



Women's involvement in livestock production in Yoni chiefdom of Tonkolili district, Sierra Leone

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Abstract

Animal husbandry is an essential part of farming and an advantageous production system with incredible opportunities to raise living standards for a sizable portion of the rural population. Rural women in sub-Saharan Africa have been actively involved in livestock production due to the importance of animals in the family farming system. The study examines the contribution of women to livestock production in the Yoni chiefdom, Tonkolili district. A total of 384 women involved in livestock production were randomly selected from eight sections of the Yoni chiefdom. Data were collected using pretested and validated semistructured questionnaires. The result of the study reveals that most women of Yoni chiefdom always participate in livestock management practices with a mean grand participation index of ($x=2.36$). Women always participate in the milking of animals ($x=2.88$), the marketing of poultry eggs ($x=2.77$), cleaning of pens and cages ($x=2.76$), marketing of live poultry ($x=2.68$), marketing of milk and milk products ($x=2.67$). The regression results show that education, marital status, family size, experience, farm income, and access to credit significantly influenced women's participation in livestock production. The most significant factors that inhibit women's participation in livestock management practices are poor economic conditions, low literacy, cultural norms, lack of self-confidence, and violence against women. Therefore, the government should launch several livestock development projects to help rural women. Microfinance banks should make loans to rural women interested in livestock businesses under eased restrictions.

Keywords: Constraints, Inhibiting factors, Livestock management, Training, Participation

Introduction

Animal husbandry is an essential part of agriculture and an advantageous production system with incredible opportunities to raise living standards for a sizable portion of the rural population (Singh et al., 2004; Thornton, 2010). Livestock is often regarded as a vital resource for rural residents, providing enough opportunity to boost family income (Batool et al., 2014; Quisumbing et al., 2015). Livestock has always

been an integral part of the sub-Saharan African family agricultural system, and rural women have always been the primary caretakers of these animals (Fonjong and Athanasia, 2007). Men and women from rural areas are equally involved in livestock management (Ayoade et al., 2009; Nosheen et al., 2011; Rais et al., 2013). Women's participation in livestock husbandry varies by location, culture, religion, and economic standing (Batool et al., 2014).

However, women's significant role in agriculture and household activities has been greatly underestimated and neglected (Ogunlela and Mukhtar, 2009; Doss, 2014). Women play a vital role in agricultural development, particularly in the production of animals (McDermott et al., 2010; Alabi et al., 2019; Adesogan et al., 2020). Most rural women make their living through livestock farming (Sesay et al., 2022a).

Smallholder farming systems have always included women in livestock production to increase family income and ensure nutritional security (Altieri et al., 2012; Wodajo et al., 2020). Women, who make up about half of the rural population, do the bulk of the work in animal husbandry (Baiphethi and Jacobs, 2009; Ogunlela and Mukhtar, 2009). Cleaning animal shelters, treating sick animals, raising calves, providing enough nutrition and water, milking animals, and processing milk into ghee, yoghurt, and butter are all part of their daily routine as livestock farmers (Batoool et al., 2014; Andaleeb et al., 2017; Kabir et al., 2019). The care and grazing of animals, the harvesting of feed, cleaning of animal shelters, and the processing of milk are all important responsibilities that fall squarely on the shoulders of the women of rural areas (Herath, 2007; Rathod et al., 2011; Kathiriya et al., 2013). They are responsible for practically every conceivable aspect of work in the agricultural and livestock industries (Zahoor et al., 2013; Patil and Babus, 2018). Women perform the majority of important jobs in the agricultural livestock industry (Arshad et al., 2013; Herrero et al., 2013). The care and management of livestock have traditionally been seen squarely within women's purview (Kristjanson et al., 2014).

Women in rural Sierra Leone, as in many other regions of the world, play an important role in the livestock industry (Sesay et al., 2022). Women spend more time daily tending to and managing livestock than men. It has been hypothesized that rural women spend most of their time caring for animals after caring for the house and children (Upadhyay, 2005; Luqman et al., 2013). However, despite all these women have done, their achievements remain largely unrecognised

nationally (Herrero et al., 2013; Mottet et al., 2018). They have limited access to veterinary care and information on true breed survival and artificial insemination techniques (Galiè et al., 2019; Krell et al., 2021). This prevents them from making informed decisions about matters as important as their animals' diets, health, sanitation, and the care of pregnant animals and newborn calves. Due to their ignorance of livestock management techniques, their productivity in the workplace suffers (Ogunlana, 2004; Luqman et al., 2013). In many parts of the world, rural women lack access to education and resources that can help them raise and care for animals (Luqman et al., 2014).

