

BACKGROUND

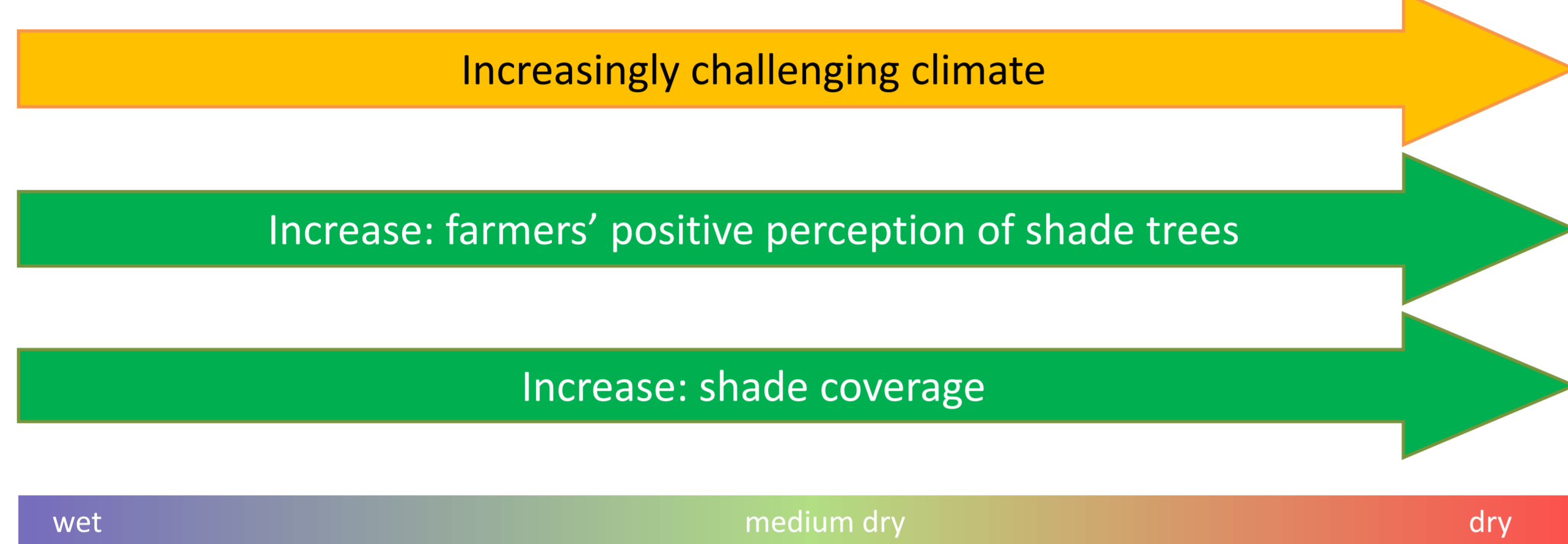
Agroforestry as adaptation to challenging climate?

- Ivory Coast biggest cocoa producing country with 33% of world production
- Production threatened by climate e.g. low rainfall and high temperatures

Cocoa agroforestry seen as adaptation measure to challenging climate

- Study aim: role of agroforestry in farmers' adaptation to challenging climate
- **Hypothesis:** Farmers use shade trees to adapt to production in dry climate

Hypothesis



MATERIALS & METHODS

Farmer interviews

Quantitative interviews

- General farm information (farmer information, yield, plantation age and history)
- Management practices, production constraints
- Perception shade trees & climatic challenges

