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Analysing key influences on sheep husbandry practices: A force field analysis

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ABSTRACT

The present study employed Kurt Lewin's Force Field Analysis to assess the driving and restraining forces influencing sheep husbandry practices among beneficiary (BF) and non-beneficiary farmers (NBF) and to examine the influence of interventions under the Farmer FIRST Programme (FFP). Major driving forces among BF farmers included access to improved germplasm, advisory services, training programmes, markets, financial resources, veterinary services, fodder resources, and infrastructure. The analysis revealed that BF farmers had a significantly higher mean rank (33.04) for driving forces than NBF farmers (17.96), indicating that stronger forces favouring the adoption of improved sheep husbandry practices. Conversely, BF farmers recorded a significantly lower mean rank (14.32) for restraining forces than NBF farmers (36.68), suggesting that beneficiaries encountered comparatively fewer barriers in adopting improved practices. Major constraints among NBF farmers included limited access to advisory services, inadequate adoption of improved technologies, and continued reliance on traditional feeding practices. The Mann–Whitney U test revealed significant differences ($p < 0.01$) between BF and NBF farmers for both driving and restraining forces. The findings demonstrated that targeted programme interventions can strengthen forces conducive to improved sheep husbandry while reducing adoption-related constraints. The study highlighted the importance of sustained institutional support, effective advisory services, capacity building, and improved access to essential resources for promoting sustainable sheep husbandry practices.

Keywords: Driving forces, Infrastructure development, Livestock productivity, Restraining forces, Socio-economic barriers, Sustainable agriculture

Sheep husbandry plays an important role in sustaining rural livelihoods, particularly in arid, semi-arid, and resource-constrained regions, by contributing to income, employment, nutrition, and livelihood security. Owing to their adaptability and relatively low resource requirements, sheep constitute an important livestock asset for small and marginal farmers (Singh, 1985; Singaravadivelan *et al.* 2019). However, the productivity and profitability of sheep farming are influenced by several technical, socio-economic, institutional, and environmental factors.

Access to improved germplasm, scientific feeding and healthcare practices, veterinary and advisory services, markets, and institutional support can facilitate the adoption of improved sheep husbandry practices. Conversely, inadequate access to quality feed and veterinary services, limited financial resources, weak institutional support, traditional farming practices, and climatic variability may constrain productivity and sustainable development of sheep production systems (Diriba and Kebede, 2020; Vasanthi *et al.* 2022). Targeted interventions involving improved germplasm, training, and technical advisory support can potentially strengthen farmers' capacity to adopt improved husbandry practices and enhance production outcomes (Derbib and Sinote, 2025).

Understanding the factors that encourage or hinder improved sheep husbandry is essential for designing effective livestock development interventions. In this context, the present study employed Kurt Lewin's (1951) Force Field Analysis to identify and compare the major driving and restraining forces influencing sheep husbandry practices among BF and NBF farmers. The study further provided insights into the relative importance of these forces for strengthening interventions aimed at promoting sustainable sheep production and improving rural livelihoods.

MATERIALS AND METHODS

The study was conducted in 2024-25 among sheep farmers in Bareilly district, Uttar Pradesh, a region with a substantial sheep population and suitable for evaluating sheep husbandry practices under the Farmer FIRST Programme (FFP; Farm, Innovations, Resources, Science and Technology) of ICAR–IVRI, Izatnagar, aimed at improving livestock-based livelihoods through improved Muzaffarnagari ram germplasm and scientific sheep husbandry interventions. A total of 120 sheep farmers were selected for the study, comprising 60 BFs selected

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purposively from villages covered under the FFP and 60 NBFs selected randomly from comparable non-FFP villages. BFs were those who had received targeted interventions under the FFP, including the provision of improved Muzaffarnagari ram germplasm for genetic upgradation, training, and technical advisory support on improved sheep husbandry practices, whereas NBFs had not received any of these interventions. Data were collected from both groups through a semi-structured interview schedule supplemented with focus group discussions. The study employed Kurt Lewin's Force Field Analysis (FFA) to identify the factors influencing sheep husbandry practices. The variables considered comprised market, infrastructural, social, technical, and economic (MISTE) factors, which were identified through expert consultation and focus group discussions and subsequently classified as driving forces that promoted improved sheep husbandry practices and restraining forces that hindered their adoption.

