Discussion sheet

Sydney Food Fairness Alliance
working towards food security and sustainable food systems

FOOD FAIRNESS ILLAWARRA
A community based alliance enabling healthy food for all

FOOD AND CLIMATE CHANGE

Is climate change really occurring?

Climate change is having, and will continue to have an immense impact on food supply around the world if left unchanged.

Yes, climate change is a reality.

According to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007), the warming of the climate system is unequivocal and is predominantly due to human activities such as fossil fuel burning and land use changes.

It is predicted that global warming will increase in the twenty-first century, with average predictions of temperature rises ranging from 1.8 degrees C to 4 degrees C. (FAO 2007).

In addition to warmer temperatures the world is experiencing more extreme weather patterns.

How will climate change affect global food supply?

Climate change is having, and will continue to have an immense impact on food supply around the world if left unchanged.

Agriculture and the production of crops is one particular area which is extremely susceptible to climate change. Although there is still enormous uncertainty surrounding the impacts of climate change and, thus, crop reduction estimates vary widely, it is clear that global warming is likely to alter the production of crops such as rice, wheat, corn, soybeans, and potatoes. These are staples for billions of people around the world.

Recent studies indicate that increased frequency of heat stress, droughts and floods negatively affect crop yields, which creates the possibility of surprises with impacts that are greater and that occur earlier than predicted. In seasonally dry and sub-tropical regions, crop production is predicted to decrease with even small temperature increases. Over most of Africa, agricultural production and access to food is expected to be seriously compromised.

Altered weather patterns can also make crops more vulnerable to infection, pest infestations and choking weeds. This can also decrease crop yields and force farmers to use expensive and harmful pesticides and herbicides on their crops.

Rice crops are one of the most vulnerable to global warming. Studies have found that rising temperatures can make rice spikelets, the slender branches that contain rice flowers, sterile. Specifically, this will affect Asia, where 90 per cent of the world's rice is grown and consumed and sub-Saharan Africa, which is the fastest growing rice consumer.

The IPCC has also found that key cash crops, such as coffee and tea, in some of the major growing regions will also be vulnerable over the coming decades to global warming. It has also been shown that warmer temperatures have reduced the combined production of wheat, corn and barley.

Is the global situation fair?

Not really. It is evident that the poorest countries will be hardest hit even though they have contributed little to causing the problem. Their low incomes make it difficult to finance adaptation.

If we all join in to stop climate change we can still reduce the detrimental impact it has on our food production. It is not too late.

Effects on agricultural production

According to the Stern Review (2006), the precise impact of climate change on agriculture will depend on what is commonly termed the 'carbon fertilisation' effect.

It has been suggested that rising concentrations in carbon dioxide could actually benefit agriculture, both by stimulating photosynthesis and decreasing water requirements.

According to Professor Lesley Hughes, speaking at the Our Declining Flora - Tackling the Threats Conference on the 21st-24th April 2008, however, extra carbon dioxide will not necessarily result in increased productivity because of other limiting factors such as nutrient or water availability.

Professor Hughes also believes that changes in plant 'architecture' will occur, causing a weakening of the root system. This will mean that it will be more difficult for trees to survive to maturity in future, as they succumb to more frequent extreme weather events.

According to Dr David Murray, scientist and conservationist, there will also be changes in seed composition. Not only will the seed protein content of cereal grains decline as atmospheric carbon dioxide increases, but the high quality proteins will be sacrificed.

What about Australia?

Australia is one of the many regions experiencing significant climate change as a result of greenhouse gas emissions. Climate change will continue to have economic, social and ecological impacts on Australia.

It has been predicted that annual average temperatures in Australia could increase. Rainfall changes will vary according to different regions, however, there is a likelihood that droughts will become more common. There is also a greater likelihood of more extreme weather events.

Although hard to precisely predict, and differing according to various regions, these changing climate patterns are likely to have a large impact on Australia's food supply if the situation is left unchanged and not effectively adapted to:

- Increases in carbon dioxide concentrations, temperature and projected changes in rainfall could have a significant impact on Australia's agriculture. According to the Center for Global Development, Australia's agricultural production will decline by between 16 and 27 per cent by the 2080s if climate change is left unchecked.
- ABARE has predicted that by 2030 Australia's wheat production could fall by 9.6 per cent. This, however, is dependent on the amount of precipitation in the future. Dependence on water by farming makes climate change a huge challenge. The agricultural sector uses more land and water than any other domestic industry.
- Heat stress can also have a detrimental impact on the health, growth and reproduction of livestock. Temperature increases could lead to reductions in milk production. Lower rainfall will also be detrimental to pastures which livestock rely on for food.
- Temperature fruits which need winter chilling to ensure normal bud-burst and fruit set will also be particularly vulnerable to climate change. Warmer winters as a result of global warming can reduce the accumulated chilling and subsequently lead to lower yields and reduced fruit quality.
- Projected warming will increase the ability of pests to survive winters, and accelerate the development of most of the species that are active in summer. Higher temperatures could also provide an increased opportunity for various viruses, parasites and bacteria to contaminate food. Global warming could potentially increase the incidence of infections and diseases caused by toxins.

