

<https://doi.org/10.48047/AFJBS.8.1.2026.142-161>

African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>

Research Paper

Open Access

Mapping and typology of actors in the timber value chain in the Faranah region (Guinea): agroeconomic analysis and implications for household well-being

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Volume 8, Issue 1, Jan 2026

Received: 15 Nov 2025

Accepted: 22 Dec 2025

Published: 28 Jan 2026

[doi:10.48047/AFJBS.8.1.2026.142-161](https://doi.org/10.48047/AFJBS.8.1.2026.142-161)

ABSTRAT

This study analyzes the mapping and typology of actors in the timber value chain in the Faranah region, within a context marked by increasing deforestation, strong household dependence on forest resources, and still fragile governance. Employing a mixed-methods approach combining quantitative surveys, participant observation, semi-structured interviews, and document analysis, it highlights the socio-economic structure of the sector, the methods of tree acquisition, value creation mechanisms, and disparities between localities. The results show that the sector relies primarily on an informal economy dominated by a poorly educated workforce (nearly 60% illiterate), which limits formalization and the adoption of sustainable management practices. The Faranah prefecture emerges as the nerve center of the chain, concentrating the largest number of actors and profit margins. Access to trees is largely based on taxes and royalties (99% of cases), revealing a dominant but largely redistributive tax system. Furthermore, high-value woods (mahogany, African rosewood) generate the highest incomes, while production yields remain low (3 to 4 planks per tree), indicative of artisanal methods and significant wood loss. The analysis also highlights strong spatial heterogeneity: Faranah occupies the high-end market segment; Dabola specializes in high-priced but limited product diversification; Dinguiraye combines low and high-end products; while Kissidougou is situated in a highly standardized, mid-range segment. Overall, the value chain is dominated by informal practices and local arrangements, which limits transparency, fair profitability, and environmental sustainability. The study further details the artisanal nature of the sector, largely based on the use of chainsaws and, to a lesser extent, portable sawmills. Data collected through individual surveys and focus groups, and analyzed using Excel and IBM SPSS, show that the resource is obtained either from customary landowners, via logging permits, or through unauthorized logging. The highest active margins are recorded in Faranah (147) and Dinguiraye (91), reflecting more intense commercial activity in these areas. Access methods are dominated by royalties (84%), followed by free access (15%) and direct purchase (1%). The yield of timber remains concentrated at around 3 to 4 timbers per tree. The most profitable trees are those purchased for 500,000 GNF and resold for between 2,500,000 and 2,600,000 GNF. Finally, the sector faces several major constraints: police harassment, recurring machine breakdowns, market volatility, persistent informality, and weak organizational structure. Formalizing the activity requires strengthening the capacities of operators, establishing a framework for consultation between communities, technical services and private actors, reducing informal taxation and taking into account local practices to transform the timber industry into a real lever for sustainable development in the Faranah region. **Keywords:** Forest operators, processors, consumers, value chain

GENERAL INTRODUCTION

The development of human activities inevitably brings with it major environmental impacts. Given the planet's limited capacity to absorb these pressures, it is crucial to regulate economic dynamics in order to mitigate their negative effects [1]. Current challenges such as climate change, global population growth, the intensification of human pressures, and the degradation of natural resources are now priority challenges for humanity [2]. In this context, general equilibrium models have progressively integrated technological innovation as a lever for improving the efficiency of economic sectors [3], reflecting the need for more sustainable and resilient development.

Alongside these environmental challenges, developing countries have faced profound economic crises since the 1980s, leading to major structural adjustments. These reforms have fostered a significant expansion of the informal economy, which has become an essential pillar of household survival strategies. Characterized by small-scale activities, strong social embeddedness, and a lack of institutional formalization, the informal economy now plays a central role in the fight against poverty and in access to employment [4].

Guinea, like many African countries, finds itself at the crossroads of these economic and environmental challenges. Population pressure, extensive agricultural practices, the uncontrolled use of inputs, soil erosion, and the decline of forest cover are major factors in the degradation of natural resources [5]. Therefore, integrating environmental considerations into development policies has become an essential requirement.

Within this global context, the timber industry occupies a unique position. Internationally, timber trade is experiencing significant growth, driven by increasing demand for energy and materials [6]. The Republic of Guinea is among the historical players in timber production, both for domestic consumption and exports. However, this sector continues to face numerous challenges: inadequate governance, sometimes uncontrolled harvesting, limited local processing, and limited attractiveness for investment [7]; [8].

Despite its strong potential, Guinea's timber industry struggles to fully play its role in the national economy. The country remains specialized in exporting low value-added raw materials, a situation described as "impoverishing specialization" [8]. The lack of robust industrialization, weak private investment, high production costs, corruption, and a fragile business climate hinder the development of a competitive and sustainable timber sector.

