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SPECIAL REPORT GLOBAL WARMING

TIME

BE WORRIED. BE VERY WORRIED.

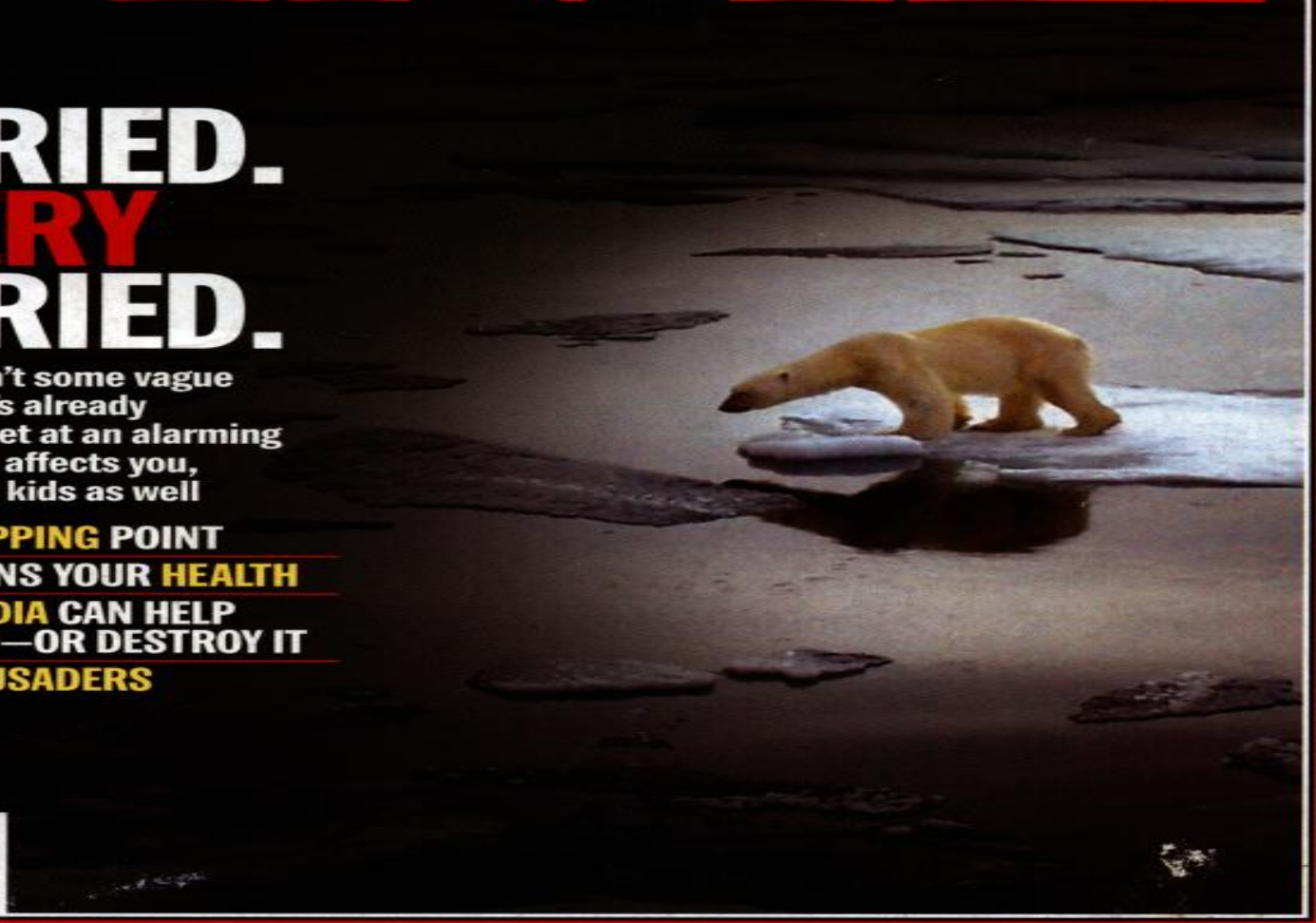
Climate change isn't some vague future problem—it's already damaging the planet at an alarming pace. Here's how it affects you, your kids and their kids as well

EARTH AT THE TIPPING POINT

HOW IT THREATENS YOUR HEALTH

HOW CHINA & INDIA CAN HELP SAVE THE WORLD—OR DESTROY IT

THE CLIMATE CRUSADERS



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Climate Change and Agriculture: Impacts and Adaptations

Victoria O. Espaldon

School of Environmental Science and Management, UPLB

- **What is it all About?**

  (A bit of down to earth science)

- **How Bad will it Be?**

  (Impacts and vulnerability)

- **What Can we Do about it?**

  (Solutions)

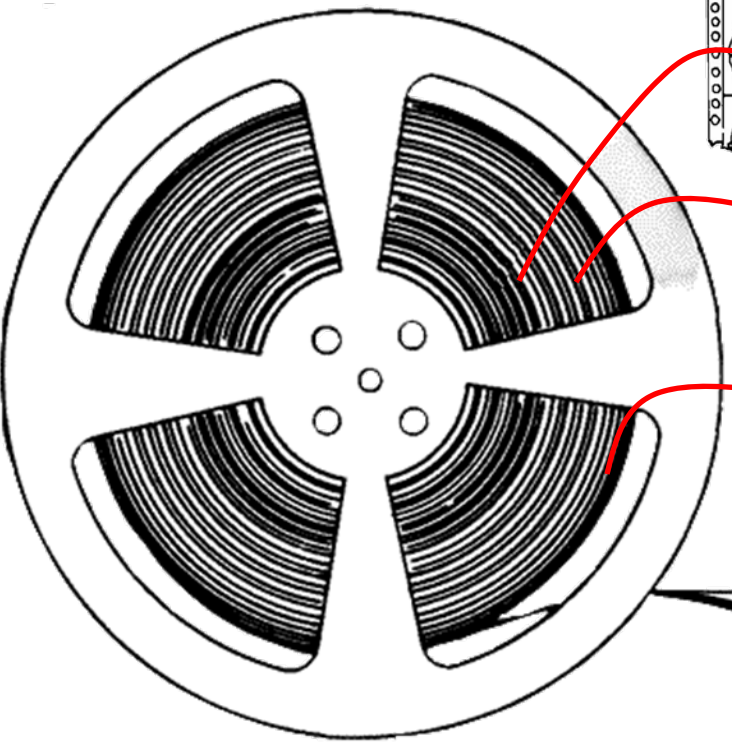
An all-important, but poorly grasped factor in the

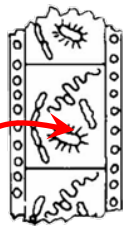
The crisis of Global Warming

Is the vastness of GEOLOGIC TIME
compared to

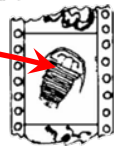
HUMAN TIME

If Earth's complete 4 ½ billion years were shown as a 24-hour movie:

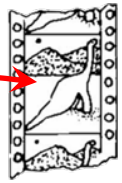




Earliest life, 6 hours (3.4 billion years ago);

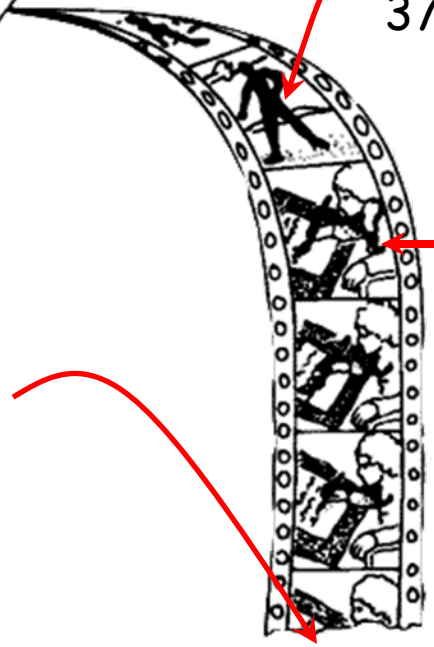


First complex life forms, 20 ¼ hours (600 million years ago). Also the age of the oldest petroleum we use



Death of the dinosaurs, 23 hours, 37 minutes (65 million years ago)

Earliest humans, 23 hours, 59 minutes, 37 seconds (2 million years)