Force Field Analysis was carried out following a structured five-step procedure (Arab-Zozani *et al.* 2019). First, the desired change, namely the adoption of improved sheep husbandry practices, was clearly defined. Second, the driving forces facilitating the desired change were identified. Third, the restraining forces hindering the adoption of improved practices were identified through brainstorming and stakeholder discussions. Fourth, each identified driving and restraining force was assigned a score ranging from 1 (weak influence) to 5 (strong influence) according to its perceived effect on sheep husbandry practices. A two-round expert panel discussion was subsequently conducted to refine and finalize the key driving and restraining forces included in the study. Finally, respondents were asked to indicate the perceived influence of each finalized force using a five-point Likert scale, and mean scores were computed separately for BFs and NBFs. In the force field diagrams, larger arrows represent forces exerting greater influence on sheep husbandry practices. Descriptive statistics were used to calculate the mean scores for individual driving and restraining forces. Differences in mean ranks between BF and NBF farmers were analysed using the Mann–Whitney U test, whereas the Wilcoxon signed-rank test was employed to compare the relative strength of driving and restraining forces within each group. Statistical analyses were performed using appropriate non-parametric procedures.

RESULTS AND DISCUSSION

Driving and restraining forces of BF farmers: The results are analyzed across five key dimensions: market, infrastructural, socio-personal, technical, and financial/ economic (MISTE factors). The mean scores for driving and restraining forces (Fig. 1) provide insights into the factors influencing sheep farming among BF farmers.

Market Factors: Among the market-related driving forces, the ability to market lambs at an earlier age (5–6 months) (Mean: 4.12) provided a key advantage by ensuring quicker returns. The consistent demand for sheep products, particularly meat and wool, and the year-round market availability of sheep and its products also supported regular income generation (Singh *et al.* 2018). On the other hand, the non-availability of wool markets (Mean: 3.43) constrained farmers' opportunities to generate income from

