Gender Dynamics, Agribusiness Participation, and Livelihood Outcomes among Tea Farmers in Taraba State, Nigeria

[1]Sobowale, M. O, & [2]Ala. M. O

[1]Cocoa Research Institute of Nigeria, PMB 5244. Ibadan, Oyo State, Nigeria
[2]Lead City University, Toll- Gate Area, Ibadan, Oyo- State, Nigeria.
mayowadamy5@gmail.com

Abstract

This study examines how gender dynamics influence agribusiness participation, access to land, credit, and productive resources, and their implications for rural livelihoods and household food security among household tea farmers in Sardauna Local Government Area, Taraba State, Nigeria. Unlike prior research that focuses broadly on smallholder agriculture, this study explicitly links gendered access to land and credit with participation in tea agribusiness, highlighting socio-institutional barriers that affect men, women, and youth differently. Primary data were collected from 75 tea-farming households using structured questionnaires and analysed with descriptive statistics, Pearson Product-Moment Correlation (PPMC), and Chi-square tests at a 5% significance level. Results indicate that tea farming is the predominant livelihood activity (70.67%) in the Mambilla Plateau, with most respondents aged 31–50 years, married (76%), and managing households averaging five members. Despite this, 84% of farmers had limited formal education, and access to institutional credit was inadequate, constraining agribusiness participation. While 81% reported access to land, only 20% possessed legally recognized rights, reflecting customary tenure systems and gender inequities. PPMC revealed a weak negative correlation ($r = –0.13$, $p > 0.05$) between land size and productivity, while Chi-square analysis showed no significant association ($\chi^2 = 1.045$, $p = 0.31$) between land access and household food security. The study demonstrates that gender-responsive land titling, inclusive credit schemes, and targeted training for women and youth are critical for enhancing equitable participation, improving productivity, and strengthening household food security in tea agribusiness, offering practical insights for policy and rural development interventions.

Keywords: Gender dynamics, Agribusiness participation, Land access, Credit, Food security

Words: 247

INTRODUCTION

Agriculture remains central to Nigeria's rural economy, supporting livelihoods, employment, and food security. Smallholder systems dominate the sector, yet they face persistent constraints such as low productivity, inadequate market linkages, and limited access to finance, inputs, and extension services. Integrating agribusiness approaches into smallholder farming is

increasingly promoted as a pathway for rural transformation and income diversification (Amede et.al., 2023).

Tea cultivation on the Mambilla Plateau in Taraba State presents an important agribusiness opportunity due to favourable agroecological conditions, including moderate temperatures, high elevation, and consistent rainfall. Although Nigeria is not yet a major global tea producer, the Mambilla region possesses significant potential for expanding domestic production, strengthening local processing, and improving market integration (Akinpelu & Oluyole, 2020). However, translating this potential into tangible development benefits depends on effective farmer participation and, critically, on equitable access to land, credit facilities, and productive resources.

Access to these assets underpins agribusiness engagement. Secure land tenure encourages long-term investment in improved planting materials, soil conservation, and small-scale processing. Credit: whether from banks, microfinance institutions, cooperatives, or informal associations: enables farmers to purchase inputs, acquire equipment, and manage seasonal cash-flow gaps. Productive resources such as quality seedlings, fertilizers, tools, extension services, and timely market information are equally essential for enhancing productivity and strengthening farmers' integration into value chains.

In Taraba State, however, many household tea farmers operate on fragmented plots with insecure tenure, face limited access to affordable credit, and experience irregular supply of inputs and extension support. These constraints reduce productivity, restrict participation in value chains, depress incomes, and heighten vulnerability to food insecurity (Akinpelu & Oluyole (2020). Gendered norms and institutional barriers further intensify these challenges: women and youth, in particular, encounter legal, cultural, and economic obstacles to land ownership, credit access, and control over productive resources.

The research problem, therefore, stems from the persistent and gender-differentiated limitations in access to land, credit, and productive resources, which constrain agribusiness participation among household tea farmers in Taraba State and weaken their livelihood and food security outcomes. Yet empirical evidence explaining how these gender dynamics shape access and participation remain limited.

To address this gap, the study aims to:

(1) assess the level of agribusiness participation among household tea farmers;
(2) examine gender-differentiated access to land, credit, and productive resources;
(3) identify socio-economic and gender-based determinants of access; and
(4) analyse the implications of differential access for household livelihoods and food security.

