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Gender Norms and Agro-Pastoral Women's Participation in Economic Activities in North-Eastern Nigeria.

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abstract

For the promotion of women's empowerment, there is a need to explore effective and efficient time management among marginalised rural women agriculturalists. This study investigates the relationship between gender attitudes and time management among agro-pastoralists in North-eastern Nigeria. Both qualitative and quantitative methods were employed in the analysis of the data, which included a household survey of 3041 participants and 30 key informants. Data were analysed using SPSS 23, and the study area map was produced by ArcGIS 10 software. Descriptive and multiple regressions (simple and stepwise) were used for data analysis. The findings reveal significant gender differences in time management, with women assuming a greater share of household and childcare responsibilities. Women's and men's attitudes toward time management are affected by patriarchal norms and societal beliefs. The study shows that above 80% of the population is primarily engaged in full-time agriculture and livestock production. The findings revealed mixed farming practices among the agro-pastoralists, with their participation in crop farming (62%), livestock (73%), and non-farm (51%) activities. The regression results indicate that nine variables significantly influence time management, with a statistical significance level of 72%. Most gender differences in time management are marked by the involvement of most women in domestic and household responsibilities/tasks rather than income-generating activities. Women spend longer hours working daily and fewer leisure hours (3 hours). There is a need to encourage attitudinal change at the community level regarding gender roles and responsibilities, implement gender equality policies and effective time management, which affords more time for income-generating tasks for females in this sector of the economy.

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Introduction

Gender attitudes and norms are the acceptable set of rules for men's or women's behaviours and roles, impacting the everyday lives of both genders, spanning from domestic responsibilities to social, economic, and political activities. In society, these roles create an imbalance between men and women and depict a clear gender power gap between what role is masculine and which is feminine. This allots more power roles to men and passive roles for women, which may be acceptable to most people (Rosenberg & Edmeades, 2023). These power roles influence men's beliefs and attitudes, as well as those of others in households, families, and communities. Several studies have shown the impact of gender attitudes on time management (Folbre, 2012; Kabeer, 2012). The patriarchal society creates unequal roles with women bearing more household and childcare responsibilities (Moser, 1993; Oyekanmi, 2005; Adeniyi, 2020). Studies in Nigeria likewise depict such patterns (Adepoju & Oppong, 1994; Orubuloye et al., 1997; Egbue, 2010). Time management is affected by gender attitudes shaping men's and women's roles (Higgins, 1956; Razavi, 2003; Chant, 2007). Women's time management is inhibited by societal beliefs and a lack of independence in decision-making (Agarwal, 1994; Kabeer, 2005; Adams & Almahmoud, 2020). Women's economic empowerment depends on crucial time management (United Nations, 2020).

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Historical perspective traces the link between colonialism and how it has affected traditional African culture and impacted women's rights (Agbaje, 2019; Pagel, 2021). Gender attitude changes due to education and economic empowerment (Muhanguzi, 2019). These attributes have been identified as key factors in shaping gender attitudes in Africa (Wekwete, 2014; Peters et al., 2019; Kan & Klasen, 2021). Inequality in the division of labour is perpetuated by patriarchal norms (Kabeer, 2018). Factors such as culture, religion, socioeconomic status, and intersectionality shape the experiences of African women (Oduyoye, 2001). Kabeer (2005) and Muhanguzi, (2019) stated that patriarchal norms and values are challenged by educated women. Also, economic empowerment schemes improve women's autonomy and decision-making power (Van Laar et al., 2024). The persistent social and cultural barriers inhibit women's access to education and economic opportunities (Agarwal, 1994; Adams & Almahmoud, 2020). Chant's (2007) and Kabeer's (2018) findings revealed that through policy interventions and community engagement, these barriers can be addressed.

In the promotion of gender equality, these norms need to be challenged (Razavi, 2003; Kabeer, 2005; Idris, 2017). To challenge these norms and encourage gender equality in a patriarchal society, there is a need for men's input (Morrell, 2001; Van Laar et al., 2024). Other studies have emphasized addressing intersectionalities in addition to race, class, and disability (Tamale, 2011; Ben-Moshe & Magaña, 2014). African feminist is expected to defy prevailing cultural norms and promote gender equality perspectives (Tamale, 2011). Akua (2022) reports that African rural women's resource constraints are the most glaring form of patriarchy, entrenched in women's subservience, especially in agricultural livelihoods. This is evident in developing countries,

where about 80% of family farms make up the overall farms (FAO, 2014). A large number of these small and medium farms are managed by family labour, with women making about forty per cent (40%) of the workforce. Although men and women have different roles in terms of food provision, women have more household work burdens (Grassi et al., 2015).

