ZERO REGIONAL ENVIRONMENT ORGANISATION (ZERO)

The climate change and natural disasters

BY Wellington Madumira

THE CLIMATE CHANGE PROBLEM

Definition:

Causes

Impacts

International Climate change debate

What can be done

Meet an Ice Core Scientist

What's the difference?

GLOBAL WARMING

Is the increase of the Earth's average surface temperature due to a build-up of greenhouse gases in the atmosphere.

CLIMATE CHANGE

Is the long-term changes in climate, including average temperature and precipitation. It recognizes that, although the average surface temperature may increase, the regional or local temperature may decrease or remain constant.

The Greenhouse Effect

The Earth is surrounded by a thin layer of gasses we call greenhouse gases. These gases are what make up our atmosphere.

Source: NASA

What are greenhouse gases?

Any gases that cause the "greenhouse effect!"

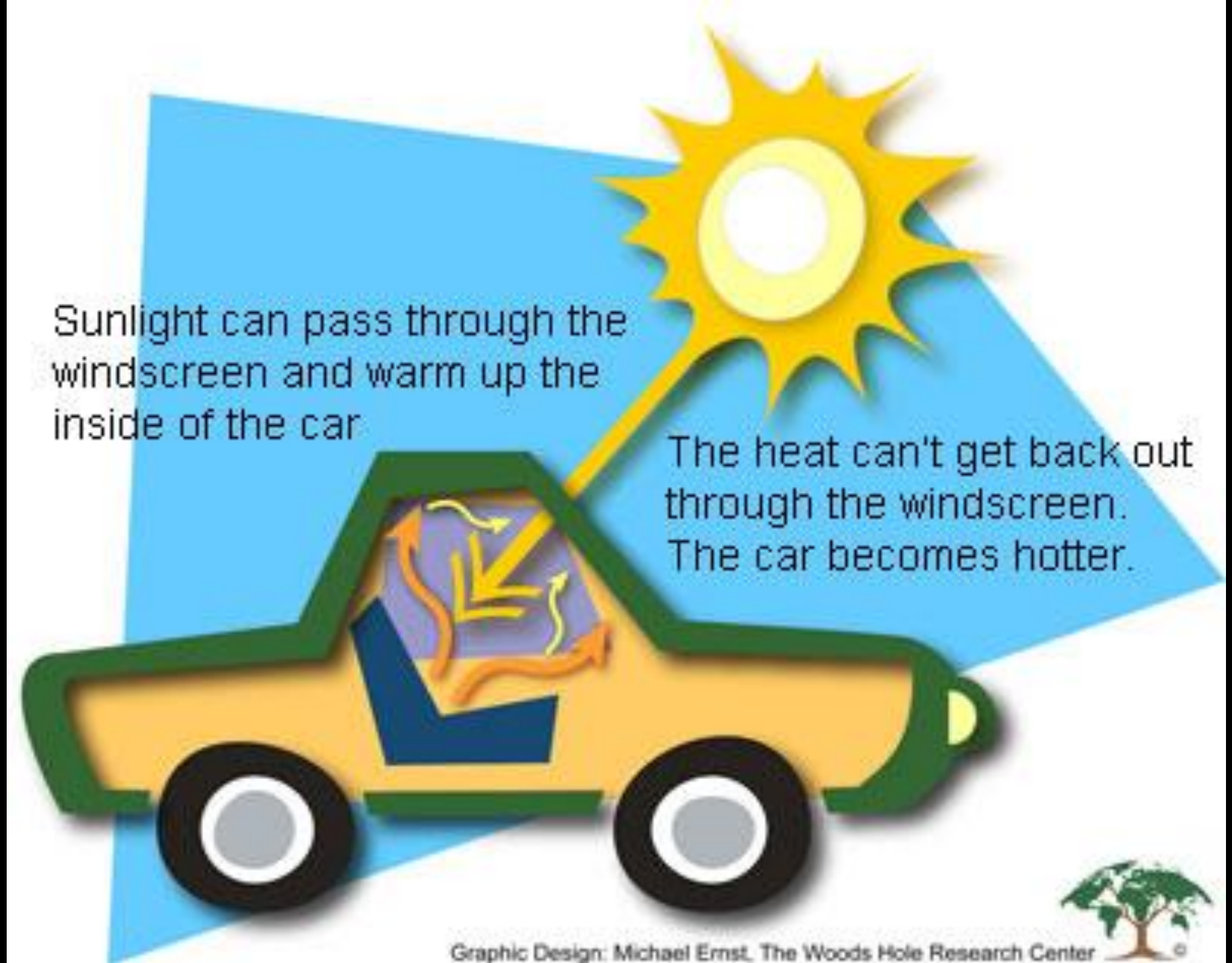
water vapor

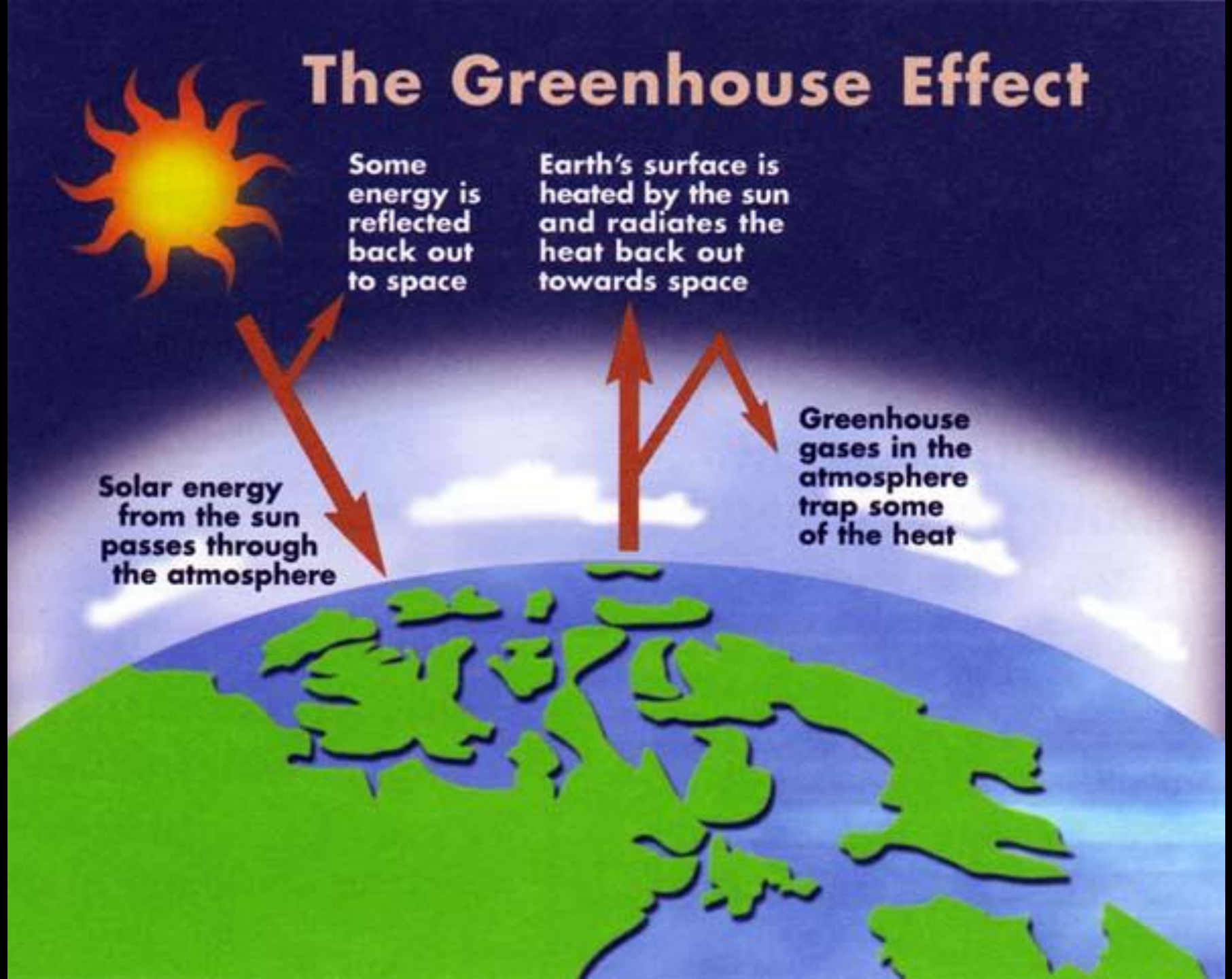
methane

carbon dioxide

nitrous oxide

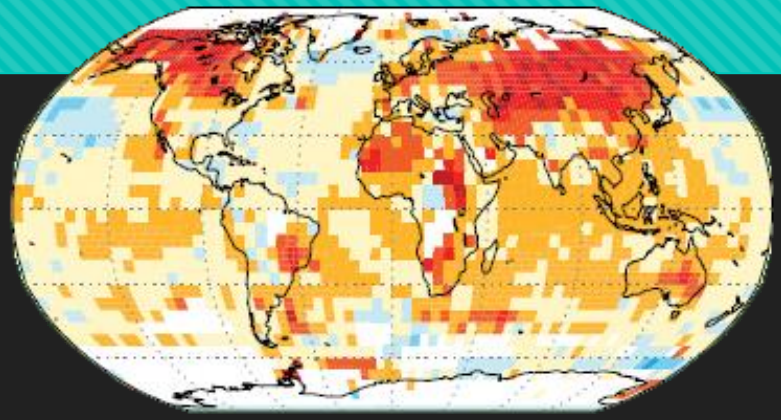
Imagine… a car on a cool but sunny day…


Sunlight can pass through the windscreen and warm up the inside of the car
The heat can't get back out through the windscreen. The car becomes hotter.
Graphic Design: Michael Ernst, The Woods Hole Research Center ©


The Greenhouse Effect
Some energy is reflected back out to space
Earth's surface is heated by the sun and radiates the heat back out towards space
Greenhouse gases in the atmosphere trap some of the heat
Solar energy from the sun passes through the atmosphere

