# Research Methodology

## Chapter 5

## Processing, Analysis and Interpretation of Data

**Wondwossen Bogale (PhD)**

**Assistant Professor, AAiT, AAU**

**wondwossenboge@gmail.com**

# 5. PROCESSING AND ANALYSIS OF DATA

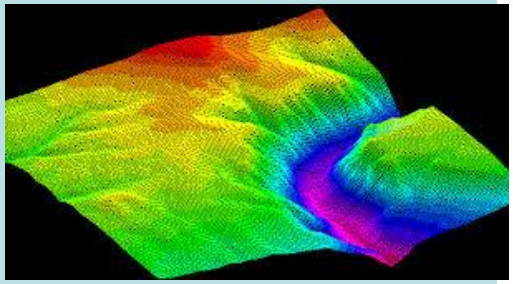
- The data, after collection, has to be processed and analyzed in accordance with the outline laid down for the purpose at the time of developing the research plan.
- Technically speaking, processing implies editing, coding, classification and tabulation of collected data so that they are ready for analysis.
- The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data groups.

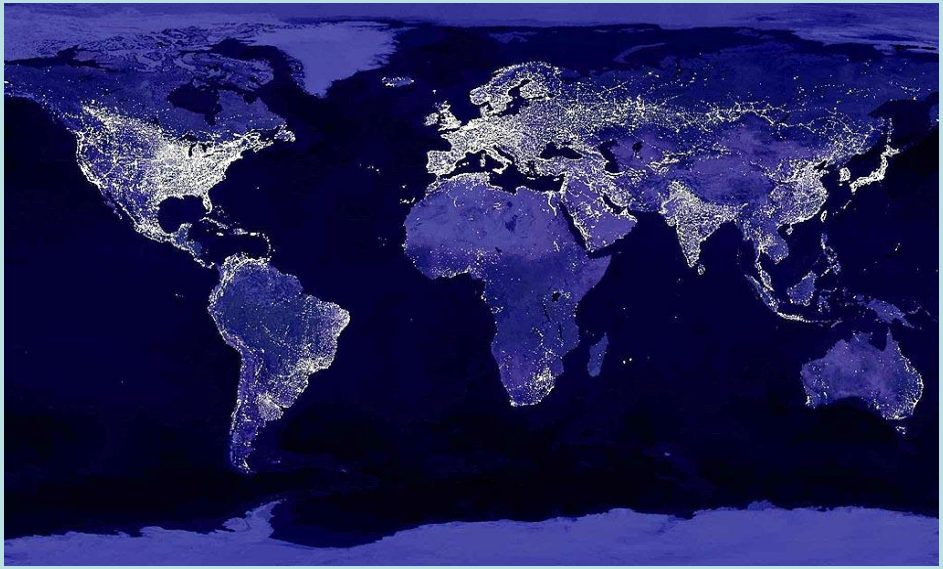
# 5. PROCESSING AND ANALYSIS OF DATA

- Data analysis helps to answer the research questions and to help determine the trends and relations ship among variables.
- After data collection , the researcher should accomplish the following : Process the data, prepare tables and graphs, analyze and interpret findings, prepare for editing and prepare presentation.

# 5. PROCESSING AND ANALYSIS OF DATA- EXAMPLES

| X | Y | Z |
|---|---|---|
| 19857.2577 | 20260.4556 | 100.3058 |
| 19875.4801 | 20207.7198 | 101.0929 |
| 19887.3953 | 20692.713 | 96.4194 |
| 19888.9069 | 21076.9713 | 95.4362 |
| 19889.711 | 21205.2833 | 97.8327 |
| 19890.2416 | 21136.566 | 96.6117 |
| 19891.2471 | 20986.9661 | 97.4735 |
| 19892.501 | 20942.4705 | 97.8558 |
| 19893.3261 | 21033.2971 | 95.7376 |





EA, World Energy Outlook 2014

| Region | Population relying on traditional use of biomass millions | Percentage of population relying on traditional use of biomass % |
|---|---|---|
| **Africa** | **728** | **67%** |
| **Sub-Saharan Africa** | **727** | **80%** |
| *Angola* | *12* | *56%* |
| *Benin* | *9* | *94%* |
| *Djibouti* | *0* | *14%* |
| *Equatorial Guinea* | *1* | *78%* |
| *Eritrea* | *4* | *63%* |
| *Ethiopia* | *87* | *92%* |
| *Gambia* | *2* | *95%* |
| *Ghana* | *21* | *84%* |
| *Guinea* | *11* | *96%* |
| *Guinea-Bissau* | *2* | *98%* |
| *Kenya* | *36* | *84%* |
| *South Africa* | *7* | *13%* |
| *South Sudan* | *11* | *97%* |
| *Sudan* | *27* | *72%* |
| ***North Africa*** | ***1*** | ***1%*** |
| *Algeria* | *0* | *0%* |
| *Egypt* | *0* | *0%* |
| *Libya* | *0* | *0%* |
| *Morocco* | *1* | *3%* |
| *Tunisia* | *0* | *0%* |

# 5.1. PROCESSING OPERATION

- With this brief introduction concerning the concepts of processing and analysis, we can now proceed with the explanation of all the processing operations.

1. **Editing**: Editing of data is a process of examining the collected raw data to detect errors and omissions and to correct these when possible.

- **Editing** is done to assure that the **data are accurate**, **consistent** with other facts gathered, **uniformly entered** and **have been well arranged to facilitate coding and tabulation**.