In agriculture and livestock production and management, women perform an essential part, as well as in household maintenance. There are several studies on women's time management strategies. Garcia-Roman and Ophir (2024) researched household time and task segregation in fifteen European countries and found that even in egalitarian societies, women carry out more household tasks than men. This pattern depicts gender inequality and higher disproportionate investment in household tasks for women. Some studies have investigated the intricacies of women's time allocation through factors such as cultural, social, and economic (Ngusa, 2022; Pierotti et al., 2022). Across Africa, women agro-pastoralists have shown how time is allocated for household chores, childcare, agricultural activities and livestock care.

Women's time management is also affected by seasonality and climate change (Goh, 2012; WHO, 2014). As climate variability has increased, women are faced with more negative outcomes than men, such as lower incomes and smaller harvests due to variations in temperature, rainfall, and other seasonal events. This also results in an increased workload in fetching fuel, water, and other household resources. Other negative impacts of climate change are on women's health, caused by physical strain, heat stress, and increased vulnerability to violence. Drought impacts livestock care and household responsibilities (Maltitz & Bahta, 2021). Gender Study (2024) states that the workload increases during the rainy season for agriculture workers. Adopting new measures and technologies such as irrigation systems, mobile phones, and media access to information assists women in managing their time (Makau et al., 2018).

In Nigeria, some research has shown the relationship and constraints experienced by women agro-pastoralists in time use and productivity in this economic sector. Based on social responsibilities, women's time and labour are constrained by their spouse's farm and livestock, taking up their productive time. Women are expected to take up additional farm responsibility by supporting their spouses in agricultural activities without compromising their roles as caregivers (Aderinoye-Abdulwahab et al., 2013; Akangbe et al., 2015; Pierotti et al., 2022; Mani et al., 2024). Ajah (2013) interviewed farmers in Abuja and discovered that women spend 300 minutes, compared with 360 minutes for men, per day on farming activities. In South-Western Nigeria, Adeyonu (2012) researched gender and seasonal sensitivity in farming households. It was deduced that apart from the household workload, all other activities are monetized. Women had less time for leisure and spent more time working, especially on household activities.

Minimising the gender gap and boosting women's empowerment and productivity requires consultation on time and labour utilization. There has been evidence of women having a higher labour burden than men, especially in rural areas, where women spend a lot of their time on family responsibilities to the detriment of income-generating activities. This creates time poverty due to a disproportionate workload. Time spent fetching water and wood fuel takes up a lot of women's time in these communities. There is a need to know if women would be more involved in income-generating activities, given the time and opportunities. This study aims to assess women's time allocation on various household and agro-pastoral activities and provide a comparative analysis with that of men in agriculture and livestock production in North-Eastern Nigeria. The aim of the research is to assess gender norms and participation in economic activities among women agro-pastoralists in North-Eastern Nigeria. The specific objectives are to ascertain gender attitudes to agriculture and livestock work, and examine the spatial variation and gender differences that exist in time allocation/management among women agro-pastoralists in the study area.

Intersectionality and Women's Participation in Economic Activities.

Crenshaw (1989) explained the concept of intersectionality, which highlights various social identities that intersect and produce gender-based discrimination and marginalisation experiences. This concept applies to women in agriculture and livestock production in investigating social identities such as race, class, age, and ethnicity to explain their inequality experiences. Women agro-pastoralists encounter gender-based discrimination in accessing credit, ownership of farmland, and market opportunities (Agarwal, 2018; Ugwu, 2019). Tavenner et. al. (2022) and Begum et. al. (2023) link intersectionality to women's marginalization based on race and ethnicity. Women experience more barriers from partial access to resources, training and networking. Age and disability-related biases affect women farmers in areas where they require training, agricultural technology and extension services (Sango, 2022). In rural areas, these women are impacted by denied access to market services and infrastructure (Tacoli, 2003; Sultana et al., 2024). These studies in developing countries such as Tavenner and Crane (2019), Sachs (2023), and Tavenner et. al. (2025) buttressed the impact of intersectionality on women's agriculture. Hence, the intersectionality framework can be applied to evaluate gender inequality among agro-pastoralists in North-Eastern Nigeria.

Several studies emphasize the important role of intersectionality due to its ability to highlight women's experiences in their place of work (Addinsall et al., 2023; Bryan et al., 2023; Anwer & Chaudhary, 2024; Opoku-Mensah et al., 2025). Intersectionality plays an important role in understanding women's involvement in economic activities by feminist geographers (Mott, 2016; Collins et al., 2021; Hall, 2022). These feminist geographers defy traditional economic frameworks by emphasising the unpaid work unduly done by women and encouraging a more inclusive approach to economic policy in space and place. These insights into social injustice and inequality create human empathy in various sectors and institutions that bring about social change. Simon & Hasan (2025) explain how women's work is shaped by patriarchy and gender inequality and how these issues should be addressed. There is a need for women's inclusion in policy formulation to address social identities and experiences. Programs targeted at interventions for women agro-pastoralists should provide training and resources through capacity building to curb all forms of bias. This social justice and equality can be achieved through women's economic empowerment, which leads to improved communal living and promotes community participation. This study addresses gender inequalities among rural farmers and livestock keepers and the challenges of women's empowerment. These are products of intersecting social determinants including social norms, access to economic and social resources, encounters with gender-based discrimination, and the concepts of equity and inclusion (Carr, 2008; Quisumbin &Pandolfeilli, 2010).