Guided by these objectives, the study tests the following mediation hypothesis:

H□: Gender and access to productive resources do not significantly mediate the relationship between socio-economic characteristics and food security outcomes among household tea farmers in Taraba State.

H□: Gender and access to productive resources significantly mediate the relationship between socio-economic characteristics and food security outcomes among household tea farmers in Taraba State.

LITERATURE REVIEW

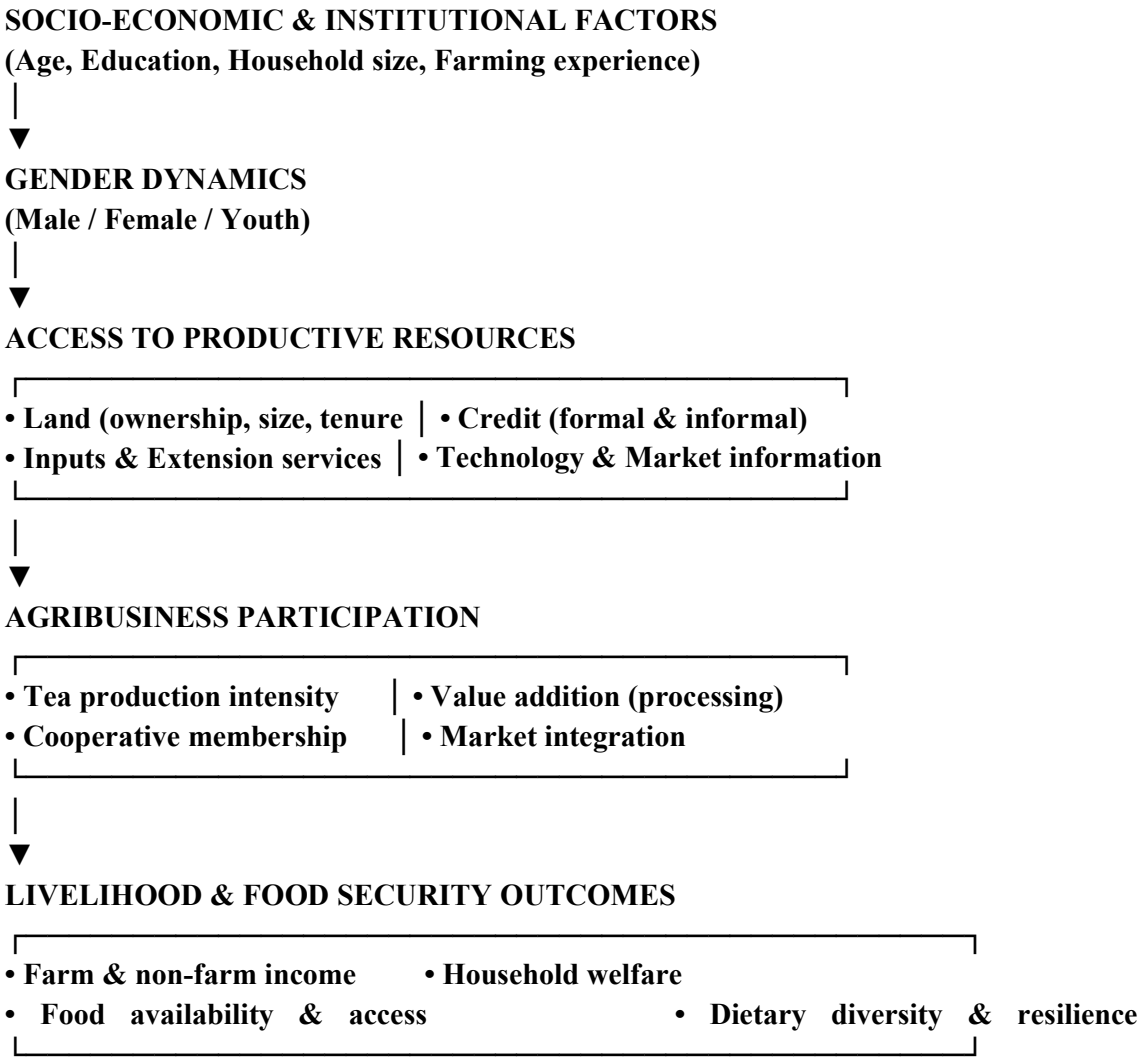
Agribusiness participation and equitable access to productive resources remain central to rural transformation and food security, particularly in developing economies like Nigeria. Agribusiness encompasses a wide range of activities: production, processing, input supply, transportation, and marketing: that link farmers to markets and enhance value addition. According to the Food and Agriculture Organization (FAO, 2023), active participation in agribusiness fosters rural employment, income diversification, and improved household welfare. Smallholder farmers who engage effectively in agribusiness are more likely to benefit from innovation, credit, and market integration, which collectively promote the shift from subsistence to commercial agriculture. However, studies show that in Nigeria, participation levels remain low due to poor infrastructure, weak institutional support, and limited access to productive resources such as land and credit (Wu et. al., 2023; Yusuf et al., 2021). This situation is particularly pronounced among smallholder tea farmers in highland regions like Taraba State, where market linkages and agribusiness opportunities are often underdeveloped.