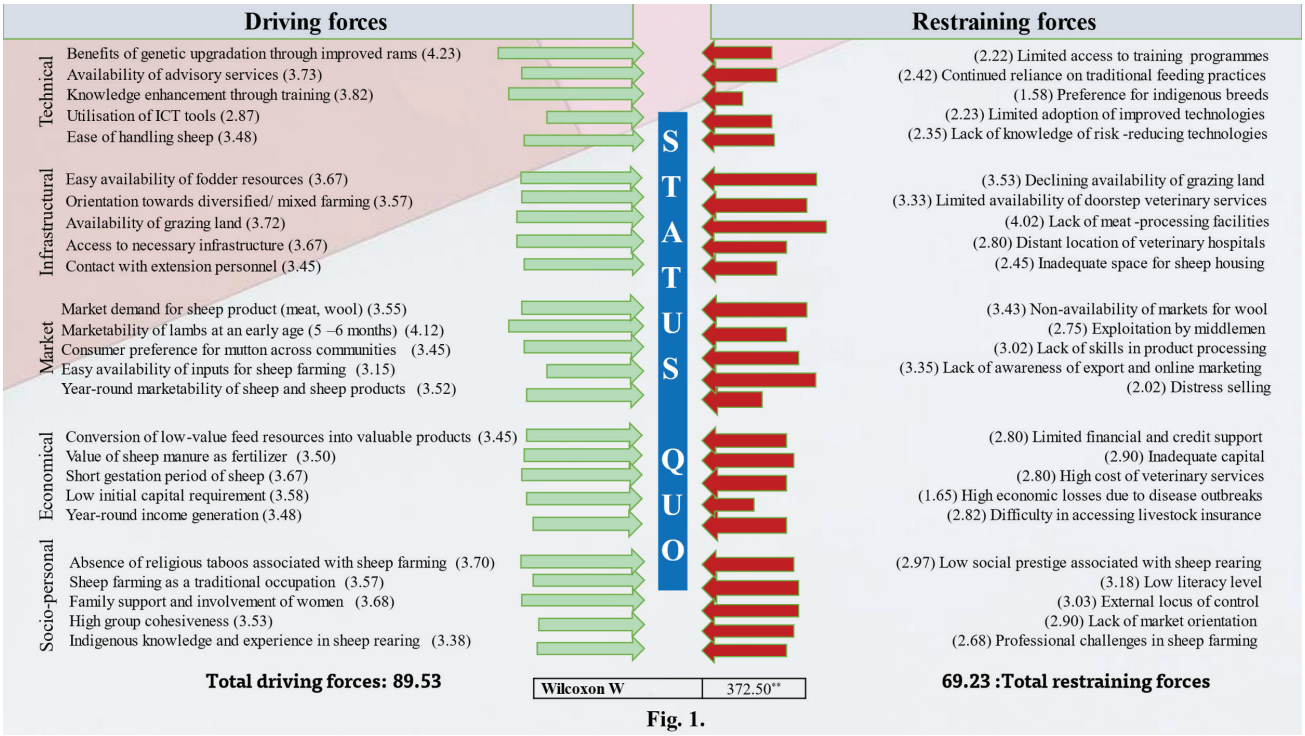


Fig. 1. Force field analysis representing driving and restraining forces of BN farmers

wool sales. Exploitation by middlemen further reduced farmers' returns, highlighting the need for direct marketing channels. Moreover, a lack of awareness regarding export opportunities and online marketing (Mean: 3.35) restricted potential market expansion.

Infrastructural factors: Availability of grazing land (Mean: 3.72) emerged as a key driving force, ensuring adequate resources for feeding. The easy availability of fodder crops, such as leguminous forages and grasses, further strengthened nutritional management. Access to infrastructural facilities, including veterinary dispensaries, input supply centres, and extension services (Mean: 3.67), also positively influenced farming efficiency. Among the restraining forces, declining availability of grazing land (Mean: 3.53) remained a major challenge due to increasing competition for land. In addition, the limited availability of doorstep veterinary services and the distant location of veterinary hospitals posed significant barriers to timely healthcare interventions.

Socio-personal factors: Among the socio-personal driving forces, the absence of religious taboos associated with sheep farming (Mean: 3.70) promoted its widespread acceptance. Family support and the involvement of women in sheep farming further encouraged active participation, while the traditional association of sheep rearing with rural livelihoods facilitated its continued adoption. Among the restraining forces, low literacy rates (Mean: 3.18) limited farmers' ability to acquire knowledge of scientific sheep husbandry practices. An external locus of control (Mean: 3.03) indicated a tendency to rely on external circumstances rather than proactively adopting improved practices. In addition, lack of market orientation restricted the entrepreneurial efforts.

Technical factors: Among the technical driving forces, benefits of genetic upgradation through improved Muzaffarnagari rams recorded the highest mean score (Mean: 4.23), highlighting strong support for breed improvement. This contributed to enhanced productivity through improved growth performance and meat production. Knowledge enhancement through training programmes (Mean: 3.82) further emphasized the importance of capacity building in equipping farmers with scientific sheep husbandry practices. In addition, the availability of advisory services strengthened farmers' technical decision-making and adoption of improved practices. Conversely, major technical restraining forces included continued reliance on traditional feeding practices (Mean: 2.22) and limited adoption of improved technologies (Mean: 2.23), indicating gaps in the practical application of scientific sheep husbandry practices.

Financial/economic factors: The conversion of low-value feed resources into valuable products (Mean: 3.45) demonstrated the economic efficiency of sheep farming. Sheep's short gestation period (Mean: 3.67) and low initial capital investment facilitated easy entry into this enterprise (Devi *et al.* 2020). In addition, the use of sheep manure as an organic fertilizer further enhanced its economic value. Among the restraining forces, limited financial and credit support (Mean: 2.80) and inadequate capital (Mean: 2.90) emerged as major constraints affecting sheep farming. High losses due to disease outbreaks (Mean: 1.65) also contributed to significant financial risks, emphasizing the need for effective disease prevention and control measures.

