The Environment and Social Security

ASEAN Social Security Association Board Meeting
October 17, 2007
Heritage Hotel, Pasay City

" If the future of the human race is to be safeguarded, its manner of dealing with the environment must change drastically …… and ..... if the human race continues to ignore this fact, its improved health and well being will not be an attainable goal."

WHO Commission on Health and Environment

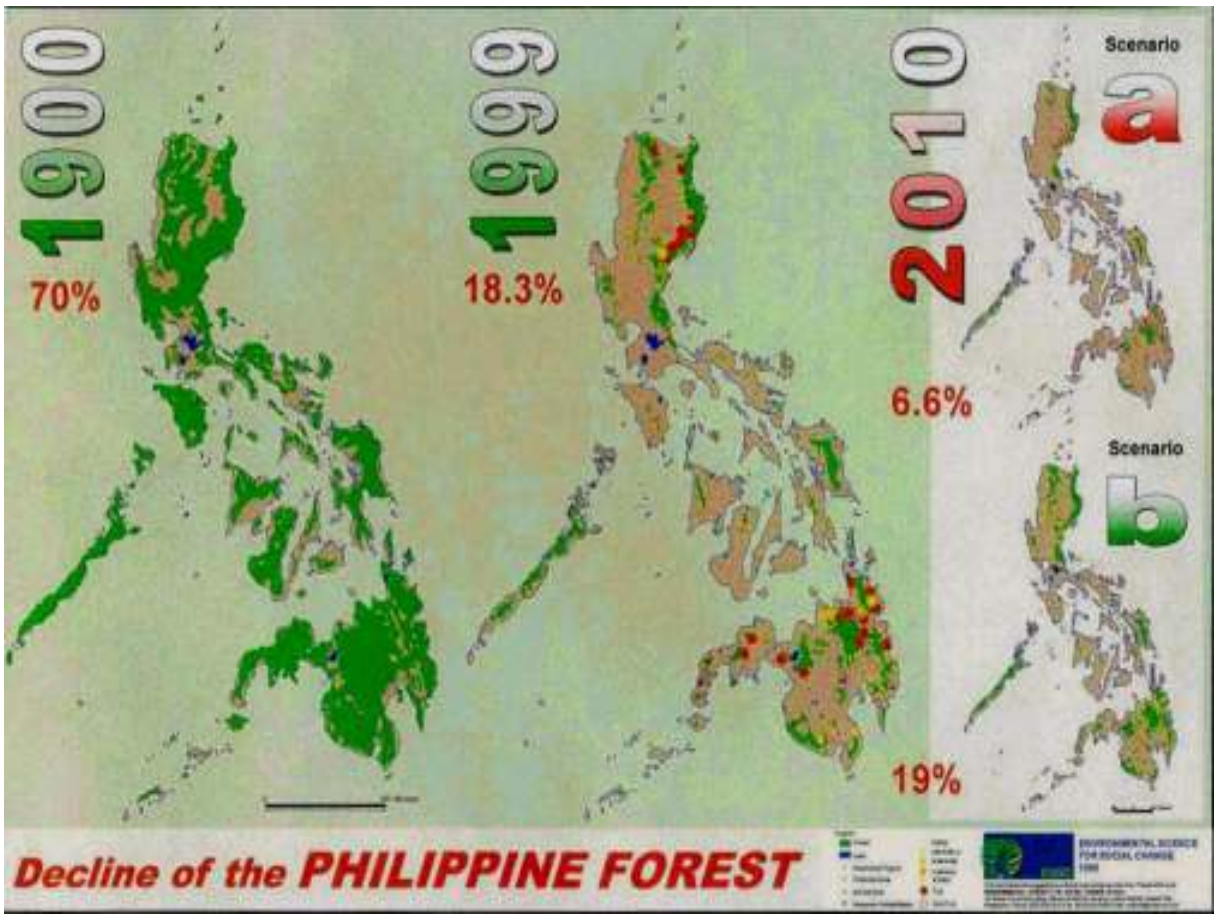
Background

- Asia has had highest economic growth from 1960-2000 – the only developing region which sustained per capita income growth in the 1980's
- Forecasted to increase in new millennium with China, India, Thailand & Vietnam taking the lead
- Economic growth coupled with high population growth
  - accounting for 65 % of population of developing countries in the world
  - accounting for more than half of the world's population

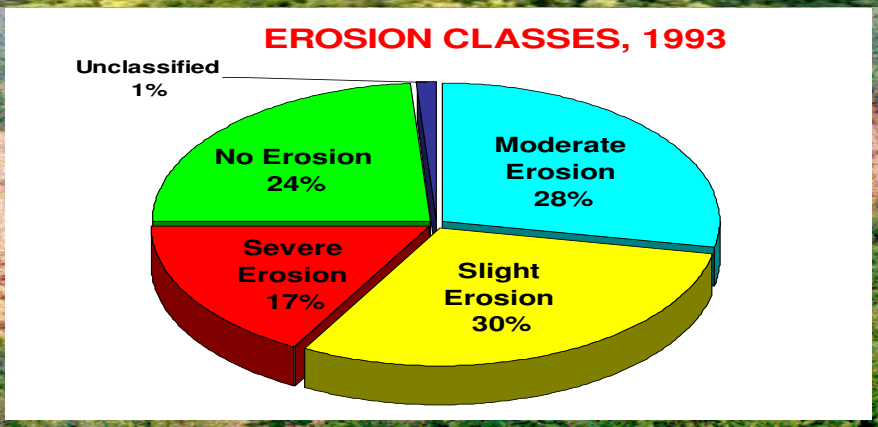
Rapid Urbanization + Industrialization are largely unplanned and uncontrolled

- Inability to cope with increasing demand for clean water & sanitation
- Inadequate housing leading to proliferation of informal settlements
- Limited mass transit system have led to traffic congestion which in turn means more emissions
- Inadequate solid waste collection and disposal capacity
- Very limited wastewater and hazardous waste treatment
- Conversion of forest lands and mangrove areas to other uses

Much of the virgin forests have been lost



- Loss of habitat for flora and fauna
- Loss of trees in watersheds = lack of water impounding capability
- Soil erosion which affects productivity of our lands
- Siltation of rivers, creeks, lakes and seas downstream



Mangroves

- Mangroves protect coasts from storms, erosion and floods, and help purify water.
- Mangroves are important feeding sites for many commercially important fish species.

Mangroves under great pressure

- converted to aquaculture, salt production and human settlement.

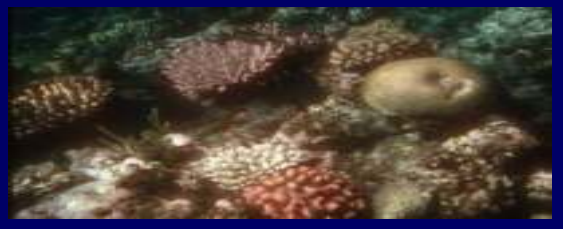
- destroyed for charcoal making

Coral reefs – 'rainforests of the sea'

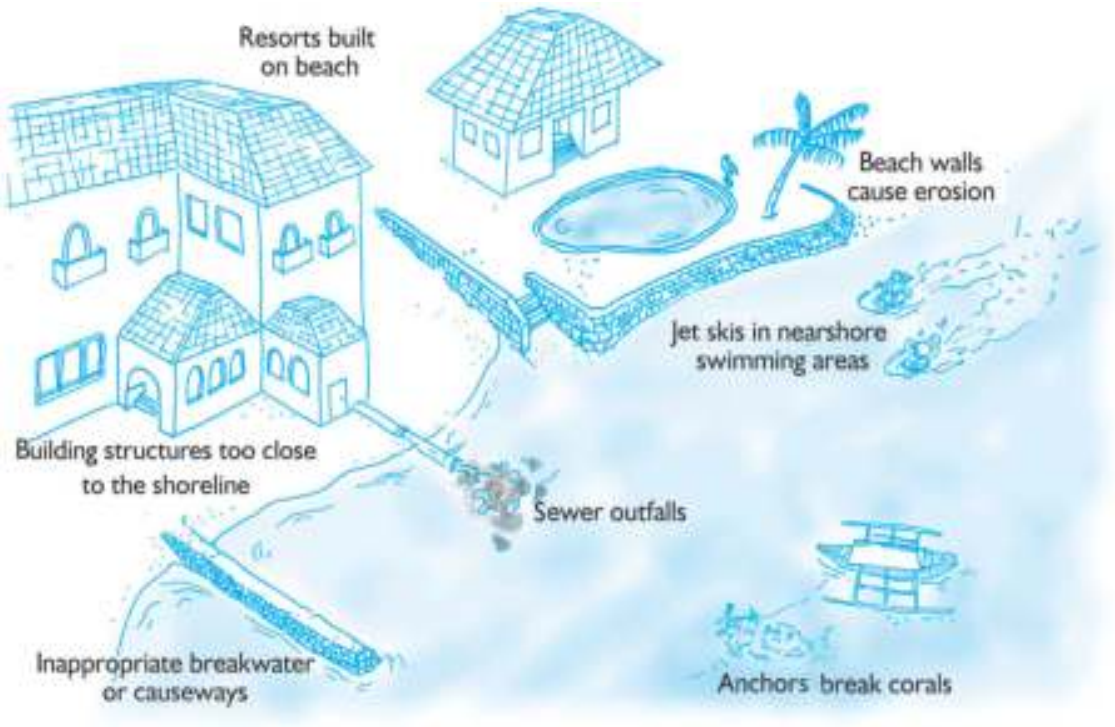
- Provide food, livelihood, recreation and protection from erosion
- At risk from human activities,
- In the Philippines, only 4-5% coral reefs are found to be in excellent conditions.

