منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Продовольственная и сельскохозяйственная организация Объединенных Наций | Organización de las Naciones Unidas para la Alimentación y la Agricultura

ASIA AND PACIFIC COMMISSION ON AGRICULTURAL STATISTICS

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Agenda Item 6.3
System of Integrated Livestock Survey for Data Collection in India

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System of Integrated Livestock Survey for Data Collection in India

Outline

- Importance of Livestock in India
  - Scope and coverage of livestock
  - Classification of livestock according to FAO guidelines
  - Major activities related to Livestock and Poultry production
- Major Statistical Operations
  - Livestock Census
  - Integrated Sample Survey (ISS) for Livestock Production.
  - Survey on Estimation of Feed and Fodder.
- Conclusion

Why Livestock Rearing is important in India?

- Provides supplementary income to families dependant on Agriculture.
- Provides nutrition in form of milk , eggs ,meat to human population.
- Quality organic manure for Agricultural purposes (dung & urine)
- Helps in exigencies like drought and other natural calamities.
- Since ownership of livestock is distributed predominately among the rural area , development in this sector directly linked to balanced development of rural economy

Scope & Coverage of Livestock in India

- Livestock sector contributes about 6.8% to India's GDP and employs 8% of the total workforce.
- Livestock Statistics plays a vital role in determining the following
  - Enhancement of production of Livestock Products & profitability from them
  - Control of animal diseases
  - Creating networks for Processing and Marketing facilities
  - Formulation policies for development of this sector

Classification of Livestock in India as per FAO guidelines

Compile and classify the data collected in Livestock Census almost as per FAO guideline with the country situation suitably integrated there in.

Main Categories	Sub-Category
Cattle	A. Calves and young stock under 1 year of age B. Young stock, 1 year of age and under 2 years C. Cattle, 2 years of age and over a) Females i) Cows - mainly for milk production ii) Heifers (including in calf) b) Males - mainly for meat production (including spent) and for Work and Breeding, separately
Buffalo	A. Buffaloes under 3 years of age B. Buffaloes, 3 years of age and over Buffalo cows - mainly for milk production
Sheep	A. Lambs under 1 year of age B. Sheep, 1 year of age and over Females - intended for breeding - intended for slaughter
Male Goats	A. Goats under 1 year of age B. Goats, 1 year of age and over - Females
Pigs (individually for Crossbred/Exotic & Indigenous)	A. Young pigs, less than 50 kg B. Pigs for breeding, 50 kg and over - Gilts - gilts in pig - Sows - sows in pig C. Pigs for fattening, 50 kg and over a) 50 kg and less than 80 b) 80 kg and over
Horses	A. Horses for agricultural production or use B. Other horses
Chickens	A. Chickens for breeding and egg production - Laying hens and pullets B. Chickens for meat production (slaughter) - Broilers - Other (capons, etc.) C. Other chickens (multi-purpose mixed stock) - Laying hens and pullets
Others	Ducks, Turkeys, Geese, Guinea Fowl, Rabbits, Beehive, Camels, Mules, Asses

Activities associated with Livestock & Poultry Production

Activity	Components	PRODUCTS			
		Main	By-products	Subsidiary	Processed
Dairying	Cow	Liquid Milk	Dung & Urine	Calf	Curd, Ghee, Paneer, etc.
	Buffalo	Liquid Milk	Dung & Urine	Calf	Curd, Ghee, Khoya, etc.
Crop + Dairy Animal	Wheat/Rice/Both	Grain	Straw	--	
	Cow/Buffalo	Liquid Milk	Dung & Urine	Calf	Curd, Ghee, Khoya, Paneer
Mutton & Wool	Sheep	Fattened Lamb & Wool	Dropping & Urine	Lamb	Woolen Products
Dairying + Meat	Goat	Fattened Castrate & Milk	Droppings & Urine	Goat for meat	(Mostly marketed as intact animal & Liquid Milk)
Poultry (Backyard)	Chicken	Eggs	Droppings	--	(Eggs are marketed)
	Chicken & Broiler	Eggs & Chicken Meat	Droppings & feathers		(Dressed broiler-ready to cook, processed feathers for cottage industry)

Major Statistical Operations

- Ministry of Agriculture and Farmers Welfare, conducts two major Statistical Operations related to Livestock Statistics in India.
- For these surveys, support is provided by the Ministry, while implementation is carried by State in Federal structure.
  - Livestock Census
    - Conducted on a quinquennial basis since 1919
    - Latest census is the 19th Census conducted in Oct .2012
  - Integrated Sample Survey*
    - Introduced to augment Livestock census as a full-fledged scheme since 1976
    - Worked out on Seasonal basis and reported Annually
  - Other Surveys :
    - Survey for Estimation of fodder production