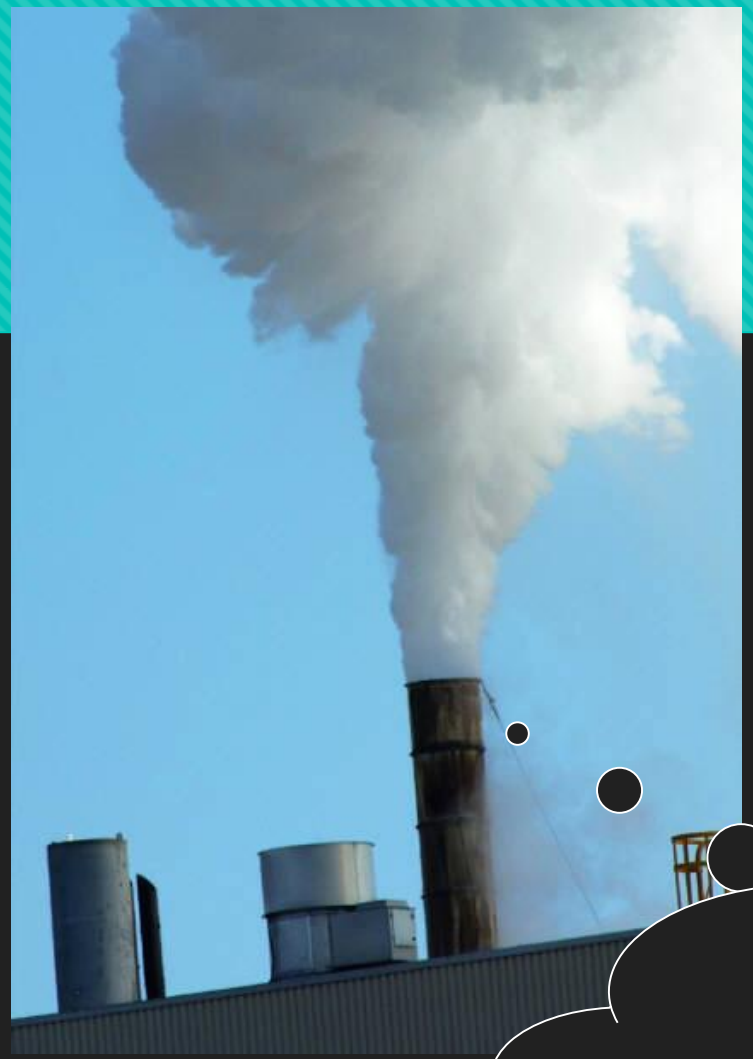
The Climate is Changing

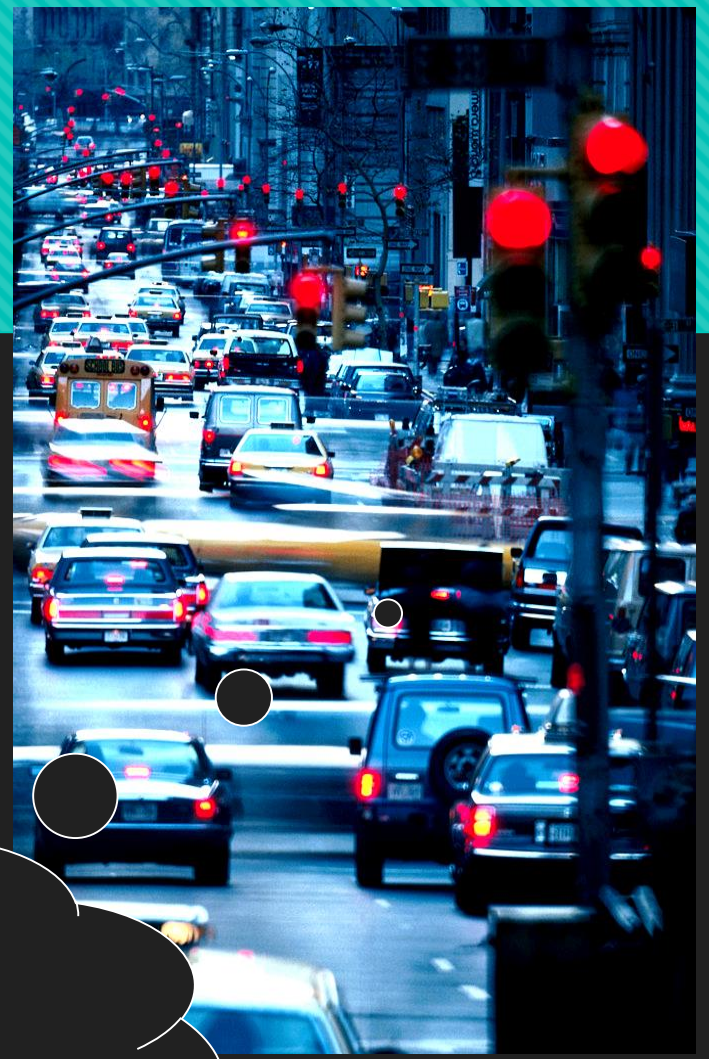
- Temperatures are rising
- Sea levels are rising
- The ocean is acidifying
- Climate change is reflected in water cycle changes and in extreme weather



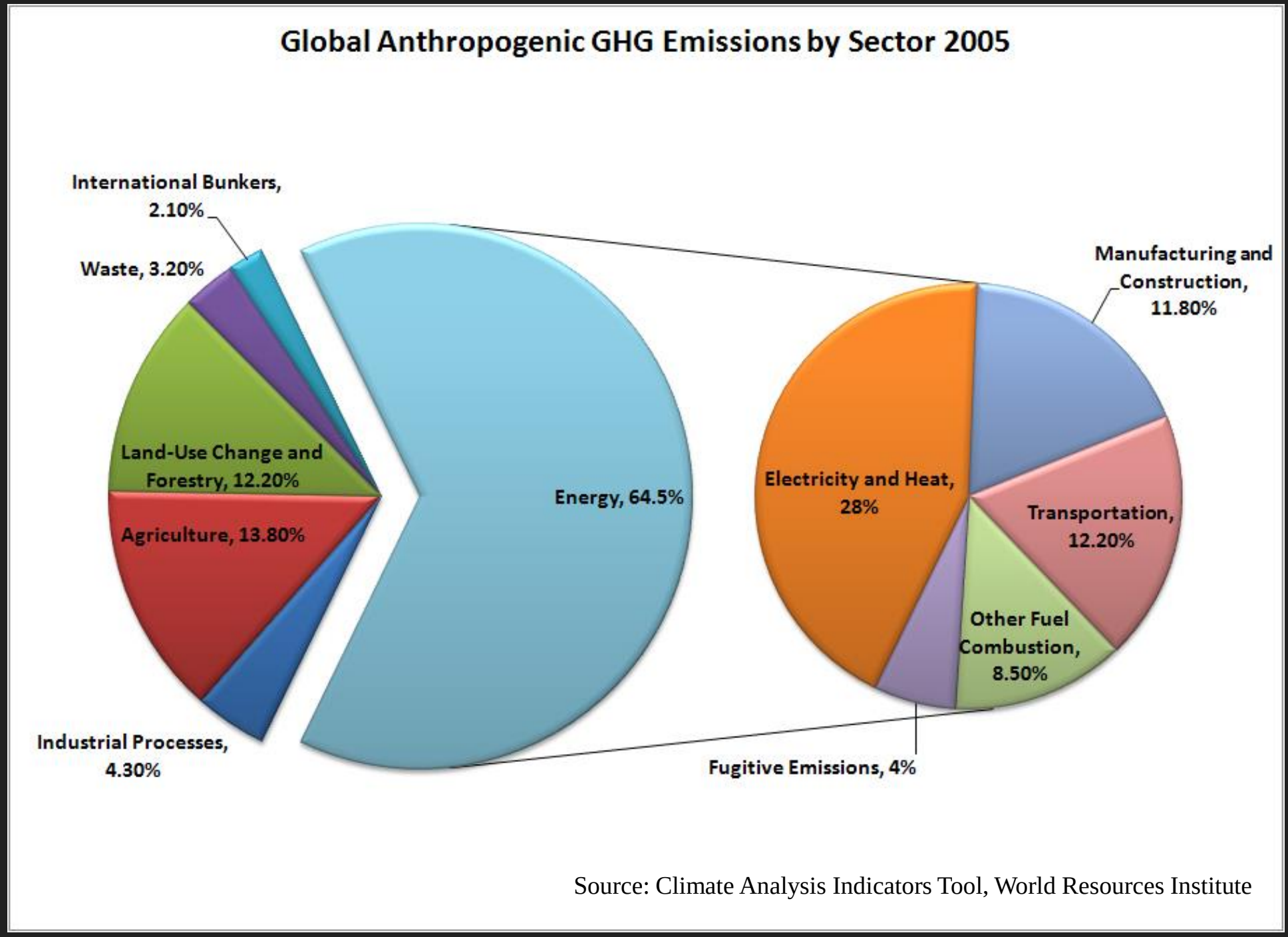
Temperature rise, indicated by color (red=higher rate of increase). Earth's surface temperature has risen ~1.3˚ F since 1850.

