



Food and Agriculture Organization
of the United Nations

Agricultural cost of production statistics: main concepts

Short Training Course on
Agricultural Cost of Production
Statistics

1 – Accounting approach

- **Economic accounting** is used \neq business or tax accounting
- **All costs** are measured:
 - Cash costs : costs generally resulting from an economic transaction
 - Non-cash costs:
 - inputs supplied by the farm or the farmer (including land)
 - Capital or fixed inputs
 - Opportunity costs
- **This is necessary to appropriately measure the productivity** of production factors, such as land, labor or capital

2 – Boundaries

- **Cost of production or cultivation stops at the farm-gate.** Strictly speaking, it excludes:
 - Transport costs : from the farm to the first selling point or to the transformer
 - Marketing costs : publicity, packing and conditioning going beyond the basic form in which the commodities are usually sold
- These costs can be measured in an AgCoP program but should:
 - Be presented separately in the tables
 - Not be included in the computation of indicators such as net or gross returns

3 – Opportunity costs (1/2)

- **Def: The opportunity cost of a good or service can be defined as its value in its next best alternative use (AAEA, 2000).**
- Used to measure the cost of an input that:
 - **Has not been purchased**, such as self-produced, supplied or exchanged inputs:
 - Non-paid family labor
 - Self-produced seeds
 - Own agricultural land, etc.
 - **Is missing** or difficult to obtain
- **Opportunity cost of capital:** the revenue implicitly foregone by the farmer by investing on the farm instead of off-farm

3 – Opportunity costs (2/2)

- **Some examples:**

- Non-paid family labor: salary rates paid in the non-farming sector
- Reused or self-produced seeds: their price if they had been sold on the market
- Own agricultural land: the rental price that the farmer would have received had he chosen to rent his land instead of cultivating it himself

- **Choosing the appropriate opportunity cost is complex, because:**

- There are multiple alternative uses, depending on the context and environment of the farm
- Markets may be too thin: rental markets for land, etc.

4 – Agricultural production

- **Production quantity** : physical quantities produced by the farm and expressed in standard or specific units:
 - Tons of maize, liters of milk, etc.
 - Estimated by multiplying the yield by the appropriate dimension unit, such as area for crops, trees for perennial crops and heads for animal products
- **Production value**: product of physical quantities and the unit producer price
- **Marketable production**: production quantities **minus** auto-consumption and on-farm post harvest losses (linked to storage for example)

4 – Production factors (1/2)

- **Def: All factors (inputs) used by the farmer to produce (outputs)**, irrespective of their acquisition mode:
 - Purchased
 - Self-supplied by the farmer or family members
 - Produced on the farm
- We distinguish:
 - **Fixed production factors (capital)**, independent on the short to medium-term from quantities produced, such as infrastructures
 - **Variable production factors**, function of quantities produced, such as seasonal labor, fertilizers, custom services (renting of farm equipment, outsourcing,...)

