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Exploring the Socio-Economic Profile of Women in Farm-Based Dairy Activities: A Case Study in District Okara

Noor Fatima
University of Agriculture Faisalabad-Okara Campus, Pakistan

Tahir Munir Butt*
University of Agriculture Faisalabad-Okara Campus, Pakistan
Email: tahirmunir@uaf.edu.pk

Muhammad Luqman
Department of Agricultural Extension and Rural Studies, University of Sargodha, Pakistan,

Muhammad Kaleem Ullah
University of Agriculture Faisalabad-Okara Campus, Pakistan

Muqaddas Zaheer
Department of Horticulture, University of Agriculture Faisalabad, Pakistan

Iftikhar Hussain
University of Agriculture Faisalabad-Okara Campus, Pakistan

Waqee Ur Rahman
University of Agriculture Faisalabad-Okara Campus, Pakistan

ABSTRACT

Pakistan, being an agrarian economy, derives nearly 24% of its GDP from agriculture, with livestock contributing around 16% to this share. Among the 8 million rural households engaged in livestock production, dairy farming plays a critical role in sustaining livelihoods, contributing 35–40% to rural household incomes. Despite women's extensive involvement in on-farm dairy practices such as milking, feeding, cleaning, and animal care their contributions remain largely unrecognized due to entrenched patriarchal norms, limited access to resources, and restricted decision-making authority. This study investigated the socio-economic characteristics and roles of women in on-farm dairy practices, the barriers they faced in adopting improved practices, and the support extended by livestock extension services. District Okara, known as a hub of dairy farming in Pakistan, was selected as the study area. A cross-sectional design was employed, focusing on Tehsil Okara. A sample of 120 female respondents was selected conveniently, and data was

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DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
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Vol. 3 No. 9 (September) (2025)

collected using a structured interview schedule. The tool was validated through expert consultation and pre-testing, while data was analyzed using SPSS software. Findings revealed that while a majority of women actively participated in essential dairy operations, only 1.7% was solely responsible for milking, and just 11.7% administered medicines or vaccines. Moreover, only 18.3% of the women had any formal degree or diploma in livestock management, highlighting the lack of professional training. Despite this, 85% of women demonstrated the ability to recognize animal illness, and 70.8% relied on home remedies for treatment. The study also showed that socio-cultural barriers such as limited mobility, low literacy rates (37.5% illiterate), and exclusion from formal training continue to hinder women's full potential in dairy development. The study concluded that empowering women through education, access to veterinary training, and active inclusion in livestock extension services was crucial for improving productivity and ensuring rural household well-being. It was recommended that policy interventions focus on increasing women's access to resources, capacity-building programs, and gender-sensitive livestock extension services to ensure inclusive and sustainable dairy development in Pakistan.

Keywords: Women in agriculture, Dairy farming, Livestock management, Socio-economic profile, Rural livelihoods, Gender roles, Extension services, District Okara, Pakistan agriculture, Capacity building

INTRODUCTION

In the agrarian landscape of Pakistan, particularly in Punjab, the role of women in agriculture and livestock management remains deeply embedded in the socio-economic fabric of rural communities. Among the various agricultural activities, dairy farming stands out as an area where women's involvement is both significant and indispensable. District Okara, recognized for its fertile lands and livestock production, offers a compelling case to examine women's contributions to on-farm dairy practices.

From feeding and milking animals to maintaining hygiene and healthcare for livestock, women carry out a multitude of tasks essential to the functioning of dairy farms (Ahmad et al., 2016; Akhtar et al., 2020). Despite their extensive participation, these women remain largely invisible in policy frameworks and official statistics due to gendered norms, limited resource access, and institutional neglect (Alvi & Khan, 2019; Awan & Sultana, 2020).

The contribution of rural women to dairy farming is not merely confined to physical labor but also includes critical roles in animal health management, breeding, fodder collection, and milk marketing, though often performed informally and without decision-making authority. This not only restricts the

potential productivity of the dairy sector but also perpetuates socio-economic inequality.

Women's involvement in dairy farming in Pakistan has often been overlooked by formal data collection systems, thereby underrepresenting their economic contributions. However, empirical studies consistently reveal that women are integral to livestock care, animal feeding, and milk processing (Hussain & Zaheer, 2020; Yousuf et al., 2020).

District Okara serves as a critical site for investigating the role of women in dairy farming. The

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DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
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Vol. 3 No. 9 (September) (2025)

district not only has a high concentration of livestock farming but also represents the socio-economic diversity of Punjab's rural landscape.

