Adaptation

The aim of this activity is to envision how you and our communities can cope with the impacts of rapid climate change. You will create a story, from now until the year 2050, of events that have occurred that helped your community adapt to expected change.

Time

One hour

Tools

- Your imagination
- Coloured pencils
- Blank paper

Some places are more prepared for climate change than others, Lady Elliot Island, QLD, Australia.

Background

Adaptation is the process by which we as individuals and a society will increase our chance of survival in response to an altered environment. It is how people, and governments, cope with the effects of rapid climate change on both regional and local scales.

The global efforts to reduce our carbon emissions will, in all probability, still commit us to a minimum 2-3°C increase in average global temperature by 2100, leaving us no choice but to adapt. Extinctions of plant and animal species will occur, permanently altering our landscapes as deserts expand, glaciers melt and sea levels rise. A growing population of 6.8 billion people rely on these natural ecosystems to survive. The developing countries near the equator, whose incomes depend on climate-sensitive industries such as agriculture, fishing and tourism, have increased risk of disease, extreme heat and drought conditions. Given that the impacts of climate change will be unevenly distributed, specific agreements must be in place to share skills and resources across the world.

Every region will have different needs. Those living in urban coastal areas will learn to address sea-level rise, while farming regions deal with water supplies under threat due to the increased intensity and frequency of drought conditions. All adaptation measures will cost money and limits will be placed on the amounts of where,

when and how it can actually be spent. The potential for civil unrest may trigger some of the largest human migrations in history as many people become unintended environmental refugees.

The most likely trigger that will drive the large-scale changes necessary, in both mitigating our carbon emissions and the adaptation measures needed to cope, is the clear and present dangers of very real and increasingly life-threatening disruptions to our daily lives. The vast array of options and measures that are available to us now will steadily diminish with each passing year as we move towards the verge of dangerous climate change.
The legacy that the leaders of today leave behind through their decisions will be judged by those left to cope with the consequences.

Classroom activity

1. During this activity you will create a story board based on events occurring now and into the future, finishing with a headline from your local newspaper in the year 2050 that reads 'Town Saved from Climate Change threats'.
2. Imagine the events that have taken place in the world and your town for this to happen (you can imagine it as a person growing up in your neighbourhood, or as if you are a political leader).
3. Record the big events on a story board with a picture, one sentence caption and the year they take place.
4. You should include in your story:
   a. the main challenges that would face your region from rapid climate change (use the list provided as a starting point and also think up your own)
   b. large changes that have occurred to the environment, the economy and to society
   c. local and global events or ideas that might have motivated people to make big adjustments in their lives
5. When creating your story, think about the following:
   a. how people could be convinced that human-induced climate change is happening
   b. how a target for atmospheric carbon levels was reached
   c. if there are any people that are likely to migrate to or away from your area
   d. there will be an extra 3 billion people on the planet
   e. where you get your food from
   f. how energy is generated
   g. what new inventions and structures may exist

Teacher Hint
Laminate 'Adaptation measures' for use in the classroom.

Worksheet

Below are the just some of the choices that our political leaders and planners will have to confront, now and into the near future. While each category has been presented as a separate set of circumstances and the possible actions that will need to be taken into the future, it is important to remember that these situations can interact and in some cases, magnify one another. The decisions become more perilous and involve a heightening of a nation's moral, ethical and economic challenges as the impacts of climate change, coupled with other factors, begin to be felt.

Adaptation measures

Pushing against the sea

Preparing for increasing sea level and storm surges

- Planning laws and increased insurance premiums restrict coastal developments and the purchase of low lying real estate
- New building standards incorporate enhanced structural support, raised decking and water tolerant foundations or moveable dwellings
- New and high value settlements and productive land protected behind extended sea walls and dyke systems or roads are replaced by canals
- Low energy desalination plants replacing freshwater sources now contaminated by salt water
- Evacuation, relocation and assistance for low lying countries such as the Maldives and Tuvalu

Not a drop to drink

Preparing for drought and water shortages

- Water restrictions and higher water costs applied to all urban areas
- All industrial processes, except food production, switch to secondary water
- Desalinated seawater, recycled treated sewage water and storm water increasingly added to current drinking water supplies
- Selective abandonment of regions under severe water stress that can no longer be sustained with migrations of people towards water sources and main cities to reduce transport costs

Food on the table **Preparing for shifts in productive land**

- Improved weather forecasting services allow for shifts in planting times
- Banning inefficient irrigation practices, enforcing best farming practices and using native drought, disease and heat tolerant crop strains to improve yields
- Diversification of farm incomes through the integration of agro-forestry that support native species, reduce erosion and provide additional economic benefits through carbon capture
- Relocation of agricultural activity into more productive areas or reductions in exports and a movement towards self-sustainability

Adaptation measures

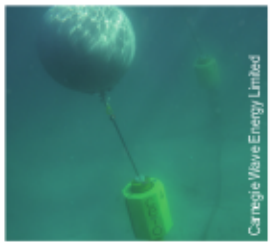
How's your health?

