TEEBAgriFood

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The Economics of Ecosystems and Biodiversity in Business and Enterprise

Edited by Joshua Bishop
Why select the Agriculture sector?

### 7.1.2 THE GLOBAL 20 REGION-SECTORS

Ranking of the 20 region-sectors with the greatest total impact across the 6 EKPIs when measured in monetary terms.

<table>
<thead>
<tr>
<th>RANK</th>
<th>SECTOR</th>
<th>REGION</th>
<th>NATURAL CAPITAL COST, US$ BN</th>
<th>REVENUE, US$ BN</th>
<th>IMPACT RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>COAL POWER GENERATION</td>
<td>EASTERN ASIA</td>
<td>452.8</td>
<td>443.1</td>
<td>1.0</td>
</tr>
<tr>
<td>2</td>
<td>CATTLE RANCHING AND FARMING</td>
<td>SOUTH AMERICA</td>
<td>353.8</td>
<td>16.6</td>
<td>18.8</td>
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<tr>
<td>3</td>
<td>COAL POWER GENERATION</td>
<td>NORTHERN AMERICA</td>
<td>316.8</td>
<td>246.7</td>
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<tr>
<td>4</td>
<td>WHEAT FARMING</td>
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<td>31.8</td>
<td>8.4</td>
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<tr>
<td>5</td>
<td>RICE FARMING</td>
<td>SOUTHERN ASIA</td>
<td>235.6</td>
<td>65.8</td>
<td>3.6</td>
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<tr>
<td>6</td>
<td>IRON AND STEEL MILLS</td>
<td>EASTERN ASIA</td>
<td>225.6</td>
<td>604.7</td>
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<tr>
<td>7</td>
<td>CATTLE RANCHING AND FARMING</td>
<td>SOUTHERN ASIA</td>
<td>163.0</td>
<td>174.0</td>
<td>0.8</td>
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<tr>
<td>8</td>
<td>CEMENT MANUFACTURING</td>
<td>EASTERN ASIA</td>
<td>147.0</td>
<td>5.8</td>
<td>23.0</td>
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<td>9</td>
<td>WATER SUPPLY</td>
<td>SOUTHERN ASIA</td>
<td>111.7</td>
<td>14.1</td>
<td>7.9</td>
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<tr>
<td>10</td>
<td>WHEAT FARMING</td>
<td>NORTHERN AFRICA</td>
<td>100.1</td>
<td>7.4</td>
<td>13.6</td>
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<td>11</td>
<td>RICE FARMING</td>
<td>EASTERN ASIA</td>
<td>99.3</td>
<td>91.2</td>
<td>1.1</td>
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<tr>
<td>12</td>
<td>WATER SUPPLY</td>
<td>WESTERN ASIA</td>
<td>86.7</td>
<td>18.4</td>
<td>4.7</td>
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<tr>
<td>13</td>
<td>FISHING</td>
<td>GLOBAL</td>
<td>86.1</td>
<td>136.0</td>
<td>0.6</td>
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<td>14</td>
<td>RICE FARMING</td>
<td>NORTHERN AFRICA</td>
<td>84.2</td>
<td>1.2</td>
<td>69.6</td>
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<tr>
<td>15</td>
<td>CORN FARMING</td>
<td>NORTHERN AFRICA</td>
<td>80.4</td>
<td>1.7</td>
<td>47.8</td>
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<td>RICE FARMING</td>
<td>SOUTH-EASTERN ASIA</td>
<td>79.7</td>
<td>41.0</td>
<td>1.9</td>
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<tr>
<td>17</td>
<td>WATER SUPPLY</td>
<td>NORTHERN AFRICA</td>
<td>76.4</td>
<td>3.4</td>
<td>22.2</td>
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<td>18</td>
<td>SUGARCANE</td>
<td>SOUTHERN ASIA</td>
<td>75.6</td>
<td>6.0</td>
<td>12.5</td>
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<tr>
<td>19</td>
<td>PETROLEUM AND NATURAL GAS EXTRACTION (excludes water and land use)</td>
<td>EASTERN EUROPE</td>
<td>72.6</td>
<td>371.6</td>
<td>0.2</td>
</tr>
<tr>
<td>20</td>
<td>NATURAL GAS POWER GENERATION</td>
<td>NORTHERN AMERICA</td>
<td>69.4</td>
<td>122.7</td>
<td>1.0</td>
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</tbody>
</table>
The TEEBAgriFood study is designed to:

1. provide a comprehensive economic evaluation of the ‘eco-agri-food systems’ complex
2. demonstrate that the economic environment in which farmers operate is distorted by significant externalities, both negative and positive, and a lack of awareness of dependency on natural and social capital
The visible and invisible flows of agricultural production
The visible and invisible flows of agricultural production

HUMAN SYSTEMS

AGRICULTURE & FOOD SYSTEMS

SEEDS  CROPS  YIELD

Biodiversity & Ecosystems

Inputs  Outputs  Invisible positive flows  Invisible negative flows
The visible and invisible flows of agricultural production

**Human Systems**
- Irrigation
- Fertilizer
- Pesticides
- Bio-Technology
- Labor
- Breeding
- Machinery
- Employment
- Food and nutrition
- Fuels
- Fibers
- (Agro)tourism

**Agriculture & Food Systems**
- Seeds
- Crops
- Yield

**Biodiversity & Ecosystems**
- Inputs
- Outputs
- Invisible positive flows
- Invisible negative flows
The visible and invisible flows of agricultural production
The visible and invisible flows of agricultural production
Trucost valuation approach to Eutrophication I

Eutrophication
Valuation Methodology

March 2015
1. OVERVIEW

GENERAL PROCESS

FIGURE 1: GENERAL OVERVIEW OF TRUCOST VALUATION PROCESS

- Eutrophication
  - Change in pollutant concentration in local water body
    - Ecological impact
      - Loss of water clarity
        - Measured by change in Secchi depth (m)
      - Loss of biodiversity
        - Reduced recreation in water bodies
          - Property prices drop ($)
    - Human health impact
      - Treating Drinking Water (Avoiding Human Health Impact)
      - Treatment Costs Associated with Increases in Pollutant
        - Untreated drinking water
          - Establish relationship between pollutant concentration and DALYs (EXIOPOL, 2008)
          - Attain value of DALY (NEEDs, 2006)
            - Adjust DALY value for income level and calculate median

Total Impact of eutrophication (2013 $/kg^-1)
Interim Report Launch
Rice Study

- Worldwide, about 80 million hectares of **irrigated lowland rice** provide 75% of the world’s rice production

- This predominant type of rice system receives about **40% of the world’s total irrigation water** and **30% of the world’s developed freshwater resources**
The System of Rice Intensification (SRI) includes intermittent flooding as part of the production package.

SRI advises transplanting of young (eight to ten days old) single rice seedlings, with care and spacing, and applying intermittent irrigation and drainage to maintain soil aeration.

In addition, the use of a mechanical rotary hoe or weeder to aerate the soil and control weeds is encouraged.
Increasing rice yields, Reducing water consumption

<table>
<thead>
<tr>
<th>Country</th>
<th>Water costs (801)</th>
<th>Rice yields (2302/2422)</th>
<th>Rice yields (1124)</th>
<th>Rice yields (1099/1422)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senegal (Water)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senegal (Rice)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Philippines (Rice)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia (Rice)</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Legend:**
- Conventional
- SRI
Three different levels of action:

1. **Recognizing value** – identifying the wide range of benefits in ecosystems, landscapes and biodiversity, such as provisioning, regulating, habitat/supporting and cultural services.

2. **Demonstrating value** – using economic tools and methods to make nature’s services economically visible in order to support decision-makers wishing to assess the full costs and benefits of land-use change.

3. **Capturing value** – incorporating ecosystem and biodiversity benefits into decision-making through incentives and price signals.
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UNEP

EU

GLOBAL ALLIANCE FOR THE FUTURE OF FOOD

Norad

QR Code