Within District Okara, women work long hours on dairy farms under patriarchal norms that often restrict their mobility, autonomy, and voice in decision-making (Fatima et al., 2025). While the district holds potential for sustainable dairy development, capitalizing on this opportunity requires a shift in perspective—one that recognizes women not merely as laborers but as key stakeholders in agricultural productivity and food security (Sabir & Iftikhar, 2020; Sultana et al., 2019).

In addition to physical labor, women contribute through their indigenous knowledge of animal behaviour and health. Feeding, fodder management and milking are other critical areas, where women's role is indispensable. Cleaning and maintaining dairy sheds and health care management are other domains dominated by women. Their daily observation and timely actions reduce morbidity and mortality rates among dairy animals. In Punjab, including Okara, women's unpaid labor forms the backbone of rural dairy systems. The invisibility of this labor in economic accounts is partly due to entrenched gender roles and partly due to socio-cultural constraints that define the boundaries of women's public participation (Murshid, 2018; Syed & Rauf, 2020).

The gendered division of labor in agriculture further complicates women's participation. Men often dominate the decision-making and marketing aspects of farming, whereas women perform the manual and time-consuming tasks (Alvi & Khan, 2019; Iftikhar et al., 2007). This gendered hierarchy is perpetuated by limited educational opportunities, cultural norms, and a lack of targeted extension services for women (Sahito et al., 2021; Subhashchandra, 2023).

In District Okara, women frequently report being excluded from livestock training sessions and cooperative memberships, which are usually male-dominated. As a result, they rely on informal knowledge transfer and traditional methods, which can limit productivity and reduce the potential benefits of modern agricultural innovations (Afzal et al., 2024).

Understanding how women engage with dairy activities in Okara can provide insights into broader gender dynamics, reveal barriers to participation, and help design interventions that are locally relevant and culturally sensitive (Zubair et al., 2023; Bano et al., 2023).

In many households, dairy is not only a source of daily nutrition but also a means of livelihood. The role of women in sustaining this vital economic activity is both undeniable and underappreciated. early morning milking routines to late-night animal care, the entire dairy cycle is closely tied to women's labor. Yet, despite such comprehensive involvement, their voices remain marginal in decision-making forums, policy debates, and resource distribution mechanisms (Kaur & Mittal, 2021; Paul, 2024; Qureshi et al., 2014).

The intergenerational knowledge passed from mother to daughter about animal health, feed management, and milk preservation also represents an intangible yet invaluable asset. This indigenous knowledge, if integrated with modern veterinary and farm management practices, can greatly enhance the productivity and sustainability of smallholder dairy farms (Sivasubramanian et al., 2024; Tandon, 2016).

Further compounding these issues are the structural barriers within agricultural institutions. In District Okara, surveys reveal that only a small percentage of women have interacted with

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

livestock extension officers, and even fewer have attended formal training programs.

Moreover, women's limited access to land ownership further exacerbates their marginalization. Inheritance laws, cultural norms, and lack of legal literacy restrict women's 0ability to claim and manage land, which is often a prerequisite for receiving credit, subsidies, or participation in government schemes. This dependency on male family members curtails their autonomy and bargaining power in both domestic and public spheres.

Empowering these women demands a multipronged approach that encompasses education, capacity building, access to credit, and representation in farmer cooperatives. Projects such as the Gender and Agricultural Livelihoods Program (GALP) in rural Punjab have demonstrated that targeted support in these areas can significantly uplift women's economic roles and improve household welfare (UNDP, 2022).

Economically, the dairy sector represents an untapped opportunity for female-driven growth. Women-led micro-dairies and milk cooperatives have the potential to boost rural incomes and reduce poverty. If replicated in Okara, such models could address both economic and social disparities

simultaneously (FAO, 2023). Health and nutrition are also closely tied to women's roles in dairy. In households where women have more control over dairy income and products, studies report improved child nutrition, better health outcomes, and increased school attendance (Fox &Romero, 2017; Manzoor et al., 2018). Thus, empowering women in dairy is not only an agricultural issue but a holistic development strategy.

Efforts to address these disparities have gained momentum in recent years, with policy discussions increasingly acknowledging the need for inclusive agricultural development. However, the effectiveness of these programs depends largely on contextual factors such as community acceptance, infrastructure availability, and policy support (Flinton et al., 2010; Sivasubramanian et al., 2024).

