



Typical farms and hybrid approaches

**Regional Training Course on Agricultural Cost of Production
Statistics**

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1 – Introduction and rationale

- **Cost of conducting a survey** each year is prohibitive
 - Surveys often represent a **large load for respondents and organizations**
 - **Production technology** does not change that quickly
- => Several organizations or networks have adopted a **strategy based on a fictive farm**, supposed to be “representative”, “typical”, “average” or “modal”
- **These approaches may be relevant for some uses** (ex: estimations in-between surveys) **and in certain conditions** (ex: homogeneity of technology and slow change in farming practices)

2 - Typical farm: definition

- **A fictive farm** to which is attributed **the characteristics** (specialization, size, production technology, etc.) **most frequently found in the group** which the farm is supposed to represent (dairy farms, farms in a specific region, etc.)
- **It is supposed to represent the farms of a given group:** region, locality or any other geographical grouping and/or specialization (ex: a dairy farm in a given region)
- But:
 - **Representativity is defined with respect to the modal characteristics** of the farms of the group (\neq from statistical representativity): the “atypical” farms of the group are not represented
 - **The strong heterogeneity of the of farm types** generates complexity in the construction of typical farms and limits the interpretability of the results

3 - Typical farm: construction process (1/2)

- **Selection of regions and locations:** on the basis of their importance in the country's output for the targeted activity/product
- **Construction of the typical farm:** in each of the selected regions, one or more typical farms are constructed based on the modal characteristics of each group
- **Farm characteristics** refer to:
 - Production type (organic, conventional, etc.)
 - Technology and degree of specialization (monoculture, ...)
 - Farm size
 - Topography and agro-climatic conditions
 - Land tenure type
 - End-uses of farm output (market / autoconsumption)
 - Any other dimension which may reflect local production patterns

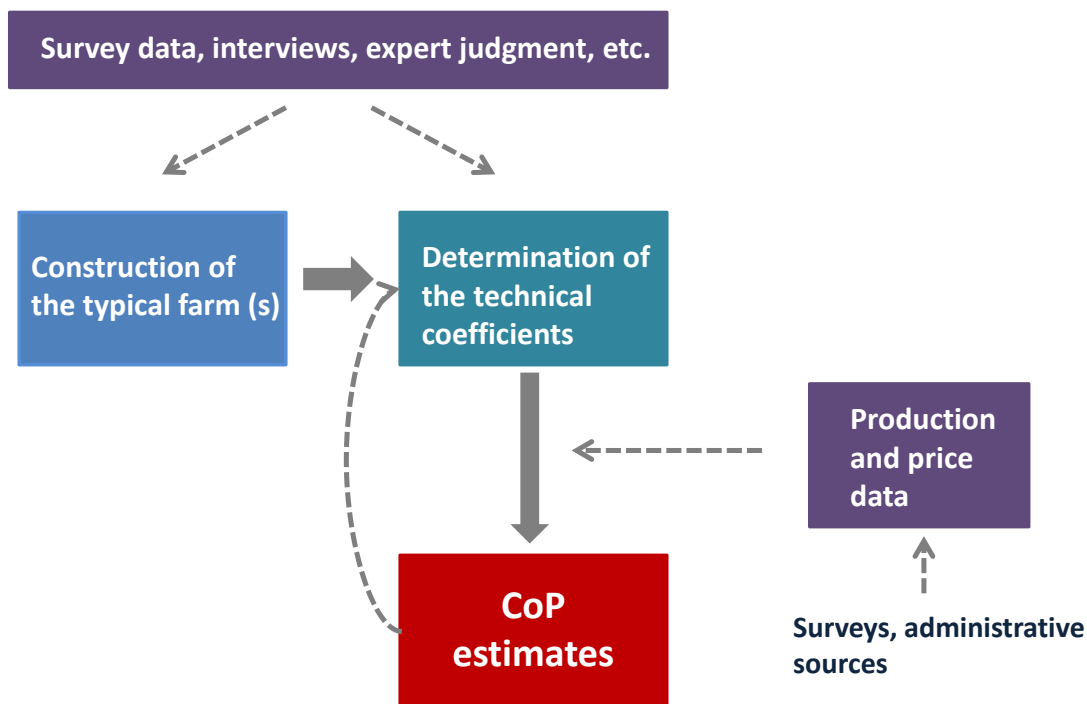
3 – Typical farm: construction process (2/2)