Image courtesy of the Joint Institute for the Study of the Atmosphere & Ocean, U. of Washington.

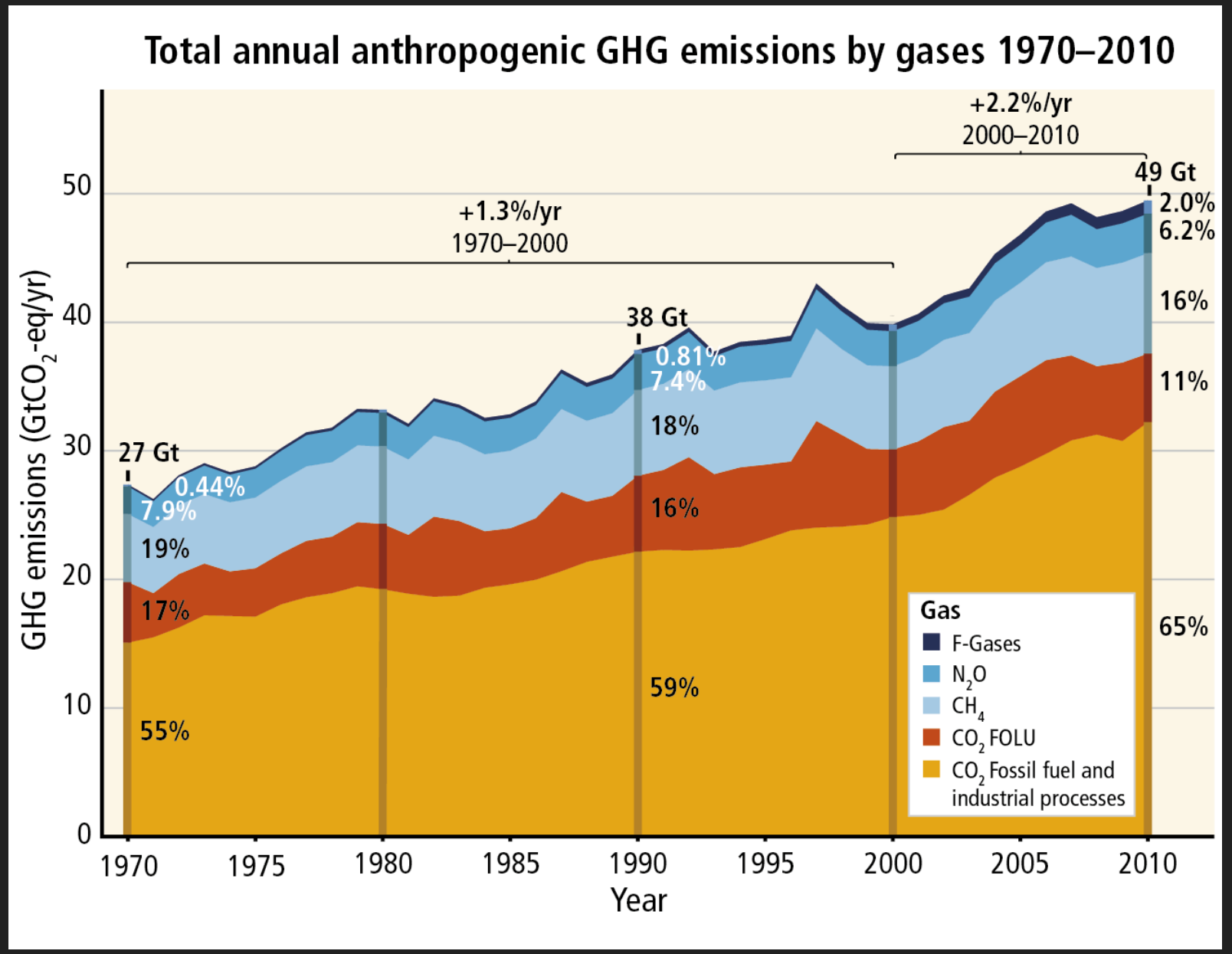




Pollution from coal, natural gas, and oil



Source: Climate Analysis Indicators Tool, World Resources Institute


Total annual anthropogenic GHG emissions by gases 1970–2010
GHG emissions (GtCO2-eq/yr)
Year
+1.3%/yr
1970–2000
+2.2%/yr
2000–2010
27 Gt
38 Gt
49 Gt
0.44%
7.9%
19%
17%
55%
0.81%
7.4%
18%
16%
59%
2.0%
6.2%
16%
11%
65%
Gas
F-Gases
N2O
CH4
CO2 FOLU
CO2 Fossil fuel and industrial processes
0
10
20
30
40
50
1970
1975
1980
1985
1990
1995
2000
2005
2010

THE NATIONAL ACADEMIES
National Academy of Sciences
National Academy of Engineering
Institute of Medicine
National Research Council

Climate change Impacts

Living things are intimately connected to their physical surroundings.

