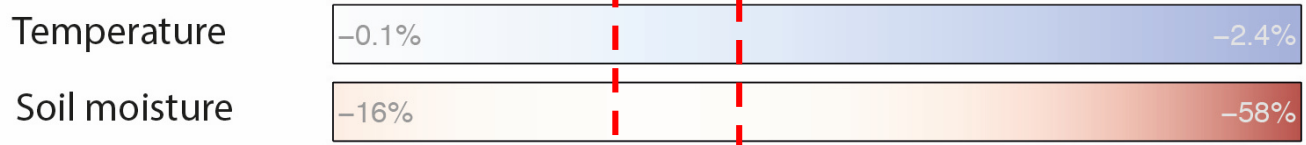
Decreased cocoa yields above a cover of ~ 30 % shade



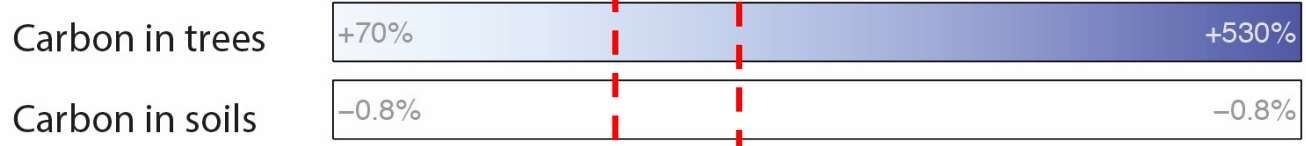
1. Agricultural production



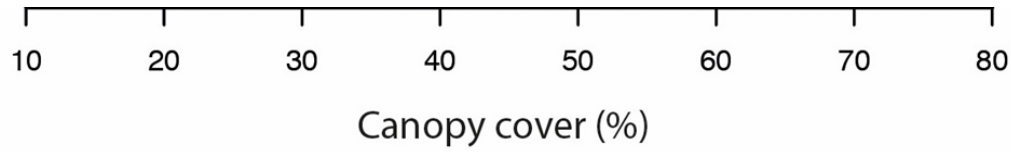
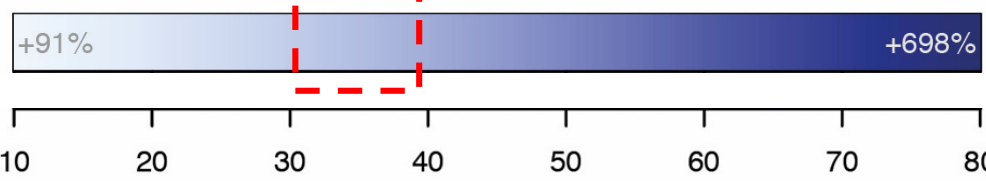
2. Climate adaptation