Women make up roughly half of the country's population and benefit the development of the other half. Therefore, the prosperity and expansion of a nation are directly related to the status of its women and the progress they make in society (Zahoor et al., 2013). It is crucial for both livestock development and the safety of food supplies that rural women participate in livestock-related activities (Njuki and Miller, 2013). Because of this, there is a pressing need for a quantitative assessment of women's role in livestock management. Currently, very little information is available regarding the involvement of women in various livestock farming activities in the Tonkolili district. Therefore, this study examines the contribution of women to livestock production in the Yoni chiefdom of the Tonkolili district.

Methodology

Study Area

The study was conducted in the northern area of Sierra Leone, in the Tonkolili district. It is centrally located in the nation, sharing boundaries with seven of its 15 districts. It is divided into two relief belts: highlands and lowlands. The climate is somewhat similar to the national average. A humid semi-equatorial climate characterizes it with two diverse seasons. It rains from May to October, then dries from November to April. Agriculture, mining, and business are the primary

livelihood alternatives, representing the district's socioeconomic characteristics of the district. Tonkolili district has the largest poultry population in the country, although household farmers commonly rear sheep and goats.

Sampling Procedure

The study was carried out in Yoni chiefdom, consisting of 16 sections, of which 8 were randomly selected. A total of 384 respondents were sampled after randomly selecting six villages from each of the previously chosen sections and then selecting eight women from each of those villages actively involved in livestock management. Data were gathered with the assistance of semistructured questionnaires that were pretested and validated before use.

Data analysis

Simple descriptive statistics such as frequency counts and percentages were used to describe socioeconomic characteristics, livestock ownership, and the restrictions faced by women in livestock management. The participation of women was determined using a 3-point Likert scale from; never involved = 1, occasionally involved = 2, and always involved = 3. A mean score greater than or equal to 2.0 was considered significant in the study. A four-point Likert-type scale: to a great extent = 4, to some extent = 3, to little extent = 2, and to no extent = 1, was used to determine the factors that inhibit women's participation in livestock activities. A mean score greater than or equal to 2.5 was considered significant in the study. The prior training area in livestock production was also analyzed and defined using mean score values on a four-point Likert scale: 4= strongly needed, 3=moderately needed, 2= least needed, 1= not needed. A mean score greater or equal to 2.5 was considered significant in the study. The Statistical Package for Social Sciences (SPSS) version 23.0 was used to analyze the data. The information was presented in tables and graphs, focusing on percentages and frequency breakdowns.

Regression analysis

Multiple regression analysis (ordinary least squares) was used to determine women's participation in livestock raising by using a subset of available socioeconomic factors. Following Ayoade et al. (2009), the multiple linear regression model for women's participation in livestock production is built in the following way:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + u$$

Where,

Y	=	Participation Index of the Respondent
X ₁	=	Age
X ₂	=	Educational level
X ₃	=	Marital status
X ₄	=	Family size
X ₅	=	Experience in Livestock production
X ₆	=	Farm income (Le)
X ₇	=	Access to credit
X ₈	=	Extension contacts
b ₁ – b ₈	=	Regression coefficients
a	=	Constant term
u	=	Error term

Results and Discussion

Socioeconomic characteristics of the respondents

Table 1 shows the socioeconomic characteristics of women in livestock production. The result reveals that most of the women in livestock production (59.5%) are between the ages of 31 and 40. The findings are consistent with those of Ayoade et al. (2009) that 56.7% of the women involved in livestock production in Nigeria were middle-aged. These findings also agree with Amin et al. (2009), who found that most respondents associated with the agriculture industry fell into the middle age group.

Most women (68.2%) in livestock production are illiterate. This finding aligns with Sesay et al. (2022b), who stated that 59.5% of farmers in the Tonkolili district of Sierra Leone are illiterate.

Similarly to the findings of Zahoor et al. (2013), most rural women (57%) were illiterate, and (19.8%) had just an elementary education.

