SGCEP SCIE 1121
Environmental Science
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Section 20531

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Food production and problems

- Humans have done well at providing food for themselves. For example . . .
  - World food production has more than doubled in the past 30 years; . . .
  - Rising faster even than the population.
- The daily amount of food in developing countries has also increased, by at least 25%.
- World food trade is a major economic production in many countries. And . . .
- More people are overweight than are hungry!
- But will it be possible to feed 10 billion, if that's where the world human population plateaus?
U.S. crop yields reflect the trend.

More and more food from about the same amount of land.

Remember those revolutions we talked about earlier - the ‘green’ revolution started out this climb.
But it’s not all good: the yield gap for grains.

Again, it’s the poorest developing nations that have the biggest problems.
And this has serious consequences: underweight children

Proportion of children under age five who are underweight, 1990 and 2006 (Percentage)

<table>
<thead>
<tr>
<th>Region</th>
<th>1990</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Asia</td>
<td>54</td>
<td>46</td>
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<tr>
<td>Sub-Saharan Africa</td>
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<td></td>
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<tr>
<td>South-Eastern Asia</td>
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<td>37</td>
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<tr>
<td>Western Asia</td>
<td>14</td>
<td>13</td>
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<tr>
<td>Latin America &amp; the Caribbean</td>
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<td>13</td>
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<tr>
<td>Eastern Asia</td>
<td>8</td>
<td>17</td>
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<tr>
<td>Northern Africa</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>All Developing Regions</td>
<td>33</td>
<td>26</td>
</tr>
</tbody>
</table>
The developed world tries to help: global food aid

- World food program
- All food aid
Another way to help is with new DNA technologies. For example . . .

- Half of the world’s people eat rice. It is . . .
  - High in energy; but low in vitamins and other nutrients. These people are particularly prone to . . .
- Vitamin A deficiency: causes blindness, and immune system failure, especially in children. It . . .
  - Affects 195 million children worldwide. And . . .
- Iron deficiency: anemia and immune system failure;
  - Causes 100,000 maternal deaths/year.
- Frankenfoods could help! But it’s controversial.
- Golden rice is a genetically modified (GM) rice with . . .
  - Added genes that allow rice to synthesize beta carotene (used to synthesize vitamin A) and iron.
From Green Revolution to Gene Revolution

- Genetic engineering incorporates desired traits into plants and animals (versus selective breeding).
- This produces transgenic (genetically modified [GM]) organisms.
- Genetic research of the Green Revolution used genes that already existed or mutated in a species.
- Genes can now be exchanged among plants, animals, and bacteria.
- This technology can help produce more food; . . .
  - And it can reduce our reliance on pesticides; . . .
  - But there are concerns about its development and use.
Global area of genetically modified crops

It is being used — a lot!
Fear versus acceptance

- Concerns and fears have generated controversy over genetically modified food. These...
- Protests are strongest in Europe.
  - Concerns are made worse by other scares (e.g., mad cow) that are totally unrelated.
  - But some concerns are real, especially environmental ‘escapes’ and resistance evolution.
- Governments may even use the controversy to prevent importing cheaper food.
- The U.S. is far less concerned:
  - 60% of food contains genetically modified substances.
  - U.S. policy does not require mandatory labeling.
Aside from that, what about hunger?

• Using food aid to alleviate chronic hunger is not good:
  • Free or very cheap foreign food hurts local farmers.
  • They stop producing food, hurting their suppliers.
  • The entire local economy deteriorates.
• Donating food aggravates the conditions it tries to alleviate. However, . . .
• Developed nations should have a moral obligation to respond to hunger. But food aid is not enough . . .
• Alleviating hunger is a matter of addressing poverty!
• Developing nations need enlightened, uncorrupt leaders.
• We do not need new science or technology to end hunger.
  • Political and social action at all levels is needed.
  • Economic arrangements between rich and poor nations need to be restructured.
• Development aid must foster food self-sufficiency and sustainable interactions with the environment.
So let's learn more about hunger!

* We'll watch this BBC production for the next 50 minutes — The Future of Food: A Looming Crisis.
  

* And check out these resources as well:
  
* http://www.wfp.org/ also from the U.N.
  
* And...

Sunday, February 26, 2012