# 5.1. PROCESSING OPERATION

**Types of Editing**

**1. Field Editing**

- Preliminary editing by a field supervisor **on the same day as the interview** to catch technical omissions, check legibility of handwriting, and clarify responses that are logically or conceptually inconsistent.

**2. Central Editing**

- Editing performed by a central office staff; often done more rigorously than field editing.

# 5.1. PROCESSING OPERATION

## 2. Coding

- A systematic way in which ***to condense extensive data*** sets into ***smaller analyzable units*** through the creation of categories and concepts derived from the data.
- ***It lets you make sense of and analyze your data***.
- Coding facilitates the **organization**, **retrieval**, and **interpretation** of data and ***leads to conclusions on the basis*** of that interpretation.

# 5.1. PROCESSING OPERATION

## 3. Classification

- ***Data classification*** is the process of organizing data ***into categories*** for its most effective and efficient use.
- Most research studies result in a large volume of raw data which must be reduced into ***homogeneous groups*** if we are to get meaningful relationships.
- ***Data having a common characteristic*** are placed in one class and in this way the entire data get divided into a number of groups or classes.

# 5.1. PROCESSING OPERATION

- Classification can depending upon the nature of the phenomenon involved:

**(a) Classification according to attributes** : data classified on the basis of common characteristics which can either be descriptive (such as literacy, sex, weight, income, etc.)

**(b) Classification according to class-interval** : For instance, persons whose incomes are within 3000 birr to 5000 birr can form one group, those whose incomes are within 5000 birr to 7000 can form another group and so on.

# 5.1. PROCESSING OPERATION

**4. Tabulation**

- The process of placing classified data into tabular form is known as **tabulation.**
- Thus, tabulation is the process of ***summarizing raw data*** and ***displaying them in compact form***

**Tabulation is useful due to the following reasons.**

1. It conserves space
2. It facilitates the process of comparison
3. It facilitates summation of items
4. It provides a basis for statistical computations.

# 5.1. PROCESSING OPERATION

EA, World Energy Outlook 2014

| Region | Population relying on traditional use of biomass millions | Percentage of population relying on traditional use of biomass % |
|---|---|---|
| **Africa** | **728** | **67%** |
| **Sub-Saharan Africa** | **727** | **80%** |
| *Angola* | *12* | *56%* |
| *Benin* | *9* | *94%* |
| *Djibouti* | *0* | *14%* |
| *Equatorial Guinea* | *1* | *78%* |
| *Eritrea* | *4* | *63%* |
| *Ethiopia* | *87* | *92%* |
| *Gambia* | *2* | *95%* |
| *Ghana* | *21* | *84%* |
| *Guinea* | *11* | *96%* |
| *Guinea-Bissau* | *2* | *98%* |
| *Kenya* | *36* | *84%* |
| *South Africa* | *7* | *13%* |
| *South Sudan* | *11* | *97%* |
| *Sudan* | *27* | *72%* |
| ***North Africa*** | ***1*** | ***1%*** |
| *Algeria* | *0* | *0%* |
| *Egypt* | *0* | *0%* |
| *Libya* | *0* | *0%* |
| *Morocco* | *1* | *3%* |
| *Tunisia* | *0* | *0%* |

# 5. 2. MEANING OF INTERPRETATION

- **Interpretation refers** to the task of ***drawing inferences*** from the collected facts after an analytical and/or experimental study.
- Interpretation needs ***fair and carful judgments***.
- ***Often the same data can be interpreted in different ways***.
- So it is helpful to ***involve others*** or take time to hear how different people interpret the same information.

# 5.3.WHY INTERPRETATION?

- ***It is through interpretation that the researcher can well understand the abstract principle that works beneath his findings.***
- Interpretation leads to the establishment of explanatory concepts that can serve as a guide for future research studies; it ***opens new avenues of intellectual adventure***
- ***Researcher can better appreciate only through interpretation why his findings are what they are and can make others to understand the real significance of his research findings.***

# 5.4. TECHNIQUE OF INTERPRETATION

Interpretation often involves the following steps:

( i ) ***Researcher must give reasonable explanations***
(ii) ***Extraneous information***

(iii) ***Consultation will result in correct interpretation*** and, thus, will enhance the utility of research results.

(iv) ***Researcher must accomplish the task of interpretation*** only after considering all relevant factors affecting the problem to avoid false generalization.

# 5.5. PRECAUTIONS IN INTERPRETATION

Precautions in Interpretation Researcher must pay attention to the following points for correct interpretation:

( i ) (a ) The data are ***appropriate***, ***trustworthy*** and ***adequate*** for drawing inferences;

(b) The data reflect ***good homogeneity***

(c) Proper analysis has been done ***through statistical methods***

(ii) The researcher ***must remain cautious about the errors*** that can possibly arise in the process of interpreting results.

# 5.5. PRECAUTIONS IN INTERPRETATION

(iv) He must never lose sight of the fact that his task is ***not only to make sensitive observations*** of relevant occurrences, but also to identify and disengage the factors that are initially hidden to the eye.

- ***Broad generalization*** should be avoided as most research is not amenable to it because the coverage may be restricted to a particular time, a particular area and particular conditions.

# 5.5. PRECAUTIONS IN INTERPRETATION

(v) The researcher must remember hat ideally in the course of a research study, there should be constant interaction between initial hypothesis, empirical observation and theoretical conceptions.

It is exactly in this area of interaction between theoretical orientation and empirical observation that opportunities for originality and creativity lie.

- He must pay special attention to this aspect while engaged in the task of interpretation

# Thank you !!!