In the Faranah region, these challenges are even more pronounced. The area faces accelerated deforestation, increasing timber harvesting, and a heavy reliance on wood and charcoal for energy. Although the sector is a vital source of income for many households, it remains largely informal and has received little agro-economic research.

This study, focusing on mapping and typology the actors in the timber value chain in the Faranah region, falls within this framework. It addresses several scientific, economic, social, and environmental concerns.

First, the timber value chain is an economic pillar for many families, but the roles, strategies, and interactions of the actors remain insufficiently documented. A structured analysis is needed to understand the real contribution of this sector to household income, employment, and local economic security.

Secondly, the region suffers from a lack of reliable data on flows, supply chains, pricing mechanisms, and extraction practices. Mapping the actors thus helps to clarify these elements and provide a holistic view of the sector.

Third, governance issues are crucial. The balance of power between forestry services, local communities, and formal and informal operators strongly influences revenue distribution and access to resources. The study helps identify who actually creates and captures added value.

Fourth, income from timber plays an important role in household well-being, but its effects on education, health, nutrition, savings, and investment remain understudied. This research addresses this gap by assessing the socioeconomic impact of the timber industry.

Fifth, human pressure on timber resources requires informed decision-making. Understanding harvesting practices and market dynamics allows us to anticipate environmental risks and guide sustainable management policies.

Sixth, the study provides factual data to support communities, technical services and development partners in regulating the sector and implementing appropriate energy or forestry strategies.

Finally, it aligns with the Sustainable Development Goals [9], particularly those related to poverty reduction, sustainable management of natural resources, energy transition, and combating climate change. Its aim is to inform policy decisions, strengthen household resilience, and contribute to the sustainable and equitable management of forest resources.

In light of all these issues, one central question guides this research:

To what extent does the structure and functioning of the timber value chain in the Faranah region (Guinea) through the diversity of actors, their roles, governance relationships and income distribution influence the economic well-being of rural households?

II- MATERIALS AND METHODS

2-1 Materials:

Presentation of the Faranah administrative region

1. Geographical location and administrative organization

The Faranah administrative region is located in the center of the Republic of Guinea, at the junction of three major ecological zones: Middle Guinea, Upper Guinea, and Forest Guinea. It extends between 8°50' and 12° North latitude. And 9°15' and 11°29' West longitude.

With an area ranging from 35,500 to 42,000 km² , it encompasses four prefectures (Faranah, Dabola, Dinguiraye, and Kissidougou), subdivided into 42 communes (4 urban and 38 rural), totaling 61 neighborhoods And 364 districts .

According to the 2014 General Population and Housing Census, the region had 942,733 inhabitants, 51.9% of whom were women, with an average population density of approximately 24 inhabitants/km². The population is predominantly rural and lives in scattered settlements.

2. Physical environment, relief and hydrography

Faranah occupies a transition zone between the Fouta Djallon massifs to the west and the Upper Guinea plateau to the east. The average altitude is around 450 m , with some notable landforms such as the Daro Mountains (Southeast) and the Fitaba Mountains (Northeast), as well as the Sankaran plateaus. and Oulada.

The region has a dense and strategic hydrographic network. It is home to several headwaters of basin of the Niger River and its tributaries (Tinkisso , Mafou , Niandan , Bafing, Banié), generating many fertile plains suitable for agriculture and agroforestry.

3. Climate and soil characteristics

The climate is essentially Sudano-Guinean , alternating: A rainy season from May to October, A dry season from November to April.

Due to its intermediate geographical location, Faranah is influenced by three climatic regimes:

1. Tropical mountain (Foutani) ;
2. Tropical sub-Sudanian;
3. Subequatorial in the South.

Annual rainfall ranges between 1,200 and 1,700 mm (up to 2,500 mm in the South), while average temperatures vary between 27 and 30°C , with humidity between 69% and 85% .

The soils are mainly ferralitic on the plateaus and hillsides, and feralitic Hydromorphic in the plains. They have strong agricultural potential but are susceptible to water erosion and degradation linked to extensive practices.

4. Vegetation and natural resources

The region features a mosaic of plant formations:

- Wooded and shrubby savannas ,
- Open forests ,
- Forest galleries ,
- Remnants of dense, humid or dry forests .

However, human pressure (deforestation, bushfires, charcoal production, logging) is leading to the expansion of savannah and a gradual reduction of natural forests. Forest cover, still estimated at 2.8 million hectares in 2020 , is in sharp decline.

5. Socioeconomic characteristics and livelihoods

The Faranah region has a predominantly rural economy, based on informal activities heavily dependent on natural resources. Households there utilize a variety of livelihoods, centered around agriculture, livestock farming, fishing, trade, and forestry.

a) Agriculture

Agriculture is the main activity and is practiced through two types of fields:

- Fields of family ownership , collectively mobilized by households;
- Individually owned fields , managed by a member of the household.

