**AIIP Statistics Summative Assessment – Stephen S. Aremu**

1. **Variables and examples from dataset**
   1. Discrete variables:
      1. Household size
      2. Number of years in education
      3. Number of days spent on primary occupation
      4. Number of days spent on secondary occupation
   2. Ordinal variables:
      1. Type of farm entity
      2. Crop type
      3. Water Source
      4. System of irrigation
      5. Fertilizer used, pesticide use
   3. Nominal variable:
      1. Gender, Marital status
      2. Religion of the household
      3. Tribe of the household
2. The study design for the agricultural survey is Experimental Study Design. In an experimental study, variables of interest are identified. One or more of these variables, referred to as the factors of the study, are controlled so that data may be obtained about how the factors influence another variable referred to as the response variable, or simply the response.

The population was sampled using Multistage Sampling Method. This method was appropriate since it entails more than 1 stage in sub-setting the population and involves segmentation into groups based on similarities.

Sources of bias has been reduced because there is more control on how the samples are selected or treated. The samples are carefully selected to reduce bias and allow for generalization to be made.

1. Research questions
   1. Has the climate change adversely affected agricultural practice and household income in Africa?
   2. Has the knowledge of climate change and Adaptation to varying climate change help in improving agricultural practice and household income in Africa?
2. In response to question 3b, descriptive statistics are calculated and summarized using sample statistics which include the mean of the sample, standard deviation and other sample measures from the dataset. Determine all the deciding factors and their probabilities to produce a probability distribution table. The distribution of the sample mean of the dataset and the probability distribution is used to generate a normal distribution.

***Null hypothesis Ho***: Adaptation to climate change has not improve agricultural practice and household income in Africa.

***Alternative Hypothesis H1***: Adaptation to climate change has improved agricultural practice and household income in Africa.

ANOVA test is a suitable approach. Variables used in the test are categorical, observations are independent within and across the group and ANOVA test is used to compare the means of more than two samples.

ANOVA test is a test of statistical significance and to determine the statistical significance the independent variables should be greater than two.

1. i. Since there is a statistical difference the Null Hypothesis Ho is rejected (i.e. Accept the alternative Hypothesis H1).

ii. We fail to reject the Null Hypothesis Ho (i.e. Reject the alternative Hypothesis H1) if there is no statistical significance.

There is a significant relationship between the Adaptation of Climate Change to Agricultural practice and household income in Africa.

1. Visualization type:
   1. Histogram: Examine the distribution of the dataset
   2. Scatter plots: Explores the relationship between variables in the data set.
   3. Barplots: Compare items in the dataset
2. The comparison of the fertilizer use, pesticide use and irrigated area in the research to the National average provided by FAO and World Bank is very important to the research. This will help to determine the degree of variation and ascertain any statistical significance.