The intersectional framework highlights the need to consider several individualities and their intersections when examining women's economic participation. This approach recognizes how gender, race, ethnicity, class, space and place, and other identities intersect to produce unique experiences of gender inequality and subjugation (McDowell 2009; Maclean 2013; Fickey & Hanrahan, 2014). It also considers the power imbalances affecting women and girls disproportionately and suggests collective actions necessary to influence transformative changes in laws, policies, and programming to achieve enduring gender equality.

The World Bank (2006) looked at the concept of women's economic empowerment (WEE) at policy and agency levels. Women's economic empowerment is women working and competing favourably in the market. The WEE concept also deals with female labour force participation (FLFP), decision-making power and autonomy, as well as education, and gender inequality in social norms. Women's economic empowerment implies that there are equality and benefit to women from decent work and social security; including time control, control of resources, lives, and bodies; and a significant participation in economic decision-making from the individual, household to international institutions (United Nations, 2024). In analysing the labour force, female labour force participation, productive and non-productive work hours, and paid/unpaid earnings are measured. For critical analysis, factors responsible for women's poor work participation and social justice need to be addressed to bring about social change which can subsequently promote equal roles and opportunities for women and men in society.

Hypotheses

- There is no significant relationship between demographic and socio-economic factors on land ownership among male and female agro-pastoralists.
- There is no significant relationship between time spent on agriculture and livestock activities and the typical day activities of the respondents.

Methodology

Study Area and Methods

The two states (Bauchi and Gombe) under study are found in the North-eastern part of Nigeria with GPS coordinates of 10.7761ºN and 9.9992ºE; 10.3638ºN and 11.1928ºE, respectively. Three local government areas were selected from each state, which comprised Dass, Kirfi, Tafewa Balewa, Akko, Billri, and Kaltungo (Figure 1). The selected local government areas (LGAs) and households were derived through a multistage random sampling method. Purposive sampling was applied in the first stage in the selection of Bauchi and Gombe States from North-eastern Nigeria. The random sampling method was applied to select six (6) Local Government Areas in the second stage from the selected states engaged in agriculture and Livestock production, and they were further divided into political wards. The third stage entails the division of each political ward into blocks comprising 10 housing Units. The final stage entails using random sampling for selected households in each block through the Microsoft Excel random number function. The study population of 3041 consist of males and females, agricultural and livestock farmers. The key informant group comprised 16 males and 21 females, making it a total of 37 key informants. Qualitative data undergoes transcription and is coded according to assigned categories for logical explanation.

The study applied mixed methods, which combined qualitative and quantitative methodologies for data collection. The use of questionnaires and interview guides was administered to the sampled population. The study ensured that both the responses of males and females within selected local government areas were analysed and reported.