3. Climate mitigation



4. Biodiversity conservation



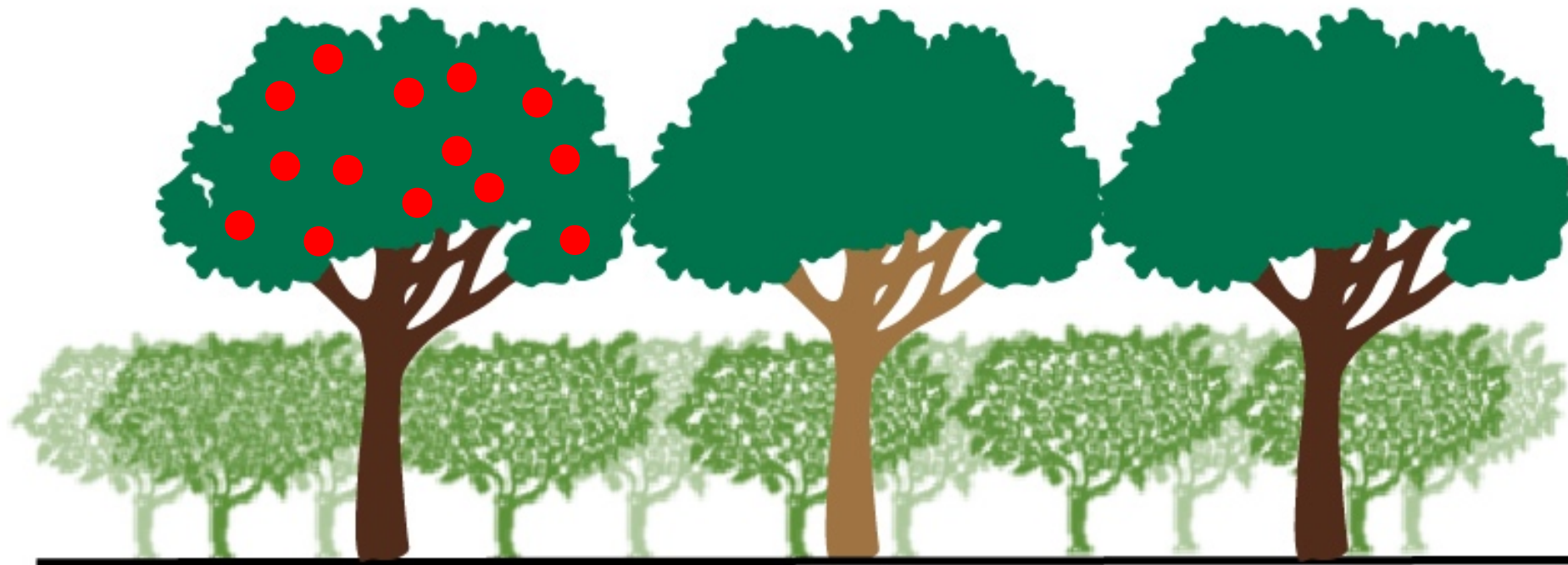
Trade-offs

Further considerations

- Climate
- Farm management
- What is the goal?

Which shade trees should we plant in an agroforest?

