International Farm Management Association Congress

Global Agriculture in transition

« Environmental Issues »

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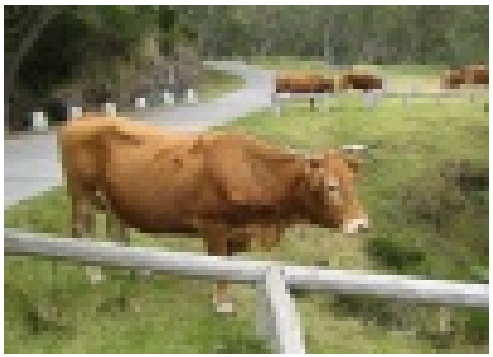


Global Environmental issues related to agriculture

- Climate Change
- Water Resources
- Biodiversity loss
- Natural Resource depletion

How does land use contribute?

What are the effects on land?

What can Policy makers and land Managers do to improve the situation?

Climate change

- Since the beginning of the industrial era, the CO2 content of the atmosphere has risen by 30%, causing global warming.
- This rise can be attributed to
  - use of fossil fuels 60%
  - land use change and cultivation 40%
- LUC emissions vs. fossil fuel emissions: a tale of 2 worlds:
  - 80% from LUC: Brazil, Indonesia, Malaysia…
  - 90% from energy: EU, US, Russia, China…

Water

- World Water withdrawals increased 8 fold during the 20th century with very substantial increases expected up to 2025.
- World Water consumption increased 6 fold during the 20th century with further very substantial increases by 2025.
- World irrigation area has increased from 100 M/ha to about 280 M/ha in the past 50 years
- Agriculture often accounts for 70-80% of water use
- Water pollution associated with agriculture is also a major issue

Bio diversity loss

- Species extinction now happening at up to 1000 times background levels
- Species homogenisation due to extinction and introduction of species to new ranges for trade and transportation reasons
- Worldwide 12% of bird species, 23% of mammals and 25% of conifers threatened with extinction
- In Europe, 43% of bird species, 45% of butterflies under threat
- Habitats under threat worldwide

Loss of biodiversity reduces capacity to deliver services such as carbon sequestration, natural hazard protection, air and local climate regulation, soil erosion control and water purification

Natural Resource Depletion

- Massive gains in human well being over the past 50 years have often been at the cost of resource depletion in terms not just of minerals but also biomass and biological resources. There resources are crucial to economy, quality of life and ecosystem functioning.
- Ecosystem changes have been at their most rapid for the past 50 years. Unless trends in resource depletion are reversed ecosystem benefits will be diminished. Without change resource use will quadruple within 20 years.

Some combined effects

- Soils ability to act as a carbon sink is under threat. Each 1°c increase in global temperature releases 2 ppm CO2 into the atmosphere
- Crop yield increases in parts of the world are stagnating or slowing down and world food stocks are rather low
- About 2 billion hectares of degraded land globally
- Over 2 billion people living in degraded areas or river basins under stress. By 2025 up to 50% of world population could live in water stressed river basins.

Emerging Messages

- Resources are not infinite and there is abundant evidence they are under pressure
- The pressures on land management are mounting
- Business as usual is not an option if we wish to feed the world and provide other services
- Policy makers and land managers have to improve resource management

Practical Steps – Common to all

Remember: Agricultural Land covers just 16% of the EARTH'S SURFACE

1. Improve soil management especially organic matter

- good for the farm
  - greater nutrient and water protection
- good for the environment
  - benefits for sequestration, biodiversity and erosion reduction

2. Improve nutrient management

- good for the farm
  - reduced inorganic fertiliser costs
- good for the environment
  - reduced GHG emissions, water pollution and habitat destruction

3. Improve water management

- good for the farm
  - more effective use of resources, lower water bills
- good for the environment
  - greater protection for biodiversity, less risk of soil salt build up

Biofuels in Agriculture/Forestry a very hot debate

Global aspects to be ensured

- Real contribution to fuel security
- Real contribution to GHG Reductions
- No undesirable side effects