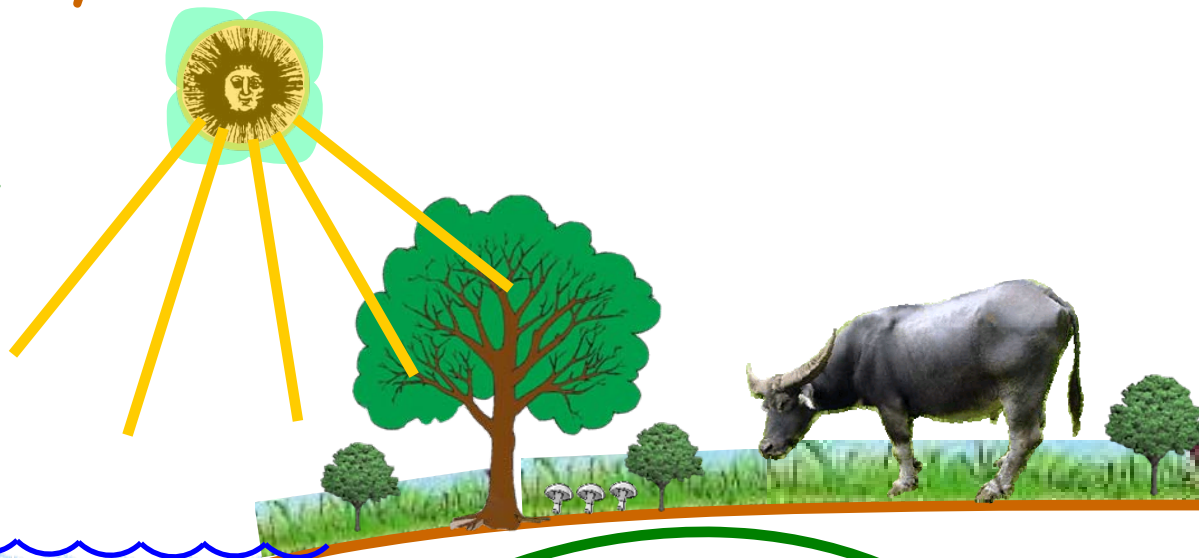


The first historian, only 0.1 second remaining (6,000 years ago)

Mid 19TH Century onset of the Age of Petroleum = 0.0027 second before THE END

The Grand Cycle of Life Materials

The Photosynthesis-Consumption loop is almost perfect . . .



Microscopic algae and diatoms

Photosyntheses by oceanic phytoplankton & land plants

$6CO_2 + 6H_2O + \text{sunlight} \rightarrow C_6H_{12}O_6 + 6O_2$

264 grams carbon dioxide +108 grams water + 683 Kilocalories sunlight energy produces

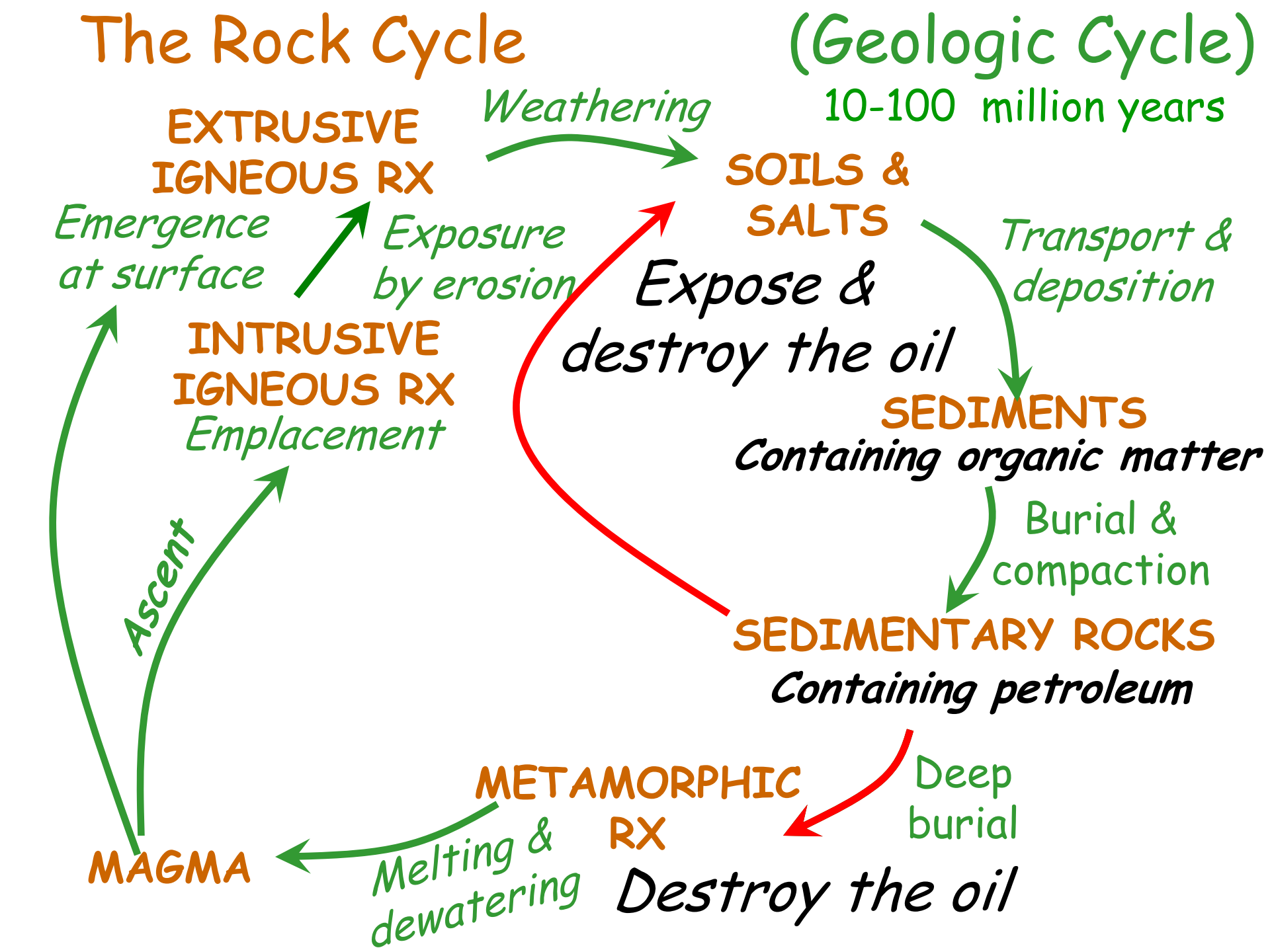
180 grams sugar containing 683 Calories chemical energy + 192 grams oxygen

