Integrating Agriculture into National Statistical System

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Overview

- What do we mean by integration?
- Why do we need integration?
- Approaches to Integration
- National Statistical System
- Master Sample Frame
- Sampling Frames
- Integrated Survey Framework / Modular approach to survey planning
- Integrated dissemination system

Why do we need integration?

- Integration will enable
  - Production of coherent and comparable data
    - Through the use of standards
  - In-depth data analysis across sectors/collections
    - E.g. crop and livestock production are often drawn from separate collections. This provides no basis for analyzing characteristics of farms that produce both crops and livestock, or for comparing them to farms that specialize in one or the other
    - Social – economic – environment e.g. livelihood of farmers, are the small farms environmentally friendly, or the big farms?
- Integration will
  - Avoid duplication of effort
  - Prevent the release of conflicting statistics
  - Ensure the best use of resources
  - Reduce the burden of response

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What do we mean by Integration?

- Integration of Agriculture into the National Statistical System
  - Agriculture is part of the overall statistics collection process
  - Use of a master sample frame for agriculture
  - Use of standard concepts, definitions and classifications
  - Integration of the Population Census and Agriculture Census
- Integration of the survey process
  - Sample design questionnaires, methods of collection, analysis and estimation
- Integration at dissemination phase

Approaches to integration

- *Ex Post* – try to link data from different surveys
  - E.g. link household data from Population Census to holding data from Agricultural Census
    - Very difficult if not planned in advance (one-to- many and many-to- One mapping)
- *Ex Ante* – plan relevant surveys so that linking variables are well defined
  - E.g. identify households/ag. holdings in Population Census to give a frame for household selection of Ag Census (list of agriculture households)
    - Update this frame periodically to serve as master sample frame
    - All agriculture surveys are based on this frame
    - Business Register to serve as institutional section of ag. census
    - Use of pre-defined multi-stage sampling reduces the need for fieldwork for updating the frame

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National Statistical System

- Many government agencies produce agricultural data
  - NSO for agriculture census
  - Ministry of Agriculture for crop and livestock surveys
  - Ministry of fisheries for fishery and aquaculture surveys
  - Ministry of Forestry for forestry related surveys
- Sometimes there is cooperation and use of common standards, etc, but mostly not

National Statistical System, ctd

- Integration of agriculture into the National Statistical System will require a high level of cooperation and commitment by a range of agencies
  - Can be achieved through establishment of coordinating bodies and technical working groups to avoid overlapping efforts
  - The Global Strategy process will assist this

Master Sample Frame

- Master sample frame should be the source for all samples for surveys of agricultural holdings, farm households and rural non-farm households
  - Samples can be designed so that data can be analyzed across surveys
  - Different institutions should be able to access the master sample for survey purposes
- Scope of master sample frame depends on
  - Number of surveys for which it is to be used
  - Main stratification variables used for planning the surveys

Master Sample Frame - Issues

- Before establishing the master frame one needs to
  - Conduct an in-depth analysis of all the data items on which data is to be collected through the national programme of surveys
  - Define precisely, for each selected data item
    - The geographic level at which the estimates are required
    - The accepted level of accuracy/tolerance
    - Periodicity at which the data is needed
  - Avoid the temptation of getting everything at the nost detailed level through sample surveys
  - Establish a survey calendar for thematic surveys based on clustering od data items

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Master Sample Frame - Issues