Most women (66.7%) in livestock production were married, and most (58.3%) had a household size of 6-10 people. According to the study, 53.1% of women working in the livestock production industry had 11-20 years of experience. This shows that women in the area under study are familiar with the production of animals. Most women (54.2%) in livestock production have a low annual farm income between Le 4000-8000. Like Zahoor et al. (2013), most women had a low annual farm income, whereas just a handful had a high annual farm income. The overwhelming

majority of women who worked in livestock production (87.0%) had no access to any loan facility. These findings are close to those of Zahoor et al. (2013), who discovered that 65.5% of rural women lacked access to credit. The findings are in line with the findings of Ayooda et al. (2009), who found that 86.7% of women active in livestock production did not have access to a credit facility. Most women in livestock production (69.8%) have less contact with extension workers in the study area. Similarly to the findings of Zahoor et al. (2013), only a minority of farmers had access to agricultural extension services, and most farmers did not interact directly or indirectly with agricultural extension service centers.

Table 1. Socioeconomic characteristics of the respondents (n=384)

Variables	Categories	Frequency	Percentage
Age	21-30	35	9.1
	31-40	228	59.5
	41-50	52	13.5
	51-60	38	9.9
	Above 60	31	8.1
Education	Illiterate	262	68.2
	Primary	46	12.0
	Secondary	29	7.6
	Tertiary	47	12.2
Marital status	Single	55	14.3
	Married	256	66.7
	Others	73	19.0
Family size	1-5	77	20.1
	6-10	224	58.3
	11-15	61	15.9
	Above 15	22	5.7
Experience	1-10	37	9.6
	11-20	204	53.1
	21-30	106	27.6
	Above 30	37	9.6
Annual farm income	Up to Le 4500	59	15.4
	Le 5000-10,000	208	54.2
	Le 10,500-15,000	93	24.2
	Above Le 15,000	24	6.3
Access to credit	No access	334	87.0
	Have access	50	13.0
Extension contacts	No contact	268	69.8
	Have contact	116	30.2

Source: Field Survey, 2022

Types of livestock kept by women

Figure 1 shows the livestock species kept by women in the study area. The result shows that the majority of women in livestock production (63.5%) raised poultry, followed by goats (16.4%), sheep (13.3%), and Cattle (6.8%). The

results align with those of Sesay et al. (2022) that most livestock farmers in Sierra Leone owned poultry. The findings also agree with Ayoade et al. (2009), who found that most women involved in livestock production in Nigeria kept chicken as their primary livestock operation, followed by goats and sheep, respectively.

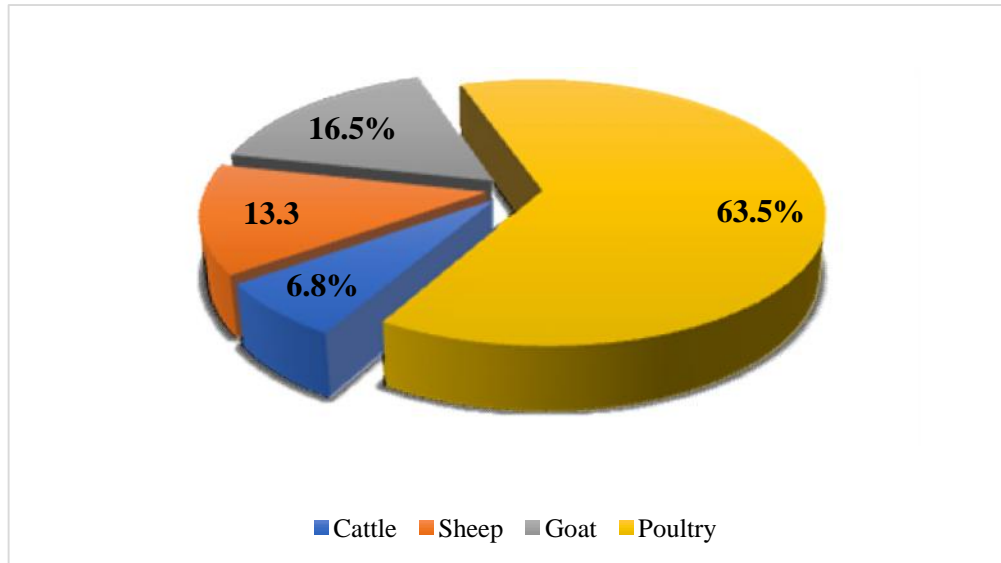


Figure 1: Livestock species owned by women

Reasons for raising livestock by women

Figure 2 shows the reason women raised livestock. The result reveals that women primarily raised livestock for commercial purposes to generate cash (53.6%), followed by household consumption, breeding stock, and religious or cultural rituals. Farmers in the livestock industry

often experience a food shortage during the wet season, so they sell live animals and livestock products to make ends meet. In addition to these necessities, farmers use their income to cover medical bills, pay for their children's education, buy farm supplies, and pay their employees (Sesay et al., 2022a).

