

# 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

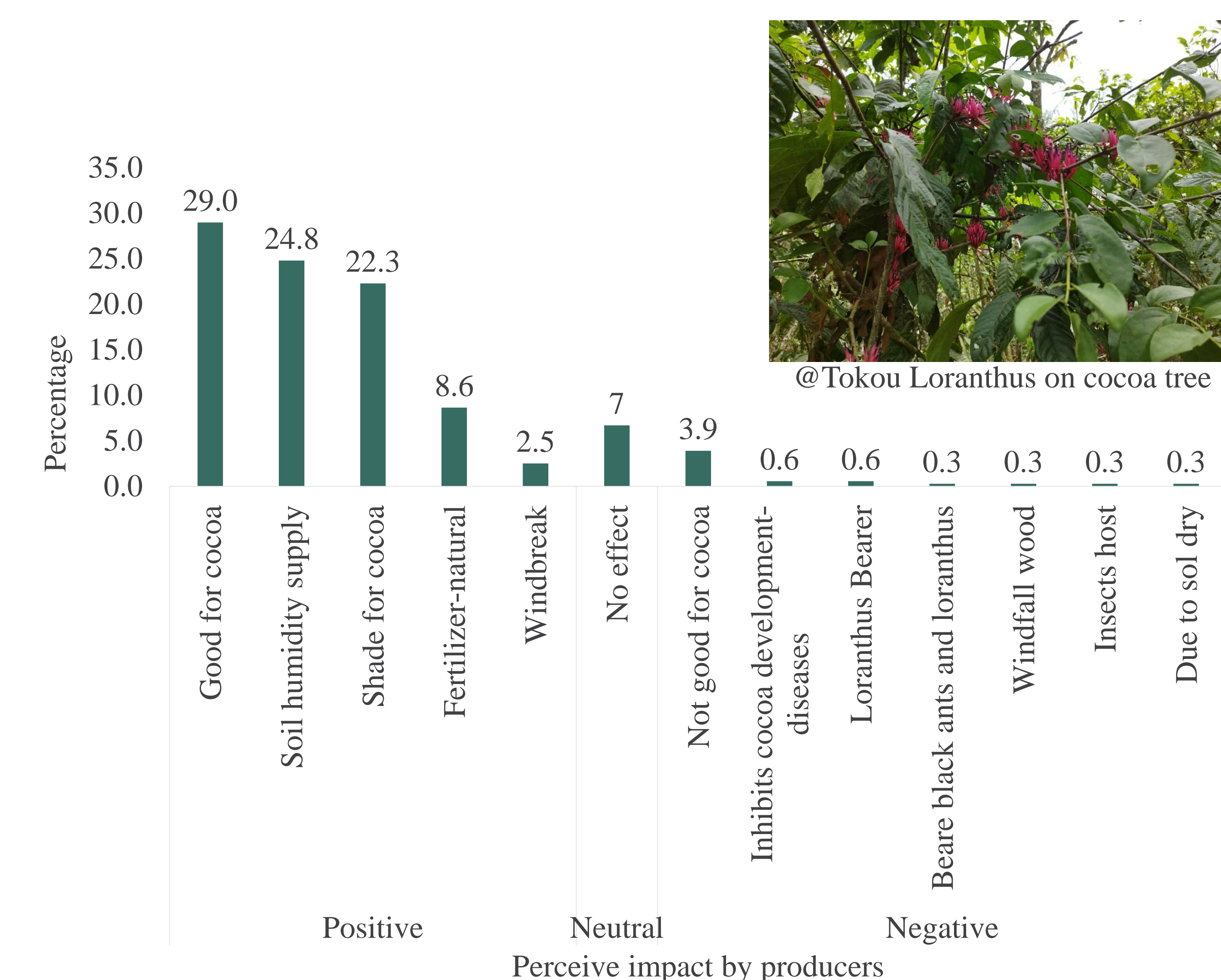
- How do different ecological conditions (tree diversity, impacts on cocoa, trees diseases) of agroforestry impact on cocoa systems?
- How do different tree species contribute to the farmers' household resilience regarding their potential to give the ecological and social services?