These areas, located in plains, lowlands, and slopes, are dominated by food crops such as rice, cassava, peanuts, fonio, maize, beans, and various market garden crops. Agriculture is primarily rain-fed, which increases the vulnerability of households to climate variations.

b) Livestock farming

Livestock farming is the second largest source of income after agriculture. It is primarily extensive, based on nomadic or semi-nomadic practices involving frequent movement of livestock in search of pasture. The region is experiencing a significant increase in livestock numbers thanks to relatively favorable environmental conditions (vegetation cover, climate). The most common species include cattle, sheep, goats, and poultry.

c) Fishing

Artisanal fishing is practiced along the Niger River, the Frikoba River, and several tributaries. It involves traditional fishing groups and women, particularly during the dry season, using adapted local techniques. The fishing potential remains significant but underexploited.

d) Informal trade and activities

The commercial system remains underdeveloped and dominated by the sale of: agricultural products, animals and livestock products, plant resources, imported goods.

Small-scale trade, artisanal transport and various informal activities complement household economic strategies.

e) Exploitation of forest resources

Forest resources are an essential pillar of livelihoods. They provide: fuelwood (the main domestic fuel), charcoal, timber, and non-timber forest products (NTFPs).

Severe monetary and multidimensional poverty exacerbates households' dependence on these resources, both for consumption and income generation. Timber also meets the growing needs of local construction and carpentry.

6. Forest resources and the importance of the timber industry

The timber industry occupies a strategic place in the regional economy:

- Firewood and coal dominate the energy mix of households;
- Timber supplies various craft and commercial activities ;
- Significant interregional flows supply Faranah, Kissidougou, Mamou, Conakry and other localities.

The value chain relies on a wide variety of actors (loggers, charcoal producers, transporters, wholesalers, retailers, households), but remains largely informal . Governance mechanisms are weak, rules are rarely enforced, and the distribution of added value remains unequal.

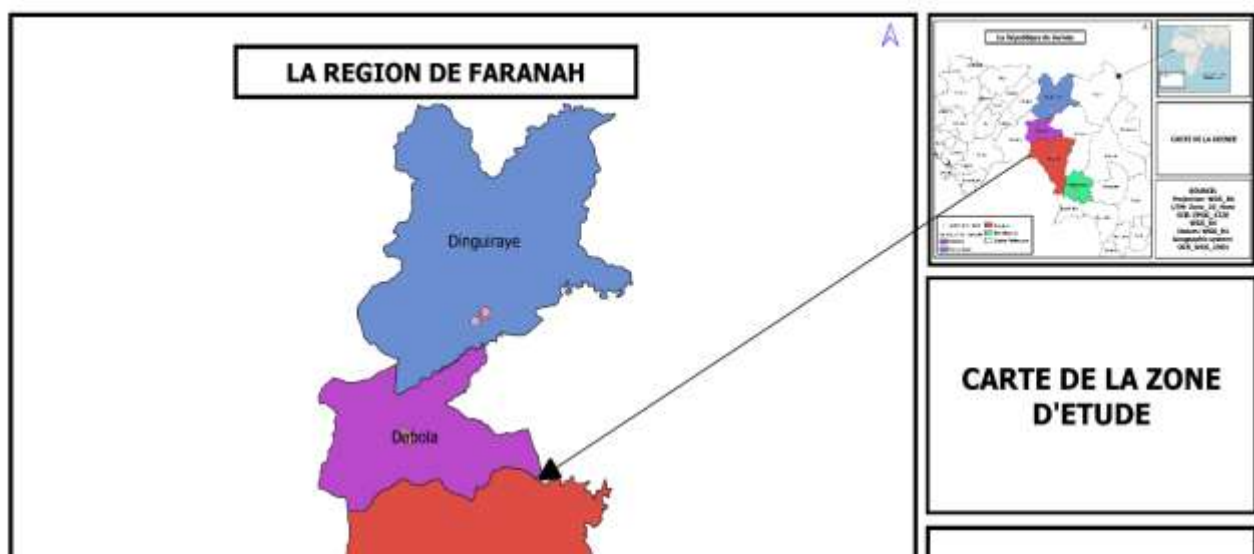
7. Relevance of the region for the study of the timber value chain

Several factors make Faranah particularly relevant for a timber value chain analysis:

- A strong dependence of households on wood energy and timber;
- The existence of a significant declining forest resource , requiring sustainability approaches;
- A local economy structured around informal actors , difficult to understand without in-depth study;
- Governance issues related to exploitation, forest control and the management of trade flows;
- Significant economic implications for household income, resilience and well-being.

In this context, the present research aims to map the actors , establish a functional typology , analyze the governance mechanisms and assess the agro-economic impacts of the sector on the well-being of households in the Faranah region.