Major problems:

- Destructive fishing
- Overfishing
- Sedimentation
- Uncontrolled coastal development

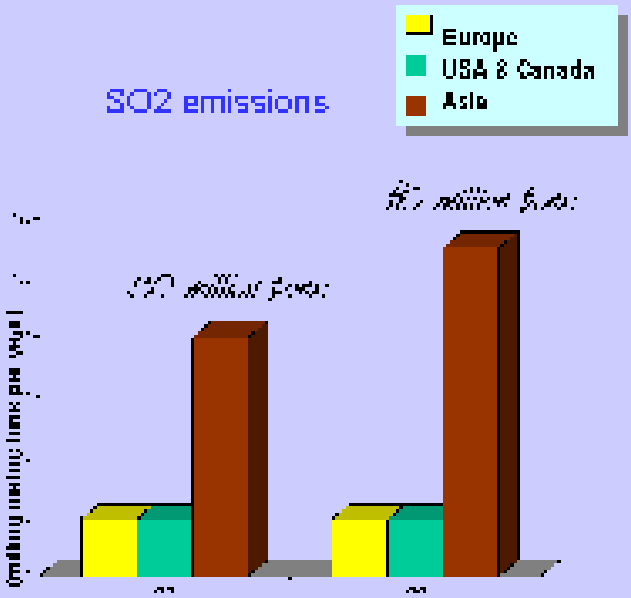


Uncontrolled tourism development degrades the coastal & marine environment



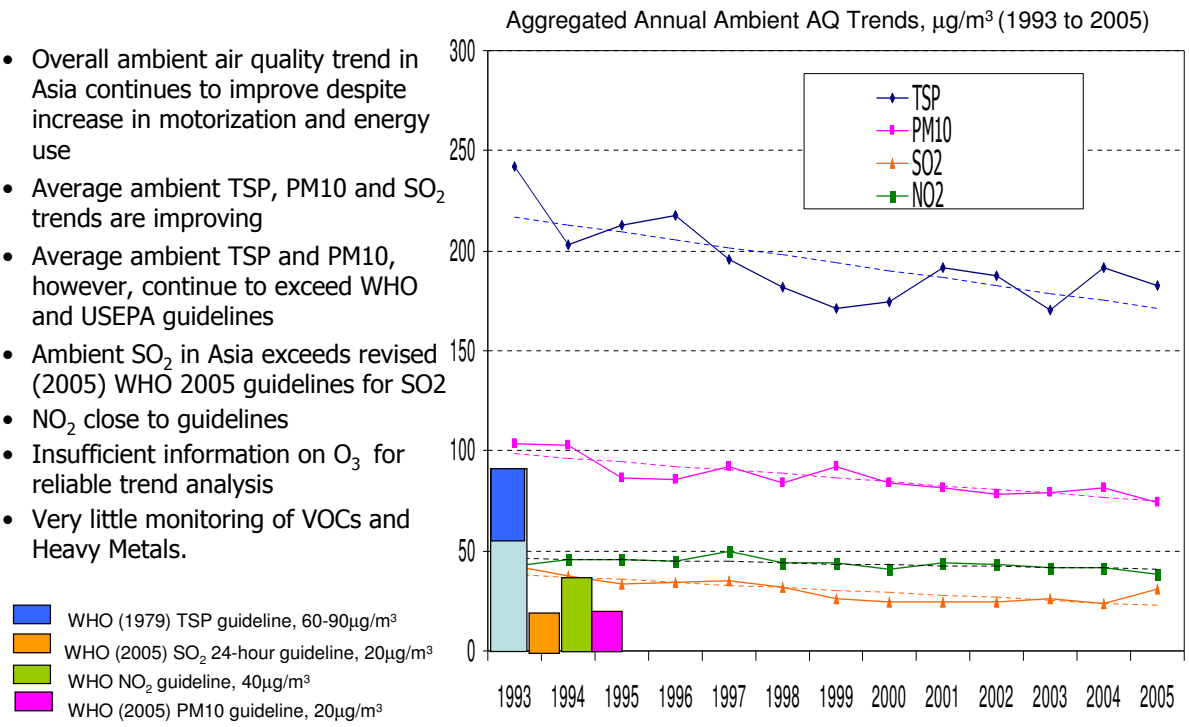
Increasing Emissions

- The fuel we burn, be it fossil fuel or biomass, releases several air pollutants.
- Releasing air pollutants into the atmosphere faster than nature can absorb creates pressure on several atmospheric related environmental issues and on human health.



Status of Urban Air Quality in Asia

- Overall ambient air quality trend in Asia continues to improve despite increase in motorization and energy use
- Average ambient TSP, PM10 and SO_2 trends are improving
- Average ambient TSP and PM10, however, continue to exceed WHO and USEPA guidelines
- Ambient SO_2 in Asia exceeds revised (2005) WHO 2005 guidelines for SO2
- NO_2 close to guidelines
- Insufficient information on O_3 for reliable trend analysis
- Very little monitoring of VOCs and Heavy Metals.



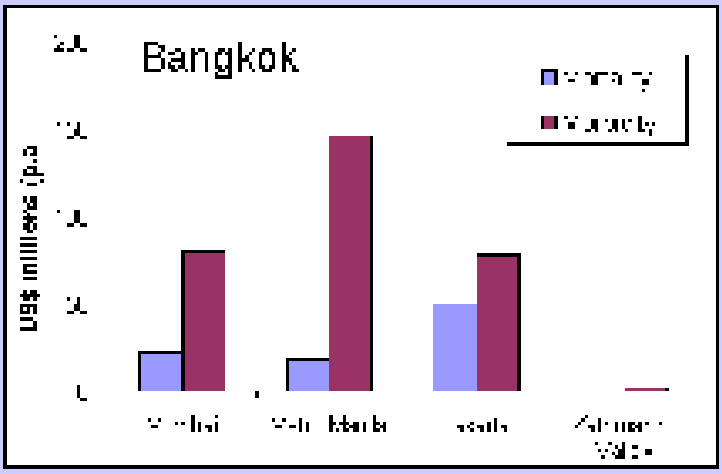
Health Costs of Air Pollution

Asia[1]
- An estimated 467,000 premature deaths occur each year due to outdoor air pollution.