## 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: Biomass 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

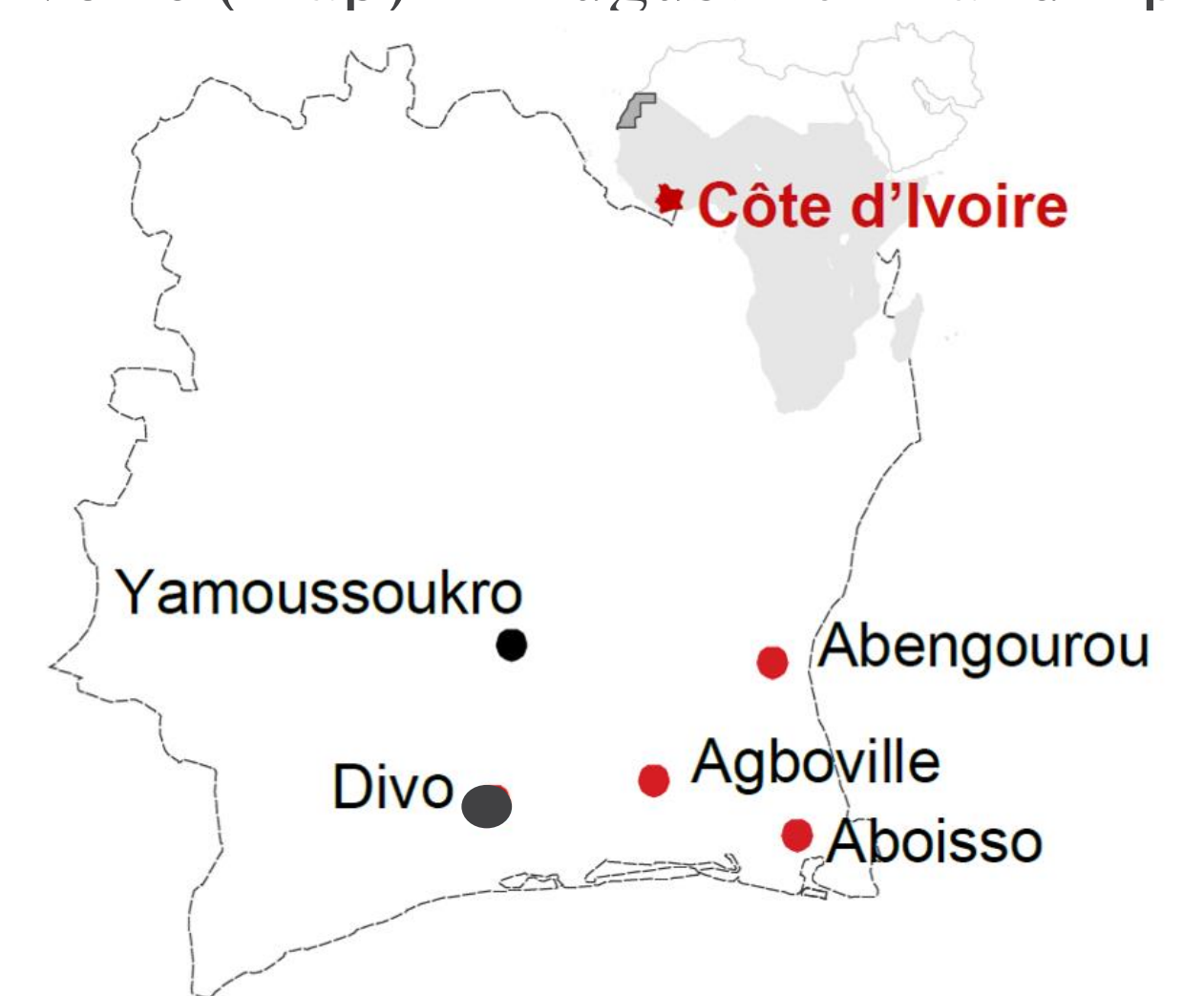


**Figure 2: Ecological impact on cocoa system**