Plantation structure

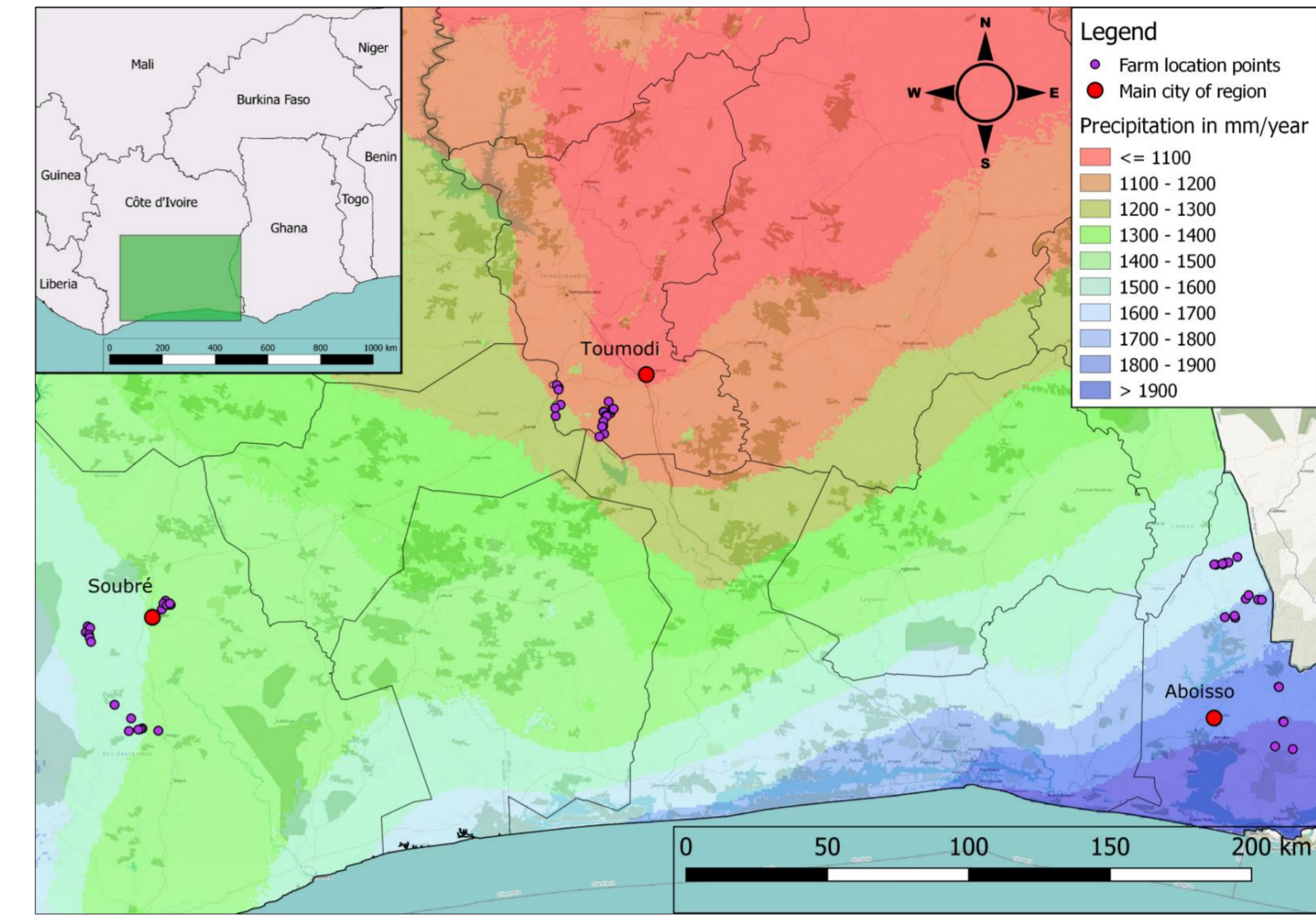
- Plantation size (GPS measuring)

Cocoa specifications

- ✓ Cocoa tree planting density,
- ✓ Cocoa tree diameter (D30)
- 3 x sample plots 10 x 10m