To bridge these gaps, policymakers must institutionalize gender in agricultural planning. This includes gender budgeting, female-targeted extension programs, gender audits of rural institutions, and ensuring women's representation in decision bodies. Simultaneously, educational campaigns can play a vital role in changing community attitudes towards women's roles in agriculture (Batool & Shah, 2023; ILO, 2023). Technology and digital tools can play a transformative role in empowering women in dairy farming. Cooperative models and women-led dairy groups have shown promise in improving outcomes. Gender mainstreaming in agricultural education is another important aspect that can empower women. Hegland (2010) points out, Islamic teachings support women's participation in economic activities, including agriculture, as long as their dignity and rights are preserved. Therefore, framing women's inclusion within culturally appropriate and religiously acceptable narratives can enhance community support and reduce resistance.

The purpose of this research was to identify the socio-economic characteristics of women working on farm dairy practice and study that much how women are involved in farm dairy operations under District Okara, an understanding of how much they are involved, the sociocultural barrier, and the impacts of development activities on women's empowerment.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

The research, in essence, tried to highlight the need to recognize and appreciate the contribution of women in dairy farming so that the issue of gender equality and rural economic empowerment can be taken more seriously at a national level in Pakistan. It also directed justice on the scale of policy and programming interventions to reverse structural adversities encountered by women in dairy farming.

MATERIALS AND METHODS

Sample Population

The target population for this study comprised 120 rural women actively engaged in on-farm dairy farming activities in District Okara, Punjab, Pakistan. These women were directly involved in various stages of dairy production, including feeding, milking, fodder collection, animal healthcare, shed maintenance, and product handling.

Sampling Methodology

For data collection a multistage random sampling methodology was embraced. In the selection of Tehsil Okara as the first stage, it was conveniently chosen based on accessibility, better logistical activity, and the fact that the researcher was not a stranger to the area. It was also fertile in the number of dairy households and even one of the more livestock-based livelihoods tehsils present in the district.

Villages were selected randomly in the second stage and this was done within Tehsil Okara with the help of a list provided by the local livestock department.

At the third stage of sampling, individual women dairy farmers were selected randomly from the sampled villages.

Data

As per the data gathered in agriculture offices in the local area, around 4,000 dairy farming families in Tehsil Okara. Out of this population, 120 respondents were established in order to represent the sample size using an online sample size calculator (SurveySystem.com). The required sample has been calculated at the confidence level of 95 and a confidence interval (margin of error) of 8.8 which was also appropriate in conducting social science research given the precision of a statistic needs required in the research.

Construction of Data Collection Tool

In order to researches on all factors, it was imperative that data collection instrument is highly precise and valid. The data was obtained through open and close ended questions to successfully gather the data that the respondents had to offer. Interview schedule was prepared accordingly. Interview Schedule contained the following contents:

Demographic factors of the interviewees

The contribution of females in farm dairy activities *Factors that introduce barrier in implementation of on farm dairy

The role of dairy department in raising on farm dairy.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

Pre-testing

One of the means of testing the reliability or validity of instrument is Pre-testing. The second reason to conduct pre-testing was to ensure that the respondents comprehend the question and answered honestly. We made our questionnaire better after pre-testing where necessary there is need of change or improvement.

Interviewing of the respondents

To gather facts, interview was carried out on respondents. Each respondent was interviewed by the investigator himself to ensure that he or she gave unbiased response and later checked every questionnaire to see whether it was correct and consistent since it would be very hard to approach the same respondent later on in any other step.

Data analysis

Statistical package of the social sciences was used to analyze collected data. Means, standard deviations as well as frequency was used to summarize the various variables through descriptive statistics. A computer software was used to interpret the data i.e. the statistical package for social sciences.

Challenges encountered by researcher in data collection

There were some un-avoidable predicaments the researcher encountered in the process of data collection. Cases in which the respondents could not read and write were quite challenging with regards to data collection. Despite the fact that the researcher did his best to assure the respondents that he was conducting a study and motivation towards the research, there were respondents who remained suspicious of the nature of the study and questioning i.e. some farmers. They believed that the information so gathered could be used against them particularly when query such as size of the land holdings, and sources of incomes were inquired.

The transportation facilities were not good as was the case in most of the villages. Most villages were not linked by main roads and thus the researchers needed to endure a lot of problems to access respondents in those villages.