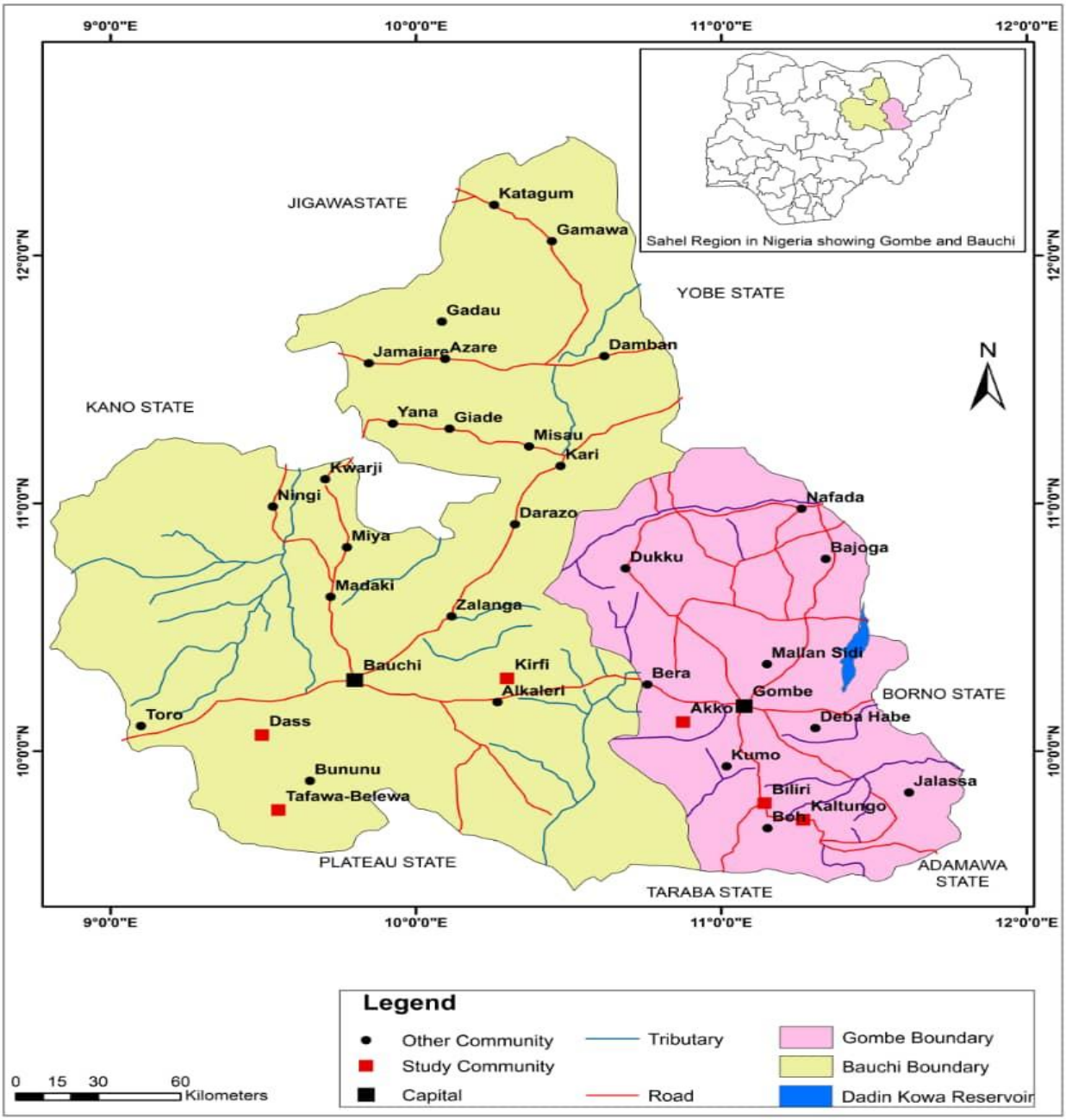

Figure 1: Selected Communities in the Research Area

The collected data instruments were analysed using the Statistical Package for the Social Sciences (SPSS 23 version). ArcGIS 10.1 was used for map production. Simple descriptive statistics, simple and stepwise regression, and Analysis of variance were used in the analysis of data. The step-wise regression technique measured the relative importance of selected social, economic, demographic, and agricultural/livestock production variables on gender quality time management among agro-pastoralists in the selected states and their LGAs. Statistics stated as:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + bnxn + e$$

Where Y = Dependent variable (Asset Ownership)

a = Constant

b_1 b_2…. bn = partial regression coefficient

x_1, x_2..., xn = independent variables (demographic, social, economic, agricultural/ livestock-related).

Y (ownership of land) = F (demographic, social, economic, agricultural and livestock-related)

Thus: Y = F (Gender, monthly income, main occupation, Decision Maker in (Number of children, Household Expenditure, Health care, Agricultural land, Livestock grazing, Agricultural production input, Types of crops grown, Crop marketing, Livestock purchase/Sales, Borrowed loan, Transportation) and Extent of community involvement.

Table 1: Number of Respondents by Selected Local Government Area in the States

Local Government Areas	Respondents	
	Frequency	Percentages
BAUCHI		
Dass	506	17
Kirfi	507	17
Tafawa Balewa	503	16
GOMBE		
Akko	512	17
Billiri	503	16
Kaltungo	510	17
Total	3041	100

Results and Discussion

Gender Attitude among Agro-Pastoralists in the Study Area

The acceptable behaviour of males and females is reported through the interview guide and focus group. Acceptable gender norms reflect the verbal and non-verbal rules guiding societal behaviour about their actions, appearance, thinking and feelings. The findings in the study area reveal that traditional norms and religion influence women and the girl child. Odalonu et. al. (2024) made a similar finding depicting the influence of patriarchal norms and culture in the study area. Denial of educational opportunity, child marriage, exclusion from outdoor economic and social activities and the lack of property rights are common problems faced by women and girl children. Key informant (KI1) reported that:

"The tradition in our community does not allow women to go out and farm, but girls can go to farm together with their father. That means farming is an occupation for men only, while women engage in small businesses at home, like buying and selling palm oil and frying bean cake, popularly known as Akara, which is made from soya bean"

Deduced from the focus group discussion, all domestic and caregiving responsibilities, which include cooking, dish and clothing washing, child/children caregiving, and all household tasks, are women's role and responsibilities while men provide for the welfare of the household. The males in this part of the country are the head of the household, and so, all household decisions are made by him, although in some circumstances, women are involved in household decisions. Changing gender roles and norms are perceived in the study area with the statement of a key informant from her life history (KI2):

"Social norms and traditions in this community have less influence on attitude and behaviour towards the roles of both men and women in contemporary times. The roles that were reserved for men only are sometimes done by women, while those reserved for women only were also done by men. Some men sometimes do some domestic work, while some women also work to generate income for the family. For instance, women engaged in small businesses, farming, pastoralists, trading, vendors, etc., to earn a living and generate their income".

