1. The main objective of the survey was aimed at drilling down to household level and measuring how specific farming system characteristics and extreme climate changes affect various countries agricultural production, household performance and net revenue.
    - Dependent Variables: Performance of Households, Net Revenue
    - Independent Variables: Climate Changes, Location, Farm Types

2. Multistage Stratified Random Sampling was used and deemed appropriate:
    - Random farm Selections allowed all farms an equal chance of selection.
    - Stratified Sampling allowed for sampling units to have common characteristics: Farming and climate changes - representative of the study to minimize error.
    - Cluster / Multistage sampling aimed to reduce expenditure and increase variability, however, it also results in a fair amount of Bias:
        - ❖ Respondent Bias opinion (Subjective Bias)
        - ❖ Non-Response Bias
        - ❖ Interviewers influence from F2F interviews

3. Q1: How many countries exhibited performance yields above average in the last growing season?
   Q2: Do sole livestock farmers output a higher net revenue per year when compared to sole crop farmers?

4. Q2:
    - Null Hypothesis: H_o = Sole Livestock Farmers do not output a higher net revenue per year when compared to sole stock farmers
    - Alternate Hypothesis: H_a = Sole Livestock Farmers DO output a higher net revenue per year when compared to sole stock farmers.

   Sample Method:
   Locate different countries that have both sole crop and sole stock farming (Stratified)

   Replication:
   Chose random sample districts (>30 normal distribution & minimize sampling error)

   Blocking:
   Gather 20 Samples per farming type (crop farming and stock Farming)

   Control
   Instructions to interviewers.
   Don't consider households that practice both crop and stock farming concurrently.

   Binomial Distribution can now be approximated with normal Distribution:
   (n > 30 and all conditions met).

Central Limit Theorem can be used to determine probability
Law of Large Numbers can be used to determine mean

P-Value can be calculated, and significance defined by ($p<0.05$)

Anova Test to determine the difference between means if groups > 3 : If there are statistical differences between countries / districts.

The **1 tailed test** to compare livestock farmers and crop farmers net revenue - possibility of relationship in 1 direction.

Assess **confidence level** to determine degree of certainty of the probability outcome with known sample mean, sample size and standard deviation.

5. If $p<0.05$, the result is Significant: evidence of unusual differences from the null hypothesis. So H_o will be rejected.

   Non-Significant result, $p > 0.05$, the null Hypothesis cannot be ruled out. Non Significant results may be as a result of sampling errors or could make practical sense.

6. **Contingency Tables** can be used to capture the data from the Surveys
   Boxplots can provide more information of the data e.g. Mean, median, range, percentiles etc.
   Bar plots can help compare the data between the stock and Crop farmers over different harvest seasons / years.

7. Important:
   - Different Chemical Types and Quantities affect crop growth
   - Livestock eat crops so their population may also be affected
   - Limited space can limit crop growth
   - A standard is needed to compare data and minimize Bias and errors.

#GitHub link: https://github.com/carissa14/Stats-Summative-Assessment