FINDINGS

Demographic Nature of the respondents Members

Age

The interviewers asked the respondents their age. Age was divided into three categories that includes young (35 years), middle aged (35-50) and old (Up to 50 years) respectively. It gives the data in this respect in the table.

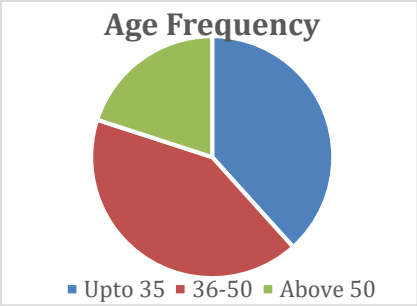
Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

Table 1: Distribution of the respondents according to their age



Age (in years)	Frequency	Percentage
Up to 35	46	38.9
36-50	50	42.6
Above 50	24	18.5
Total	120	100.0

Less than half (42.6%) belonged to middle aged around (36 to 50), whereas 39.9% respondents belong to young years age group (up to 35) and remaining 18.5% respondents were above 50.

Education

The women have been asked about their scale of education. To understand it more accurately 1st women were posed a question of whether they are literate or illiterate. Then in 2nd step literate women were further asked of their level of education. A big percentage over half (61.1) of the respondent were identified to have some form of education whilst of 38.9 only were illiterates; whoever never attended school at all.

Table 2: Distribution of the respondents according to their years of schooling

Years of schooling	Frequency	Percentage
Illiterate (0)	45	37.5
Primary-Middle (5-8)	33	27.5
Matric (9-10)	27	22.5
Above Matric (10+)	15	12.5
Total	120	100.0

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

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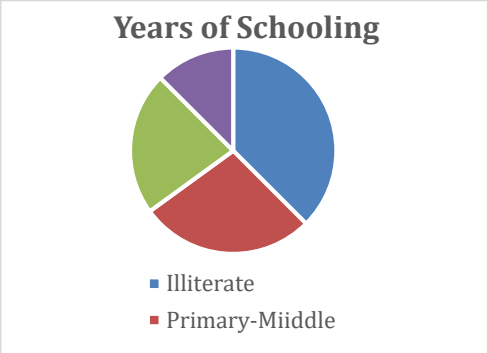
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

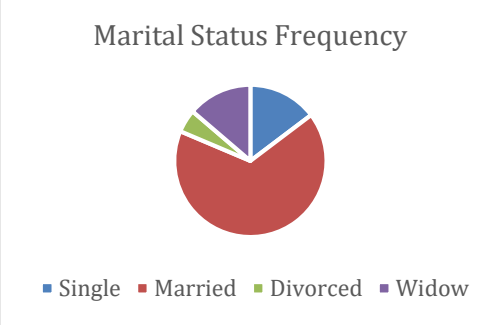


Less than half 37.5% respondents were illiterate and remaining 62.5% were literate. From those 62.5% literate respondents 27.5% were belonged to (primary-middle) and about one fourth (22.5%) were metric and remaining 12.5% respondents are above metric. It was observed that schools are far away from the villages and higher secondary school facility is limited in the research area. Besides these, there is also lack of facilities in the schools, which also negatively affected the learning of the students.

Marital Status

The respondents were asked about their marital status. The data in this regard are given in the Table.

Table 3: Distribution of the respondents according to their marital status



Marital status	Frequency	Percentage
Single	18	15
Married	82	68
Divorced	6	5
Widow	14	12
Total	120	100.0

Majority (68%) of the respondents was married while only 15% were single, 5% were divorced and 12% was widow.

Responsibility for Milking

A survey was performed to see who was actually sharing the responsibility of milking in dairy practices.

Table 4: Primary Responsibility for Milking in the Household

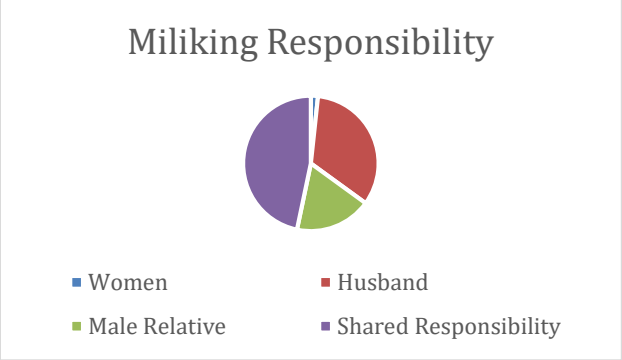
Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