This study's results show that women and girl children are plagued by some traditional norms and religion which deny them empowerment opportunities, especially in economic and social activities. Assets deficiency and education is a challenge commonly faced by the female gender. Rosenberg and Edmeades (2023) ascertain that men have more power roles than women. Women's role is mainly towards caregiving and household responsibilities, while men are seen as income earners for the family. Other scholars such as Onyekanmi (2005) and Adeniyi (2020) also concur with the findings of this study. However, some changes were identified by women who reported that in contemporary times, some male roles are performed by females and vice versa in some communities. With economic and educational empowerment, there is an improvement in women's autonomy and decision-making at all levels (Van Laar et al., 2024).

The quantitative household questionnaire analysis, on gender attributes among the respondents engaged in agriculture and livestock production, is depicted in Table 2.

The characteristics of both genders about the type and number of years in their main occupation are depicted. Spatially, across the selected local government areas, the majority of respondents are females and a few males. The highest numbers of female respondents were found in Kirfi LGA in Bauchi State and Kaltungo in Gombe State, while the male respondents were more in Dass LGA in Bauchi State and Billiri in Gombe State. The farmers and pastoralists make up the majority of the respondents in the study area. The males are more into farming, while the females are more into livestock production and trading. This is suggestive that there is a significant gender division in agricultural practices, which is likely a reflection of traditional gender roles and power dynamics in rural communities. Here, livestock rearing is often associated with women's responsibilities while men focus on farming activities (Ogunlela & Mukhtar, 2009; Oseni et al., 2014). Very few respondents are employed in the public and private sectors. The public sector has more males in employment, and females are more likely to work in the private sector. Dass and Akko LGAs have the highest number of respondents with full-time employment in Bauchi and Gombe States, respectively. A large number of respondents are working full-time in their various occupations and have been engaged in such occupations for over 10 years. Most of the respondents with more than 20 years of working experience are found in Kirfi and Billiri LGAs in the study area.

In the study area, ownership of farmland plays a vital role in sustainable agricultural/livestock production. Due to farmland fragmentation, most farm holdings are of a small size. Most of the farmlands are scattered in the area and are made up of 1-5 small-sized farms. Almost half of most farmlands are owned by male spouses/partners, as reported by the female respondents. The gender disparity is clearly shown in relation to ownership of land and livestock. Males have a higher percentage of ownership of assets (land) than females. With the denial of land ownership rights, especially among rural poor women, it is not surprising to observe that more women are engaged in livestock production than the men. A small proportion of respondents have joint ownership of farmlands as well as farmlands which are owned by family members. Crops produced in the study area span from cowpea, groundnut, millet, rice, sorghum, and soya bean.

Livestock production within the study area entails having between 1 and 5 livestock. A large percentage of female respondents are owners of livestock. Livestock is reported by females as another form of livelihood which supports their small crop production (Zecca & Saima, 2025). It is noteworthy to report that these women are more into small livestock production. Most large livestock are reared by men since they require taking these livestock outside

the homestead. The small livestock are reared close to or at the homestead, where women spend most of their time in this part of the country. More than half of the respondents are those who share ownership of these livestock with their spouse, spouse alone and livestock belonging to family members (Bonis-Profumo et al., 2022). Large livestock reared include cattle, chickens, ducks, goats and pigs. The women depend on this additional livelihood to augment their income from crop farming, especially in areas where the norms and culture deny the women the right to ownership of farmlands.

The participation of women in the agricultural sector is significant to food security in their households and communities in this Northern region of Nigeria, as shown in Table 4. The main factors influencing their participation include culture and gender norms, education, income and accessibility to agricultural facilities/infrastructure. The result depicts that more than 60% of households are involved in food crop production, with 72% of the female respondents involved in food crop farming activities. Similarly, over 77% of female respondents are also involved in livestock production. This shows that there is mixed farming among the agro-pastoralists in the study area. The result is that women are, to a large extent, highly involved in livestock production. Both genders contribute 73% of those who are into livestock rearing in both Bauchi and Gombe states. Homestead rearing of livestock is mostly associated with females than males, in addition to their other household activities. This includes dairy and poultry animals, which source their food around the neighbourhood or are fed by the women in their homestead, in addition to their other household tasks.