China[2]
- Environmental and health costs of air pollution in China is about 7 % of GDP [budget deficit in 2003 = 3.3% of GDP][3]
- Estimates shows that these costs could rise to 13% of China's GDP by 2020

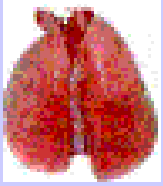
Bangkok
- Health cost of air pollution
- $640 million
- $800 million by 2020

Economic Implications of Health Impacts[4]



Expansion from asthma[4]

Expansion from bronchitis[4]



Source: ... © 2002 ... Global Air Pollution and Climate Change ... Economic Valuation ... UNEP ... 2004 ... UNEP ... www.unep.org

Health Effects and Health Costs

Health Effects

Number of Premature Deaths

Risks	Global Estimate	Asian Estimate
Unsafe Water	1,730,000	730,000
Urban Outdoor Air	**799,000**	**487,000**

Source: WHO, 2002

Health Costs (per year)

- **Manila US$392M**
- **Shanghai US$880M**
- **Bangkok US$424M**
- **India US$14 to $ 191.6M**
- **Jakarta US$ 100 M**

Source: ADB 2002. Policy Guidelines on Reducing Vehicle Emissions

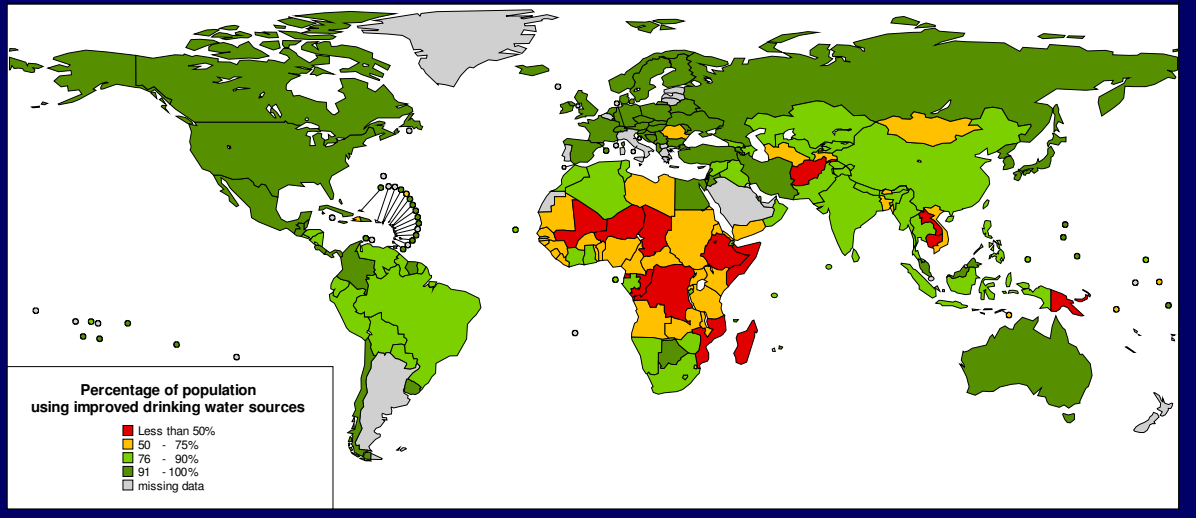
- **Only 2.56% of the world's water is freshwater**

WATER RESOURCES

Country	Total Resources	2000 m^3/person
World	42,655.0	7,045
Asia	13,508.0	3,668
United States of America	2,460.0	8,838
Japan	460.0	3,393
Lao People's Dem Rep	190.4	35,049
Malaysia	580.0	26,074
Myanmar	880.6	19,306
Indonesia	2,838.0	13,380
Cambodia	120.6	10,795
Vietnam	366.5	4,591
Philippines	146.0[1/]	1,907[1/]
Thailand	110.0[2/]	1,854[2/]

Improved Drinking Water: Status in 2002

Coverage of improved drinking water sources, 2002



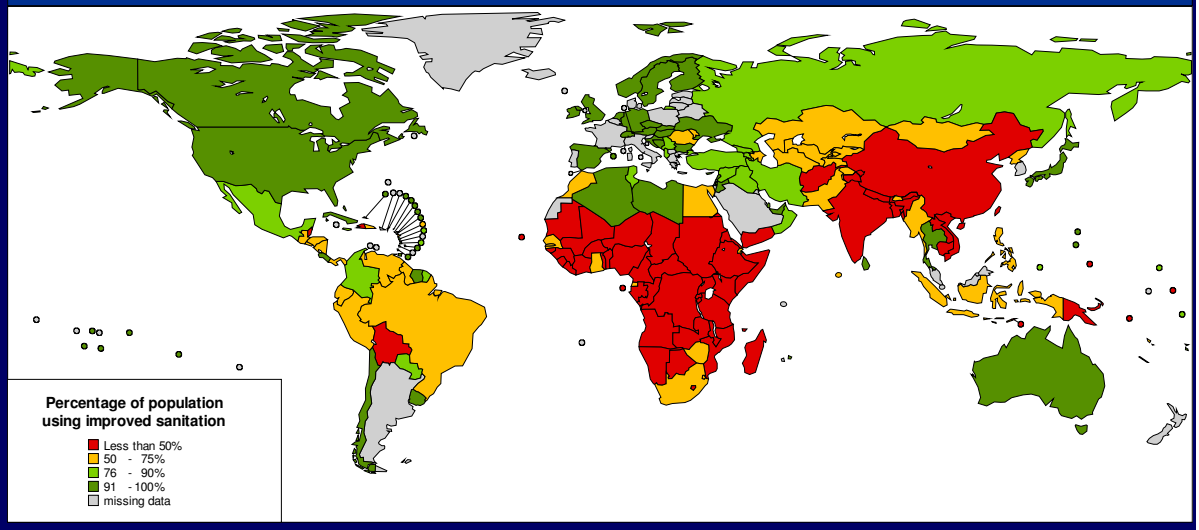
Meeting the MDG Drinking Water and Sanitation Target:
Mid-term Assessment of Progress
WHO and UNICEF, 2004

WHO/OMS

Improved Sanitation: Status in 2002

WHO/OMS

Sanitation coverage, 2002

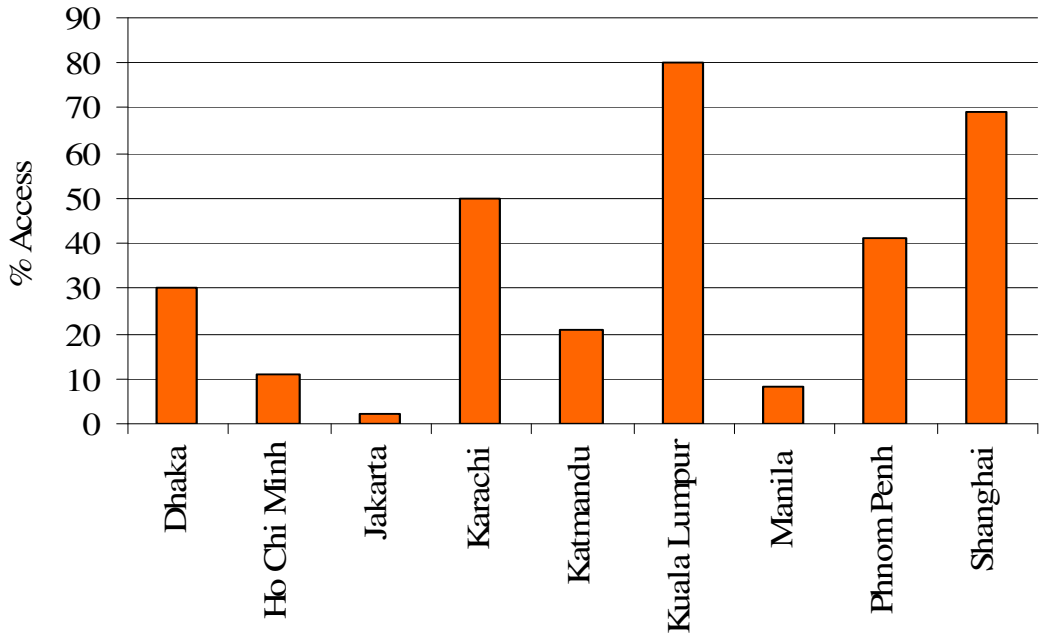


Meeting the MDG Drinking Water and Sanitation Target:
Mid-term Assessment of Progress
WHO and UNICEF, 2004

Water quality deteriorating

- Degraded by industrial effluents, sewage, urban and agricultural run off, solid waste
- Level of suspended solids in Asia's rivers have quadrupled since late 70s.
- BOD is 1.4 times levels recommended by OECD
- Fecal coliform levels are 50 times higher than WHO recommended levels

