A “silent tsunami”: Global food security in the 21st century
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Introduction

“We have to put our money where our mouth is now, so that we can put food into hungry mouths. It is as stark as that” – World Bank President Robert Zoellick, when calling for contributions to the $500 million World Food Programme (WFP), 14 April 2008.

In the first decade of the 21st century it was thought that the world would overcome the divide between people who were free from hunger and those who were not. But achieving this aim has been difficult for all governments and individuals involved.

On 22 April 2008 the United Nations issued a press release which stated that “a silent tsunami unleashed by costlier food threatens 100 million people”. The focus of the global food security debate over many decades has been to ensure that everyone is free from hunger – a fundamental right – and that people should have at all times physical and economic access to food that is sufficient in quantity and quality for a healthy and active life. Food security is a global need that is continually affected by changes to the natural and human environments around the world.

A “silent tsunami”: Global food security in the 21st century is a resource for middle school students that investigates the issue of food security, equity and sustainability. This resource uses a global perspective by building on questions developed in Global Perspectives: A framework for global education for Australian schools, Curriculum Corporation (2008). The ongoing food security dilemma needs to begin with these questions:

- why should we care about food security?
- what is the issue?
- who is involved in the issue?
- how and why has the issue arisen?
- what conflicts are involved in the issue?
- how should the issue be resolved?
- how would you respond to this issue?
- how would you justify this response to the issue?

The “issues” questions for which you will seek answers provide a useful guide for tackling a global issue of such importance. Students can attempt all of these questions as a unit of work. Alternatively, small groups can focus on one or several of the questions as they relate to separate topics e.g. nutrition and under-nutrition, population growth, food prices, energy, climate change or case studies of countries or regions.
Global food security – what is the issue?
Interdependence and globalisation

Hunger facts

Hunger and poverty claim 25 000 lives every day.

854 million people do not have enough to eat – more than the populations of USA, Canada and the European Union.

820 million people in developing countries alone are hungry – one in four lives in sub-Saharan Africa.

524 million of the world’s hungry live in South Asia – more than the populations of Australia and USA.

More than 60 per cent of chronically hungry people are women.

Every five seconds a child dies because she or he is hungry.

Undernutrition affects an 350 to 400 million children under the age 18 years.

10.9 million children under five die in developing countries each year. Malnutrition and hunger-related diseases cause 60 per cent of the deaths.

One out of four children – roughly 146 million – in developing countries are underweight.

Source: www.wfp.org/aboutwfp/facts/hunger_facts.asp

Millennium Development Goals

World leaders gathered at the World Food Summit in 1996 to commit their countries to cutting hunger in half by the year 2015. During the1990s other major goals were identified and brought together in the Declaration adopted by the United Nations (UN) Millennium Summit in September 2000 and later restated in the form of eight Millennium Development Goals (MDGs). MDG 1, Target 3 aims to halve, between 1990 and 2015, the proportion of people who suffer from hunger.

What is food security?

Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Food and Agriculture Organization,(FAO) of the United Nations. When this doesn’t occur, a country or region is in a situation of food insecurity. Achieving food security means ensuring that sufficient food is available, supplies of food are relatively stable and those in need, can obtain food.

What is national food security?

To achieve national food security, a country must be able to grow sufficient food, have enough foreign exchange to enable it to import food or a combination of both. Similarly, food security for a household means either growing the food, having sufficient income to purchase the food it is unable to grow or a combination of both.
The current food crisis

The FAO predicted the food security situation was vulnerable because of:

- changing climate
- growing demand for meat and other livestock products contributing to the rising price of food grains – the impact of a dietary shift which is directly related to a rise in per capita income in developing countries, especially India and China
- rising global cereal prices – which are likely to remain high, mainly because of drought-like conditions in major cereal exporting countries (e.g. Australia) and low world stocks (e.g. the price of wheat rose approximately 160 per cent between 2005 and 2007)
- rising transport rates – the impact of rising fuel prices
- rising export prices – many countries will have to pay more than in earlier years for imported cereals from world markets, even though they are expected to import less
- rising price of fertiliser – the impact of rising fuel prices which increases production costs
- rising price of seed – impacts on production costs
- shifting preferences in cropping patterns – the swing away from growing food crops to biofuels.

Figure 1.1: Egyptian activists are surrounded by anti-riot soldiers during an anti-government demonstration in Cairo, Egypt, Sunday April 6, 2008.
Source: (AP Photo/Hossam Ali)

As a result of food shortages in 2008 riots erupted almost simultaneously in many regions of the world. The United Nation’s Food and Agriculture Organization (FAO) reported in April 2008, food riots and demonstrations in Bangladesh and Haiti and at least ten other countries. At the same time the World Bank issued an urgent call to rich nations to help stop rising food prices because it saw that this was contributing to social unrest in many poor countries.

Figure 1.2: Countries with food crises, 2008
Source: www.stratfor.com
In June 2008 the aid group Oxfam International warned of an unprecedented global threat to more than a billion people. In the same year, the United Nations warned that the world risks losing seven years of progress in the fight against global poverty, with 100 million people being forced into extreme poverty. All food prices have been increasing, but those rising most sharply are the world’s staple crops such as maize (corn), wheat and rice, food on which most of the world’s poor relies.

The food crisis in Zimbabwe

One of Zimbabwe’s regions that suffered food insecurity the most was Matabeleland in the east and southeast. In this region in 2008 there was almost total failure of the maize crop and there were widespread food shortages. A medical worker said “The situation is extremely severe in Matabeleland. Hunger is extreme … there are the odd maize deliveries but it only goes to people with Zanu cards (members of President Mugabe’s political party) … even where there is food people can’t afford it” (*The Age*, 22 July 2008, p 10).

It is in the interest of all governments to make sure that people have enough to eat. Hungry people cannot work; hungry adults cannot adequately care for their children; hungry children cannot learn. Without a well-nourished, healthy population, development is difficult.

In August 2008 the UN warned that Zimbabwe was a nation facing food insecurity (early warnings occurred from 2000–01 when land redistribution began). The UN advised that hundreds of thousands of people required immediate food aid because they had harvested very little in the preceding few weeks. The situation was made worse by the political situation, for example, the government’s mishandling of land redistribution programs and the hyperinflation which was affecting the price of all food available in shops.