- Overall parameters to consider
  - Physical land mass and natural environment, economic output of agriculture, and the well-being of the farm and rural populations
- Statistical units
  - Farm or agricultural holding, household and land parcels
- Geo-referencing
  - Required to provide a link between the economic, environmental and social dimensions of statistical units
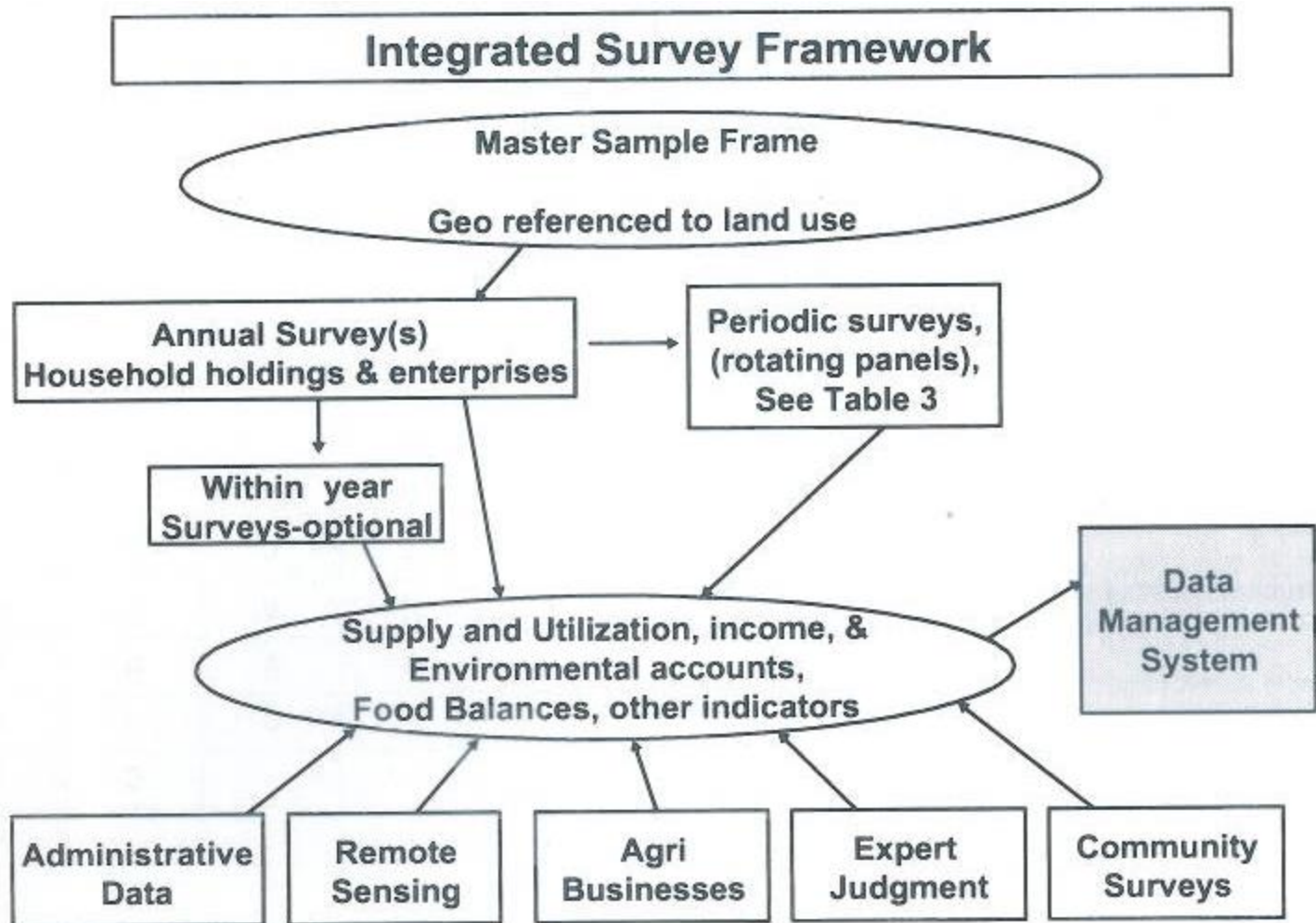
Developing an Integrated Survey Framework

- It includes
  - Sample design, Questionnaire, Data collection methods, Analysis and estimation
  - Timing and frequency of data collection are most important for agricultural statistics
  - Different production cycles (crops, livestock, fisheries)
- Identify core data requirements
  - Production data
  - Economic data (input/output on the holding)
  - How use of fertilizers, chemicals, tillage methods etc. impact environment
  - Social well being of farms and rural households
- Decide on the census/survey instruments
- Single purpose or multi purpose
- Need for longitudinal data