Comparative Situation of Cities in Asia with Access to Sewerage Systems, 2000



Philippines Environment Monitor 2003: Water Quality

Health Impacts of Polluted Waters

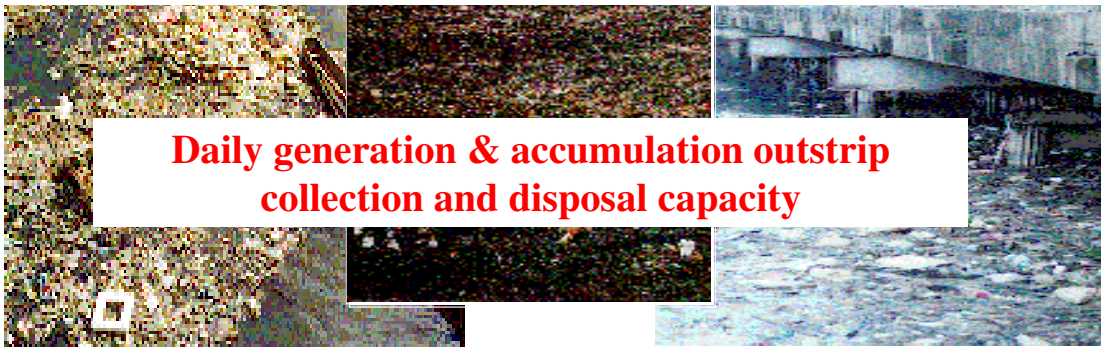
- more than 500,000 infant deaths per year due to dirty water and poor sanitation
- 40% of global diarrhea episodes in children under five occurred in the Asia (1990)

Economic Impacts of Environmental Degradation in Philippines

- Economic Loss of over-fishing is estimated at about PhP 6.5 billion *($125M)* per year in lost fish catch
- Red tides, which are harmful algal blooms largely caused by increasing pollution loads, produced yearly losses in exports of around PhP 1.6 billion *($30M)* during the 1990s.
- Human toll also significant - Premature deaths among the working population due to water pollution in Manila Bay (harmful algal bloom) are estimated to cost PhP 310 million annually *($6M)*

Solid Waste

One of the most pressing environmental problem in Asian cities of developing countries today



Daily generation & accumulation outstrip collection and disposal capacity

Leachate pollutes the soil, groundwater, surface and coastal waters

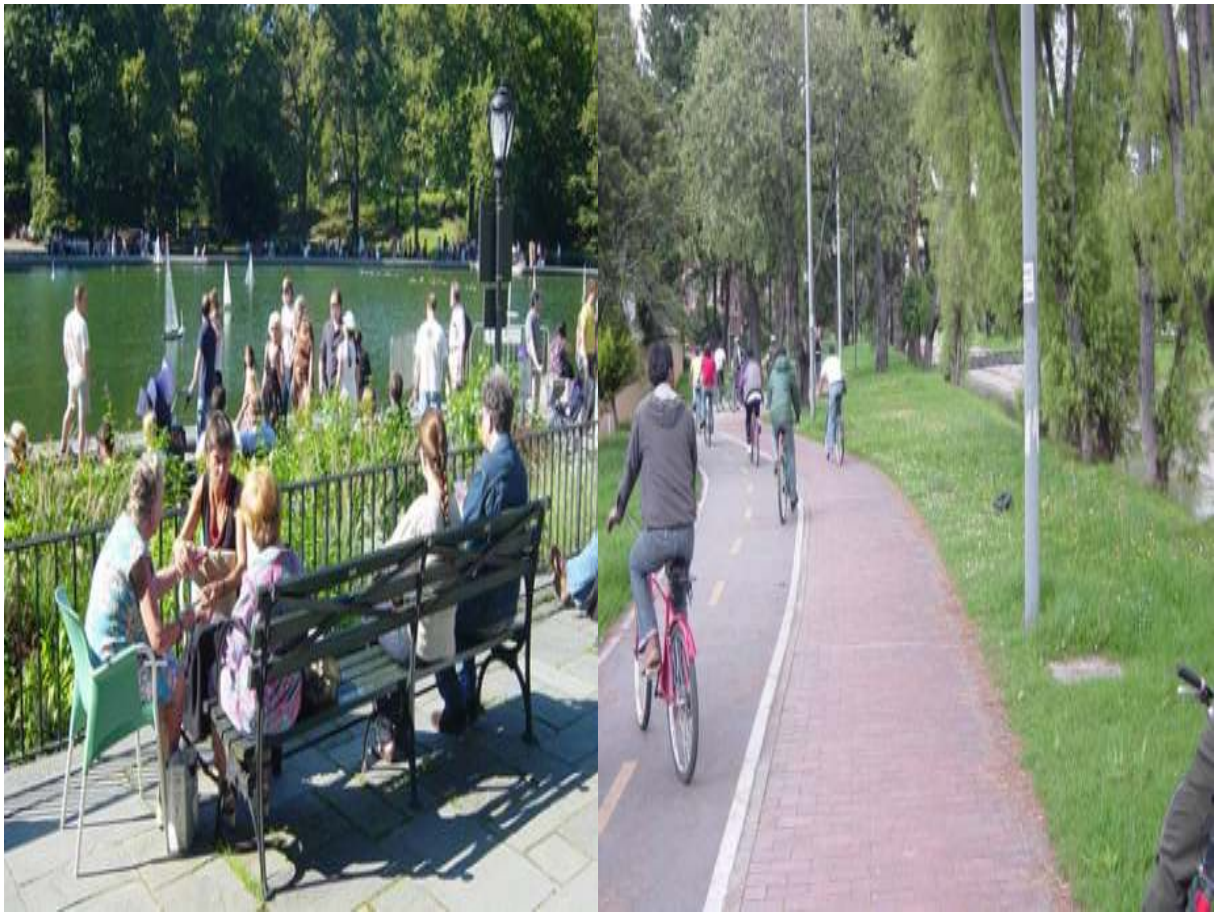
Contributes to air pollution: suspended particles affect the respiratory system

Burning waste releases furans and dioxins which are known to cause cancers

Also releases methane gas which is one of the greenhouse gases that contributes to global warming (20 times more potent than CO2)

Composting & Recycling largely informal – not integrated within a city's SWM system

…SYMBOLS OF INEQUALITY AND LACK OF DEMOCRACY.

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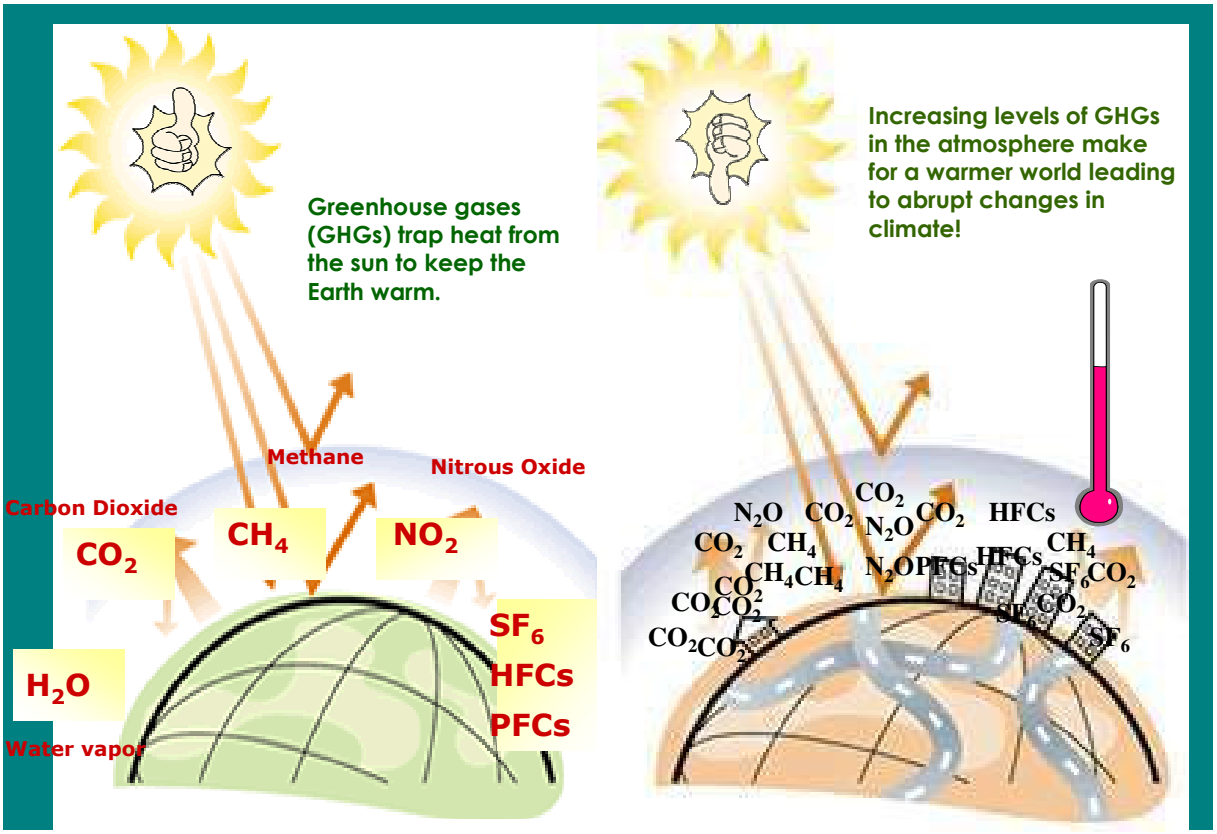
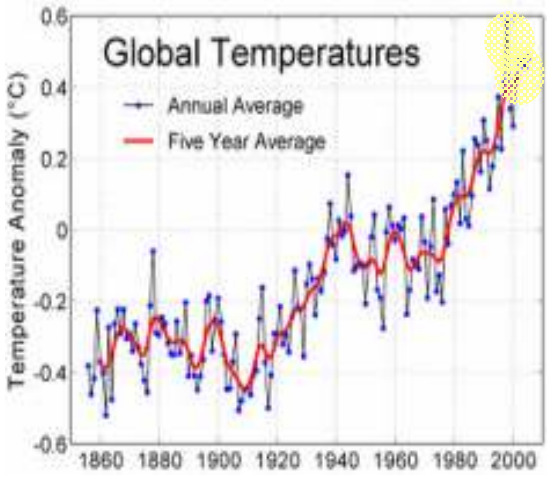
APRIL 3, 2006
SPECIAL REPORT GLOBAL WARMING
TIME
BE WORRIED. BE VERY WORRIED.
Climate change isn't some vague future problem—it's already damaging the planet at an alarming pace. Here's how it affects you, your kids and their kids as well
EARTH AT THE TIPPING POINT
HOW IT THREATENS YOUR HEALTH
HOW CHINA & INDIA CAN HELP SAVE THE WORLD—OR DESTROY IT
THE CLIMATE CRUSADERS