Response category	Frequency	Percentage%
Women	2	1.7
Husband	40	33.3
Male relative	22	18.3
Shared responsibility	56	46.7
Total	**120**	**100%**

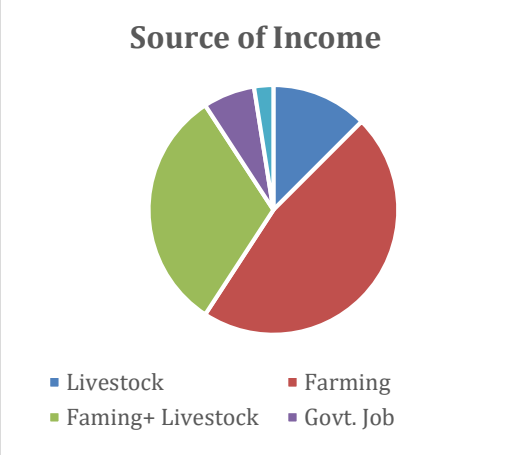


Milking responsibilities in most households are predominantly shared, with 46.7% of respondents reporting joint involvement. A significant portion (33.3%) indicated that the husband is primarily responsible, while 18.3% mentioned a male relative. Only 1.7% of respondents reported that women themselves are primarily responsible for milking.

Sources of Income

A survey was conducted to check the source of income of respondents.

Table 5: Distribution of the respondents according to their source of income



Source of income	Frequency	Percentage
Livestock	15	12.5
Farming	56	46.7
Farming + livestock	38	31.6
Government job	8	6.7
Government job + farming	3	2.5
Total	120	100.0

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www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

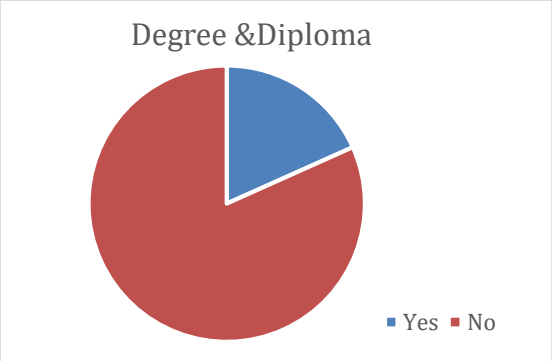
Clear majority 46.7% of the respondents was related to farming with their source of earnings where as 12.5% of the respondents was related to livestock as their source of earnings and 31.6% of the respondents were related to farming + livestock only and other remaining 9.2% were related to service + farming.

Degree and diploma in livestock management

A survey was performed to check how many women were actually having any degree in livestock management and how many of them were devoid of any essential knowledge.

Table 6. Distribution of the respondents according to the any degree and diploma in livestock management

Response	Frequency	Percentage
Degree in live stock mgt	22	18.3
No Degree	98	81.7
Total	120	100.0



Recognition of illness

A survey was performed to check how many respondents had the ability of recognizing the illness in dairy animals.

Table 7: Distribution of respondents according to the recognition of illness

Response	Frequency	Percentage
Able to recognize illness	102	85
Not able to	18	15
Total	120	100.0

Large majority of respondents (85%) are able to recognize illness in their livestock, while only 15% are not able to do so.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

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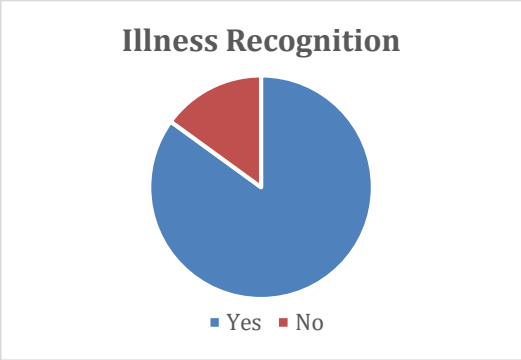
ISSN Print: 3007-3146

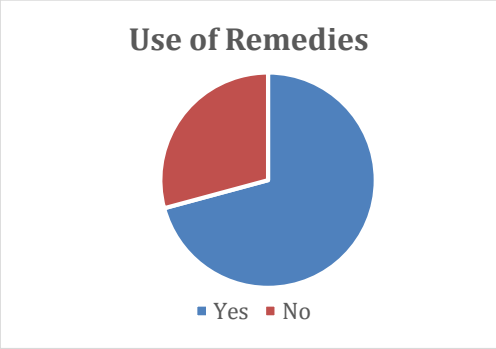
Vol. 3 No. 9 (September) (2025)



Use of Remedies

A survey was performed to check how many of respondents were using home remedies to treat illness in animals.