carbon dioxide + water + sunlight ⟶ sugar + oxygen

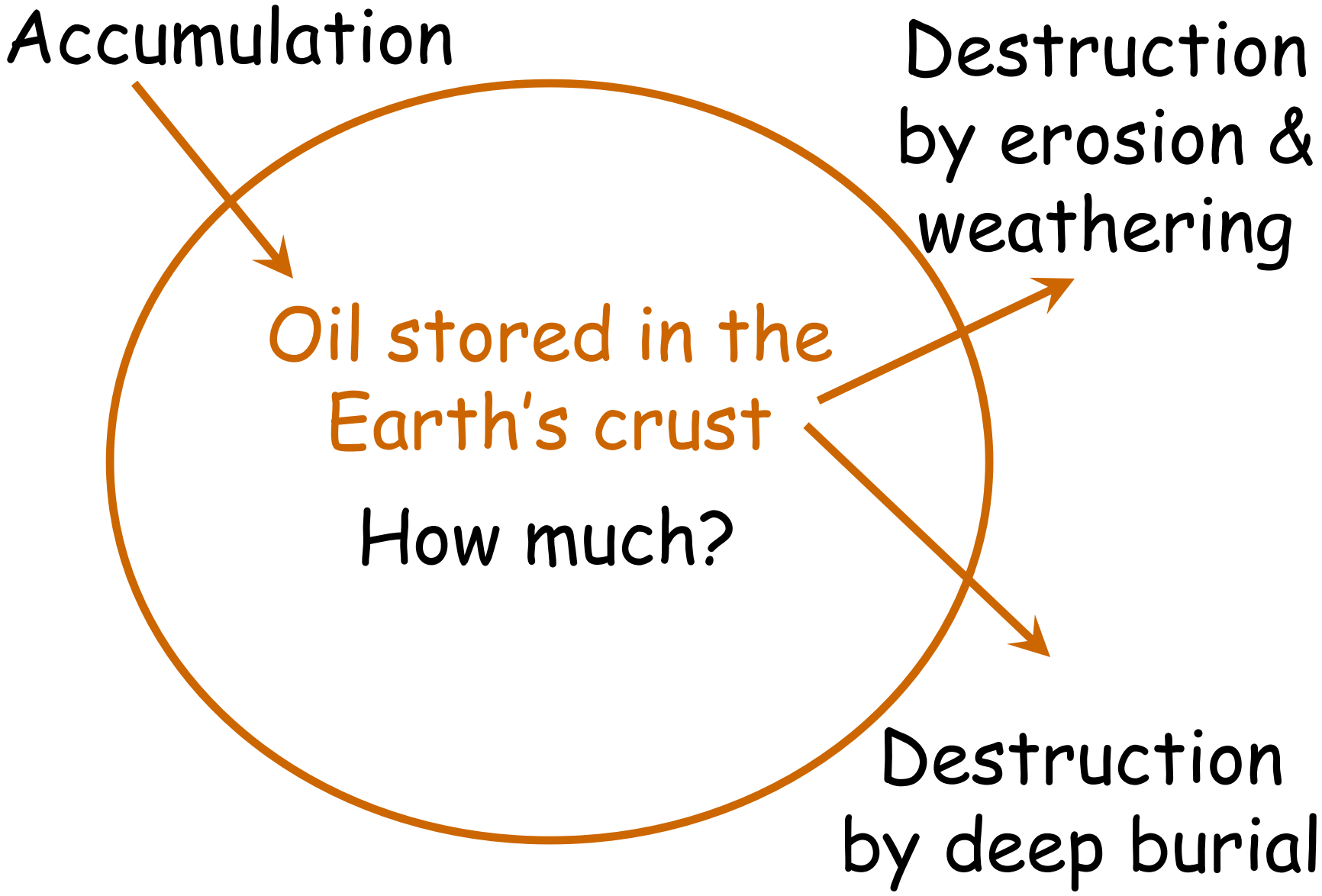
carbon dioxide+water⟵sugar+oxygen

Consumption *by animals & fungi*

. . . But tiny amounts of organic matter are buried in sediments, and mature into petroleum.


The Rock Cycle
(Geologic Cycle)
10-100 million years
EXTRUSIVE IGNEOUS RX
Weathering
SOILS & SALTS
Emergence at surface
Exposure by erosion
Transport & deposition
Expose & destroy the oil
INTRUSIVE IGNEOUS RX
Emplacement
SEDIMENTS
Containing organic matter
Ascent
Burial & compaction
SEDIMENTARY ROCKS
Containing petroleum
METAMORPHIC RX
Deep burial
MAGMA
Melting & dewatering
Destroy the oil

Steady-state storage of oil:
Accumulation rate ≈ Destruction rate



The best geological estimates:

1. How much oil had accumulated in the Earth before Humanity started using it?

   Two trillion barrels (2,000,000,000,000)

2. How long did it take to accumulate?

   Six hundred million years (600,000,000)

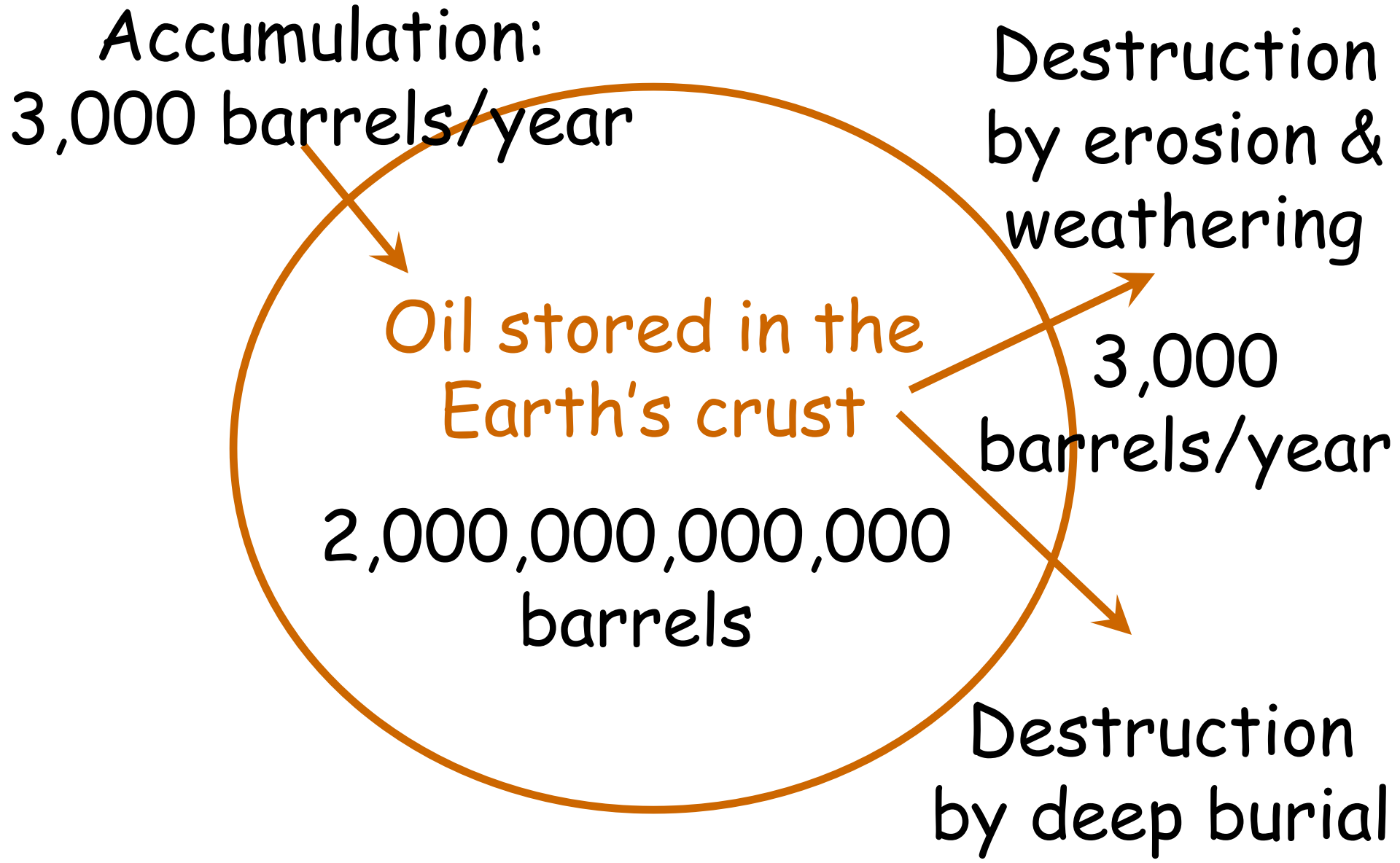
3. How much oil accumulated every average year?

$$\frac{2{,}000{,}000{,}000{,}000}{600{,}000{,}000} = \frac{20{,}000}{6} \approx 3{,}000 \text{ barrels per year}$$

Because this is so little, oil is essentially a

non-renewable resource!