- The determination of the modal characteristics is based on a combination of:
 - **Hard data**, generally coming from censuses and surveys
 - **Interviews** with farmers, extension workers, etc.
 - **Expert judgment**
- This process is carried out by a **panel of experts** composed of a wide range of participants from the food and agriculture sector:
 - farmers
 - extension workers
 - government and non-government organizations
 - input and equipment providers
 - agronomists and researchers, etc.

4 – Determination of CoP data and statistics (1/2)

- The basic parameters and technical coefficients used to construct data on CoP are determined by the **consensus of the group of experts**
- If available, **farm-level data is used as the starting point** for the discussions
- **These parameters are then combined with data on prices and output levels to construct CoP statistics**
- **The outcome (the cost estimates) is presented to the panel for cross-checking**, which may lead to a revision in the underlying parameters and a new round of calculations
- **Several iterations may be needed** until a consensus is reached

4 – Determination of CoP data and statistics (2/2)



5 – Advantages

- **Level of detail:**
 - Detail is necessary to construct the typical farm
 - High-level of expertise of the expert panel
 - More budget can be devoted to detailed analysis
- **Simulation/analysis:** detailed cost and activity data can be used to analyze the environmental impacts of different farming practices, the relation between productivity and soil types, etc.
- **Comparability:** because data collection and cost allocation is (generally) done in a uniform and systematic way, data can be compared in time and in space
- **Budget:** the budget allocated to programs based on typical farms is generally a fraction of the budget needed for full-scale farm surveys

6 – Limits

- **Absence of statistical representativity:** typical farm approaches do not take into account the full diversity of the production systems and conditions in which farms operate
 - => The results cannot be interpreted as national or even regional averages without a significant loss of precision, unless in very specific cases
 - Statistical representativity may be improved by increasing the number of typical farms, but at the price of budget increases
- **Complexity:** the determination of typical farms is in itself a complicated exercise, given the multiplicity of characteristics to consider and the important data requirements
- **Limited objectivity:** estimates for typical farms are partly the result of judgments made by experts and other panel members => may reflect more their opinion rather than the ground truth

7 – Hybrid approaches (1/2)

Typical farm approaches can constitute a **complement to standard survey-based approaches:**

- **For countries with little or no statistical infrastructure,** they constitute a cost-efficient way to compile a preliminary set of CoP estimates, which can eventually be improved and completed by sample surveys
- **For less important crops** for which the use of surveys is not justified economically
- To estimate CoP **between two survey rounds**

7 – Hybrid approaches (2/2)

- The respective benefits of survey and typical farm approaches can be combined in a hybrid strategy consisting of:
 - **Undertaking periodic structural surveys** in order to assess with precision and statistical soundness the production costs
 - **Constructing homogenous groups of farms** (typologies) based on statistical techniques such as cluster analysis
 - **Selecting a reduced number of farms** from these homogenous groups
 - **Determining data on cost of production** for this reduced number of farms, updated and cross-checked with the data compiled from the structural surveys

8 – Examples

- **Brazil:**
 - The typical farm approach is used to construct regional and national figures on CoP for all the major commodities.
 - The fictive farm is defined and selected by a panel of experts as the modal farm in the region of interest. Technical coefficients are determined by the panel for all the variable and fixed inputs and combined with information on agricultural output and input prices to determine CoP.
 - The role of the organization in charge (Conab – a public institution) is to coordinate the work of the panel, consolidate the results and ensure their consistency across time, space (regions) and commodities.
- **The Agri-Benchmark network** is another major user and promoter of this approach, used to assess CoP for crops and livestock for a wide range of developed and developing countries.

9 – References

- **Global Strategy to Improve Agricultural and Rural Statistics (2016)**, Handbook on Agricultural Cost of Production Statistics, Handbook and Guidelines, pp.33-35, 45. FAO: Rome.
- <http://www.agribenchmark.org>