# European Academy for Sustainable Rural Development

Eighth Summer Academy

## Sustainable Agriculture and Rural Development: an integrated approach

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# *Contribution of Sustainable Agriculture to Rural Development*

technical, social, economic and institutional aspects in the context of an integrated approach


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# Think of the last meal you had in your own country

- What were some of the items?
- What are the ingredients in these items (if it was processed)?
- Where did these ingredients come from?
    - Can you locate the country, region, farm?

# Farm Typology

- On what type of farm where they produced?
  - Small scale? On a farm greater than 150ha?
  - Family owned?
- What production methods do they use?
  - Industrial, input intensive?
  - Organic/ecological?

# Farm Typology

- What are the conditions like for workers?
- Are they paid fairly?
- What are the living conditions like for the animals? Are they confined or outdoors?
- Where do they sell their product?
- What types of distribution strategies are used?

# Why am I asking all these questions?

- Informed purchasing decisions
- These decisions → production
- Production methods → the success of rural communities

# What agricultural issues concern rural development?

- Environmental/technical
  - Production/land use
- Social
  - Farm worker rights
  - Animal welfare
- Economic
  - Fair wages (farmers and workers)
  - Local communities

# Production Techniques (Modern/Industrial)

- Trend from post WWII – 1980's/present
  - Maximize production/efficiency
  - monocultures, high-input dependent
  - loss in balance needed for long-term sustainability
  - Viewed as an economic activity which is profit driven

## Environment

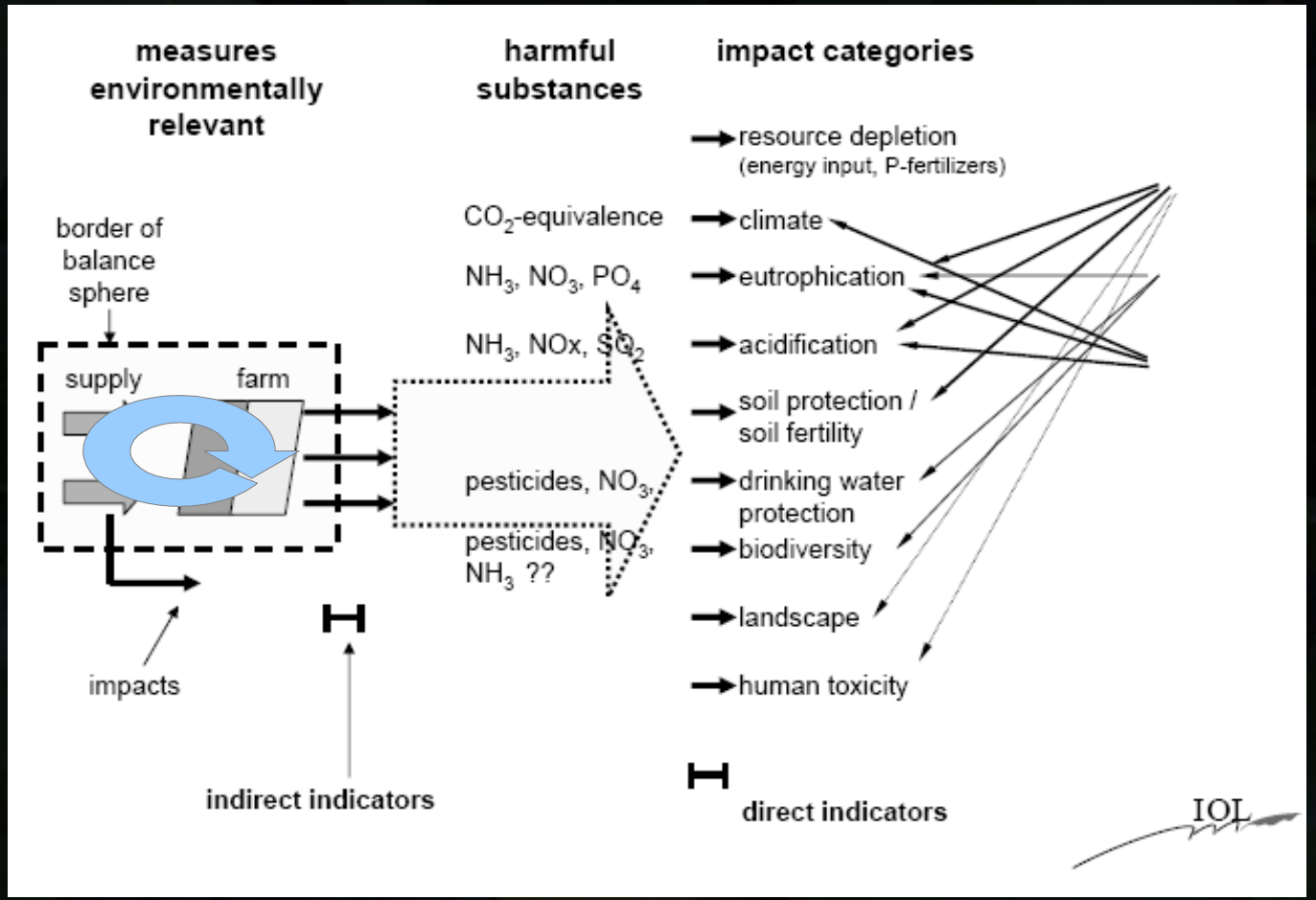
- Food supplies 24% higher per capita than in 1961
- Amount of land in agriculture about constant
- Heavy increase in production on land
  - Using modern/industrial methods
    - Increased irrigation
    - Decreased fallowing, etc
    - Heavy dependance upon inputs: capital, pesticides, fertilizers, machinery