Table 8. Distribution of the respondents according to the use of home remedies



Response	Frequency	Percentage
Yes	85	70.8
No	35	29.2
Total	120	100.0

70.8% of the respondents use home remedies for treating their livestock, while 29.2% do not.

Administration of medicines or vaccines

A survey was performed to check how many respondents were administering medicines or vaccines to treat dairy animals.

Table 9: Distribution of the respondents according to the administer medicines or vaccines

Response	Frequency	Percentage
Yes	14	11.7

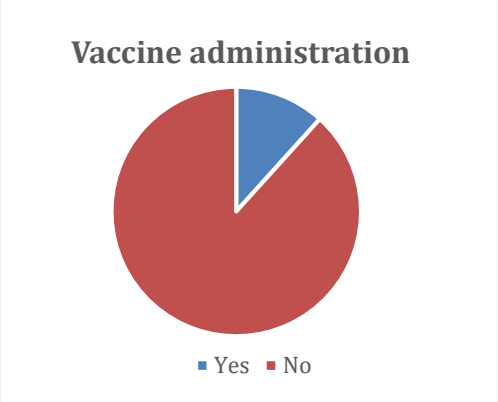
Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

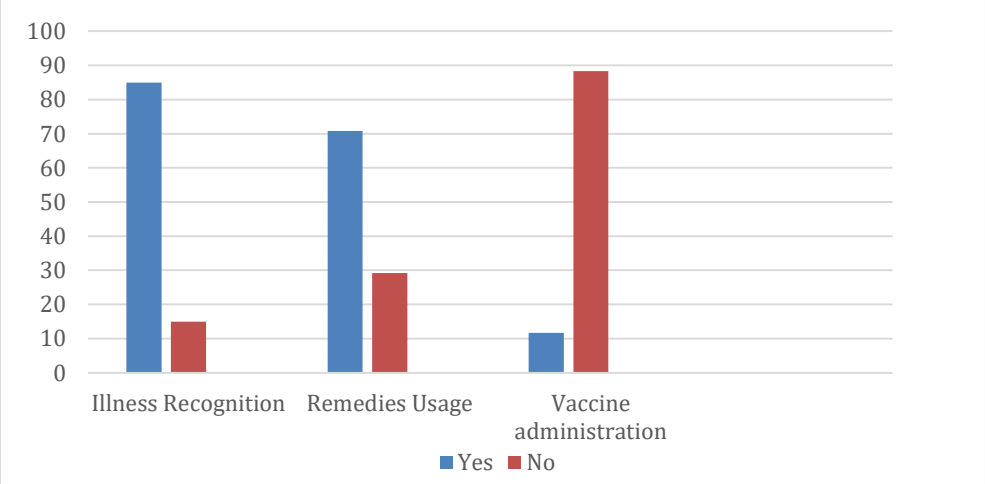
Vol. 3 No. 9 (September) (2025)

No	106	88.3
Total	120	100.0



11.7% of the respondents administer medicines or vaccines to their animals, while a significant majority of 88.3% does not.

A graphical overview of Illness Recognition, Use of Remedies and Vaccine Administration



Recognition of contribution of Women:

A survey was performed among different individuals of different rural areas to check if the contribution of women is recognized is dairy practices or not.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

Sr. No.	Yes		No	
	f	%	f	%
1	115	95.8	5	4.2
2	68	56.7	52	43.3
3	88	73.3	32	26.7
4	49	40.8	71	59.2

The majority of respondents (95.8%) believed that women's contribution to dairy farmings essential, only 56.7% felt that women's roles are recognized in their families or communities, indicating a recognition gap despite their significant involvement. About 73.3% of women expressed satisfaction with their own contributions to dairy work, showing a sense of self-worth and pride in their role. In contrast, only 40.8% reported receiving appreciation for their efforts, highlighting a lack of external acknowledgment.

Barriers faced by women

A survey was performed to rank the different barriers faced by different women working in the field due to different societal norms and lack of facilities provided to then in a patriarchal society.

