

Full Length Research Paper

Standard of living, gender dimensions and women empowerment among Fulani pastoralist in Kaduna State, Nigeria

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The participation of women in dairy farming varies according to region, culture, and socioeconomic status. These dynamics restrict women's abilities to exercise equal access and control over resources. Utilizing descriptive statistics and data from 316 clustered Advancing Local Dairy Development in Nigeria (ALDDN) Project beneficiary communities, this study assesses gender roles and empowerment among pastoralists in Kaduna State. Results showed that 62% of the respondents were female, while 38% were male, with a mean age of 35.5. About 22% of the women pastoralists can read and write in Hausa. Approximately 50% are agro-pastoralists, with 84% owning agricultural land. The living standard results showed that 44% live in mud but iron-roofed houses, grazing under uncertainties (98%). In terms of access to resources, about 52% of the female respondents belong to a cooperative, and 32% have savings. Major household decisions are taken by men, as indicated by 85% of the female respondents. About 68% of the cattle are owned by husbands only, while backyard gardening is predominant among women. Thus, education, training, and promotion of digital credit options have the potential to increase women's empowerment. Therefore, interventions should be targeted towards improving their access.

Key words: Women, pastoralist, household, access.

INTRODUCTION

In 2021, Nigeria's agriculture sector employed three in every four workers in rural areas and contributed 26.84% of the country's gross domestic product (GDP), mainly from crops (91.23%), livestock (0.12%), forestry, and fishing (8.65) (National Bureau of Statistics NBS, 2022). Eighty-six percent of the country's livestock is found in the savannah areas, which make up 80% of the national

land mass (NAERLS and FMARD, 2021).

Agricultural production is a critically neglected issue in Nigeria, where livestock and its products are important sources of livelihood, food, income, and nutrition; yet, dairying has not been fully exploited and promoted. The country has about 19 million cattle head, low domestic milk production of about 500,000 metric tons, and a

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supply deficit of 1,200,000 metric tons, resulting in a large portion being imported to cover the gap, which is responsible for high prices of processed milk that many cannot afford (FAO, 2021). However, there is a growing demand for meat and milk fueled by increases in purchasing power, population growth, and urbanization in the country. For instance, Whitton et al. (2021) indicated that there is a 5.3% annual growth in meat consumption, and a per capita milk consumption of 10L/person, which is way below the 40L/person globally.

Within pastoralist systems, dairy plays an important role in supporting women and improving their financial situation. Thus, Veeranna and Singh (2004) reported that women are the prime decision-makers in dairy production activities such as the utilization of milk, care of pregnant animals and calves, bringing of fodder, and feeding concentrates. This assertion was supported by Spanevello et al. (2020) who found that in several countries, women are responsible for milking the cows, making butter, cheese, and other byproducts. Accordingly, Akhtar and Khan (2000) suggested that dairy production is originally understood as a female activity. Perhaps it is for this reason that small-scale dairy projects have been popular investments for development projects aiming to improve the lot of rural women.

However, as Batool et al. (2014) highlight, the participation of women in dairy farming varies according to the region, culture, and socioeconomic status. In Nigeria, the Fulani pastoralists are a highly gender-differentiated society (Onyima, 2016). In this society, there is a high consciousness of the existing differences of being male or female; most communities are made up of male-headed individual households (usually father, husband, or a brother) who maintain control over the household, provide basic necessities, and make decisions on the disposal or purchase of cattle and transfer milking rights to women. Boys can go to school, while girls are expected to participate or acquire household knowledge from their mothers and marry early to raise children. The Nigerian Dairy Development Programme (NDDP, 2018) indicated that males take complete care of the animals – feeding, tending, visits to clinics, and all other transactions involving the cattle, while boys aged six and above tag along with their fathers. In the event that a woman inherits cattle from a deceased father or purchases them herself, a male relative is always in charge of the cattle. Dairy production was among the sectors encouraged to improve household income. The traditional marketing system, which involves local dairy products such as *madara* (fresh milk), *nono/kindirmo* (sour milk), *manshanu* (local butter) and *chuku* (cheese), is dominated by fulani women and girls who are directly engaged in the collection, processing and sale of the dairy products.

Women pastoralists play a major role in dairy farming, including milk production, processing, and marketing.

However, not all women control the sale of milk and its

products. Prevailing social norms inhibit women pastoralists from accessing productive resources such as knowledge, skills, markets, and dairy inputs. Limited mobility, resulting primarily from existing gender dynamics and power relations, restricts women's abilities to exercise equal access to and control over financial and other productive resources. In areas where several dairy-processing plants exist, women most often do not receive the money in hand for the milk sold. Consequently, intra-household inequality can undermine women's status beyond the home. Doss (2011) narrated that women in male-headed households are seldom recognized as beneficiaries of agricultural research and development programs or adopters of improved technology. As a result, technical training and extension programs primarily focus on men.

Nigerian agricultural policies acknowledge the distinct roles of men and women in agriculture, aiming to promote gender-sensitive approaches that ensure equal access to and control of productive resources. These policies are designed to bridge gender gaps, reduce women's vulnerability to biases in agriculture, and address unequal gender power dynamics. While Kaduna state has endorsed these policies with a focus on gender consideration in the planning, programming, budgeting, and implementation of agricultural programs, there is currently no specific policy targeting women dairy farmers in the state.

On the other hand, several studies on pastoral women in Nigeria highlight the critical role they play in pastoral systems amidst growing awareness of gender equality. However, a significant part of the literature focuses on income-generating activities, climate change, access to extension services, and power relations (Aderinoye-abdulwahab et al., 2013; Aderinoye-Abdulwahab and Chingonda-Nkhoma, 2015; Badejo et al., 2017; Onyima, 2019; Aderinoye-Abdulwahab et al., 2022). Nevertheless, Sen (2001) stated that one of the most important issues in gender development is women's empowerment.