The map of the Faranah administrative region shown below illustrates the geographical location of the study area as well as its main administrative subdivisions.



Map of the Faranah administrative region created by the author

The Painting 1. Synthesizes the demographic structure of the Faranah region by distinguishing the main age groups, in order to assess population dynamics

Table 1 : Population of the Faranah region by age group

Prefecture	0-11 months	1-4 years	5-9 years old	10-14 years old	15-19 years old	20-24 years old	25-49 years old	50-59 years old	60 years and over	Total
Dabola	6579	22507	23027	19390	19737	17833	43630	9522	10908	173133
Dinguiraye	7149	24456	25020	21070	21446	19316	47407	10346	11853	188123
Faranah	9924	33949	34732	29249	29770	26898	65808	14363	16452	261145
Kissidougou	10405	3597	36419	30668	31216	28204	69003	15060	17250	273822
Faranah Region	37057	116509	119198	100377	102169	92311	225848	49291	56463	896223

Source: INS, demographic projections

2.2 Research Methodology:

We conducted a participatory survey through various meetings with stakeholders in the timber industry within the study area. Participants were selected based on their location within the study area. This process took place between January and May 2025. The various meetings allowed us to accurately execute the steps of participant observation— fieldwork, data collection, and source consultation [10]. It also enabled us to reconstruct the sequence of actions and interactions [11]. When combined with documentary research and interviews, participant observation helps us understand the meaning, process, and dynamics [10].

Section 1: Choosing an Approach

To ensure consistency between research objectives and results, a research approach combining the advantages of qualitative and quantitative methods was adopted. This intellectual approach has the merit of capturing reality from various perspectives. In current studies, researchers tend to favor triangulation, which involves diversifying the approach and tools to understand reality in all its aspects. In this study, triangulation was carried out as follows.

In terms of approaches: qualitative research and quantitative research;

In terms of tools: document analysis, interviews, data analysis.

Section 2 : Strategic groups and sampling.

The sampling method is crucial to the reliability of the results of the wood study or data analysis. Therefore, we selected a representative sample of the population to draw useful conclusions from an optimized survey. The sampling methods chosen are as follows:

Voluntary participation sampling : we offered a questionnaire to the entire target population and drew conclusions from the responses obtained on a voluntary basis, without consideration for the silent majority.

Quota sampling: we interviewed roughly equal parts of each category of the population, and each category is defined on the basis of objective criteria such as age, sex, wealth status, and level of education for each category of actor.

Section 3 : Data collection techniques.

Our approach to conducting surveys in both rural and urban settings involves observation, listening, immersion in the rural or urban environment, daily note-taking, the absence of closed-ended questionnaires, contextualization, and non-delegation of tasks. This has allowed us to obtain quantifiable results (output, cost, quantity).

Section 4: Interviews

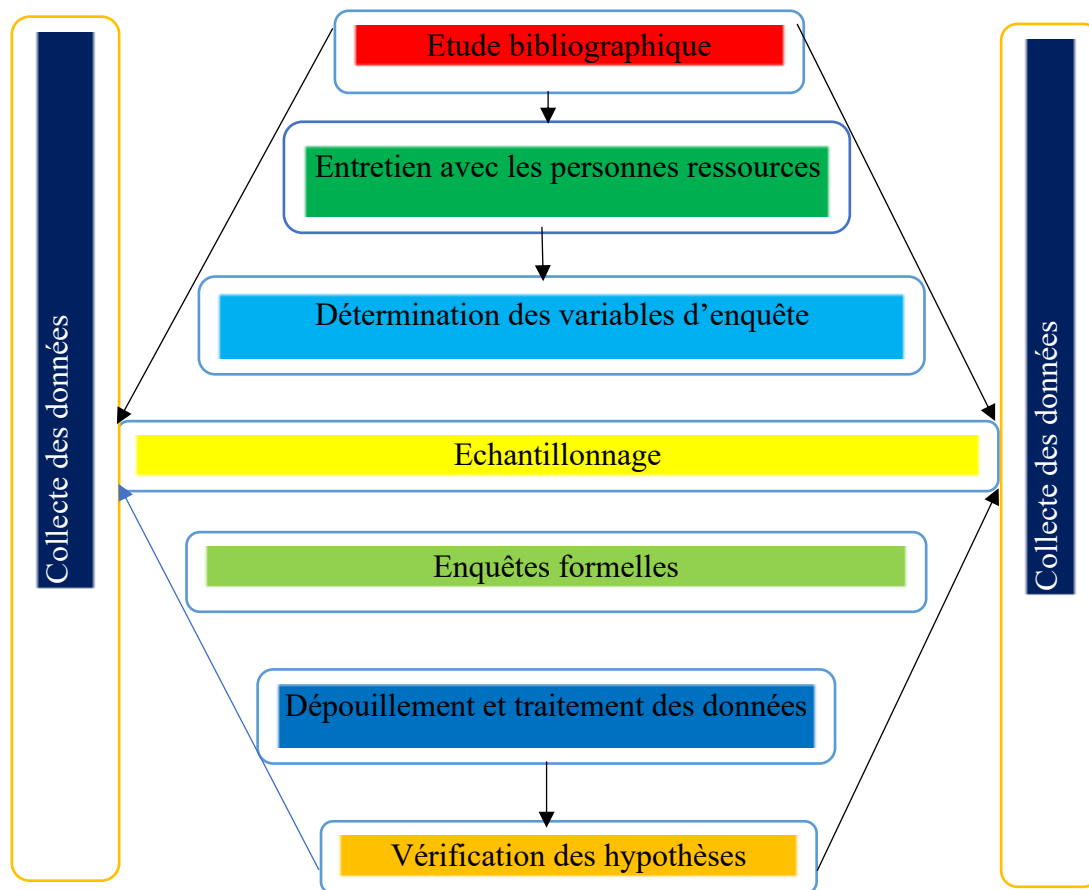
For conducting qualitative or quantitative research, the interview method is often preferred. A research interview is quite different from a casual conversation where one is guided by the flow of the moment [21]. This interview allowed us to gather and analyze several elements such as age, gender, financial situation, level of education, length of professional experience, the well-being of the respondents, and many others. For this article, we opted for the semi-structured interview, which is conducted in two ways: individual interviews and focus group interviews.

