Session 27 amaia.arandia@unavarra.es

DEVELOPMENT OF A TOOL TO DIAGNOSE ECONOMIC, SOCIAL AND ENVIRONMENTAL SUSTAINABILITY OF ANIMAL HUSBANDRY SYSTEMS.

APPLICATION TO DAIRY FARMING

A. Arandia[1], J.M. Intxaurrandieta[2], P. Santamaria[3], O. del Hierro[4], L. Nafarrate[5], C. Icaran[3], E. López[3], M. Pinto[4], J.M. Mangado[2]

1 Dpto. Gestión de Empresas, UPNA, Pamplona
2 ITG Ganadero, Villava (Navarra)
3 IKT, Arkaute, Vitoria-Gasteiz (CAV)
4 NEIKER, Derio (Bizkaia, CAV)
5 SERGAL, Arkaute, Vitoria-Gasteiz (CAV)

Introduction

- The sustainability of agricultural production systems is an objective more and more considered in economic policy planning.
- CAP's 2nd pillar: sustainable rural development.
- CAP's 1st pillar: market regulation criteria, no consideration of production systems.
- Farm technical management and advice based mainly on economic criteria.
- Our objective: provide a "measure" of the sustainability of agricultural production systems, taking as a starting point individual data and results of livestock holdings, participants of technical-economic management and advice programs.
- Three sets of indicators: economic, environmental and social.

Economic indicators

- Traditionally, the most utilised.
- Farm durability depends on economic viability, but also on other economic factors, such as the capacity to adapt to changing markets and policies.
- Indicators proposed:
  - ***profitability***: result of the productive process
  - ***autonomy***: capacity to adapt to changing environments with no outside dependence
  - ***diversification***: in production, customers…
  - ***margins***: share of sales and total income as margins
  - ***stability***: farm expectations at medium and long term
  - ***cost structure***: distribution of production costs

Environmental indicators

• Dialecte® and Planète® tools of environmental impact assessment

• Indicators proposed:

- ***livestock and territorial base***: balance between livestock and land
- ***land management***: soil protection, irrigation, pesticide use…
- ***nutrient balance***: Nitrogen and P_2O_5
- ***effluent management***: infrastructures for a sound management
- ***natural elements & biodiversity***: hedgerows, streams...
- ***global management***: environmental programs…
- ***energy balance***: energy efficiency, fuel equivalent
- ***GHG emissions***: CO_2 equivalent

Social indicators

• Two dimensions (Van Calker et al., 2005): *internal* (working conditions) and *external* (society's perception)

• Indicators proposed:

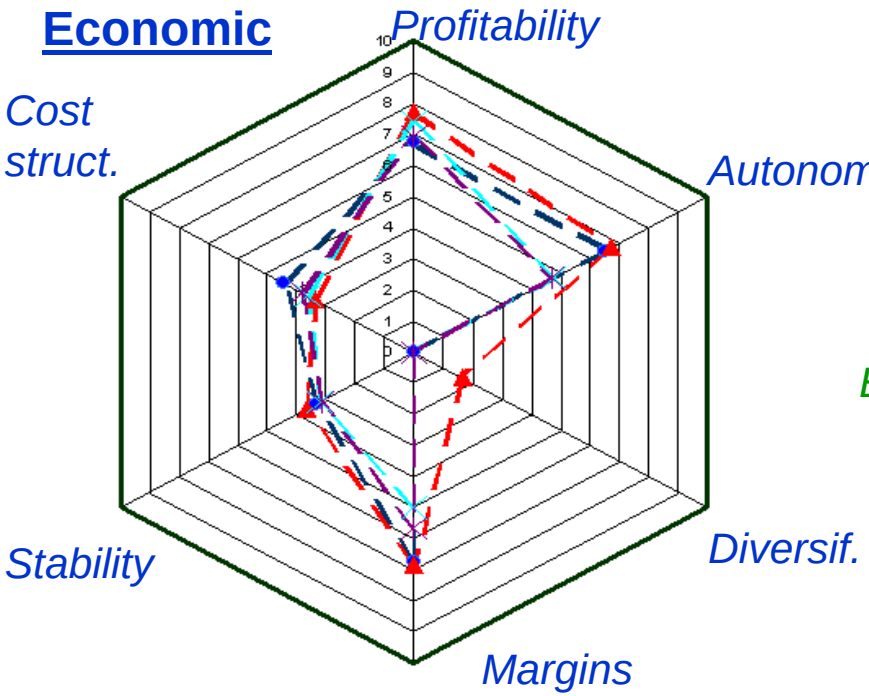
- ***farm ownership***: gender, full/part-time, family farms…
- ***generation of employment***: decently remunerated, resources required…
- ***quality of life***: availability of spare time, holidays…
- ***quality of work***: daily hours, concentration of duties…
- ***animal welfare***: frequency of visits, confinement
- ***landscape & traditional systems***: cultural heritage, local breeds, aesthetic values…
- ***product quality & closeness to consumers***: designations of origin, agritourism…