Aid workers in Zimbabwe said the first signs of famine were large numbers of people migrating to areas where there was some hope of obtaining food, and children were arriving at hospitals suffering from *kwashiorkor* (a form of malnutrition).
Global food security – what is the issue?

ACTIVITIES

Remembering and understanding

1. In your own words outline the meaning of the following:
   - Famine
   - Food insecurity
   - Hunger
   - Malnutrition
   - Undernourishment
   - More developed country
   - Less developed country.

2. What were the main causes of the most recent global food crisis?

3. Study the world map. What have been the main causes of food crises in Africa, Indonesia and the Middle East? Why do you think these factors have an impact on food security?

Creating and analysing

4. Use an atlas, the resources of the Internet and your school library to investigate the food situation in Zimbabwe. Draw a map of Zimbabwe showing its location in southern Africa and neighbouring countries. Investigate and label the locations of food insecurity and the people and natural environments at risk. Record this information as annotations on your map.
   a. Approximately, how is Masvingo from the capital city, Harare? How and why might the distance from the capital city affect the level of food aid this region would receive?
   b. Why is there food insecurity in this country?
   c. Who are the people or groups involved?

Applying and evaluating

5. “Diseases in overfed and underfed countries will be quite different”. Investigate this statement in greater detail. Find information which will help you examine this statement. Present your findings as a short report and include maps, graphs, tables or photographs that support or challenge the statement.

6. Choose one of the countries from the world map and research the specific reasons for its food crisis. Present your findings either as a news or a magazine report.

7. Go to www.un.org/millenniumgoals/2008highlevel/pdf/newsroom/mdg%20reports/MDG_Report_2008_ENGLISH.pdf to read the report on how well MDG 1, Target 3 has been achieved.

8. To discover more detail about selected countries and hunger go to www.wfp.org/aboutwfp/introduction/hunger_who.asp?section=1&sub_section=1 and click on the geography of hunger map. From there you will be able to zoom in and out of regions and countries to discover latest news and updates.
How is the world fed?  
Interdependence and globalisation

A fundamental relationship that underpins any global education study is the relationship between the natural environment (e.g. air, water, soil, landforms), the human environment (people and societies) and resources – something that can be used by people – e.g. water, minerals, labour.

Subsistence farming

Subsistence farming is the growing of food primarily for each family’s needs. Some of the excess may be bartered, but the food is usually not grown to be sold. This type of farming usually takes place in poorer countries. Subsistence farming still produces most of the food in the world’s poorest countries.

“Well over two thirds of the world’s poor live in rural areas and most people in Asia, the Pacific and Africa rely on the Earth’s natural resources for their living.”


Commercial farming

Commercial farmers, mainly located in richer or more developed countries, are engaged in the same basic process as subsistence farmers in poorer countries. However, they have applied technology such as tools (using a wide variety of machines), manure (using chemical fertilisers) and labour (replacing a considerable amount of human energy by using fossil fuels and machines). The aim of growing food is mainly for profit rather than family consumption and can be sold outside the country where it is grown for export. Therefore, the food can be bought and consumed a long way from where it is grown.

International food marketing

Just as a farmer sells surplus food in order to buy other goods, so countries sell (export) surplus food to buy other products that are needed (imports). Food is a major trading item for most poor countries whereas other countries may rely more on manufactured goods. The problem for most poor countries is that even if they have surplus food to export, the cost of imports (e.g. fossil fuels and fertilisers) from rich countries is generally increasing faster than the price received for their food exports. If export income is greater than import costs, a country will have money for development. A country that has higher import costs than export revenue is at a development disadvantage and can be very vulnerable to changes in commodity (goods bought and sold) prices and disasters such as drought.

Figure 2.1: 2007–2008 impact of projected food price increases on trade balances

Source: http://news.bbc.co.uk/1/low/world/7284196.stm
**Food production: a photo essay**

**Figure 2.2:** Wet rice production near Tirtagangga, Bali, Indonesia – planting a new crop. Most areas grow two to three crops a year.
Source: Roger Smith

**Figure 2.3:** Threshing and winnowing the rice crop, near Tirtagangga, Bali, Indonesia. This work is traditionally carried out by women.
Source: Roger Smith

**Figure 2.4:** Rice crop production, near Himeji, Honshu Island, Japan. The land in flat fertile valleys is extremely important for rice production in a mountainous country like Japan.
Source: Roger Smith

**Figure 2.5:** Harvesting the summer rice crop, Honshu Island, Japan. Mechanical harvesters are used throughout Japan to reap the crop.
Source: Roger Smith

**Figure 2.6:** Traditional fishing boats secured on a beach on one of Indonesia’s islands.
Source: AusAID

**Figure 2.7:** Fish caught by a trawler in the Solomon Islands. In many parts of the world, fishing companies with large trawlers catch fish for export. These trawlers operate in both national and international waters.
Source: Gordon Anderson, AusAID

**Figure 2.8:** Fish that have been caught in local waters are sold in a Solomon Islands market. Subsistence fishermen in many parts of the world may find they have lost part of their food supply or the size of the available catch, to be sold at the local market, has been substantially reduced.
Source: Rob Maccoll, AusAID

**Figure 2.9:** Women and children collecting shellfish in Kiribati. The fishing gear required by subsistence fishermen is very simple and of low cost.
Source: Lorrie Graham, AusAID
ACTIVITIES

Remembering and understanding

1. In your own words explain what you understand by the terms natural environment, human environment and resources.

2. Describe the pattern of trade shown in figure 2.1. Name two countries that will be large and moderate trade losers and two that will be large and moderate trade gainers. Why do you think some countries will gain and others will lose trade?

Creating and analysing

3. Refer to the text to draw a diagram to show how the international food market works. Which countries are more likely to be exporters/importers of food?

4. Look at the photos shown in figures 2.2–2.5. Use the photos to compare and contrast subsistence rice farming in Bali, Indonesia and commercial rice farming in Japan. How does each practice affect the amount of food grown?

5. Look at the four photos shown in figures 2.6–2.9. Use an atlas to locate the Pacific island and Asian countries shown in the photographs.
   a. What differences might there be in the costs of boats and equipment required for each method of fishing?
   b. Brainstorm the possible effects on people and the natural marine environment of a country allowing large trawlers to fish in its waters.