Section 5 : The Formal Investigation

The survey was conducted using a questionnaire to collect data in the field using Kobo. collect .

Data cleansing : This step encompasses all the procedures that allowed us to check, edit, and correct errors and inconsistencies in the database. Therefore, it is a delicate step that required great rigor to guarantee the reliability of the processed data. We used diagram 1 below.

Diagram 1: Timeline for the execution of activitie



Source: Created by the author (2025)

III-RESULTS AND DISCUSSION

3-1 Results: The essential results of the study are summarized in Figure 2 and in Tables 2 to 8, which illustrate the main socio-economic and organizational dimensions of the timber value chain.

The mapping of the timber value chain is presented in diagram 2.

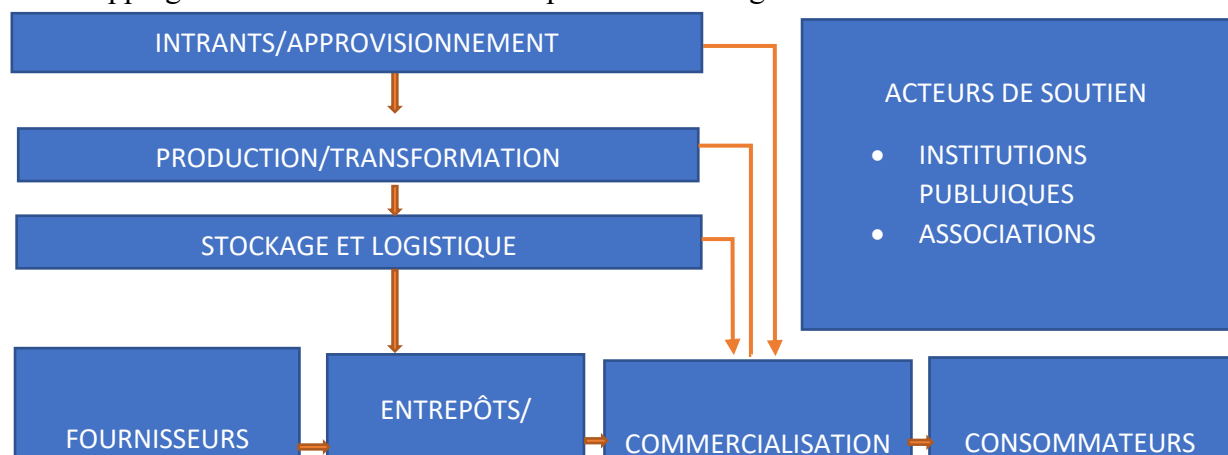


Diagram 2 : Mapping the wood value chain

Table 2 below shows the amounts of royalties related to timber cutting in Faranah.