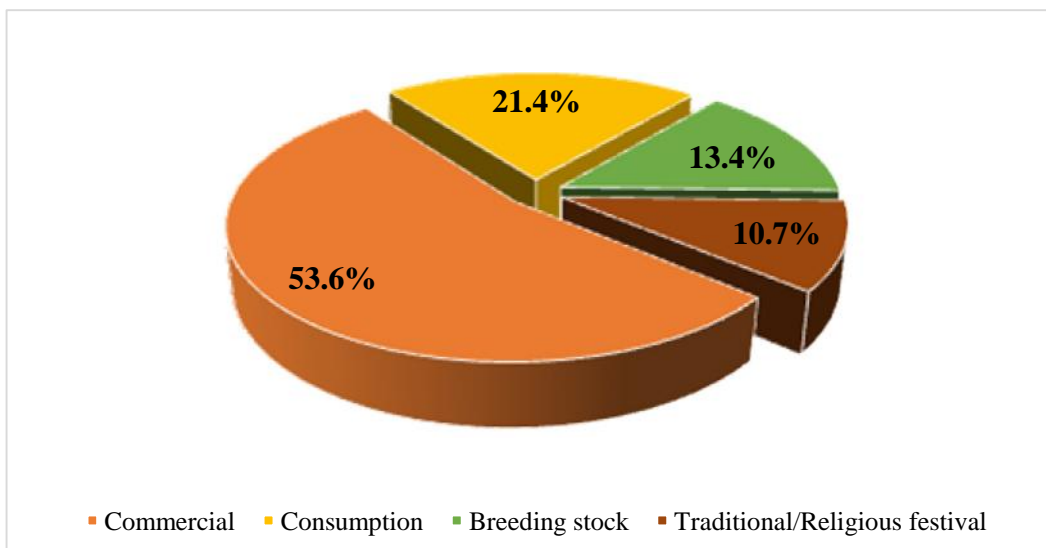


Figure 2: Reason women keep livestock

Level of women's participation in livestock management activities

Table 2 shows that women in livestock production always participate in the following livestock management practices such as milking of animals (x=2.88), marketing of poultry eggs (x=2.77), cleaning of pens and cages (x=2.76), marketing of live poultry (x=2.68), marketing of milk and milk product (x=2.67), collection of manure (x=2.66), egg collection (x=2.64), care of sick animals (x=2.64), feeding of animal (x=2.55), and brooding and breeding of animals (x=2.54). The results are consistent with Ayoade et al. (2009), which state that women always participate in

feeding animals, cleaning pens, cages, and watering. The findings align with those of Saghir et al. (2005), who found that women take part in several livestock management tasks, such as cleaning animal pens, preparing animal feed, milking cows, and baking dung cakes. According to Zahoor et al. (2013), most of the responsibilities for livestock care fall on rural women's shoulders. These responsibilities include watering, milking, cleaning sheds, feeding, treating sick animals, and producing ghee. The fact that women in the research area always participated in cattle management techniques is indicated by the grand mean of the participation index, which was calculated to be 2.36.

Table 2: Participation of women in various livestock management activities (n=384)

Livestock activities	Always (%)	Occasionally (%)	Never (%)	Index	Mean (x)	Rank order
Feeding	58.1	39.1	2.9	596	2.55	8
Tethering	12.2	60.4	27.3	326	1.85	10
Cleaning of pens, cage	78.9	18.0	3.1	647	2.76	3
Collection of manure	68.0	29.9	2.1	637	2.66	6
Watering of animals	9.6	48.4	41.9	260	1.68	11
Milking of animals	90.6	7.0	2.3	723	2.88	1
Grazing of animals	8.3	33.1	58.6	191	1.50	13
Egg collection	65.6	32.8	1.6	630	2.64	7
Fodder collection	3.6	25.3	71.1	125	1.33	15
Vaccination	7.6	33.6	58.9	187	1.49	14
Care of sick animals	68.8	26.3	4.9	629	2.64	7
Brooding and breeding	59.1	36.2	4.7	593	2.54	9
Making animals' sheds	7.6	37.8	54.7	203	1.53	12
Marketing live animals (cattle)	4.9	19.0	76.0	111	1.29	16
Marketing of live animals (goat and sheep)	3.1	26.3	70.6	125	1.33	15
Marketing of poultry	70.3	27.3	2.3	645	2.68	4
Marketing of poultry eggs	76.8	23.2	0.0	679	2.77	2
Marketing of milk and milk product	67.2	32.8	0.0	642	2.67	5
Barn preparation Construction/fencing	2.1	21.1	76.8	97	1.25	17

