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RURAL WOMEN PARTICIPATION IN LIVESTOCK MANAGEMENT: FREEDOM AND CONSTRAINTS

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Abstract

In Pakistan, rural women were the major labor suppliers for domesticated livestock raising, providing monetary revenue and reducing family and farm budgets. Thus, variables affecting women's livestock management involvement are crucial to rural livelihoods. However, rural women's livestock sector involvement factors have received minimal research. To this end, this study examines the factors that influence women's livestock management in Khyber Pakhtunkhwa, Pakistan. To gather data, 200 women were chosen and interviewed face-to-face using multistage sampling. In data analysis, descriptive statistics, frequencies, percentages, and multiple regression were employed. Compared to males (1.16 hours/day), rural women (3.21 hours/day) participate more in livestock management. Women participated more in indoor livestock operations than males in outdoor activities including fodder cutting and milk and milk product selling. Age, livestock raising experience, financial availability, and livestock income determined women's livestock management involvement. The research proposed that government and non-government organizations recognize rural women's livestock

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management contributions and provide credit to boost their engagement in the study region.

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1. Introduction

Livestock is an important sub-sector of agriculture that plays a pivotal role in the development of an economy (Naz and Khan, 2018). Livestock contributes to income and employment generation and food and fuel provision thus having a significant role in rural livelihood support especially in developing countries (Andaleeb et al., 2017). It has been reported that the majority of the poorer households around the world are involved in livestock rearing to attain multiple benefits (Smith et al., 2013). These benefits included economic and social security during the time of crisis as well (Ahmad, 2014; Biradar et al., 2013).

It is acknowledged in the literature that livestock are reared under the various farming systems due to the associated multiple benefits to support rural livelihoods. The literature also shows that in livestock rearing rural women have a great role (Andaleeb et al., 2017; Naz et al., 2018; Ahmad, 2014). Rural women not only perform their household chores like cooking, cleaning, dishwashing, washing clothes, care of elders and children, etc. but also actively participate in managing livestock both at the farm and household level (Naz et al., 2018). Livestock management is predominantly regarded as a women's job around the developing world (Ali, 2016; Batool et al., 2014; Issac et al., 2012; Grace, 2007). However, women's contribution to livestock management is largely ignored in developing countries including Pakistan as well (Ahmad, 2014).

Few time allocation studies have examined women's livestock management engagement nationwide (Ahmad, 2014; Andaleeb et al., 2017; Khan, 2012). According to these studies, women usually spend 2 to 5 hours daily in livestock management activities in rural areas of the country. It has been acknowledged in the literature that women perform almost all of the livestock management activities (Ali, 2016; Uttami and Seruni, 2013; Ahmad, 2014;

Naz et al., 2018; Andaleeb et al., 2017). These activities included mostly feeding animals, watering, shed cleaning, milking, and milk products processing (Naz et al., 2018), etc. which had an active participation of rural women as depicted by several research studies (Naz et al., 2018; Andaleeb et al., 2017; Ahmad and Tanwir, 2013; Khan et al., 2012).

Women's role in livestock management further accounted for the economic and social well-being of the respective households and thus to the respective locality and national accounts as well (Ahmad, 2014). The contribution of livestock rearing to the respective households is comprised of cash income, food, fertilizer, and fuel provision (Issac et al., 2012; Nirmala et al., 2012; Biradar et al., 2013; Naz and Khan, 2017). The results of a study conducted by Hashmi, et al. (2007) in the rural areas of district Toba Tek Singh of the Punjab province showed that due to women's active role in livestock management, poverty has been significantly decreased which showed that livestock rearing contributed towards the provision of cash income along with the food and fuel provision.

The manure provision in the form of farm yard manure from livestock rearing accounted for the increased soil fertility which further boosted crop and vegetable production and thus contributed to rural household food security (Naz and Khan, 2018; FAO, 2015). Making dung cakes from the dung of animals served as a source of fuel in the rural areas which have been used for cooking purposes in the rural areas of the country (Ahmad, 2014). The food, fuel, fertilizer, and cash income provision from livestock rearing thus contributes towards lowering the household and farm budget in the rural areas of the country (Naz and Khan, 2018). All these benefits were enjoyed by the rural households mainly due to the active participation of women in livestock management (Andaleeb et al., 2017; Ahmad, 2014; Khan et al., 2009).