Steady-state storage of oil:
Accumulation rate ≈ Destruction rate

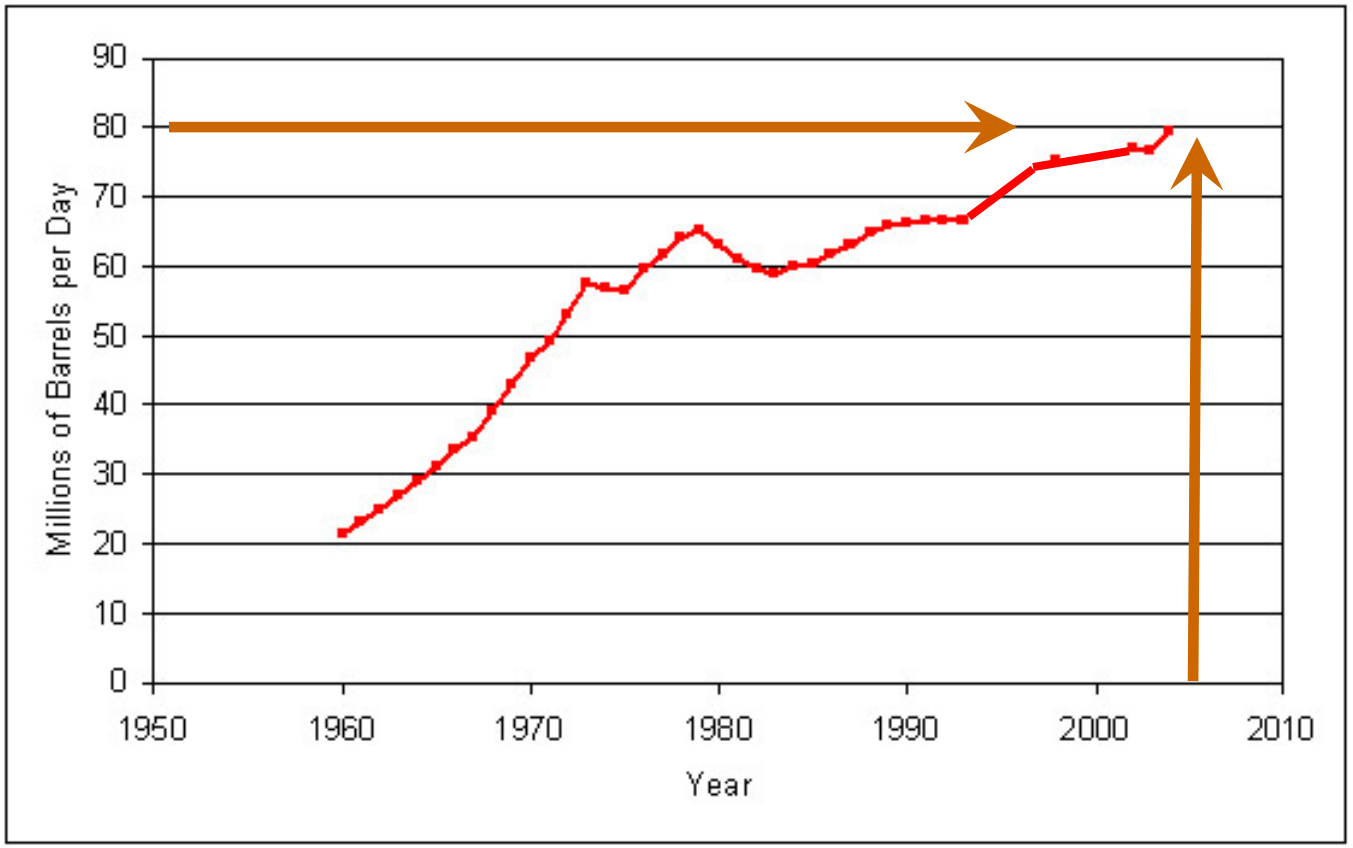


After many million years, a rough balance was attained between petroleum **accumulation** and **destruction** by deep burial and erosion.

At any time thereafter, about 2 trillion barrels remained stored in the rocks, an important factor in keeping atmospheric CO_2 reasonably low . . .

. . .until we started extracting in in the 19th Century.

3,000 barrels accumulate in the Earth in one year . . .



All the people on Earth use 80 million barrels a day

≈ 29 billion barrels each year.

$$\frac{29 \text{ billion bbl}}{3{,}000 \text{ bbl/y}} \approx 8.8 \text{ million barrels/year}$$

What Humanity uses yearly took almost 9 **million** years to store.

http://www.diracdelta.co.uk/science/source/b/a/barrel/image001.jpg

In **one** year, Humanity pulls out of the rocks

and burns, and returns to the air

The carbon Earth took out of the air

And stored in the rocks for almost

nine million years.

Thus is Humanity inflicting on Earth's living environment

one of the most severe abuses she has ever had to endure:

The fever we call Anthropogenic Global Warming.

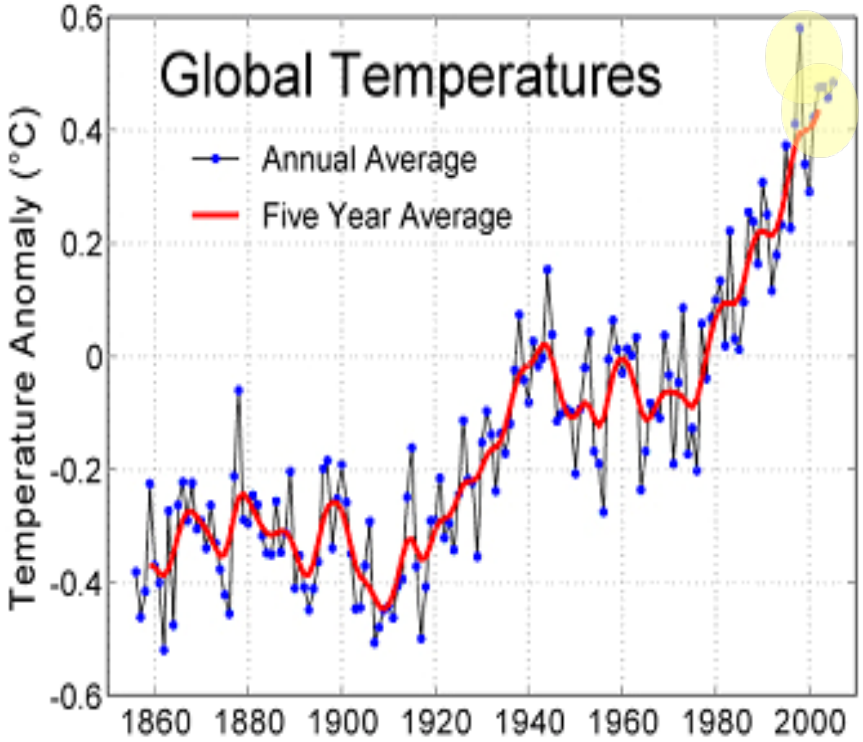
Hurricanes Katrina, which drowned New Orleans,

And Supertyphoon Reming, whose lahars killed hundreds

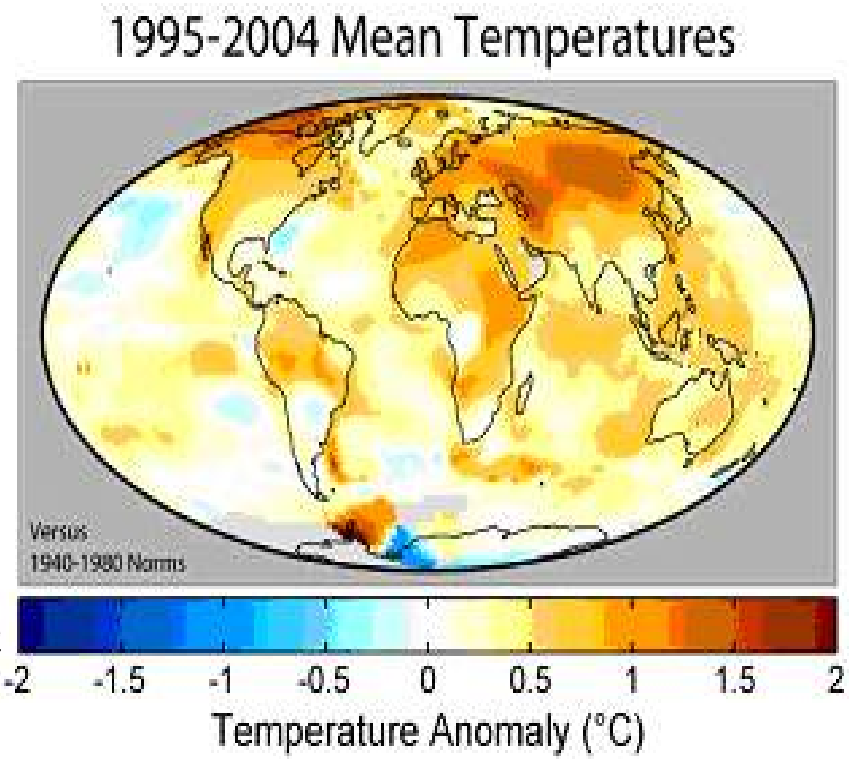
at Mayon Volcano in 2006

May be but tiny symptoms of that trauma.

