Food and Agriculture Organization of the United Nations

The livestock census and the nomadic livestock methodology

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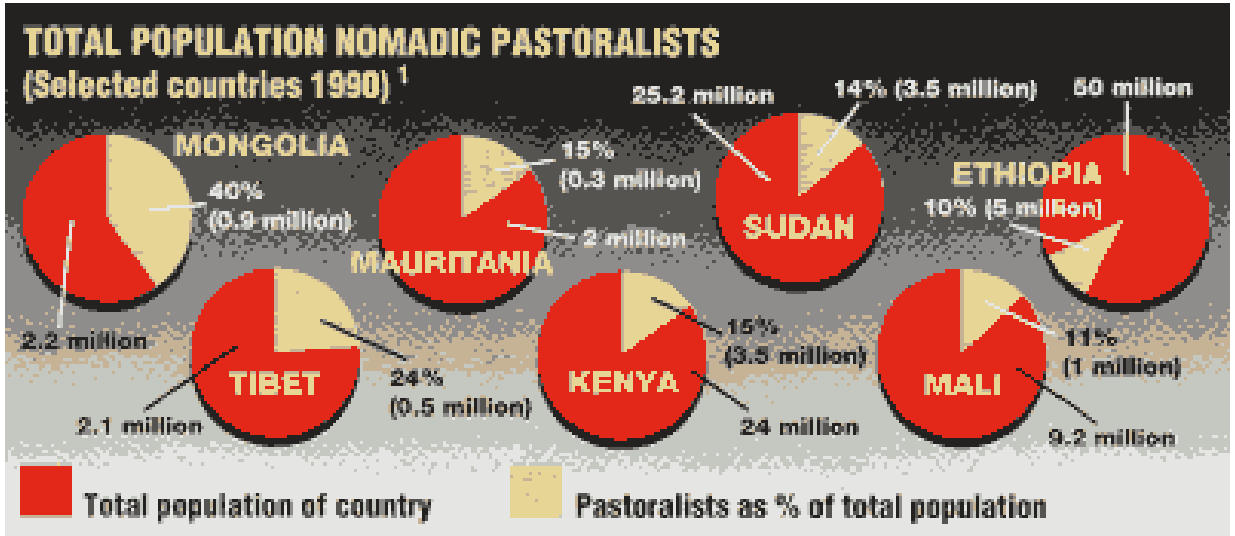
Outline

- Importance of livestock statistics
- Issues to be addressed
- Enumeration Methods
- Survey design
- Data collection tools
- Cost
- Decision tree
- General recommendations

Importance of livestock statistics

- Total number of pastoralists in the world not known within any degree of confidence:
  - 180.7 million individuals(Thornton *et. al*., 2002);
  - 200 million individuals (Rota and Sperandini, 2009)
- For nomads, a commonly quoted figure seems to be 30-40 million individuals
- Probably safe to estimate that there are at least 100 million people who depend on nomadic or transhumance production systems



Issues to be addressed

- Nomadic and transhumant pastoralists move their animals according to the availability of fodder resources and tend to inhabit relatively remote and inaccessible areas
- Standard surveys methods of agricultural enumeration cannot be easily applied
- Special attention is required to devise appropriate methods
- FAO's previous Guidelines on collecting livestock data were published more than 20 years ago.
- Some definitions needed to be adapted
- Review of existing literature - the issue is discussed in several documents and research papers, no single document holistically synthesising the approaches used

Enumeration Methods

Two main approaches: ground and aerial surveys

•Ground Surveys

- Enumeration points
    - Watering Points
    - Vaccination Posts
    - Dip tanks
    - Stock Routes
    - Temporary seasonal camps
    - Specific enumeration points
    - Livestock Markets
- Ethnic Groups/Clans

Enumeration Methods (ctd.)

How to Count Animals?

•Requires prior careful consideration, standardisation and guidance: what species? Only totals or the breed, sex and age?

