

Exploring the role of Women On-Farm Sustainable Dairy Practices in District Okara

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ABSTRACT

The crucial role that women play in advancing sustainable dairy practices on farms in District Okara, Pakistan is a region known for its livestock and agricultural production is examined in this review paper. Through their participation in routine agricultural tasks, animal husbandry, and milk production, women in rural Pakistan especially in Okara make a substantial contribution to the dairy industry. In addition to managing the family and the financial aspects of dairy farming, their duties frequently involve feeding, milking, and overseeing the health of the animals. In spite of these efforts, women's contributions are still not given enough credit in the larger agricultural discourse. In order to improve farm production and environmental sustainability, this article looks at important sustainable techniques that women use, such as effective feed management, water saving, waste recycling, and disease control. The study also addresses the obstacles women encounter in gaining access to technology, education, and decision-making platforms, which restricts their ability to embrace more sophisticated sustainable practices. In order to empower female farmers as important contributors to the sustainable growth of the dairy industry, the assessment urges increased assistance for them through resource access, policy interventions, and capacity building. A well-Structured questionnaire will be designed in order to collect the data. The collected data will be analyzed by using computer software Special Packages for Social Sciences (SPSS).

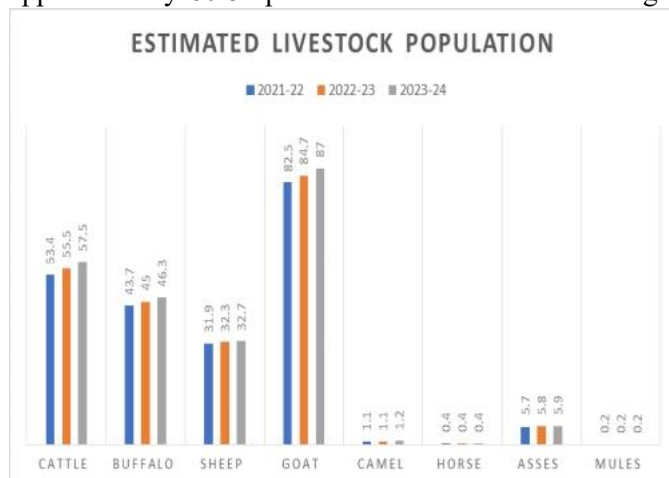
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INTRODUCTION

Agriculture is the backbone of our country's economy, sharing 24% of the country's GDP although this share has decreased in these years (Economic Survey of Pakistan, 2023-24). Pakistan ranks fifth globally in milk production. Pakistan's high production is attributed to its large dairy sector, which involves numerous small-scale dairy farms nationwide. Pakistan's significant role in the global dairy industry, despite challenges in productivity and infrastructure that can impact efficiency compared to other top-producing countries (The International Farm Comparison Network (IFCN) Dairy Report, 2022).

With over 8 million rural families heavily involved in livestock production, animal husbandry is a vital part of Pakistan's rural economy and a lifeline for these families, contributing between 35 and 40 percent of

their total earnings. In the broader economic context, the livestock industry has established itself as the primary driver of agricultural expansion, accounting for 14.63 percent of China's GDP in FY2024 and approximately 60.84 percent of the value added to agriculture (Economic Survey of Pakistan,2023-24).



Source: Economic survey of Pakistan

Importance of sustainable dairy farming

There is a growing interest and demand for sustainable food production due to a growing concern about environmental pollution and climate change. In this vein, the topic of sustainability in agriculture is the subject of debate not only for the experts in the industry but also for government officials and researchers (Kyungsoo Nam, 2021). Sustainable agriculture describes the effective use of natural resources without short-term depletion or harm. A production method that lessens the impact of pollutants and greenhouse gas emissions that can arise during the production of crops or livestock is also referred to by this term. The goal of sustainability in agriculture in the early 1990s was to preserve land for long-term farming. (Heesun Lim, 2021). However, studies centered on the effective use of Earth's limited natural resources as the population increased and the economy matured in the early 2000s. Studies on the sustainability of agriculture have recently looked at strategies for adjusting to population expansion, shifting consumer habits, and mitigating the environmental effects of agriculture, including climate change. It has also been emphasized that sustainable intensification in agriculture is a method or system that raises agricultural production without having a negative effect on the environment or converting more non-agricultural land (Beyoung et al., 2021).