- Australia's marine life is also susceptible to climate change. Climate change is affecting ocean temperatures, the supply of nutrients from the land, ocean chemistry, food chains and ocean currents. These will subsequently affect the abundance, distribution, breeding cycles and migrations of marine plants and animals, which many people rely on for food and income. Australia's coastal ecosystems, such as wetlands and estuaries, are also particularly vulnerable to climate change.
- Not everything will experience disadvantage from climate change, however. According to the CSIRO, global warming may actually help the production of some foods. It is predicted that areas such as sugar, wine and horticulture farms could benefit from the warmer temperatures.

Food prices and nutrition

Climate change has had a major contribution to higher food prices in Australia. In September 2007 the ABS found that consumers were paying 11.9 per cent more for basic food items than they were two years before. That is almost double the Consumer Price Index rise of 5.9 per cent during the period.

Higher food prices will continue to have an impact on Australia's food security. Those on lower incomes will be most vulnerable to higher prices. More households in Australia will experience hunger as a result of not being able to afford food.

Higher food prices are also likely to have an effect on our nation's overall nutrition. There is a concern that higher prices for fresh produce will force those on lower incomes to purchase lower quality, processed foods that already contribute to health issues such as diabetes and childhood obesity.

Effects on the economy

The Australian food industry is a vital part of Australia's economy. Climate change will therefore have an impact on Australia's economy.

The Australian Greenhouse Office's report on Risk and Vulnerability (2005) has provided an assessment of the potential economic losses to the agriculture sector:

- drought reduction in pasture growth could cause an $8 billion loss in annual export earnings
- fruit and vegetable crops — lost earnings of $2 billion annually
- perennial horticulture losses due to higher water demand and other costs to potentially reach $2 billion per annum
- annual broadacre crops — lost production in marginal areas worth as much as $8 billion.

Global Implications

It is clear that climate change has had major impacts on global food security, and if left unchanged will continue to affect the nutrition and hunger of those in Australia and around the world.

Globally, it is estimated that 800 million people are experiencing hunger (about 12 per cent of the world's population) and malnutrition causes around 4 million deaths annually, almost half in Africa.

According to one study, temperature rises of 2 or 3 degrees C will increase the number of people at risk of hunger, potentially by 30-200 million (*The Stern Review*). With the world population predicted to increase steadily in the years to come, the situation could become much worse if nothing is done about the situation.

The implications of climate change are far-reaching:

- malnourishment can have large impacts on the growth and development of a person in all stages of their life
- increasing hunger is also likely to result in a mass movement of environmental refugees
- it could also create civil unrest with food riots and war.

Solutions?

Delegates to the Rome Food Summit, held on 3-5 June 2008, announced their increased commitment to the fight against hunger and for agricultural development. A total of US$18.36 billion has been committed to global food security and agriculture this year.

But what can you do to help?

One way you can help to increase food security is by maintaining a home garden and growing your own food.

The United Nations Food and Agriculture Organisation is a firm supporter of home gardens and has stated that they "have an established tradition and offer great potential for improving household food security and alleviating micronutrient deficiencies."

Home gardening can increase food security through:

- direct access to a diversity of nutritionally-rich foods
- increased purchasing power from savings on food bills and income from sales of garden products
- fall-back food provision during seasonal lean periods.
- it is also an easy way to ensure access to a healthy diet.

Here are some simple things **YOU CAN DO:**

- take public transport, walk, ride a bike or carpool
- turn lights off when not needed
- switch off appliances at the power point
- save water by taking shorter showers and installing an energy efficient showerhead
- recycle and minimise waste
- set up a worm farm to recycle food wastes and supply fertiliser to your garden
- purchase carbon offsets.

You can also support organic agriculture. The FAO believes that organic agriculture can address local and global food security challenges.

Organic agriculture offers an alternative food system that improves agricultural performance to better provide access to food, nutritional adequacy, environmental quality, economic efficiency and social equity. It is thus not only good for you but better for the environment as well.

Additionally, you can help address the global food crisis by supporting policies which aim to reduce Australia's greenhouse gas emissions.

You can also help by personally reducing your own greenhouse gas emissions and carbon footprint. You don't have to make large sacrifices or need a lot of money to do this.

If we all join in to stop climate change we can still reduce the detrimental impact it has on our food production. It is not too late.

REFERENCES

- United Nations Food and Agriculture Organisation (2007); *Climate Change: Implications for Food Security*
- Intergovernmental Panel on Climate Change (2007) Fourth Assessment Report
- Stern. N (2006); *The Economics of Climate Change: The Stern Review* (Cambridge)
- CSIRO (2001); *Climate Change: Impacts for Australia*
- *Africa: Can Crops be Climate-Proofed?* http://allafrica.com/stories/200801110527.html
- Preston B.L and Jones R.N (2006); *Climate Change Impacts on Australia and the Benefits of Early Action to Reduce Global Greenhouse Gas Emissions*; CSIRO
- Centre for Global Development (2007); *World Agriculture Faces Serious Decline from Global Warming*; http://www.cgdev.org/content/article/detail/14404
- Australian Greenhouse Office (March 2005); *Climate Change: Risk and Vulnerability – Promoting an Efficient Adaptation Response in Australia*
- Australian Bureau of Agricultural and Resource Economics (2007); *Climate Change Impacts on Australian Agriculture*
- United Nations Food and Agriculture Organisation (2007); *Improving Nutrition Through Home Gardening*
- United Nations Food and Agriculture Organisation, El-Hage Scialabba. N (2007); *Organic Agriculture and Food Security.*