Agriculture and Agricultural Landscapes in the 21st Century

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Agriculture and Agricultural landscapes in the 21st Century: a perspective from the International Assessment of Agricultural Knowledge, Science and Technology for Development (www.IAASTD.org)

Hans R. Herren, Co-Chair IAASTD, President Millennium Institute

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Goal of the Assessment

How can we reduce hunger and poverty, improve livelihoods, and facilitate equitable, environmentally, socially and economically sustainable development through the generation, access to and use of agricultural knowledge, science and technology?
Three Kinds of Places

1. Need more calories
2. Enough calories, want more protein
3. Excess calories
Agriculture’s Complexity

The inescapable interconnectedness of agriculture’s different roles and functions

- Health
- Social
- Culture
- Gender
- Tradition

- Food production
  - Valuation of environmental services
  - Recognition and diversified land use
  - Cultivation and commercialization of traditional foods

- Environmental
  - Soils
  - Water
  - Climate
  - Biodiversity

- Economic
  - Income
  - Marketing
  - Trade
Agricultural Productivity

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Land per Person</th>
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<tbody>
<tr>
<td>1798 Malthus</td>
<td>~1 billion people</td>
<td>20,000 m²/person</td>
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<tr>
<td>2009</td>
<td>~6 billion people</td>
<td>2,000 m²/person</td>
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<tr>
<td>2050</td>
<td>~9 billion people</td>
<td>1,333 m²/person</td>
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The main peculiarity which distinguishes man from other animals, is the means of his support, is the power which he possesses of very greatly increasing these means.

Thomas Malthus
Number of Cows

![Graph showing the number of dairy cows over time, with a decrease from 1920 to 1960 and a subsequent increase from 1980 onwards. The graph has two lines representing actual data and 1950 technology.](image-url)
Milk Production

![Graph showing milk production per cow from 1920 to 2000. The x-axis represents the year, from 1920 to 2000, and the y-axis represents milk per cow in pounds, ranging from 0 to 22,500 pounds. The graph shows a steady increase in milk production over time.]
Corn Production
Knowledge

Most major advances have been made at the expense of established “facts”. Invention of the wheel was inhibited for who knows how long by the then accepted theory that putting one foot ahead of the other is the way to move forward.

Daniel J. Boorstin
Abraham Lincoln

- U.S. Department of Agriculture
- Homestead Act
- Morrill Act
Conditions for Success

The private sector must be the engine of economic growth; inflation must be low to maintain price stability; state bureaucracies must be small; government budgets must be close to balanced; tariffs on imported goods must be lowered or eliminated; restrictions on foreign investment must be removed; industries, and stock and bond markets must be open to foreign ownership and investment; quotas and domestic monopolies must be gotten rid of; exports must increase; state-owned industries and utilities must be privatized; capital markets must be deregulated and currencies made convertible; the economy must be deregulated to promote domestic competition; government corruption, subsidies and kickbacks must be eliminated; banking and telecommunications systems must be opened to private ownership and competition; and citizens must be allowed to choose from among competing foreign and domestic pension options and mutual funds.

Thomas L. Friedman
Food Trends

Index 100 in 1961

- Undernourished in developing countries
- Total food production
- Food production per capita
- Food price

Sources: FAOSTATS, SOFI, Millennium Ecosystem Assessment
An Optimistic View

This is my long-run forecast in brief. The material conditions of life will continue to get better for most people, in most countries, most of the time, indefinitely. Within a century or two, all nations and most of humanity will be at or above today's Western living standards.

Julius Simon