- 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

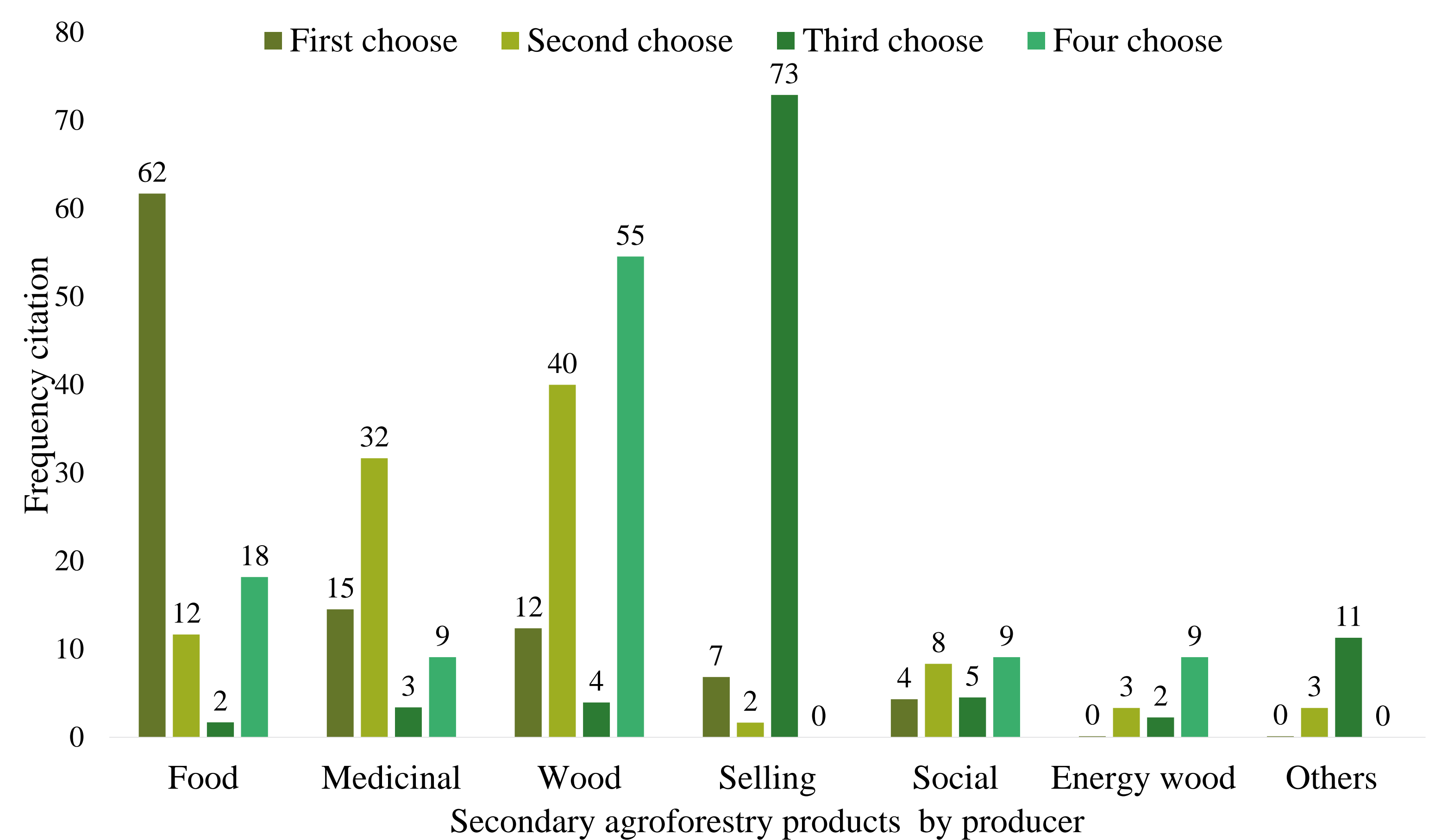


**Figure 1: Regions PRO-PLANTEURS I+II (© GIZ)**

- 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.