Environment

- Food supplies 24% higher per capita than in 1961
- Amount of land in agriculture about constant
- Intensification of production
  - Using modern/industrial methods
    - cultivation of improved varieties
    - use of synthetic fertilizers and pesticides
    - increased irrigation
    - decreased fallowing, rotation, etc
    - mechanization

# Environment

## Farm-born negative environmental impacts



Environment

66% of used agricultural land has been degraded in the past 50 years by

- erosion,
- salinization,
- compaction,
- nutrient depletion (loss of soil fertility, reduction of organic matter)
- biological degradation (degradation of soil structure
- or pollution

# Sustainable Agriculture

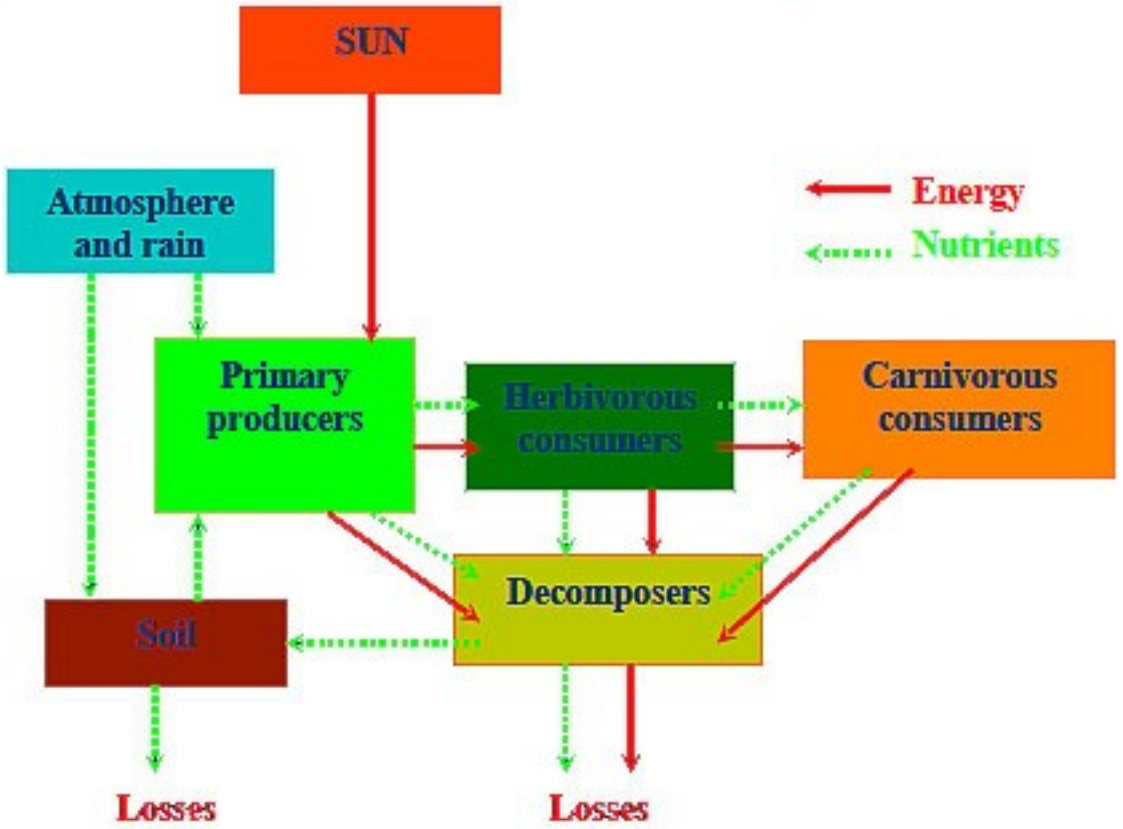
FAO Council (1989) has defined Sustainable Agriculture as:

- ..the management and conservation of the natural resources base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations.
- Sustainable development in agriculture, forestry and fisheries sectors conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.