Although women play key roles in smallholder dairy farming, information on gender roles in dairy farm management, access, and control over resources is lacking. This sometimes leads to a poor responsive approach in proactively identifying, understanding, and implementing projects or interventions to address gender gaps and overcome historical gender biases in policies and interventions among women pastoralists.

Objectives

This study was carried out to assess gender roles, access and control in dairy farming in Kaduna State. The main objectives include:

1. Describe the socioeconomic characteristics of the respondents;

2. Determine the living standard of the respondents;
3. Describe the gender aspects of the respondents; and
4. Describe the level of women empowerment in dairy farm household in the study area.

LITERATURE REVIEW

Livestock is an essential component of Nigeria's complex farming system, currently playing a key role in food supply and food security. Livestock resources also sustain poor marginalized landless people by providing draught power, transportation, nutrients for poor soils, income generation and diversification, and financial capital, all contributing to the overall well-being and resilience of many communities.

An assessment of poverty reduction strategies for Nigeria showed that the greatest effects would come from subsectors such as livestock, for which the growth in food demand is highest (Omamo et al., 2006). One premise for the sector's potential as an engine for growth is that the current distribution of livestock is more egalitarian than that of other assets, such as land. Livestock also substantially contribute to household nutrition and the livelihoods of poor women. Animal-source foods have been identified as some of the highest-valued foods, containing essential nutrients missing from plant sources; even small amounts can have noticeable positive impacts on the health of nutritionally vulnerable populations. Thus, livestock plays a key role in improving food security and nutrition in poorer households.

The distribution of vegetation in Nigeria is broadly categorized into tropical rainforest (salt-water swamps, freshwater swamps, and the high forest) or savannah (Guinea, Sudan, and Sahel). Consequently, 60% of the country is made up of the Guinea and rainforest, which are unsuitable for livestock production due to the presence of tsetse fly and trypanosomiasis. Notably, though, livestock distribution is lopsided towards the northern part of the country, with more than 90% of the cattle population concentrated in the Sudano-Sahelian zones. There are mainly two indigenous breeds of cattle in Nigeria: Zebu (including Bunaji or White Fulani, Rahaji, Adamawa Gudali, Wadara, Azawak, and Sokoto Gudali) and Taurine (N'dama, Keteku, and Kuri). Keteku breed is common in the southwest due to its tolerance to trypanosomiasis, while the Kuri breed is found in the northwest (Pagot, 1992; Babayemi et al., 2014). The average milk yield from the traditional system is 1.5 L per day; during the dry season, this figure drops to about 0.5 L per day but could increase to between 1.5 L per day with supplementation using cottonseed cake (Ilu et al., 2016). This is because the indigenous cattle reared in the country are mostly beef type, resulting in low milk yield.

Exotic breeds such as Holstein Friesian, Brown Swiss, Jersey, and their crosses are common in more intensive, specialized dairy systems. Crossbred cattle produce an average milk yield of 10 L per day, while the pure breed

(Friesian) is about 30 L per day. Pastoralists own about 95% of the cattle population and produce most of the milk. The milk produced is mostly traded in the informal sector or consumed by producer households; less than 10% of this milk is delivered to processors. Commercial farms (with pure and crossbred cattle) produce less than 5% of the total milk produced.

Notably, over the years Nigerian government has implemented several livestock policy reforms aimed at developing the livestock subsector. These include:

1. The National Livestock Transformation Plan (NLTP): A ten-year implemented in 2019, to curtail the movement of cattle and boost livestock production.
2. National Livestock Breed Improvement Programme (NLBI): implemented in 2021 to address the development and transformation of the livestock value chain, upgrade indigenous breeds of livestock, and increase their milk yield.
3. National Dairy Development Programme (NDDP): a programme initiated by Sahel Consulting to enhance the livelihoods of participating Fulani dairy farmers.
4. National Pasture Development Programme (NAPDEP): flagged off in 2022 to reduce farmer-herder clashes.

Development of Gazetted Grazing Reserves and Promotion of Modern Ranches, Ruminant Livestock Intervention Programme, Monogastric Livestock Intervention Programme, National Animal Disease and Pest Control Programmes.

Livestock Productivity and Resilience Support Project (L-PRES): is a 6 Year Project to improve livestock productivity, resilience and commercialization of selected value chains.

METHODOLOGY

Study area

The study was carried out in Kaduna State. The State lies between latitudes 9 and 11° N of the equator and between longitudes 6° E and 8° E of the prime meridian. The average annual rainfall and humidity are 1,272.5 mm and 56.64%; respectively while the average daily minimum and maximum temperatures are 15.1 and 35.18°C. The mean annual rainfall shows a marked decrease from South to North (1,524 to 635 mm). The State has 23 Local Government Areas (LGAs), with a population of about 6,113,503 (National Population Commission, (NPC), 2006), and it was estimated to increase to about 9,798,258 in 2021 based on the National Population Commission (NPC) annual growth rate of 3.18%.