What's it all about? Global Fever

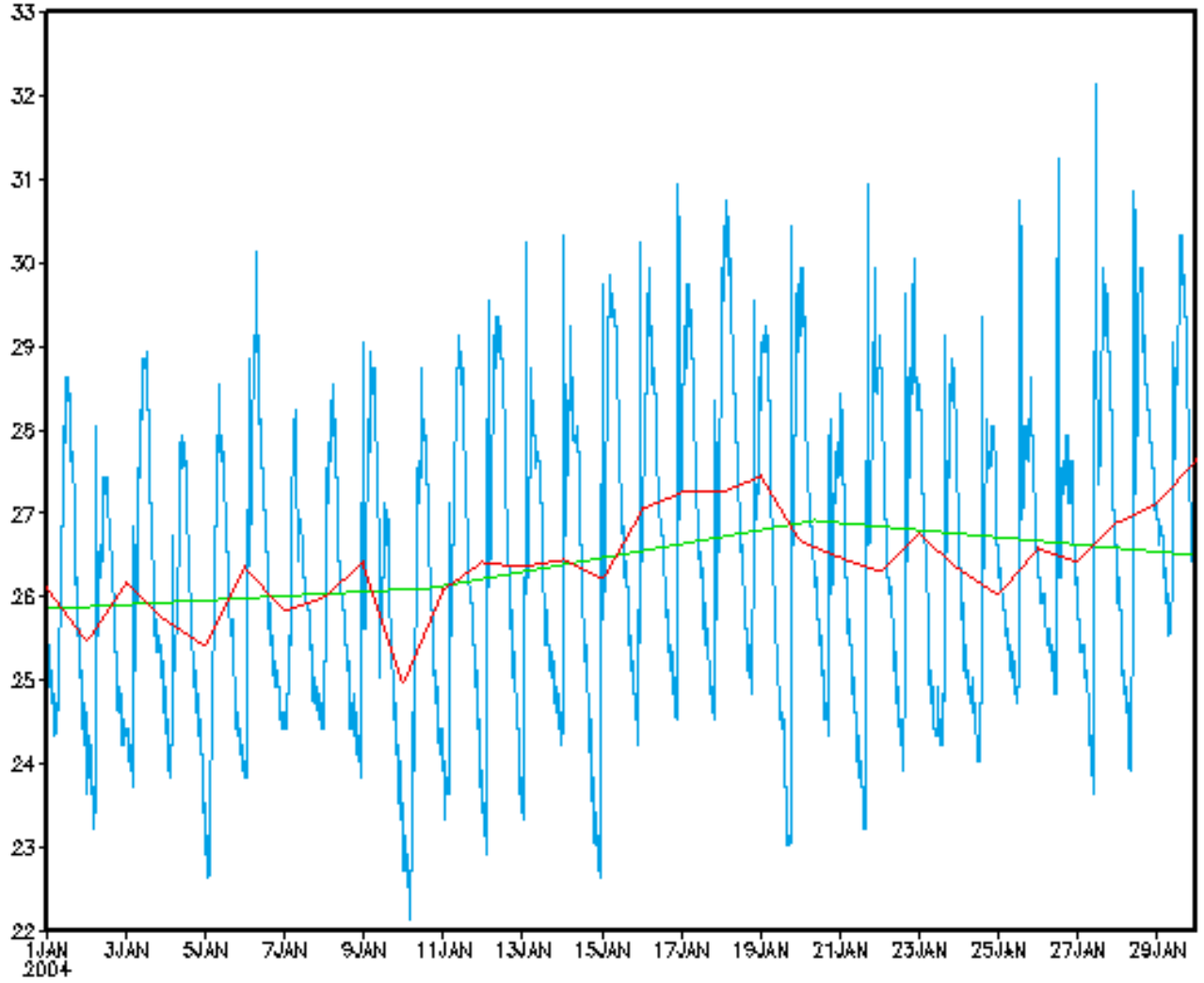


(Sources: Climatic Research Unit of the University of East Anglia, Hadley Centre of the UK Meteorological Office, Data set TaveGL2v, Jones and Moberg, 2003)



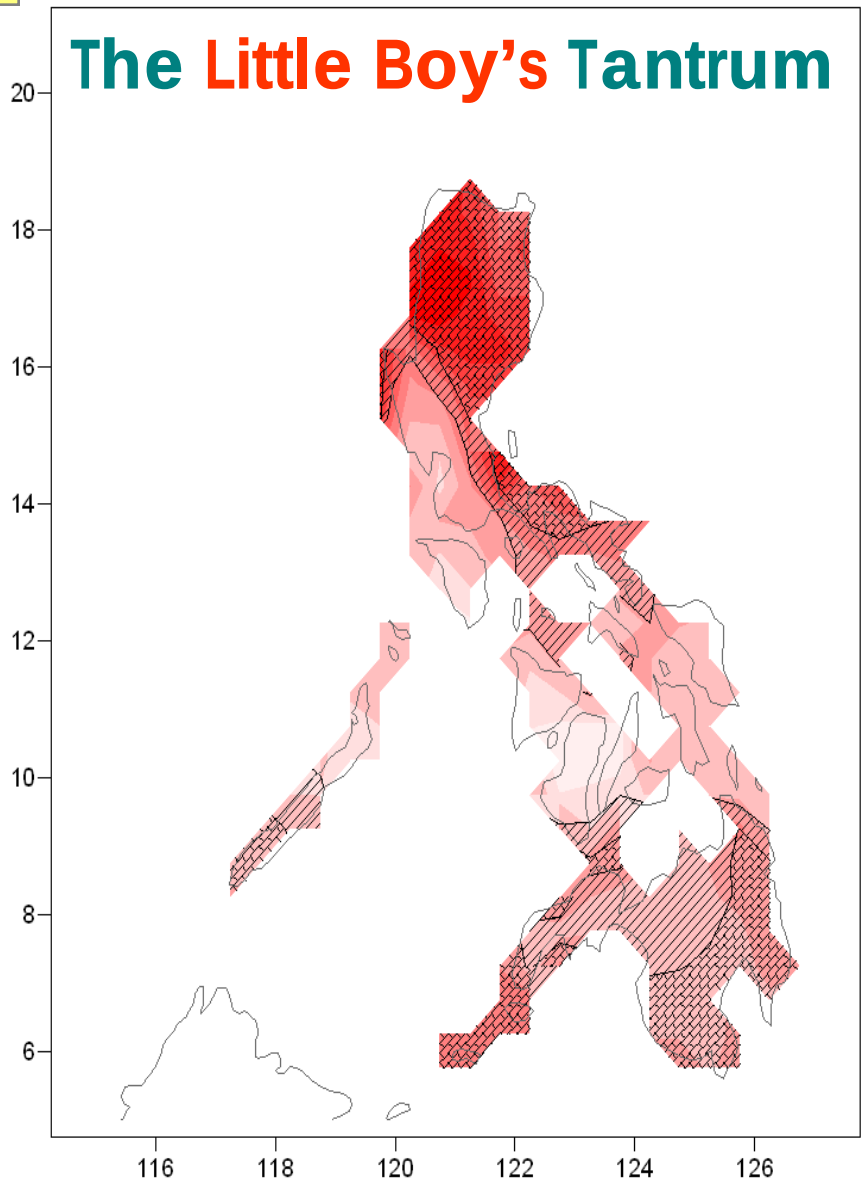
(Source: NASA GISS Surface Temperature Analysis or GISTEMP)

CLIMATE IS MORE THAN JUST "WETHER-WETHER"



Rainfall anomalies due to El Nino events (1950-2000)

The Little Boy's Tantrum



Rainfall anomaly (mm)