The atmosphere is the earth's blanket.

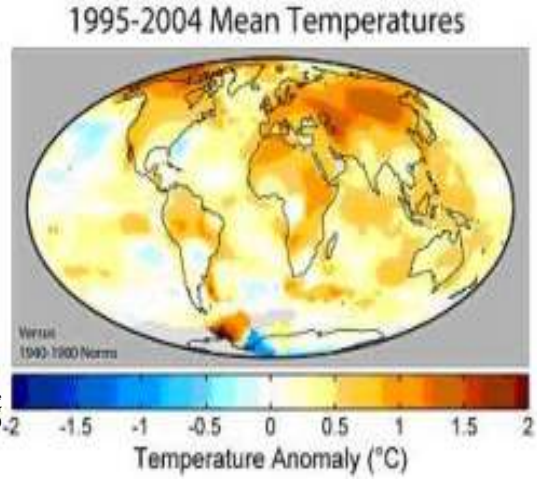


The Greenhouse Effect

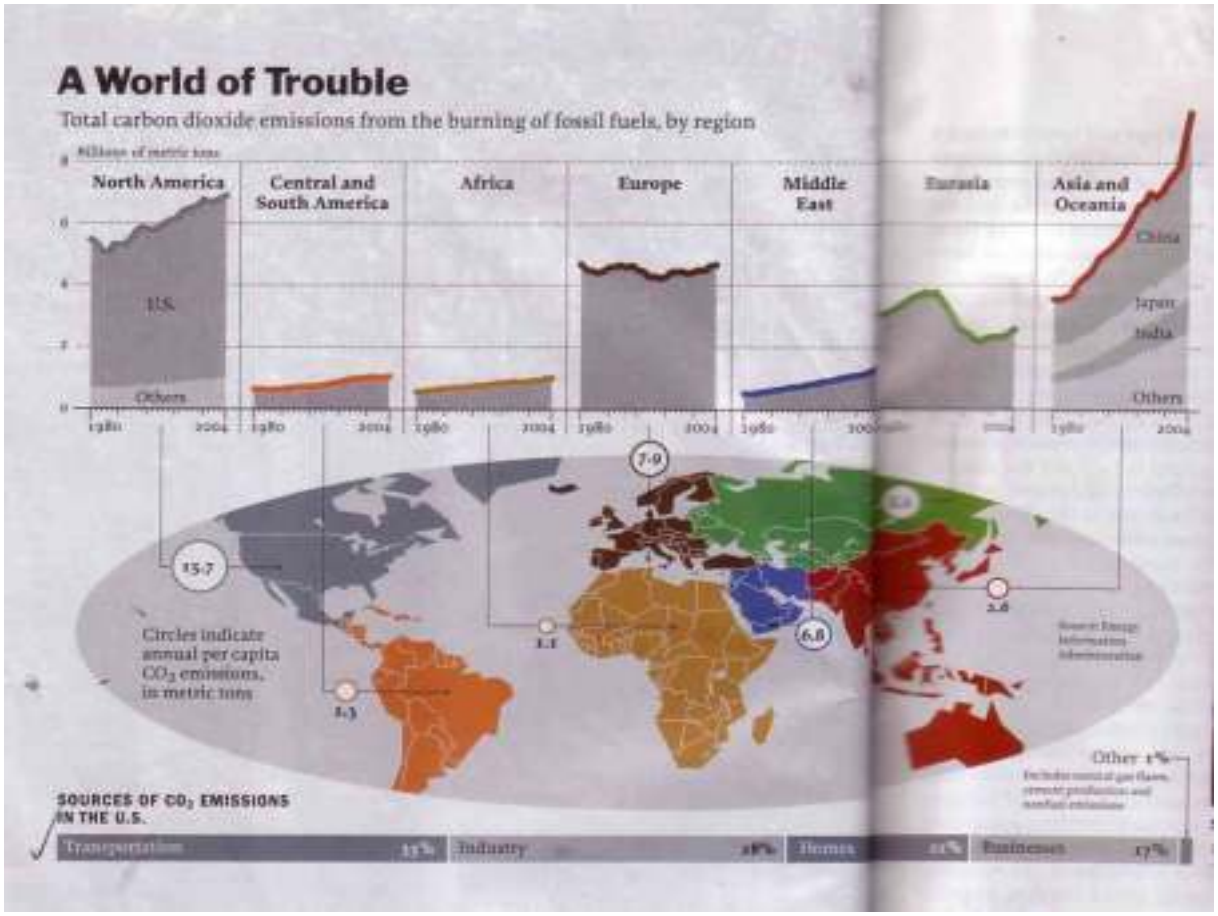
What's it all about? Global Fever



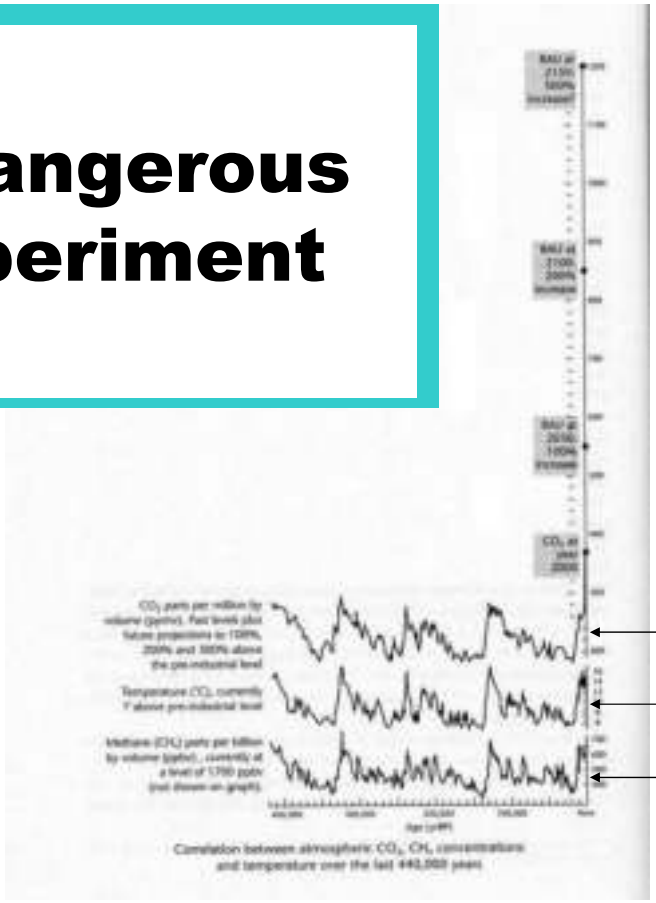
(Sources: Climatic Research Unit of the University of East Anglia, Hadley Centre of the UK Meteorological Office, Data set TaveGL2v, Jones and Moberg, 2003)

