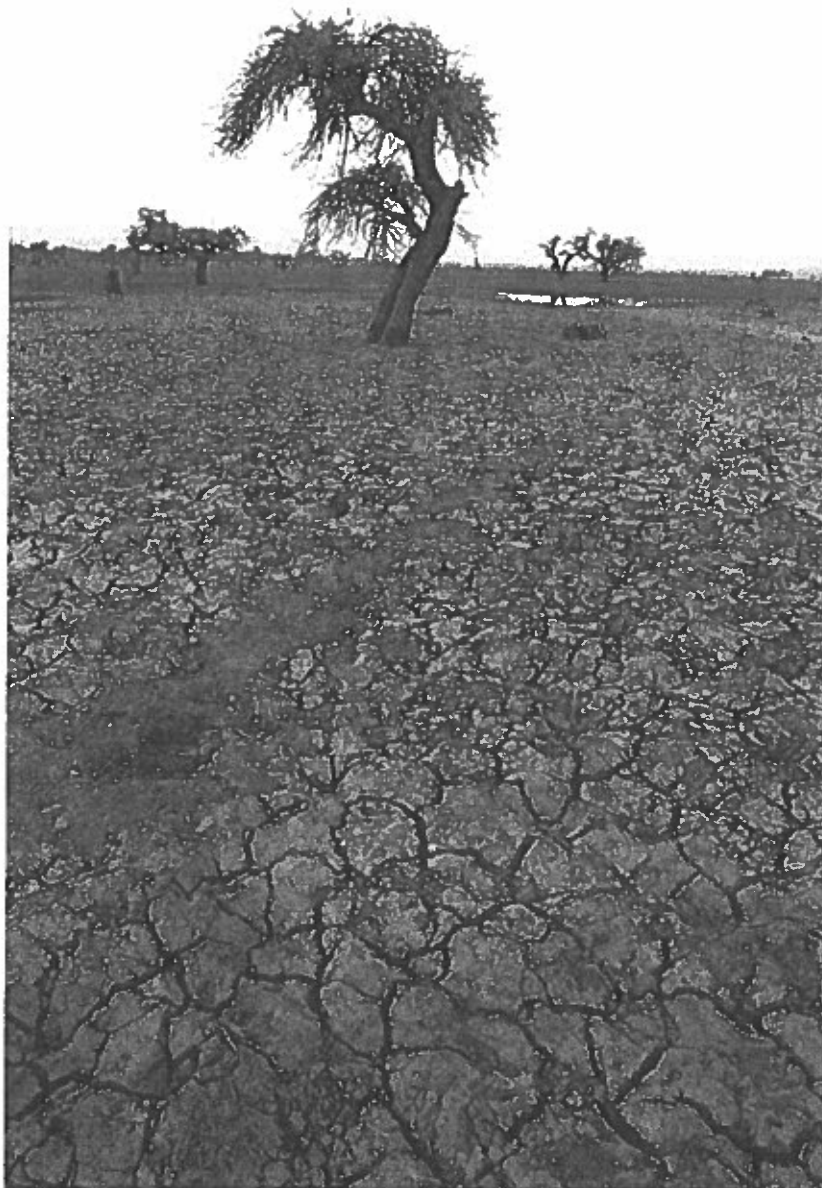
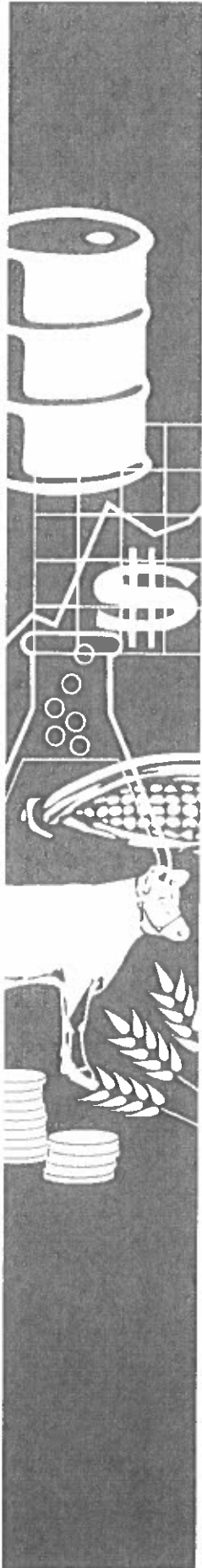