Sampling technique and size

A multi-stage sampling procedure was used to generate data for this study. The first stage involved the purposeful selection of 3 Local Government Areas (LGAs) (Zaria, Sabon gari and Makarfi) in the State based on the significant number of Fulani settlement in the areas. A list of pastoralists registered with the Advancing Local

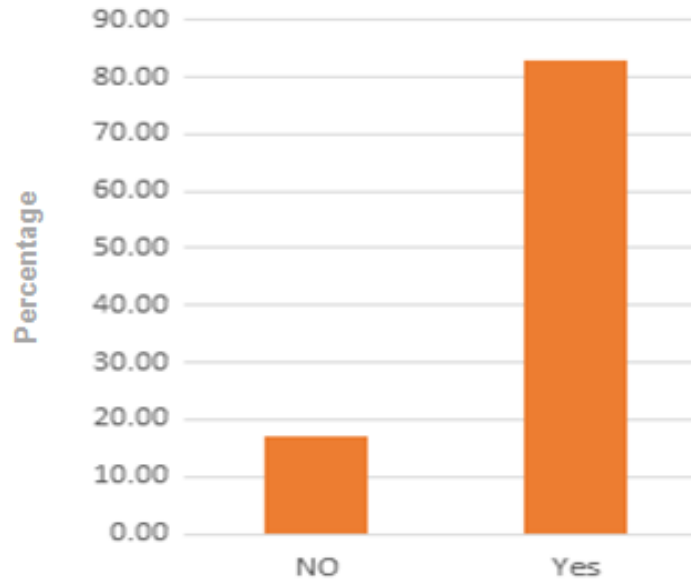


Figure 1. If children in formal school.

Dairy Development in Nigeria (ALDDN) Project was collected from the project key informant. The project estimates an outreach of 2678 beneficiaries. Secondly, for a comprehensive coverage, the sample size was derived using RAOSOFT online sample size calculator with confidence level set at 90% and margin of error set at 10%. The minimum sample size for the project site at the cluster level is 316 for the beneficiary communities. In the last stage, 81, 123 and 112 respondents were randomly selected in Zaria, Sabon gari and Makarfi LGAs respectively. It is noteworthy that only respondents that agreed to participate in the study were interviewed.

Data collection and analysis

Data required for this study was obtained from primary sources through individual interview among pastoralists. A structured questionnaire was used to collect quantitative data using Computer Assisted Personalized Interview (CAPI) by well-trained researchers from the respondents. Data from secondary sources such as journals, published and unpublished documents, statistical reports of Food and Agriculture Organization (FAO) and National Bureau of Statistics was used to review relevant literature. Descriptive statistics such as mean, percentage and frequency were used for description. The results were also presented graphically using pie chart, bar chart, line graph and histogram.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Amid the 316 sampled, about 62% of the respondents were female with an average age of 33 years. While 38% were male with an average age of 38 years (Table 1). On the other hand, majority of the farmers (female 94% and male 95%) are married where the mean number of adults, children and adult women in a household is 4, 7

and 2 respectively. In Table 1, only about 12% of the female respondents have finished primary school, while about 11% of the male had secondary school certificate. In retrospect though, about 22% of the women pastoralists can read and write in Hausa against 19% of their male counterparts. There are however more children attending primary school (83%) in government/public schools (90%) in the studied areas (Figures 1 and 2). Notably the only available primary school is the government owned as shown in Figure 3. The result in Figure 4 revealed that majority of the Fulani (74%) are sedentary, while Figure 5 showed that a moderate number of the respondents are agro-pastoralist (50%). Cultivated land is under private ownership as indicted by 84% of the respondents (Figure 6). However, most holdings are small, the average size is approximately 1.8 hectares (Table 2).

Living standard of the respondents

The result in Figure 7 showed the housing condition of the respondents, majority (44%) live in mud but iron roofed houses (Figure 9). Although the Fulani try to leave outside the mainstream of modernization, there is an indication of a gradual process of modern housing where houses are built with more sophisticated building materials (Figure 10), such as corrugated iron roofing sheets, improved floor and wall finishing and built bathrooms. Notably there are about 24% of the respondents that are living in the traditional "ruga" settlement, where in the studied area the houses are cone shaped made from mud walls, thatched roofs and wooden or metal doors (Figure 11). Evidently in this case there were no sanitary conditions as bushes were used

Table 1. Socioeconomic characteristics of the pastoralist in the study area.

Variable	Female			Male		
	Frequency	%	Mean	Frequency	%	Mean
Age						
18-27	71	36.41		26	21.31	
28-37	75	38.46		39	31.97	
38-47	24	12.31	32.93	25	20.49	38.59
48-57	16	8.21		19	15.57	
58-67	8	4.10		10	8.20	
68-77	1	0.51		3	2.46	
Total	196	61.71		121	38.29	
Marital status						
Divorced	1	0.51		-	-	
Married	183	93.85		115	95.04	
Single	2	1.03	NA	6	4.96	NA
Widowed	10	5.13		0	0	
Total	196	100		121	100	
Level of education						
Islamic school	151	77.84		95	77.87	
Primary	23	11.86		8	6.56	
Read and Write (other language)	1	0.52	NA	1	0.82	NA
Secondary	17	8.76		13	10.66	
Tertiary	2	1.03		5	4.10	
Total	194	100		122	100	
Ability to read						
Yes	126	64.62		60	50.00	
No	70	36.84		60	50.00	
Total	196	100		120	100	
Household size						
<i>Both male and female children</i>						
1-5	146	46.79				
6-10	118	37.82				
11-15	33	10.58	6.76	95		NA
16-20	9	2.89				
21-25	4	1.28				
26-30	2	0.64				
Total	312	100				
<i>Adults</i>						
1-5	250	79.11				
6-10	56	17.72	4.03			
11-15	7	2.22				NA
16-20	3	0.95				
Total	316	100				
<i>Adult women only</i>						
1-5	298	96.13				
6-10	11	3.55	2.35			NA
11-15	1	0.32				
Total	310	100				

NA: Not applicable.