Ecosystems are affected by changes in:

- temperature
- rainfall/moisture
- pH

GLOBAL PROBLEM-LOCAL IMPACTS







Impact of Climate Change

prolonged wet, hot, and dry weather conditions affect the efficient use of their resources and investment decisions

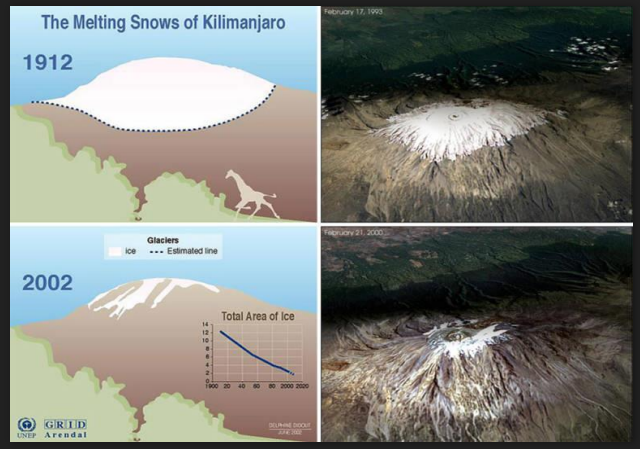
Climate change in Africa

- In the period 2000-08, Africa accounted for over 20% of all the weather and climate-related disasters that occurred globally (UNISDR, 2011)

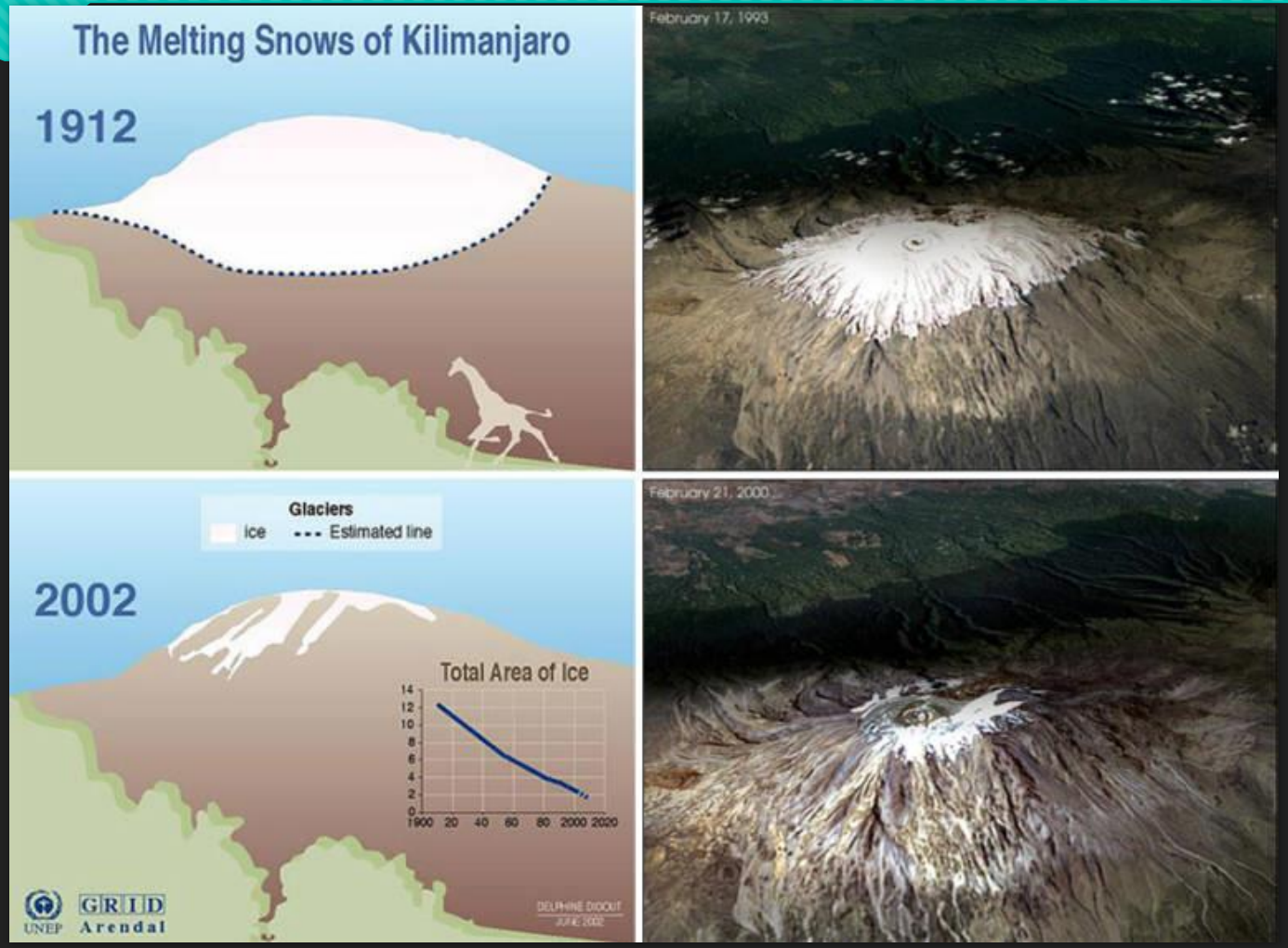
  In the last thirty years, 7 out of the 10 worst drought disasters in the world have taken place in sub-Saharan Africa.

