

Colorado State University

General Guidance on Activity Data Collection Methods

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Overview of Presentation

NR EL

- General GHG Inventory Steps
- Data Sources
- Filling Data Gaps





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General Activity Data Sources

- Data Source Types
 - Census
 - Survey
 - Expert Knowledge
- Data Collection
 - e.g., Questionnaire, Remote-sensing technologies, Site visits



Census-Based Methods



Census-Based Methods

- Goal: Quantify population parameter with data for all entities in population
- Should have no uncertainty
- Non-responses can be problematic and must be addressed
- Not always possible to apply census-based methods due to financial, labor or time constraints



Surveys/Sample-Based Methods









Survey/Sample-Based Methods

- Goal: Use the sample statistic to make inferences about the population parameter
- Randomly select samples through a formal process
 - Simple random sampling, systematic sampling, stratified sampling, multiple stages
- Collect data and evaluate
- Given statistical design, calculate sample statistics and variances and then use the results into inventory analysis
- N R E L
- Variances allow you to quantify uncertainty

Land Use/Cover Area Frame Statistical Survey (LUCAS)









Expert Knowledge

- Suitable if other types of data collection are not feasible
- Should be collected from multiple experts
- Evaluate biases
 - Focus on recent experiences, limited experience in general, motivation or managerial goals, selection bias
- Quantify uncertainty based on responses



Expert Knowledge - Farming Practices in Brazil

Table 1 Proportion (%) of total area in each land-use and management category in Mato Grosso and Rondônia during 1970, 1985, and 2002

Land-use and management categories	Mato Grosso (%)			Rondônia (%)		
	1970	1985	2002	1970	1985	2002
NT – high input/Cerrado	0.0	0.0	0.1	0.0	0.0	0.0
FT – high input/Cerrado	0.02	0.04	0.02	0.0	0.0	0.0
NT - medium input/Cerrado	0.0	0.0	11.5	0.0	0.0	0.0
FT - medium input/Cerrado	1.3	5.0	1.7	0.0	0.0	0.0
NT – low input/Cerrado	0.0	0.0	3.1	0.0	0.0	0.0
FT – low input/Cerrado	0.8	3.8	0.5	0.0	0.0	0.0
NT - high input/Forest	0.0	0.0	0.04	0.0	0.0	0.006
FT - high input/Forest	0.008	0.01	0.006	0.01	0.005	0.004
NT - medium input/Forest	0.0	0.0	4.6	0.0	0.0	1.6
FT - medium input/Forest	0.5	1.9	0.7	4.6	9.7	1.1
NT - low input/Forest	0.0	0.0	1.3	0.0	0.0	1.3
FT - low input/Forest	0.3	1.4	0.2	6.4	12.8	0.9
Perennial crops	0.2	0.6	0.2	5.1	12.1	4.0
Nominal grassland/Cerrado	43.3	22.0	7.4	0.0	0.0	0.0
Nominal grassland/Forest	36.9	18.8	6.3	76.4	54.2	24.7
Degraded grassland/Cerrado	8.3	23.4	23.1	0.0	0.0	0.0
Degraded grassland/Forest	7.0	19.9	19.7	7.2	10.3	59.2
Improved grassland/Cerrado	0.7	1.6	10.5	0.0	0.0	0.0
Improved grassland/Forest	0.6	1.4	8.8	0.0	0.4	6.9
Settlements	0.06	0.15	0.2	0.3	0.5	0.3
Total managed area (10 ³ ha)	10629.7	20335.6	29060.6	367.6	1775.5	5744.0

Note that forest includes Amazon forest and Cerradão (high Cerrado) areas.

NT, no-tillage, FT, full tillage.

Maia et al. 2010, Global Change Biology



Filling Gaps in Activity Data

- Important for time series consistency
- Data splicing method (IPCC 2006, 2019)
 - Surrogate data

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Trend Interpolation/Extrapolation





Conclusions

- Three basic types of data collection census, survey and expert knowledge
- Use the type most appropriate given the resources and circumstances
- Quantify uncertainty so error can be propagated through inventory analysis
- Fill-gaps using appropriate data splicing methods



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Thanks for your attention!



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