Applying and evaluating

6. Describe the similarities between the subsistence and commercial fishing rights and the problems occurring through the introduction of farming mechanisation in poor countries. For example
   a. what are the advantages to a subsistence farmer of having animals (such as buffalo) to work on the farm?
   b. what would be the advantages and disadvantages of attempting to replace bullocks by tractors in a densely populated area of small farms?

7. Working in small groups, imagine that you are an economic adviser in a poor semi-arid country dependent on growing millet (a staple food for the people) and raising cattle. There are already some signs of approaching desertification in the decline of plants on which cattle feed. The firewood shortage for cooking is also becoming acute. A large agribusiness meat company from a rich country offers to establish a factory to kill cattle and export frozen beef to more developed countries, but the condition is a 50 per cent increase in cattle numbers. The company suggests raising cattle on some of the land used for growing millet. It also suggests using part of the income from exporting meat to buy food grains from other countries. In a 400-word response from your group, advise the government what it should do and why? How is your advice similar to or different from that of other groups in your class?
What is the impact of rising food prices on people?

Social justice and human rights

Global rises in food prices

Average global food prices have been rising steeply since 2004–05. The International Monetary Fund (IMF) stated that food prices increased by 10 per cent in 2006, 15 per cent in 2007 and by 23 per cent in the first six months of 2008. The seriousness of the situation in 2008 was also reflected by the fact that world food reserves were at their lowest in 25 years.

During 2008, the global rise in food prices brought about a huge humanitarian crisis, particularly for those millions of people living on less than US$2 per day. It impacted on food security and posed an immediate threat to 290 million people. People in many countries and regions had no food security.

Many countries in the world rely on staple foods. A staple food is a food that is eaten regularly and provides a large proportion of a population’s diet. Cereals form the staple food of many countries – rice, maize and wheat are a staple food for around four billion people. Other cereals include millet, rye and sorghum. Some countries which depend on cereals for around 70 per cent of their diet include Burma, Nepal, Afghanistan, Ethiopia, Eritrea, Zambia, Niger and Mali.

“Food prices skyrocketed to a 30 year high – rising 30 per cent in three years”

“Rising hunger could dwarf tsunami, warns Oxfam”

Figure 3.1: Changes in global food prices 2000 to 2008.

Figure 3.2: Changes to wheat and rice prices 2000–2008.
Source: http://farm3.static.flickr.com/2394/2445946301_d2946ed678_o.jpg
Food crisis – some personal stories

I am a 43-year-old widow and live on the edge of the Sahara. Wheat prices have gone up 67 per cent in the past year. We have stopped eating bread and are now eating cheaper foods such as sorghum (a dark grain widely consumed by the world’s poorest people). But I pay more even for sorghum – its price has increased by 20 per cent in the past 12 months. I live on the 50 cents a day I earn weaving textiles to support my family of three. I have cut out breakfast, drink tea for lunch and ration a small serving of soupy sorghum meal for family dinners. I don’t know how long we can survive like this.

Manthita, Mauritania

I am a retired factory worker and live in a port city on China’s east coast. My family of three still eats the same things, including pork ribs, fish and vegetables, but we are eating less of it. Almost everything is more expensive now, even normal green vegetables. The level of our quality of life is definitely reduced.

Liu Yinhua, China

Our best-quality fish leaves the country right in front of our eyes every day. They leave us with sardines as they eat juicy fish. We stand no chance against the hunger of richer countries. Even the poor quality fish that remain have gone up in price by about 40 per cent over the past five years.

Mame, Mauritania

I am a shopkeeper and have been watching people at the market who have started hoarding because of fear that rice and oil will run out. It is the urban poor who have fled rural life to live in teeming slums that seem to feel it the most. If people don’t have enough to fill their stomachs, then what’s the use of an economic boom in exports? My customers are always asking for cheaper goods, like groundnut oil instead of soybean oil.

Manjeet Singh, New Delhi, India

I had to sacrifice my she-goat last month because we are so hungry. By doing so, I traded my family’s morning milk for dinner meat, which only lasted a few days. My family cannot afford the high prices for basic foods and now my two young children cry in the morning from hunger. Everything at the market – the wheat, rice, sugar and animal feeds – is higher priced than I have ever seen them before. What will we do? Soon we will have nothing left to sell. I don’t know how I will feed my family. We just can’t afford it.

Mahmoud, Mauritania

Figure 3.3: Selected food price rises between March 2007 and March 2008.
Source: http://news.bbc.co.uk/1/low/world/7284196.stm

Figure 3.4: An Egyptian family having breakfast.
Source: FAO © FAO/Ami Vitale
ACTIVITIES

Remembering and understanding

1. Outline the main points of evidence that show a global food crisis was occurring in 2007 and 2008.


Creating and analysing

3. Use the graphs to describe the rise in food prices from 2000 to 2008. How will this affect the poor people who rely on these foods as a part of their staple diet?

4. Construct a consequence chart (download a chart from the Global Education Website at www.globaleducation.edna.edu.au) showing the links between world food supply trends and their impact on natural and human environments of many countries. After including the various trends in the smallest circles of the consequences chart (you will need to add more small circles), include in the two medium-size circles the words “natural environment” and “human environment”. These words will indicate whether the trend has a strong relationship to the natural or human environment (or both – in which case you will need to add extra lines to the chart). Add arrow heads to the lines linking the circles on the chart. These should show the impact of the trends operating in the natural or human environments, on the world food supply situation.

   World food supply trends
   • climate change
   • rising price of food grains
   • increasing freight rates
   • rising fertiliser costs
   • increasing costs of imports
   • rising seed costs.

Applying and evaluating

5. Conduct some research on the main food staple of various countries. Which countries rely on cereals? Other staples grown in tropical countries include roots and tubers such as cassava, yams, taro and sweet potato.

6. Conduct some research into countries that suffer overnutrition compared to undernutrition. Compare the maps and describe similarities and differences. Can you find a relationship between the level of development in a country and nutrition?

Figure 3.5: A Moroccan family discussing the local food situation. The woman in yellow is the head of a local agricultural cooperative.
Source: FAO © FAO/Djibril Sy
How do changes in world population impact on food security?