Note: * = Significant impact if the mean score is 2.0

Source: Field Survey, 2022

Factors that determine women's participation in livestock production activities

Multiple regression analysis (ordinary least squares) was performed to identify the socioeconomic factors determining women's participation in livestock production (Table 3). The general model was considered fit to the data having a significant $F(8, 375) = 369.10$, $p < 0.01$, $R^2 = 0.89$. This shows that the independent variables included in the model could explain 89% of the variation in the factors influencing women's participation in livestock production based on the samples taken.

According to the study findings, there is a positive and significant connection between the participation of women in livestock production

and educational attainment ($p < 0.02$), marital status ($p < 0.01$), and a significant negative relationship with family size ($p < 0.01$), experience ($p < 0.01$), farm income ($p < 0.01$), and access to credit ($p < 0.01$). Education was significant ($P < 0.02$), meaning that the more educated women are, the more probable they are to participate in livestock production. The findings are comparable with those of Ayoade et al. (2009), who stated that education considerably impacts rural women's participation in livestock operations. Marital status is another factor that influences women's involvement ($P < 0.01$); that is, the marital status of women determines the tendency to participate in livestock production. Since most women in the study area are married, they must seek their husband's consent before participating in livestock production as tradition demands.

Table 3: Socioeconomic factors that determine women's participation in livestock production activities

variables	Unstandardized Coefficients	Standard error	T-value	Significant
Constant	1.93	0.04	49.60	0.00
Age (X_1)	-0.01	0.01	-0.38	0.70
Education (X_2)	0.02	0.01	2.27	0.02
Marital status (X_3)	0.07	0.01	6.77	0.00
family size (X_4)	-0.19	0.02	-12.53	0.00
Experience (X_5)	-0.21	0.01	-20.36	0.00
Farm Income (X_6)	-0.05	0.01	-5.23	0.00
Access to credit (X_7)	-0.17	0.03	-5.12	0.00
Extension contact (X_8)	0.02	0.02	0.76	0.45
		R square	Adjusted R square	F statistics
		0.89	0.88	369.10

Factors that inhibit women's participation in livestock activities

Table 4 shows that poor economic condition ($x = 3.66$), low literacy level ($x = 3.55$), cultural norms ($x = 3.52$), Lack of self-confidence ($x = 3.36$), violence against women ($x = 3.14$), male dominance ($x = 3.05$), informal matrilinear rules ($x = 3.03$), and social security ($x = 3.01$) are the most significant factors that inhibit women participation in livestock management practises. These results are consistent with those obtained by Munawar et al. (2013), who discovered that

barriers to women's participation in livestock-related activities include low self-esteem, social insecurity, low literacy rates in the village, social conflicts, and a lack of information from the media. Women's lack of self-confidence results from the low literacy rate, as self-confidence grows with an individual's level of education (Nosheen et al., 2008). The results also align with Butt et al. (2013) that lack of education, poverty, male dominance, social structure, and lack of self-confidence hamper women's participation in agricultural and livestock activities.

Table 4: Factors that inhibit women's participation in livestock activities (n=384)

Factors	To a great extent (%)	To some extent (%)	To a very little extent (%)	To no extent (%)	Mean (x)	Rank order
Lack of self-confidence	59.1	19.8	19.3	1.8	3.36	4
Social security	16.4	70.3	10.7	2.6	3.01	8
Low literacy level	71.1	15.9	10.2	2.9	3.55	2
Social conflicts	23.7	54.4	15.6	6.3	2.96	9
Lack of awareness	18.5	18.5	53.9	9.1	2.46	12
Lack of social interaction	7.6	25.5	57.3	9.6	2.31	14
Cultural norms	63.0	28.4	6.0	2.6	3.52	3
Violence against women	29.2	59.6	6.8	4.4	3.14	5
Poor economic conditions	74.0	20.6	3.4	2.1	3.66	1
Conventional belief system	13.3	53.6	29.7	3.4	2.77	11
Informal matrilinear rules	20.1	67.2	8.1	4.7	3.03	7
Lack of women's organizations	16.4	21.1	52.1	10.4	2.43	13
Lack of legal, economic, and political literacy	23.4	56.8	8.3	11.5	2.92	10
Male dominance	47.7	22.7	16.4	13.3	3.05	6
Women work not recognized	6.5	23.7	19.0	50.8	1.86	15
Low payment of work for women	4.7	18.7	24.2	53.1	1.74	16

Note: * = Significant impact if the mean score is 2.5; Source: Field Survey, 2022

Constraints faced by women in livestock production

Table 5 shows the constraints faced by women in livestock production. The result reveals that inadequate capital (83.3%), followed by limited access to credit facilities (80.7%), control over resources (79.2%), dominance by spouses (77.1%), and cultural or religious beliefs (72.9%) are the main constraints women face in livestock production. The findings align with Ayoade et al.