This implies that women often handle daily tasks like cleaning, watering, feeding, milking, and caring for young animals. While men may be involved in larger livestock and decisions related to sale or investment, women often play an important role in the daily management of smaller livestock kept closer to the home (SDC, 2000; Ali et al., 2022; Gbolagade, 2024). Most of the produce from these livestock is utilised for household consumption, and the surplus is sold and serves as a source of income for the women. Livestock grazing and marketing of the products are some of the activities in which the male respondents are involved in the study area.

Table 2: Gender and Occupational Attributes in the Study Area

		Selected Local Government Areas						Total
		Dass LGA	Kirfi LGA	Tafawa Balewa LGA	Akko LGA	Billiri LGA	Kaltungo LGA	
Sex of Respondents	Male	128	126	123	124	126	124	751 (25%)
	Female	378	381	380	388	377	386	2290 (75)
Main Occupations	Farming	245	138	242	165	313	288	1391 (46%)
	Livestock Production	160	313	175	317	162	164	1291 (42%)
	Trading	93	55	72	28	9	40	297 (10%)
	Public Sector	2	1	13	2	13	3	34 (1%)
	Private Sector	6	0	1	0	6	15	28 (1%)
Type of Main Occupation	Full-Time	427	391	351	492	459	389	2509 (83%)
	Part-Time	79	116	152	20	44	121	532 (17%)
Number of years in Main Occupations	Less than 10 Years	342	117	292	251	112	214	1328 (44%)
	10-20 Years	111	267	153	162	238	186	1117 (37%)
	Above 20 Years	53	123	58	99	153	110	596 (19%)
Total		506	507	503	512	503	510	3041 (100)

It is further deduced from household participation in farming and livestock activities that a significant number of women are engaged in food crop production and small livestock production. Homestead rearing is mostly attributed to women in the study area. These women also represent the high proportion of farmers engaged in subsistent agriculture (Small-scale farming). This type of farming is mainly for household consumption. This corroborates FAO's (2014) research that family farms are mainly managed by women who are a vital part of family labourers. This is the additional task carried out by women in rural communities.

Most respondents state that they are also involved in non-farming activities such as processing, manufacturing and marketing of agricultural products. Others include wages earned from local employment within the communities in Bauchi and Gombe states. Rural dwellers in the study communities who have no access to farmland or livestock account for those who do not engage in farming activities. Their non-farm activities include trading, selling handicrafts, manufacturing, construction, and transportation, amongst others. These are sustainable ways of supplementing household income, improving rural economic growth, employment, wealth, and even the distribution of the population. This income serves as an insurance against reduced farming income and the challenges encountered in the agricultural production. Higher proportions of participants in non-farm activities are females who carry out these activities within their homestead. These activities are other sustainable ways to earn more income and improve the rural economy (Asfaw et al., 2017; Kehinde & Ogundeji, 2023; Sadiq et al., 2023). Some of the non-farming activities include trading and manufacturing that take place in the homes of these respondents.

Table 3: Ownership of Farmland/Livestock by Gender in the Study Area

		Sex distribution of respondents		
		Male	Female	Total
Ownership of most Farmlands	Self	541	433	974 (32%)
	Spouse/Partner	91	1300	1391 (46%)
	Self and spouse/partner jointly	52	316	368 (12%)
	Other household member	67	241	308 (10%)
Ownership of Livestock	Self	324	1131	1455 (48%)
	Spouse/Partner	124	315	439 (14%)
	Self and spouse/partner jointly	205	630	835 (28%)
	Other household member	98	214	312 (10%)
Total		751	2290	3041 (100%)

Table 4: Household Participation in Farming/Livestock Activities by Gender in the Study Area

Respondents Participation		Sex of Respondents		
		Male	Female	Total
Participation in Food crop farming	Yes	536	1355	1891 (62%)
	No	215	935	1150 (38%)
Participation in Livestock Production	Yes	505	1703	2208 (73%)
	No	246	587	833 (27%)
Participation of respondents in Non-farm economic activities	Yes	335	1226	1561 (51%)
	No	416	1064	1480 (49%)
Total		751	2290	3041 (100%)

Gender Participation among Agro-pastoralists in the Study Area

Table 5: Regression Model on Land Ownership among Male and Female Agro-Pastoralists

Model	R	R Square
1	.808[a]	.653

P- value at 0.05 level of significance.