  The number of people exposed to floods in the region grew from 500,000 in 1970 to almost 2 million people per year in 2010 (UNISDR, 2011)

  Zimbabwe is particularly vulnerable due to its heavy dependence on rain-fed agriculture and climate sensitive resources (Chagutah, 2010).



Mt Kilimanjaro Melting



Climate Change in Zimbabwe

Zimbabwe's 5 agro-ecological zones

Rainfall patterns & crop production progressively deteriorate from region I-V.

E.g. Chinhoyi , Chibero & their surroundings have shifted from natural region II to natural region III

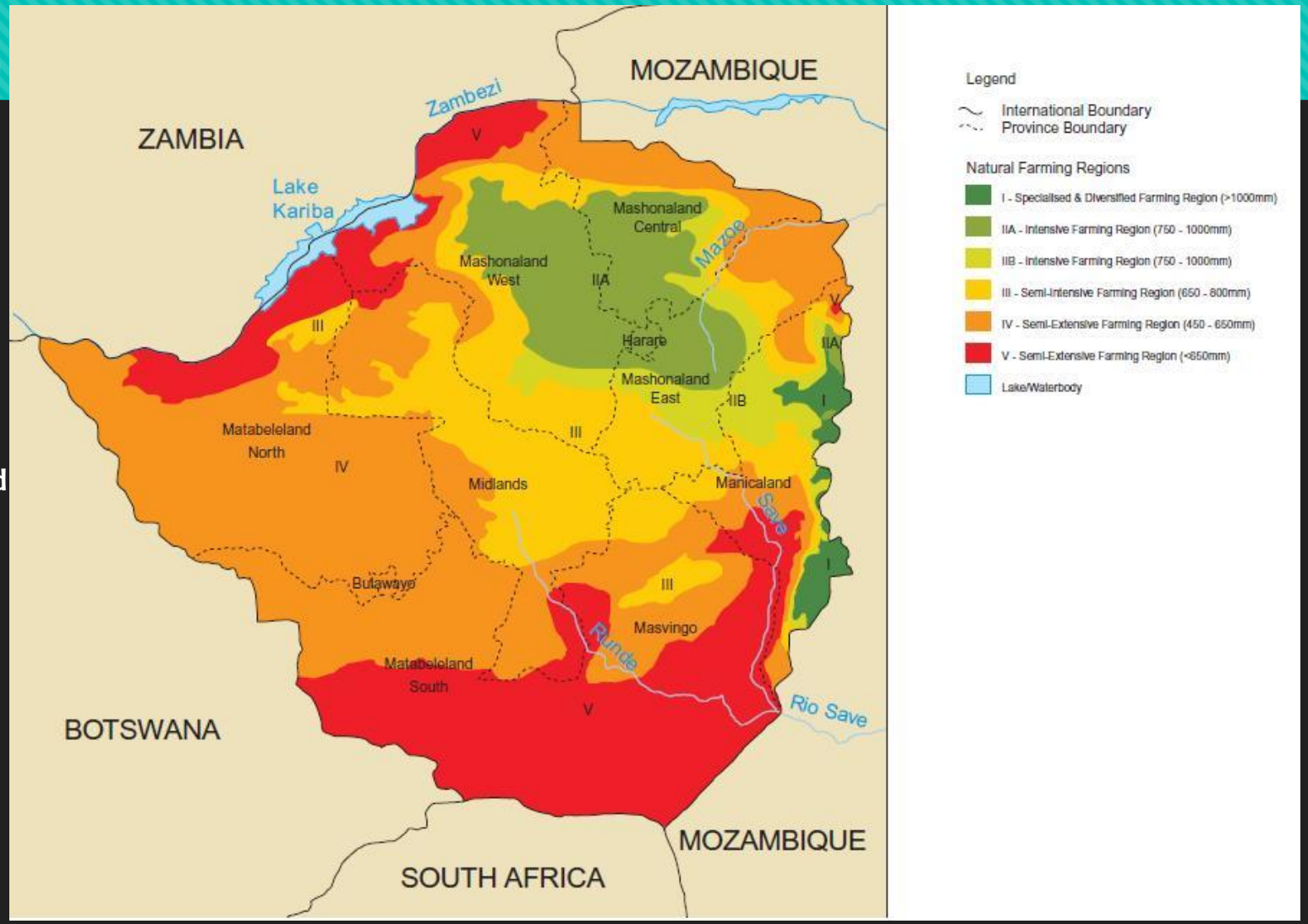
Kwekwe and its surroundings have shifted from natural region III to natural region IV.

In addition, natural region I has reduced in size,

Natural region II has shifted further east and,

natural region III has shifted to the north.

Overall, the climate in Zimbabwe is regionally differentiated, but is generally becoming warmer with more erratic rainfall patterns.



(IIED, 2012)

Impacts

- crop damage
- death of livestock
- Less or too much rainfall leading to soil erosion
- bush fires as a result of prolonged heat
- poor plant germination
- Pests
- lower incomes
- deterioration of infrastructure

Effects on Human Health

Disease	Vector	Present Distribution	Likelihood of Distribution Changes with Climate Warming
Malaria	Mosquito	Tropics, subtropics	Highly likely
Dengue fever	Mosquito	Tropics, subtropics	Very likely
Schistosomiasis	Water snails	Tropics, subtropics	Very likely
Yellow fever	Mosquito	Tropical South America and Africa	Very likely
Onchocerciasis	Blackfly	Africa, Latin America	Very likely
Lymphatic filariasis	Mosquito	Tropics, subtropics	Likely
Leishmaniasis	Phlebotomine sandfly	Asia, southern Europe, Africa, Americas	Likely
American trypanosomiasis	Triatomine bug	Central and South America	Likely
African trypanosomiasis	Tsetse fly	Tropical Africa	Likely
Dracunculiasis	Copepod	Central and West Africa	Unknown

Source: From Table 4.21 in *Health and Environment in Sustainable Development: Five Years After the Summit*, World Health Organization (1997), and based on an unpublished assessment prepared by A.J. McMichael et al.