Integrated Survey Framework

- Should be designed to
  - Provide an annual work programme that is consistent from year to year
  - Minimize the required scope of censuses
  - Recognize that some data need to be collected more often than annually because of the seasonal nature of agriculture and the crop and livestock production cycles
  - Take into account the additional data sources that need to be included in the overall framework
    - Administrative data, remotely sensed data, community surveys

Integrated Survey Framework

Master Sample Frame

Geo referenced to land use

Annual Survey(s) Household holdings & enterprises

Periodic surveys, (rotating panels), See Table 3

Within year Surveys-optional

Supply and Utilization, income, & Environmental accounts, Food Balances, other indicators

Data Management System

Administrative Data

Remote Sensing

Agri Businesses

Expert Judgment

Community Surveys

Agricultural Survey Program

Water Use

Crops Yields

Crop Production

Fish Production

Agricultural Inputs

Cost of Production

Crops

Acquaculture

Agricultural Census

Population Census

Time Use

Inter-census surveys

Livestock

Rural

Agricultural Labour

Livestock Production

Water Use

Livestock Yield Coefficients

Rural Activities/ Income/ Infrastructure
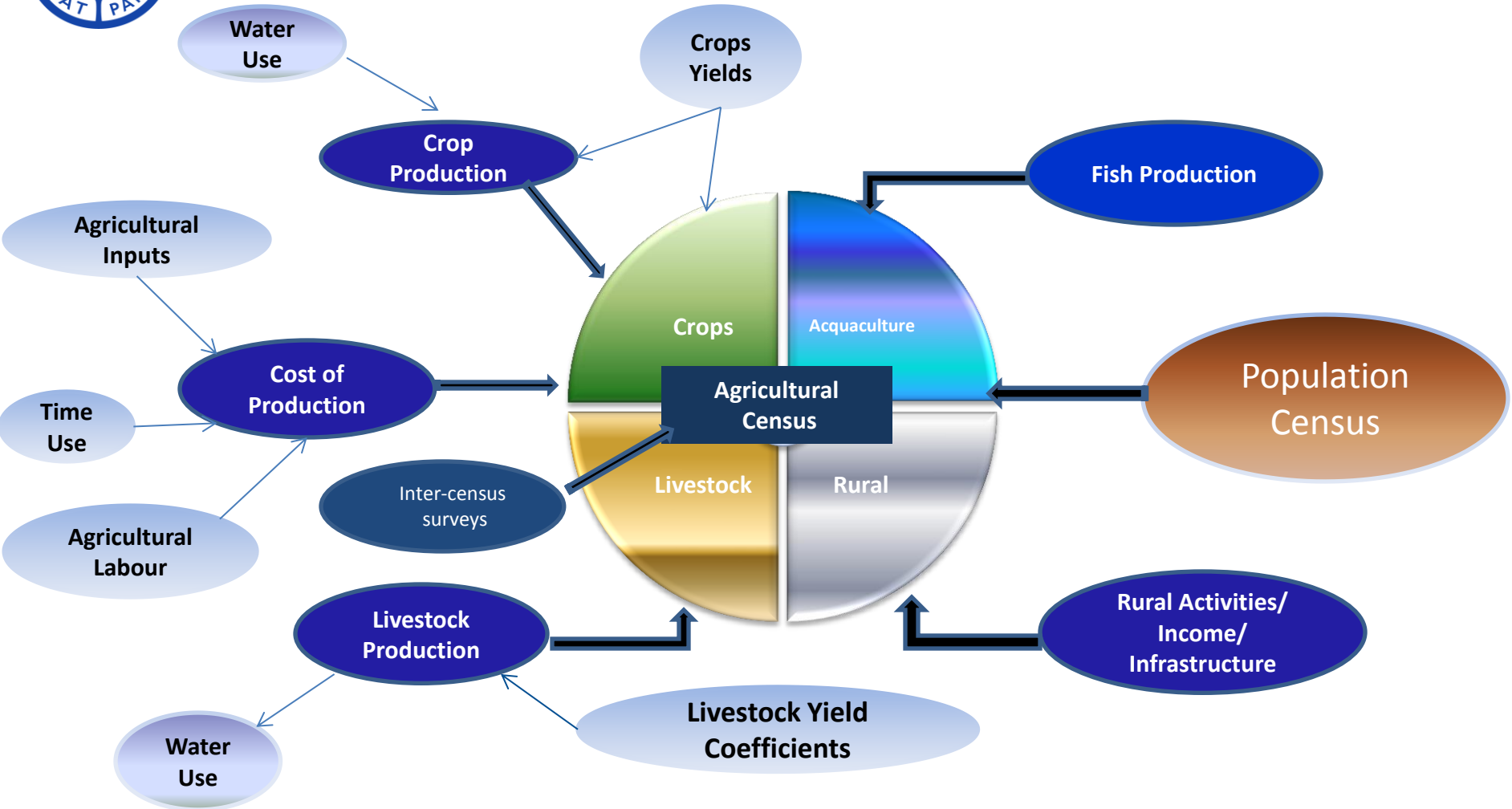
AGRICULTURE AND RURAL DEVELOPMENT