Associated tree specifications

- ✓ Species, height, stem diameter (DBH)
- ✓ Crown size
- 1 x plot 20 x 50m



Three sites and individual sites along rainfall gradient in 100mm steps

RESULTS

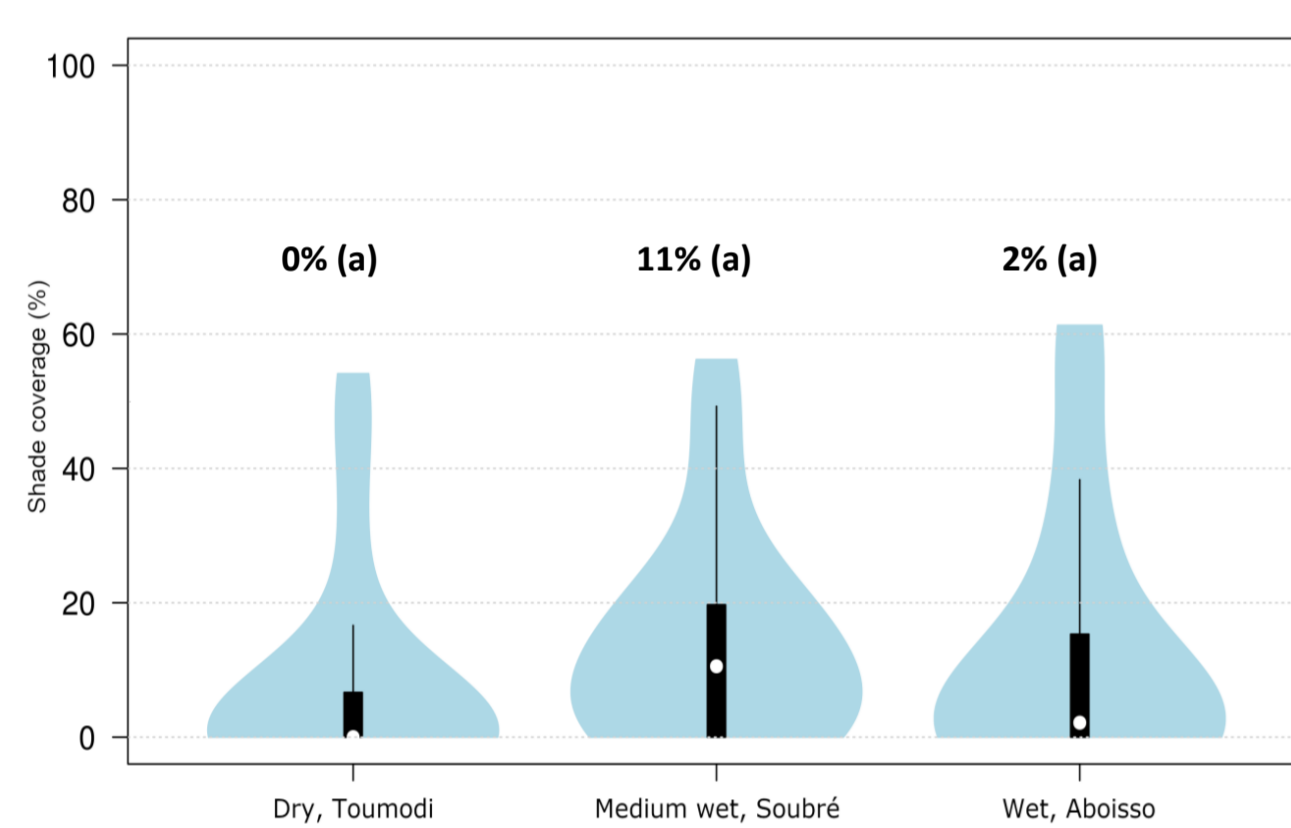
Shade coverage

Overall very low shade coverage

- Below 30% considered low

In dry region further trend towards extremely low shade coverage

- Contrary to expectation



Shade coverage, white circles show the medians. Small letters indicate significant differences between median values. (for total sample, n = 60; and per region, n = 20)

