Regional Workshop on Statistical Literacy:
Increasing Effective Use of Agricultural and Rural Statistics
13-17 July 2015
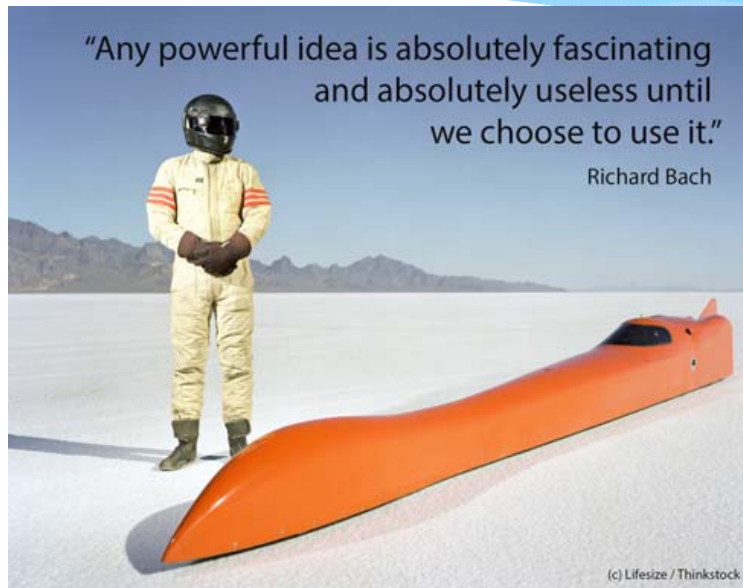
Session 1.3
Statistical Literacy

UNITED NATIONS
SIAP
Statistical Institute for
Asia and the Pacific

Objective of the presentation

Identify the criteria that are necessary to achieving statistical literacy

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Introduction

"Any powerful idea is absolutely fascinating and absolutely useless until we choose to use it."

Richard Bach

(c) Lifesize / Thinkstock

Source of image: http://www.analyticshero.com/2012/10/25/31-essential-quotes-on-analytics-and-data/

Recall...
Statistical Capability Framework – Tier 2

Statistical Use	• **Discovering & Assessing** • **Analysing and Interpreting** • **Communicating** • **Applying**
Statistical Production	• Specifying • Designing and Building • Acquiring and Processing • Validating and Disseminating • Evaluating
Statistical Leadership	• Positioning • Influencing • Enabling

Source: Australian Bureau of Statistics, Draft Statistical Capability Framework
(http://www.abs.gov.au/websitedbs/a3121120.nsf/home/ABS+Statistical+Capability+Framework)

Statistical Literacy

"Statistical literacy is a critical, though neglected skill, that should be addressed if children are to become more informed members of the community."

- Gal (2004)

Statistical Literacy

- **Statistics alone do not form evidence, they are just numbers – they need to be analysed and interpreted effectively and accurately to ensure that they form actual "evidence." (UNECE, 2012)**

- **Increased need for decision makers to be able to critically evaluate and appraise information.**

Statistical Literacy

"…the ability to understand, interpret and evaluate **statistical information…"**

-   **Trewin (2005)**

Statistical Literacy

"Statistical literacy is the ability to understand and critically evaluate statistical results **that permeate our daily lives – coupled with the ability to** appreciate the contribution that statistical thinking can make in **public and private, professional and personal** decisions**."**
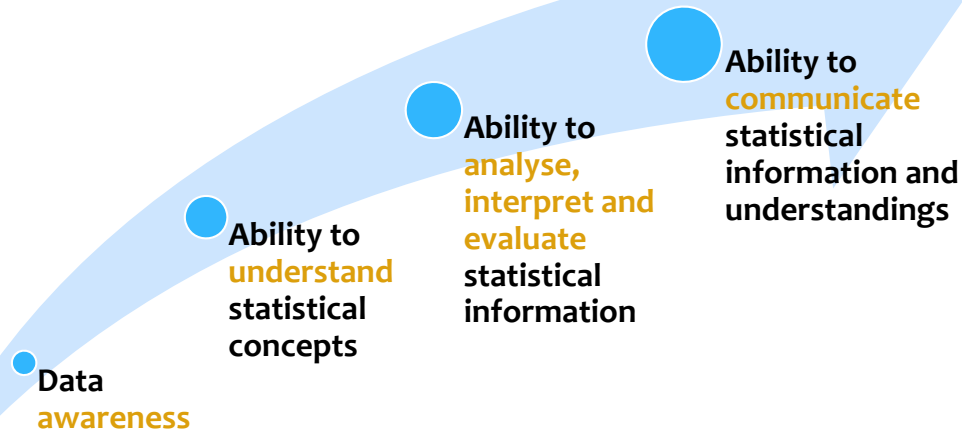
-   **Katherine K. Wallman (1993)**

Statistical Literacy

Criteria to be addressed if data users and stakeholders are to become "statistically literate":

Ability to **communicate** statistical information and understandings

Ability to **analyse, interpret and evaluate** statistical information

Ability to **understand** statistical concepts

Data **awareness**

Statistical Literacy

Criteria 1: Data Awareness

- **Knowing what types of data are available**

- **How those data are collected**

- **How they can be used**

BUT decision makers need to first be clear on the issue they are attempting to address.

DATA NEED BEFORE DATA SOURCES!

Statistical Literacy

Criteria 1: Data Awareness (cont.)

Defining data need entails:

- **Articulating the issue or area of investigation;**

- **Identifying the key population (i.e., demographic and geographic); and**

- **Specifying particular time frames being investigated.**

Statistical Literacy

Criteria 1: Data Awareness (cont.)

Ability to assess data quality and "fit for purpose"

Data needs have been identified

Must identify suitable data and information sources to address that need

"Fitness for purpose"

Statistical Literacy

Criteria 1: Data Awareness

Criteria that determine "fitness for purpose" (ABS, 2008):

Criteria	Remarks
Institutional environment	Institutional environment within which the data are collected and processed
Relevance	Degree to which the data meet real needs
Accuracy	How correctly the data describe the phenomena they were designed to measure
Timeliness	Delay between the reference point and when the data become available

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Criteria 1: Data Awareness

Criteria that determine "fitness for purpose" (ABS, 2008): (cont.)

Criteria	Remarks
Accessibility	Ease with which the data can be referenced, including suitability of form through which information can be accessed
Interpretability	Availability of supplementary information and metadata and the appropriate presentation of data to assist in the correct interpretation of data
Coherence	Degree to which data can be successfully brought together with other statistical information within a broad analytical framework and over time

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Statistical Literacy

Criteria 2: Understanding Statistical Concepts

- **Fundamental to the ability to use statistics effectively in decision-making is the need to understand a number of statistical premises, e.g.:**

  - **Random sample vs. census population;**
  - **Observational or experimental; and**
  - **Descriptive or inferential.**

- **Ability to read information presented in tables, graphs, and maps**
- **Interpret the meaning and implications of statistical concepts (e.g., percentage, ratio, and variability)**

Statistical Literacy

Criteria 3: Analysing, interpreting and evaluating statistical information

- **Ability to evaluate critically the statistical information presented**

- **Determine appropriate analytical techniques**

- **Identify when concepts have been applied without proper statistical foundation**

Statistical Literacy

Criteria 4: Communicating statistical information and understandings

- **Communicating in a way that makes it real, relevant, and meaningful to the audience**

- **Gives the data context and credibility**

Thank You!