Smallholder livestock farmers coping and adaptation strategies to agricultural drought

Y.T. Bahta*

University of the Free State, 205 Nelson Mandela drive, Agricultural Building, P.o.box 339, Internal box 58.

* Correspondence: Email: Bahtay@ufs.ac.za, Tel: +27514019050.

Appendix 1

To calculate appropriate sample sizes for a survey, two formulas were developed for continuous and categorical data by Cochran [33]. The questionnaire that was used, collected both continuous and categorical data. Thus, to ensure that the sample size was appropriate, the calculation for categorical data was applied and is expressed as Equation 1.1:

Total sample size calculated using:

\[ M_0 = \frac{u^2 \times f \times i}{e^2} \]  (1.1)

Where: \( M_0 \) = sample size; \( u \) = value for the selected alpha level; \( f \) = variance of estimate = 0.25 (maximum possible proportion (0.5) \times 1 – maximum possible proportion (0.5) produces maximum possible sample size); \( e \) = acceptable margin of error for proportion being estimated = 0.05 (Error researcher is willing to take).

Alpha level (\( u \)) of 1.65-estimated variance of 0.5 and an error level of .05 were used; the formula would look as follow:

\[ M_0 = \frac{(1.65)^2 \times (0.5)(0.5)}{(0.05)^2} = 272 \]  (1.2)

Resulting in a sample size of 272 respondents. Note that, if the sample size exceeded 5% of the population, the correctional formula of Cochran [33], expressed as Equation 1.3 was applied:

\[ M_1 = \frac{M_0}{\frac{M_0}{\text{population}}} \]  (1.3)

\[ M_1 = \frac{272}{\frac{272}{868}} = 207 \]  (1.4)
Where $M_0$ sample size, $M_1$ is the final sample size (Table 1.1).

**Table 1.1.** Number of farmers who received assistance from government and sampling procedure.

<table>
<thead>
<tr>
<th>Local Municipality</th>
<th>Number of farmers</th>
<th>Share of farmers (Number of farmers/Total)</th>
<th>Number of samples (percentage *total sample size (207))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dikgatlong</td>
<td>347</td>
<td>40%</td>
<td>83</td>
</tr>
<tr>
<td>Magareng</td>
<td>119</td>
<td>14%</td>
<td>29</td>
</tr>
<tr>
<td>Sol Plaatjie</td>
<td>263</td>
<td>30%</td>
<td>62</td>
</tr>
<tr>
<td>Phokwane</td>
<td>139</td>
<td>16%</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>868</td>
<td></td>
<td>207</td>
</tr>
</tbody>
</table>

Source: Northern Cape Department of Agriculture, Forestry, and Fisheries [34] and Author.