

Sample Design

Sample Size Estimation

The poultry farm listing initially included 22,877 farms, with an average annual farm size of 4,615.76 and a standard deviation of 14,165.21. Due to the high variability in farm sizes, only farms with an annual size of less than 20,000 birds were sampled to reduce the standard error. Farms with an annual size of 20,000 or more, totalling 625, were selected for a full count (census). After removing these larger farms from the list, 22,252 farms remained. This reduced the average annual farm size to 3,335.72 and significantly lowered the standard error to 3,148.71.

Then, to estimate the sample size by province, the following method/tool was employed:

$$n_d = \frac{z^2 * cv_{yd}^2}{e^2 + \frac{cv_{yd}^2}{N_d}} * deff$$

where,

- n_d :- Sample size for domain d (province)
- z :- 1.96; 95% confidence level
- cv_{yd} :- coefficient of variation for annual number of poultry for domain d (province)
- e :- relative error of margin to be tolerated 8.55%
- N_d :- number of observations at domain d (province)
- $deff$:- design effect; assumed 1.1

Based on the above assumption, the domain-wise sample sizes are as follows:

Province	Sample size
Koshi	533
Madhesh	219
Bagmati	512
Gandaki	457
Lumbini	499
Karnali	528
Sudurpaschim	354
Total	3,102

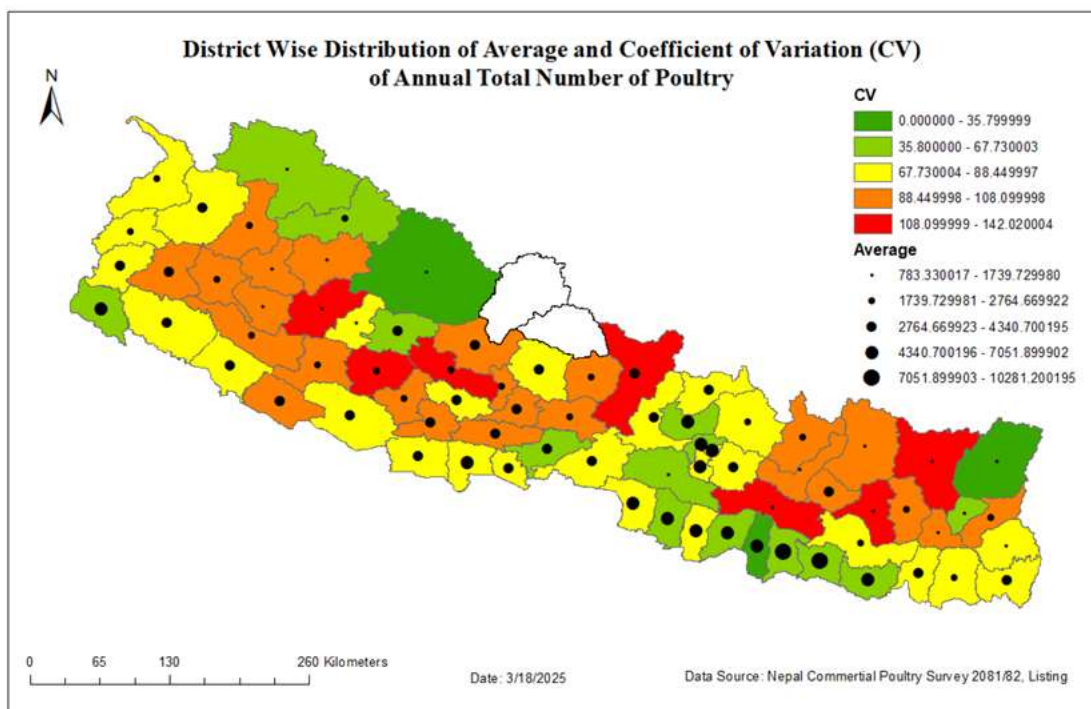
Allocation of Sample Size

Before allocating the sample size, the poultry farm list was categorised based on bird type and annual farm size.

Poultry type	Count
Broiler	20,054
Layers	1,631
Kuroiler	309
Giriraj	258

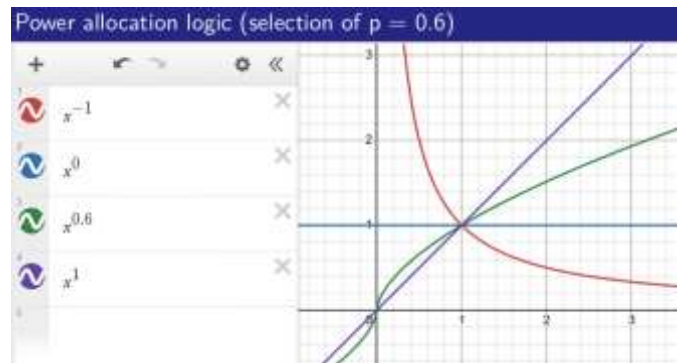
Annual poultry size	Count
500-1,000	3,573
1,000-5,000	13,809
5,000-10,000	3,497
10,000-20,000	1,373

Strata were then formed by combining province, district, bird type, and annual poultry farm size, resulting in a total of 584 strata. Once the strata were established, the sample size was allocated using power allocation with an exponent of $p = 0.6$. This approach was chosen to increase the sample size in more heterogeneous areas and reduce it in more homogeneous ones, based on the following observed district-level patterns:



Map produced: Tika Ram Mahato, Statistics Officer, National Statistics Office, GIS Section

This allocation was also guided by the following graph, where the x-axis represents the stratum size and the y-axis represents the corresponding sample size:



Sample Selection

Once the sample size for each stratum was determined, simple random sampling was applied within each stratum to select the samples.