Identity and cultural diversity

The world’s population continues to increase at a rapid rate. It took until 1830 for the world’s population to reach 1 billion people; 1930 (2 billion); 1960 (3 billion); 1975 (4 billion); 1987 (5 billion) and 2007 (6.6 billion).

How and where will the world’s population expand by 2050?

The world’s population is expected to increase by 2.5 billion during the next 42 years, from over 6.6 billion in 2008 to 9.1 billion people by 2050. Approximately 99 per cent of that growth will take place in the poorest countries of the world where population growth already outpaces food supply.

Issues arising from changes in Africa’s future population

In the past century Africa’s population has increased from 133 million (8 per cent of the world’s population) in 1900 to 944 million (14 per cent of the world’s population) in 2007.

In less than 50 years it is estimated that the population of the continent of Africa will make up more than 20 per cent of the world’s population – an increase of more than six per cent from 14 per cent of the world’s population in 2007 (figure 4.3).

Figure 4.1: World population growth

Source: Geography Teachers’ Association of Victoria 2006 New Perspectives: VCE Geography Units 1–4

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How do changes in world population impact on food security?

The major reason for these changes is high birth rates which are expected to triple the population of many of the world’s poorest nations. Many demographers and family planning experts advise of the coming population explosion in some of Africa’s poorest countries. They warn that efforts to reduce poverty and feed Africa’s population will fail unless urgent measures are taken. By 2050, African countries such as Burundi, the Democratic Republic of Congo, Chad, Guinea-Bissau, Liberia, Malawi, Mali, Niger and Uganda, which are among the poorest nations in the world, are projected to triple in size. By 2050 it is projected that:

- Nigeria will have a population of 258.1 million
- The Democratic Republic of Congo will have a population of 183.2 million
- Ethiopia will have a population of 170 million
- Kenya will have a population of 64.8 million.

By 2050, about one in five of the world’s population will live in an African country. Such growth rates will make the world food situation even more complex. Of all the world’s regions the food/population situation in Africa is the most critical. It is expected there will be greater levels of hunger and food insecurity, competition for food-producing land and competition for scarce resources such as seed, fertiliser and water. The pressure to migrate, to neighbouring or other countries, will be immense.
ACTIVITIES

Remembering and understanding

1 Describe the change in global population shown in figure 4.1.

Creating and analysing

2 Draw one graph to show the population change in major regions and another graph to show the percentage change in population over time (choose the best type of graph to represent this information). Compare the percentage of world population data, in figures 4.2 and 4.3 for “More developed” and “Less developed” regions, for the years 1900, 1950, 2007 and 2050.
   a Which region has grown the most between 1900 and 2007?
   b Over what period (50 years or approximately 50 years) did the most significant changes take place?
   c What are the projected percentage figures for “More developed” and “Less developed” regions in 2050?
   d What are the projected percentage changes for “More developed” and “Less developed” regions between 2007 and 2050?

3 What do you notice about the percentage of world population data, in figures 4.2 and 4.3 for Africa, for the years 1900 and 1950 compared with 2007 and 2050?

4 In figure 4.3 compare percentage of world’s population data for 2007 and 2050 for Africa, Asia, Europe, Latin America and the Caribbean, North America and Oceania. What is the significant difference for the figures for Africa when compared to all other world regions?

5 Use the Internet to visit the Population Reference Bureau web site at www.prb.org/pdf07/07WPDS_Eng.pdf Study the data on page 10 – population figures for the Pacific Region. Identify the most important population differences in 2007, and the projected differences for 2025 and 2050, for the richer countries (Australia and New Zealand) and the poorer Pacific countries.

Applying and evaluating

6 Select any one aspect of food production (e.g. ploughing, herding, irrigating, transporting, marketing) for any of the African countries mentioned in the text. Research this aspect using text books, the Internet and the school library.
   a Create a photo/sketch essay in your investigation to describe how, when and where traditional technology is used in this one aspect of food production. Each of your photos must have a caption. Figures 4.4–4.5 will give you some idea of the photo resources you could use in your research.
   b As a final task, draw diagrams to show how this traditional technology is used today and how this technology might change in the future.
   c Outline the problems in meeting the food needs of the growing population in the African country you have chosen.

7 Find the current world population at www.census.gov/ipc/www/popcloreworld.html
What will be the impact of changing energy resources on global food security?

Sustainable futures

During 2007 and 2008 there was a dramatic rise in the global price of fuel which had an impact on food prices. In Australia, like many rich countries, suggestions were made to counter these price rises. One of these was to switch to biofuels. A biofuel is a renewable fuel that is derived from biological matter e.g. biodiesel, biogas and methane. This fuel “crisis” was developing at the same time as global food shortages. These two situations were closely linked.

“The global food crisis and rising fuel prices are inseparable. Our heavy reliance on energy is hurting the poor and plunging the vulnerable into poverty. We must change the way we use the planet’s resources – all of our children will inherit the global food and energy crisis unless we lead now.”

Tim Costello, “Energy habits are fuelling food crisis”, The Age, 5 June 2008, p 17

“The consequences for the world’s poor are brutal: we drive, they starve”.


The trend towards the production of biofuels – and turning the world away from its heavy dependence on fossil fuels that are sourced from a few countries – has had negative consequences for the world’s poor. Maize (corn) is a staple food for many people, particularly those in the Americas. As a biofuel, corn became more valuable as a fuel than as a food source. Other crops that can be grown to produce biofuels include sugar cane, palms and soybeans.

“It says enough that one car tank of biopetrol needs as much grain as it takes to feed an African for one year, or that a reported one-third of American grain production is now subsidised for conversion into biofuel”. United Nations food expert Jean Ziegler screamed for it to stop: ‘Children are dying . . . It is a crime.’

Simon Jenkins, “The green push has gone mad”, The Age, 17 April 2008, p 13

The International Food Policy Research Institute said at the time that:

• the swing to producing biofuels around the world had increased food prices by 30 per cent
• in 2008, the existing plans to expand biofuel production would push the price of edible oils up by a further 19 per cent and corn by 26 per cent which would directly affect many African countries.