Table 10: Weighted score, mean, standard deviation and rank order of the respondents' opinion about the barrier

Barrier	Weighted Score	Mean	Std. Dev.	Rank
Non-Accessibility of vet. Medicines due to cost	381	3.18	1.41	1
Unbalance of work and domestic chores.	375	3.13	1.50	2
Overburdening of both home and farm duties	373	3.11	1.38	3
Support of male family members	373	3.11	1.44	4
Lack of female extension workers	370	3.08	1.45	5
Long distance to milk collection markets	368	3.07	1.41	6
High cost of animal feed	366	3.05	1.53	7
Permission to attend meetings	365	3.04	1.44	8
Undervaluing of work due to your gender	361	3.01	1.38	10
Adequate shelter	358	2.98	1.35	11
Accessibility to clean drinking water for animals	354	2.95	1.42	12
Lack of capital limit expansion of dairy operations.	353	2.94	1.45	13

Dialogue Social Science Review (DSSR)
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ISSN Online: 3007-3154
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Vol. 3 No. 9 (September) (2025)

Access to loans or financial support	352	2.93	1.43	14
Limitation by household responsibilities for dairy tasks	352	2.93	1.48	15
Financial viability of dairy farming	352	2.93	1.38	16
Poor roads/transport	350	2.92	1.39	17
Restriction in going to markets or vet.	350	2.92	1.49	18
Storage or refrigeration problems for milk	349	2.91	1.47	19
Cultural/social norms barrier	348	2.90	1.48	20

Dialogue Social Science Review (DSSR)
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ISSN Online: 3007-3154
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Vol. 3 No. 9 (September) (2025)

The analysis of the 20 listed barriers revealed that access to veterinary medicines due to cost was the most significant challenge, with the highest mean score of 3.18, indicating a widespread concern among respondents. Closely following are issues related to balancing dairy work and domestic chores (mean = 3.13) and the perception that women are overburdened with both home and farm duties (mean = 3.11). These results highlighted the dual burden rural women carry in managing both household responsibilities and dairy tasks.

Other prominent barriers included the lack of supportive male family members (mean = 3.11) and inadequate female extension services (mean = 3.08), which pointed to social and institutional gaps in women's empowerment and technical support. Geographical and infrastructural barriers, such as distance to milk collection centers (mean = 3.07) and poor road/transportation facilities, also hindered women's effective participation in the dairy value chain. Financial challenges were recurrent, with high costs of animal feed, lack of capital for expansion, and limited access to financial support ranking in the mid-tier of barriers. Cultural and mobility constraints—including social norms restricting women's open participation and limited freedom to attend training or travel to markets—also emerged as significant, though slightly lower-ranked issues.

Overall, the findings underscore that women face a multifaceted set of barriers— economic, social, cultural, and infrastructural—that restricted their full and independent participation in dairy farming. Addressing these challenges was essential for enhancing women's contributions and empowerment in the rural dairy sector.

Role of livestock extension department

A survey was performed to rank the response of people about the role of extension department in dairy farming.

Dialogue Social Science Review (DSSR)
www.thedssr.com

DIALOGUE SOCIAL SCIENCE REVIEW

ISSN Online: 3007-3154
ISSN Print: 3007-3146

Vol. 3 No. 9 (September) (2025)

Table 11. weighted score, mean, standard deviation and rank order of the respondents' opinion about role of extension department in dairy farming

Question	Weighted Score	Mean	Std. Dev	Rank
Awareness of the Dairy Development Department	405	3.38	1.25	3
Accessibility to livestock extension officers.	423	3.52	1.16	9
Visit of livestock extension officers to village	436	3.63	1.11	10
Political involvement	455	3.79	1.08	11
Meeting a livestock extension officer	455	3.79	1.02	11
Comfort in interacting with the officer	415	3.46	1.21	7
Understanding the speech of officer	400	3.33	1.21	2
Training or awareness sessions attending	396	3.30	1.25	1
Training help dairy practices.	408	3.40	1.19	5
Receiving of any printed materials, guides, or leaflets.	421	3.51	1.15	8

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The findings revealed a concerning gap in the awareness, accessibility, and effectiveness of the Livestock Extension and Dairy Development Departments in rural areas. A significant number of respondents were unaware of the presence of these departments in their locality, which suggested a major communication shortfall. Moreover, most women reported that livestock extension officers were not easily accessible and rarely visited their villages. Even among those who had interacted with these officers, many did not feel comfortable or found the communication difficult to understand, indicating a lack of community engagement and gender-sensitive outreach.