Effects on Agriculture

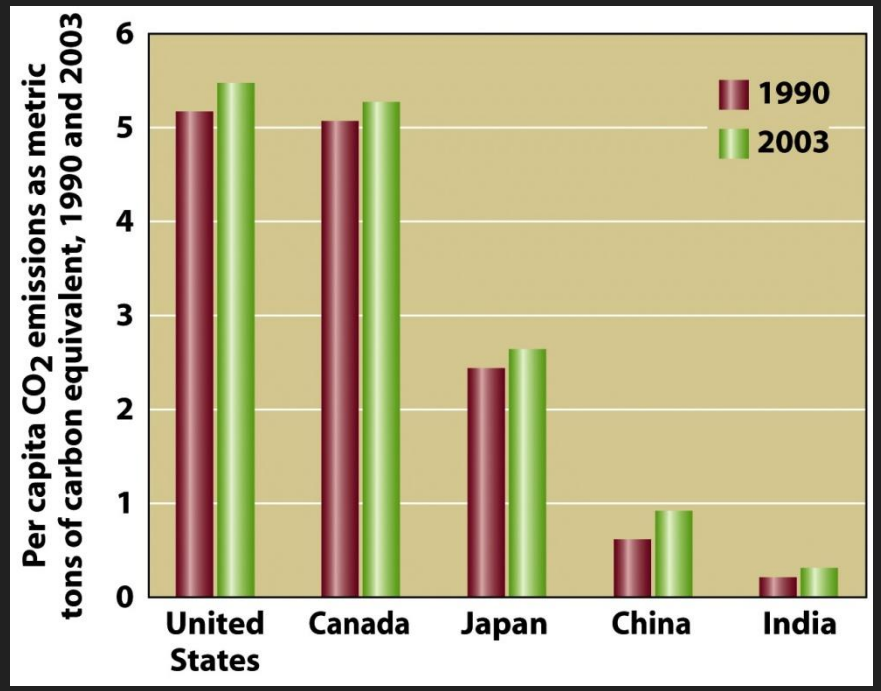
- Difficult to anticipate
  - Productivity will increase in some areas and decrease in others
- Rise in sea level will inundate flood plains and river valleys (lush farmland)
- Effect on pests is unknown
- Warmer temperatures will decrease soil moisture- requiring more irrigation
- Location (i.e. elevation and altitude) where certain crops can be grown may have to change

Evidence of climate change

- High frequency and severity of droughts and flodding
- excessive precipitation
- drying up of rivers, dams and wells
- changes in timing and pattern of seasons

International Implications of Climate Change

- Developed vs. Developing countries
  - Differing self-interests
  - Differing ability to meet the challenges of climate change



Talanoa dialogue

- To increase their climate pledges "fivefold: five times more ambition, five times more action" in a bid to meet the 1.5C target by 2100
- Countries such as the US, Japan, China, did not support
- countries such as Canada, Ukraine and Jamaica support

Paris rulebook agreed

- Implementation of the Paris Agreement on climate change is in limbo as developed countries remain noncommittal to financial obligations
- developed world were shifting goals to put the burden of financing the implementation of the Paris Agreement on the private sector

Climate finance reporting Article 9

- United States, which is considered to be one of the main polluters of the environment, pledged to deposit three billion dollars to the GCF. Under former President Barrack Obama's administration, the country delivered one billion dollars. But since President Donald Trump assumed power he has rejected the agreement, adding that climate change is a hoax/joke
- On the first day of the COP, the World Bank announced positive news, doubling its climate finance, putting $200 billion (€176 billion) towards climate finance in the coming five years for developing countries

- The language under both parts is relatively permissive, with countries allowed to report the full value of loans as climate finance, rather than the "grant-equivalent" portion of the total.

Adaptation fund

- **Germany made a €70m** contribution to the Adaptation Fund, while smaller pledges from the likes of **France, Sweden, Italy and the EU** raised the total to **$129m** – a record annual fundraising for the fund.
- **Germany** also became the first country to announce a concrete amount for the **Green Climate Fund (GCF)**'s replenishment round, offering €1.5bn – double the amount of its previous contribution in 2014. Norway also pledged **$516m** to the GCF, while Japan said it would consider more funding once the replenishment process officially starts in 2019. Japan also put forward diplomat Kenichi Suganuma to be the next head of the GCF, due to be selected in February. **The GCF has so far received only $7bn of the $10bn promised to it in 2014** due both to the US reneging on part of its $3bn pledge, as well as changes in exchange rates from donor country currency to US dollars.

- The World Bank, announced $200bn for its 2021-2025 climate investment programme, which doubles the $100bn given to its previous five-year investment plan up to 2020. Half the total will come directly from the bank, equal shares of this going to mitigation and adaptation. The remaining $100bn will come from other parts of the World Bank group and “mobilised” private capital

What wasn't agreed?

- Largely absent from these talks, which had a technical focus, was the key question of how countries will step up their targets on cutting emissions. On current targets, the world is set for 3C of warming from pre-industrial levels, which scientists say would be disastrous, resulting in droughts, floods, sea level rises and the decline of agricultural productivity.

When will that be agreed?

- The key deadline is 2020, when countries must show they have met targets set a decade ago for cutting their emissions, and when they must affirm new, much tougher targets.