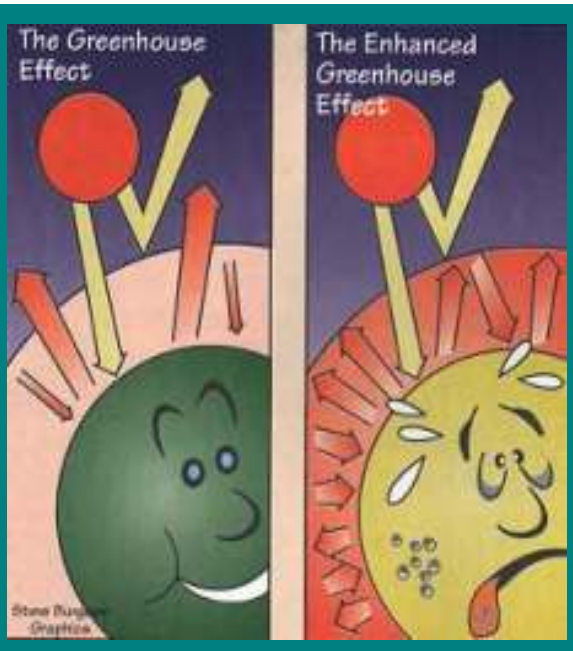


(Source: NASA GISS Surface Temperature Analysis or GISTEMP)



A Dangerous Experiment





Human & Natural Drivers of Climate Change

- Global atmospheric concentrations of carbon dioxide, methane & nitrous oxide have *increased as a result of human activities since 1750.*
  - Pre industrial value: 280 ppm
  - 2005 value: 379 ppm
- 11 of the last 12 years (1995-2006) rank among the 12th warmest years since 1850

Source: IPCC 4th Assessment Report: Summary for Policy-makers

What's it all about?

To summarize...

- World has gotten **warmer**.
- It will continue to get **hotter** in this century and beyond.
- WE are causing this **dangerous** trend.

More **intense and longer droughts** since 1970 particularly in the tropics and subtropics due to increase in temperature and decrease in precipitation.

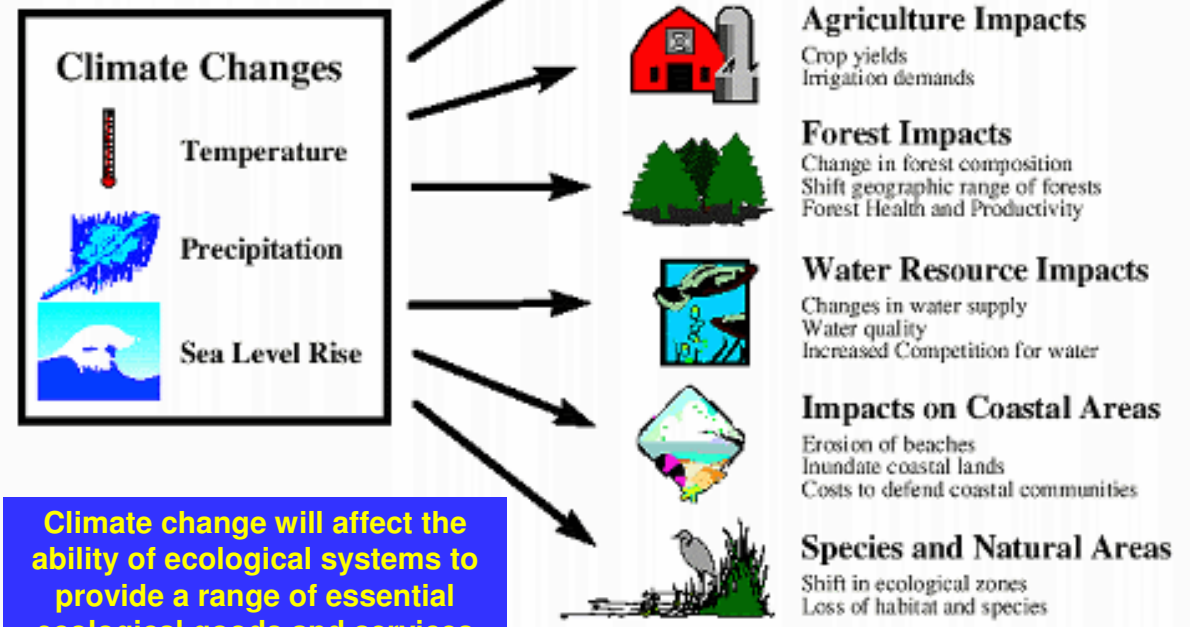
There is observational evidence of **increase intensity of tropical cyclone activity in the North Atlantic** since 1970 correlated with the increase in sea surface temperature

Cold days, cold nights and frost have become less frequent. While **hot days, hot nights, and heat waves have become more frequent.**

Direct Observations of Recent Climate Change

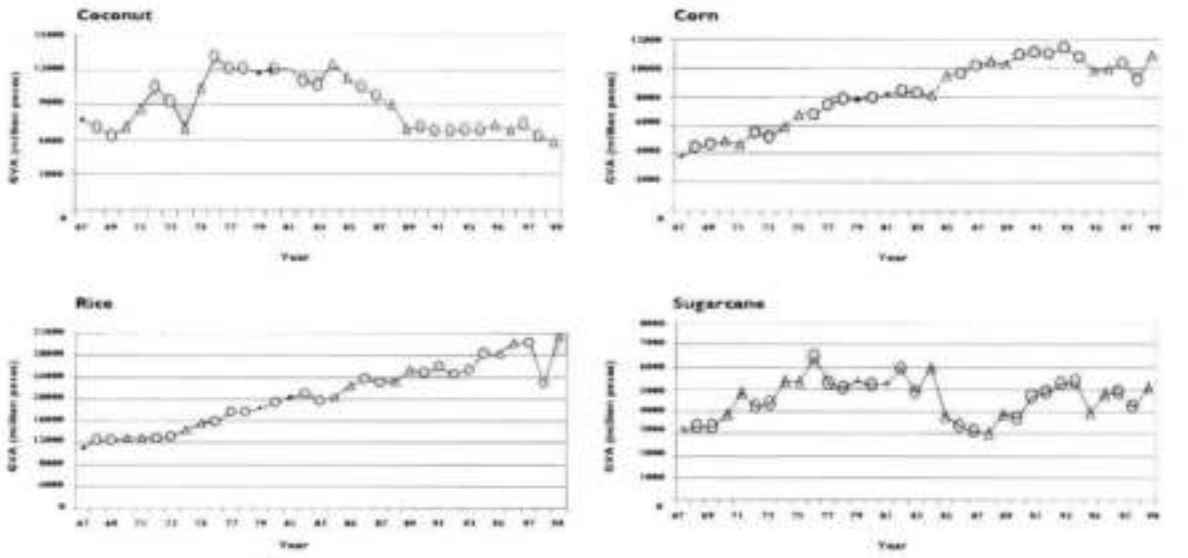
Source: IPCC 4th Assessment Report: Summary for Policy-makers

Potential Climate Change Impacts



Climate change will affect the ability of ecological systems to provide a range of essential ecological goods and services

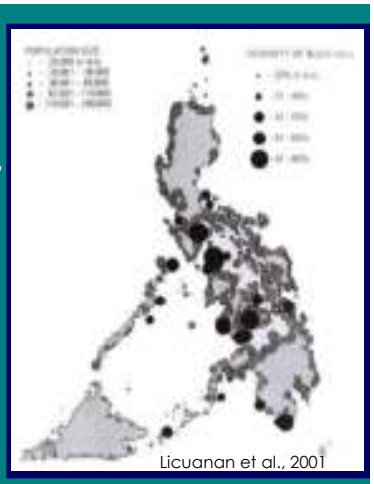
El Niño and Philippine Crops



1°C increase leads to 15% decrease in rice yield

Source: Impacts of Climate Change in Asia, Burning our Future, Greenpeace

Climate Change Impacts


Licuanan et al., 2001

- Increase in sea surface temperatures of about 0.5^0C can already initiate coral bleaching
- 1995 & 1998 coral bleaching events

  (e.g., Tubbataha Reef Marine Park, Bolinao, Kalayaan Island Group, NW Palawan)
- June-Nov 1998 coral bleaching led to 46% decrease in coral cover and about 49% of overall coral death in the area

Arceo, et. al. *Coral Bleaching in the Philippines*. Disturbing Climate. 2001
World Wildlife Fund. *Climate Change Scenarios for the Philippines*

CORAL BLEACHING & DEATH

Coral's Faltering Partnership

THE 'RAINFORESTS OF THE SEAS' MAY NEED TO BE SAVED, TOO.

