Economic concepts used to estimate incomes at family level

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Incubation workshop "Improving access to food through agroecology: public policy scenarios in favor of the agroecological transition"

CIRAD, Montpellier, 25-27 février 2020
Métaprogramme GloFoodS
Observation units

• Farm = **set of plots** (own or rented) and **animals** of a producer and his family that have assets / resources (**workforce, tools, equipment and infrastructures**) to exploit them

• Family = **set of individuals** who are part of the producer's household (HH = live in the same house) and/or who share assets and resources and/or contribute money to the HH and the farm (wages, remittances) = **Livelihood or activity system**

• Plot = **piece of land** of the farm managed under a single form of tenure and legal status, exploited with the same land use and with the same combinations of technologies and practices = linked to a cropping system
Analysis units

• Production system (SP) = **level of basic organization of the agricultural production processes** → socio-economic strategies of the family + logic of other levels (value chains, solidarity, contradictions and conflicts, etc.)
  • Analyzing a SP implies studying the combination of assets / resources (or factors of production) available for the family
  • Analyzing a SP allows to study the productive processes at farm level, which are based on sub-systems at the level of plots (cropping systems) and groups of animals (livestock systems)
    • One **practice** refers to the way in which a producer carries out a productive process in a cropping or livestock system (agroecology can be identified at this level!)
    • While a **technology** can be studied independently of a producer (which is the case in a reference farm), a practice refers to a specific context in which it is applied
Assets/Resources Combination

• The assets / resources (or capitals, production factors) contribute to the productive processes in the farm
  • Natural capital = the land or plots of the farm + access conditions (tenure)
  • Human capital = workforce = the number of peoples engaged in activities on the farm (family members and others) + qualification
  • Financial or economic capital = available capital for production (< 1 year) and investment (> 1 year), credit, savings (+ animals considered as "living capital": livestock, pigs)
  • Physical capital: equipment, infrastructure, machinery and other tools (animals used for traction)
  • Social capital: membership of groups, associations, unions, professional networks
Combination of activities at family level (1)

- On the farm: crops, animal husbandry, product processing, etc.
- Cropping system (SC) = crop succession and / or association, as well as the practices and technologies that are applied in a plot according to a specific scheme
  - The agronomic logic of the SC, closely related to biophysical and socioeconomic conditions (in particular the conditions of access to land and natural resources, for example, water) can be systematically analyzed at the plot level
  - For example, a successive cultivation of maize and dessert beans using the same varieties and the same practices of fertilization, pest management, soil cleaning, etc. in the same plot, it can be considered as a cultivation system if the same sequence and the same way of producing is repeated every year
  - What happens at the plot level, what grows in it, the conditions under which it is grown, the way in which the cultivation is carried out, as well as the history of cultivation of the plot, all this constitutes the SC
- Livestock system (SA): at the level of a group of animals and is equivalent to a set of elements in dynamic interaction, organized by man with a view to developing resources through domestic animals to obtain a variety of products (milk, meat, leather, skins, labor and fertilizer) or with a view to achieving other production objectives
Combination of activities at family level (2)

• Outside the farm: other activities based on the use of natural resources (collection of wild products, hunting, fishing) or not: wage labor, independent activity, local or in migration
  
  • Pluri-activity (= the same person can have several activities in and off farm) and the diversification of the activities of the members of a household (= different people can have each activity is different from the activities of the other members), whether locally or in migration (remittances), that contribute to the socio-economic development of families

• Unit of analysis: system of activities (on and off the farm, at family level = local and in migration)
A systemic approach

• The assets / resources and activities are interrelated each other, and with other...
  • In the case of family labor, work dedicated to agricultural activities on the farm and with other activities outside the farm can enter into competition with off farm activities and generate tensions for the producer and his home and need to choose and prioritize
  • The activities can be complementary
    • Eg this is the case in crop rotation (the bean, being a legume, fertilizes the soil for the corn that follows it) or in the case of manure produced by livestock that can be used to fertilize the crops, at no cost (more that the work that displaces it)
• The word "system" refers to these complex interactions that must be studied to understand the productive system.
The Gross Product (PB)

- **Definition:** estimated gross agricultural production value based on market price
  - At the plot level, the PB refers to a calculation per hectare (or apple) that corresponds to the yield multiplied by the unit price of the products (for each planting season, including all items produced in the event that there are crop associations or AFS (agroforestry systems) sum to obtain an annual value at plot level)
  - For animal husbandry, the PB is calculated by adding the (annual) value of animal products (L of milk, kg of cheese or curd, # of animals sold or kg of meat, etc.)
  - At farm level, the PB is the sum of the gross products of the various crop systems and animal husbandry systems
- **The price considered is the actual farm gate price**
  - If the product is sold outside the farm (in a market), transport and marketing costs must be taken into account
  - When products are sold at different times, an average price must be taken into account
  - Sum of the different sales operations divided by the total amount sold
- **The PB allows an assessment of the total production, no matter if the product is sold or self-consumed**
Gross margin and operating costs
(= intermediary costs)

- Gross margin = PB minus operating costs and to which possible subsidies are added (when they exist)
- The operating costs correspond to what disappears in the act of production:
  - Seeds, inputs (fertilizers, chemicals, primary materials to do it, etc.)
  - Motorization costs (gasoline for an irrigation pump, a rototiller, a chainsaw, etc.) linked to the use of equipment on a specific plot
  - The costs of the external labor contracted for a specific job on the plot
  - Costs that correspond to permanent salaried labor are included as structural expenses. Unpaid family work is not valued (neither is mutual support or a turned hand)
  - Water cost: The cost of water is an operating cost unlike taxes to access an irrigation system, for example, which are generally structural expenses
  - The cost of renting the land (at valuation when on average)
  - The cost of processing / processing the products on the farm
  - Veterinary costs, purchase of food for animals, purchase of animals
- The gross margin is calculated at the level of each crop sub-system (plot) or animal breeding workshop, that is, for each technical itinerary (vegetable or animal)
- Total gross margin = sum of gross margins of the various sub-systems
Gross Value Added (VAB)