Livestock Census : Background

- Coverage
  - Livestock census covers the entire nation in almost 648 districts and nearly 660 thousand villages and 64 thousand urban wards across the country
- Census conducted with the following schedules

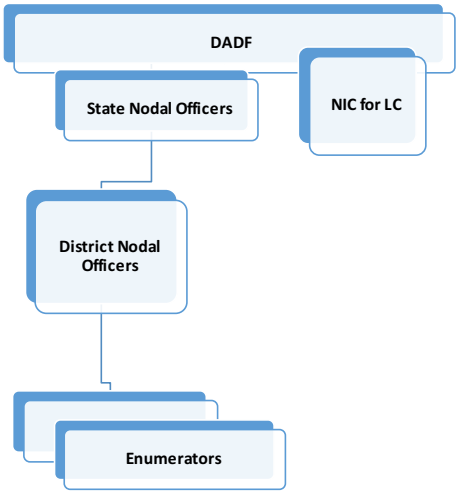
Schedule	Description
1 – House-list of households, enterprises & institutions	Recoding list of households , etc. under enumeration.
2 - Village/Ward profiles	Based on schedule 1 & schedule 3
3 – Household, Enterprise & Institution schedule	Further divided into three parts 1. Livestock 2. Poultry 3. Number of Equipment Used

Livestock Census 2012: Objectives and targets

- To provide information on livestock population, category wise along with age, sex-composition etc. **up to village level** in rural areas **and town level** in urban areas.
- **Animals** and **Poultry birds** owned by the households, household enterprises, non-household enterprises and institutions were counted at their site.
- 100% scrutiny of the schedules.

19th Livestock Census : Implementation

- **100% Central assistance to** States/UTs
- About 171 housand **enumerators and 28472 supervisors were engaged** for LC.
- **For Breed Survey** Para-vets/ Veterinary services practitioners were engaged for Enumeration
- **State Nodal Officers- N**odal officer was designated as the Livestock Census Authority, who was the overall in-charge of supervising the conduct of the Census and Breed Survey, its scrutiny and validation.
- **NIC:** for software development, Data entry and report generation.



Integrated Sample Survey (ISS) : Overview

- Livestock products data is estimated through " Integrated Sample Survey"
- ISS helps State Animal Husbandry Departments to assess the impact of the govt. efforts towards
  - Increase production.
  - Genetic up gradation.
  - Disease Control
  - Feed & fodder management
- ISS helps in predicting GDP from this sector

ISS : Parameters Estimated/Ancillary data Collected

- Population (number) of livestock in terms of breed, sex, age composition.
- Yield rates of milk, eggs, wool and meat in 3 Seasons.
- Anciliary data
  - Conversion of milk into milk products
  - Utilization of dung converted into dung cakes, manure, and other purposes
  - Causes of increase/decline of animal population
  - Feeding practices of the cattle/buffalo.
    - How they are fed ? Stall-fed or grazed etc.
    - What type of fodder/ feed? Green / Dry / concentrates etc.

Methodology of Integrated Sample Survey (ISS) : Coverage

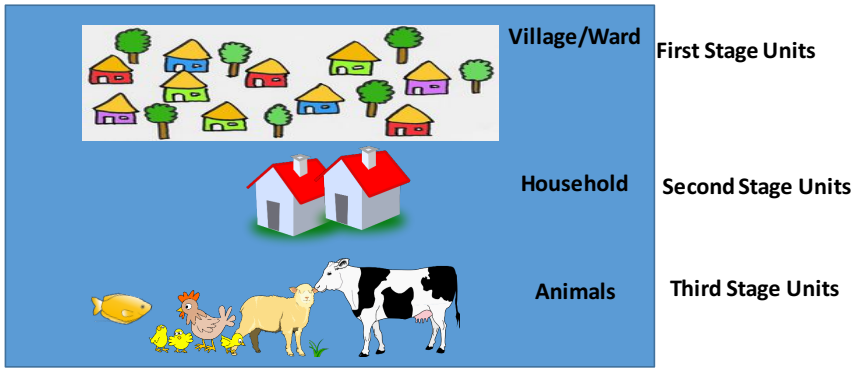
- ISS covers entire Rural and urban areas
  - Conducted in sample villages/urban wards.
  - Undertaken from March to February, divided into 3 seasons

Season	Period	Duration
Summer	March 1 – June 30	122 days
Rainy	July 1 – October 31	123 days
Winter	November 1 – February 28 (29)	120 (121) days