Close-up on Six Food Insecurity Factors:

Oil, Ethanol, Climate Change, Meat Production, Grain Stocks, and Money Markets

The following fact sheets are for use as handouts for class discussions or small group work, or as a starting point for more detailed research.



Fact Sheet #1: Oil

Facts About Oil

- Oil is a non-renewable resource and the basis of modern industrial economies
- Scientists estimate that within the next few decades the demand for oil will exceed production and reserves will run out
- Countries with the largest oil reserves are: Saudi Arabia, Canada, Iran, Iraq, Kuwait, United Arab Emirates, Venezuela, Russia, Libya, and Nigeria
- Wars over oil have been fought in Kuwait, Iraq, Nigeria, and Sudan; as oil reserves are depleted, wars over this resource could increase
- Increased worldwide consumption of oil and gas results in emissions of greenhouse gases, which cause climate change

Links Between Oil and Food Insecurity

- Oil prices have risen six-fold since 2002; they are predicted to double again by 2012, sending gas prices to \$2.25 CAD a litre¹¹
- Improving economies in China and India have increased their demand for oil to support manufacturing and production; improved living standards in these countries have created more demand for personal vehicles and fuel
- Production of crop fertilizers requires large amounts of oil and natural gas; the rise in the price of oil has resulted in the cost of fertilizer doubling between fall 2007 and spring 2008¹²
- Oil provides most of the energy to run farm machinery, so the rising cost of oil is increasing production costs for farmers
- In our current global food system, food is mass produced in a few countries and exported to other countries around the world, requiring large amounts of oil for transportation; many people have adopted the 100-Mile Diet, which encourages buying and consuming food grown and produced within 100 miles of their homes as a way to reduce the use of oil in food transportation
- Diminishing oil supplies, combined with growing awareness of the environmental impact of burning oil, has led to interest in the use of biofuels, such as ethanol, as alternatives; however, biofuels are produced using food sources such as corn and sugar cane, so diverting food crops for fuel contributes to smaller food reserves worldwide

¹¹Paul Waldie, "Why grocery bills will soar", *Globe and Mail*, April 25, 2008.

¹²Ibid.

Fact Sheet #1: Oil

(cont'd)

For Discussion

1. List the ways rising oil prices contribute to global food insecurity.
2. What are the benefits and drawbacks of oil use?
3. Countries in the West developed their economies with an almost unlimited use of global oil reserves. Should countries with emerging economies, such as China and India, restrict their consumption of oil in the face of diminishing supplies and environmental concerns? Why or why not?
4. What are the implications of a future oil crisis (i.e. diminishing supplies and rising prices) for the global economy? For Canada? What impact would an oil crisis have on you and your family?
5. What could be done to avert a future oil crisis?



Fact Sheet #2: Ethanol

Facts About Ethanol

- Ethanol, or ethyl alcohol, is a volatile, flammable, and colourless liquid that burns with a blue flame
- It is found in alcoholic beverages and thermometers, but its single largest use is as fuel or a fuel additive
- Ethanol is commonly blended with gasoline and used as a source of automobile fuel nicknamed “gasohol” (90 per cent gasoline and 10 per cent ethanol)
- The ethanol industry in Brazil is based on sugar cane; the US and Canada’s ethanol industries are based on corn
- Ethanol is a cleaner burning fuel source than oil, so it reduces greenhouse gas emissions that contribute to climate change
- Ethanol is expensive to produce and requires intensive energy inputs; some scientists argue that the production of ethanol requires more energy than it ultimately yields