(2009), who found that the most significant barrier to women's participation in livestock production was a lack of appropriate capital, followed by a preoccupation with domestic responsibility and male dominance. According to Yisehak (2008), women who work in the agricultural sector participate in home production activities such as caring for children, preparing meals, transporting water and fuel, and other similar tasks.

Table 5: Constraints faced by women in livestock production (n=384)

Constraints	Frequency	Percentages	Rank order
Involvement in nonfarm activities	195	50.8	8
Dominance by spouses	296	77.1	4
Less control over resources	304	79.2	3
Social security	209	54.4	7
Cultural/religious belief	280	72.9	5
Inadequate capital	320	83.3	1
Limited access to credit facilities	310	80.7	2
Low literacy rate	221	57.6	6
Lack of local women's organizations	188	49.0	10
Inadequate infrastructure in rural areas	165	43.0	9

Note: Responses are not 100% due to multiple responses of the respondents. Source: Field Survey, 2022

Training areas needed by women in livestock production

Table 6 shows the area of training women in livestock production needs. The results revealed that women needed to be strongly trained in the milking process ($x=3.58$), caring for diseased animals or poultry birds ($x=3.52$), livestock marketing ($x=3.43$), breeding of livestock ($x=3.36$), feeding concentrate ($x=3.05$), and cattle rearing ($x=3.02$). The results are consistent with

Naveed et al. (2009) reporting that management and care of animals with diseases and precautionary measures for disease, feed production, and milk production are the most training needs of women in livestock production. The results are also partially similar to those of Luqman et al. (2013), who revealed that women's training needs in caring for diseased animals or poultry, making feed concentrate, feeding and watering livestock, and selecting livestock or poultry birds.

Table 6. Women in livestock production need training areas (384)

Priority training areas	Strongly needed (%)	Moderately needed (%)	Least needed (%)	Not needed (%)	Mean (x)	Rank order
Caring for diseased animals/poultry birds	65.6	24.0	7.0	3.4	3.52	2
Making feed concentrate	27.3	55.7	11.2	5.7	3.05	5
Feeding and watering of livestock	16.9	26.0	49.5	7.6	2.52	7
Selection of livestock/poultry birds	11.2	25.5	53.6	9.6	2.38	8
Calf rearing	28.6	49.7	16.9	4.7	3.02	6
Milk processing	71.9	17.4	7.8	2.9	3.58	1
Breeding of livestock	61.2	20.3	11.5	7.0	3.36	4
Cleaning and maintenance of animals'/poultry sheds	6.0	15.4	28.4	50.3	1.77	10
Construction of livestock (animals'/poultry) sheds	7.3	32.3	47.1	13.3	2.34	9
Marketing of livestock	54.9	35.9	6.0	3.1	3.43	3

Note: * = Significant impact if the mean score is ≥ 2.5

Source: Field Survey, 2022

Conclusion

The study was carried out to examine the participation of women in livestock production activities and to identify the elements that influence their participation in agricultural activities. According to the findings, most women always participated in livestock management activities. Women are primarily involved in livestock management practices: animal milking, poultry eggs, cleaning of pens and pens, live poultry, marketing of milk and milk products, manure collection, egg collection, care of sick animals, feeding animals, and brooding and

breeding of animals. Education and marital status significantly influenced women's participation in livestock management activities. The most significant factors that inhibit women's participation in livestock management practises are poor economic conditions, low literacy level, cultural norms, lack of self-confidence, violence against women, male dominance, informal matrilinear rules, and social security. The primary obstacles to women's participation in the animal production sector were inadequate financial resources, limited access to credit facilities, less resource control, dominance by spouses, and cultural or religious beliefs.

Therefore, the government should launch several livestock development projects to help rural women. Microfinance banks should make loans to rural women interested in livestock businesses under eased restrictions. Extension agents should provide training programmes for rural women participating in livestock operations with assistance from nongovernmental organizations.

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