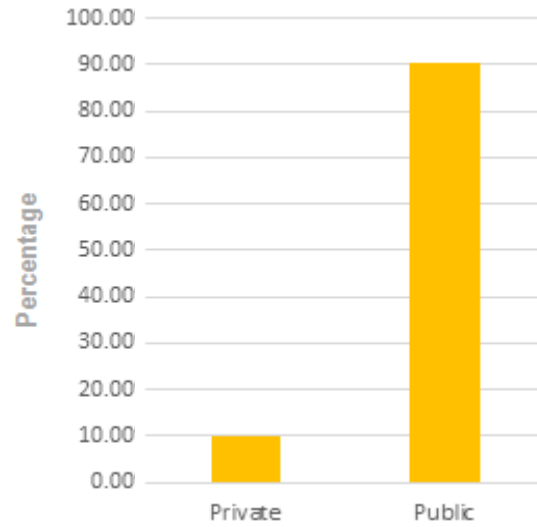


Figure 2. Type of school.



Figure 3. Government nomadic primary school.

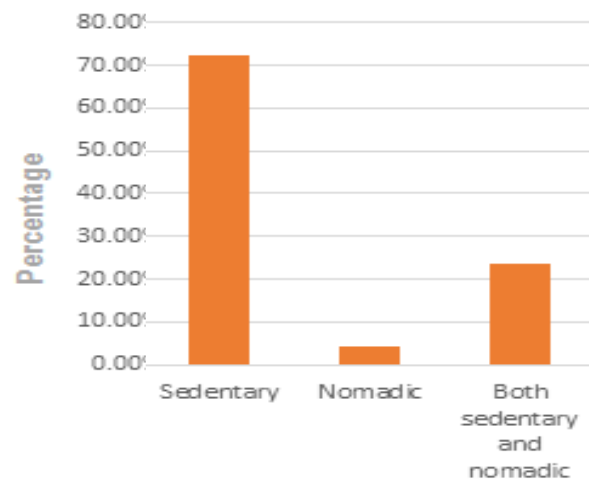


Figure 4. Type of settlement.

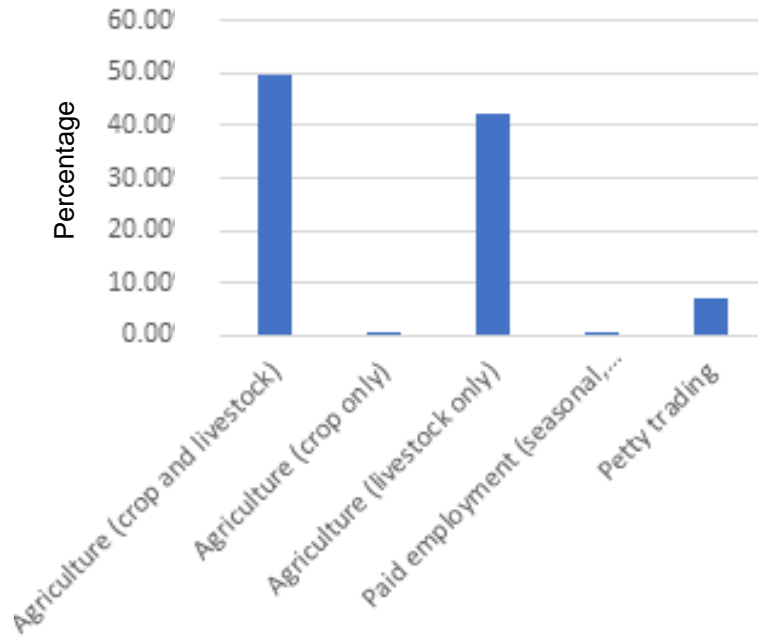


Figure 5. Main occupation.

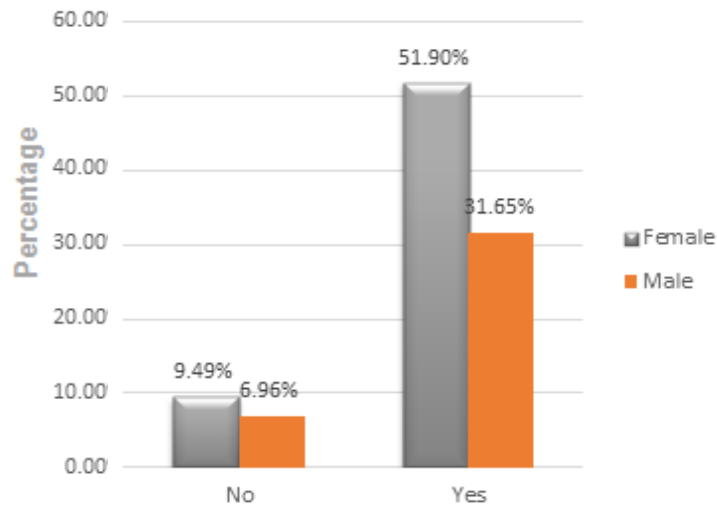


Figure 6. Land ownership.

Table 2. Farm size of the respondents.

Size	Frequency	%
<0.5	52	22.22
0.5-1.0	30	12.82
1.1-1.5	40	17.09
1.6-2.0	38	16.24
2.1-2.5	30	12.82
2.6-3.0	44	18.80
Total	234	100

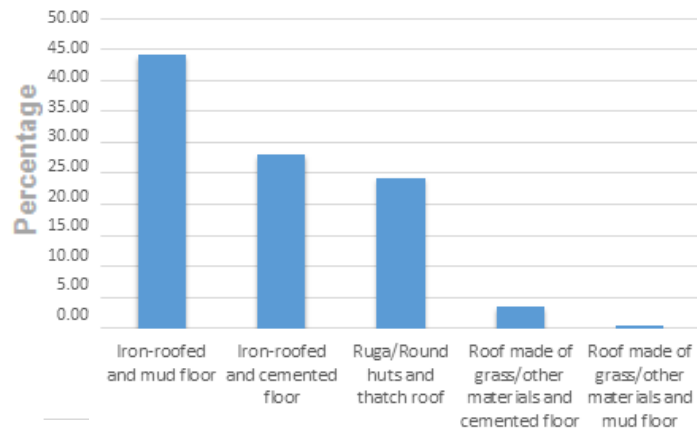


Figure 7. Housing condition of the respondents.