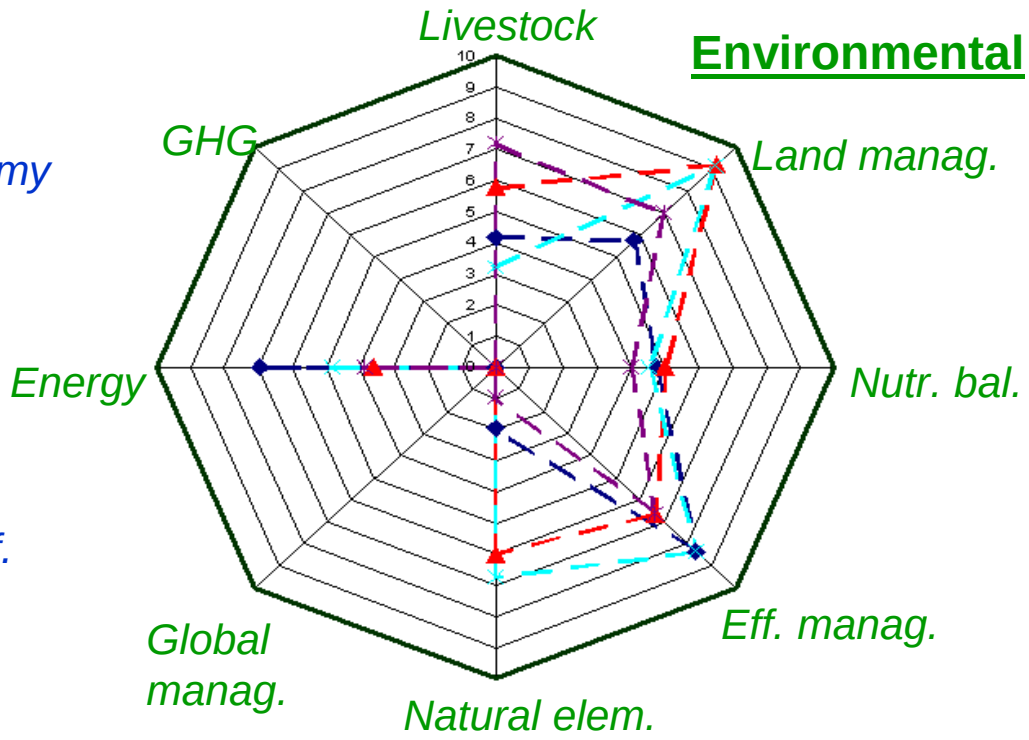
Application

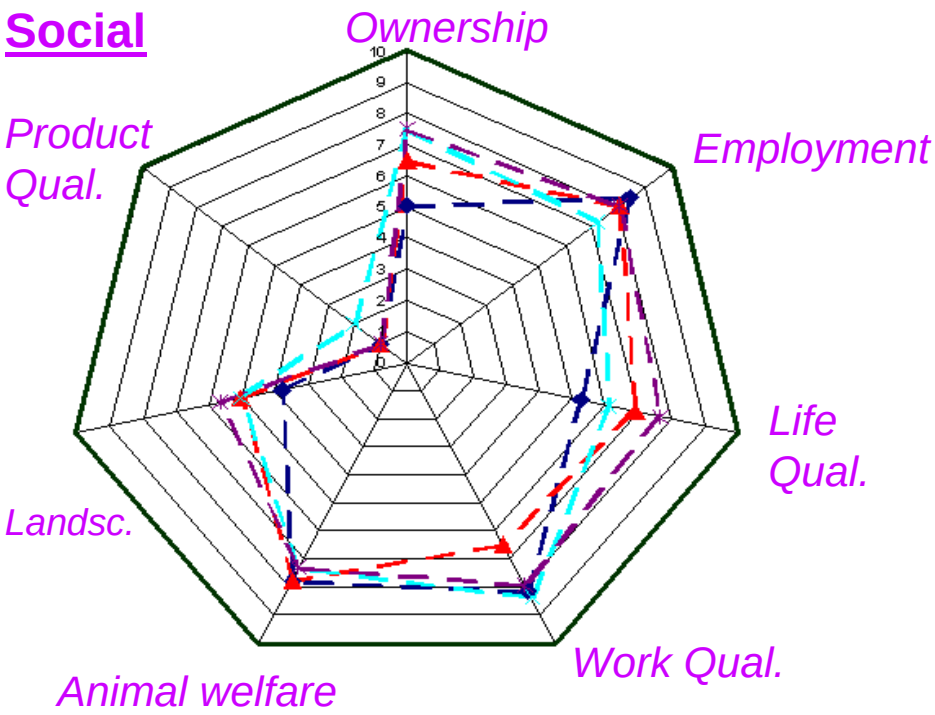
Application

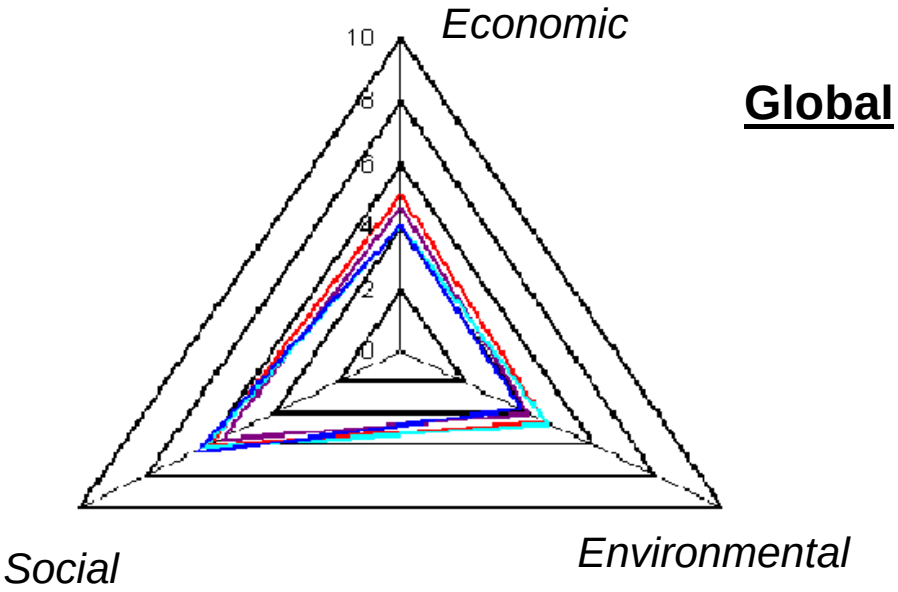
Farm characteristics

	1	2	3	4
Cow Ns.	113	71	120	72
LU	144	96	165	98
UAA (Ha)	56.04	45.36	52.93	64.18
LU/Ha	2.57	2.11	3.11	1.53
Output (lts.)	997853	647917	976051	706020
AWU	3	2.25	3	2.5
Cow/AWU	37.6	31.6	40	28.8
Lts./AWU	332618	287963	325350	282408


Economic
Profitability
Cost struct.
Autonomy
Stability
Diversif.
Margins


Environmental
Livestock
GHG
Land manag.
Energy
Nutr. bal.
Global manag.
Eff. manag.
Natural elem.


Social
Ownership
Product Qual.
Employment
Life Qual.
Landsc.
Work Qual.
Animal welfare


Global
Economic
Social
Environmental

Some comments

- Very few farms, ongoing research
- Initial data collection easy for economic & environmental indicators
- Social information collection new for both interviewer and farmer
- Similar results: reasonable system characterisation (*Farm Type 41 "Specialist dairy farming", land-based*)
- Application of results at different levels:
  - Holdings and advisers: energy & nutrient balances to increase efficiency and guarantee cross-compliance; new economic ratios to complement short-term profitability focus…
  - Public Administration: tool to obtain information on the sustainability of production systems.