1.Direct observations

- Interviewers count animal themselves
  - Use of hand tally, or counter
    (single or multiple counters)
  - Taking photographs (ex. Pictorial Evaluation Tool)
  - Marking counted livestock
  - Giving enumeration certificate

Enumeration Methods (ctd.)

- Aerial Surveys
  - Low Level Aerial Surveys
  - Counting livestock in areas from aerial photographs taken for that purpose
  - Drones and micro-drones
  - Satellite imagery

Survey design

- Ground surveys
  - *Enumeration points*
    - First step – complete list of all enumeration points for the frame
      - Case of Niger: enumeration points identified – stock routes for nomadic livestock; water points for transhumant
    - Census or sample survey?
    - Stratification: geographical or by type of enumeration point
      - Case of Niger (2004/5), 3 strata of water points have been identified: Boreholes, incl. drilled boreholes and pumped water sources; Wells, incl. cemented and traditional; Other watering points, permanent ponds and rivers
      - Case of Mali (2001), water points classified into 2 categories: deep water, isolated pools, boreholes, wells or small isolated ponds; surface water: perennial ponds, large lake, rivers and tributaries
    - Multi-stage sampling

Survey design (ctd.)

- *Ethnic Groups/Clans*
  - **S*ampling frame* -** complete list of all the ethnic groups/clans of the country, can be obtained form the agricultural census or updated secondary data (administration, university, NGO…)
    - In Niger, a complementary survey on nomadic camels has been through a multi-level sampling: the primary statistical units were nomadic tributes and the secondary statistical units were households
- *Specific livestock species*
    - Mongolia: separate stratum was assigned to camels because of their relatively low number compared to the other livestock species
    - Niger: specific questionnaire has been design for camels

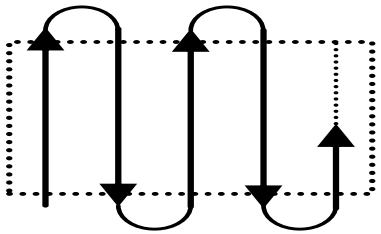
Survey design (ctd.)

Aerial Surveys

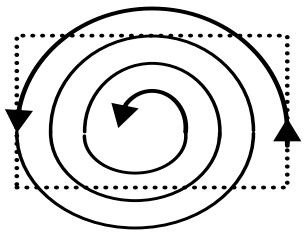
•Two methods

- Total Aerial Counts or Block Counts
  - All area is covered, no gaps between the flown patterns;

Parallel Flight Pattern



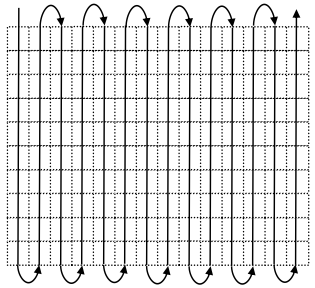
Spiral Flight Pattern

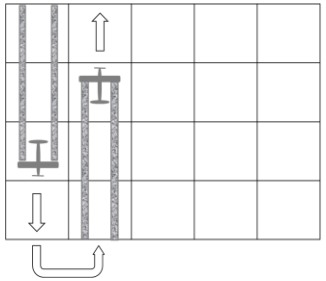


Survey design (ctd.)

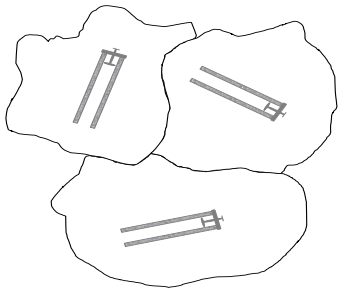
Aerial Sample Surveys

•Systematic Reconnaissance Flights (SRF)