Turning natural ecosystems into biofuel crops causes major carbon emissions that can worsen the global warming that biofuels are meant to reduce. The production of biofuels also has dramatic impacts on the natural
environment of many poor countries. For example:
- annually, Indonesia loses approximately two million hectares of its rainforest – some to logging but increasingly more to palm oil production. Carbon-rich peatland is also converted to crops releasing carbon dioxide to the atmosphere
- each year Indonesia exports 20 per cent of its palm oil as a biofuel to rich energy-consuming countries
- the Brazilian Amazon and Cerrado (tropical savanna) are being converted to soybean crops increasing Amazon deforestation
- in Ethiopia, in 2008, a European company gained the rights to grow biofuels, most of which are to be exported to rich energy-consuming countries
- biofuels are produced by means of a monocultural (i.e. the growing of a single crop) form of agriculture which can have a devastating impact on soils, water supply and wildlife due to a reduction of biodiversity
- furthermore, communities that practice monoculture tend to have the economic power to purchase the best agricultural land and to push poor subsistence farmers – whose survival depends on land to grow food – onto increasingly marginal land where crops struggle to produce the same yields as on the less marginal land.

What is the opinion of the Food and Agriculture Organization (FAO)?

According to the Food outlook report of the FAO in early 2008, the following trends and events occurred:
- over 18 months, soybean and palm oil prices increased sharply
- the rise in the prices of edible oils was the sharpest amongst all food items
- the price of palm oil rose from US$350 per tonne to US$1250 per tonne in one year
- biofuel demand accounted for approximately 50 per cent of the increase in the worldwide demand for vegetable oils in 2007
- rising consumer demand, created by rising per capita incomes, pushed up the price of oilseeds in China and India
- floods in Malaysia, one of the big producers of palm oil, also contributed to a world shortfall in production
- when a store in Chongqing, China, announced a cooking oil promotion in November 2007, a stampede in the store left three dead and 31 injured
- in 2007 China was the world’s biggest palm oil importer
- Malaysia continued to clear tropical rainforests to make way for palm oil plantation to meet demand of the European nations for biofuel
- while demand for biofuels has influenced recent food price trends, the degree to which this has occurred is highly debated, with estimates ranging from three per cent to 30 per cent; The state of food and agriculture 2008 – biofuels: prospects, risks and opportunities, Food and Agriculture Organization of the United Nations Rome, 2008, p 101.

Figure 5.2: Price changes for canola and soybean in US$ per tonne. Source: Westpac Economics
What will be the impact of changing energy resources on global food security?

ACTIVITIES

Remembering and understanding

1. Clarify your understanding of the two terms “fossil fuels” and “biofuels”. Why are many of the world’s farmers prepared to grow crops for biofuels? Who buys these crops?

2. Research the meaning of the term “ecologically sustainable development” and “monoculture”. In your own words outline the meaning of these terms. In what ways is the production of biofuels both “ecologically sustainable” and “ecologically unsustainable”?

Creating and analysing

3. Study the cartoon. What does this cartoon say about biofuels contributing to the global food crisis? Create your own cartoon to show the impact of growing biofuel crops on the environment.

4. Recent history and experience have shown that the effects of growing biofuels can have a life-changing impact for people living in poor countries. Construct a chart, with a large box at the top with the words “Growing biofuel crops” and a large box at the bottom with the words “Is responsible for poverty among subsistence farmers in poor countries” (see Figure 5.3). Between the two boxes place other smaller boxes. Include text in these boxes to show how the production of biofuels has dramatic impacts on the natural and human environments of the world’s poorest farmers. Construct appropriate links between all of the boxes by using a series of arrows which show the interrelationships between the statements in the two largest boxes. Use the text above, the resources of the Internet and your school library to research the wording to use in the smaller boxes.

Applying and evaluating

5. Conduct a class discussion about the impact of increase biofuel production on the future of subsistence staple food production in poor countries. Use the following questions as a guide (groups may need to research before the discussion):
   - where are the biofuels produced and which people are at risk?
   - what is the issue (e.g. outline the evidence that considerable food insecurity is already occurring in a particular country or region because of biofuel production)?
   - who is involved in the biofuel production (in a particular country or region)?
   - what is being done, and what should be done, about the food crisis, worsened by the switch to biofuel production (in a particular country or region)?
   - how is the food crisis, worsened by the switch to biofuel production (in a particular country or region), likely to be resolved?

6. Write a short essay supporting the idea that biofuel crops should be grown on marginal and cleared agricultural land not on native habitat.

Figure 5.3: Biofuels chart
Source: Barbara Baldock, Margaret Calder and Joan Carlin, (2008). Lifting the lid: A teaching resource for primary teachers for the International Year of Sanitation, GEP, p 10
How will climate change affect food security?  
Sustainable futures

What is the issue?

The World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) in 1988 established the United Nations Intergovernmental Panel on Climate Change (IPCC) which involved over 2,500 scientists from 30 countries. The IPCC says that 20 to 40 per cent of human-generated emissions of carbon-dioxide is increasing (enhancing) the greenhouse effect (the greenhouse effect is a naturally occurring phenomenon) leading to global warming and climate change. As a result the atmosphere traps heat rays that normally dispel into space, causing global warming.

On balance the majority of the world’s scientists support the view that some global warming is occurring or, at the very least, that human activities (such as burning fossil fuels) are bringing about changes in the atmosphere in a way that has never occurred before. A minority of scientists question the evidence upon which the global warming theory is constructed.

Climate change, crop yields and food supply

Climate change will bring greater fluctuations in crop yields and local food supplies and hazardous events, such as landslides and erosion damage, which will adversely affect the stability of food supplies and thus food security.

It is suggested that climate change will affect food security in the following ways:

- food availability (i.e., changes in how much can be produced and traded)
- access to food (i.e., the effect on growth and distribution of incomes, and thus demand for agricultural produce)
- stability of food supplies
- food use.

The overall impact of climate change on food security will differ across regions and countries and over time.

Climate change will make developing countries more dependent on imports and place further stress on food security in sub-Saharan Africa and to a lesser extent in South Asia. The adverse impacts of climate change will fall disproportionately on the poor.

What is likely to happen to agriculture?

It is expected there will be different responses in agriculture, depending on location. In some regions and countries, areas potentially suitable for cropping will expand, the length of the growing period will expand, the length of the growing period will increase and crop yields may rise.