Table 2 : Timber cutting royalty in Faranah

Essences	Number of pieces	Volume in m ³	Unit Price	Amount in GNF
Mahogany	1184.48	293.97	300,000	88,191,000
Daniela Oliveri	5829.95	531.47	100,000	53 147000
Cheesemaker	249.6	7.8	250,000	1,950,000
Gmelina arborea	90	7.50	300,000	2,250,000
Kapokier	9904.57	309.50	150,000	46,425,000
Vene	895	282.30	300,000	84,690,000
Swallowed	199.99	16.66	100,000	1,666,000
Total	18353.59	1449.20	-	278319000

Source: OGUIB Branch (Guinean Timber Office)

This table presents the different wood species harvested, the volume cut, the unit price applied, and the total amount generated. In terms of volume, the most harvested species are Daniela Oliveri (531.47 m³) and Kapok tree (309.5 m³), followed by African rosewood (282.3 m³) and mahogany (293.97 m³). In terms of monetary value, mahogany (88,191,000 GNF) and African rosewood (84,690,000 GNF) generate the highest revenues, despite lower volumes than Kapok tree or Daniela Oliveri. The kapok tree, Gmelina Arborea and Avalé made a very marginal contribution, with amounts less than 2.5 million GNF each. The total amount generated by the logging was 278,319,000 GNF for a total volume of 1449.2 m³.

Table 3 below highlights the distribution of respondents according to the localities studied and education levels, providing a clear picture of the respondents' profile.

Table 3: Distribution of respondents by locality and education level

Respondent's level of education			Urban Municipality				Total
			Faranah	Dabola	Dinguiraye	Kissidougou	
None	Gender of the respondent	Female	34	0	0	12	46
		Male	73	23	41	40	177
	Total		107	23	41	52	223

Primary	Gender of the respondent	Female	3	0	0	6	9
		Male	19	17	36	20	92
	Total		22	17	36	26	101
Secondary	Gender of the respondent	Female	3	0	0	1	4
		Male	13	10	14	7	44
	Total		16	10	14	8	48
University	Gender of the respondent	Male	2	0	0	0	2
	Total		2	0	0	0	2
Total	Gender of the respondent	Female	40	0	0	19	59
		Male	107	50	91	67	315
	Total		147	50	91	86	374

This table shows us that, in general, the majority of respondents are illiterate. In the Faranah prefecture, only two individuals have completed higher education. At the secondary level, the lowest rate was recorded in the Kissidougou prefecture at 16.66%. At the primary level, the highest rate was recorded in Dinguiraye at 35.64%, and the lowest rate in Dabola at 16.68%. For those with no formal education, Faranah has the highest rate at 47.98%, after Kissidougou, Dinguiraye, and Dabola. This can be summarized in the following table.

Table 4: Category of actors encountered in the wood value chain

Urban Municipality	Category of actor in the value chain					
	Tans Bois	Wholesalers	Exploit Forests	Consumers	Retailers	Active margin
Faranah	44	19	24	49	11	147
Dabola	18	14	8	0	10	50
Dinguiraye	9	28	22	0	32	91
Kissidougou	10	5	14	34	23	86
Active margin	81	66	68	83	76	374

Based on this table, we observe that Faranah is the driving force of the value chain. Margins are more balanced between categories in Dinguiraye and Kissidougou. In Dabola, the chain is fragile, with low margins and an absence of consumers. Consumers and processors together capture over 40% of the margin, making them major players.

Table 5 below highlights the different modes of access to felled trees, allowing us to understand local practices and arrangements surrounding forestry operations.

Table 5: Method of access to felled trees

Method of access to the felled tree	Urban Municipality				Total
	Faranah	Dabola	Dinguiraye	Kissidougou	

Royalty	Gender of the respondent	Female	40	0	0	19	59
		Male	83	42	69	58	252
	Total		123	42	69	77	311
Free access	Gender of the respondent	Male	22	8	21	4	55
	Total		22	8	21	4	55
Purchase	Gender of the respondent	Male	1	0	0	2	3
	Total		1	0	0	2	3
Total	Gender of the respondent	Female	40	0	0	19	59
		Male	106	50	90	64	310
	Total		146	50	90	83	369

From this table, we find three modes of access to the woods: free access, royalty and purchase.

The analysis of this table shows us that among the people surveyed in the four prefectures that make up the Faranah region, Faranah pays the fee more than all the other prefectures followed by Kissidougou, Dinguiraye and finally Dabola.

Evaluation of the creation and distribution of added value along the chain

The Painting Figure 6 below highlights the yield of trees into timber, providing an overview of the transformation performance observed in the field

Table 6 : Yield of timber trees

Locality			Yield of timber trees						Total
			1	3	4	5	6	10	
Faranah	Quantity of wood purchased	5	0	1	0	0	0	0	1
		10	0	36	15	0	4	0	55
		12	21	7	11	0	0	0	39
		15	0	0	1	0	1	0	2
		20	1	25	9	0	7	0	42
		30	0	1	1	0	0	0	2
		50	0	0	0	0	1	0	1
		100	0	0	2	0	1	0	3
Total			22	70	39	0	14	0	145
Dabola	Quantity of wood purchased	10	0	0	18	0	0	0	18
		12	7	1	23	0	0	0	31
	Total			7	1	41	0	0	0
Dinguiraye	Quantity of wood purchased	10	0	0	9	0	0	0	9
		12	22	15	44	0	0	0	81
		15	0	0	1	0	0	0	1
Total			22	15	54	0	0	0	91
Kissidougou	Quantity of wood purchased	10	13	54	4	9	0	1	81
		12	0	1	1	0	0	0	2
		15	0	0	1	0	0	0	1