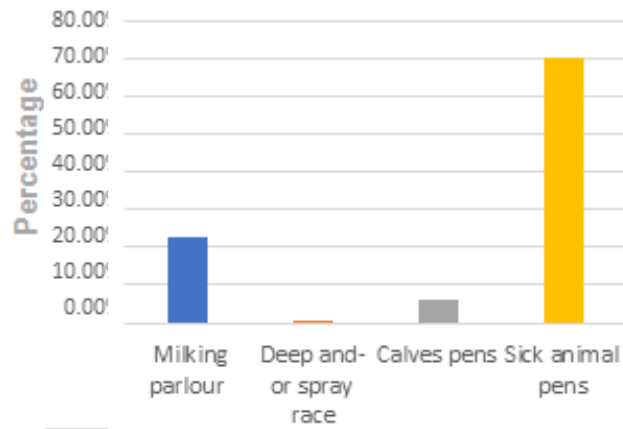


Figure 8. Available facilities in Ruga.



Figure 9. Housing type (mud +corrugated roof).



Figure 10. Housing type (brick+corrugated roof).



Figure 11. Housing type (thatch).

as toilets. The result agrees with the findings of Abolade et al. (2019) in their study of housing informality of fulani nomads in Ogbomoso region, Nigeria. On the other hand, about 61% of the respondents have a permanent kraal for their cattle; other facilities available are sick animal pens (23%) and a milking parlour (71%) (Figure 8).

Livestock production systems among the Fulani remains semi-intensive (Figure 12) grazing on open rangelands complimented with supplementary feeds during the dry season. Access to pasture and water expands particularly during the dry season in search for feed and water. Almost all (98%) of the pastoralist interviewed graze under uncertainties for pasture and water, as access to water is restricted to streams (about 78%) (Figures 13 and 14).

Gender differences and access to social resources

About 52% of the female respondents belong to one cooperative or the other, where 40% are registered with the Local Government Authority (LGA) against 32% and 28% of the male counterpart respectively (Table 3). There are indications that these cooperatives are functioning as 50% of the female cooperatives meet either weekly or fortnightly compared to only 26% of the men (Figure 15). The cooperatives demonstrated a democratic system particularly among the women, where 70% of the leaders were elected and 52% were chosen by consensus among the men (Figure 16). Leadership tenure-ship lasts for about 3-4 years in both cases.

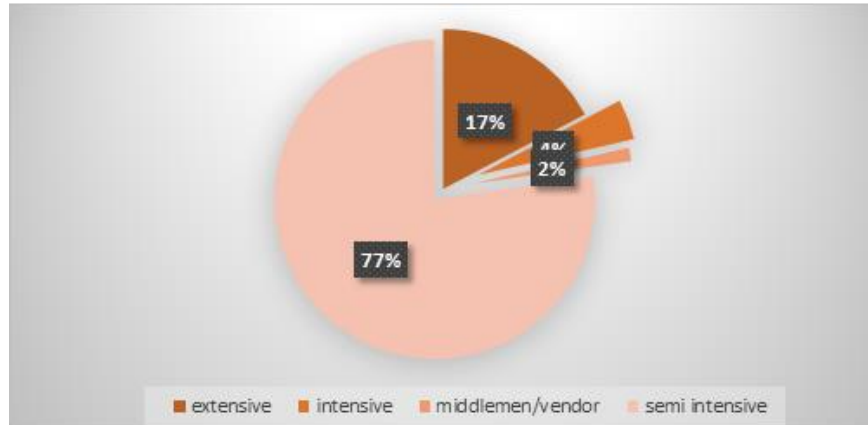


Figure 12. Management system.

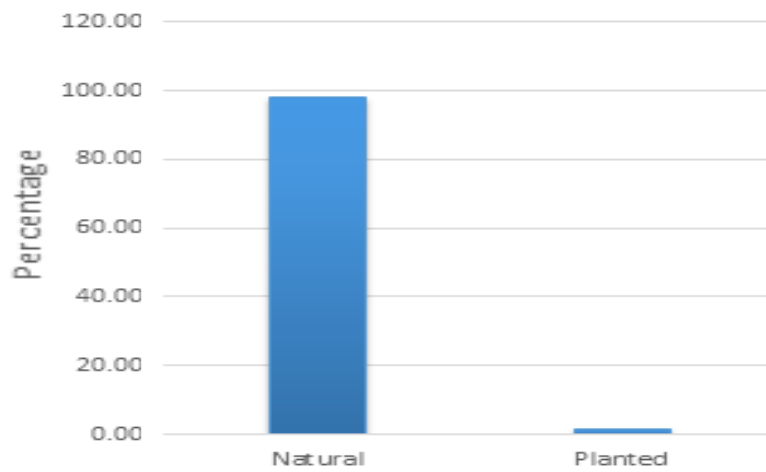


Figure 13. Type of pasture.