-850 -750 -650 -550 -450 -350 -250 -150 -100 -50 0

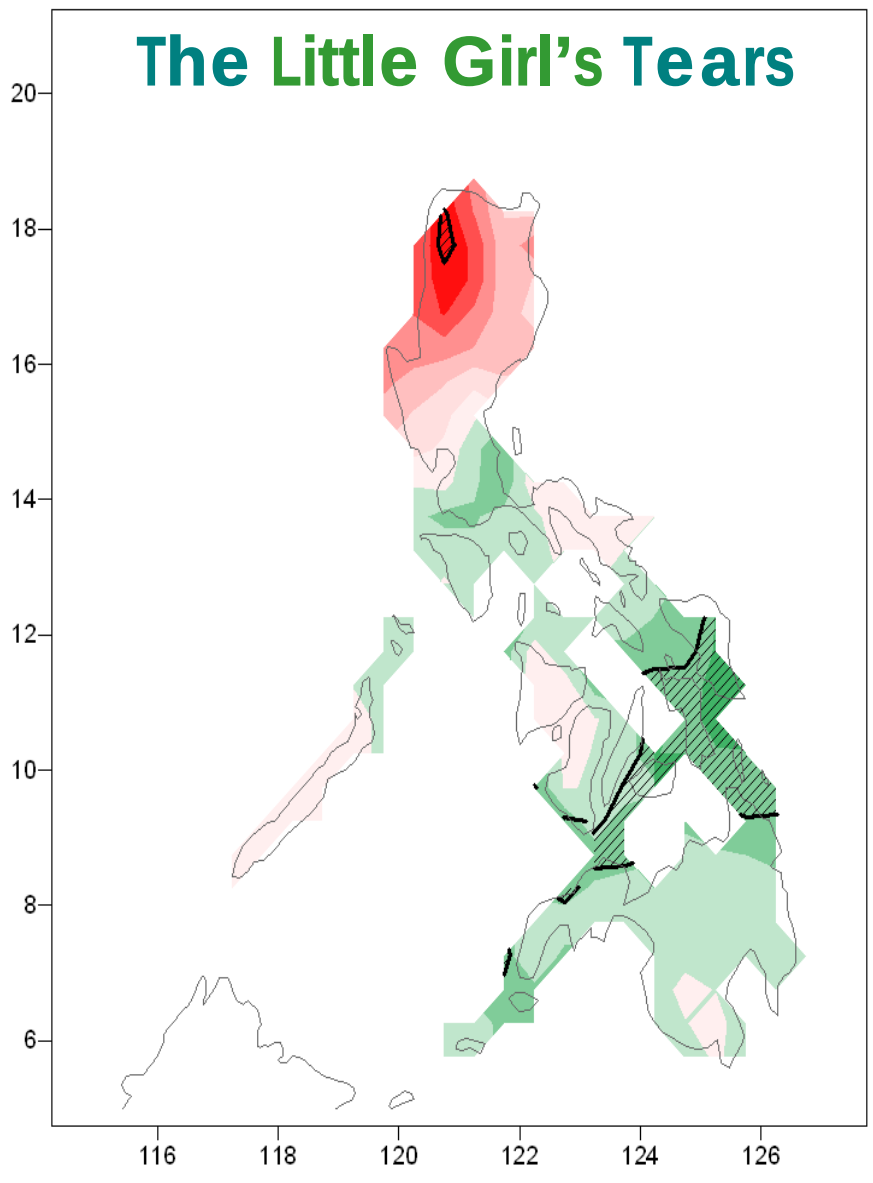
Significant P-value

0 0.01 0.05

Data Source: IPCC-DDC, CRU_TS.2.0 gridded dataset from the Climate Research Unit of the University of East Anglia
ENSO Index: MEI; Period: 1950-2000; Statistical method: Resampling
Map created: 10 May 2006, F. B. Avila and E. G. Anglo, Manila Observatory

Rainfall anomalies due to La Nina events (1950-2000)

The Little Girl's Tears



Rainfall anomaly (mm)

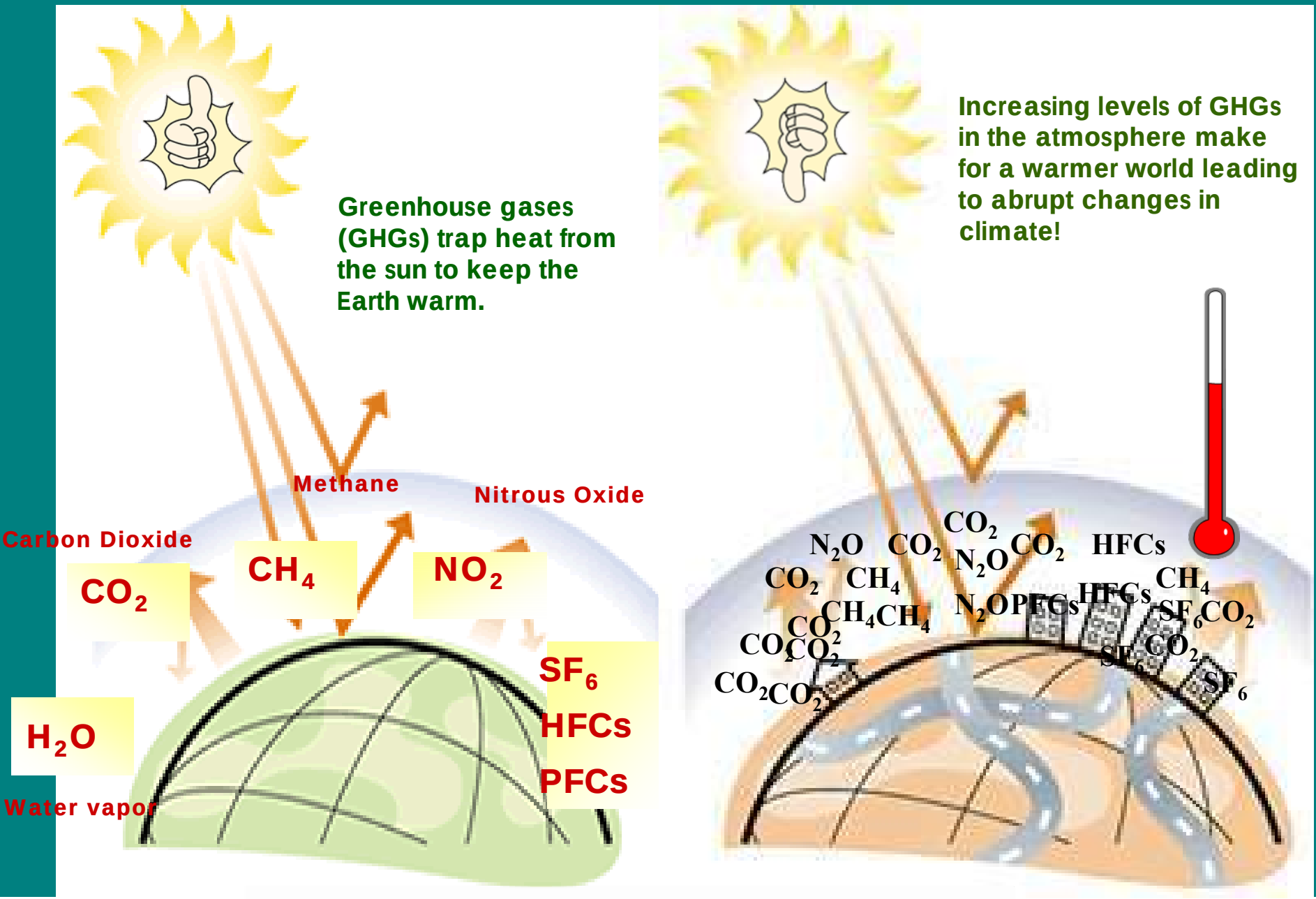
-500 -400 -300 -200 -100 0 100 200 300 400

Significant P-value

0 0.05

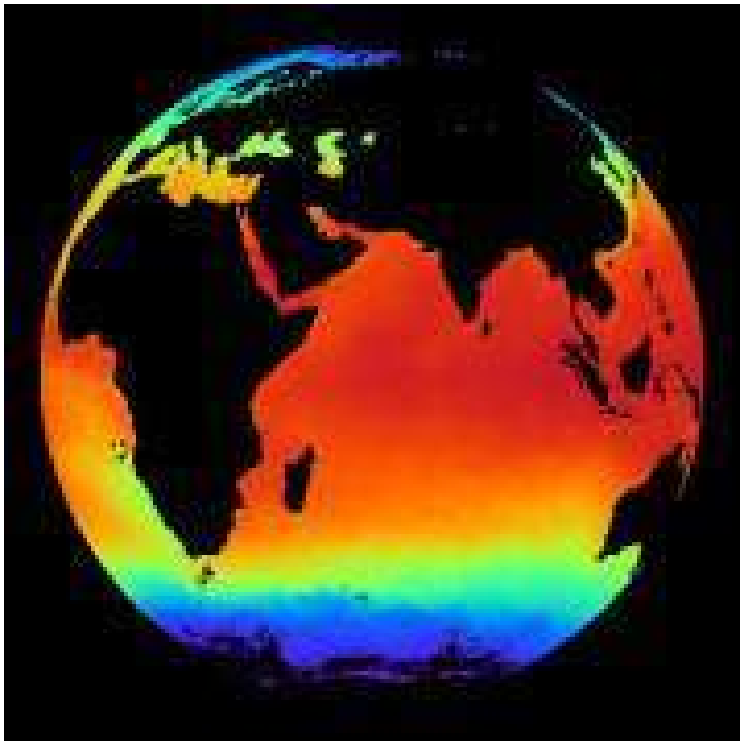
Data Source: IPCC-DDC, CRU_TS.2.0 gridded dataset from the Climate Research Unit of the University of East Anglia
ENSO Index: MEI; Period: 1950-2000; Statistical method: Resampling
Map created: 10 May 2006, F. B. Avila and E. G. Anglo, Manila Observatory

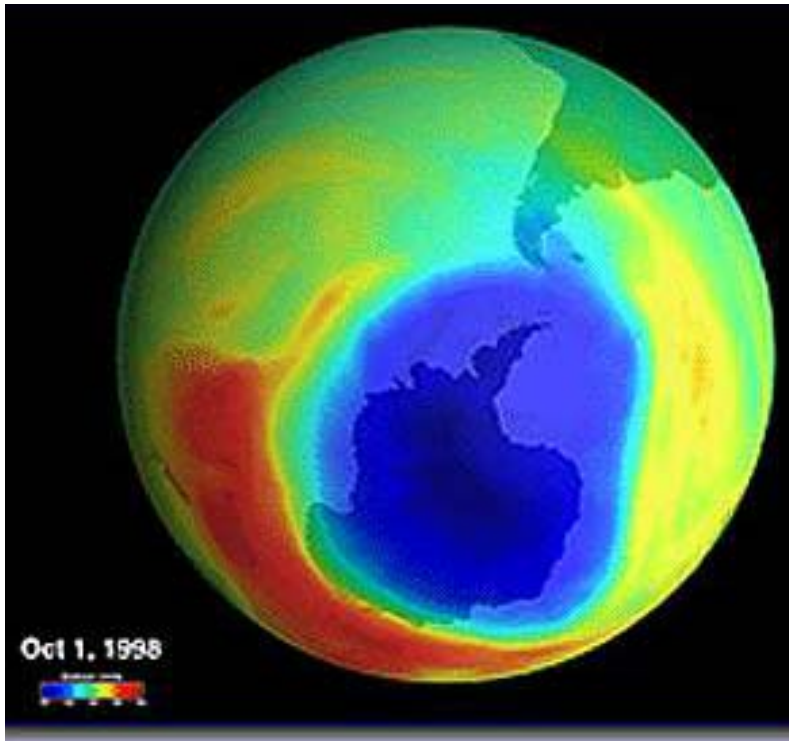
The atmosphere is the earth's blanket.



