

Workshop 1 AGRICULTURE
Development of core elements of integrated sustainability scenarios for agriculture
(Goal definition and Pre-Backcasting)
Florence, 19-20 October

Quantitative assessment and measure of sustainability. Indicators for Italian agriculture

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MAIN STEPS

1. Defining sustainability
2. Measuring sustainability
3. Selecting indicators
4. Implementing indicators
5. Aggregating indicators
6. Results for Italian agriculture

THE POLICY CONTEXT

Sustainable development

- Strategic objective in EU
- Integration in sectoral policies
- Priority at government level

MAIN OBJECTIVE

To provide a tool for:

- monitoring and evaluating the sustainability of Italian agriculture
- information and Knowledge
- decision support

DEFINING SUSTAINABILITY

“sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

(World Commission on Environment and Development, *Our Common Future*, 1987, p. 43)

duty of each generation of individuals toward its successors is to ensure that the availability of capital stock will not decline over time (weak sustainability)

DEFINING SUSTAINABILITY

- multidimensional concept
environmental, social and economics objectives
- global concept
- dynamic concept

MEASURING SUSTAINABILITY

Indicators as a “vehicle for summarising, or otherwise simplifying and communicating, information about phenomena that are of importance to decision-makers”
(Moxey et al, 1998)

“**Indicators** provide the basis for assessing progress towards the long-term objective of sustainable development. Long-term targets only have meaning as policy goals if progress towards them can be assessed objectively” (Commission of European Communities, 2001)

SELECTION OF INDICATORS

With reference to

- European Commission
- European Environmental Agency
- OECD

SELECTION OF INDICATORS

European Commission proposals

socio-economic dimension

“A Framework for Indicators for the Economic and Social Dimensions of Sustainable Agriculture and Rural Development”

(European Commission, 2001)

environmental dimension

“Indicators for the Integration of Environmental Concerns into the Common Agricultural Policy” (COM(2000)20);

Statistical Information needed for Indicators to monitor the Integration of Environmental concerns into the Common Agricultural Policy

(COM(2001)144)

SELECTION OF INDICATORS

European Environmental Agency

IRENA operation (Indicator Reporting on the Integration of Environmental Concerns into Agriculture Policy)

35 agri-environmental indicators supported by data sets at NUTS 2/3 level classified according the DPSIR model

Indicator report "Agriculture and environment in EU-15 – the IRENA indicator report"

Indicator-based assessment report on the integration of environmental concerns into agriculture policy

<http://webpubs.eea.europa.eu/content/irena/index.htm>



SELECTION OF INDICATORS

OECD

Environmental Indicators for Agriculture Volume 3 (2001)

13 agri-environmental themes

4 groups

Driving force - State -Response (DSR) framework

Environmental Indicators for Agriculture Volume 4 (forthcoming)

INDICATORS FOR ITALIAN AGRICULTURE

- to verify the possibility of enacting proposals based on the current information system in Italy
- to make international comparisons

Criteria for selection:

- policy relevance
- reactivity
- analytical soundness
- ease of interpretation
- cost-effectiveness

INDICATORS FOR ITALIAN AGRICULTURE

Data: only from official sources (ISTAT, FADN)

Geographical Unit: NUTS 2/3 and/or municipalities

Time dimension: time series, at least 5 years

Theoretical Framework: DPSIR

INDICATORS FOR ITALIAN AGRICULTURE

Social dimension

Human capital

- Agricultural employment
- Ageing index
- Educational levels of farmers

Equal opportunities

- Breakdown of workers in agriculture
- Resident population in rural municipalities

INDICATORS FOR ITALIAN AGRICULTURE

Economic dimension

Efficiency (associated mainly with the use of inputs)

Profitability of labour

Profitability of land

Productivity of labour

Productivity of land

Viability (related to the potential for farms to survive in the market)

Marginalisation

Diversification in farm holders' activities

Competitiveness (as regards the sector's contribution to the nation's wealth and the process of capital accumulation)

Share of value added of agriculture in total value added

Fixed investments in agriculture

INDICATORS FOR ITALIAN AGRICULTURE

Environmental dimension

Soil pressures Herd density
Livestock
Phosphorus balance
Use of plant protection products

Air quality Methane emissions (CH₄)
Ammonia emissions (NH₃)
Carbon dioxide emissions (CO₂)
Direct use of energy

***Water resources
(quality)*** Nitrogen balance
Potential leaching of nitrates
Fertiliser use
Application of a fertilising plan

INDICATORS FOR ITALIAN AGRICULTURE

Environmental dimension

***Water resources*: use and management of water resources (quantity)**

- Irrigation systems
- Irrigated land
- Type of catchment

Biodiversity: **genetic diversity (within species and among species), diversity of ecosystems**

- Protected areas
- Condition of plant species
- Forest areas affected by fire
- Organic farming
- Agri-environmental measures

