Ecological and social services of cocoa agroforestry systems to improve the livelihoods of farmers and sustainable cocoa production in Côte d'Ivoire

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Introduction

- New production models based on agro-ecological rules: production systems such as cocoa-based agroforestry.
- Thinking about resilience provides an approach that integrates ecological and social aspects.
- Agronomic aspects: Diversity of the agricultural system, secondary products using on system.
- Social aspects: Local knowledge of the diversified system. A key aspect of sustainable production is the co-creation of knowledge and innovation between farmers and scientists.

Research Questions

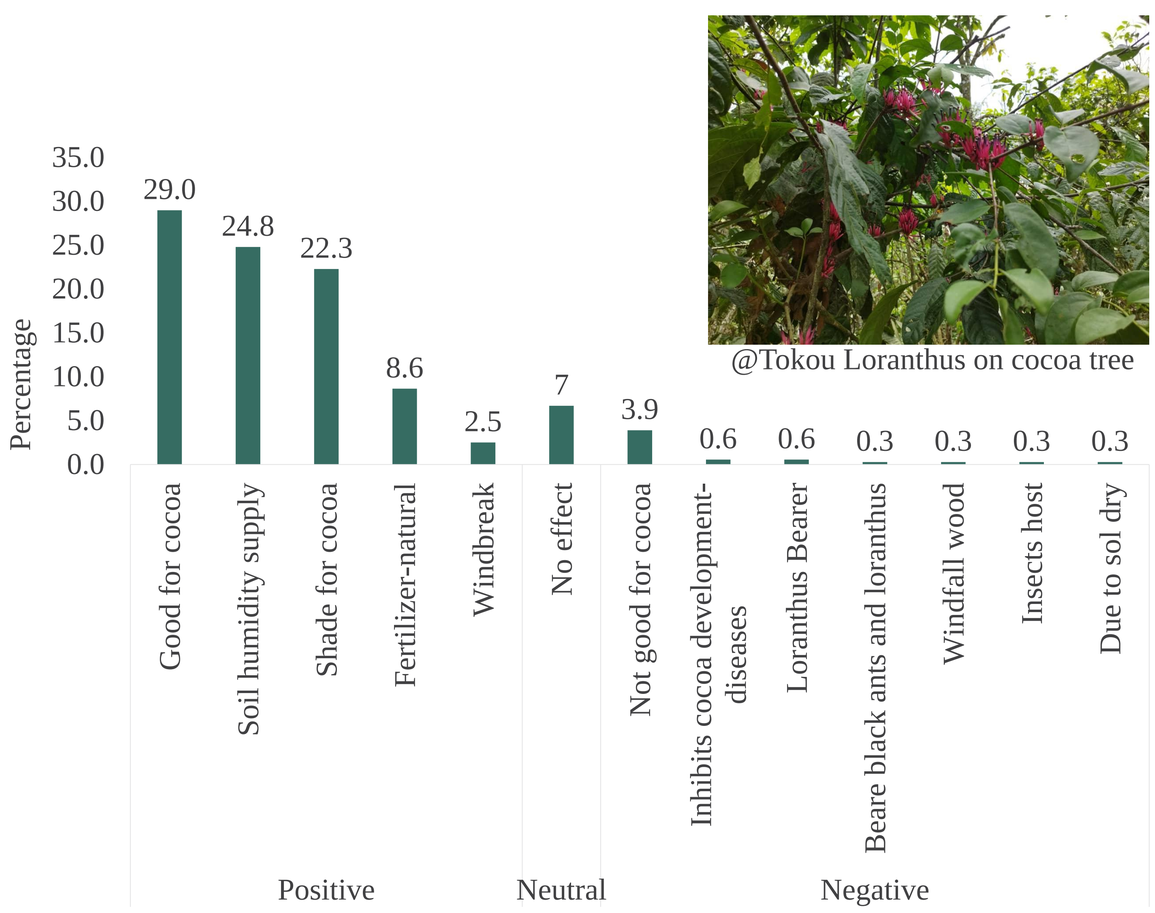
- How do different ecological conditions (tree diversity, impacts on cocoa, trees diseases) of agroforestry impact on cocoa systems?
- How do different tree species contribute to the farmers' household resilience regarding their potential to give the ecological and social services?

Results

Concerning biomass storage, the systems from Divo, Agboville, and Abengourou store more biomass, which contributes to soil fertilization and climate regulation (Table 1).