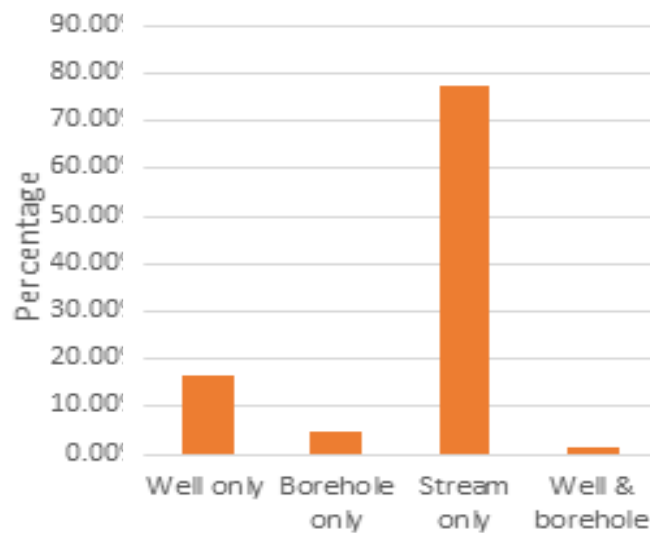
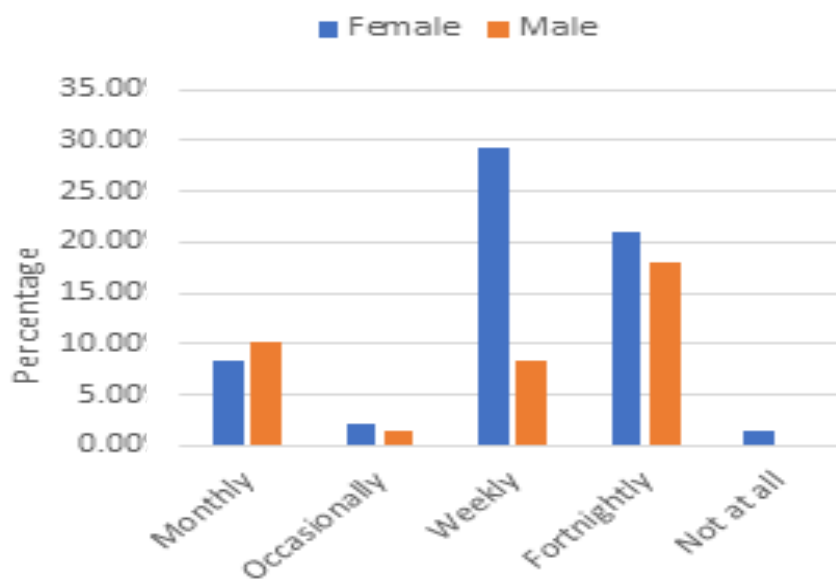


Figure 14. Source of water.

Table 3. Social resources.

Variable	Female		Male		Total	
	Frequency	%	Frequency	%	Frequency	%
Cooperative membership						
Yes	166	52.53	100	31.65	265	83.86
No	30	9.49	20	6.33	51	16.14
Total	196	62.03	120	37.97	316	100
LGA registration						
Yes	107	40.07	74	27.72	181	67.79
No	59	22.10	27	10.11	86	32.21
Total	166	62.17	101	37.83	267	100
Access to credit						
Yes	5	1.58	2	0.63	7	2.22
No	189	59.81	120	37.97	309	97.78
Total	194	61.39	122	38.61	316	100
Access to extension support						
Yes	7	2.64	4	1.51	11	4.15
No	158	59.62	96	36.23	254	95.85
Total	165	62.26	100	37.74	265	100

**Figure 15.** Frequency of meetings.

However, in terms of access to credit, a greater proportion of the cooperative remain outside the financial sector where about 97% had no access to formal credit in both cases (Table 3). To further buttress their non-inclusion, the cooperatives have savings activities which are mostly informal (such as Adashe, monthly contribution

and social contribution). From the table there is inadequate access to extension services by the cooperatives as indicated by 96% of the respondents.

In Figure 17, about 39% of the female respondents have savings compared to 26% of the male respondents. While 79% reported that they save their income at home,

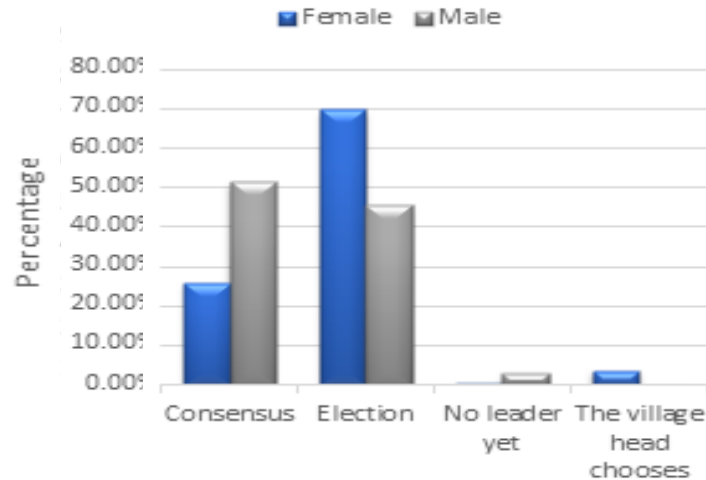


Figure 16. Choice of leaders.

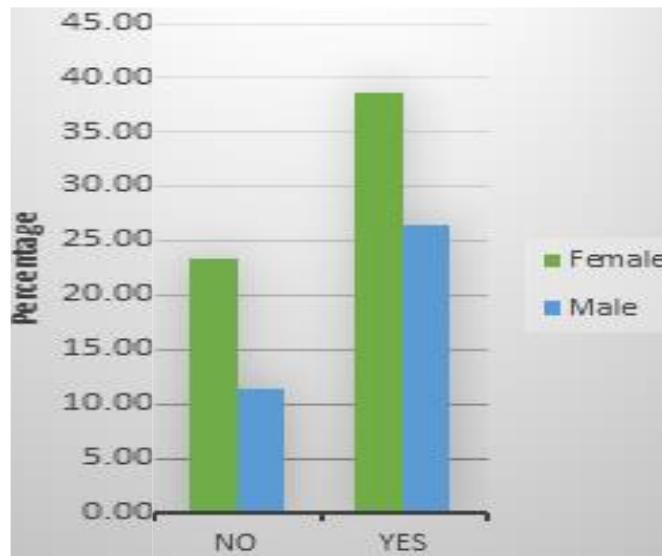


Figure 17. Ability to save.

only a hand full (17%) save in the bank (Figure18).

