Environmental Integration of Agriculture

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Content

• Definition of environmental integration
• Why do we need environmental integration in agriculture?
• Environmental integration techniques, tendencies
What is Environmental Integration?

The environmental integration of a human activity means to produce products and services while environmental concerns are placed at the same level than economic and social aspects.
What is Environmental Integration?

Environmental integration of human activities calls for a proactive management of environmental effects.
Why do we need environmental integration in agriculture?

There is two main reasons why we need environmental integration in agriculture:

• Environmental effects of agricultural productions
• Social demands of consumers
There is three main direct relationships:

- Agriculture covers a significant proportion of the world land
- Agriculture consumes natural resources
- Agriculture produces waste, emissions and spills
Agricultural land use transformations

Agricultural land covers around 1/3 of the terrestrial surface and it seems to be stabilised.

However, different trends can be found in developed and developing countries.
Changes in agricultural land cover

**Evolution of agricultural land: Most developed countries**
as % of total

- European Union
- North America
- Japan

**Evolution of agricultural land: Intense growth countries**
as % of total

- China
- Brazil

Source: FAO agri-environmental indicators (AEI)
http://faostat.fao.org/site/674/default.aspx
Changes in agricultural land cover

Evolution of agricultural land: Some regional contexts
as % of total

Source: FAO agri-environmental indicators (AEI)
http://faostat.fao.org/site/674/default.aspx
Changes in agricultural land cover

**Intense growth countries**

- Natural and seminatural land
  - Agricultural land
  - Urbanised land
  - Intensive Agricultural land

**Most developed countries**

- Natural and seminatural land
  - Agricultural land
  - Urbanised land
  - Intensive Agricultural land
  - Almost finished
  - Abandon and Set-aside
  - Natural and seminatural land

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**Farm and fortune**

Hong Kong's agricultural sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of farmers and workers</th>
<th>Cultivated area (hectares)</th>
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<tbody>
<tr>
<td>1995</td>
<td>8,900</td>
<td>2,070</td>
</tr>
<tr>
<td>2000</td>
<td>5,600</td>
<td>1,430</td>
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<tr>
<td>2005</td>
<td>5,300</td>
<td>833</td>
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<tr>
<td>2010</td>
<td>4,700</td>
<td>746</td>
</tr>
<tr>
<td>2011</td>
<td>4,600</td>
<td>734</td>
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<tr>
<td>2012</td>
<td>4,500</td>
<td>732</td>
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<tr>
<td>2013</td>
<td>4,400</td>
<td>729</td>
</tr>
</tbody>
</table>

Source: Food and Health Bureau SCMP
Changes in agricultural land cover

Source: Spatial Data Infrastructure of Madrid Region
Qualitative changes

Intensification

Landscape simplification

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Changes in agricultural land cover

*Campo de Dalias (Almería)*
Changes in agricultural land cover

Aral Sea (Kazakhstan - Uzbekistan)

1989

2014
Changes in agricultural land cover

Torremocha de Jarama (Madrid)

Source: Spatial Data Infrastructure of Madrid Region

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Changes in agricultural land cover

Loss of cultural diversity and traditional infrastructures
Environmental integration of agriculture through land management

Development of urban agriculture
Vertical agriculture
Protection of high nature value farming (HNV) and cultural landscapes

Source: http://parcs.diba.cat/es/web/baixllobregat/inici
Land management

Protection of agricultural areas around cities

Source: http://parcs.diba.cat/es/web/baixllobregat/inici
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Source: http://parcs.diba.cat/es/web/baixllobregat/inici
Water consumption is increasing

Environmental effects of agricultural productions

Natural resources consumption

Irrigated land: World

Water consumption is increasing
Environmental effects of agricultural productions

Natural resources consumption

Soil. Soil management is producing loss organic content of soils and soil erosion

Half of the topsoil on the planet has been lost in the last 150 years
Environmental effects of agricultural productions

Man-made resources consumption

Fertilisers
Pesticides

Figure 2. Global nutrients (N+P₂O₅+K₂O) consumption
Strategies for input use reduction

Integrated Agriculture

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Organic farming

Evolution of organic farming as % of total

Strategies for input use reduction

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Greenhouse gases emissions

Agriculture, forestry and land use change cause \( \frac{1}{4} \) of anthropogenic emissions of GHG.

About 60% of it is caused by agriculture and poultry.
Integration strategies related with GHG

Supply side
- Improve carbon sequestration by soils
- Extensification
- Bioenergy production based on manures

Demand side
- Changes in diets
THANKS!!

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