Links Between Ethanol and Food Insecurity

- Ethanol is the source of much controversy: some people want to increase its production as a more efficient fuel additive (to cut greenhouse gases) and others argue that using crops for fuel rather than food has decreased the global food supply and contributed to rising food prices
- In Canada, refiners are required to ensure five per cent ethanol content in their gasoline by 2010; the five per cent ethanol content regulation would reduce greenhouse gas emissions by 4.2 million tonnes annually, the equivalent of taking one million cars off the road¹³
- Ontario is reconsidering its plan to require 10 per cent ethanol content in gasoline by 2010¹⁴ due to concerns the corn-based fuel is boosting food prices¹⁵
- Some analysts have blamed biofuels for pushing up food prices as much as 30 to 60 per cent, while others argue biofuels have only increased food prices two to three per cent¹⁶
- Brazil’s ethanol industry is based on using alcohol from sugar cane, which is not a food staple and is a more efficient source of ethanol than corn
- Eco-agricultural specialists argue that other plant-based and non-food sources of ethanol production (such as switchgrass) are better alternatives
- One person could be fed for a year on the corn needed to fill an ethanol-fueled SUV¹⁷
- Farmers in some developed countries receive government subsidies to grow corn for ethanol; \$11 to \$12 billion US a year in subsidies and tariffs has diverted 100 million tonnes of cereals from human consumption¹⁸

¹³ Estimate by Natural Resources Canada, cited in Shawn McCarthy, “A lobby machine that runs on ethanol”, *Globe and Mail*, May 30, 2008.

¹⁴ “Canada’s hypocrisy on hunger”, *Globe and Mail*, June 2, 2008.

¹⁵ Robert Benzie, “McGuinty has second thoughts on ethanol plan”, *Toronto Star*, July 10, 2008.

¹⁶ Eric Reguly, “Biofuels come under fire at UN food summit”, *Globe and Mail*, June 4, 2008.

¹⁷ Oxfam report, cited in Eric Reguly, “Biofuels come under fire at UN food summit”, *Globe and Mail*, June 4, 2008.

¹⁸ Jacques Diouf, cited in Eric Reguly, “Biofuels come under fire at UN food summit”, *Globe and Mail*, June 4, 2008.

Fact Sheet #2: Ethanol

(cont'd)

For Discussion

1. List the ways increased use of ethanol contributes to global food insecurity.
2. What are the benefits and drawbacks of ethanol use?
3. Debate whether the benefits of producing and using ethanol outweigh the costs to the global food supply.
4. Suggest ways for moving forward in ethanol production. Is it possible to balance the needs for transportation fuel with environmental sustainability and global food security?





Fact Sheet #3: Climate Change

Facts About Climate Change

- Average temperatures have climbed 1.4 degrees Fahrenheit (0.8 degree Celsius) around the world since 1880, much of this in recent decades, according to NASA's Goddard Institute for Space Studies¹⁹
- The twentieth century's last two decades were the hottest in 400 years and possibly the warmest for several millennia, according to a number of climate studies; the United Nations' Intergovernmental Panel on Climate Change reports that 11 of the past 12 years are among the dozen warmest since 1850²⁰
- Average temperatures in Alaska, western Canada, and eastern Russia have risen at twice the global average, according to the Arctic Climate Impact Assessment report compiled between 2000 and 2004; Arctic ice is rapidly disappearing, and the region may have its first completely ice-free summer by 2040 or earlier²¹
- Nine planet Earths would be required to absorb all the world's carbon if every poor person had the same energy-rich lifestyle as an American or a Canadian²²
- On average, one person out of 19 in a developing country will be hit by a climate disaster, compared to one out of 1,500 in a developed country²³
- In Niger, a child born during a drought is 72 per cent more likely to be stunted than a child born during a normal season²⁴