# Environmental Characteristics of Sustainable Agriculture

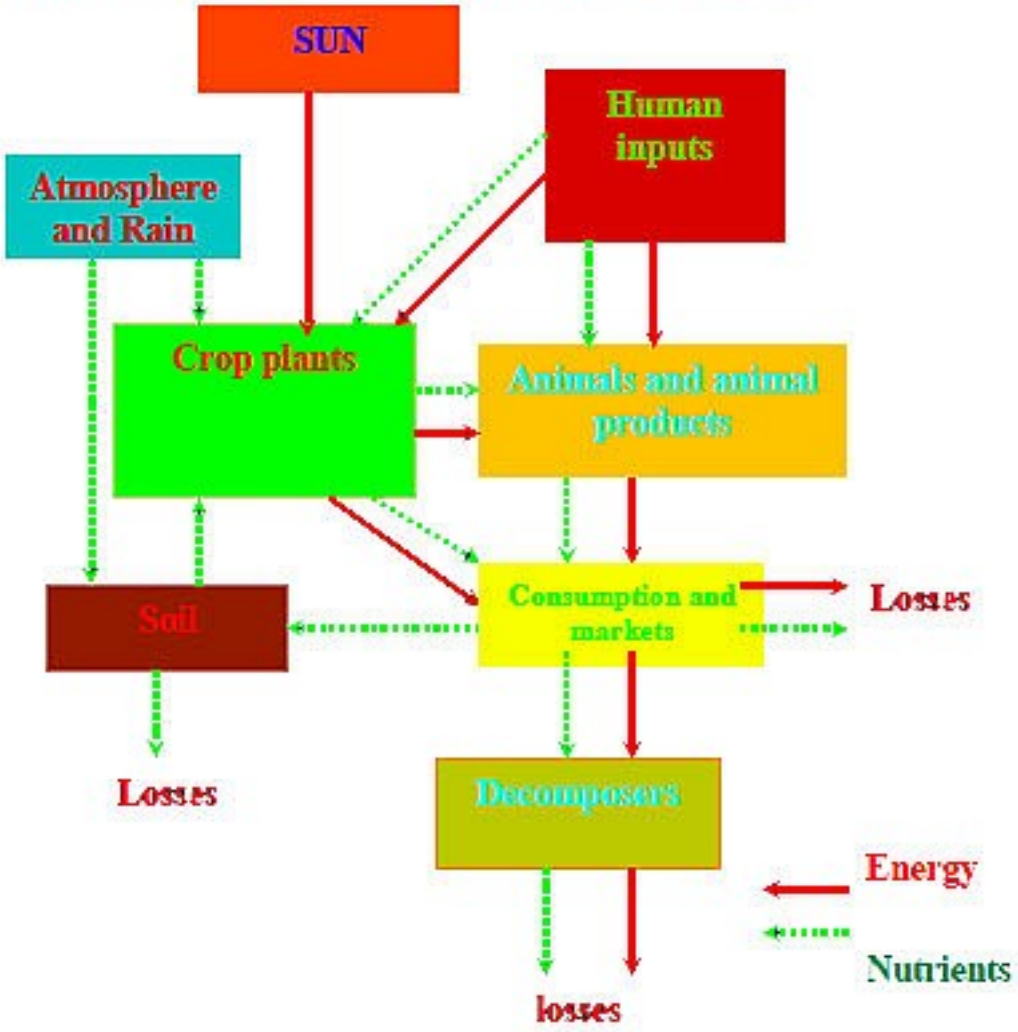
- “environmentally non- degrading and technically appropriate”
- Local ecosystem is mimicked:
  - Ecosystem is the functional relationship between the living organisms and their environment within an arbitrary boundary
  - It operates in a state of dynamic equilibrium

Fig 1. Functional Components in a Natural Ecosystem




Adapted from: Gliessman, S.R. 1997. Agroecology: Ecological Processes in Sustainable Agriculture