Other locations may experience more frequent heat waves and droughts, increased heavy precipitation events and flooding and the possibility of increased coastal storms. A temperature rise in some areas may expand the range of many agricultural pests and increase the ability of pest populations to survive the winter and attack spring crops. There may be reduced livestock productivity and increased livestock mortality.

In what way will climate change impact on the way that food is used?

Climate change will also affect the ability of individuals to use food effectively by altering the conditions for food safety and changing the disease pressure from vector-, water-, and food-borne diseases. For example, vector-borne diseases such as malaria, are likely to spread or reduce with climate change. A vicious circle could arise and the result could be a reduction in people’s ability to work, an increase in poverty or an increase in mortality.
How will climate change affect food security?

Figure 6.1: Projected changes in agricultural productivity 2080 due to climate change

Cartographer/designer/author credit: Hugo Ahlenius, UNEP/GRID-Arendal

A recent IPCC report also emphasised that increases in daily temperatures will increase the frequency of food poisoning, particularly in temperate regions. Warmer seas may contribute to increased cases of human shellfish and reef-fish poisoning in tropical regions and movement of that particular disease towards the poles.

What is the likely impact in the first and latter decades of the 21st century?

In the first decades there are likely to be low impacts of climate change, but also lower overall incomes and a higher dependence on agriculture. By contrast, the second half of the century is expected to bring more severe impacts but possibly a greater ability to cope with them. However, questions associated with global equity and sustainability will remain important.

Figure 6.2: Reef fishing in Kiribati – a country in which people depend on the sea for food. Experts warn that global warming may cause migratory patterns of fish to change as they find cooler waters.
Source: Lorrie Graham, AusAID
ACTIVITIES

Remembering and understanding

1. List the potential positive and negative impacts of climate change on agriculture.

2. Study the map.
   a. Which regions are most likely to have future food insecurity due to climate change?
   b. Which regions will improve their food security?
   c. Name three countries in different continents that will have agriculture productivity reduced by between 15 and 50 per cent by 2080.

3. In your own words outline the meaning of:
   • enhanced greenhouse effect
   • temperate latitudes
   • industrialised world
   • developing world
   • vector-borne diseases
   • water-borne diseases
   • food-borne diseases
   • mortality.

4. How will climate change affect the spread of diseases? How does the spread of diseases impact on subsistence agriculture in poorer countries?

Creating and analysing

5. Study the map. Describe the distribution of less developed countries that will be adversely affected by changing agricultural conditions compared to more developed countries.

6. Using an atlas, the resources of the Internet and your school library to complete a project on the Sahel region of Africa.
   a. Where is the Sahel? Which countries are located in the Sahel? Draw a map.
   b. Describe the climate of the Sahel (include a climate graph).
   c. How is the climate changing in the Sahel?
   d. What food do people grow in the Sahel?
   e. How will climate change affect food security? (CIA factbook at www.cia.gov/library/publications/the-world-factbook/)

   Present this project as a poster, a documentary or a PowerPoint.

Applying and evaluating

7. Conduct a class discussion on the impacts of climate change on agriculture. Use the following to guide your discussion.
   • How is the issue likely to be resolved?
   • How should the issue be resolved?
   • How would you respond to this issue?
   • How would you justify this response to the issue?

For a detailed examination of climate change see:
• GEP, (2007), Climate change – a topic generating a lot of heat, Global Education Project Victoria;
Case study: Food security in Asia

Identity and cultural diversity/Peace building and conflict

Over a number of years there has been great concern regarding food security for the people of Timor Leste, the Philippines and Bangladesh. In the villages of these countries millions of people – some of the world’s poorest – have been forced into greater poverty by sharply rising food prices and lower food production. Rice is one of the staple foods in these countries and in one year its price more than doubled. The impact of this for people living in rural areas (who generally eat the food they grow) was less than for people in cities where the majority of the population is often dependent on imported food.

What have been the reasons for this situation?

During 2007 and 2008 global demand for foodstuffs rose sharply caused by:

- changing consumption patterns – rising incomes in developed countries such as the United States of America, Australia, and parts of Europe, has lead to increased demand for food. In addition, rising incomes in some developing regions such as Asia involves an increase in the number of people living on an animal-based diet (note: it takes 8.3 grams of corn feed to produce one gram of beef and 3.1 grams to produce one gram of pork)
- the surge in demand by western countries for biofuels as government policy and fossil fuel prices drives populations to cut fossil fuel use and emissions
- new constraints on food supply – fertile land that once grew food for people now produces biofuels or grain for livestock feed
- world grain stocks falling to their lowest point in 25 years due to unique weather conditions occurring in some of the world’s major food-producing countries e.g. Australia, the world’s second largest grain exporter, substantially cut its output
- the growth in global population – every year there are 73 million more mouths to feed.

What has been the situation in Bangladesh?

The food security situation in Bangladesh has been serious. Price rises in food staples brought about a great deal of suffering. In addition, there was underlying tension and the threat of food riots. This situation comes about because Bangladesh is a very poor country where more than 50 per cent of income is spent providing food. The cost of food for families rose by 74 per cent. The rise in international and national freight rates, due to the rises in the cost of fossil fuels, also had a major impact as Bangladesh imports more than 65 per cent of its grains and these imports suddenly became much more expensive.

Figure 7.1: Bangladesh and neighbouring countries

Source: Oxfam Australia
www.oxfam.org.au/world/stasis/bangladesh/
more expensive. There are also problems with reduced food production due to natural disasters resulting in poor harvests.

**Suva Rani – Climbing out of poverty**

*This section has been adapted from Focus Vol 22 no3, Sept to December 2007, p 28*

Suva Rani is from the Lalmonirhat (Lalmanir Hat) district in the northwest region of Bangladesh. Suva did not complete year three at primary school because her father was an impoverished day labourer who was unable to afford the fees. At 15 she married Bhupal Chandra, another day labourer. They began married life in extreme hardship and often went hungry during the *monga* (famine season) when Bhupal was out of work. Suva gave birth to four children in a few years. This brought the couple great joy but also worsened their poverty.