The Wilcoxon value (W = 372.50**) showed a statistically significant difference ($p < 0.01$) between the driving and restraining forces. This underscored the stronger influence of driving factors in motivating farmers to adopt improved sheep husbandry practices. Addressing the identified restraining forces while reinforcing key driving factors can significantly enhance the adoption of scientific sheep husbandry practices. Strategies such as promoting the adoption of improved technologies, strengthening livestock advisory and extension services, expanding market opportunities for wool, and improving access to financial and credit support are critical for sustaining positive outcomes in sheep farming among BF farmers.

Driving and restraining forces of NBF farmers: The mean scores for driving and restraining forces (Fig. 2) influencing sheep farming among NBFs are analyzed across five key dimensions: market, infrastructural, socio-personal, technical, and financial/economic (MISTE factors).

Market factors: Among the market-related factors, NBF farmers experienced several challenges that hindered their profitability. Although the ability to market lambs at an earlier age (5–6 months) (Mean: 3.63) offered opportunities for quicker returns, its potential was not fully realized due to limited access to organized sheep marketing channels. While there was a steady demand for sheep products, particularly meat and wool, NBF farmers were unable to fully capitalize on these opportunities because of weak market linkages. Among the restraining forces, the non-availability of a dedicated wool market (Mean: 4.03) emerged as the most prominent constraint, severely limiting income opportunities from wool sales. Exploitation by middlemen (Mean: 3.55) further reduced farmers' profit margins (Sudeepkumar and Kaithiravan, 2025). In addition, lack of awareness of export and online marketing (Mean: 3.48) restricted access to alternative marketing avenues, thereby limiting income diversification

Infrastructural factors: NBF farmers faced notable infrastructural constraints that impeded effective sheep farming. Although the availability of grazing land (Mean: 3.28) and fodder crops played an important role in sheep production (Derbib and Sinote, 2025), these resources were often insufficient to meet the recommended feeding requirements. Among the restraining forces, declining availability of grazing land (Mean: 3.67) emerged as a major concern (Porwal *et al.* 2006), reducing the availability of essential feed resources. In addition, the limited availability of doorstep veterinary services (Mean: 3.57) and the distant location of veterinary hospitals (Mean: 3.95) restricted access to timely healthcare interventions (Kumar *et al.*