Fig 2. Functional Components in an Agroecosystem

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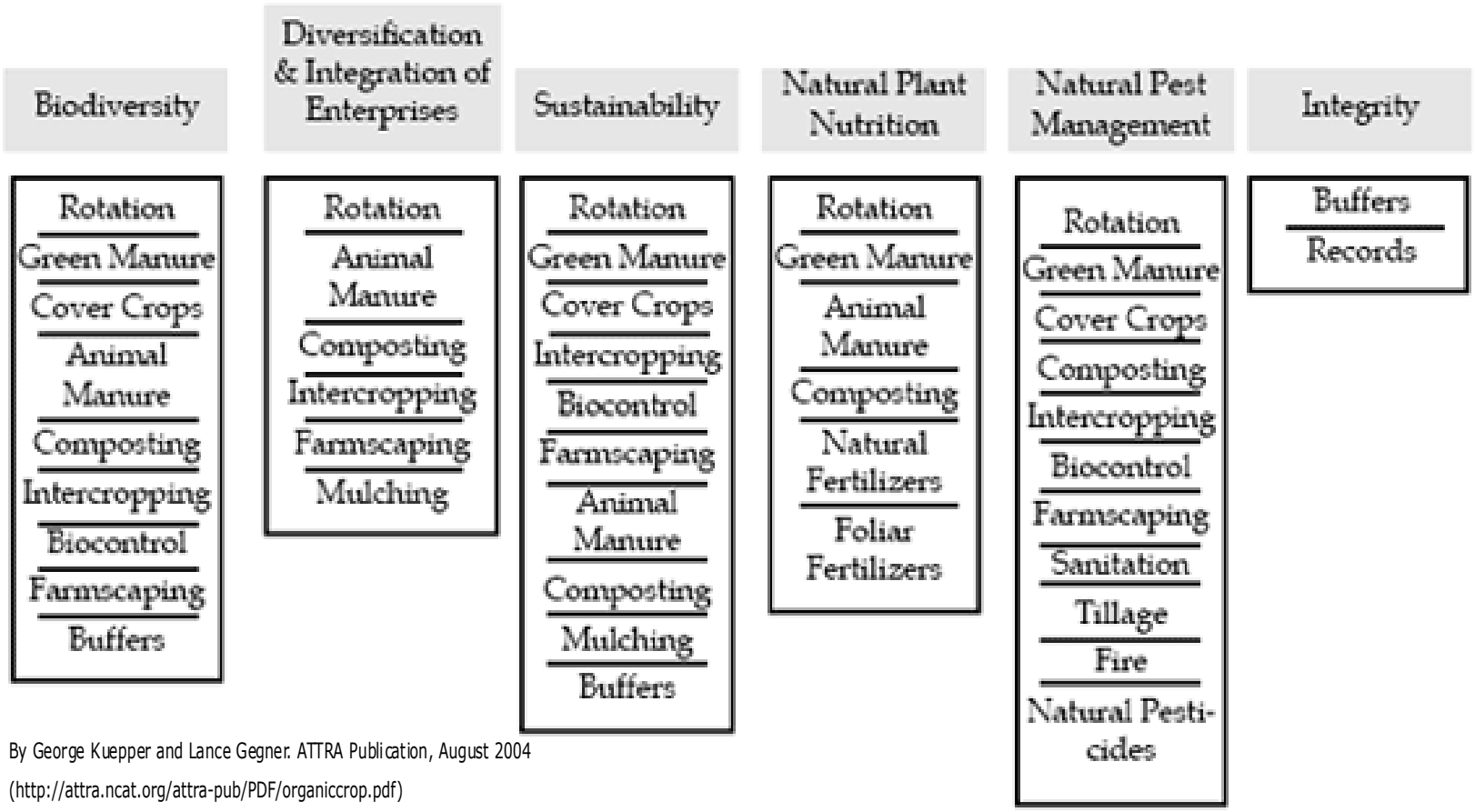
# Environmental Characteristics of Sustainable Agriculture

- Biodiversity is maintained for being able to compensate for losses while still keeping the system simple enough to manage.
- Plants and animals managed together for systemic resilience
- The focus is on processes.
- Performance is monitored and changes are made to maintain systemic balance.