Access to land, credit, and productive resources forms the backbone of successful agribusiness participation. Land is a fundamental asset for agricultural production, yet ownership and control are often influenced by customary tenure systems that disadvantage women and young farmers. Secure land tenure not only determines production capacity but also influences farmers' eligibility for credit and long-term investment decisions. Credit, in turn, is critical for financing inputs, mechanization, and value addition, but rural farmers frequently face exclusion from formal financial systems due to lack of collateral, high-interest rates, and bureaucratic hurdles. Consequently, they resort to informal mechanisms such as cooperatives, thrift groups, or local moneylenders (Wu et. al., 2023; Yaqoob 2023). Access to agricultural inputs, extension services, and technology also determines productivity and competitiveness in agribusiness. When these are unavailable or unequally distributed, smallholders remain trapped in low-return cycles of production, limiting their capacity to engage in profitable value-chain activities.

Gender plays a critical role in shaping access to these productive resources and determining participation levels in agribusiness. Although women constitute a significant portion of the agricultural workforce, they often occupy marginalized positions within the value chain, engaging mostly in low-income tasks such as weeding, harvesting, and local sales. Patriarchal norms, gender-biased land tenure systems, and unequal access to credit and inputs exacerbate these disparities (Egwue et.al., 2025). The World Bank (2021) emphasizes that empowering women through inclusive agribusiness models enhances productivity, improves household welfare, and strengthens food security. Evidence from Kenya and Rwanda further indicates that gender-sensitive cooperative structures increase women's decision-making power, raise household incomes, and improve food security outcomes. However, similar research on gender-sensitive tea value-chain structures in Nigeria remains sparse.

Food security, as defined by the FAO, involves consistent physical, social, and economic access to sufficient, safe, and nutritious food. Agricultural commercialization can increase household income and purchasing power, but it may also present trade-offs if it encourages monocropping or reduces land available for food crops. In the case of tea farming, the crop itself does not directly contribute to caloric intake but provides cash income that can enhance food purchasing power. Therefore, policies must balance commercial agriculture with household food needs to prevent food insecurity (Yaqoob, 2023).

The conceptual framework for this study integrates insights from three major theories: the Sustainable Livelihoods Framework (SLF), the Theory of Access, and the Agricultural Commercialization Theory. The SLF highlights that access to natural, financial, human, social, and physical capital is essential for sustaining rural livelihoods. Within this context, land and credit serve as vital assets influencing tea farmers' ability to participate meaningfully in agribusiness. The Theory of Access by Ribot and Peluso (2003) extends this understanding by examining how power relations, social identity, and institutional norms affect who benefits from resources. Finally, the Agricultural Commercialization Theory posits that integrating farmers into market systems enhances income and food security but warns that excessive dependence on markets without safeguards can heighten vulnerability (Matthys., 2022). These theories collectively highlight the interconnected nature of resource access, agribusiness participation, gendered power dynamics, and food security outcomes.



The conceptual framework posits that **gender-mediated access to land, credit, and productive resources** shapes the extent of agribusiness participation among household tea farmers, which in turn determines livelihood and food security outcomes. Socio-economic and institutional factors influence this process directly and indirectly through gender dynamics.

At the exogenous level, **socio-economic and institutional characteristics** (age, education, household size, farming experience, cultural norms, cooperative membership, and policy environment) influence farmers' opportunities and constraints. These factors interact with **gender**, which acts as a critical mediating variable influencing control over, and benefits derived from, productive resources.

Access to productive resources: land tenure security, credit (formal and informal), agricultural inputs, extension services, technology, and market information; constitutes the core mechanism through which gender disparities manifest. Differential access affects farmers' ability to invest, adopt innovations, and engage meaningfully in tea agribusiness activities.