Sustainable animal food production has gained popularity over the past ten years due to growing awareness of the environmental problems created by agricultural production, ongoing economic competition that lowers farm profitability, and animal welfare issues (Arvidsson et al., 2020). Meanwhile, the interest of farmers concentrates on the production components that represent their source of revenue. However, as research has proved the effect of welfare and animal management methods on the productive aspects, farmers are getting careful of their animals, however as the farm and livestock dimensions develop, the attention to every single animal diminishes (Lovarelli et al.,2020). The role of Precision Livestock Farming (PLF) is to provide farmers with technical help, which is a promising step for all elements connected to efficient and sustainable animal production. PLF has a lot of promise to help farmers raise animals in healthy settings and produce food in a way that is safe and has less of an impact on the environment. (Lovarelli et al., 2020).

Pakistan's agriculture sector has been severely affected by frequent floods and longer droughts over the last decade (Bakhsh and Kamran, 2019). More than 8 million farmers in Pakistan are engaged in animal husbandry, mostly smallholders and farmers whose livelihoods depend directly on animal production (GOP, 2019). Smallholder farmers are often poor, resource-poor, and have little to adapt to reduce the negative impacts of climate change on agriculture and dairying. (Abid et al., 2016). Therefore, it is important to remember that climate change can have negative effects on dairy products in the absence of adaptation strategies. Therefore, the only way to lessen the harmful consequences of climate change is to implement measures at the agricultural level. (Ali and Erenstein, 2017, Gorst et al., 2018, Mumtaz et al., 2019, Salman et al., 2018). According to some research, farmers' adaptability is just as crucial to lessening the effects of climate change on dairy production (Belay et al., 2017, Ferdushi et al., 2019, Gedefaw et al., 2018).

LITERATURE REVIEW

It is believed that women's top priority is childcare (Jabeen *et al.*, 2023). Compared to other family members, mothers devote a disproportionate amount of their time on child-related duties. Holding, washing, and feeding their infants are among the child-related duties that women perform, making them the primary caregivers (McPhee *et al.*, 2003). Opportunities and caregiving and maternal responsibilities continue to conflict, and it is time for women to engage in the workforce. Women are consequently frequently denied access to justice, work, education, and health care.

Patriarchal norms and gender inequality in Pukhtoon and rural Pakistani society

With the rigid patriarchal and religiously driven traditions and rituals, the Pukhtoon caste is one of the most powerful in Pakistan. Highlights of the Pukhtoon culture date back to Herodotus's time (484–425 BC). In 330 BC, Alexander the Great also traveled to Pakistan and Afghanistan to study this culture. The culture of the Pukhtoon is firmly patriarchal. Additionally, although women typically wear veils, they might be seen assisting men in the fields. On the other hand, wealthy metropolitan women raise their children and handle household responsibilities while staying at home (Gohar *et al.*, 2011). In a similar vein, the community, customs, cultures, household incomes, lifestyle choices, castes, and numerous other factors shape the status of rural women in Pakistan. (Yunis *et al.*, 2018). Because to patriarchal sociocultural norms, women are frequently excluded and segregated, this ultimately restricts their opportunities for growth and empowerment. Women are dependent on men for a variety of reasons, including a lack of education and skills, limitations on working outside the home, incorrect interpretations and applications of purdah, the honor attached to their sexuality, domestic duties, and a lack of market awareness, in addition to being disregarded in the nation's mainstream development process (Hossen, 2020). Because of this, men receive more attention in all areas of life, including food, education, ownership, decision-making, and the ability to use resources. (Simpler, 2007). Pakistani women are predominantly involved in unpaid and unrecognized tasks, making them the most disadvantaged group without any form of compensation or acknowledgment. As a result of their exclusion from development plans, these women have lost out on significant opportunities for growth and productivity (Moulabuksh *et al.*, 2022).