Links Between Climate Change and Food Insecurity

- Several distinct weather incidents in recent years have resulted in reduced wheat and rice harvests; scientists have linked these weather patterns to the effects of climate change; examples:
 - An extended drought in Australia's Murray-Darling Basin in 2006–2007 reduced Australian wheat production by 58 per cent from the previous year²⁵
 - A 2006 heat wave in California's San Joaquin Valley killed large numbers of livestock
 - In 2008, rains in Kerala, India, destroyed large swaths of grain
 - In May 2008, cyclone Nargis in Myanmar (Burma) destroyed much of the country's rice crop

¹⁹ National Geographic News, *Global warming fast facts*.

http://news.nationalgeographic.com/news/2004/12/1206_041206_global_warming.html (June 14, 2007).

²⁰ Ibid.

²¹ Ibid.

²² United Nations Development Programme Fast Facts, *UNDP and Climate Change*,

www.undp.or.id/factsheets/2007/UNDP%20and%20Climate%20Change%20-%20Bali.pdf (December, 2007).

²³ Ibid.

²⁴ Ibid.

²⁵ USDA FAS, 2007.



Fact Sheet #3: Climate Change

(cont'd)

- It is estimated that by 2080, agricultural output in developing countries could decline by 20 per cent and yields could decrease by 15 per cent on average due to climate change leading to water scarcity²⁶
- Agricultural practices are a major contributor to greenhouse gas emissions (17 to 32 per cent of greenhouse gas emissions are a result of agriculture or land use changes)²⁷
- The production and use of synthetic fertilizers emit nitrous oxides, methane gas, and carbon dioxide into the atmosphere
- Intensification of farming practices has resulted in a huge increase in fertilizer use
- Other farm operations (e.g. tillage, seeding, application of agrochemicals, and harvesting) also emit carbon dioxide
- Livestock production generates nearly one-fifth of the world's greenhouse gases, more than transportation²⁸; 1 kilogram of beef produces the same amount of carbon dioxide emitted by the average European car every 250 kilometres²⁹

For Discussion

1. Explain how changing weather patterns contribute to global food insecurity.
2. How do agricultural practices contribute to climate change? What can be done to lessen their impact?
3. Why do we continue to use fertilizers on a large scale to increase crop yields, when using more sustainable farming practices will be better for the environment in the long-run?
4. Suggest ways that the needs for an increased global food supply and environmental sustainability might both be met. Will trade offs be necessary? If so, which side do you favour and why?

²⁶ Martin Khor, *Food Crisis, Climate Change and Sustainable Agriculture* (presented at the Food Security Summit in Rome, June 2008).

²⁷ Greenpeace, *Agriculture's climate change role demands urgent action*, www.greenpeace.org/canada/en/nccent/agriculture-and-climate-change (January, 2008).

²⁸ Mark Bittman, "The staggering cost of rising world meat production", *International Herald Tribune*, January 28, 2008.

²⁹ Ibid.

Fact Sheet #4: Meat Production

Facts About Meat Production

- Livestock can be raised in different ways, but the majority of meat production in North America is done through factory farming rather than smaller-scale animal husbandry practices
- The aim of factory farming is to produce as much meat as possible for the lowest financial cost; unfortunately, this often includes a high cost to the environment
- On a global scale, the wealthy eat the most meat, often at the expense of poorer people who depend on staple food grains that are diverted to feed livestock
- Developed countries have consumed more than their share of the global meat supply for many decades; the average daily meat consumption of Americans is eight ounces—roughly twice the global average³⁰