Enhanced access leads to higher levels of **agribusiness participation**, reflected in production intensity, value addition, cooperative engagement, and market integration. Increased participation improves **livelihood outcomes**, including income generation and economic stability, which subsequently enhance **household food security** through improved food access, dietary diversity, and resilience.

Empirical studies reinforce these theoretical perspectives, but they also reveal several gaps. Gornott & Murken, (2022) and Oruonye et.al., (2024) opined that secure land tenure and rural credit access significantly improve productivity and food security among Nigerian farmers. Similarly, Egwue & Nnadi., (2025). find that gender-inclusive cooperative structures enhance access to land and markets, yielding measurable welfare benefits in East Africa. The World Bank (2023) further asserts that inclusive agribusiness value chains foster resilience, dietary diversity, and rural prosperity. While these studies provide robust insights, they often adopt broad agricultural analyses that do not capture commodity-specific realities, particularly in specialized highland cash crops like tea. Many treat the household as a homogeneous unit, thereby overlooking intra-household gender dynamics that shape access to resources and decision-making. Additionally, most Nigerian studies examine lowland food crops rather than perennial cash crops where tenure arrangements, investment horizons, and gender roles differ substantially.

A synthesis of the literature reveals recurring limitations that justify the present study. Table 1 summarizes the key gaps identified across existing studies:

Table 1: Synthesis of Key Research Gaps in Prior Studies

Theme	**What Prior Studies Have Done**	**Limitations / Research Gaps**	**Relevance to Current Study**
Agribusiness Participation	Identified determinants in general agriculture	Limited crop-specific analyses; tea value chain underexplored	Provides tea-specific analysis in Taraba
Land & Credit Access	Linked tenure and credit to productivity	Weak focus on gendered access; neglect of informal finance	Examines gender-differentiated and multi-channel access
Gender Dynamics	Highlighted women's marginalization	Focus mainly on food crops; limited evidence for cash crops	Explores gender roles in tea agribusiness
Productive Resources	Documented input and extension constraints	Limited value-chain perspective	Links resource access to participation

Commercialization & Food Security	Showed commercialization impacts	Weak analysis of non-food cash crops' food security effects	Assesses tea agribusiness–food security relationship
Institutional/Power Dynamics	Applied in land studies	Rarely used for agribusiness research in Nigeria	Applies Theory of Access to resource control
Geographic Focus	Southern & Northern Nigeria emphasized	Tea-producing Mambilla Plateau understudied	Fills regional and commodity gaps

Collectively, these insights underscore that expanding gender-equitable access to land, credit, and productive resources is not only key to agribusiness participation but also a pathway to sustainable rural livelihoods and food security in Taraba State. The identified gaps further justify the need for a context-specific, gender-responsive, and value-chain-oriented study of household tea farmers.

Critique of previous studies

Despite valuable contributions, existing literature exhibits three major limitations:

1. **Crop Bias** – Most studies focus on staple crops (maize, cassava, rice) or cash crops like cocoa and coffee, leaving a gap in evidence on *tea farming*, particularly in Nigeria.
2. **Limited Integration of Gender and Access Theories** – Many works examine gender disparities or resource access separately, without combining these perspectives to explain agribusiness participation holistically.
3. **Insufficient Context-Specific Evidence** – Few studies situate analyses in highland tea-producing regions such as Taraba State, where ecological conditions, market access, and gender norms differ significantly from other zones.

The present study addresses these gaps by focusing on tea farmers: a neglected group: and integrating gender, access, and commercialization perspectives to examine how access to land, credit, and productive resources shapes agribusiness participation and food security.

Methodology

This study adopted a survey research design, suitable for collecting primary data from household tea farmers in Sardauna Local Government Area (LGA) of Taraba State. The design enabled the collection of first-hand information on agribusiness participation, access to land, credit, and other productive resources, as well as implications for rural livelihoods and household food security. Data were obtained through a pre-tested structured questionnaire administered directly to respondents.

The study was conducted in Sardauna LGA, located on the Mambilla Plateau: a highland region with a unique climate suitable for tea cultivation. The area hosts several tea-producing communities with smallholder and medium-scale farmers. The target population included male and female household tea farmers actively involved in production, processing, or marketing of tea, whether as owners, tenants, or managers of tea farms.