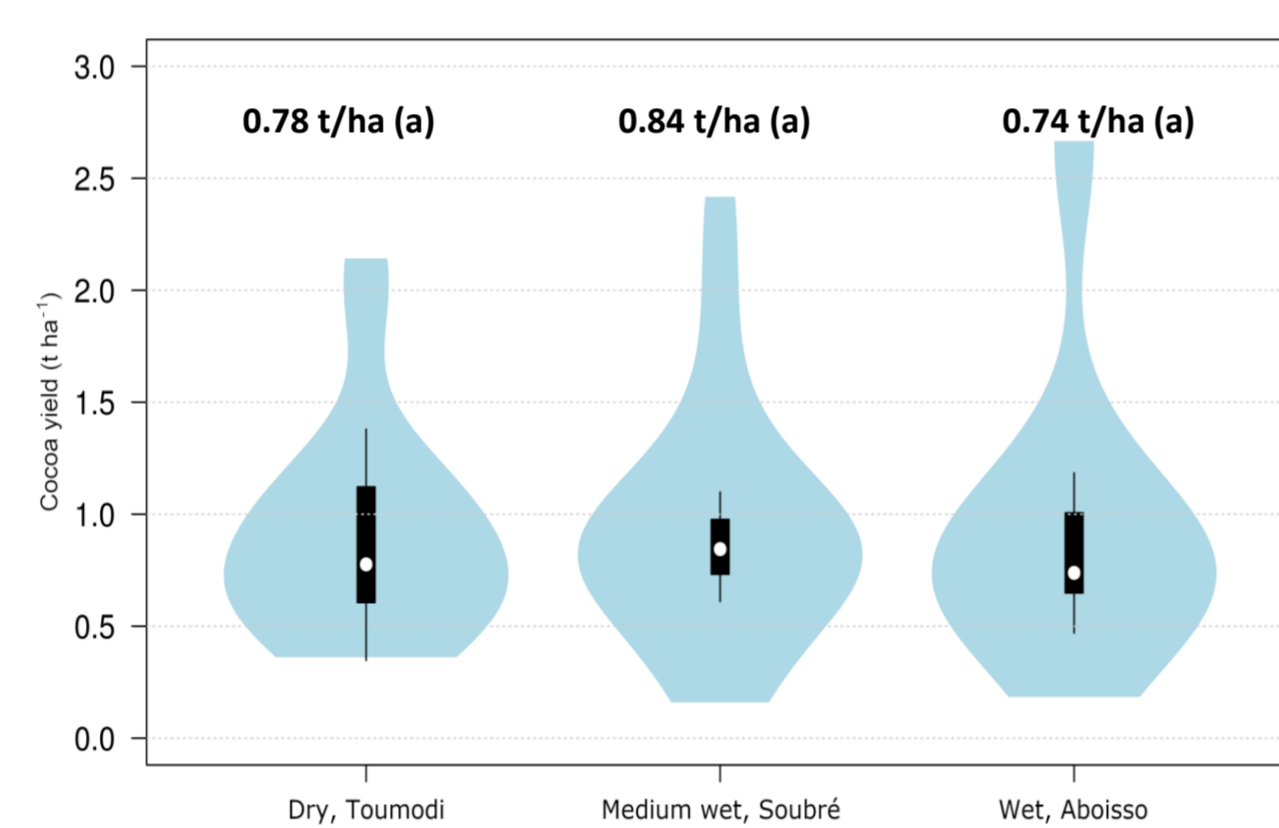
Cocoa yield

Not differing across the regions

- Despite low overall shading and precipitation differences

Production area (median)

- Dry 1.5 (a), medium wet 3.7 (b), wet 1.4 (a)