•Stratified Random Aerial Transects



•Aerial Quadrat Sampling

•Aerial Block Sampling

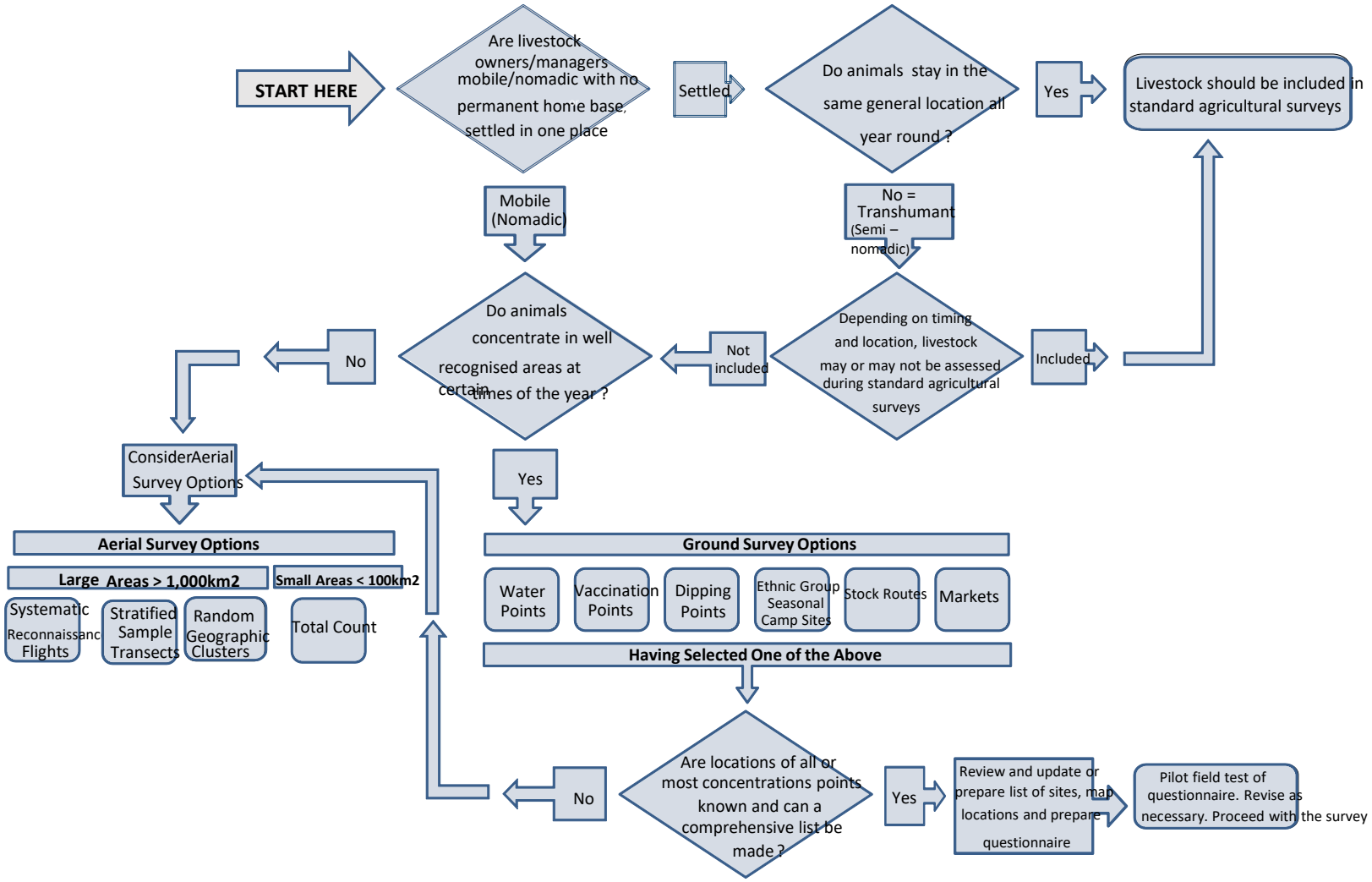
Data collection tools

- CATI/CAPI - recommended
- Use of GPS

Cost

Country	Year	Method	Total cost (USD)	Total nomadic / transhumance animals counted	Estimated total nomadic / transhumance population	Cost per animal counted (USD)	Cost per animal in the estimated population (USD)
Afghanistan	2002	Census: village visits	No cost given	Unclear as many may be sedentary			
Ethiopia-Afar	2004	Stratified sample: household visits	312,416	Not clear	9,014,365	Cannot calculate	0.03
Ethiopia-Somali	2004	Aerial: 3.5% Systematic sample	223,453	477,694	13,648,408	0.47	0.02
Jordan	1991	Census: Constructed locations	2,476,616	3,346,000	3,346,000	0.74	0.74
Mali	2001	Census: water points	241,535	4,193,848	4,193,848	0.06	0.06
Mongolia	2012	Ground: 33% stratified sample	277,976	13,640,000	40,920,000	0.02	0.01
Niger	2004-5	Stratified sample: water points and transhumance routes	No cost given	Not given	10,644,899		
Nigeria	1992	Aerial: 5% systematic sample	No cost given				

Decision tree



General Recommendations

- Close Linkage and Coordination with National Agricultural Census
- Training and Guidelines for Standardised Data Collection
- Avoidance of Double Counting
- Advance Public Awareness Campaign
- Dissemination of Results to All Stakeholders
- It is essential that field activities are coordinated with wider agricultural surveys, the data collected are in line with the integrated survey framework and international classifications and definitions advocated by the Global Strategy to Improve Agricultural and Rural Statistics are used

Comparison of Nomadic / Transhumance Enumeration Example Methodologies