# ORGANIC CROP PRODUCTION

## Foundational Principles and Practices



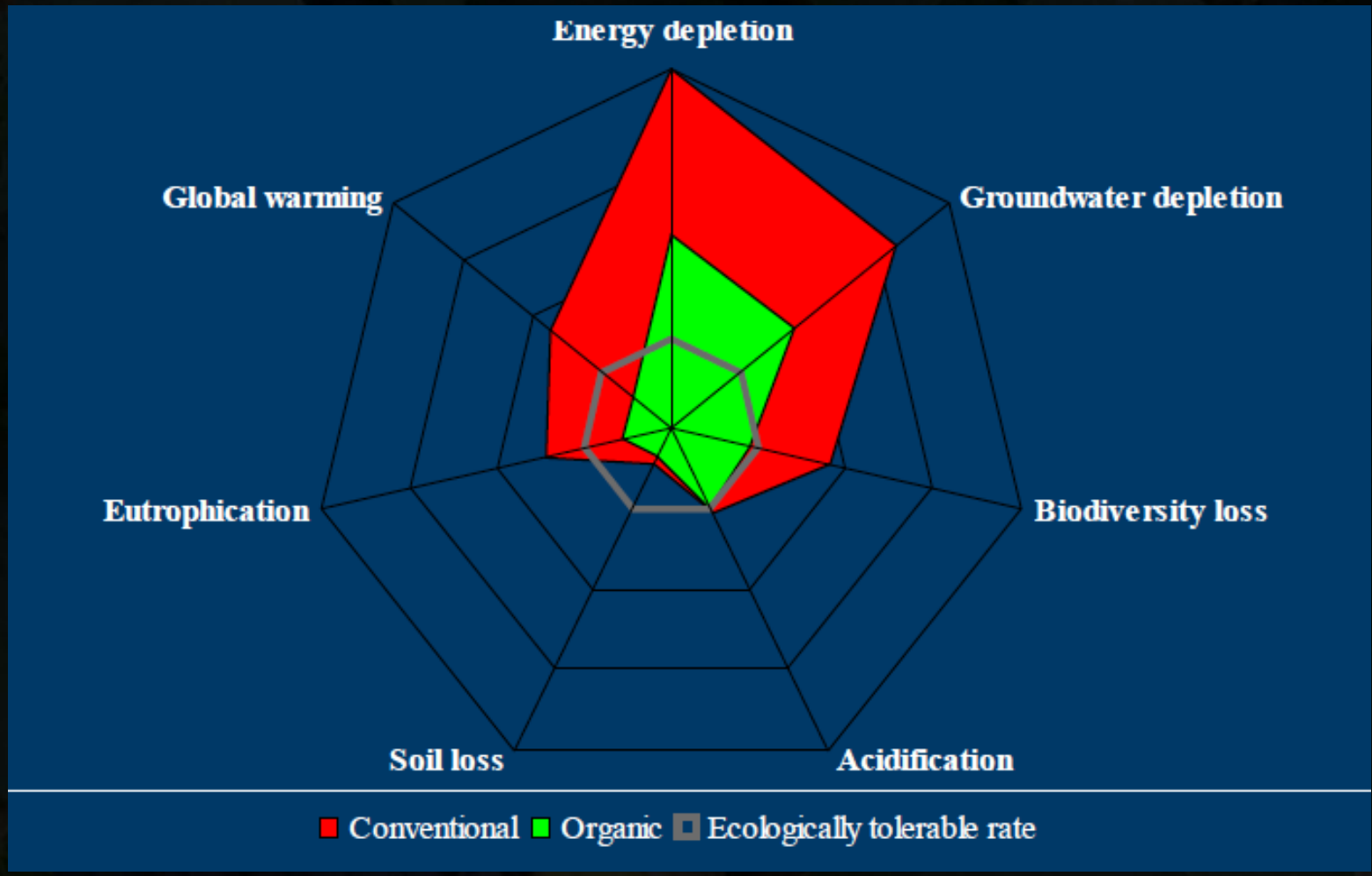

By George Kuepper and Lance Gegner. ATTRA Publication, August 2004

(http://attra.ncat.org/attra-pub/PDF/organiccrop.pdf)

# How can we measure environmental sustainability?

- Measures should be:
  - Standard and comprehensive.
- Assessment tools should be:
  - Rapid.
  - Standardized
  - User-friendly.
  - Meaningful to public policy.
  - Applicable to management.

# Life Cycle Analysis



# What does sustainable agriculture mean for rural development?

- Keep rural areas attractive
  - Benefitting tourism
  - Play a role in countering rural exodus (quality of life)
- Build environmental stability as stewards
  - Maintaining resources for future generations (biodiversity, soils, water, etc)
- Preserve natural resources for urban communities (water, etc) building urban-rural relations
- Reintroducing or preserving the local technical knowhow for the craft of farming

# Pie Ranch

- Mobile chicken coop
- Fields with mixed cultivation
- Fallow areas
- Animals included in farm system (nutrient replacement)

# Pie Ranch

- Scale relevant to ecosystem: only a few head of animals
- Allowed to pasture: not in confinement

# Pie Ranch

- Scale relevant to ecosystem
- Intercropped
- Use of manual labor
- Biodiversity preserved

# Social Concerns in Modern/Industrial Agriculture

- commodity focused production
- decreasing incomes – farming is not profitable, no youth interest in farming
- toxic biocide residues in products
- health risks for growers and consumers
- abandoned production in mountainous and less favored areas
- Exploitation of unskilled labor
- Animal welfare concerns

# Pork production in Denmark

- 5 mill people
- 25 mill slaughtered pigs
- Farmers with pig-production
  - 1982: 57.000
  - 1995: 21.000
  - 2002: 12.000
- Processing (cooperatives)
  - 1960: 62
  - 2003: 2 (Danish Crown has 90%)

# Living at the farm

Major animal welfare problems:

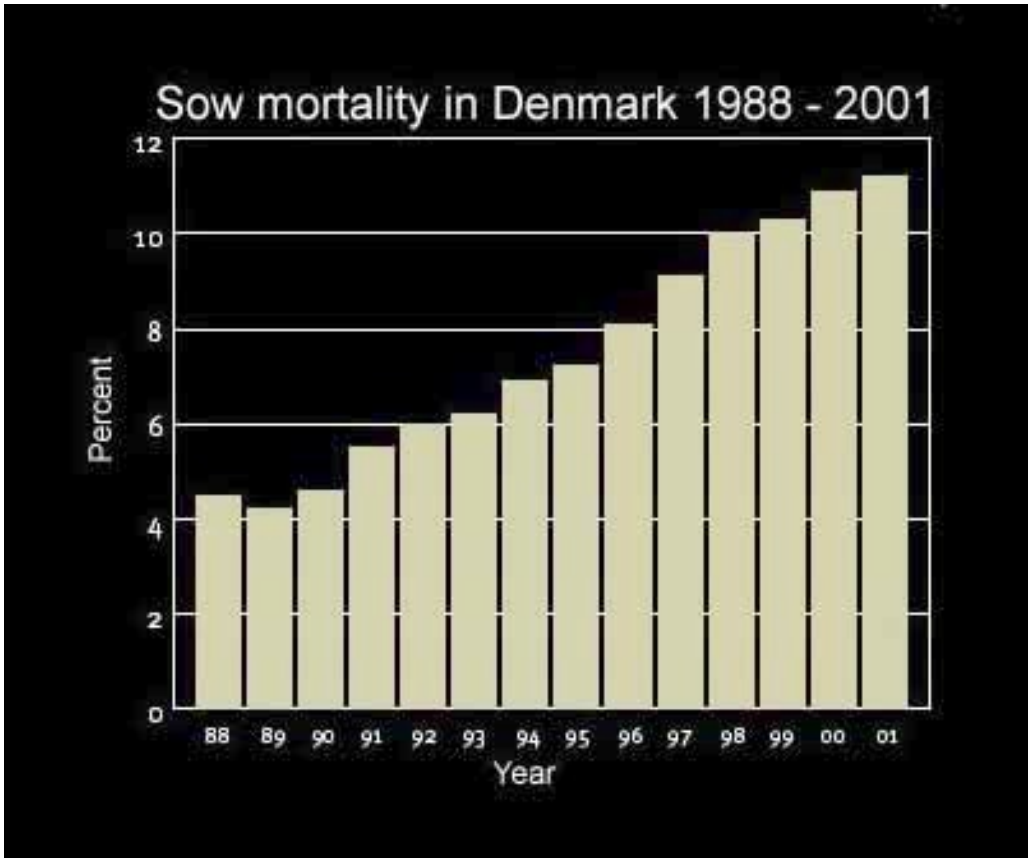
- Fixation
- No place to move
- No admittance to the free

- The sows develops stereotypical behaviour (such as bar biting), panic and stress, discomfort, bone weakness
- 3% of all slaughtered pigs received adverse comments by the public veterinary inspection in the slaughterhouses. Tail bites, lung scars, bed-sores.

# Sow mortality

***Half the slaughtered sows had severe malformations in the stomach.***

***Ulcers were found in one third of the sows.***



# Impact on the environment and landscape

- Tremendous amounts of manure is spread on fields as fertiliser
- Lakes, springs, fjords and even groundwater reservoirs is contaminated with nutrients
- Algae blooms destroy aquatic environments (eutrophication)

- Evaporation of ammonium from fields treated with manure raises the pH in the air and rain, and is a threat to certain plant species

# Transportation of animals

- No food or water
- Stress
- Unclear demands to Wans (ventilation, drinkingwater and space)
- No veterinary control at beginning or end
- Mixed with pigs from other farms  at the slaughterhouse