BY MAC MARGOLIS

With their rainbow hues and the splendid variety of species they cater to, coral reefs are often called the rainforests of the seas. They might also be described as the ocean's architects—a consortium of tiny polyps hurling up high-rises of calcium-carbonate, which they mine from the seawater. Covering just 1 percent of the Earth's surface, they may host 25 percent of all marine life, which makes the reefs true underwater metropolises.

Now the sea's city builders are under siege. The ocean bottom might be the last place you'd think to be troubled by a climate out of kilter. But recently scientists have found that reefs are taking the brunt of the warming atmosphere. Some 30 percent of coral reefs are already irreparably damaged, thanks mainly to rising sea-surface temperatures, which hampers the coral's ability to gather nutrients. Another 30 percent may be poised for collapse. The reefs of the Seychelles never recovered from a 1998 heat surge in the Indian Ocean, another study says. Ten species of fish are either extinct or on the brink. Overall, the variety of marine life among the reefs has fallen by half. As reefs go, so go the oceans.

A coral is one of nature's odder couples: a plant inside an animal. The animal, a tiny polyp, shelters a tinier plant (an algae called zooxanthellae), which returns the favor by sharing the energy it produces through photosynthesis with its host. The skein of algae also lends the reefs their dazzling colors. The energy produced by this duo goes back into reef building, a neat bit of aquatic chemistry that mixes carbonic acid with calcium from seawater to form calcium-carbonate, the chalky stuff of seashells. But when temperatures spike, the partnership falters. The animal expels the algae, and the coral goes bone white and barren.

FADED GLORY: Coral reefs in the Seychelles have been killed by climate change.

The bad news doesn't end there. Many experts now think creeping acidity, caused by carbon build-up in the atmosphere, is even more menacing to the oceans than the rise in temperatures. Normally seawater handily converts atmospheric carbon dioxide to carbonic acid, and buffers it with calcium to make the concrete of coral reefs. Too much carbon dioxide, however, leads to excess acid, which eats away the coral shells. The oceans are now 30 percent more acidic than in preindustrial times. "It's like going in for a routine checkup and seeing your blood pressure has gone wacko," says Thomas E. Lovejoy, head of the Washington based H. John Heinz Center for Science, Economics and the Environment. Lovejoy calls acid oceans the "single most profound environmental problem."

The irony is telling. For years, many climate scientists reckoned that the oceans were part of the solution, sopping up excess heat and carbon. Now even the forgiving oceans need saving.

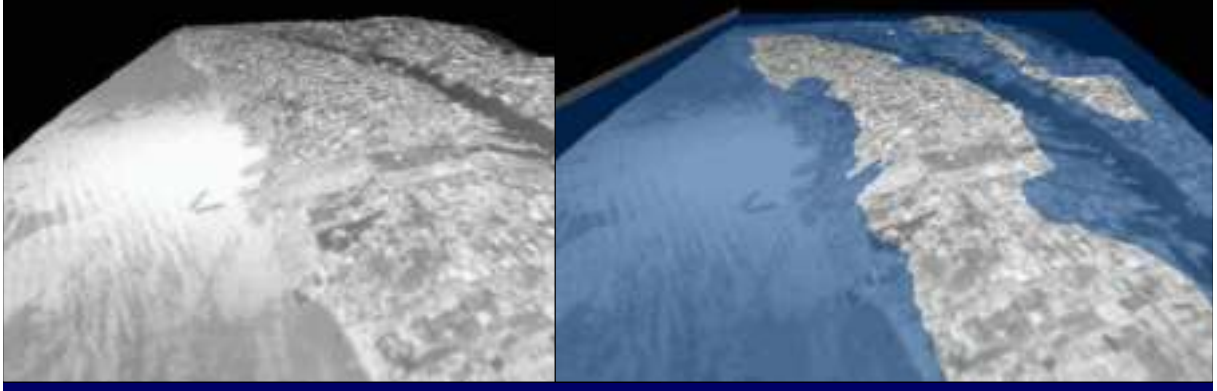
With FERNANDO DE FREITAS in Darwin and KARLA BRUNING in New York

Coral reefs occupy 1% of total earth's surface but is home to 25% of marine life

Changing coastlines/communities

Navotas, Philippines

Galgana et al., 2004



0 m sea-level rise

1 m sea-level rise

Trouble Beyond the Tropics

EVEN AS FROGS VANISH FROM THE CLOUD FOREST, WILDLIFE IN COOLER PLACES ALSO STRUGGLES WITH CLIMATE CHANGE.

As the Arctic pack ice it lives on has shrunk, the **POLAR BEAR** population has dropped 17 percent in the last 10 years. Experts fear another 30 percent decline by the middle of the century as spring thaws come earlier and shorten the bears' hunting season.

The **ARCTIC FOX** has adapted to live off the meager food supply its snowy habitat affords it. Now, it fights to survive as warmer temperatures lure competitors like the red fox north.

In the mountains of Arizona, the mating cycle of the **GRAY-BREASTED JAY** has been pushed forward by a week and a half since the 1970s. Researchers hope the jay will yield insights into how animals adapt.

Many British birds now range 20km further north than 20 years ago. That threatens the habitat of the U.K.'s only endemic species, the **SCOTTISH CROSSBILL**. One idea: relocate it to Iceland.

Animals that have lost the will or the ability to migrate are especially at risk as climate patterns change. As the shellfish it feeds on decrease in size and number in the warmer Bering Sea, the **SPECTACLED EIDER DUCK** is looking like a sitting you-know-what.

Studies of **RED DEER** in Scandinavia show that offspring born after warmer winters weigh less than those born after colder ones. Over time this spells trouble, as smaller deer never make up for their size deficit, and they produce fewer offspring of their own.

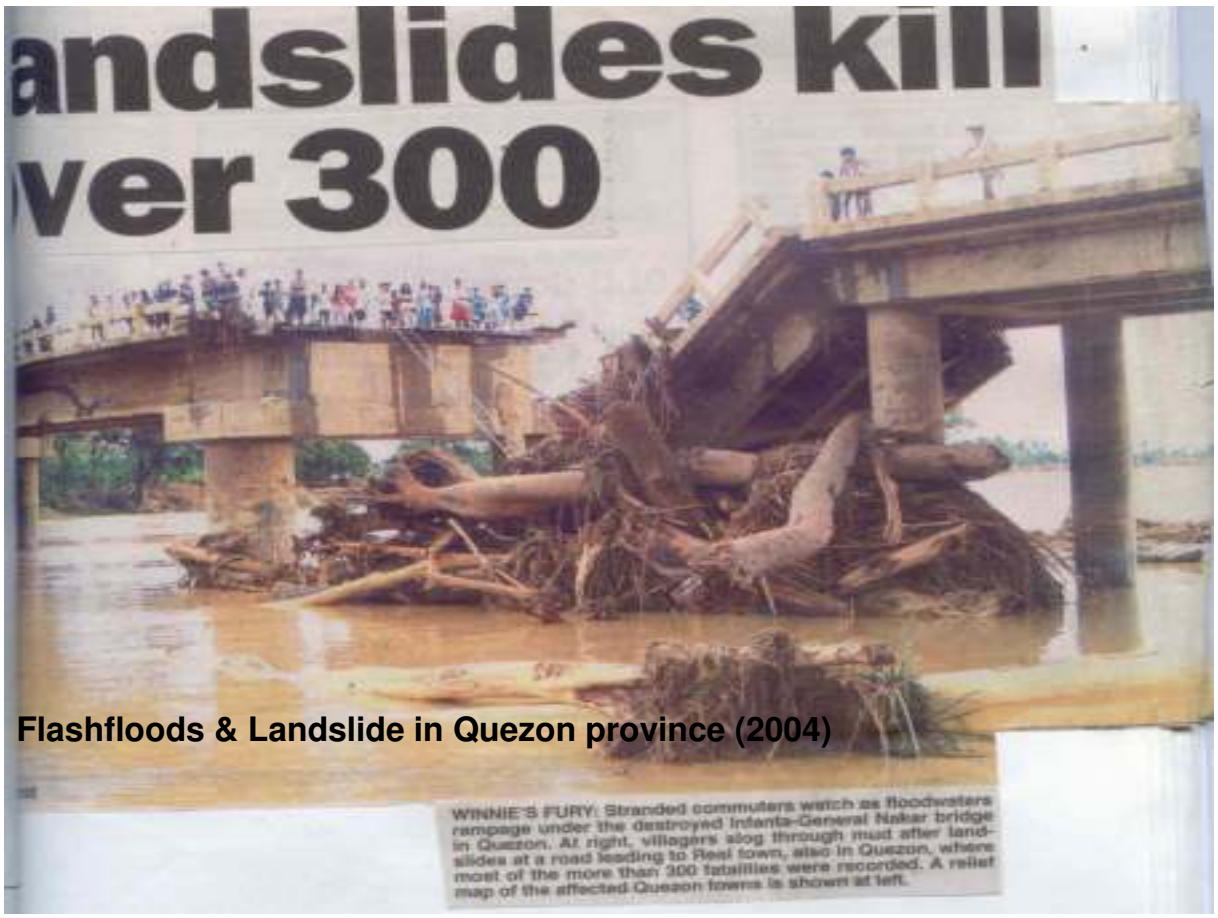
In Australia, the already rare **BOYD'S FOREST DRAGON** could become even more scarce as it loses the lives of up to 30 percent of its range. Unlike that of most reptiles, the dragon's body temperature typically stays within a few degrees of the ambient temperature, which makes it unusually sensitive to changes in climate.