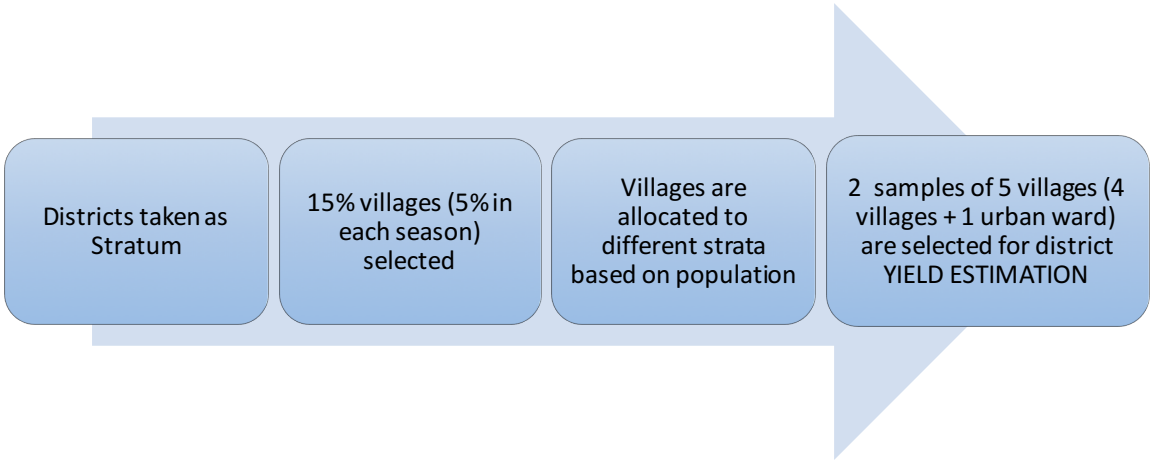
  - Gives progressive estimates while taking care of season-variability
  - Each season is further divided into 4 rounds (or months).

Methodology of Integrated Sample Survey (ISS) : Design

- Stratified 3 stage design with district as stratum

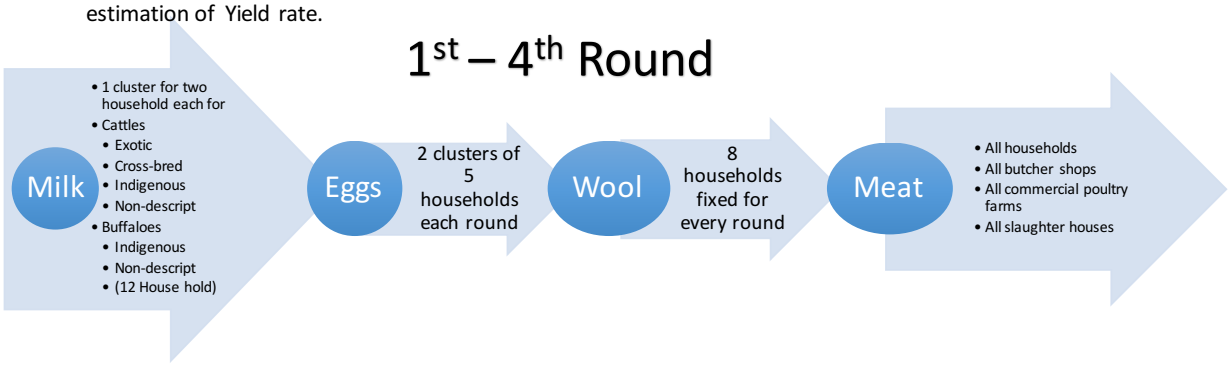


ISS : Sample Selection of First Stage Units



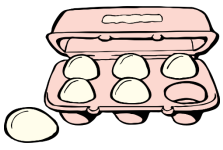
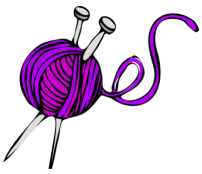
ISS : Sample Selection for Second Stage Units

- Sample Selection for Second units are done with equal probability and without replacement for estimation of Yield rate.