Links Between Meat Production and Food Insecurity

- As economies in developing countries are growing, demand for meat is also growing; demand for meat in China has doubled in the last two decades³¹
- The majority of the corn and soybeans grown in the world is used to feed livestock rather than people—an increased demand for meat means an increased demand for grain
- Producing one kilogram of chicken meat requires 3.4 kilograms of feed; one kilogram of pork requires 8.4 kilograms of feed³²
- Livestock production generates nearly one-fifth of the world's greenhouse gases, more than transportation³³; one kilogram of beef produces the same amount of carbon dioxide emitted by the average European car every 250 kilometres³⁴
- An estimated 30 per cent of the earth's ice-free land is used for livestock production³⁵
- Although a person can live on food grown on 0.2 hectares (0.5 acres) of land or less, it takes four football fields, or 1.6 hectares of land to feed one Canadian³⁶
- Animal waste contributes to nitrate, phosphorus, and nitrogen pollution in rivers and groundwater
- Overgrazing of land contributes to soil erosion, deforestation, and greenhouse gases
- Most of the world's rangelands are currently grazed at or beyond capacity; since the 1960s, one-third of the forests in Central America have been cut down for cattle grazing³⁷

³⁰ Ibid.

³¹ Ibid.

³² USDA, 1997, cited in Stephen Leckie, *How Meat-Centred Eating Patterns Affect Food Security and the Environment*, International Development Research Centre (IDRC), 1999.

³³ Mark Bittman, "The staggering cost of rising world meat production", *International Herald Tribune*, January 28, 2008.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Agriculture Canada, 1992, cited in Stephen Leckie, *How Meat-Centred Eating Patterns Affect Food Security and the Environment*, IDRC, 1999.

Fact Sheet #4: Meat Production

(cont'd)

For Discussion

1. How does increased meat production and consumption contribute to global food insecurity?
2. What are the benefits and drawbacks of livestock production?
3. Consumption of meat in rich countries has reached an unsustainable level while at the same time people in the developing world are increasing both their income and their meat consumption. What can be done about this pressure on food supplies?
4. Overproduction of meat has resulted in two major global problems: reduction in food security for the world's poor and environmental degradation. What solutions would you propose for these problems?



¹⁷ FAO, 1990, cited in Stephen Leckie, *How Meat-Centred Eating Patterns Affect Food Security and the Environment*, IDRC, 1999.

Fact Sheet #5: Grain Stocks

Facts About Grain Stocks

- Grains, also called cereal crops, include maize or corn, rice, wheat, oats, barley, sorghum, and rye
- Grains are grown in greater quantities than any other crop worldwide and provide more energy for the world's population than any other crop group
- In developing countries, grain—in the form of corn or rice—comprises the majority of the population's diet
- The United States, Australia, Canada, China, India, Russia, France, and Argentina are leading wheat exporters
- Thailand, India, Vietnam, the United States, and Pakistan are leading rice exporters
- The amount of grain exported each year depends on a number of factors, including weather conditions, harvests, and export controls placed by governments concerned about domestic supplies

Links Between Grain Stocks and Food Insecurity

- Increasing demand for grain as livestock feed, extreme weather conditions, water scarcity, and low stockpiles have all resulted in rising grain prices
- In January 2008, the FAO Food Price Index (FFPI) jumped by 47 per cent from the year before, led by increases in cereals (62 per cent), dairy (69 per cent), and vegetable oils (85 per cent)³⁸
- Prices of nearly all food commodities have risen since the beginning of 2008 supported by a persistent supply and demand situation; rice prices gained the most, corn prices also made gains, and because of low stocks, wheat prices are well above 2007 levels³⁹
- An extended drought in Australia's Murray-Darling Basin in 2006–2007 reduced Australia's wheat production by 58 per cent from the previous year⁴⁰
- In May 2008, cyclone Nargis in Burma destroyed much of Burma's rice crop; the effects of the storm may mean that Burma will be forced to import rice for the first time
- Grain stockpiles have been declining as a "just-in-time" inventory method—producing without storing large surpluses—has become the norm; in times of crisis this means fewer grain reserves to draw upon

³⁸ FAO, *Twenty-ninth FAO Regional Conference for the Near East*, <http://ftp.fao.org/docrep/fao/meeting/014/k2369e2.pdf> (March, 2008).