Environmental aspects to be inbuilt

- Land us change not releasing GHGs
- No increase in water use in river basins under pressure
- Protection of biodiversity habitats
- Don't rob Peter to pay Paul on soil OM management

Overall – limited role + much dependence on 2nd generation

Environmental problems raised by changing farming, situation and practice in the EU

Water:	Nitrates, phosphates, pesticides, depletion due to irrigation. Sedimentation.
Air:	Ammonia, Greenhouse gases (methane and nitrous oxide), Pesticides.
Soil:	Erosion, declining organic matter, contamination. Compaction.
Biodiversity:	Habitat disturbance and destruction, decline in farmland birds.
Landscape:	Threatened by intensification and land abandonment. Removal/change of features contributing to protection of water, soil, biodiversity.
NB:	Many positive aspects as well as food production; e.g. CO2 sequestration, soil protection, protection of landscape, etc.

Environment and Agricultural issues in the EU

- Specialisation and concentration of production are realities of European agriculture.

  - high concentrations of animals in Netherlands, Belgium, Brittany, Po Valley, SW England, Denmark, etc.

- Infrastructure has been built around and influences these developments on and off the farm.

- Trend very hard to change but has led to environmental problems linked to intensification.

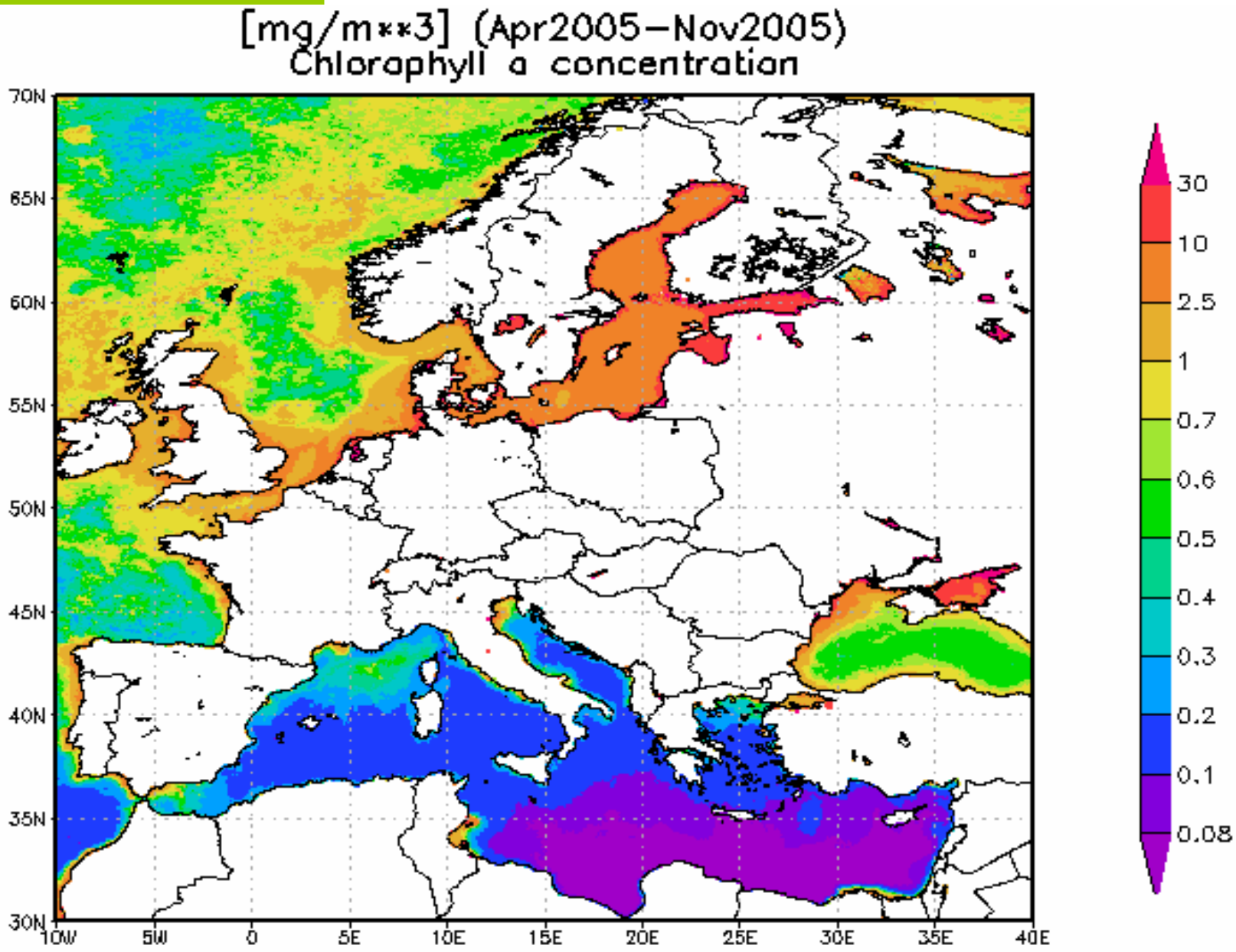
- Marginalisation also occurring and leading to different environmental problems such as decreased Biodiversity in hill regions, increased erosion in terraced valleys.