Political influence was also perceived as a barrier, possibly affecting equitable service delivery. Training sessions and awareness programs by these departments were largely absent, and those who attendeded reported limited usefulness, highlighting gaps in content relevance and delivery methods. Additionally, the distribution of printed informational materials such as leaflets or guides was almost nonexistent. These factors collectively pointed to a weak support system that failed to effectively reach and empower rural women engaged in dairy farming. Strengthening the presence and function of these departments through inclusive, gender-responsive strategies were essential for improving women's participation and productivity in the livestock sector.

Inefficient use of fertilizers was not only an environmental hazard but had substantial economic loss in term of efficiency of crop and profit of farmers (Elahi et al., 2015). Excessive use of fertilizers caused serious environmental issues i.e., soil acidification, air pollution, water eutrophication and degradation (Steffen et al., 2015; Wang et al., 2018; Sha et al., 2020; Li et al., 2020). Elahi et al. (2015) study results indicated that with the balanced use of fertilizers, the technical efficiency of the crop improved by 14% in the wheat-cotton cropping pattern.

CONCLUSION

The Research concluded by revealing important insights into the socio-economic and practical involvement of women in on-farm dairy practices in District Okara. A substantial portion of the respondents (42.6%) were middle-aged, with a considerable representation of young women (38.9%), indicating that a large segment of the active female population is engaged in dairy-related tasks. While the literacy rate among respondents was relatively higher (62.5%), a notable 37.5% remained illiterate, and many of the literate respondents had only received education up to the primary or middle level. This limited educational background was further exacerbated by the lack of access to quality schools in rural areas, which restricts women's ability to pursue higher education and technical knowledge in dairy farming. Most women (68%) were married, reflecting typical rural family structures where women contribute significantly to household and agricultural responsibilities. Farming and livestock were reported as the primary sources of livelihood for the majority, with 46.7% involved solely in farming and 31.6% engaged in both farming and livestock. This showed the central role of agriculture in rural households and women’s indirect involvement in income-generating activities. Regarding their practical roles, the study indicated that milking responsibilities were largely shared (46.7%) or handled by husbands (33.3%) and male relatives (18.3%), with only 1.7% of women reporting sole responsibility for milking. This suggested that while women contribute to dairy work, certain tasks remained male-dominated due to cultural norms. Furthermore, only 18.3% of women held any formal qualification in livestock management, highlighting the gap in technical training. Despite this, 85% of respondents were capable of recognizing animal illness, and 70.8% used home remedies—demonstrating strong traditional knowledge. However, women's involvement in

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Vol. 3 No. 9 (September) (2025)

administering formal veterinary care remained limited, with only 11.7% reporting that they provided medicines or vaccines. This showed that while rural women possess practical experience, they lack formal training and support in modern livestock healthcare practices. Overall, these results underscored the need for targeted interventions, including training, access to resources, and inclusive extension services, to empower women and enhance their effectiveness in sustainable dairy farming practices.

FUTURE SUGGESTIONS

Local training programs for rural women should be organized on livestock care, disease management, and dairy practices. Female livestock extension officers should be recruited. Village-level veterinary sub-centers with accessible medicines and vaccines should be established. Rural education infrastructure should be improved for girls. Women should be provided with microcredit and soft loans. Women's access to markets and milk resources sg\hould be facilitated. Linkages between women farmers and government or NGO development programs should be strengthened. Joint ownership of livestock and farm resources between men and women should be promoted. Exposure visits and knowledge-sharing sessions for rural women dairy farmers should be organized. Certification programs for women with traditional dairy knowledge should be introduced to improve their recognition. Transportation facilities or mobile veterinary units to reach remote areas should be offered. Child-care centers near training venues should be established to enable women's participation. Local leaders and male family members should be encouraged to support women's roles in farm decision-making. Women's involvement should be acknowledged properly in dairy projects to ensure inclusion and sustainability.

Authors Contributions Statement

Noor Fatima completed the research and prepared the draft; Muhammad Kaleem Ullah Reviewed and finalized the draft.

Conflict of Interest

The authors declare no conflict of interest.

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Ethical Statement

Ethical considerations were upheld throughout the study, ensuring informed consent and confidentiality in data collection from all participants. **Availability of Data and Material**

We declare that the submitted manuscript is our work, which has not been published before and is not currently being considered for publication elsewhere.

Code Availability

Not applicable.

Consent to Participate

All authors participated in this research study.

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Consent for Publication

All authors submitted consent to publish this research article in IJCISS.

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