genotypes are of the trailing type. French beans or common beans, which are recognized for their high protein content and wide adaptability, are a major legume crop in the mid-hill and mountainous regions of Nepal (Chhetri and Bhatta, 2017; Luitel et al., 2021). The beans grown in the Karnali zone of Nepal are known as Jumli simi, which are traditional high-altitude landraces of French beans. (Prasad et al., 2016). Mixed bean cultivation has traditionally been an integral practice in mountain farming systems, although it is gradually being replaced by monocropping (Joshi et al., 2025). The three-year average results showed that the Chaumase genotype produced the highest green pod yield (35.0 t/ha), followed by Trishuli (28.0 t/ha), WP Con Bean (24.6 t/ha), and White OP (22.9 t/ha). Similarly, in terms of seed yield, Chaumase and Trishuli (2.1 t/ha each) performed best, while Dhankute Chirrke (1.44 t/ha) and White OP (1.09 t/ha) were found to be promising genotypes for seed production (Kalauni et al., 2019).

In the Tilagufa municipality of Kalikot, French beans are traditionally produced on a small scale, with limited access to quality seeds, irrigation, fertilizers, and pesticides, resulting in high production costs. Pests and diseases were major challenges in production and limited market information is the major marketing problem. Despite low yields due to these constraints, French bean cultivation is economically important in the Karnali region, offering significant income opportunities and potential to improve food security and rural livelihoods (Adhikari et al., 2024).

2 Materials and Methods

2.1 Study area and sample size

For this study, the Kalikot district was purposively selected because it is one of the most French bean producing districts in the high hills of the Karnali region. A total of 100 farmers were chosen from a population of 3,022 for data collection using proportionate stratified random sampling across the different local levels. A field survey was conducted in February 2025 to collect primary data from farmers through semi-structured questionnaires, focus group discussions, and key informant interviews, while secondary data were obtained from various sources. Data analysis was performed using Microsoft Excel 10 and STATA V12. Descriptive statistics such as means and frequencies, as well as gross margin, profitability index, multiple linear regression, independent sample t-tests, and severity indices for major bean production problems were computed.

2.2 Gross margin and profitability index analysis

Gross margin is the difference between the Gross return (GR) and the Total Variable Cost (TVC). It is a useful planning tool in situations where fixed capital is a negligible portion of the farming enterprise in the case of small-scale subsistence agriculture (Olukosi and Erhabor, 1988). Gross margin was calculated as follows:

Gross margin (GM) = Gross return (GR) – Total variable cost (TVC)
Net profit = Gross margin (Rs.) – Fixed cost (Rs.)

Where, Gross return (Rs.) = Price of French beans (Rs. /kg) × total quantity sold (kg);
Total variable cost (Rs.) = Summation of the cost of all variable inputs;
Profitability index = Net farm Income / Total variable cost (NFI/TVC)

2.3 Indexing

Scaling techniques provide the direction and extremity attitude of the respondent towards any proposition (Miah, 1993). The problems faced by the bean farmers in the study area were ranked by using a scaling technique comparing the intensity of different levels of using scale values 1, (1-1/n), (1- 2/n), (1-3/n) and so on:

$$I = \sum S_i * f_i / N$$

Where, I = index $0 < I < 1$; I = index value (ranging from 0 to 1); S_i = scale value for the i^{th} severity category; f_i = frequency of responses in the i^{th} severity category; N = total number of respondents ($= \sum fi$)