Gender differences and feeling of decision making in the household

The result for gender difference in different aspect of household found that in the mainstream of the households, ethno-cultural characteristics has a sharp categorization of the household into sex and gender. Thus, women and girls carryout the daily domestic tasks of fetching water, cooking food, caring for children and washing clothes (Figures 19, 20 and 21). Once these tasks are accomplished, the women can work on their own account or go to town for visits (Figure 22).

Major household decisions are taken by men as indicated by majority of the female respondents: when it comes to borrowing and use 77% and 73% (respectively) of the women indicated that it is the sole decision of the household head (Figure 23), further agreed by all male respondents. As the case may be, majority of the respondents borrow either from family and friends (47%) and their respective cooperatives (41%) (Figure 24).

Household food consumption is another aspect in which women are disempowered, as indicated by 88% of the women, male household head makes the decision on milk consumption (further agreed by all male respondents). On the other hand, children consume more milk (66%), hence malnutrition was not visible among children and women during qualitative interview. On the

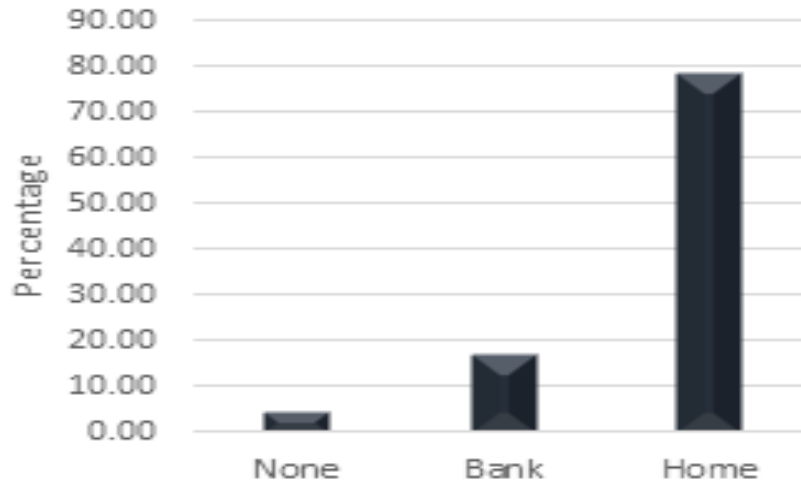


Figure 18. Savings domicile.



Figure 19. Washing.



Figure 20. Fetched water/cooking.



Figure 21. Taking care of children.



Figure 22. Leaving for town.

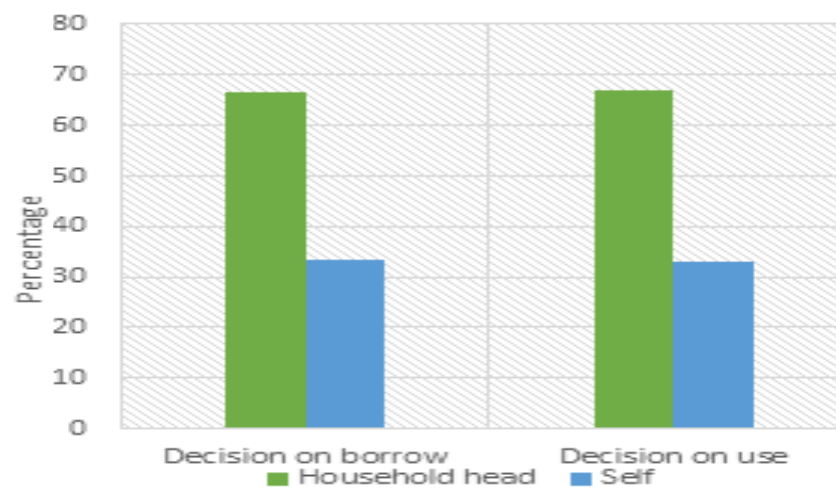


Figure 23. Household decision on borrowing.

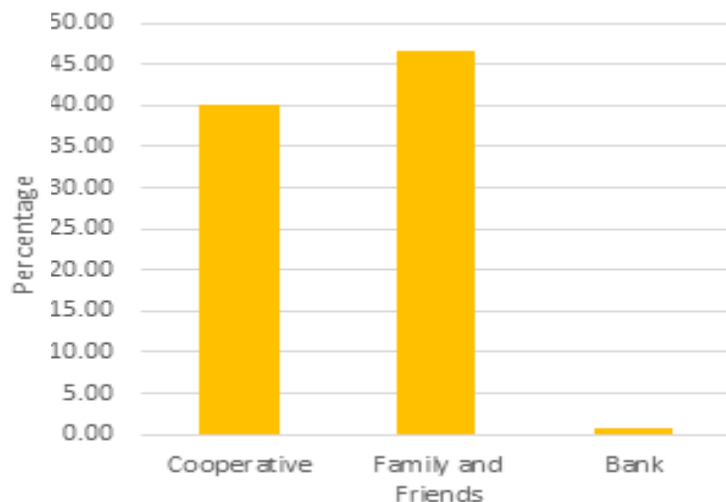


Figure 24. Household source of credit.