Empowering Rural Women: Economic Activities and Supportive Initiatives

Although the women who were expelled generally lacked specialized entrepreneurial skills, they were working to establish independent and sustainable lives. Under strict patriarchy, women are expected to stay inside the home and take care of the family's health and nutrition, bear and raise children, manage the household, fetch water and fodder, and gather fuel wood. Only men are thought to be responsible for meeting all of the basic needs for their family (Flinton *et al.*, 2010). These women engaged in a variety of

economic endeavors in addition to their household duties in order to maintain the household economy and earn money for their own needs. Women's economic activities are supported by certain government and non-government organizations. By using microcredit services, for example, women can significantly contribute to the social and economic advancement of their families (Murshid, 2018). The Benazir Income Support Program (bisp) and non-governmental groups including the Sarhad Rural Support Program (SRSP), the Saiban International Organization, and the Barani Area Development Project (BAP) perform additional supporting responsibilities. These initiatives' main goal is to increase women's income-generating possibilities and national policies to strengthen their income-generating capacities, which will reduce rural poverty. In order to support rural women's decision-making power through awareness and economic independence, these women's organizations helped with traditional activities by offering microcredit, enhancing health facilities, water supply schemes, and capacity-building skills training, including leadership and accounting, as well as skill-based training like carpet weaving, crop production, poultry raising, and footwear production (Hoque., 2008). Hoque and itohara provide a similar explanation for the development organization's influence on the decision-making process of rural women to engage in economic activities.

Challenges and Opportunities faced by rural women

The ability, awareness, and self-respect of women themselves must be changed, as must institutions and communities after norms and behavior change. Additionally, an enabling economic environment with favorable value chains and markets, as well as supportive legal and political environments, must be created in order to empower women economically (Fox et al., 2017). However, employment circumstances for women are incredibly challenging almost everywhere. They become financially independent as a result of economic activity, but it also increases workloads, exploitation, and social violence (Akter et al., 2020).

Rural women's access to a variety of resources is thought to significantly impact household well-being and increase their alternatives for earning a living (Swathi, 2016). However, the majority of these livelihood pursuits are not regarded as active employment. Because they are not compensated, their household chores are not appreciated and are rarely regarded as useful activities. As a result, the national accounting systems do not include them. (Sedik., 2017). Because it is consistently limited to the domestic sphere, a large portion of their labor goes unpaid and unacknowledged. As sociocultural responsibilities, women and girls are primarily responsible for gathering fuel for cooking and heating, fetching water, and caring for youngsters and elderly family members. (Agholor., 2019). In addition to carrying out important agricultural work, these women are mostly maintained to perform unpaid household duties, and development strategies continue to overlook and ignore the contributions of women (Fabiya., 2007). These women have a potentially significant unrealized economic contribution, but they are disregarded, invisible, voiceless, and undervalued in the development plans. As a result, conservative agricultural and economic studies only consider the input of men, ignoring the abundant input of women. The main reason why women's domestic work is not acknowledged is that it is rarely seen as a source of revenue and is instead valued according to non-economic standards, like sex, which raises significant concerns about human justice and gender equity (Tandon., 2016).

The rural women were trying to develop self-sufficiency and livelihoods, but they lacked specialized business skills. Under strict patriarchy, women are expected to stay inside the home and take care of the family's health and nutrition, bear and raise children, manage the household, fetch water and fodder, and gather fuel wood. Men are thought to be responsible for meeting all of the family's basic needs. In order to support themselves and the household economy, some women also participated in certain business

endeavors. Women's economic endeavors are supported by certain government and non-government development initiatives (*Flintan, 2010*).