Paradox *A kangaroo lies dead, victim of a five-year drought in Australia. Rising temperatures are creating havoc with the earth's weather, bringing too much rain to some, not enough to others*

Seeking shelter *The streets of Jakarta vanished underwater after torrential rain displaced 190,000 people in February. Bigger storms make the world's floodplains even more vulnerable*

Disasters: Earth falls

- **In Dec 2003, at least 200 died from landslides and flooding after the area experienced the heaviest rainfall in 25 years.**
- **Landslide happened after heavy rains dumped 600 mm of rain on Panaon island in the space of 3 days.**
  (30 year average rainfall for Dec only 147mm)



Flashfloods & Landslide in Quezon province (2004)

Landslide of 20M cum – equivalent to 200,000 dumptrucks

A WASTELAND of fallen trees messes up the landscape on the way to Infanta.

ROGER MARGALLO

Flashfloods & landslides in Quezon province 2004

Aerial view of Agos River Area

CAUSES (Triggering & Ground Condition)

Triggering Factor

- **Heavy rainfall (342mm of rain from typhoon Winnies in a 9-hr measurement from PAGASA Infanta Station compared to monthly average of 900 mm)**
- **Seismic activity (earthquake)**

Ground Condition

- **Highly fractured rocks**
- **Thick soil cover**
- **Lack of vegetation cover**
- **Man-made structures (road cuts, cut slope, excavations)**
- **Topography (Steep slopes, low-lying areas)**

Disasters: Earth falls

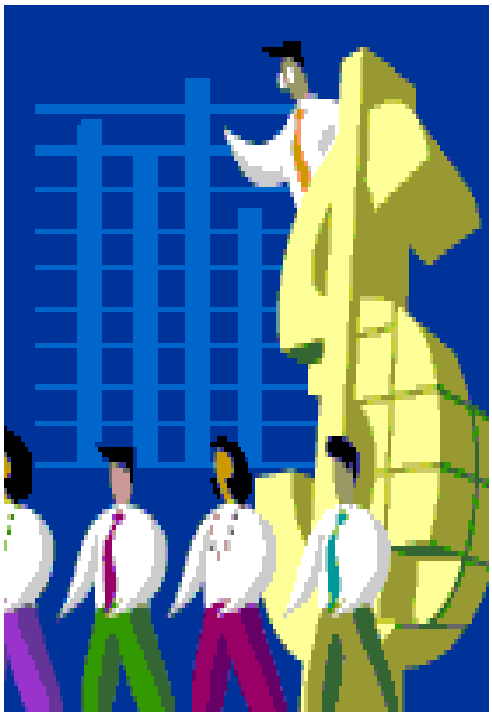
Figure 1 Oblique aerial photo showing the relative positions of the Philippine Fault and the town of Guinsaugon with respect to the landslide. Image courtesy of Michael D. Kennedy (U.S. Navy).

- Mudslide happened after heavy rains dumped 459.2 mm of rain on the area in the space of 3 days.
- Estimated 1,500 to 2,500 people died

Environmental degradation affects the poor most

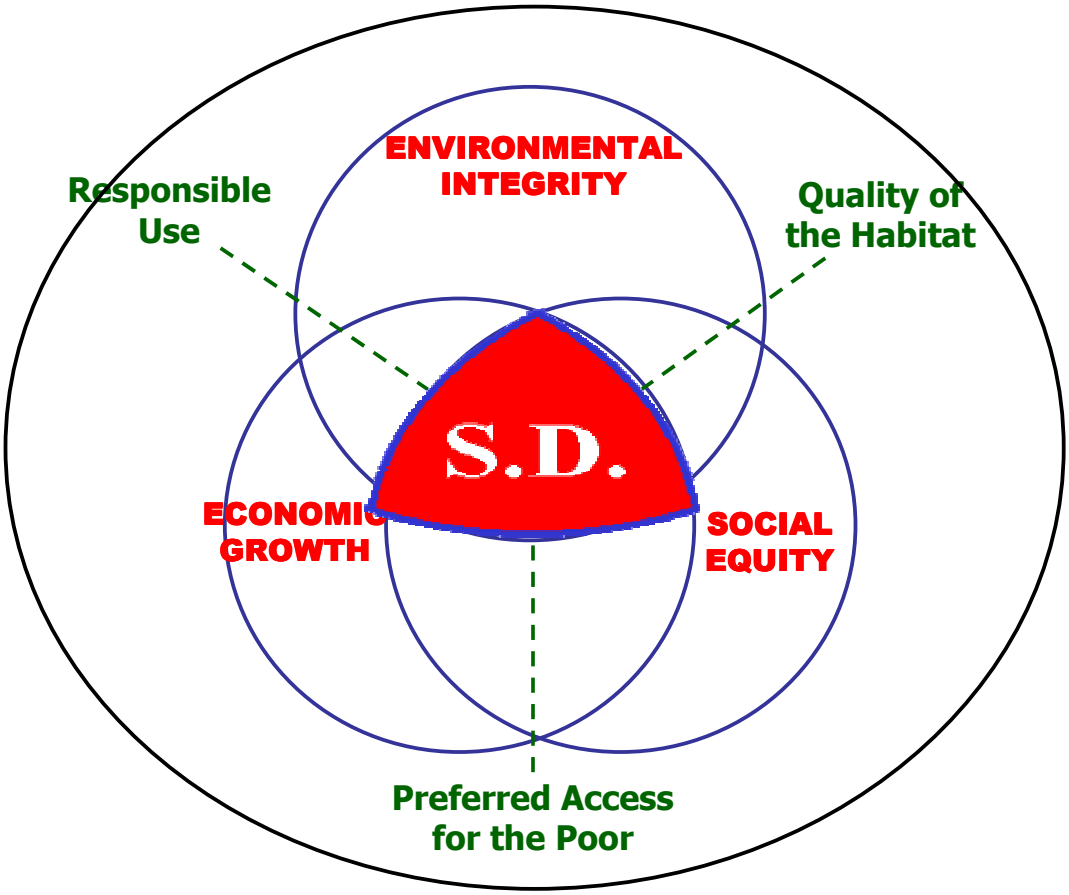
- Most vulnerable, not equipped to cope (limited options and opportunities)
- Most exposed (e.g. jeepney & tricycle drivers, street vendors, those who walk, waste pickers)
- End up paying more (example- due to lack of access to clean water, the poor buy from vendors, paying 3-5X)

Urgent actions are needed to improve environmental quality in Asia in order to sustain economic growth, reduce poverty & improve the lives of people



" Without adequate environmental protection, development will be undermined, and, without economic growth which is essential to reduce poverty, environmental protection will fail"

1992 Earth Summit, Rio de Janiero, Brazil



Environmental protection is key to achieving social security (health, homes, livelihood, productivity) ----

--- more importantly, it is essential to sustaining LIFE itself!