The sample size was initially determined using **Yamane's (1967) formula** for finite populations:

$$n = \frac{N}{1 + N(e)^2}$$

where:
n = sample size,
N = population size (3,000),
e = level of precision (0.05).

Substituting into the formula:

$$n = \frac{3000}{1 + 3000(0.05)^2}$$

$$n = 353$$

While Yamane's formula yielded a minimum sample size of approximately 353 respondents, the study adopted a final sample size of **75 farmers** due to practical field constraints, including the scattered nature of tea farms on the Mambilla Plateau, difficult terrain, time limitations, and budgetary considerations. Similar agribusiness and livelihood studies in hard-to-reach rural settings have successfully employed smaller, well-structured samples while maintaining analytical rigor. The sample of 75 respondents was considered sufficient for descriptive analysis, Chi-square, and Pearson Product-Moment Correlation (PPMC) inference, particularly given the relatively homogeneous nature of tea-farming households and the focused objectives of the study.

A multi-stage sampling technique was used. In the first stage, Sardauna LGA was purposively selected for its prominence in tea production. In the second stage, five tea-producing communities: Kakara, Nguroje, Mbamnga, Warwar, and Leme: were randomly selected to ensure spatial representation. In the third stage, a combination of random and snowball sampling was employed to select 15 household tea farmers per community, yielding a total of 75 respondents. Snowball sampling was particularly appropriate because no comprehensive lists of active tea farmers existed in some remote settlements, and social referral efficiently located participants. Multiple "seed" respondents per community were used to reduce referral bias.

The final sample included 40 male (53.3%) and 35 female (46.7%) respondents, allowing for gender-disaggregated analysis. A sample of 75 was considered statistically sufficient: for proportion estimates, the 95% confidence margin of error is approximately 11%, and it meets Tabachnick and Fidell's (2007) guideline for multivariate analysis ($N \geq 50 + 8m$, with m = number of predictors).

The internal consistency of the questionnaire was assessed using Cronbach's alpha (α). The instrument comprised sections measuring access to land, credit, productive resources,

agribusiness participation, and food security indicators. The reliability test yielded a Cronbach's alpha coefficient of 0.80, which indicates that the questionnaire items were internally consistent and reliable.

Validity was ensured through content and face validation procedures. The draft questionnaire was reviewed by experts in agricultural economics, gender studies, and rural development, including academic supervisors and experienced extension officer's familiar with tea farming systems on the Mambilla Plateau. Their feedback helped refine the wording, relevance, and clarity of the questions.

Primary data were collected using a structured questionnaire with closed- and open-ended items, capturing socio-economic characteristics, agribusiness participation, access to land, credit, inputs, and household food security. Trained research assistants fluent in local languages ensured clarity and cultural sensitivity during administration.

Ethical approval was obtained from the Institutional Research Ethics Committee of CRIN, and community leaders provided permission to conduct the study. Informed consent was obtained from all participants, either in writing or verbally (with a witness for those unable to sign). All data were anonymized and securely stored to ensure confidentiality.

Data Analysis

Data obtained for this study were analysed using both descriptive and inferential statistical methods to address the study objectives on gender, agribusiness participation, and access to productive resources among household tea farmers in Taraba State. Descriptive statistics such as frequency counts, percentages, means, and standard deviations were employed to summarize respondents' demographic and socio-economic characteristics, levels of participation in tea agribusiness, and patterns of access to land, credit, and productive resources. These measures also provided insights into gender-based differences in resource access and livelihood outcomes among male and female farmers.

For inferential analysis, the Pearson Product-Moment Correlation Coefficient (PPMC) was used to determine the strength and direction of relationships between key continuous variables. Specifically, correlations were examined between variables such as access to land, credit, and productive resources (independent variables) and agribusiness participation levels, household livelihood outcomes, and food security status (dependent variables). For example, relationships were tested between land size and level of agribusiness engagement, access to credit and income generation, and access to inputs and food security outcomes. The PPMC was computed using the following formula:

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{\sqrt{\sum(x-\bar{x})^2 \sum(y-\bar{y})^2}}$$

Where:

r = correlation coefficient,

x = independent variable (e.g., access to land or credit),

y = dependent variable (e.g., level of food security or agribusiness participation).

A positive value of r indicates a direct relationship, while a negative value suggests an inverse association.