³⁹ FAO, *Crop Prospects and Food Situation*, 2008.

⁴⁰ USDA FAS, 2007.

Fact Sheet #5: Grain Stocks

(cont'd)

- Government and private wheat reserves are at an all-time low; the world consumed more grain than it produced for the past eight years and grain stockpiles are only 40 days short of the next harvest from running out of food¹¹ (in 1998 and 1999, it was 116 days)¹²
- In order to feed their own populations, some governments have partially or completely restricted the exports of various foodstuffs (e.g. Argentina, Bolivia, Cambodia, China, and Vietnam)
- Prices for grain products have risen more than eight per cent in Canadian stores; Maple Leaf Foods Inc. raised the price of a loaf of bread by 40 cents¹³

For Discussion

1. Why is the demand for grain increasing?
2. Why is the global supply of grain decreasing?
3. In order to prevent a worse situation of world hunger, global grain reserves need to be built up. However, stockpiling grain when prices are volatile leads to higher food prices and hoarding. What role should governments play in this situation?
4. Is it right for governments of grain-exporting countries to partially or completely ban exports in order to feed their own populations first? Or should they make the food needs of the global population their main priority?
5. Propose possible solutions to ensure global grain supplies are adequate both now and in the future.

¹¹Eric Reguly, "What crisis? Worst is yet to come", *Globe and Mail*, June 2, 2008.

¹²James Randerson, "Food crisis will take hold before climate change, warns chief scientist", *The Guardian*, March 7, 2008.

¹³Paul Waldie, "Why grocery bills will soar", *Globe and Mail*, April 25, 2008.

Fact Sheet #6: Money Markets

Facts About Money Markets

- Capitalist economies are driven by money and making profits
- One way people make money in capitalist systems is by playing the stock market and speculating that the price of a good or service will increase in the future—in other words, buying stocks while the price is low and selling when the price is high
- The process of buying and selling stocks, bonds, currencies, real estate, commodities, or any other valuable financial instrument is called “financial speculation”
- Recent financial speculation in food commodities such as corn, wheat, soybeans, and rice has caused prices of these commodities to rise

Links Between Money Markets and Food Insecurity

- Due to the downturn in the US economy and the weakening US dollar, investors have recently removed money from equities and mortgage bonds and invested in food and raw materials, contributing to a sharp increase in prices of food commodities
- The amount of money invested in food commodities has grown from \$13 billion US in 2003 to \$260 billion US in March 2008⁴⁴
- Speculators are betting on food scarcity in the future due to increasing corn production for ethanol, the effects of severe weather patterns, and the rising price of oil
- Importing countries are being hit by higher food prices, which benefit large farming conglomerates in exporting countries; smaller scale farming operations producing for domestic markets benefit very little from food price increases
- Mexico used to produce enough maize to supply its domestic market plus export a surplus, however with pressure from the North American Free Trade Agreement (NAFTA) to open its market to imports, Mexico now imports 30 per cent of its maize; meanwhile, speculation has driven up the cost of maize in the US, which has led to higher costs for Mexicans, causing a “tortilla crisis” for the Mexican poor⁴⁵

⁴⁴ Sinclair Stewart and Paul Waldie, “Feeding Frenzy”, *Globe and Mail*, May 31, 2008.

⁴⁵ La Via Campesina, *An Answer to the Global Food Crisis: Peasants and Small Farmers can Feed the World!*, www.viacampesina.org (July, 2008).



Fact Sheet #6: Money Markets

(cont'd)

For Discussion

1. How does financial speculation contribute to global food insecurity?
2. Who profits from rising food commodity prices? Who suffers?
3. The buying and selling of food commodities turns food into a profit-making instrument for investors; however, food is also a basic human right that should be universally available to all. Debate the ethical and social implications of this situation.
4. Propose possible approaches to reduce the impact of financial speculation and global markets on global food shortages now and in the future.