Policy aspects

- Environmental policy and practice traditionally has played catch up on agricultural development.
- Until 1990s, agricultural policy paid little heed to the environment.
- Integration of environmental concerns into all policy sectors is a TREATY OBLIGATION in the EU since 1997.
- Environment no longer a tolerated nuisance but a participant by right in CAP debate.
- Successive reforms since 1992 have gradually strengthened more sustainable agricultural policy.

Main environmental legislation relevant to the CAP Common Agricultural policy

- Water,
  - Nitrate directive (1991)
  - Water framework directive (2000)
- Gradual improvement now in manure and chemical nitrogen management across EU with much more attention to storage and use designed to meet crop requirements.
- From 2009/10 river basins management planning to apply aimed at achieving good chemical and biological status by 2015: **major implications for agriculture**.


[mg/m**3] (Apr2005-Nov2005)
Chlorophyll a concentration
70N
65N
60N
55N
50N
45N
40N
35N
30N
10W
5W
0
5E
10E
15E
20E
25E
30E
35E
40E
30
10
2.5
1
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.08
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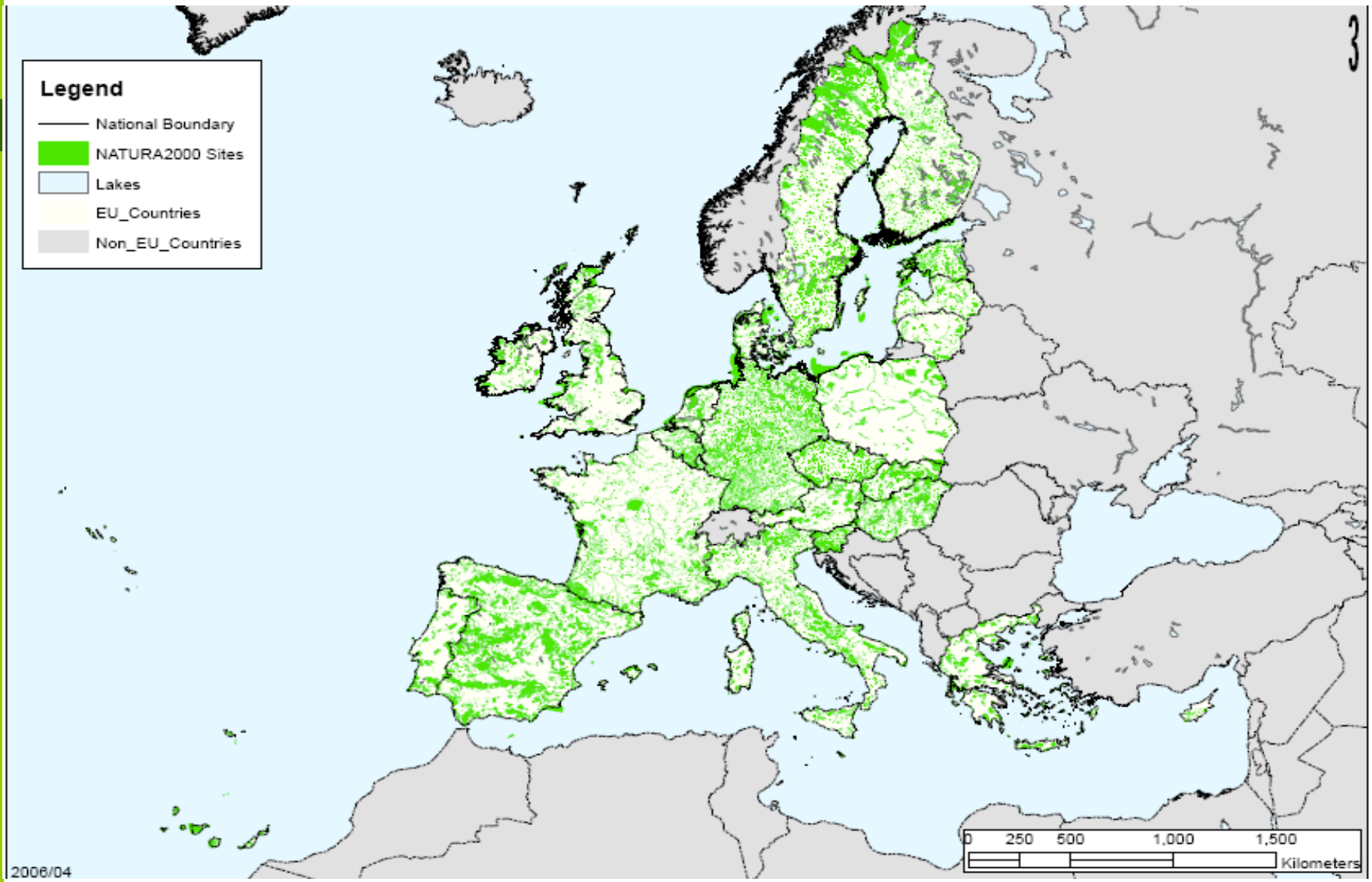
Main environmental policy relevant to the CAP(2)