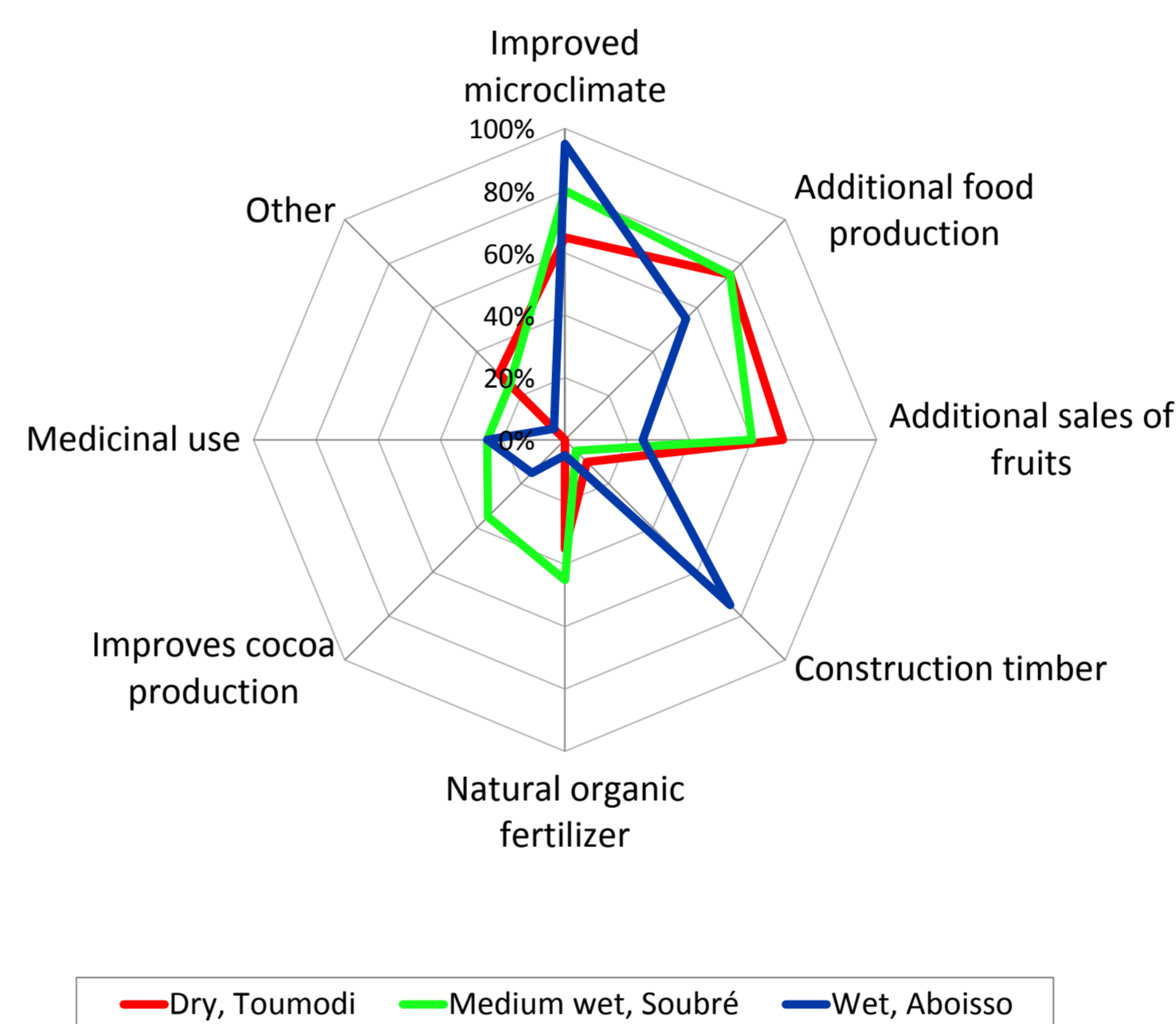
Cocoa yield, white circles show the medians. Small letters indicate significant differences between median values. (for total sample, n = 60; and per region, n = 20)

Farmers' perception of shade trees

Advantages

Improved microclimate:

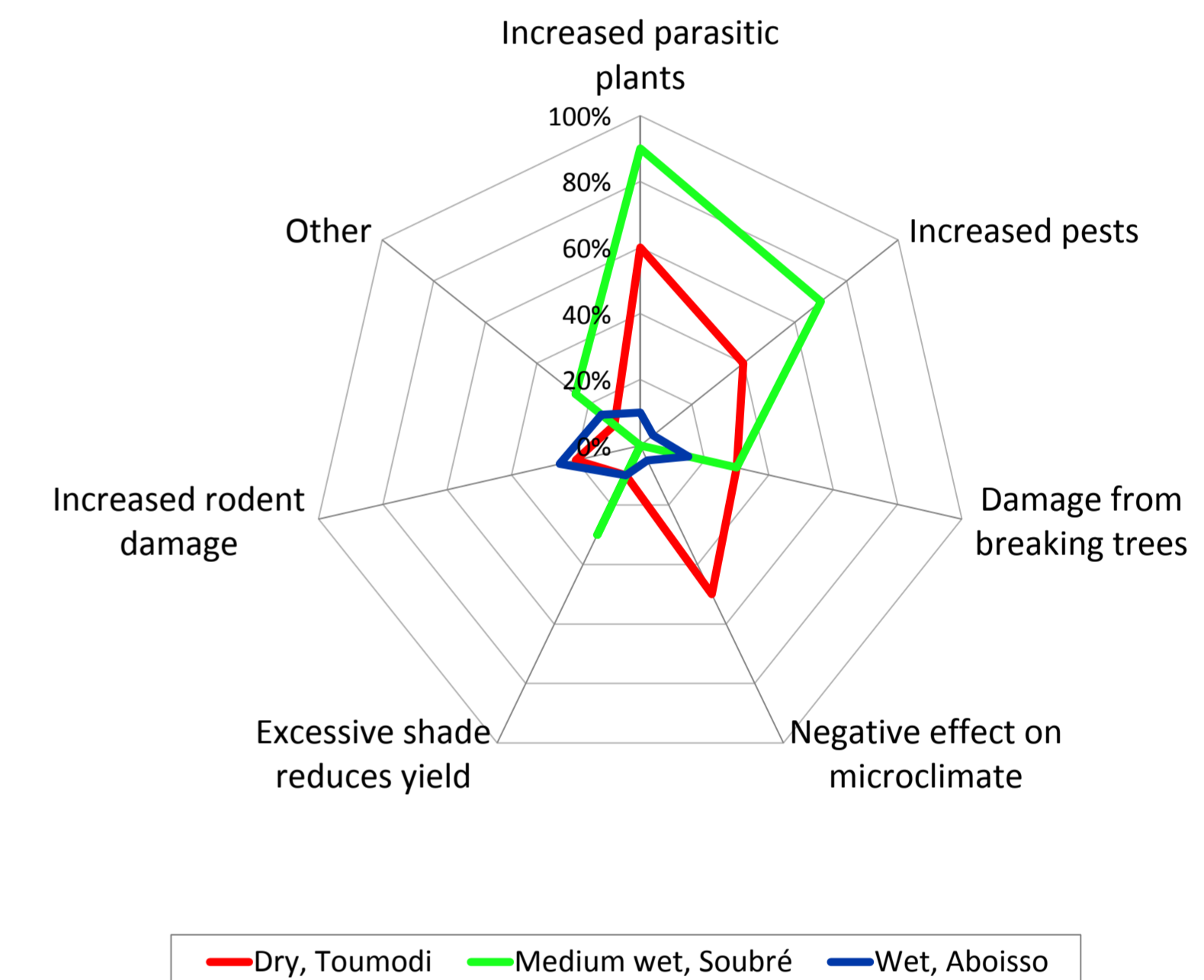
- More frequently mentioned with increased precipitation



Disadvantages

Negative effect on microclimate:

- Frequently mentioned by farmers in dry region



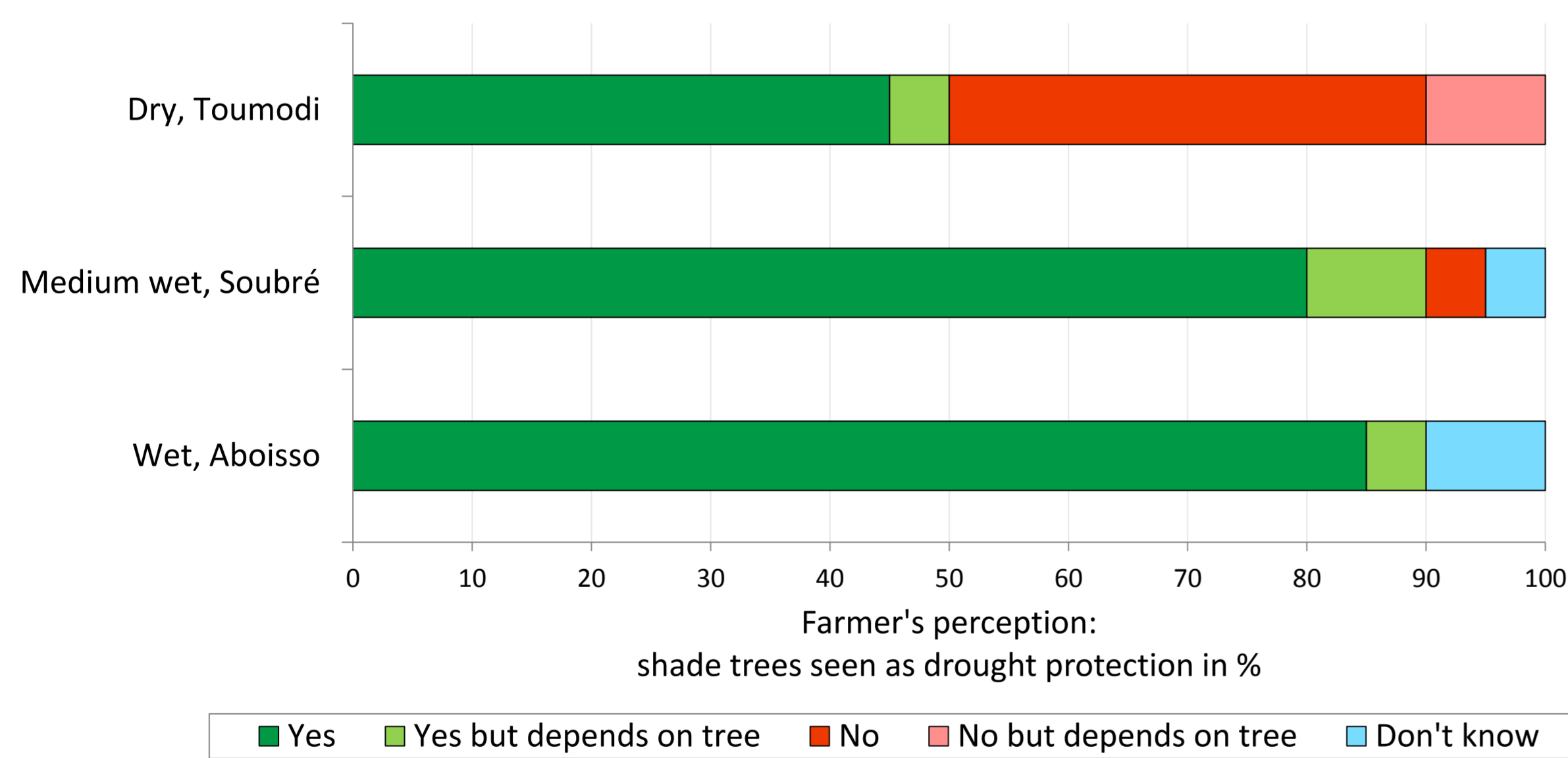
Farmers perception: Do shade trees protect your cocoa against drought?

Dry region:

- Increased skeptical perception to drought buffering effect of shade trees

Wet and medium wet regions:

- Mostly positive perception



CONCLUSIONS

Expected as hypothesized:

- Increase of shade coverage towards dry regions
✗ Trending towards the inverse
- Farmers perceive shade trees as beneficial regarding challenging climate
✗ In climatically challenged region, rather negative perception

➤ Ivorian cocoa farmers do not adapt to climate change via agroforestry

Reasons:

- Historic: precedent official recommendation to eradicate shade trees
- Legal: Logging practices, Land ownership, property rights
- Climatic: in dry region water competition effect of shade trees

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ACKNOWLEDGEMENTS

The author thanks DITSL for the financial support, ICRAF for the collaboration, ANADER for their support, and all farmers for their warm welcome.