# Processing

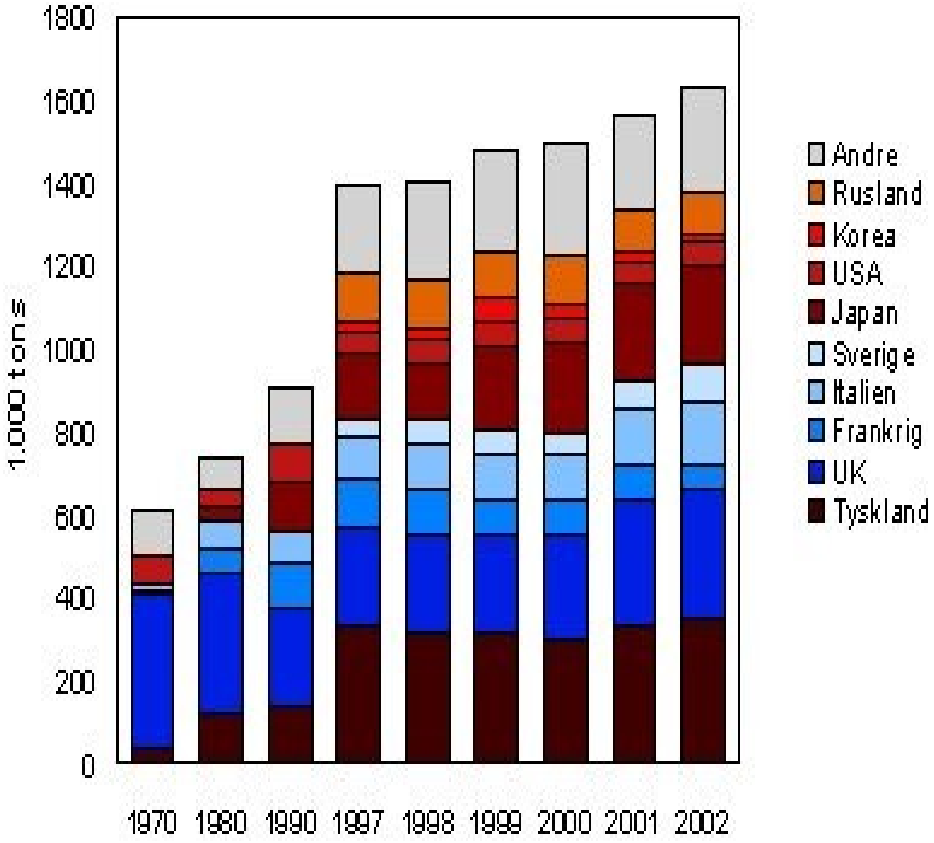
"Invisible" processing methods

- Machine cutting
- Injection of proteins in order to absorb water

Additives

Fat content

# Where is it sold ?




- 86 pct is exported
- 60 pct. of total export is sold in EU

# How is it sold: The Happy Pig

- *The Happy Pig"* has 0.85 m2 of space. An ordinary pig has 0.65 m2.
- It is already prohibited to use *antibiotics* preventive
- According to the standards there is no guarantee that the pig live free range. In the standards it is mentioned that the this is the overall goal.


*That is why "The Happy Pig" is happy:*

- *Admittance to* straw bedding
- *30 % more place*
- *No antibiotics in fodder*
- *No fixation*

# Working conditions in the food sector

## Farm

- Rise in numbers of working accidents at 60% from 1993-98
- Highest rate of deadly accidents: 10 pr 100.000 accidents

## Processing

- Big problems with noise, monotonous, repetitive work, heavy loads, etc.
- In Denmark The Food processing Industry contribute 4,1% of the early retirement (employ 3,5% of the workforce)
- Illness is 25 % above normal (removal to hospitals)

# Social Characteristics of Sustainable Agriculture

Foundations for renewal that build and sustain the capacity of people/communities

- Workers: not mechanized pieces of production but empowered learners
- Training youth for farming
- Urban rural linkages
  - Encourages community involvement → promotes local knowledge and empowerment
  - Develops social capital within communities

# Social Characteristics of Sustainable Agriculture

- Workers and farmers receive a fair wage for their product
    - Direct to consumer/retail sales
    - Fair trade
- Consumers are embedded in the farming process through product choice or actual farm-consumer relationships
- Youth see a future in farming
- Animal welfare

# What does this mean for rural development?

- People see value in farmland through community connections
- Provides developing nation farmers (rather than middlemen) with living income
- Agro-ecosytem includes the health and welfare of animals and people as important as natural environment

# Pie Ranch

- Farmers sell added value product, direct to consumer
- All ingredients are produced on farm

# Pie Ranch

- Farm workers receive skills training:
  - Apprenticeship programs

Community Education

  - Nutrition education
  - Cooking skills development

# Pie Ranch

- Community eduction
  - urban-rural connections
- School programs
  - youth awareness in farming and nutrition

# Economic Concerns in Modern/Industrial Agriculture

- Costs are not reflective of actual costs of production
  - Direct subsidies
  - Indirect subsidies
    - Cheap oil
    - Health costs of pesticides/fertilizers entering environment/food system not included in cost
    - Pollution cleanup/maintenance cost not included in costs
-

# Economic Concerns in Modern/Industrial Agriculture

Use of synthetic inputs:

- Increases cost to farmer
- Negative effects on environment and human health by entering the food chain (hidden costs)

Unstable costs of production:

- Fertilizer cost and availability depends on the petroleum cost and availability

# Economic Concerns in Modern/Industrial Agriculture

- Overproduction of commodities 'dumped' in developing nations
  - Driven by free trade agenda
  - Undercuts costs of local products
  - Threatens local farmers' livelihood

# Economic Concerns in Modern/Industrial Agriculture

- Ownership based outside of community removes money from local communities
  - profits go to absentee owners, money not available in community

# Economic Characteristics of Sustainable Agriculture

"economically viable"...

- Farmers are able to earn a living wage
- Independent of costs of external inputs
- Receive a fair percentage of final market price (retail price)
- Land is affordable for new farmers