According to the findings, rural households benefited greatly from women's participation in livestock raising. Therefore, it is to everyone's advantage to have more women working in the industry. Yet research is deficient not just in gauging women's participation in livestock management but also in identifying factors that encourage women to participate. This research in Khyber Pakhtunkhwa, Pakistan, tries to fill that void by examining the variables that encourage or discourage women's participation in livestock management. The main goals of this study are to investigate the following questions.

1. To quantify the role that women play in livestock management.

2. To identify the determinants of women's participation in livestock management.

2. Description of Study

The current research study has been conducted in the Khyber Pakhtunkhwa Province of Pakistan. The province is comprised of a total of 24 districts however, recently the area of Federally Administered Tribal Areas (FATA) has also been included in the province raising the number of districts. Various types of livestock including goats, sheep, cattle, buffalo, etc. have been reared in the province which had a significant contribution towards rural livelihood support (Khan et al., 2012; Naz and Khan, 2018; Andaleeb et al., 2017). Mostly, the poor households in the province kept livestock to derive multiple benefits in the shape of cash income, food, fuel, fertilizer, etc. (FAO, 2015; Andaleeb et al., 2017). These reasons mainly accounted for the selection of the province as the study area for the current research.

Moreover, it was found that livestock is domesticated and rural women have been involved in the rearing of livestock (Khan et al., 2012; FAO, 2015). However, the extant research on the topic has hardly examined the amount to which women contribute to livestock management operations including feeding, milking, watering, shed cleaning, milk product processing, etc. As a result, research on women's roles in cattle management in the region is highly sought. Research on the factors that encourage or discourage women's involvement in livestock management is therefore not only important for the advancement of livestock but also for the advancement of women's rights. All of this laid the groundwork in the province for such a study to be conducted. Two districts i.e., Mardan and Chrsadda from the Khyber Pakhtunkhwa province have been randomly selected which are part of Peshawar Valley (Naz et al., 2018).

2.1. Types of Livestock

The knowledge about major types of livestock is important in the context of this research study. Therefore, the required data in this case were collected and presented in Table 1. Data show that the major types of livestock included buffalo, cows, goats, and sheep with the respective percentages of 16, 33, 40, and 11. The average number of livestock per household was 2.85. The average number of buffalo, cows, goats, and sheep per household was 0.45, 0.95, 1.15, and 0.30, respectively. Data reveal that goats were the major types of livestock

followed by cows and buffalo. The reason behind the rearing of goats and cows in increased numbers in the study area may be associated with its easy management as it requires less feed as compared to buffalo. The same fact has been described by other researchers which supported the current study results (Naz et al., 2018). Moreover, it has been observed that these animals were mostly reared for milk and milk products production in the study area at the domestic level which further contributes towards lowering the household and farm budget as well.

Table 1. Major Types of Livestock in The Study Area

Livestock type	Frequency	Percentage	The average number of livestock
Buffalo	90	16	0.45
Cow	190	33	0.95
Goats	230	40	1.15
Sheep	60	11	0.30
Total	570	100	2.85

2.2. Description of Livestock Management Activities

The current research study selected eight types of livestock management activities after the review of relevant literature. The main reason behind the selection of these activities is related to their daily occurrence. These activities included fodder cutting, animal feeding, watering, cleaning of sheds, young animal care, milking, and the processing and distribution of my goods. These activities have been described by Naz et al., (2018) as below.

Fodder Cutting: The activity of fodder cutting describes the harvesting of forage crops, grass, and plants which are provided as feed to animals. This activity has been mostly performed manually with the use of certain tools like spade, sickle, etc.

Animal Feeding: The second livestock management activity was animal feeding in which the chopped green fodder dry fodder or a mixture of both the fodders were provided to animals in their containers.

Watering of Animals: The third activity watering refers to providing water to animals in a container at their living place or either the animals to the nearby streams, canals, etc.