Women's Vital Role in Agriculture and Livestock Management in Pakistan

There is no denying the importance of women's participation in agricultural work and animal management worldwide. Seventy percent of Pakistan's population has worked in some capacity in the agricultural industry, making it an agricultural nation. Since Pakistan is an agricultural nation, the majority of its workforce has worked in agriculture-related fields, with women making up around half of these workforces. This underscores the need of gender equality (*Luqman et al., 2006*). In Pakistan, it is believed that women are more accustomed to beginning their careers at a younger age than men. When it comes to the care, maintenance, and administration of animals, women perform this responsibility far better than males do. The majority of women's time is spent on farming and livestock-related tasks in every province in Pakistan, including cultivation, irrigation, weeding, harvesting, cutting fodder, watering, grazing animals, and milk processing (*Iftikhar et al., 2007*). Furthermore, women carry out routine rural jobs like farming, livestock care, and household chores more sparingly, delicately, and effectively.

Important Role of women in the On-Farm sustainability

In order to support the sustainable development of the agricultural sector and raise the standard of living for rural households, farmer organizations—such as cooperatives, associations, self-help groups, producer organizations, farmer-based organizations, farmer groups, and collective actions—are becoming more and more important. These groups facilitate collaboration between smallholders and agricultural producers with limited resources, which benefits rural farming households in a number of ways (*Garrity., 2004*).

It is impossible to dispute the importance that women play in managing livestock and helping with agricultural activities worldwide. Seventy percent of Pakistan's population has worked in some capacity in the agricultural industry, making it an agricultural nation. Since Pakistan is an agricultural nation, the majority of its workforce has worked in agriculture-related fields; over half of these workers are women, so the gender component cannot be disregarded (*Luqman et al., 2006*). In Pakistan, it is believed that women are more accustomed to beginning their careers at a younger age than men. When it comes to the care, maintenance, and administration of animals, women perform this responsibility far better than males do. The majority of women's time is spent on farming and livestock-related tasks in every province in Pakistan, including cultivation, irrigation, weeding, harvesting, cutting fodder, watering, grazing animals, and milk processing. (*Iftikhar et al., 2007*). Furthermore, women carry out routine rural jobs like farming, livestock care, and household chores more sparingly, delicately, and effectively.

Challenges and Contributions of Women in Agriculture in Azad Jammu and Kashmir

Northeastern Pakistan is home to the province of Azad Jammu and Kashmir (AJK). Agriculture, tourism, services, and remittances from the huge number of Kashmiris residing abroad form the foundation of this region's economy. In rural farm setup, men and women have distinct roles to play in agriculture-related activities. Nonetheless, women play a significant role in managing cattle, poultry, and crops. Regretfully, it has been observed that, when compared to their actual potential, farmland productivity falls short of expectations. This has been attributed to a number of factors, including the use of conventional farming methods, a lack of access to contemporary extension services, and a smaller land holding scenario. The adoption of high-yielding varieties, agronomic techniques including crop rotation, balanced fertilizer treatment, and other methods for preventing insects, pests, and disease are also not well understood. In the

past, the AJK government has taken action to manage natural resources by offering a range of services, such as distributing seed and fertilizer to farmers and vaccinating cattle. (Khursheed *et al.*, 2019).