Landscape: **changes in form and structure of the landscape**

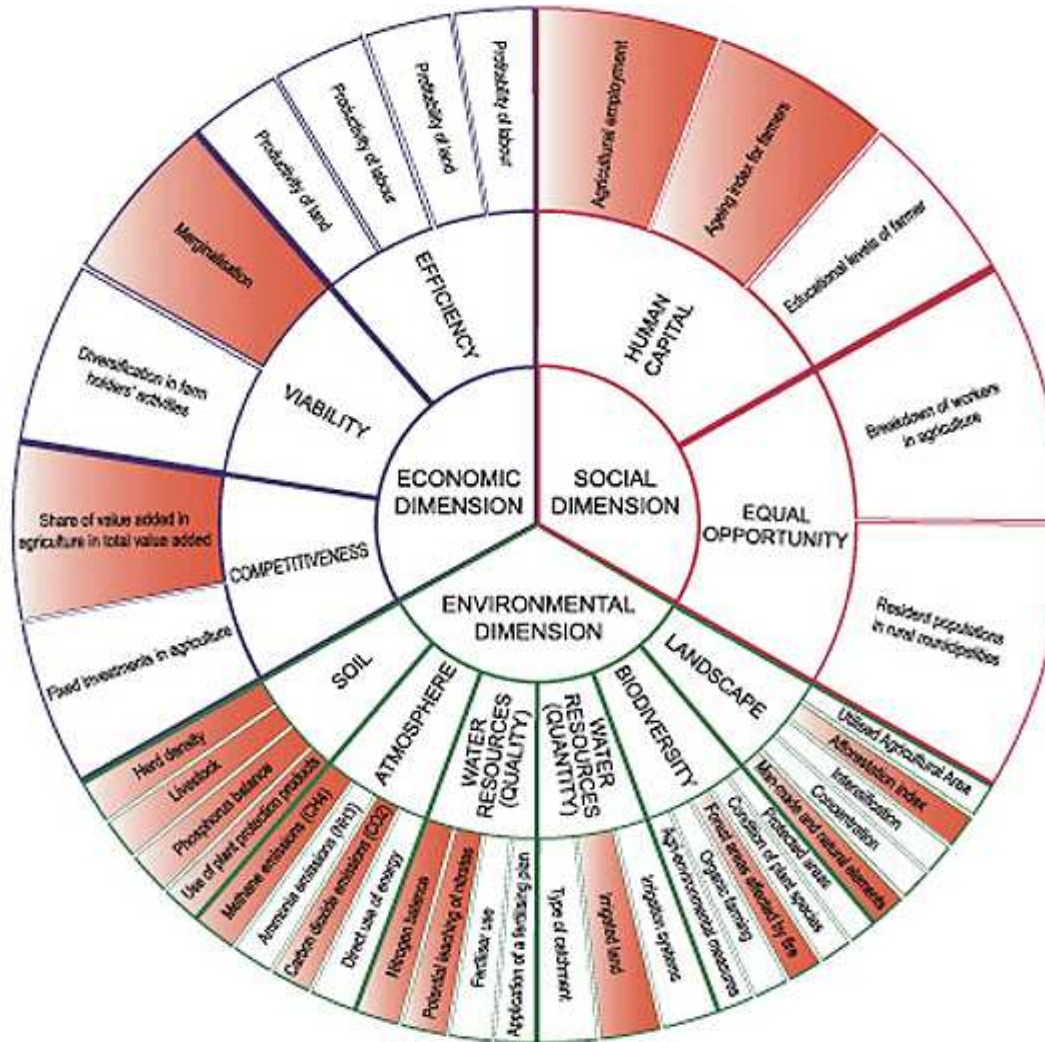
- Utilised Agricultural Area
- Afforestation index
- Intensification
- Concentration
- Man-made and natural elements

INTERPRETATION

Lack of sustainability criteria : thresholds, standard,
target values

Synthetic evaluation of sustainability: aggregation

THE DASHBOARD OF SUSTAINABILITY



THE PATH TOWARDS ENVIRONMENTAL SUSTAINABILITY

Difficult tough progressive

Difficulties

Increasing pressure on

Soil (livestock, pesticide, nutrients)

Water (leaching, irrigation, groundwater abstraction)

Landscape (reduction of UAA)

Progress

Agricultural practices (more environmental friendly, methane, ammonia)

Farm management (fertilising plans)

Natural resources management (irrigation systems, organic agriculture, agri-environmental measures, protected areas)

Biodiversity and landscape (more attention towards: protected areas, natural and man made elements)

Thank you!

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Trisorio, A. (ed), Measuring sustainability. Indicators for Italian Agriculture. INEA, Rome, 2004
http://www.inea.it/ops/pubblica/rapporti/rappsost_ing.pdf



SELECTION OF INDICATORS

European Commission: Rural development 2007-2013

Common monitoring and evaluation framework

Objective related Baseline Indicators

10 indicators on environmental conditions

Biodiversity, water quality, soil, climate change