Land costs

Short Training Course on Agricultural Cost of Production Statistics
1 – Land: a special type of asset

• **The service life of agricultural land is indefinite** (≠ to capital and variable inputs): it can maintain its physical characteristics through time

• **Land cannot be depreciated**: it does not strictly qualify as a capital asset

• **In practice, land quality varies overtime** (+ or -), depending on several factors such as:
  
  o Nature and intensity of its use for cropping, pasture or other

  o Changes in climatic conditions and in the environment (physical and non-physical)

• A plot of land has a **fixed geographical position**

• **Land use and cover vary overtime**: conversion of agricultural to non-agricultural land for example
2 – Why valuing land costs

- **Land is an essential production factor** for cropping activities: as any production factor, it has to be valued to measure profitability.

- A range of **costs are attached to land ownership and use**.

- **For the land owner**, the selling or rental value of his land can represent a significant share of its revenues.

- **For the farmer renting land**, rental costs usually represents a significant share of its total production costs.

- Land values are also used for **fiscal purposes**.

- **Land values affect and are affected by many factors**, among which input prices, net agricultural margins, etc. -> it is therefore key for policy purposes to properly measure land values and costs.
3 – Land tenure types

- **Owned land** comprises:
  - Land owned by the farmer
  - Land owned by a group of persons, in the case of communal land
  - Land under concession, whereby an authority gives a person or group of persons the right to carry out farming activities for a pre-defined and often long period of time

- **Rented land** implies that:
  - The farmer pays a monetary rent in exchange of the use of the land
  - The farmer gives the land owner a share of its harvest in payment for the use of the land
  - The farmer provides goods or services to the land owner in exchange of the use of the land: labor to harvest the plots of the land owners, machinery, etc.

- **Land tenure type is often not formalized by a title of property or a rental contract** => challenge for a proper valuation
4 – Value of land: definition and drivers

- **Land value = market value of the land resources** used for agricultural production (including livestock), irrespective of the land tenure type.

- Infrastructure not directly related to land resources, such as housing or warehouses, have to be valued separately.

- **The value of the land depends on a multitude of factors, related to:**
  
  - Its assumed productivity, such as: soil acidity level, topography (slope, etc.) or orientation.
  
  - The infrastructures that improve land quality, such as: drains, embankment or access to water (wells, etc.).
  
  - Its localization: distance to the main markets, proximity to roads or urban centers, existence of conflicts in the zone.
  
  - The status of the land: private, communal, state-owned, religious.
  
  - The land regulations: fiscal, land ownership structure and rights.
• **Expenses** associated to agricultural land comprise:
  
  o Cost of the regular maintenance of the land, such as cleaning, clearing or embankment refection
  
  o Costs related to the use of the land, such as taxes or access rights to water

• **Investments** are expenses that aim at:
  
  o Increasing land resources: purchase of new agricultural land
  
  o Improving the quality of the land resources: construction of drainage systems, roads, creation of terraces or earthmoving works

• **Land capital**: value of the stock of agricultural land resulting from the flow of investments made on and for the land
6 – Land costs: definition

• **Land costs comprise:**
  
  o Expenses associated with the agricultural land
  
  o The cost of using the land for agricultural purposes:
    
    ▪ Rental price if the land is rented
    
    ▪ Imputed cost if the land is owned

• **Land costs exclude:**

  o Investments made on the land

  o Expenses associated with farm infrastructure not directly related to the land resources (housing, storage facilities, etc.)

  o Expenses associate to farm land but not agricultural land: maintenance and repair of warehouses, silos, etc.
Recommended approach

• **Use the rental price effectively paid** by the farmer as stipulated in the rental contract

• **If the rent corresponds to a share of the harvest**, the cost is estimated by valuing the quantities at the producer price

• **The rental price is the best measure** of the opportunity cost of the land. It comprises by construction:
  
  o The cost of using the land, including taxes, permits and other expenses associated to the value/quality of the land
  
  o The cost of maintaining the land
  
  o The implicit value of the land, reflected in the yield which it generates
Alternative approach

• If the rental price is unknown (informal contract, non-response):
  
  o The cost has to be imputed using standard market rates in the locality

  o Given the spatial variability of the land rental prices, it is necessary to choose locality-specific rates

• If rental markets for agricultural land are too thin or nonexistent, market rates cannot be used. Possible alternatives are to:

  o Use official rates, where these exist, which often provide floor prices

  o Impute an rental cost based on the parameters of a hedonic equation

  o Estimate an opportunity cost based on the value of the land
Recommended approach (from a theoretical perspective):

- **Determine the opportunity costs** (OCC) for the farmer associated with the ownership of the land: the flow of revenues that would have been generated had the farmer invested an amount equivalent to the value of his land in an alternative asset.

- The opportunity cost is estimated as follows:
  
  - Step 1: **determination of the market value of the land**
  
  - Step 2: **determination of the annual return of the alternative investment** (often, long-term bond rates are chosen)

  - Step 3: **OCC = market value of the land x annual return**

- **Limits**: Value of the land? Alternative investment?
Alternative approach (recommended from a practical viewpoint):

- **Impute a fictive rent to the land owner**: the rental price that he would have received had he chosen to rent his land rather than using it.

- **Local rental rates can be used** for plots with similar characteristics, if a representative rental market for agricultural exists.

- This approach implicitly assumes that the cost for the owner of using his land is equivalent to what he would have received as a payment for renting the land (opportunity cost / rationality principle).

- **This approach implicitly assumes that imputed rent is actually an upper bound of the net returns provided by the land**: if the net revenues associated with the ownership and use of the land for agricultural purposes are higher than rental revenues, the owner would be better off choosing the latest option.
Rental rates for farming land may be subject to local or national regulations, specifying:

- Ceiling rates,
- Floor rates (less often so)

Using this administrative information makes an economic sense only if these rates are effectively used by a significant proportion of farmers.

Regulated rates may be used to impute missing data, if other auxiliary information is missing.

It is a good practice, when the estimations are made using regulated prices, to present overall results with and without these estimations.

Practical problems (which rate to choose) and confidentiality issues (will the farmer accept to respond?) arise when effective rates differ from legal rates, exposing a lack of enforcement of the regulation.
Hedonic regressions

- It is used to provide more accurate estimations of land values and rents

- Method: infers land values (or rental rates) from a number of characteristics associated with the land and correlated to its price:
  
  o Step 1: The parameters (ex: effect of crop type on land price) are estimated or calibrated on the basis of a sub-sample of farms and updated regularly

  o Step 2: Land characteristics gathered in the CoP survey are then combined to these parameters to estimate the price/rent

- Limits:

  o **Existence of a detailed database** allowing to correlate prices/rents to observed characteristics of the land

  o The estimation of the parameters requires technical know-how
6 – Presenting data on land costs

• Land costs are presented in a separate line in CoP tables.

• Imputed costs for owned land and rental costs are generally presented separately.

• Many countries present the economic indicators with and without imputed land costs, due to:
  
  o **The high uncertainty** affecting the estimation of land costs.

  o **The lack of robustness** of these estimations (strong variations depending on the method used).

  o Including imputed costs may sometimes lead to presenting strongly **negative returns**.
7 – References