Biodiversity protection directives

- Conservation of wild birds (1979)
- Conservation of natural habitats (1992)

- Leading to increase nature protection generally and specifically to the establishment of a network of protected sites throughout Europe – NATURA2000
- NATURA sites account for +/- 18% OF EU territory evenly spread across farm, forest and other land and coastal areas.
- NATURA site management is strongly supported through the Rural Development pillar of the CAP.

Map of Natura 2000 network in EU25



Main environmental policy relevant to the CAP(3)

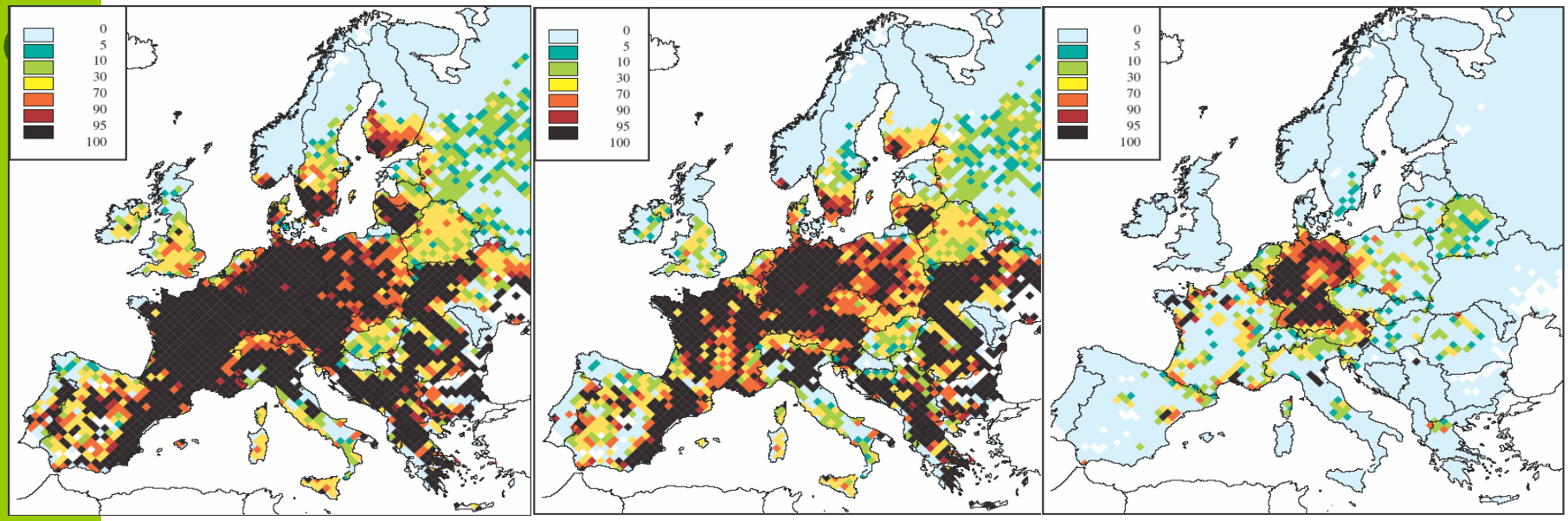
AIR

- Emissions ceilings legislation currently being toughened to reduce notably ammonia emissions significantly by 2020
- Strict standards for large pig and poultry units

SOIL

- Draft legislation currently in the European Parliament and Council
- Plant protection legislation relevant to water, air and soil in place since 1991 and being strengthened

Excess of critical loads for eutrophication



2000 2020 2020

Current legislation Max. feas. reductions

Percentage of ecosystems area with nitrogen deposition above critical loads using grid-average deposition. Calculation for 1997 meteorology.

Building environmental concerns into agricultural policy shape in the EU

Concepts:

- farmers, like all other citizens are required to obey legislation.
- the polluter pays principle applies.
- farmers should be paid for environmental services to society.

Translated into practice:

- cross compliance meaning that farmers must respect specific legislation and requirements related to maintaining land properly as a condition for the receipt of direct support. Cross compliance is not the reason for support but a condition to be fulfilled.
- on a contract basis agri-environment payments are made to farmers delivering services going beyond cross-compliance, some fertiliser and pesticide use requirements and other relevant legislation.

Cross-compliance issues

Important role in increasing the public acceptability of agricultural support in EU from the viewpoint of:

- **Environment**
- **Public and animal health**
- **Public and plant health**
- **Animal welfare**