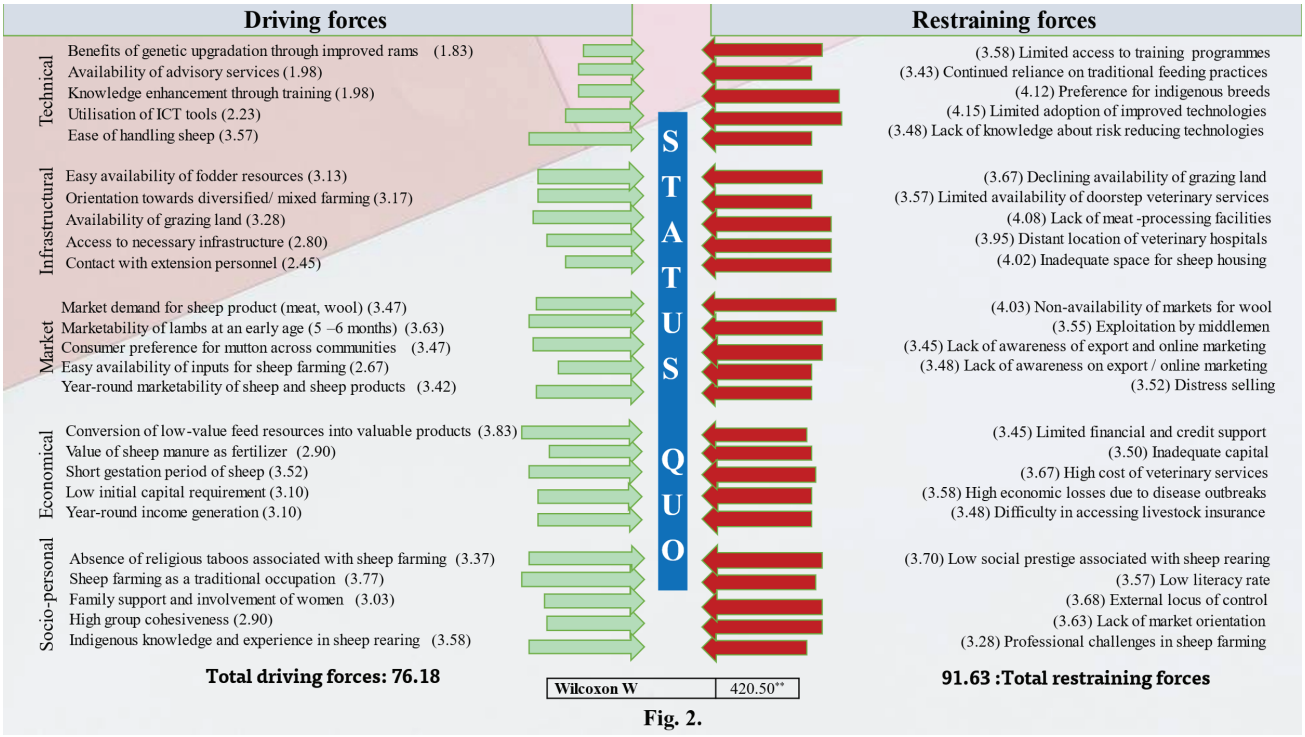


Fig. 2. Force field analysis representing driving and restraining forces of NBN farmers

2014). Furthermore, the lack of meat-processing facilities (Mean: 4.08) deprived NBF farmers of opportunities for value addition and better market returns.

Socio-personal factors: Socio-personal factors highlighted several limitations among NBFs. Although the absence of religious taboos associated with sheep farming (Mean: 3.37) promoted its cultural acceptance, this factor alone was insufficient to overcome other socio-personal constraints. Among the restraining forces, low literacy rates (Mean: 3.57) limited farmers' ability to acquire knowledge of scientific sheep husbandry practices (Suresh *et al.* 2008). In addition, an external locus of control (Mean: 3.68) indicated a tendency to rely on external circumstances rather than proactively adopting improved practices. Furthermore, lack of market orientation (Mean: 3.63) hindered entrepreneurial efforts, leaving NBF farmers dependent on traditional and less profitable production practices.

Technological factors: Technological constraints were particularly prominent among NBF farmers. Although benefits genetic upgradation through improved rams (Mean: 1.83) offered considerable potential for improving sheep productivity, NBF farmers had limited access to improved breeding programmes. Among the restraining forces, continued reliance on traditional feeding practices (Mean: 3.58) and limited adoption of improved technologies (Mean: 4.15) emerged as major constraints, reflecting gaps in the practical implementation of scientific sheep husbandry practices. These limitations reduced the productivity and overall efficiency of sheep farming among NBF farmers (Sahu *et al.* 2026)

Financial/economic factors: Financial constraints were a major concern among NBF farmers. Although the conversion of low-value feed resources into valuable products (Mean: 3.83) demonstrated the economic potential of sheep farming, NBF farmers were unable to fully realize this advantage because of limited financial resources. Among the restraining forces, limited financial and credit support (Mean: 3.45) and inadequate capital (Mean: 3.50) emerged as major constraints, restricting investment in improved sheep husbandry practices (Diriba and Kebede, 2020). In addition, the high cost of veterinary services (Mean: 3.67) and losses due to disease outbreaks (Mean: 3.58) increased the financial burden on farmers. Furthermore, difficulty in accessing livestock insurance (Mean: 3.48) exposed NBF farmers to unexpected losses, reducing the economic security and sustainability of sheep farming.