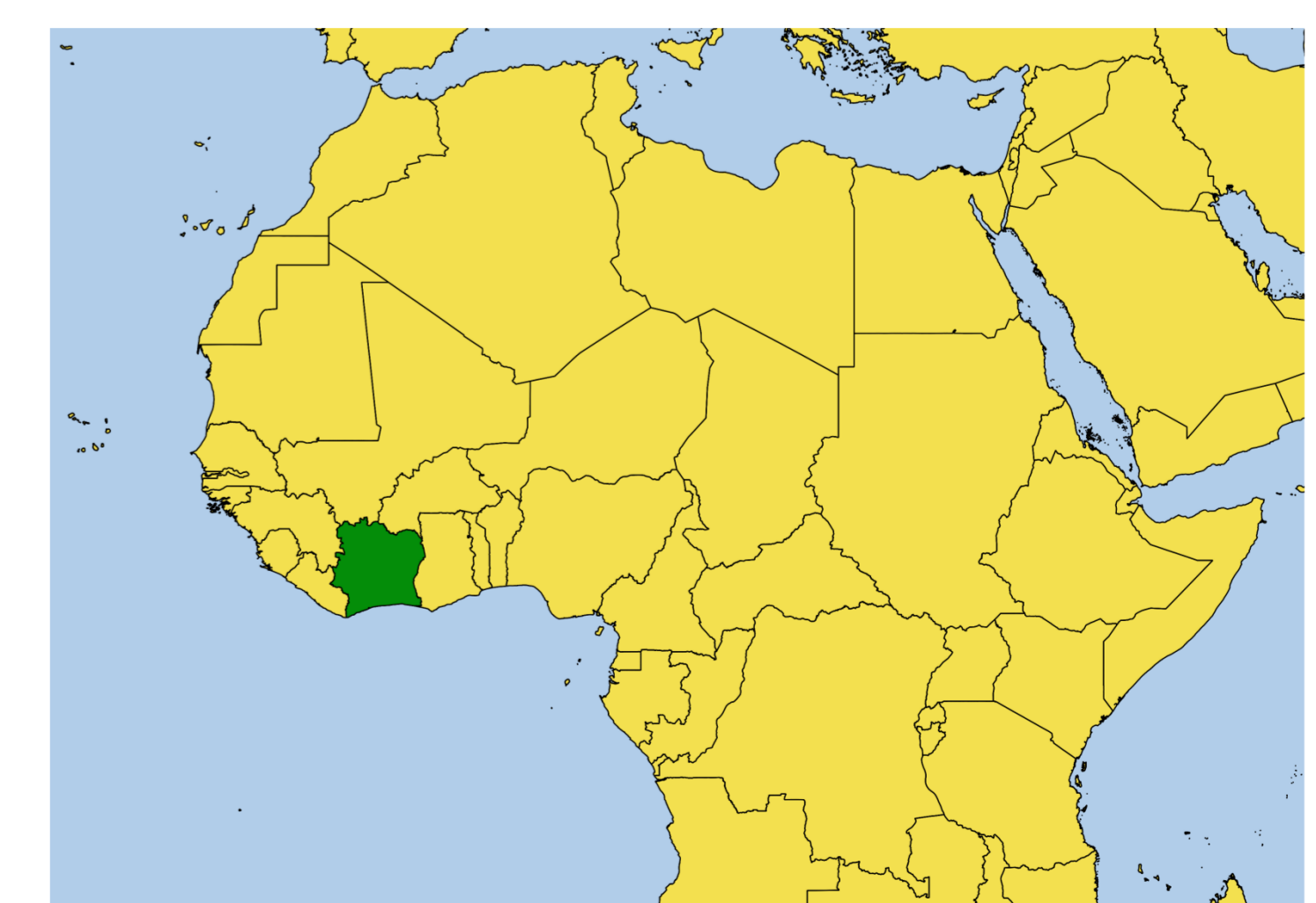
On the way to the plantation



Cocoa pods on tree



Discussion with farmer



Location overview