Role in improving on the ground implementation of relevant legislation, good agricultural and environmental condition of land including soil and permanent pasture protection.

Teething problems still exist (system as yet only 2.5 years old) and being addressed.

Considerable potential in contributing to sustainable agriculture in EU.

Agri-environment

Major role in delivery of environmental services:

- **Voluntary for the farmer.**
- **Payment based on income foregone, costs incurred and transaction costs.**
- **Uptake varies between Regions and Member States. Uptake lowest in most intensive areas.**
- **Approaches at Member State level may be general, specific or combine both.**
- **Strong contribution to protection of birds, habitats and water.**
- **Essential that all measures go beyond good practice. Hence the relationship to cross compliance, fertiliser and pesticide practice, and other legislation.**
- **About 25% of EU agricultural land and farmers now participating; similar approach now being developed for forestry**
- **Agri-environment has proven very useful in helping farmers convert to organic farming.**
- **Agri-environment has high educational value for farmers and society.**
- **It fits into the Rural Development pillar of the CAP which increasingly involves a holistic approach to Rural issues.**

Some conclusions

- Demands on agricultural land are greater today than ever before.
- The economic hierarchy of demands often puts environment last. This is not without consequences!
- Resource use is a global issue; so decoupling from growth is essential.
- Concepts of reduce, recover, recycle and use make sense for agriculture and environment.
- Farming's role in environmental degradation, maintenance and enhancement is increasingly recognised.
- Farmers have shown willingness to deliver environmental services. This needs greater recognition.
- A wider role for measures to protect environment related to climate change (mitigation and adaptation), water and biodiversity is necessary worldwide.
- The EU model provides an interesting approach to environmental protection and enhancement.
- In nature, everything is connected and there are no free lunches.