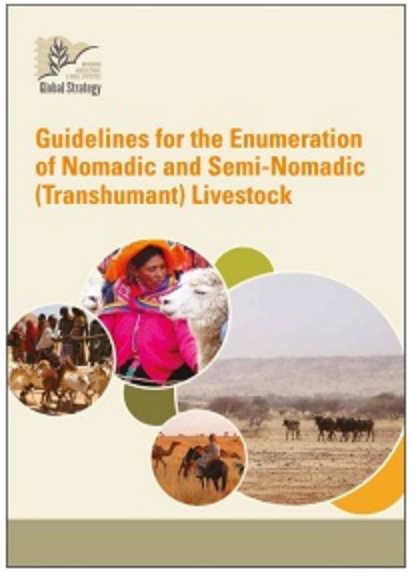
Country	Year	Method	Design
Afghanistan	2002	Ground All villages visited	Census (total enumeration) Whole country included Single level result
Ethiopia - Afar	2004	Ground	Stratified sample survey Result at Wereda (Zone) level 40 households per Kebele (Village). All Kebeles visited
Ethiopia - Somali	2004	Aerial	Systematic sample survey (3.5% of area surveyed) Single level result
Jordan	1991	Ground survey, herds brought to specially constructed counting centres	Census (total enumeration) Whole country covered Single level national result
Mali	2001	Ground Dry season concentration areas around water points	Census (total enumeration) All areas included Single national level result
Mongolia	2012	Ground survey, visits to individual herds	Stratified sample survey. Result at Province (Aimag) level 33% of herds sampled (why that many?)
Niger	2004-5	Ground Water points and transit corridors	Stratified sample survey Result at national, regional and department level Several months duration
Nigeria	1989-91 1992	Aerial Ground	Systematic sample survey (5% of area surveyed) Single national level result Targeted surveys

More information

- http://gsars.org/en/guidelines-for-the-enumeration-of-nomadic-and-semi-nomadic-transhumant-livestock/

GUIDELINES & HANDBOOKS, PUBLICATIONS

Guidelines for the Enumeration of Nomadic and Semi-Nomadic (Transhumant) Livestock



These Guidelines are intended to be a reference document providing technical and operational guidance on various aspects of the Enumeration of Nomadic and Semi-Nomadic (Transhumant) Livestock in various country conditions, with particular attention being paid to developing countries.

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Thank you!