The Greenhouse Effect

CLIMATE CHANGE vs. OZONE HOLE





CLIMATE CHANGE

CARBON DIOXIDE (CO_2)

WARMING, PRECIPITATION, SEA-LEVEL RISE

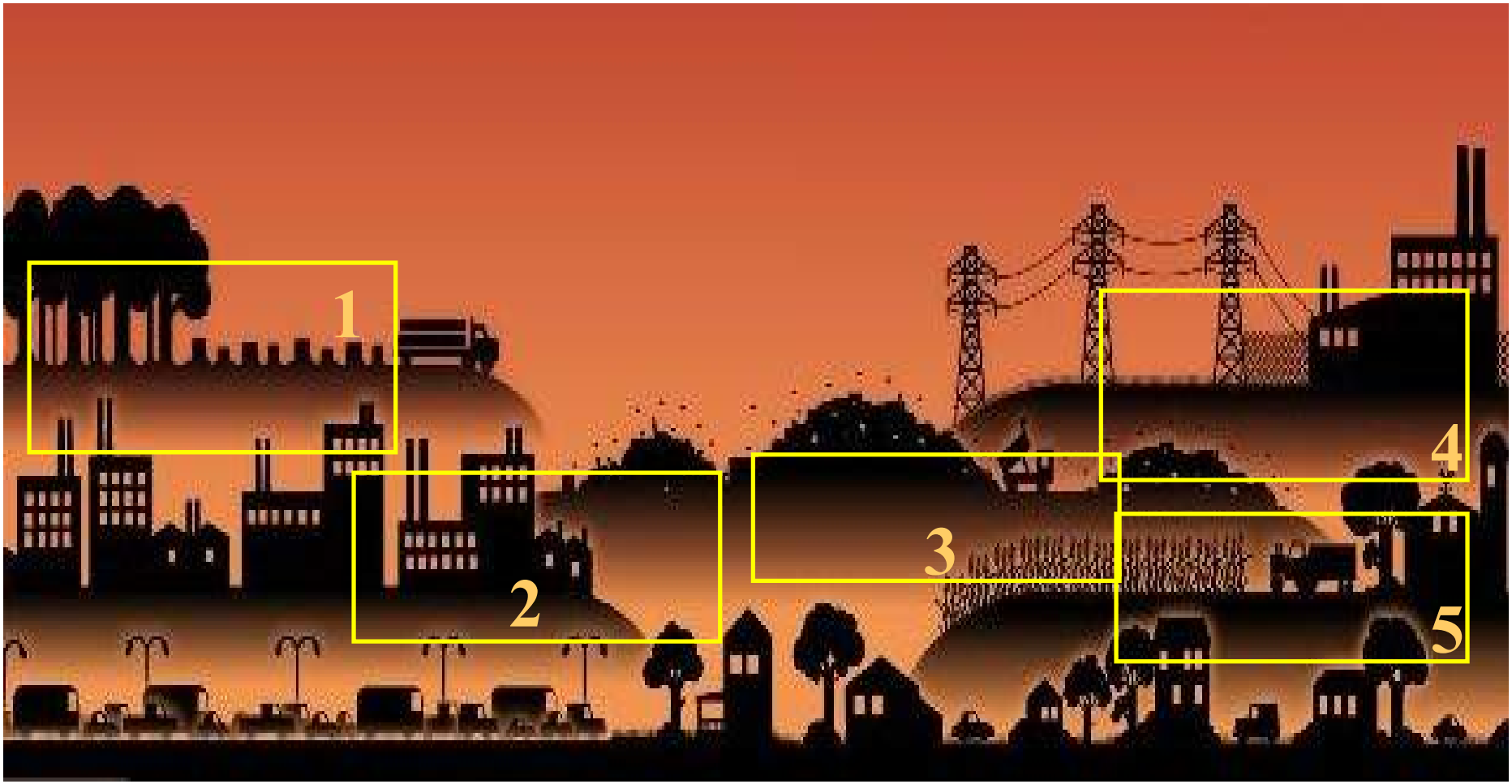
KYOTO PROTOCOL

OZONE LAYER DEPLETION

CHLOROFLOUROCARBONS (CFCs)

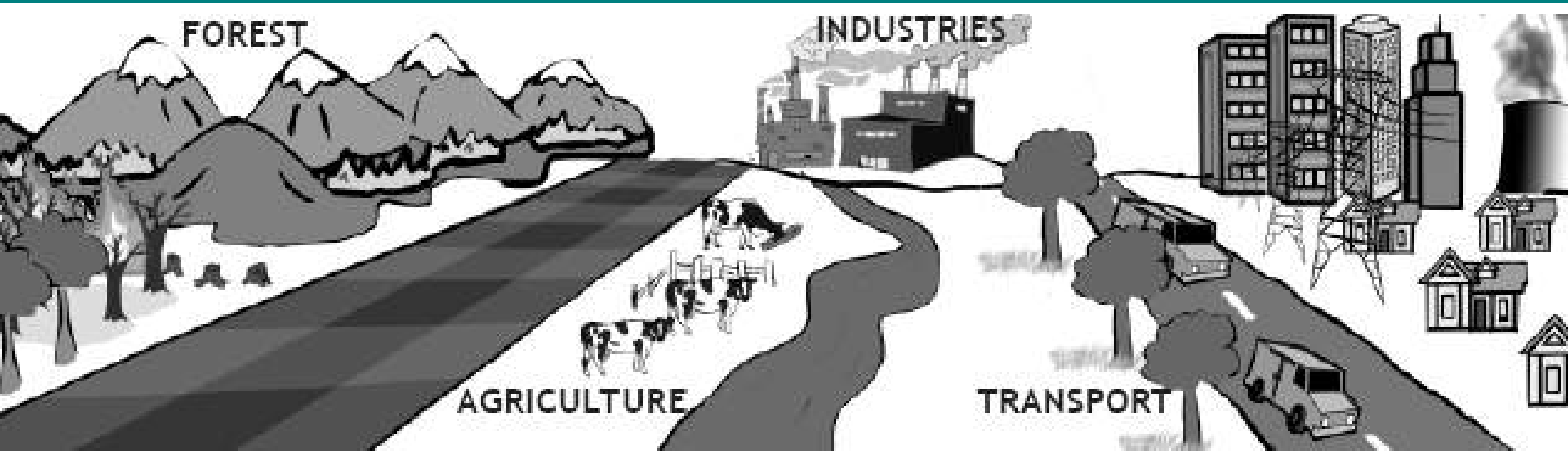
UV RAYS

MONTREAL PROTOCOL



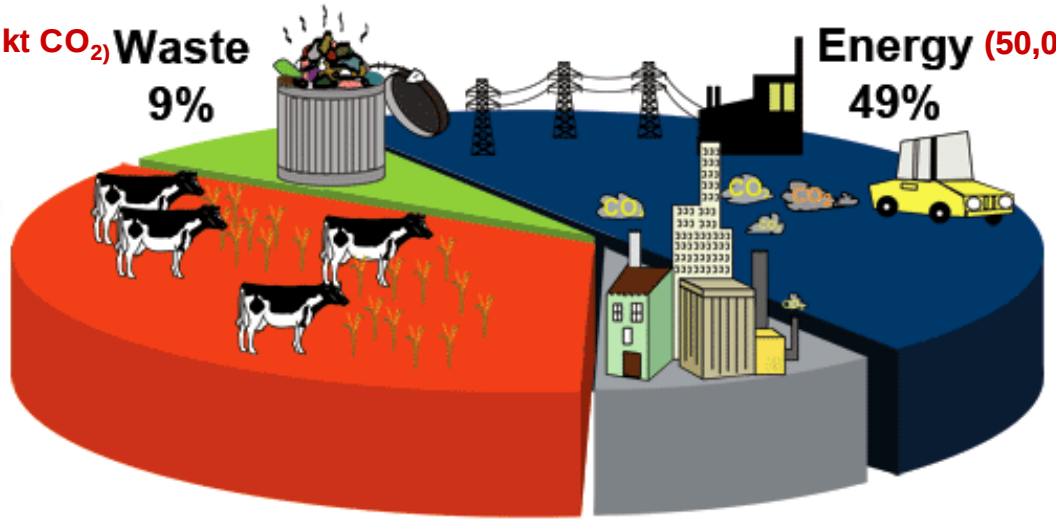
Human-made greenhouse gases.