		40	0	2	0	0	0	0	2
	Total		13	57	6	9	0	1	86
	Total		64	143	140	9	14	1	371

Observation of this table shows us that production is heavily concentrated on yields of 3 to 4 planks per tree. Very low or very high yields remain marginal. Faranah stands out for the greatest diversity of yields. Kissidougou has a strong concentration on yields of three planks, Dabola focuses on yields of four planks, and Dinguiraye provides a balance between 3 and 4 planks per tree.

Table 7 : Acquisition method based on selling price and purchase price

Tree purchase price			Timber selling price					Total
			1,400,000	1,500,000	1,600,000	2,500,000	2,600,000	
300,000	Acquisition method	CONTRAC T	0	5	0			5
		Tax	0	94	23	0	0	117
	Total		0	99	23	0	0	122
320,000	Acquisition method	CONTRAC T	0	1	0	0	0	1
	Total		0	1	0	0	0	1
400,000	Acquisition method	tax	39	15	36	1	0	91
	Total		39	15	36	1	0	91
500,000	Acquisition method	Tax	0	0	0	121	38	159
	Total		0	0	0	121	38	159
Total	Acquisition method	CONTRAC T	0	5	0	0	0	5
		Tax	39	110	59	122	38	368
	Total		39	115	59	122	38	373

This table shows us that the most lucrative segment is trees purchased for 500,000 GNF and resold for over 2,500,000 GNF. Trees costing 300,000 GNF also offer a good return, but at a lower selling price. Purchases at 400,000 GNF are less significant: the margin is comparable to 300,000 GNF, but with a higher initial cost. The intermediate segments are less attractive. Taxation is the most dominant mode of access (99%).

This part of Table 8 examines the interaction between the method of tree acquisition and the Selling prices vary depending on the specific characteristics of the localities concerned.

Table 8 : Interdependence between acquisition method and selling price according to location

Name of the Locality	Timber selling price					Total
	1,400,000 0	1,500,000	1,600,000 0	2,500,000 0	2,600,000 0	

Faranah	Acquisition method	Unconditional	0	18	47	81	1	147
	Total		0	18	47	81	1	147
Dabola	Method of acquisition ;	Royalty	0	0	12	37	0	49
	Total		0	0	12	37	0	49
Dinguiraye	Acquisition method	Unconditional	39	11	0	4	37	91
	Total		39	11	0	4	37	91
Kissidougou	Acquisition method	By contract	0	5	0	0	0	5
		Tax	0	81	0	0	0	81
	Total		0	86	0	0	0	86
Total	Acquisition method	By contract	0	5	0	0	0	5
		Unconditional	39	110	59	122	38	368
	Total		39	115	59	122	38	373

Analysis of this table reveals the following: Faranah is positioned in the upper-middle range (1,600,000 to 2,500,000 GNF), Dabola is high-end but with a base price of 1,600,000 GNF, Dinguiraye has a dual profile (1,400,000 to 2,600,000 GNF), and Kissidougou is heavily specialized in the middle segment (1,500,000 GNF). Therefore, the timber market operates almost without a contractual framework, with a predominance of open access facilitated by the payment of a tax or fee.

3.2 Discussion

The analysis of the timber value chain in the Faranah region highlights contrasting dynamics depending on the species, locations and categories of actors.

1. Differentiated Valuation of Wood Species: The results show that certain species, such as mahogany and rosewood, generate the highest revenues, despite lower harvest volumes compared to kapok and olive tree (*Daniela olivei*). This finding aligns with the work of [13], who indicate that the market value of tropical timber depends more on its technological quality and demand on

the international market than on the volume harvested. [14] point out that buyers' preference for certain so-called "noble" species leads to targeted overexploitation, exacerbating their scarcity.

2. Low level of education among stakeholders: The socio-educational profile of the respondents reveals a high proportion of illiterate individuals (nearly 60%), with only two having attained university level. This reality limits their mastery of sustainable management standards and access to market information [15]. According to [16], the low human capital in forestry sectors of developing countries constitutes a major obstacle to formalization and innovation. Our results confirm this deficit, which is particularly pronounced in Dabola and Kissidougou.

3. Distribution of actors and margins: The stakeholder mapping shows that Faranah dominates the value chain, concentrating 39% of the margins. This disparity corroborates the observations of [17], who emphasize that the spatial structuring of timber supply chains depends heavily on road accessibility, proximity to markets, and commercial networks. Dinguiraye and Kissidougou exhibit a more balanced distribution of margins, which supports the idea of a "polycentric" value chain [18].