Preparing for diseases and heat stress

- Improvement in sanitation, education and the availability of clean, fresh drinking water for developing countries
- Increased monitoring and international cooperation to reduce the spread of tropical and novel infectious disease outbreaks
- Green-scaping cities and lifestyle changes to reduce the heat island effect and deaths due to heat stress
- Emergency response plans to deal with large scale climate induced disasters and evacuation

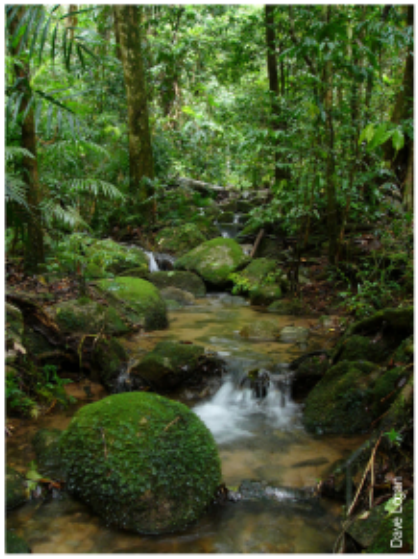
Infrastructure **Preparing for fossil fuel shortages and stress on infrastructure**

- Create smart power grids that switch on demand between a number of sources of energy (coal fire, nuclear, biomass, wind, wave, solar)
- Increase in resilience of road, rail and power infrastructure to prolonged temperature extremes with increased monitoring for degradation
- Deconstruction, removal and recycling of infrastructure such as power, water, sewer and communication networks for those areas that are deemed non-recoverable from the effects of climate change



Life in the corridor **Preparing for migrating species**

- Quantifying the value of forests as 'carbon reserves', assisting developing countries to reduce tropical deforestation and support for afforestation projects to reduce rates of desertification
- Establishment of large scale terrestrial and marine peace parks and wildlife corridors to enable the shift of organisms across habitat fragments and political boundaries
- Fire shelters and evacuation corridors for communities at risk from increasingly frequent wild fires



Storyboard

2010: Climate change basics and sustainability included in all schools.

Town Saved From Threats of Climate Change

Questions

1. Why do we need to adapt to climate change?
2. Predict what the most likely adaptation challenges are as a result of climate change for your community, state and country in the medium and long term.
3. Why is it important that we plan adaptation strategies?
4. Discuss what the key priorities for adapting to climate change should be, ranking these in order from highest to lowest. Justify the reasoning behind your decisions for the priorities.
5. Find out who is developing a climate change adaptation plan or project in your region and provide a summary of these activities.
6. What are the impediments that are presented to us for adapting to climate change?
7. What is mal-adaptation?
8. Discuss the risks of mal-adaptation to climate change.
9. Evaluate the potential difficulties that face political leaders in the decisions on adaptation measures.
10. How are the millennium development goals important in adapting to climate change?

Research projects

1. Are zoos and seed banks an adequate way of protecting species against climate threats?
2. Can we confidently link ecological change with social and economic consequences? Discuss, giving examples.
3. Using the Royal Society report on Geo-Engineering, assess some of the potential consequences of moving down this path.
4. Should our focus on adaptation be on simply addressing the local threats?
5. Evaluate the consequences of choosing not to adapt.

References

Reid et al. (2009) Coral Reefs and Climate Change: The guide for education and awareness. CoralWatch, The University of Queensland, Brisbane. (See Path to Success page 186 and Changing the Globe page 222)

Millenium Development goals; www.un.org/millenniumgoals/
Intergovernmental Panel on Climate Change (IPCC); www.ipcc.ch
Shifting Baselines; www.shiftingbaselines.org
Global Change Institute; www.gci.uq.edu.au
Global Environment Facility; www.gefweb.org
Local Governments for Sustainability (ICLEI); www.iclei.org
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Department of Climate Change - Australian Government; www.climatechange.gov.au
Global Carbon Capture and Storage Institute (GCCSI); www.ret.gov.au
COP15 United Nations Climate Change Conference Copenhagen 2009; http://en.cop15.dk/frontpage
The Royal Society http://royalsociety.org/