- VAB = Gross margin minus subsidies
- The VAB = Real agricultural income $\rightarrow$ creation of real value in the farm (therefore, does not include subsidies)
  - For cropping systems, the GVA is calculated per hectare (or apple)
  - For animal husbandry systems, it is calculated by zoo technical unit (UTB), that is, by animal, whatever the species
- At farm level, the VAB = sum of the VAB of the different crop and breeding sub-systems
The Net Margin and structural costs

- Net margin (net agricultural income) = Gross margin minus structural costs, financial costs and other costs
- Structural costs correspond to fixed costs that do not vary with the level of activity on the farm and do not disappear in the process of production
  - Rental of buildings, maintenance of infrastructure, equipment and tools, insurance,
  - Permanent staff salaries
  - Repayment of a loan / credit (= value of the borrowed financial capital + interest rate)
  - The net margin is generally calculated at farm level
- It can be calculated by crop and animal husbandry system, assigning to each workshop the corresponding structural expenses, in proportion to its use
  - Does not include income earned outside the farm
- At farm level, Net margin = net agricultural income before household expenses
- If there are taxes, it is necessary to take them into account as structural costs
Family income

• Non-agricultural income = all off farm income or contributions of household members who do not come from farm production = income from external work, even in migration, in different economic sectors: agricultural wage earners, transport, commerce, etc.

• Total net income of an agricultural family = sum of net margin and non-agricultural income
Labor productivity and return to labour

• Labor productivity = production divided by the number of days per man needed to obtain it
  • Labor productivity is expressed in kg of product per work day
  • It allows comparing the productivity of different cropping systems and comparing the systems in several years without having any bias related to price variations
  • It does not allow comparing systems whose production differs (rice with corn, for example). Labor productivity is expressed in kg of product per day (or hour) of work

• It can be calculated at the plot level by dividing the total production of the plot (in kg or unit of measure used) by the number of days spent on this same plot, or by unit area (hectare) by dividing the yield (kg / ha or other unit) by the number of days men per hectare

• it allows to evaluate, depending on real situations, the cropping systems efficiency in term of labor in several farms
  • The proportion of family labor and foreign labor varies from one farm to the other, which leads to a bias when you want to compare the economic performance of the different technical itineraries → it is necessary to consider the total amount of work in the calculation (family and hired)
  • Return to labor is net income divided by family member labor man.days = valorization of family labor : can be calculated for whatever crop for one year but cannot be compared from 1 year to another one as prices changes !!!
Consequences on the type and level of detail of the necessary information

**Assets / Production Factors / Resources**
- Labor or work force on the farm (family and external)
- Land (own or not)
- Equipment, tools, infrastructure (own or not)

**Agricultural activities on the farm “Farming”**
- Crop systems
- Animal husbandry systems
- Product processing
- Collection of wild products, fishing, hunting, etc.

**Activities outside the farm « Off-farm »**
- Local activities (agricultural laborer, construction work, local administration, etc.)
- Activities in migration (remittances)
Consequences on the type and level of detail of the necessary information

• General data at the family / production system level
  • Identification of the producer and composition of his family, with the socio-demographic and socio-economic characteristics of all its members
    • Name, Age, Sex, if you work on the farm, if you work outside the farm, Value of contributions (money) to the home (including wages, remittances)
  • Characterization of the capital of the producer and his family
    • Beneficiaries of some organization that implements a program / project with an emphasis on agricultural production, characterization of the type of actors that have provided these programs / projects and support and related benefits; identification of credit beneficiaries linked to agricultural production
  • Characterization of assets / resources
    • Who works on the farm (family and external labor)? What do you work with (equipment, tools, infrastructure)? What land (total / used area, own or not)
Consequences on the type and level of detail of the necessary information

- Data at the plot level (crop systems)
  - Characterization and assessment of crop systems
    - What is produced and how is it produced on farm plots? How many days of work (per year)? At what cost?
  - Origin and characteristics of plant material / technology
    - Selection, obtaining and use of seeds (+ associated cost + value of plantations)
  - Rotation / succession of crops for one year / several years on the same plot
    - Case of permanent crop plantations
  - Sowing and pasture management (+ associated costs)
  - Technical itineraries (combination of practices)
    - Organization of work (time and space) according to tasks (soil management, fertilization, cleaning management, pest management); costs (inputs for fertility reproduction and pest management + labor)
  - Production level (yield)
  - Orientation (= use of production) + and value of products
    - If the harvested product is different from the self-consumed / sold product, it must be valued in the way it is consumed / sold. Ex. - Corn (cob, flour, tortilla ...)
  - Characterization and valuation of the production of the garden and of the crops of the trees dispersed in the farm (costs)
Consequences on the type and level of detail of the necessary information

• Data at the animal level (breeding systems)
  • Characterization and assessment of animal husbandry systems
  • Composition of the herd and value of the animals bought or sold during the reference year (animals of the productive system)
  • “Non-productive” animals (“live” capital) & exceptional income and costs
• Technical itineraries (combination of practices)
  • Labor organization (pest management, food: use of supplements, etc. vaccines, insemination, etc. costs (supplies and pest management + labor)
• Orientation (= use of production) + value of products: type of production (milk / meat / eggs / cheese, etc.) and animals (traction for transport and soil preparation, reproduction ...); Self-consumption / sale of products