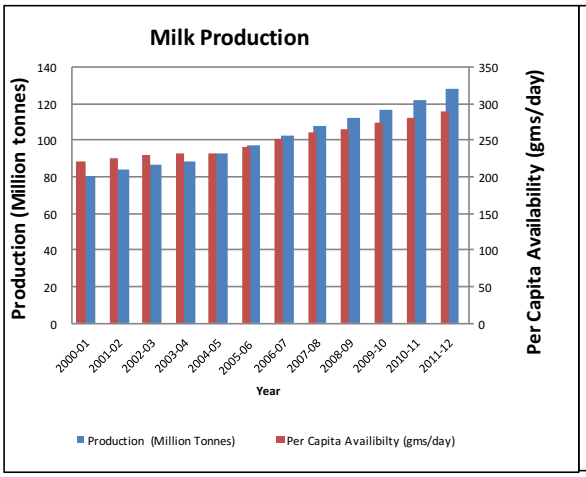


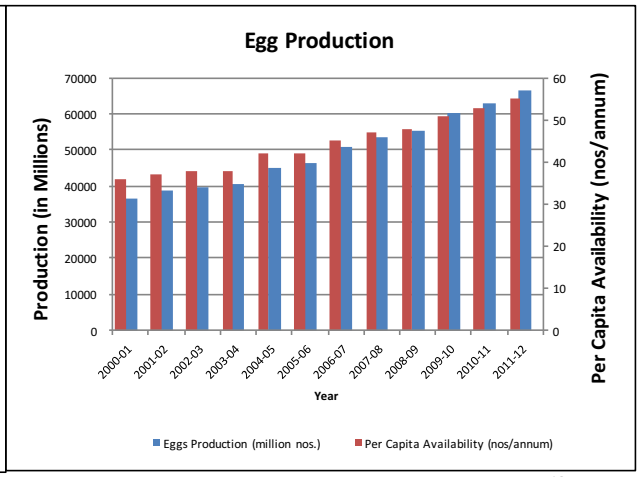
Note : *The recording of wool yield will be done in the shearing season in the selected villages from the sample of 5/8 households having sheep.*

ISS : Sample Selection for the Third Stage Units

Product :	MILK	EGGS	WOOL	MEAT
				
Animals:	Two Animals in milk from each hhd. Exotic, Crossbred , indigenous ,Non descript .Cattle and indigenous & non descript Buffaloes ,24 animal in total	All the laying birds from 10 house holds	Two rams / two whether, two ewes, two lambs	All animals slaughtered in each household/shop. Administrative returns for all commercial poultry farms, recognized Slaughter houses.

ISS Results over the years





Survey for Estimation of fodder production

- Pilot attempt made by GOI using the following statistical operations.
  - Existing Area estimation scheme is used to estimate of crop residue which is used as fodder
  - General Crop Estimation Survey
    - Provides estimation of crop residue or fodder in the following categories
      - Green Fodder
      - Dry Fodder
    - Estimate of Crop residue using crop cutting experiments in in 5x5 m square/ equilateral triangle/ circle converted into Qty. /per hector.
- Quantity of Fodder green and dry produced are the product of the above two estimates.
- Concentrates and other animal feed has to be collected from factories outlet thereby giving total availability feed and fodder on annual basis.

Conclusion

- Contribution of Livestock sector in human food chain both direct and indirect is significant :
  - direct in term of providing protective proteins like Milk , Egg, Meat and its by products
  - indirect contribution in terms of supply of draught power for various agricultural operations & for nutritional enrichment and conditioning of arable land.
- It is quite essential to maintain updated information on livestock, livestock products, growth pattern, national demand & supply, import/export data for framing suitable policy for the overall development of this sector.

References

- http://mospi.nic.in/Mospi_New/upload/Manual%20on%20Animal%20Husbandry%20Statistics.pdf
- Instruction Manual for Integrated Sample Survey, provided by AHS Division, DADF, Ministry of Agriculture, GOI
- http://www.fao.org/ag/againfo/resources/en/publications/sector_briefs/lsb_IND.pdf

THANK YOU

BACKUP

ISS Estimation Example
Estimation for Number of Milk Animal

Column Number

Table 1: Estimation of number of milk animal (cattle) and estimation of its variances

season	stratum	Total no of village	No of villages for complete enumer-ation	No of enumerated milk animal M_{srhi}	Census no of milk animal M_{hi}	$\hat{M}_h$	$\hat{R}_{sh}$	$\hat{M}_{sh}$	$\hat{R}_{sh} * M_{hi}$	$M_{srhi} - \hat{R}_{sh} * M_{hi}$	$(col.11)^2$	$\hat{V}(\hat{M}_{sh})$	%SE
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	I		1										
			2										
			10										
	Total	V_h	n_h	Σ	Σ	$M_h = \sum_{i=1}^{V_h} M_{hi}$	col.5/ col.6	col. 8*col. 7	col. 8*col. 6	col.5-col.10	Σ	$(col.3)^2$*col.12/ col.4(col.4-1)	√col .13*100/ col. 9
	Pooling of the stratum in the season												
	I	V_h	n_h	Σ	Σ	$M_h = \sum_{i=1}^{V_h} M_{hi}$	col.5/ col.6	col. 8*col. 7	col. 8*col. 6	col .5-col.10	Σ	$(col.3)^2$*col.12/ col.4(col.4-1)	√col .13*100/ col. 9
	II												
	III												
	overall							$\Sigma = \hat{M}_s$				$\Sigma = \hat{V}(\hat{M}_s)$	√col .13*100/ col. 9