At a significant level of 0.05, fifteen predictors were able to explain 65% of ownership of land between both genders in agricultural/livestock production. The ownership of land is one of the major prerequisites to engage in agriculture and livestock production at the grassroots level. Several independent factors depict a significant relationship between demographic and socio-economic variables among agro-pastoralists at a P value of 0.000. These factors include monthly income, decision-making ability regarding crops marketing, main occupations, decision-making ability regarding borrowings, decision-making ability regarding agricultural land use, extent of involvement in decision-making in the village committees, decision-making on the use of transportation facilities, decision-making on number of children birthed, decision-making on livestock purchase, gender, decision-making on health care, decision-making on household expenditures, decision-making regarding livestock raising/grazing, decision maker agricultural production input, decision-making on types of crops grown. The degree of freedom (Df) (15, 3025) has an F-Value of 378.829, where $P < 0.05$.

Table 6. ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	423.071	15	28.205	378.829	.000b
Residual	225.218	3025	0.074		
Total	648.289	3040			

The regression and ANOVA models presented in Tables 5 and 6 reveal an R^2 value of 0.653 and an R of 0.808, which is statistically significant at a probability level of 0.05. The regression result indicates marked differences in gender participation due to ownership of land. This is a required asset that allows most agro-pastoralists to engage in farming or livestock activities. Factors such as income, decision-making and the extent of involvement affect their performance in this economic sector at sixty-five per cent (65%). The null hypothesis, which states there is no significant relationship between

demographic and socio-economic factors on land ownership among male and female agro-pastoralists is rejected, and the alternative hypothesis is accepted.

Gender Attitude and Time Management among Agro-Pastoralists in the Study Area

Time spent by males and females with respect to their usual day activities is captured as a typical day for the respondents in this study (Table 7). The time is measured in terms of hours, and this spans from less than 3 hours to over 14 hours of various working activities per day (24 hours). Sleeping/resting time is used to evaluate the workload of both genders in the study area.

The data reveal that males have more sleep/rest hours than females. The respondents who have less than 5 hours of sleep are more females than for males. The sleeping time of 5-9 hours is more for females than males. Other sleep/rest hours above 9 hours were reported by more males than females. This implies that time management among agriculture and livestock producers shows that women have less time for sleeping/resting compared to their male counterparts. Women's responsibilities start early before dawn, with household unpaid tasks, which include water and fuel (firewood) collection. These tasks prepare the household for the day's activities. The survey finding further depicts that in the study area, more males than females work less than 5 hours. More women are working longer hours (above 10 hours per day) than 27% of males. This study also measures the primary sector's economically productive working hours. More females are working less than 5 hours per day in this sector. For working periods above 5 hours daily, the results show that more males have more time to spend working in this sector compared to women, who have less time devoted to this sector. This can be attributed to other unpaid activities that women are engaged in, resulting in time poverty in economic work. More females than males are not involved in the primary sector of economically productive work.

Household tasks and caregiving among women were reported to account for more of their time. These unpaid activities are the major constraints confronting rural women and small-sized farm-holders in agriculture/livestock production. The measures to overcome time poverty will result in food security among poor women agro-pastoralists. The findings from this study area reveal a large proportion of the respondents who do not participate in secondary and tertiary economically productive work. This can be attributed to the lack of major industries and servicing firms in the study area. There are fewer women than men in these two sectors in Gombe and Bauchi states. Most of this is attributed to customs and norms, as well as the long hours spent on household and caregiving activities that women carry out within the study area. Female respondents play a significant role on the time spent in unpaid household work. Some proportions of male respondents are not involved in these activities, unlike all the female respondents who are actively involved in this type of work. About 55% of males who take part in any form of unpaid work spend less than 3 hours on that work compared to women who spend the same hours on unpaid work. Over 77% of females work between 3 and 14 hours per day, while about 24% of males work the same number of hours. This suggests that females spend longer hours on unpaid work such as fetching water and fuel, cooking, caring for children and the elderly than on productive activities. The males spent more time on economically productive or paid work such as farming and cow rearing. Longer hours (above 15 hours) per day represent women respondents working more than men. The males spend an average of 5-9 hours daily in their activities. In economically productive activities, women are seen spending less time due to their heavy time investment in unpaid household responsibilities/tasks. Men are not engaged much in unpaid household work (less than 3 hours daily) in Gombe and Bauchi states. The observed numbers of men who carry out such activities are mostly young boys and men in the family. This is reaffirmed in research on time spent on tasks between men and women (Pierotti et al., 2022; Mani et al., 2024). Ajah's (2013) and Adeyonu's (2012) research are consistent with this finding that women spend less time on farming activities.

The model in Table 8 shows the time management across gender in the study area. The result depicts the factors that influence the daily activities of both male and female respondents.