In 2002, along with other poor women in her area, Suva enrolled in an AusAID-funded Building Resources Across Communities (BRAC) microfinance program. During the course Suva was shown how to manage a loan of 4000 taka (about A$80) to start up a paddy husking business. She worked very hard to make her business a success and was careful about making regular repayments on her loan. Her efforts were rewarded. Over the next few years Suva was able to increase her capital.

- In 2003 Suva took out a second, slightly larger loan – the money was invested in a cow-rearing business, and she sold milk in the local markets. By the end of the year she managed to save 14 000 taka which she used to lease a piece of land for her husband to cultivate.
- In 2004 Suva took out a third loan (8000 taka) to expand her paddy husking business. At the end of 2004 Suva’s capital had risen to 25 000 taka. She set up a tube well and installed a sanitary latrine in her house.
- Soon after Suva took a further loan which allowed her to engage her son in a banana-selling business.

In just three years, Suva’s capital reached 42 000 taka, thanks to the profit from both her son’s work and selling milk at the markets. By 2007, Suva was leasing more agricultural land for banana cultivation.

Suva Rani’s amazing success demonstrates what women can achieve with access to financial advice, a manageable loan and a bit of support. She is now self-reliant and as a measure of her success her family is healthy and well nourished, each of her children goes to school and the whole family can look forward to a brighter future.

Note: BRAC programs cover all 64 districts of Bangladesh and 78 per cent of all rural villages. BRAC employs over 95 000 people to implement its programs, the benefits of which touch 110 million people. Up to 2007, AusAID had contributed A$6.6 million to help.

**Figure 7.2:** Suva Rani, by means of BRAC microfinance, made the most of her chance to break the poverty cycle.

*Source: AusAID/BRAC*
Remembering and understanding

1. Describe and explain how poverty and global economic and social events make the population of the poorer countries in the Asia-Pacific region more vulnerable to food insecurity.

2. Outline and explain how the availability and price of food is a different issue for people living in cities than for those living in rural areas.

Creating and analysing

3. Study an atlas and the resources of the Internet to locate the Asian countries mentioned in this section.

4. Construct a table that compares the Asian countries mentioned in this section with Australia in terms of the following characteristics:
   a. capital city – name
   b. capital city population
   c. country population
   d. area
   e. projected population (choose a future year and use that year for each of the countries)
   f. levels of nutrition
   g. choose one of the following population indicators – birth rate, death rate, life expectancy (male or female), infant mortality
   h. choose one social indicators – doctors, children under-weight, children attending primary school, public spending on health
   i. choose one economic indicator – Gross National Income per capita or Gross Domestic Product per capita, electricity consumption per capita, agricultural products as a percentage of total exports
   j. choose one environment indicator – forests and woodlands – percentage of total land use, or carbon dioxide emissions per capita.

Write a summary paragraph for Australia and one of the Asian countries comparing the data, particularly for such indicators as level of nutrition, children under-weight and Gross National Income per capita.

5. Carry out the same activities as in 3, 4, and 5 above for the following Pacific countries: Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. (see the following website www.prb.org/pdf07/07WPDS_Eng.pdf)

Applying and evaluating

6. Read the text and view the photograph of Suva Rani. Draw a flow diagram to show how she has helped all the members of her family. List interview questions you would like to ask her about the ways in which she has broken the cycle of poverty.
Case study: Food security in Africa
Identity and cultural diversity/Peace building and conflict

The outlook for food security in Africa appears bleak. Climate change will have a major impact on the natural and human environments of this continent.

The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) to provide the decision-makers and others interested in climate change with information about climate change. The IPCC predicts that a rise in temperature of 3°C could reduce water availability for 1.8 billion more African people by 2080. Other climate-related changes that are predicted include:

- rising sea levels which will increase flooding
- increasing desertification – arid and semi-arid lands will increase by up to 8 per cent
- increasing the risk of malaria – an additional 80 million people.
- In terms of agriculture the following is likely to occur:
  - maize, wheat and soya-bean yields are predicted to fall significantly
  - net crop revenues will drop by as much as 90 per cent by 2100
  - small-scale farms will be the most affected.

If current trends continue, sub-Saharan Africa will be 0.5–2°C warmer by 2050 and will have 10 per cent less rainfall. There will be more extreme weather events such as drought and floods and the length of the growing season will shorten.


The following description of the situation in a region of South Africa, is based on a report by Charlotte Sterrett, in “Where has all the water gone?”, Oxfam News, Oxfam Australia, Winter 2007, pages 13 and 14.

(Oxflam Australia in Africa)
The effects of climate change are already being felt amongst some of the world’s poorest people. After years of fighting for access to adequate health care, food, clean water and sanitation and striving to reduce the effects of HIV and AIDS and conflict, many communities are facing the effects of climate change.

Oxfam Australia works with 10 partners in UMKhanyakude to help communities with high levels of HIV to grow and obtain enough food to eat. Many people in the communities
are concerned about the effects of prolonged drought and extremely low rainfall on their crops. One of these is the community of Hluhluwe, a small town in the north-eastern corner of South Africa.

Some observations by the local people include:

- rainfall has become more erratic over the last few decades, occurring less frequently and for shorter periods. The ground used to be soft and easy to dig by hand; water was freely available just under the surface and food was plentiful; there was a lake nearby that provided fish. But now the land is dry and hard and there is no water under the surface; even the lake has dried up
- the seasons are not the same as they used to be; winter is not as cold now, the weather is much hotter and drier and more humid
- there is little difference between summer and winter.

Without water, community crops and gardens won’t grow and people aren’t able to get the nutritious foods they need to stay healthy. This is particularly the case in a community affected by HIV and AIDS. Without water and nutritious food there are devastating consequences for communities.

**What are the people of Hluhluwe doing to cope with the changes to their natural environment?**

To cope with the water shortages, the community has sunk a borehole, digging more than 80 metres to find water. They plan to use the water from this source for a community garden that will provide nutritious food for Hluhluwe’s most vulnerable residents. Yet, there is no guarantee that the borehole will last. The community needs water pipes and to learn how to look after the land and adapt to the drier conditions. More drought-tolerant crops and vegetables will need to be grown.