The Wilcoxon W value (W = 420.50**) indicated a statistically significant difference ($p < 0.01$) between the driving and restraining forces. This emphasized that NBF farmers face considerable challenges across multiple dimensions, particularly in accessing improved technologies, infrastructural facilities, and market opportunities. As a result, targeted interventions to address these limitations are crucial for improving the productivity and economic stability of NBF farmers. Addressing the identified restraining forces by strengthening infrastructural facilities, improving access to financial and credit support, and promoting the adoption of improved technologies will help NBF farmers adopt more efficient and profitable sheep husbandry practices.

Table 1. Comparison between BF and NBF on driving and restraining forces

Forces	Respondents	Mean rank	Mann-Whitney U test	Z
Driving	BF	33.04	124**	-3.659
	NBF	17.96		
Restraining	BF	14.32	33**	-5.425
	NBF	36.68		

**Significant at 1% level (p<0.01)

Comparison between BF and NBF for driving and restraining forces: Data in Table 1 revealed that BF farmers had a significantly higher mean rank (33.04) for driving forces compared to NBF farmers (17.96). The higher mean rank indicated that BF farmers perceived greater advantages and motivating factors in their sheep husbandry practices. The major driving forces among BF farmers included genetic upgradation through improved Muzaffarnagari rams, knowledge enhancement through training programmes (Suresh, 2011), availability of livestock advisory services, better market opportunities, and improved access to veterinary services, fodder crops, and infrastructural facilities (Suresh *et al.* 2008), which collectively contributed to the higher driving forces.

NBFs had a lower mean rank (17.96), indicating that they perceived fewer driving forces. The lower rank reflected limited access to the advantages available to BF farmers. In contrast, BFs had a significantly lower mean rank (14.32) for restraining forces compared to NBFs (36.68), indicating that BF farmers experienced fewer barriers and challenges in their sheep husbandry practices. NBFs faced greater constraints due to continued reliance on traditional feeding practices (Sasidhar and Suvedi, 2016), limited adoption of improved technologies, and limited access to improved breeding programmes. They also encountered more significant challenges related to declining availability of grazing land (Shinde and Sejian, 2013), the distant location of veterinary hospitals (Khalid, 2014), and the lack of meat-processing facilities (Kumar, 2018). In addition, NBFs were more affected by exploitation by middlemen (Shruti *et al.* 2021), the non-availability of a dedicated wool market, limited financial and credit support, and the high cost of veterinary services (Meena *et al.* 2018). Higher socio-personal constraints, including low literacy rates, an external locus of control, and lack of market orientation, were also more pronounced among NBFs. The Mann–Whitney U test results revealed significant differences between BF and NBF farmers in both driving and restraining forces, with Z-scores indicating strong statistical significance. These findings indicated that the interventions provided under the Farmer FIRST Programme were effective in strengthening driving forces and reducing restraining forces among BF farmers.

The significant difference in driving and restraining forces between BF and NBF farmers emphasized the positive impact of targeted interventions such as genetic improvement programmes and training initiatives. BFs experienced improved sheep growth performance, better access to livestock advisory and veterinary services, and increased profitability associated with these interventions. In contrast, NBFs struggled with inadequate resources, limited adoption of improved technologies, and greater vulnerability to market exploitation and disease outbreaks. Promoting the adoption of improved technologies, strengthening livestock advisory and extension services, and expanding wool market opportunities are recommended to address these barriers. Promoting community-based extension services and encouraging cooperative marketing structures could further enhance sheep husbandry success. Cooperative marketing structures enable farmers to pool resources, improve bargaining power, and secure better prices for sheep products, ultimately reducing reliance on middlemen and stabilizing incomes among NBF farmers.

This study highlighted the potential of targeted interventions in strengthening driving forces and mitigating restraining forces influencing sheep husbandry practices. Sustained technical and institutional support, strengthened veterinary services, and improved market infrastructure are essential for promoting sustainable sheep husbandry development. Given the favourable influence of FFP interventions on improved sheep husbandry practices, expanding the programme's coverage could enable more NBFs to access its benefits and encourage wider adoption of improved sheep husbandry practices.

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