ENVIRONMENT

(SOCIAL: Livelihood, Food security, Gender)

Steps to implement an Integrated Survey Framework

- Determine the set of core data items for which at least annual data are required

- Group other core items by category, such as economic variables, environmental measures, social variables and other. These constitute the modules. [data for these items will come from rotating panel surveys]

- Select a replicated sample for the annual core items using Multiple Probability Proportional to Size (MPPS)
  - ie divide the sample into subsample replicates
  - Provides for longitudinal data

Steps to implement an Integrated Survey Framework ctd

- Design a survey questionnaire to obtain the annual core data items
  - Each year the core questionnaire should contain supplementary questions regarding one of the subject areas (modules) described above
- Each year one of the modules will be linked to the annual core items
  - From year 4, at least one of the replicate samples will have been covered by all the modules/questionnaires
- Next slide illustrates the rotating (modular) approach
- Details are also given in the Global Strategy paper

TABLE 3: Example of a replicated survey design with the use of an annual core questionnaire and rotating sets of supplemental questionnaires

YEAR \ REPLICATE	REP 1	REP 2	REP 3	REP 4	REP 5	REP 6	REP 7	REP 8	REP 9	REP 10	REP 11	REP 12
1	A	A	A	A	A							
2		B	B	B	B	B						
3			C	C	C	C	C					
4					D	D	D	D				
5					A	A	A	A	A			
6						B	B	B	B	B		
7							C	C	C	C	C	
8								D	D	D	D	D
9									A	A	A	A
10										B	B	B
11											C	C
12												D

Detailed Questionnaires for Rotating panel surveys

Every replicate receives the same core questionnaire every year for annual core data items plus obtains data for one following rotating panels:

A. Economic items including Farm structure, expenditures, income

B. Environmental items including inputs, chemicals, tillage, water use, land use

C. HH income, consumption, employment

D. Items of national interest

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Integrated dissemination system

- A data management system that
  - Provides access to official statistics for dissemination purposes
    - Should also encompass a wide range of data sources
  - Enables the storage and retrieval of survey results
  - Provides access to farm, household and geo-referenced data for research
- CountrySTAT is an example
  - Web-based information system
  - Allows countries to better organize, harmonize and standardize statistical data from multiple sources
  - Easily accessible on-line

Summary

- Integration of agriculture into the National Statistical System will be achieved through
  - Implementation of a master sample frame
  - An integrated survey framework
  - An integrated database
- Countries will need to
  - Review their current governance arrangements
  - Make changes to meet the challenges of coordination
  - Ensure that the statistical system is sustainable