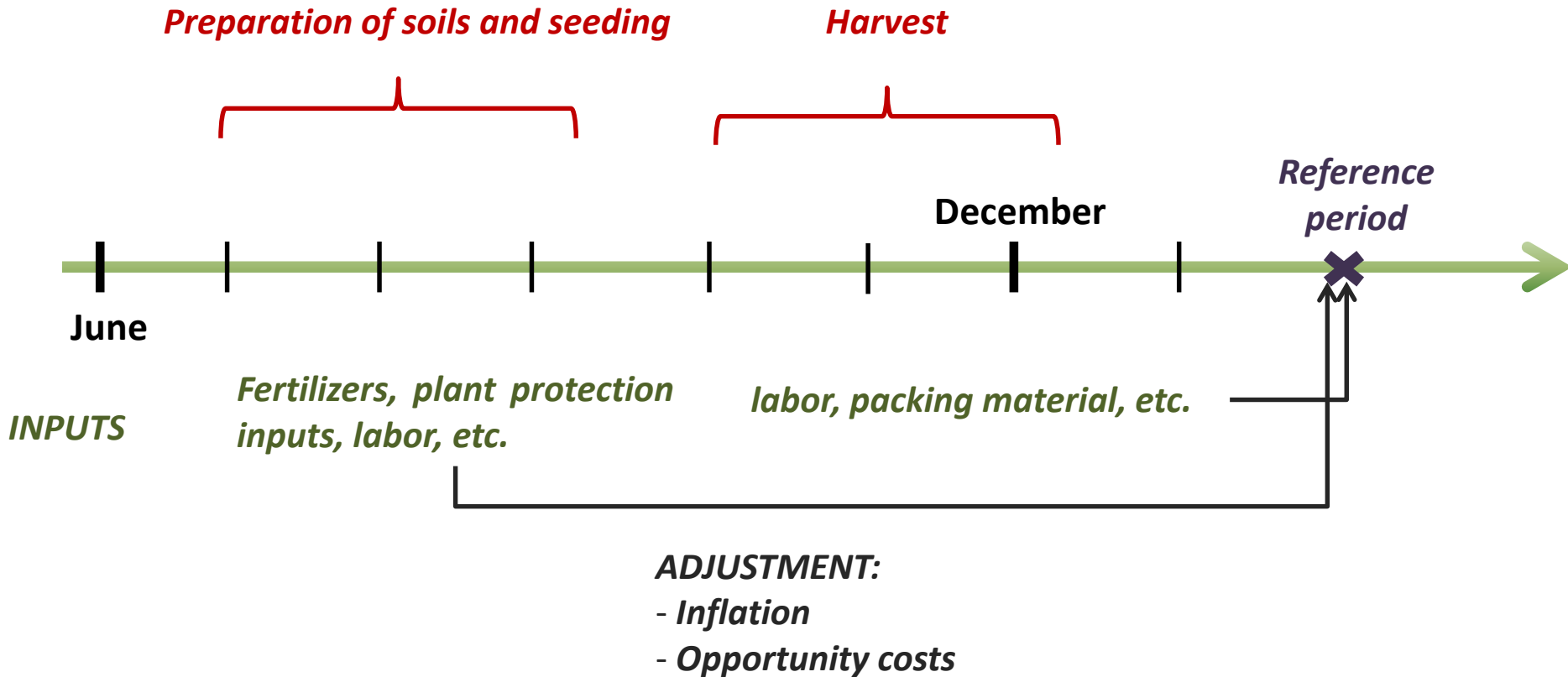
5 – Production factors (2/2)

- Inputs can be purchased through:
 - The **farm's own savings**
 - **Credit**, contracted from a mortgage company or other (cooperatives, government, other farmer, etc.) => Mortgage costs (interests and other) have to be accounted for
 - In accordance with the opportunity cost principle, **inputs have to be valued at their market price at the time of use** and not at the time of their purchase

6 – Reference period (1/3)

- **It is important that costs and revenues** be computed for a common reference period:
 - The cropping season for crops
 - Calendar year, semester,...: for livestock and other activities which are more uniformly spread throughout the year
- Farm expenses, selling/consumption of the product and data collection occur at different points in time
- **Adjusting the data to the common reference period** is often overlooked but is necessary to:
 - Account for inflation throughout the year
 - In theory, account for the opportunity costs (discounting factor) associated with the holding of the inputs

6 – Reference period (2/3)



6 – Reference period (3/3)

There are in principle 3 adjustments to make:

<i>Period</i>	<i>Example</i>	<i>Cost</i>
Input PURCHASE	A bag of 50 kg of fertilizer at 50 Euros is purchased	$C_1 = 50$
Input USE	25 kg used (not all the fertilizer purchased is necessarily used in the same cropping season)	$C_2 = (C_1/2) * (1 + r_1)$
END OF THE CROPPING SEASON		$C_3 = C_2 * (1 + r_2)$

$r_1, r_2 =$ inflation (+ if possible a discounting factor)

7 – Different prices for different uses

- **To value production:**

- Producer prices (farm-gate prices)

- Price at the first selling point: transport expenses and margins have to be deducted

- **To estimate a missing price** : the price of a similar (or alternative) good or service on the market. Problem: if the market is too thin...

- **Accounting for subsidies**, measuring both the prices net of subsidies and inclusive, to:

- Measure the effective profitability (inclusive of subsidies)

- Measure the economic profitability (net of subsidy)

- Assess the economic relevance and efficiency of farm subsidies

8 – References

- **AAEA Task Force on Commodity Costs and Returns (2000).** *Commodity Costs and Returns Estimation Handbook*. United States Department of Agriculture: Ames, Iowa, USA.
- **Global Strategy to Improve Agricultural and Rural Statistics (2014),** Literature review on cost of production methodologies, Technical Report Series GO-04-2014. FAO: Rome.
- **Global Strategy to Improve Agricultural and Rural Statistics (2016),** Handbook on Agricultural Cost of Production Statistics, Handbook and Guidelines, pp.13-24. FAO: Rome.