Challenges and Contributions of Women in Agriculture in Balochistan

The largest province in the southwest of Pakistan in terms of land area is Balochistan. In terms of infrastructure and extreme poverty, it is the province with the least amount of development. The region is primarily covered in arid landscapes. Ranges of the Rocky Mountains, deserts, and arid grazing areas, with the exception of a small area that contains grazing pasture that is reasonably productive. The economy is mostly reliant on agriculture, especially livestock and fisheries. (Noman *et al.*, 2018). In Balochistan, women work in practically every field. Nonetheless, women participate in tasks related to agriculture at a comparatively higher rate. Despite their family duties, rural women have carried out multiple chores relating to crop cultivation, livestock rearing, and fisheries development. Furthermore, women's greater interest in the livestock industry is demonstrated by the fact that they produce a greater number of livestock than they do in crop production. Raising poultry, camels, goats, and sheep is the main source of income and sustenance for the local population in rural areas. (Shafiq., 2008). In order to raise cattle, women accepted traditional methods from their family elders for rearing, breeding, and related management procedures. Dairy products like butter, yogurt, and oil are also produced by women. Men are only in charge of giving sick animals medicine, which indicates that women play a significant role in the general growing of crops, the rearing of livestock, and the management of these operations. For the purpose of preserving fish, coastal women also participated in the common practices of salting and drying. Additionally, coastal ladies take part in creating beautiful jewelry and décor wonders using seashells and unusual stones. Consequently, it is said that Balochistan's socioeconomic structure displays an uneven distribution of the labor force, with women playing a significant role in agriculture.

Challenges and Contributions of Women in Agriculture in Gilgit Baltistan

Pakistan's northern regions are home to the Gilgit Baltistan (GB) territory. Since most of its residents' work in agriculture, the agro-pastoral system forms the foundation of its economy (Joekes, 1995). In addition to the complete spectrum of agricultural activities, women have important and potential responsibilities in related domains including animal management, horticulture with regard to assignments, and crop pre- and post-harvest operations (Beg, 2011). Barley, maize, and wheat are the main cereal crops grown here. When it comes to vegetable gardening, the main crops grown in Great Britain are tomatoes, onions, peas, cabbage, and potatoes. Women have more power in the production of vegetables; for example, they are the ones who choose which type to produce. Additionally, GB's environment made it possible to produce dried fruits, which gave tiny farming communities a source of monetary income, particularly during the winter. The business sector, non-governmental organizations, government initiatives, and development participants have all contributed to the development of these revenue-generating areas for women during the past 30 years.

Challenges and Contributions of Women in Agriculture in Khyber Paktunkhwa (KPK)

The subtropical region of Pakistan's Khyber Paktunkhwa (KPK) province has a diverse topography and is connected by the Himalayas, Karakorum, and Hindu Kush Mountain ranges. In general, KPK can be separated into three main areas. The southern region, where cereal crops may be produced. The middle zone is made up of hilly regions encircling productive farmland. Due to favorable natural conditions, this area has an adequate supply of water for cash crop cultivation, which is the primary driver of the higher income levels of the people who live there. There is no access to the valleys in the northern region, which is covered

in hilly mountain terrain. In particular, this area produces vegetables and off-season crops like saffron mushrooms.

Due to the widespread socioeconomic situation in the province, women in rural regions have been volunteering for a variety of agriculturally related jobs. For instance, women play a crucial role in post-harvest agricultural tasks like husking, grading, and preserving agricultural products. They also engage in the care and rearing of livestock, namely cattle, goats, and chickens (Andaleeb *et al.*, 2017). Families in rural areas rely on the money they make from selling dairy products and animals to city dwellers (Akhtar *et al.*, 2020). Furthermore, agro-forestry employs a significant number of female farmers. The need for seedlings can be met by a large number of private nurseries.

Challenges and Contributions of Women in Agriculture in Punjab

Punjab province has the most population of any region in Pakistan. Punjab has a wet and dry climate and is located in a tropical region. This region is rich in agricultural activity and has higher overall production thanks to the massive irrigation provided by the British government's creation of the greatest canal irrigation system in the world. Punjab contributes the most to agriculture farming when compared to other provinces. Particularly in Punjab's rural districts, the agricultural industry is regarded as the main source of income. The agricultural farming and animal rearing industries greatly benefit from the contributions of rural women farmers (Manzoor *et al.*, 2018). Together with males, rural women carry out a variety of farming duties, such as pre- and post-harvest work. Regardless, women farmers play important roles in the agricultural industry, but they are unable to influence decision-making because of constraints imposed by cultural norms and beliefs in various communities (Ishaq and Memon, 2017).