Through their development work, Oxfam Australia will better understand the impact of climate change and be able to help these communities most at risk of food insecurity.
ACTIVITIES

Remembering and understanding
1 The following activities provide the geographical location of this case study.
   a Using figure 8.1, the resources of the Internet or your school library, outline
      the difference between South Africa and southern Africa. Construct a list of
      southern African, West African countries, East African countries and North
      African countries.
   b European countries, such as Britain, France, Germany, Holland, Italy, Portugal
      and Spain colonised Africa during earlier centuries. List five examples of
      present-day African countries, matched with their former colonising “ruler”
      e.g. Mozambique – Portugal.

2 Outline how climate change is predicted to impact on food production in Africa.
   Describe the impact shown on the map.

Creating and analysing
3 Explain why Oxfam’s program works at the community level. Work in small groups
   to design an information campaign for Oxfam Australia called “Climate change,
   food and the people of Hluhluwe”. The campaign will provide information on
   the present situation for the people of Hluhluwe and practical ideas that will be
   introduced by Oxfam Australia to help reduce the impact on food supplies. Your
   campaign could be presented as an advertisement, documentary, multi-media
   format or poster.

Applying and evaluating
4 Go to
   www.reliefweb.int/rw/fullMaps_Af.nsf/luFullMap/7A3E61FBCEE22B81C12574D
   B00430B1/$File/rw_FFS_horn081007.pdf?OpenElement
   and study the annotated
   map of the Horn of Africa depicting the food insecurity crisis in September 2008.
   Here 17 million people face a food crisis.
   a List the countries that make up the Horn of Africa. Research and record the
      population of each country.
   b Where data is provided, calculate the percentage of the total population in
      each country that is suffering food insecurity.
   c List the causes of the humanitarian emergency.

5 Work in pairs. Imagine you work for an NGO (non-government organisation) such
   as Oxfam. Prepare a report for your colleagues about the action that needs to be
   taken in one of the countries in the Horn of Africa.
What action can be taken to improve food security?

Sustainable futures

Many people, communities and governments have become aware of the need for the world to take a path towards sustainable and equitable development. Basic requirements – air, food and water – come from the natural environment, as do the energy and natural resources for housing, transportation and the products people buy and use. Protecting the natural environment is an important aspect of sustainable development. Likewise identifying, challenging and eliminating the causes of poverty and oppression in the human environment are important parts of equitable development.

How can food security be obtained for the world’s poor?

A number of responses can improve food security for the world’s most vulnerable communities. By investing more money in agriculture and supporting development programs, communities can develop sustainable methods of growing foods that can meet their needs and look after fragile environments. Supporting the private sector in poor countries, particularly small business, to produce and market food will also have a positive impact. The production of biofuels will need to occur in such a way that is socially and environmentally sustainable. International trade systems need to reduce uncertainty in the global food market so that poor communities are not disadvantaged. In the meantime, food aid will form an important part of emergency aid for the most vulnerable people until a more sustainable solution can be found. But this should be done in such a way that communities do not become dependent on food aid and local food production and marketing are not undermined. Such dependency would be a negative outcome in the world’s desire to provide long-term and sustainable aid.

World Food Day is organised each year by the Food and Agriculture Organization (FAO) of the United Nations. In 2008, World Food Day occurred on October 16. Use this day to focus on this issue and take action to improve food security for the world’s most vulnerable people.

Special programs

The FAO has special programs for food security at both national and regional levels. Some of the many activities include school meal and garden programs, supplying water for irrigation, growing high-value crops and developing crops and animal production.
ACTIVITIES

1 Using media reports

Over a given period collect newspaper reports of food security issues (global, regional or national) to pin on a display board. The reports can be gathered from the print and electronic media. Discuss the reports and classify them in terms of:

- scale of the food security issue: family, group, local, national and global
- number of people, groups or nations involved
- likely outcome: now, next year and in the future.

2 Five questions to ask

Activity 1 should be followed up by a discussion on how food insecurity affects children in poorer countries. Guest speakers from organisations such as Oxfam Australia, World Vision, UNICEF or AusAID could assist further understanding and provide suggestions for action. This would be especially effective if, following the guest speaker, students discuss the food insecurity situation using the following structure.

Images What images do you and others have of the effects on children of the food insecurity situation? What do you, and others, think the situation is really about?

Background What has actually happened so far and why?

Solutions What are some possible solutions you can suggest?

Choices What are the best possible solutions?

Action What can be done about the food insecurity situation? How can we influence future discussions and decisions?

3 Action for food security – things to keep in mind

- prepare a list of action ideas
- share ideas
- decide as a group
- remember:
  - the first step is the most difficult
  - don’t tackle anything too large
  - evaluate your action before taking the next major step.

- Responsible methods taken by you or your class could include action to:
  - inform others e.g. a display
  - encourage others e.g. writing letters to other students
  - direct change e.g. making submissions to people with the power to bring about change (politicians, local council)
  - operate change e.g. joining an organisation, raising funds.

4 Organise a hunger banquet

Oxfam Australia provides details on how to organise a hunger banquet to demonstrate the unequal distribution of resources and wealth in the world, particularly food. This elaborate and fun role play assigns people to high, middle or low income tier and each group is served a corresponding meal. All instructions are provided on the website at www.oxfam.org.au/publications/teaching/#banquet
What action can be taken to improve food security?

**ACTIVITIES**

**Websites**

In completing the activities in this publication, students should seek a wide range of information from as many sources as possible. The following sites that are very relevant to this publication are listed below.

Australian Agency for International Development (AusAID) – Global education website


Food and Agriculture Organization (FAO) of the United Nations


Population Reference Bureau, World Population Data Sheet, 2007

[www.prb.org/pdf07/07WPDS_Eng.pdf](http://www.prb.org/pdf07/07WPDS_Eng.pdf)

United Nations Development Programme (UNDP)


United Nations Intergovernmental Panel on Climate Change (IPCC)

[www.ipcc.ch/](http://www.ipcc.ch/)

Oxfam interactive map at

[www.oxfam.org.uk/oxfam_in_action/issues/food_crisis/map.html](http://www.oxfam.org.uk/oxfam_in_action/issues/food_crisis/map.html)

World Food Day

A “silent tsunami”: Global food security in the 21st century is a resource for middle school students that investigates the issue of food security, equity and sustainability. This resource uses a global perspective by building on questions developed in Global Perspectives: A framework for global education for Australian schools, Curriculum Corporation (2008).