Cleaning of Sheds: In this activity, the living place of the animals is kept clean by taking away the animal's excrement. The excreta was then utilized as farm yard manure and also in the form of dung cakes for fuel purposes. The activity of cleaning sheds is performed manually with the use of some hand implements.

Young Animal Care: This activity refers to taking care of young animals in the form of their feeding, health care of the limb, calf, etc. at the homesteads or farms.

Milking: Milk is collected from the mammary glands of mammals, namely cows, buffalo, sheep, and goats.

Preparation of Milk Products: the surplus quantity of milk is converted into various milk products like yogurt, butter, and butter oil for home use and marketing purposes.

Marketing of Milk and Dairy Products: This activity is related to the marketing of surplus quantities of milk and dairy products like yogurt, butter, butter oil, etc. for cash income.

2.3. The Role of Women in Livestock Management

According to studies (Naz et al., 2018; Andaleeb et al., 2017), women in the study area play a crucial role in livestock management. When looking for statistics on women's participation, particularly in terms of time invested, the literature comes up short. table 3 displays how much time women spend on different tasks related to livestock management was the focus of the current study. Both sexes were determined to spend 4.38 hours daily, on average, on the eight distinct kinds of cattle management responsibilities. It took a median of 4.80 hours per day per man and 1.75 hours per day per woman to cut fodder, feed animals, water animals, clean sheds, care for young animals, milk animals, prepare milk and milk products, and market milk and milk products. According to the findings, caring for livestock ranks first in terms of time spent, followed by milking, and then cutting fodder. The average daily time spent on livestock activities by women and men was 3.21 hours and 1.16 hours, respectively, with women spending much more time on the activities than males.

Women were found to be in charge of all aspects of caring for farm animals, including feeding (six hours), watering (four hours), cleaning (four and a half hours), tending to young animals (two hours), milking (four hours), and educating (two and a half hours) about milk and milk products. However, men

are superior at two tasks associated with animal management: fodder cutting (2.8 hours) and marketing (1.25) of milk and milk products. Only women in the inspection area were responsible for the guiding of milk and milk products. Current results are consistent with those of Naz et al. (2018), who found that farm girls in the Mardan area have been instrumental in educating the community about the benefits of milk products. Consistent with the limited prior research by Naz et al. (2018), Andaleeb et al. (2017), and Khan et al. (2009), the present study found that girls devoted around five hours per week to various livestock control sports. the data also showed that women participated at a higher rate in indoor activities, while males were more engaged in outside activities such as fodder cutting and milk and milk product marketing. Supporting these findings are studies published in peer-reviewed journals (Naz et al., 2018; Andaleeb et al., 2017; FAO, 2015; Arshad et al., 2013; Amin et al., 2010). The dominant culture of the target area restricts women's freedom of movement, which may explain why more women than males participate in indoor cattle management sports. Not only in Pakistan (Naz et al., 2018; Khan et al., 2009), but also in other developing countries (Utami and Seruni, 2013; Rais et al., 2013), the literature has provided the same reason for the increased participation of women in indoor livestock control activities.

Table 2. Women's Roles in Livestock Management in The Research Field

Livestock Management Activities	Time Spent on Average (Per Hour)		Total Time Spent
	Men	Women	
Fodder cutting	2.8	2	4.8
Feeding animals	3	6	9
Watering of animals	0.5	4	4.5
Cleaning of sheds	0.5	4.5	5
Young animal care	0.25	2	2.5
Milking of animals	1	4	5
Preparation of milk products	--	2.75	2.75
Marketing of milk and dairy products	1.25	0.5	1.75
All activities	1.16	3.21	4.38

3. Research Methodology & Estimation Strategy

3.1. Sampling Technique and Sample Size

The current research study employed the multistage sampling technique of the probability sampling method. The multi-stage sampling technique has been extensively used in the literature relevant to the current issue (Naz and Khan, 2018). In the first stage of sampling, two districts Mardan and Charsadda were selected randomly. In the second stage, one tehsil from each of the districts has been selected randomly. In the last round of sampling, two union councils were selected at random from each of the selected tehsils. Two villages from each of the two selected union councils were randomly selected in the last round of sampling. In the fifth and last stage of sampling, 200 households involved in livestock rearing were selected from the respective villages randomly 50 households from each village. The respective households were selected from the list provided by the respective Nazims (head of the local administrative setup) of the villages. It indicates that the sample size is comprised of 200 households involved in livestock rearing which have been equally distributed among the selected villages as shown in table 3.