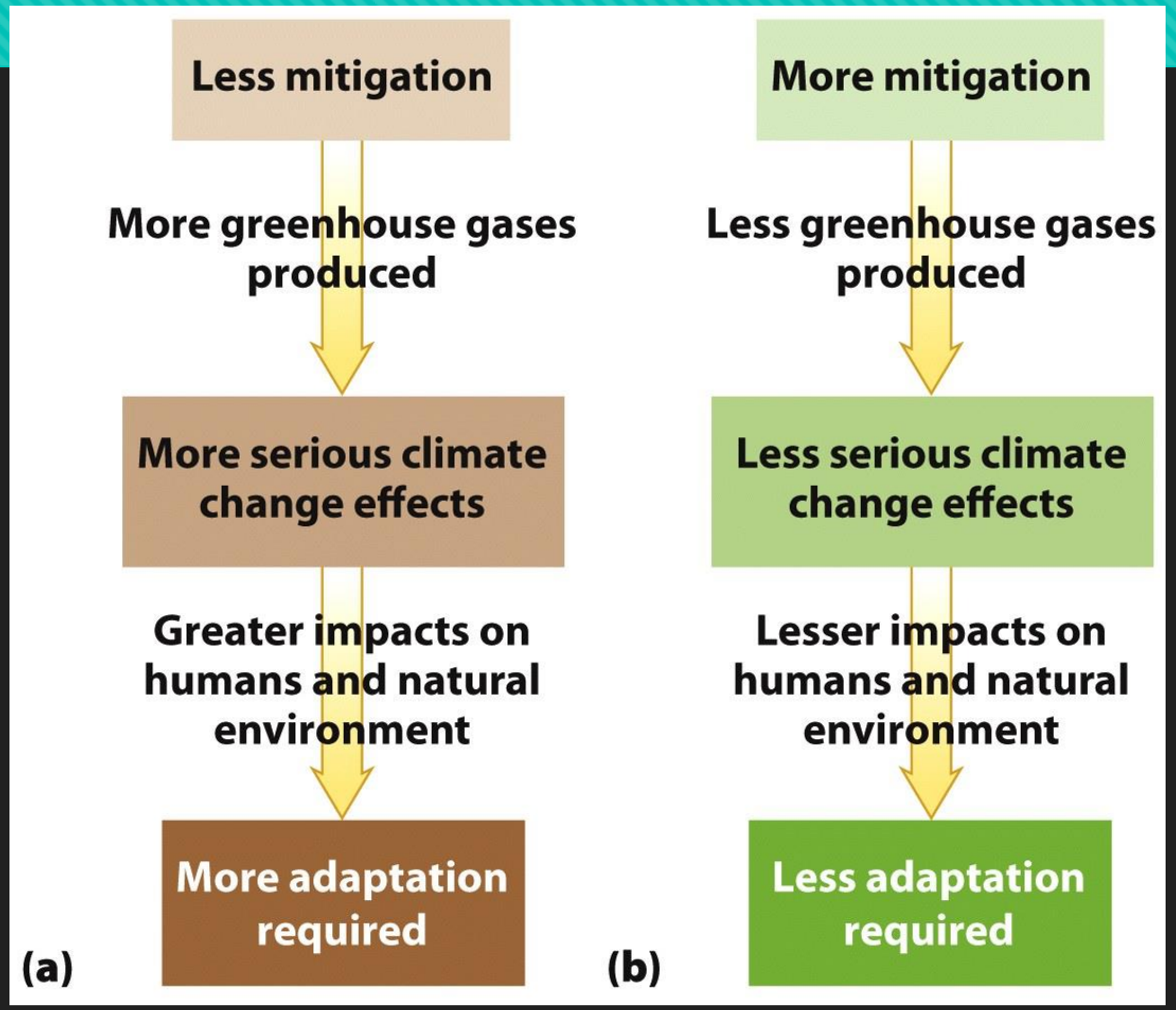
What does the science say?

- allowing warming to reach 1.5C above pre-industrial levels would have grave consequences, including the die-off of coral reefs and devastation of many species.

Dealing with Global Climate Change

- To avoid the worst of climate change, CO_2 levels must be stabilized at 550ppm
  - 50% higher than current levels
- Two ways to attempt to manage climate change
  - Mitigation
    - Focuses on limiting greenhouse gas emissions to moderate global climate change
  - Adaptation
    - Focuses on learning to live with to the environmental changes and societal consequences brought about by global climate change

Dealing with Global Climate Change- Relationship Between Mitigation and Adaptation



Dealing with Global Climate Change- Mitigation

- Locate/invent alternative fuels to fossil fuels
- Increase efficiency of cars and trucks
- Sequestering carbon before it is emitted
- Plant and Maintain trees to naturally sequester carbon

Adaptation strategies

- strengthening and improving indigenous land
- Ensuring good water management practices
- use of decision support tools such as seasonal weather forecast data and early warning systems
- growing drought resistant crops
- improving indigenous animal breeds
- development of irrigation infrastructure

Reactions by CSOs

- Access to adequate, timely and unconditional climate finances forms the basis upon which climate action can be undertaken. The finance mechanism origin dates back to 2009 when a 100-billion/year fund was announced to support developing countries, but nine years later the total contribution represents but a fraction of the actual funding needs
- The definition of climate finance should exclude loans that are provided to developing countries as they promote perpetual debts of future generations but rather should be limited to loans provided in line of the $100 billion per year by 2020 commitment.
- Biggest polluters should contribute what they pledged and the finance should reach the intended beneficiaries.
- Need to have clear, concrete targets and roadmaps on climate finance

- Disbursed climate finances should not be clear on what we really need in order to adapt.
- Developing countries needs support as grants not loans
- Receivers of climate finances should be given opportunity to prescribe needs for those finances

Recommendation

- Real action to prevent climate change, clearly already underway, will not emerge from the UNFCCC hallways – multilateral efforts have proven to be flawed.
- Our climate is now dependent on real action at national and subnational levels, with citizens demanding climate justice
- Clean energy is developing at a faster pace than expect and at a cheaper price. However, its adoption must be speeded up, in order to be able to cut down emissions and meet the established targets by 2020.

- Adaptation should take into consideration ecosystem based adaptation and community based adaptation
- There is need of capacity building for communities to understand REDD+ issues since the REDD+ program is not well understood

THANK YOU TINOTENDA SIYABONGA