In addition, the Chi-square (χ^2) Test of Independence was employed to examine the associations between categorical variables. This included relationships such as gender and access to land, gender and credit access, land ownership status (Yes/No) and household food security (Secure/Insecure), and credit access and agribusiness participation categories (Low/Medium/High). The Chi-square statistic was computed using the formula:

$$X2 = \sum \frac{(O-E)\ 2}{E}$$

Where:

O = observed frequencies, and

E = expected frequencies.

All statistical analyses were performed at a 5% level of significance ($p < 0.05$), implying that relationships or associations were considered statistically significant if the probability value was less than 0.05. The analyses were conducted using appropriate statistical software to ensure accuracy, reliability, and validity of results.

This combination of descriptive and inferential techniques provided a comprehensive understanding of how gender and access to land, credit, and productive resources influence levels of agribusiness participation, household livelihoods, and food security among tea-farming households in Taraba State.

Results

Socio-economic Characteristics and Agribusiness Engagement

Among the 75 respondents, 53.33% were aged 31–40 years, and 26.67% fell within 41–50 years, with a mean age of 45 years. The population is relatively active and physically capable of sustaining agribusiness activities, consistent with observations that younger smallholder groups are more likely to adopt and sustain value-chain practices (Boye et.al., 2024). Married respondents constituted 76%, indicating greater access to family labour and customary land inheritance (Gornott & Murken, 2022). Household sizes averaged five members, suggesting sufficient labour for smallholder tea farming without overstretching household resources (Bello & Adeola, 2022).

Educational attainment was generally low: 84% had no formal education, potentially limiting access to credit, land documentation, and agribusiness information (Aruleba , 2024; Ibrahim et.al., 2023). Religious affiliation was predominantly Muslim (77.33%), influencing land inheritance and gender roles in agriculture (Udoh. et.al., 2020).

Table 2: Socio-economic Characteristics of Respondents (N = 75)

Variables	Frequency	Percentage %
Gender		
Male	40	53.3
Female	35	46.7
Age (years)		
<30	5	6.7
31–40	40	53.3
41–50	20	26.7
51–60	6	8.0
> 60	4	5.3
Marital Status		
Single	2	2.7
Married	57	76.0
Male	40	53.3
Female	35	46.7
Age (years)		
<30	5	6.7
31–40	40	53.3
41–50	20	26.7
51–60	6	8.0
Marital Status		
Single	2	2.7
Married	57	76.0
Separated	5	6.7
Divorced	4	5.3
Widowed	7	9.3
Household Size		
1–3	13	17.3
4–6	47	62.7
7–9	9	12.0
> 10	6	8.0
Education		
Primary	7	9.3
Secondary	3	4.0
Tertiary	2	2.7
No formal education	50	66.7
Non-formal education	13	17.3
Religion		
Christian	10	13.3
Muslim	58	77.3
Traditional	7	9.3
Primary Occupation		

Farmer	53	70.7
Artisan	10	13.3
Trader	7	9.3
Civil Servant	3	4.0
Daily Wage	2	2.7
Secondary Occupation		
Trading	25	33.3
Farming	20	26.7
Artisan	27	36.0
Others	3	4.0

Discussion

Livelihood Diversification and Agribusiness Participation

Tea farming emerged as the predominant economic activity, with 70.67% of the respondents identifying it as their primary occupation. This reinforces the role of tea cultivation as a livelihood mainstay in the Mambilla Plateau region, which has a unique agro-climatic advantage for tea production. Other occupations included trading (9.33%), civil service (4%), and artisanship (13.33%). The dominance of tea farming supports findings by Aboushady et.al., (2023). who reported that niche cash crops such as tea and coffee are rapidly becoming engines of rural income generation in Nigeria's highland zones.

Access to Land

Findings presented in Figure 1 indicate that 81% of the respondents reported having access to land for tea farming, while 19% did not. This high level of access to land among respondents suggests a generally favourable condition for agricultural participation in the study area. Secure land access is a foundational prerequisite for sustained involvement in agribusiness and has implications for household economic stability and food production.

This result underscores the critical role of land availability in enabling smallholder farmers to engage in productive agricultural activities. It supports the argument by (Daudu et.al., 2022), who asserted that land access significantly shapes farmers' livelihoods and food security outcomes, particularly for women in rural Nigeria. While national trends often show restricted land access for women due to customary tenure systems, the relatively high proportion of access reported in this study indicates a more inclusive pattern of land use, at least among tea farming communities in Taraba State.