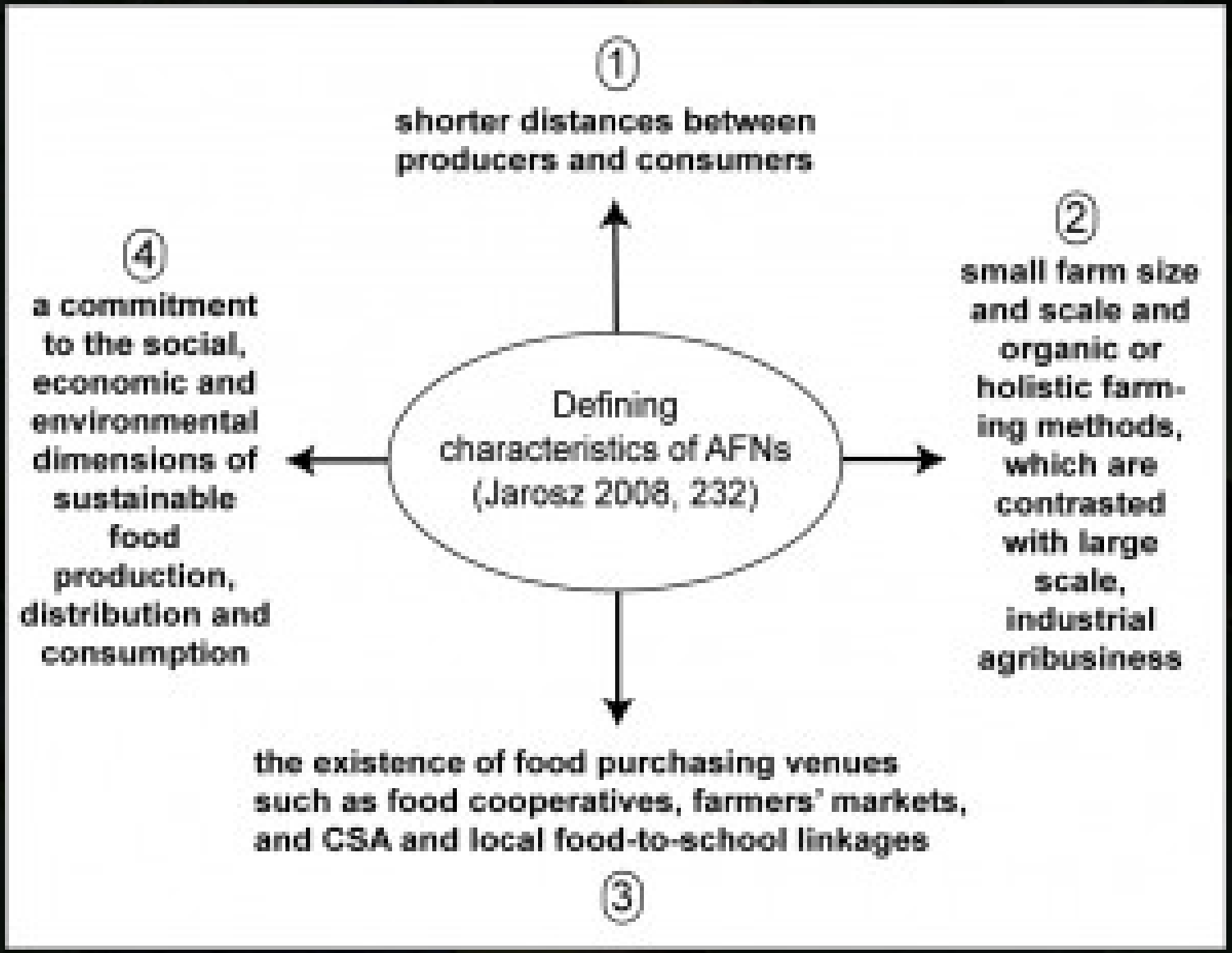
# Economic Characteristics of Sustainable Agriculture

Localized economies/alternative food systems (locavores)

- Farm to consumer, to retail, to institution sales eliminate middleman's take
- Money stays within the community → multipliers
- Promote regional economic growth
- Financial control remains in farmers hands

# Economic Characteristics of Sustainable Agriculture

- Communities see value in farming and farmland
  - Will support rather than fight presence of farms
  - Have sense of “ownership” for farm – sometimes actual ownership, sometimes symbolic
- Alternative Food System




Ed Harris, University of Edinburg. http://localfoods.wordpress.com/results/

# What does this mean for rural development?

- Investment in regional economies builds economic strength of rural areas
- Farming needs support industries:
  - Suppliers, processors, retailers →
  - Encourages regional businesses
- Creates 'quaint' rural communities attractive to tourists

# Pie Ranch

- Near state park – slated for development
- Approached community land trust to purchase property
- Now community is trying to put rest of land in trust for agricultural or preservation use
- Sales local to San Fransisco
- Supports family, rural community, and network of urban youth

# Institutional role in sustainable agriculture

- Policies
  - Shape production practices
    - post-WWII activities → food security
    - 1980's – present → food safety/quality
  - EU shifted from production subsidies to land in farming
  - Added cross-compliance with environmental measures

# Cross - compliance

- Generally, the EU is encouraging the adoption of more environmentally friendly practices by:
  - Offering financial assistance to farmers who agree to adapt their agricultural practices,;
  - Helping with the cost of nature conservation; and
  - Insisting that farmers must respect environmental laws and look after their land properly if they wish to qualify for direct income payments.

# Rural development support

- Encouraging development of rural activities, focusing on farming
  - Encouraging adoption of new techniques
  - Development of new farmers
  - Marketing and quality assistance
  - Diversification of rural activities
    - Encouraging processes, other small businesses

# Market-driven institutional support

- Policies that encourage purchasing patters supportive of regional economies
- Farm-to-school efforts
  - Purchases using state, local funds make preference for local, sustainably produced product
  - Has great potential to reinvigorate regional economies, encourage sustainable practices, etc

# Systems thinking

- At the farm level
  - Nutrient cycling, etc
- At the local level
  - Influence on natural environment
  - Affect on population (empowerment)
- At regional level
  - Distribution linkages
- At individual level
  - Broad affect of product purchase choices

Thank you!