4. Access Methods and Taxation: The results show that taxation is the dominant access method (99% of cases), while direct purchase remains marginal. The royalty system is particularly important in Faranah. This reliance on taxes reflects both an attempt at formalization and significant tax pressure. However, according to [19], forestry tax systems in Central and West Africa suffer from a lack of equity: they provide little benefit to local communities and sometimes hinder the competitiveness of stakeholders. Our analysis confirms this trend, showing that the highest margins are captured by processors and consumers at the expense of forest operators.

5. Profitability and selling price: The yield study reveals that the majority of trees produce between 3 and 4 planks, illustrating inefficient harvesting. This result aligns with the conclusions of [12], who demonstrate that the low yield is linked to rudimentary felling techniques and significant timber losses during sawing.

The concentration of profit margins in certain localities and the dominant role of "high-value" timber species raises questions about the sustainability of logging operations. [20] point out, the sustainability of forestry sectors in Africa depends on the ability to strengthen local governance, diversify the species traded, and improve the distribution of added value among stakeholders. In our case, the lack of formal organization and low levels of education undermine the long-term viability of the value chain.

CONCLUSION AND RECOMMENDATIONS

The timber sector in the Faranah region is a crucial pillar for household income and socio-economic resilience. However, its potential remains largely untapped due to several structural constraints: low levels of education among stakeholders, the absence of formal contractual mechanisms, predominantly informal governance, and a strong reliance on taxes and royalties as the main means of accessing resources. This is compounded by the overexploitation of high-value timber species and limited product diversification, exacerbated by low-yield, artisanal techniques. The study thus reveals a paradox: although forest resources represent a major economic asset for the region, their exploitation remains inefficient, poorly controlled, and vulnerable to increasing human pressures. Profit margins, concentrated in a few localities and market segments, reflect an inequitable distribution of added value, to the detriment of a large proportion of operators and local communities.

Given these findings, a profound transformation of the sector is essential. It must evolve towards a more professional, better-governed, and environmentally sustainable management model, capable of securing forest resources while improving the living conditions of rural populations.

This requires:

a- Strengthening the technical and organizational capacities of stakeholders.

Stakeholders in the sector (loggers, operators, sawmills, transporters, traders, artisans, forestry services, local authorities) have:

- a low level of education;
- limited mastery of modern harvesting and processing techniques;
- an often informal organization, without written rules or management tools;
- limited negotiating power with buyers and authorities.

Potential solutions: Needs assessment by stakeholder category, technical capacity building, Organizational capacity building, Implementation methods

b- Establishing an inclusive consultation framework between forestry services, local authorities, and private stakeholders.

Governance is:

- largely informal, with many decisions made on a case-by-case basis;
- characterized by weak coordination between forestry services, local authorities, operators, and traders;
- a source of conflict (access to resources, tax sharing, inspections, fines) and mistrust.

Potential solutions: Establishment of multi-stakeholder dialogue frameworks; Clear mandate for these consultation frameworks; Practical consultation tools; Clarification of roles

c- A tax reform for greater fairness and transparency. The sector is:

- subject to multiple taxes and fees that are poorly understood by stakeholders;
- characterized by sometimes opaque collection processes, with limited returns to local communities;
- exposed to informal practices (unreceipted payments, case-by-case negotiations) that foster corruption and discourage formalization.

Potential solutions: Simplification and harmonization of taxation; Making taxation more equitable; Transparency and traceability of revenue; Incentive-based taxation

d- Diversification of harvested tree species and promotion of sustainable management practices.

- There is intense pressure on a few valuable tree species, with a risk of depletion;
- Biological diversity is not valued: other species remain under-exploited or are sold at low prices;
- Harvesting techniques are often intensive and show little regard for regeneration (area, rotation, natural regeneration, reforestation).

Potential solutions: Diversify tree species and products; Integrate sustainable management practices; Reforestation and agroforestry; Awareness-raising and changing perceptions.

The four key areas (stakeholder capacity, consultation, taxation, diversification/sustainable management) are interdependent:

- Without strengthened capacity, stakeholders cannot negotiate better terms or implement improved techniques;
- Without consultation, taxation risks remaining perceived as unfair and rules as externally imposed;
- Without clear and equitable taxation, stakeholders are not incentivized to formalize their operations or adopt sustainable practices;

Without diversification and sustainable management, the resource will be depleted, and the potential of the timber industry for the well-being of households in Faranah will disappear in the medium term.

Such a transition would allow the timber industry to become not only a local economic driver but also a strategic lever for preserving forest ecosystems and strengthening the well-being of households in the Faranah region.

Acknowledgements

The authors thank the technical services and the various actors in the timber value chain in the Faranah administrative region.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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