Figure 1: Distribution of access to Land by the respondents

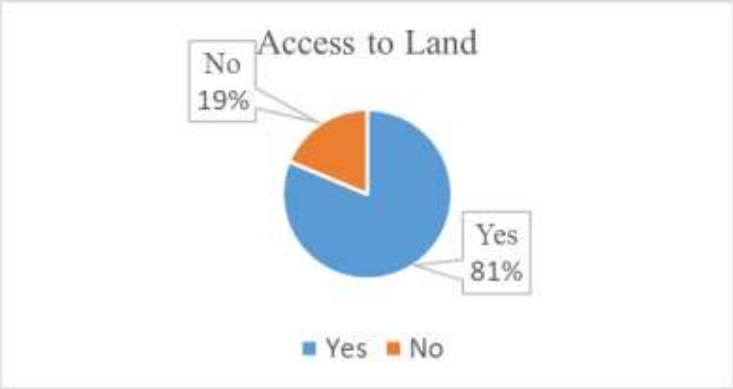


Figure 1: Access to Land by the respondents
Source: Field Survey 2025
Land Right

As shown in Figure 2 in Sardauna LGA, only 20% of tea-farming households reported having legally recognized rights to the land they cultivate, while a striking 80% indicated they have access without ownership rights. This pattern reflects the predominance of customary tenure arrangements in rural Nigeria, where land is often allocated by traditional authorities or family lineages, and formal titling remains rare due to high costs, administrative complexity, and limited institutional reach (Egwue et.al., 2025; FAO, 202333). Farmers with secure rights typically enjoy greater tenure security, encouraging long-term investments in perennial crops, soil conservation, and improved tea varieties, whereas those with only access rights often face tenure insecurity, discouraging capital-intensive practices and reducing productivity (Lawin & Tamini, 2019). Moreover, lack of formal rights limits access to collateral-based credit, constrains agricultural commercialization, and heightens vulnerability to eviction or land reallocation, with implications for household income and food security (Kehinde et.al., 2021). The high proportion of access-only arrangements also raises gender and equity concerns, as women and youth are often relegated to secondary land rights under customary norms, thereby reinforcing disparities in resource control and decision-making (Doss et al., 2018).

Figure 2: Distribution of rights to Land by the respondents

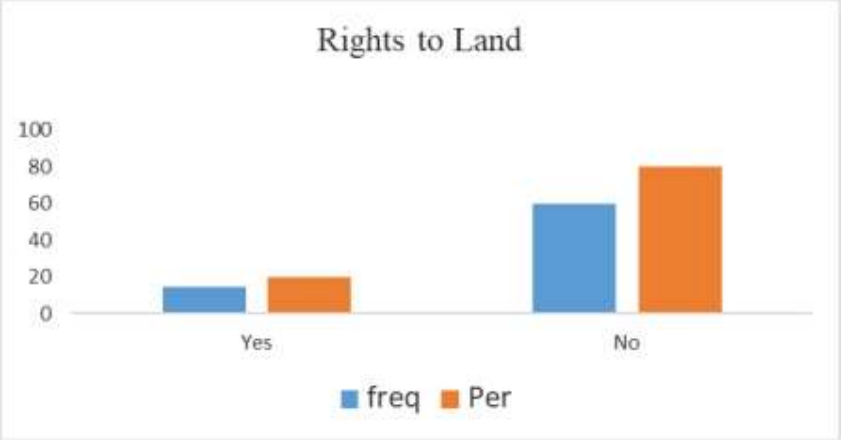


Fig 2: Rights to land by the respondents
Source: Field Survey, 2025.

Interpretive Insight

Correlation and Chi-square analysis

The socio-economic characteristics of respondents in Sardauna LGA indicate a relatively young, moderately educated, and experience-diversified agrarian population, well-positioned to engage in tea agribusiness. Education appears particularly important in empowering farmers to claim land rights, participate in cooperatives, and access formal credit channels such as microfinance or trust-based out grower schemes (Babban Gona model). Household sizes, while moderate, influence labour availability for farm management and productivity.

Pearson's Product Moment Correlation (PPMC) analysis revealed a weak negative correlation between land size and agricultural productivity ($r = -0.13$, $p > 0.05$), indicating that larger plots do not automatically yield higher output. This counterintuitive pattern likely reflects **management inefficiencies**, as farmers with larger holdings face labour and resource constraints that limit uniform input application and care, and **soil heterogeneity**, where larger plots encompass varying soil fertility, reducing per-hectare yields.