Different economic benefits

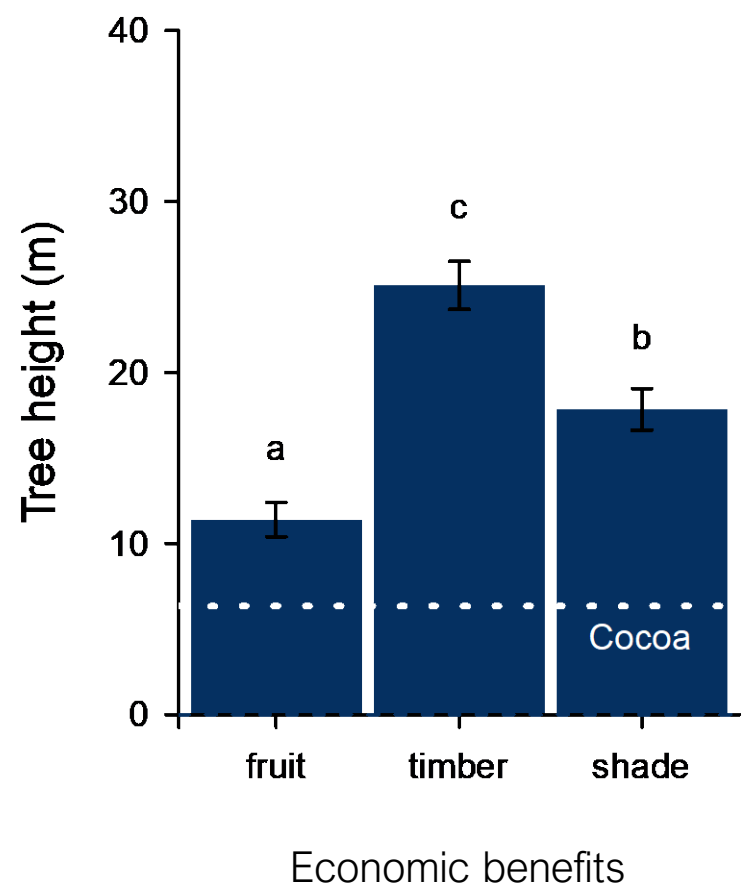


Fruit

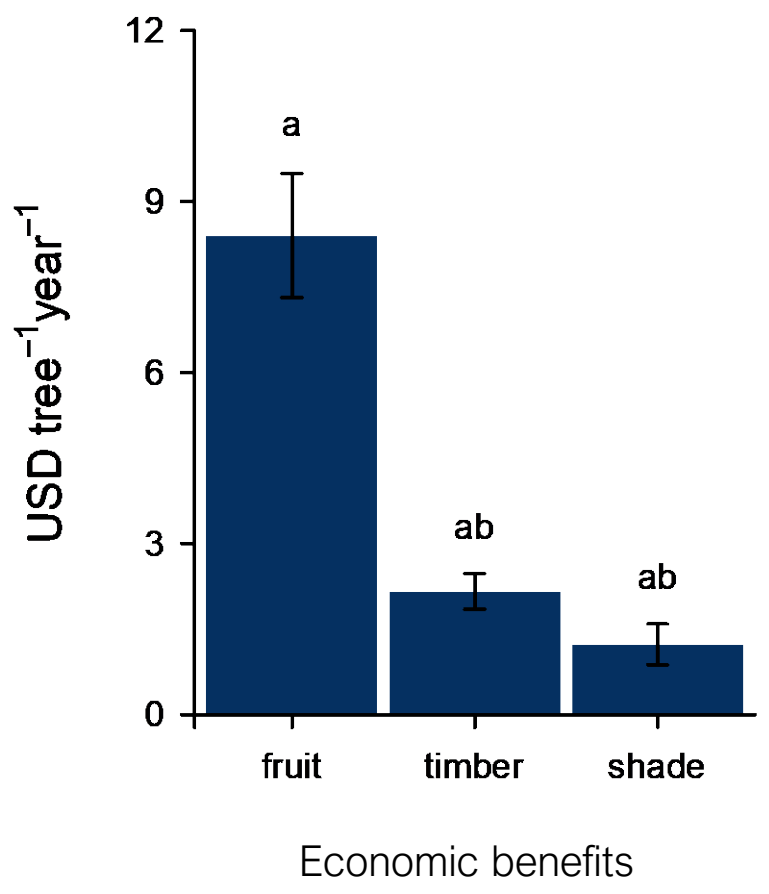
Timber

Shade

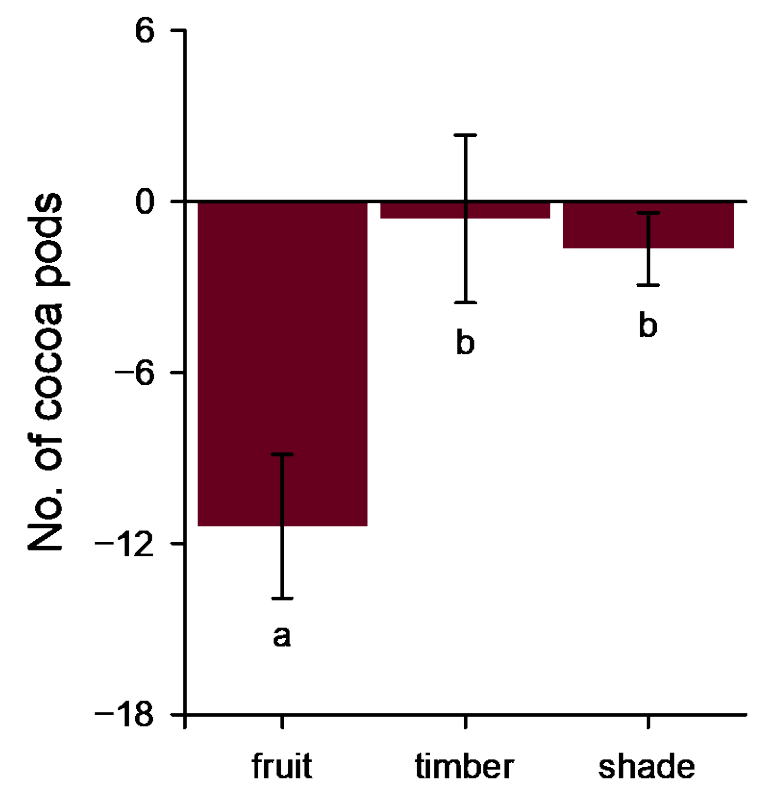
Height & Carbon storage



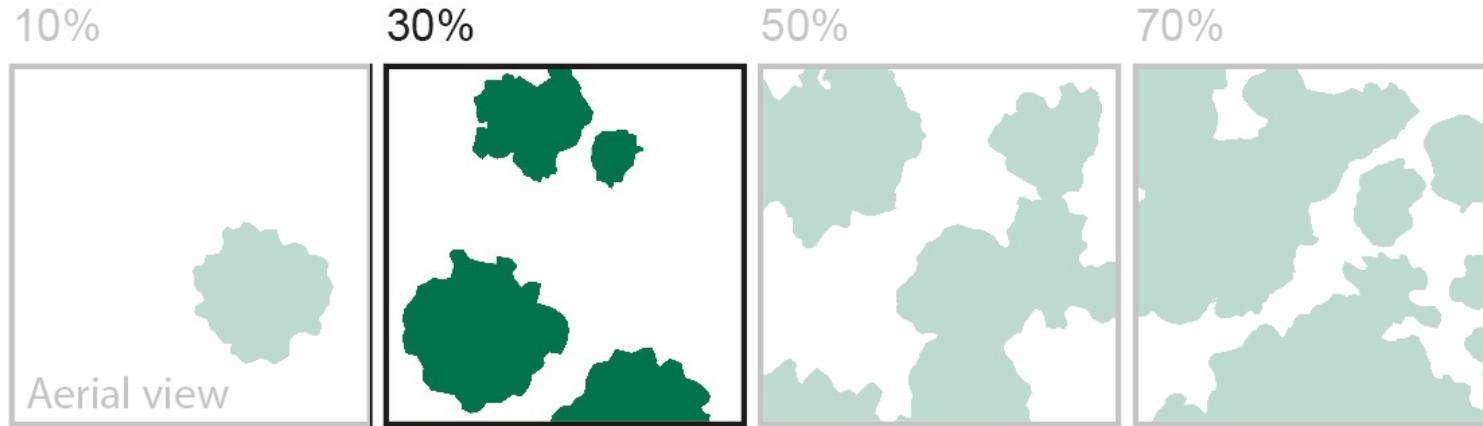
Alternative incomes



Yield losses



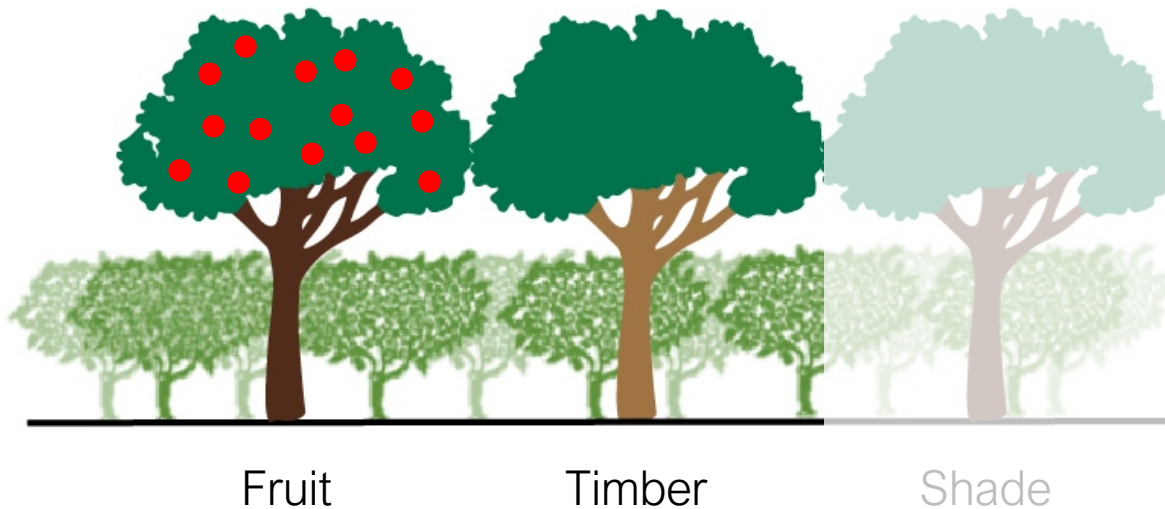
Optimizing shade tree cover



Trade-offs

Shade tree cover around 30 %

Optimizing shade tree species



Plant timber trees with few scattered fruit trees



Acknowledgements

James Oppong

Simon Hart

Kwaku & Daniel Oppong

Jonas Landolt

Dennis Kyereh

Edward & Georgina Yeboah

Johan Six

SARECO
Swiss-African Research Cooperation

ETH zürich



Thank you!