Table 7: Hours Spent Working on Various Activities by Gender

Work/Activity	**Time spent (Hours)**	**Sex of Respondents**	
		Male (%)	**Female (%)**
Sleeping/Resting	Less than 5 hours	15.0	23.3
	5 to 9 hours	65.3	69.9
	10 to 15 hours	14.5	6.3
	over 15 hours	5..2	0.5
Work per day	Less than 5 hours	21.2	18.4
	5 to 9 hours	51.1	32.5
	10 to 15 hours	26.5	38.1
	over 15 hours	1.2	11.0
Primary Sector Economically Productive Work	Less than 5 hours	38.9	61.3
	5 to 9 hours	39.0	24.0
	10 to 15 hours	7.6	2.5
	over 15 hours	5.2	0.1
	Not Applicable	9.3	12.1
Unpaid Household Work	Less than 3 hours	.55.0	22.1
	3 to 14 hours	24.0	77.9
	Over 14 hours	0.0	0.0
	Not Applicable	21.0	0.0
Total		(100)	(100)

Table 8: Step-Wise Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.695[a]	.483	.483	.350
2	.778[b]	.606	.606	.306
3	.816[c]	.666	.666	.281
4	.834[d]	.695	.695	.269
5	.840[e]	.706	.705	.264
6	.845[f]	.714	.714	.261
7	.847[g]	.718	.718	.259
8	.849[h]	.721	.720	.258
9	.849[i]	.721	.720	.257

Predictors: (Constant), (a) working hours per day,(b) Time spent in tertiary sector economically productive work, (c) Satisfaction with leisure time, (d) Time spent in primary sector economically productive work, (e) Time spent in secondary sector economically productive work time, (f) Attendance at trade and business association, (g) Time spent in non-productive work, (h) Time spent working in unpaid household work, (i) Membership of village/community development committee.
Dependent variable: Typical Day (Daily Activities)

Table 9: ANOVAa

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	520.04	9	57.782	871.523	.000j
Residual	200.956	3031	0.066		
Total	720.996	3040			

Time spent on a typical day is determined by the time spent on productive and non-productive activities, household and domestic activities, time spent on leisure and membership of associations and development committees. 48% of time spent working per day determines a typical day for agro-pastoralists in Bauchi and Gombe states. The additional 24% is explained by the time spent in tertiary, primary and secondary sectors, leisure time, attendance at trade and business associations, time spent in non-productive and unpaid household work, and membership of village/community development committee. The step-wise model showed clearly that out of the ten predictors entered into the model, nine predictors were statistically significant at 72%. Membership in trade and business associations was excluded from the model. The null hypothesis is rejected, and the alternative hypothesis shows that there is a significant relationship between time spent on agriculture and livestock activities and the typical day tasks of the respondents. This explains the experiences of time management of an agro-pastoralist's typical day at a significant level of less than 0.05. The degree of freedom (df) (9, 3031) has an F-value of 871.523, where P is 0.000 (Table 9).

The regression model depicts factors that affect typical daytime management in the area under study. The nine variables entered into the analysis showed their influence on effective time management in Bauchi and Gombe states. The time spent working on daily tasks affects how the respondents will be economically productive. Women who spend more time working mostly on unpaid tasks will lack economic power in their households. Similarly, Adeyeye et al. (2021) find that women farmers spend more time working than men in diverse activities. Men who engage more in large-scale productive agro-pastoral activities will have an economic advantage compared to women in the household. The number of hours spent on primary, secondary and tertiary activities further put the women at a disadvantage. In communities having traditional and social restrictions on women's movement and activities, a small percentage of women are engaged in these levels of economic activities. Men have more time to rest and engage more in leisure and social activities, especially as members of associations and community development. The multitasking in women's daily activities, such as farming, rearing animals, and domestic and household duties, highlights gender bias and poor time management.

Conclusion

This study concludes that gender norms and traditions are some of the hindrances experienced more by the female gender in the area under study. The men are bestowed with power roles and are the economic providers, while marginal roles are assigned to women, depicting gender bias and differences. The types and scale of the primary occupation among the respondents speak volumes about the reason to address some gender norms, culture and traditions. In view of economically empowering the food and livestock producers and rural families, the gender roles need to be progressive and evolve to embrace more economic roles being assigned to women. Gender plays a significant role in agriculture and livestock production; it emphasises the assigning of income-generating roles to men in this sector. The gender difference observed in time management shows that women spend less time on economically productive activities than men. This disempowers their roles in the household, family and community. The level of participation of both genders in economic activities and ownership status of assets also depicts gender inequality in the study area.

Among the agro-pastoralists, time allocation and management in this sector are favourable to men, as observed in the states. Female time is allocated to more domestic and household tasks than to large-scale farming/livestock activities. Poor leisure time is experienced by females with poor engagement in educational, social and community development activities in their respective localities. This study recommends a progressive change in the roles of women, creating more time allocation to educational and economic empowerment technologies to reduce their time poverty in this sector. Creating opportunities for decision-making power among women and empowering them to be more involved in community development projects and programmes will foster positive gender attitudes and better time management. Initiation of gender interventions, policies, and sensitization should be implemented at the grassroots level.

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