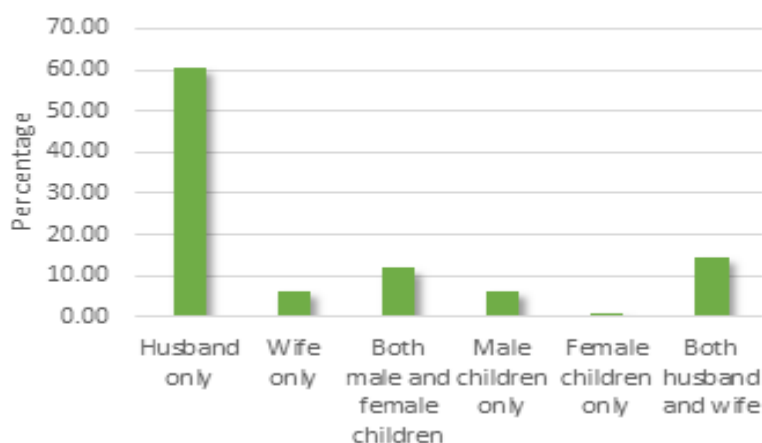


Figure 25. Asset (cattle) ownership.

average the household consumes between 1-2 L in a day, which does not change in the dry or wet reason. The most prevalent method of milk storage are plastic containers and unrefrigerated, however all respondents pasteurize milk before consumption. Milk consumed in the household is locally prepared through fermentation; however there are others that prefer factory produced yoghurt.

Gender differences and access to productive resources

At the household level, women do not have authority to own or sell cattle, generally if for any reason a woman owns cattle (mostly through inheritance) ownership is transferred to male head of the household. The work involved in livestock rearing is strongly demarcated,

typically women take responsibility of milking at the homestead assisted by the girl child, while chicken are also managed by women. The result in Figure 25, clearly demonstrated the dominance of male over female when it comes to assets ownership. The result thus revealed that about 68% of the cattle are owned by husbands only, while only 15% indicated that cattle ownership is for both husband and wife. This has implication on women empowerment, since some women may be willing and able to engage in dairy production but are restricted by tradition and custom of their community.

DISCUSSION

The agricultural landscape in Nigeria presents potential for increased productivity, with the majority of farmers being middle-aged, leaving room for younger individuals

to enter the workforce. Yeboah and Jayne (2020) reported that the average age of working-aged individuals involved in farming in Nigeria is approximately 39 years, contradicting previously widely reported data suggesting that the average age of African farmers is 60 years. This demographic shift may be attributed to changing family structures, potentially influenced by a polygamous family system. There is evidence suggesting that the traditional lifestyle and subsequent disinterest in formal education among the Fulani are gradually diminishing. According to Dahiru et al. (2017), Fulani pastoralists hold positive views about education. However, their low participation in formal education is influenced by a perception of fear that the system may pose a threat to their social capital.

Additionally, among the Fulani pastoralists, there is a gradual transition from a nomadic to a semi-nomadic lifestyle, with increasing participation in agro-pastoralism. Ultimately, there has been a shift towards a more sedentary community lifestyle, where only the herdsman and their cattle move seasonally during dry periods (Mbih, 2015). Additionally, Afolayan et al. (2019) reported that the majority of Fulani in Nigeria are agro-pastoralists who maintain a pastoral nomadic lifestyle.

The mobility of herds during the dry season in search of pasture has been a longstanding characteristic of the Fulani way of life. However, in the study area, where Fulani are engaged in agro-pastoralism, labor is hired to assist with this mobility. The wages for this labor are paid in the form of a two-year-old female cow. This practice aligns with the findings of Majekodunmi (2014), who reported that poor pasture and declining water supplies, exacerbated by the prolonged harsh dry season, compel herders to relocate their cattle to regions where the dry season is shorter and its impacts are less severe. In the family system, the social status of other members is determined by the man. The male figure typically has access to cattle, land, and inheritance rights, which significantly influences the mobility pattern of the household. Furthermore, if the man holds a royal title, it further determines the status of his wives and children within the community. In the Fulani ruga system of Kaduna State, it is rare for a woman to cultivate crops in the field due to the restrictions imposed by cultural and religious norms. There is specialization only to the extent that growing vegetables is done predominantly by women during the rainy season, women plant a small plot of vegetables which provides a supplement to household vegetable supplies. Important vegetables produced as backyard gardening include Cabbage, Spinach, Lettuce, Kenaf, Roselle, Moringa, Okra and Pumpkin. The production activity is strictly for household consumption rather than a business activity.

CONCLUSION AND RECOMMENDATIONS

The study delineated gender roles, access, and control of resources in small dairy households. The Fulani are agro-

pastoralist, polygamous, and remain relatively backward in terms of formal education. They maintain a moderate standard of living with access to animal care facilities. Grazing on open ranges signifies their dependence on nature for fodder, leading to a lifestyle marked by uncertainties. Fulani women are socially empowered but remain outside the formal economy, disempowered in household decision-making, and lack access to productive resources. This demonstrates that hailing from a livestock-producing community does not necessarily result in gainful engagement in livestock production. Education, training, and the promotion of digital credit options through formal financial institutions, as well as exposure to information media, may have the potential to increase women's empowerment. Building on the results obtained from this study, there is a need for a revised and more effective nomadic education system to be developed. Agricultural policy reforms for range management systems should be centered on more localized, integrated, participatory learning, and adaptation. Effective initiatives undertaken by development agencies to improve women's education, skill acquisition training, and access to information could enhance women's empowerment, although these should be implemented strategically to avoid backlash. Programmes designed to promote Fulani women's empowerment should be carefully crafted to avoid perpetuating or deepening inequalities.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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