Table 3. Distribution of Sample Size

Selected districts	Selected Union Councils	Selected villages	Sample size
Mardan	Alo	Qasmi	50
	Bakhshali	Bakhshali	50
Charsadda	Dherizardad	Dherizardad	50
	Abazai	Abazai	50
Total			200

3.2. Data Collection:

For the collection of data, a pre-tested semi-structured questionnaire is used. The questionnaire was prepared based on the specific objectives of the study and then reviewed by the two relevant experts and amended in light of their valuable guidelines. This effort was made to improve the reliability and

validity aspect of the data. The respondents of the study were women who were actively involved in livestock rearing in the selected households. The reason behind the selection of women respondents included the management of livestock both on the farm and within households in the respective area (Andaleeb et al., 2017; Khan et al., 2009).

For the data collection from women respondents, the semi-structured questionnaire was used while employing face to face interview method. Before, the start of the interviews, respondents were informed about the purpose of this research study and usage of data only for this research. Moreover, formal permission has also been sought from these respondents, and those who refused to interview were replaced with another available women respondent. The questionnaire included mainly the information about socio-economic characteristics of the respondents, major types of livestock, and time allocation to various livestock management activities.

3.3. Econometrics Analysis:

The collected data while using the questionnaire through the interview method have been entered in Statistical Package for Social Sciences (SPSS) version 20 and subjected to the required analytical techniques like frequencies, percentages, descriptive statistics, and multiple linear regression wherever required. Women's contributions to livestock management have been measured using a time allocation technique (Naz et al., 2018) which has been further analyzed through descriptive statistics like mean values. Following the lead of Andaleeb et al. (2017), we employed multiple regression analysis to investigate the variables that affect women's participation in livestock management. Here is a rough calculation based on the linear regression model;

The formula for determining WPLMA is as follows:

$$WPLMA = \beta_1 + \beta_1 AGER + \beta_2 EDUR + \beta_3 HS + \beta_4 AC + \beta_5 EXP + \beta_6 FS + \beta_7 FT + \beta_8 LI + \dots \quad [1]$$

Women's involvement in livestock management activities (WPLMA); respondents' ages in years; respondents' levels of education in years; respondents' levels of experience in years; herd size in animals; respondents' access to credit in years; herd size in years; respondents' income from livestock in dollars; coefficients (β); error term (ϵ). Women's age, education,

experience, family size, family type, access to credit, herd size, and livestock income were selected as independent variables based on a literature review, and the dependent variable was the amount of time women spent managing livestock. Ordinary Least Squares (OLS) were used to estimate multiple linear regression models. Model estimation preceded the execution of post-estimation diagnostic tests for things like multicollinearity, heteroscedasticity, and normality.

4. Results and Discussion

The results of the multiple linear regression model after the checking of diagnostics tests have been presented in Table 4. After the running of diagnostic tests, no violation has been detected and thus results have been presented and interpreted with full confidence. The value of R-square has been reported as 0.55 which explains that 55% variation has been explained by the independent variables in the dependent variable. The results of each variable have been presented briefly as follows.

Table 4. Influences on Women's Livestock Management

Variable	Coefficients	Student Error	T-ratio	P-value
Constants	1.60	0.60	2.67	0.014
Respondent's Age	0.04	0.02	2.00	0.042
Education of the respondent	0.05	0.03	1.67	0.431 ^{NS}
Experience in livestock rearing	-0.06	0.016	3.75	0.000
Family size	0.04	0.03	1.33	0.115 ^{NS}
Family types	0.14	0.24	0.58	0.645 ^{NS}
Credit access	0.00	0.00	5.10	0.000
Herd size	0.02	0.01	2.10	0.548 ^{NS}
Livestock income	0.00	0.00	5.22	0.000