Similarly, the Chi-square test showed no statistically significant association between land access and household food security ($\chi^2 = 1.045$, $p = 0.31$), though descriptively, households with land tended to be more food secure. This suggests that while land access is a necessary precondition for agricultural engagement, it is **not sufficient** on its own to ensure food security; complementary factors such as labour, inputs, management practices, and extension support are critical.

Overall, the findings indicate that household tea farmers in Sardauna LGA are heavily reliant on agriculture for livelihoods, particularly tea cultivation. However, limited education, labor constraints, and socio-cultural factors, including religiously influenced land access norms, present challenges to optimizing productivity and achieving household food security. These results align with previous studies emphasizing the need for context-specific interventions that combine equitable resource access with capacity-building, effective management support, and attention to demographic and cultural realities in rural agribusiness development (IFAD, 2023; World Bank, 2024).

Table 3: Correlation and Chi-square Analysis of Land Size, Productivity, and Household Food Security

Variables	Test	Statistic	p-value	Interpretation
Land size vs. Agricultural productivity	Pearson's r	–0.13	0.24	Weak negative correlation; larger plots do not necessarily increase yield due to management inefficiency and soil heterogeneity
Land access vs. Household food security	Chi-square (χ^2)	1.045	0.31	No statistically significant association; land access alone does not guarantee food security; complementary inputs, labour, and management matter

Table 4: Here's a comparative table summarizing key aspects of tea production, land access, tenure security, and gender patterns in Nigeria (Sardauna LGA), Kenya, Rwanda, and Ethiopia:

Aspect	Nigeria (Sardauna LGA)	Kenya	Rwanda	Ethiopia
Primary occupation	70.7% tea farming; others include trading (9.3%), artisanship (13.3%), civil service (4%)	Majority smallholder tea farmers (~60% of national production); tea main cash crop	Tea is a major cash crop; smallholder farmers dominate; limited livelihood diversification	Tea cultivation less widespread; key income source for highland households
Land access (% with land)	81%	~75–80% (family inheritance or lease)	~85% due to land reform and titling initiatives	~70–75%; predominantly customary allocation
Formal land rights (% with legal title)	20%	~25–30% formal title; mostly customary allocation	~50–60% formal title; government registration programs in place	<20%; mostly customary rights
Gender equity in land access	Women often secondary rights; gender disparities in control	Women generally restricted in land ownership;	Women's access improved under land reform, but	Women mostly hold secondary or communal rights; limited

		often usufruct rights	disparities persist	decision-making power
Tenure system	Predominantly customary; access without formal title common	Customary and leasehold; limited formal title	Mix of formal and customary post-land reform	Predominantly customary
Livelihood diversification	Limited; tea dominates income; small proportion in trade, civil service, or artisanal work	Moderate; tea dominates but some households engage in subsistence crops	Moderate; tea dominates; some subsistence cropping	Limited; subsistence crops often supplement tea income
Impact on food security	Land access alone not sufficient; labor, inputs, and management critical	Smallholders often maintain food security via crop diversification and income from tea	Land titling improves investment but small plots may limit food production	Limited; productivity constrained by tenure insecurity, input access, and labor

Conclusion:

This study examined agribusiness participation and access to land, credit, and productive resources among household tea farmers in Sardauna LGA, Taraba State, Nigeria. Findings reveal that tea farming dominates livelihoods, but productivity and household food security are constrained by limited education, labour shortages, and inadequate access to credit and inputs. Although most farmers have land access, tenure insecurity and sociocultural norms: especially gendered and religiously influenced: restrict equitable ownership and resource utilization. Statistical analyses showed a weak negative correlation between land size and productivity, likely due to management inefficiencies and soil heterogeneity, while land access alone did not guarantee food security, highlighting the need for complementary resources and support.

Recommendations:

1. **Gender-responsive credit schemes**: Establish cooperative- or mobile-based microfinance programs targeting women and youth to facilitate access to loans and inputs without requiring formal land titles.
2. **Secure land titling**: Simplify registration processes and recognize female and customary land rights to encourage long-term investment and enable collateral-based credit.
3. **Adult literacy and agribusiness training**: Focus on women and youth to enhance productivity, financial literacy, and market participation.

4. **Input and extension support**: Provide quality seedlings, fertilizers, tools, and advisory services to improve efficiency, particularly on larger plots.
5. **Infrastructure and market access**: Develop roads, markets, and processing facilities to reduce post-harvest losses and strengthen value chains.

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