Undervalued Contributions of Rural Women in Sindh's Agriculture and Livestock Industry

The contributions made by women to the livestock industry are more commendable than those made by men. It should be mentioned that harvesting regimes have a significant seasonal influence on the revenue produced by agricultural crops. Nonetheless, revenue from livestock operations is typically produced on a regular basis, making it a useful way to meet various household needs, particularly in rural areas (Faheem *et al.*, 2020).

Sindh province is regarded as Pakistan's second most populous and economically growing region, behind Punjab. Sindh is primarily an agricultural region, with the exception of Karachi city. Nearly 70% of the population, particularly in rural Sindh, is involved in agricultural activities. The primary crops grown in the Sindh region include rice, wheat, sugarcane, cotton, bananas, and mangoes. The degree of commitment made by rural women farmers has not been taken into account when calculating their participation (Druza and Peveri, 2018). Because of local conventions and cultural norms, they are rarely acknowledged for their greater contributions to a variety of sectors, such as crops, livestock rearing and dairy development, back yard poultry, back yard kitchen gardening, agro-forestry, and fisheries (NoorMmemon *et al.*, 2015). The use of traditional methods, restricted access to the newest technologies, a lack of technical understanding, and the unavailability of necessary inputs caused the women farmers to produce poor crop yields.

Even in this era of globalization and information technology, women in rural Pakistan still trail far behind when it comes to registering their businesses. Poverty and food security continue to limit development in rural areas. Even though they work in agriculture, the vast majority of people there are involved in the industry. Pakistan has many small farmers, just as other developing nations, and their role should be highlighted. Interestingly, the majority of the people who labor on these small farms are women. Rural women's involvement in animal husbandry is crucial and seen as essential for underprivileged groups. The

role of rural women in the economy has traditionally been disregarded, despite its significance in lowering poverty and food insecurity in rural regions (Faheem *et al.*, 2020).

Punjab, the most populated region of Pakistan, is situated in an area with a hot and arid environment. The terrain is rich in agricultural and increases overall production due to the excessive use of water from the greatest canal in the world, which was constructed by the British government. Punjab is the province with the largest agricultural contribution. Particularly in Punjab's rural districts, agriculture is regarded as one of the primary sources of income. In the fields of agriculture and animal husbandry, rural women farmers are performing admirably (Manzoor *et al.*, 2018).

Compared to men, women's contributions to the livestock business are more admirable. It should be noted that the income generated by agricultural crops is significantly influenced by harvesting schedules. However, as livestock enterprises usually provide income on a regular basis, they offer a practical means of covering a range of household expenses, especially in rural locations.

Animal care and management

Women's contributions to agriculture, especially in animal husbandry, are essential to the long-term viability of rural communities and the food production system as a whole (Keeling *et al.*, 2019). Numerous studies have been carried out recently to evaluate the significance and role of women in agriculture (Abreha *et al.*, 2020; Sariyev *et al.*, 2020). But in spite of their important contributions, women frequently encounter a number of obstacles and limitations that restrict their ability to participate in decisions pertaining to animal husbandry activities (Hossain *et al.*, 2021; Ndlovu and Mjimba, 2021).

The majority of activities pertaining to cattle management involve women. The management of livestock has always been seen as the exclusive domain of women. Cutting fodder, cleaning sheds, milking dairy animals, processing animal and milk products, and maintaining the herd's health is all tasks performed by women. In rural India, raising livestock is a significant source of revenue for all types of farmers, including small, marginal, and even landless farmers. Rural women have important roles in the production of the agriculture sector by working passionately on crop production from soil preparation to post-harvest operations, according to Ahmed and Hussain (2004). According to aggregate data, women make up roughly 43% of the agricultural labor force worldwide, including in developing nations (FAO, 2011). Furthermore, the World Bank (2013) reports that approximately 50% of women worldwide are employed. However, their contributions are actually valued less, and rural women are less likely to recognize their potential to improve their own, their families', and their communities' quality of life Akinsanmi, 2005; Younas *et al.* (2007).

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