Table 1: Biomaas storage by system

Region N=80	Species richness	Above-Ground Biomass in Kg
Divo	54	158.21
Agboville	37	118.32
Abengourou	63	114.99
Aboisso	47	60.37
Yamoussoukro	63	50.815



@Tokou Loranthus on cocoa tree

Figure 2: Ecological impact on cocoa system

- While 7% of the farmers perceive no effect of introducing trees in their cocoa plantations, the majority perceives positive impacts (Figure 2)

Research Design

- Research is conducted in 5 regions of Côte d'Ivoire (map) in August 2022 and April 2023
- Data collection methods include:
  - Semi structured interviews (80)
  - Field inventories (80)
- Data analysis methods include:
  - Descriptive data analysis
  - Biomass

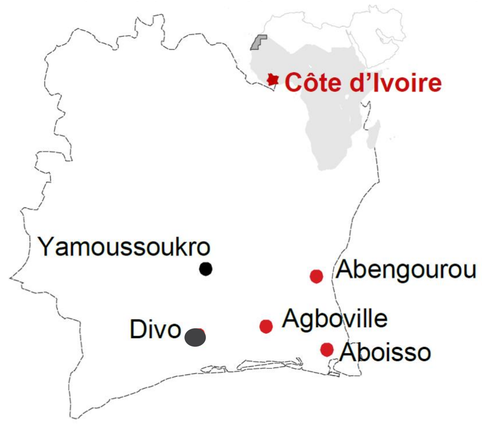


Figure1: Regions PRO-PLANTEURS I+II (© GIZ)

- Cocoa farmers conserve and plant the trees to improve cocoa production and also for their domestic use.
- As for fruit trees, they are more tree from conserved during the plots creation and also planted after cocoa has been planted (Table 1).

Table 2: Category of tree in cocoa system

Type of tree N=63	Shade tree %	Fruits tree %
Conserved and introduced	25.7	66.6
Introduced	61.6	0.0
Conserved	12.8	25.9

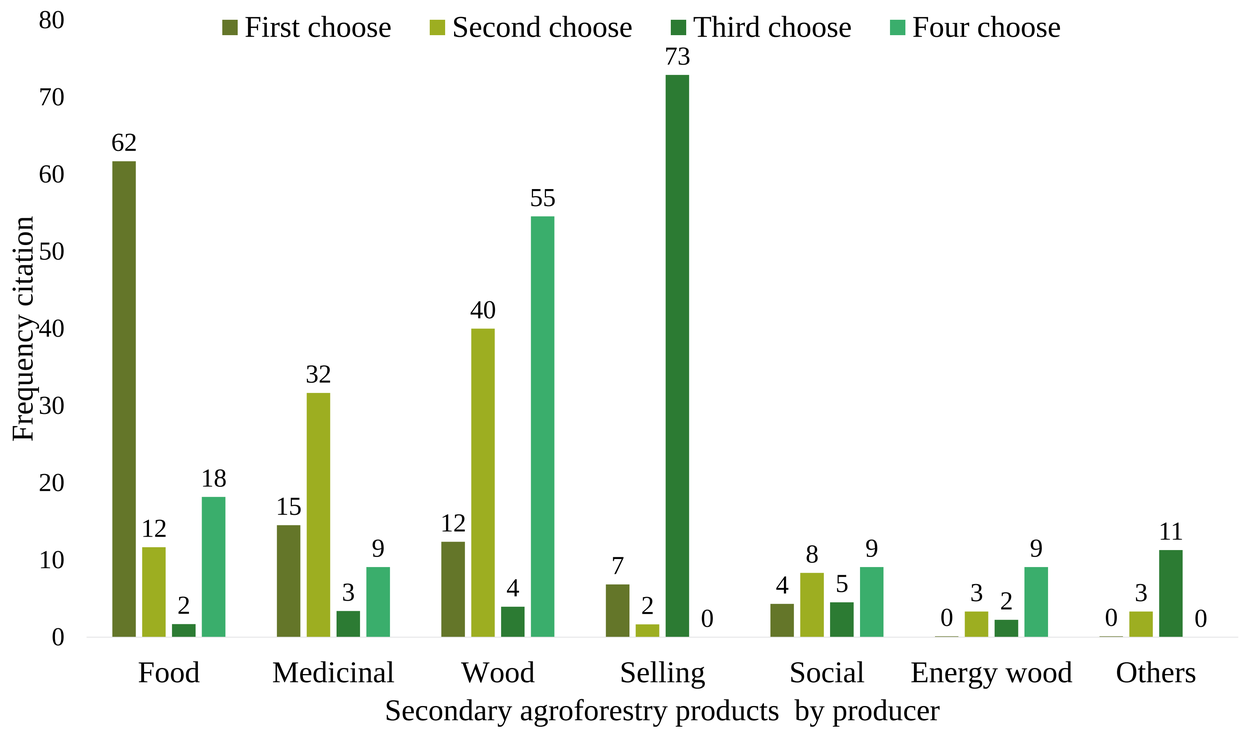


Figure 3: Agroforestry products use

- Food is the first choice for secondary products from agroforestry systems, followed by medicinal use.
- That shows the role of agroforestry products in household resilience (Figure3).

Conclusion

✓ High diversity of species associated in cocoa system
✓ Secondary products used according to household need and demand.
✓ Practices implemented by the farmer contribute to the management of cocoa and household resilience.

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