Level of significance= 5%,

R-square= 0.55,

NS= non-significant

The age has been deemed significant having a positive link with the dependent variable as evidenced by the high t-ratio (2.00) and p-value less than 5% of the significance threshold. Women over 40 years of age were primarily involved in livestock management activities as with the passage of

age these women have fewer home obligations and thus, they find time for livestock keeping. These results have been found compatible with the findings of Andaleeb et al. (2017) who claimed that women over 40 years of age had a greater degree of engagement in livestock activities in district Mardan. Results show that the educational level of the respondent has no significant effect on their participation in livestock management activities as indicated by a low t-ratio value (1.67). However, the positive sign of the variable indicates that educated women mostly involve themselves in income-generating activities like livestock rearing as well.

There is a statistically significant inverse relationship between this factor and women's involvement in livestock management (t-ratio=-3.75). The findings show that more seasoned women handle animals in less time and with more efficiency than their less seasoned counterparts. The current result was found consistent with the findings of Andaleeb et al., (2017). It was discovered that family size had a positive but statistically insignificant influence; its p-value was higher than 5%. Women with bigger families often have more free time to devote to livestock management because they get help around the home from other members of the family. Andaleeb et al. (2017) and Ahmad (2014) both find results consistent with these conclusions.

There is a negative and statistically insignificant influence of the family type on women's involvement in livestock management. In contrast to women living in joint family systems, where they typically have more free time owing to the existence of assistants for home tasks, women living in nuclear family systems spend less time caring for livestock, as shown by the negative coefficient. The high t-ratio of 5.10 for credit access indicates that it is a positive and significant factor in explaining women's involvement in livestock management. Increased herd size results from increased access to financing, which in turn encourages women to devote more time and energy to livestock management. Ahmad's (2014) and Zahoor et al.'s (2013) conclusions are in agreement with these findings.

Women's involvement in livestock management is significantly influenced by the number of animals owned by the household (the "herd size"). It is a well-known fact that as the size of a herd grows, so does the amount of time spent on tasks like milking, feeding, and watering, allowing women to take on more of these responsibilities. We find that livestock income is a significantly significant predictor of women's involvement in livestock management (t-ratio of 5.22). This evidence points to a two-way causality between women's involvement in livestock management and the money generated by animals.

Livestock income rises as the number of women in the labor force rises and vice versa.

A high t-ratio of 5.22 indicates that livestock income is a positive and highly significant driver of women's involvement in livestock management. This evidence points to a two-way causality between women's involvement in livestock management and the money generated by animals. Livestock income rises as the number of women in the labor force rises and vice versa. These findings are in line with those of Andaleeb et al. (2017) and Khan et al. (2009), who also found a positive and statistically significant correlation between women's involvement in livestock management and livestock revenue.

5. Conclusion and Recommendations

Women in Pakistan, like in many other developing countries, are essential to the success of livestock farms. In addition to their more typical tasks within the home, such as childcare, cooking, cleaning, and more, women also manage animals for food, fuel, fertilizer, and financial earnings. Women play an important role in livestock management, but there is a paucity of studies on the factors that motivate and measure their involvement. Therefore, the findings of this study are essential for expanding our understanding of this field. Khyber Pakhtunkhwa is a province in Pakistan known for its abundance of animals, particularly goats and cows. Time spent caring for cattle may be an indicator of women's participation in livestock management. The aforementioned responsibilities include but are not limited to fodder cutting, feeding, watering, stall cleaning, newborn animal care, milking, product preparation, and product marketing. On average, women spend 3.21 hours each day caring for cattle, while men contribute just 1.16 hours. Many domestic tasks, including milk product production, animal feeding, and milking, shed watering and cleaning, and infant care, are often performed by women. Due to societal norms and restrictions, men are more likely to work outside the home, such as selling milk and other dairy products or chopping fodder.

Several variables were found to influence women's participation in livestock management, including their age, level of experience in livestock raising, access to financing, and livestock revenue. In light of these facts, it is strongly recommended that women's contributions to cattle management be recognized and actively fostered on a global scale. This calls for a concerted effort to broaden the scope of programs that help rural women earn a living.

Government and non-governmental organizations (NGO) efforts to empower women in livestock management should prioritize women's access to capital and educational opportunities.

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