GHG Sources in Phil.

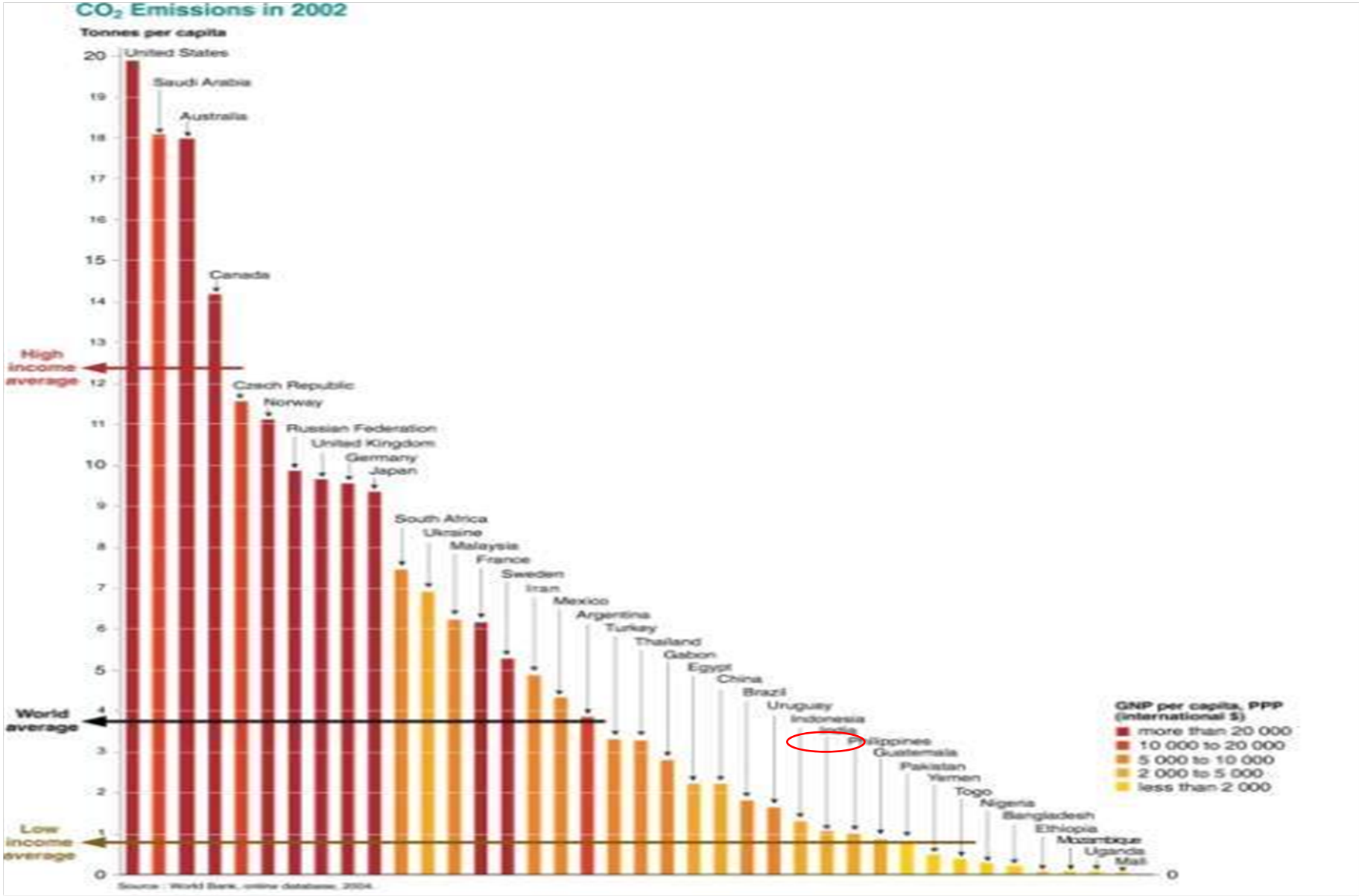


TOTAL: 103,085 kt CO_2

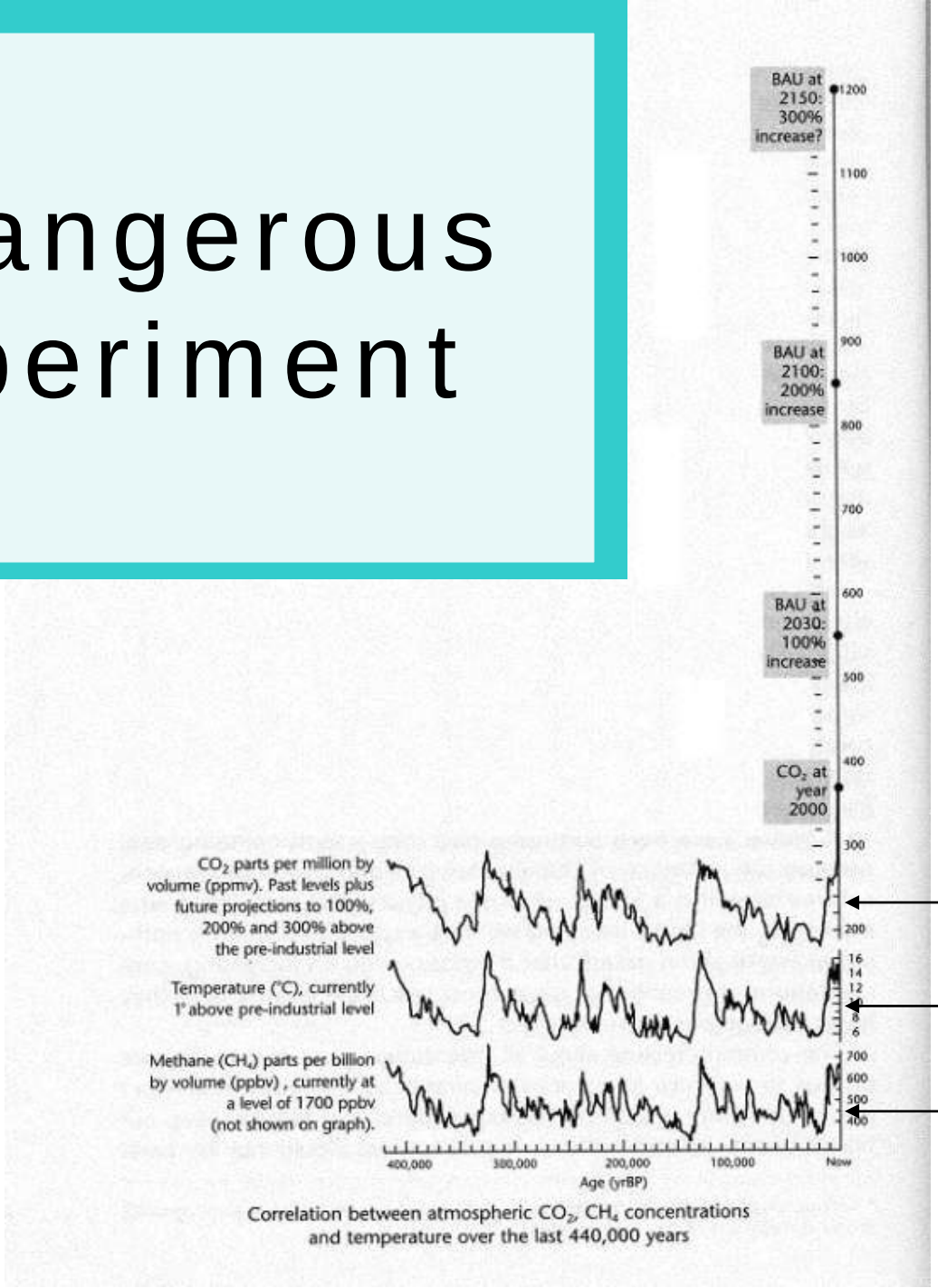
Source: 1994 Philippine GHG Inventory



Global Emissions



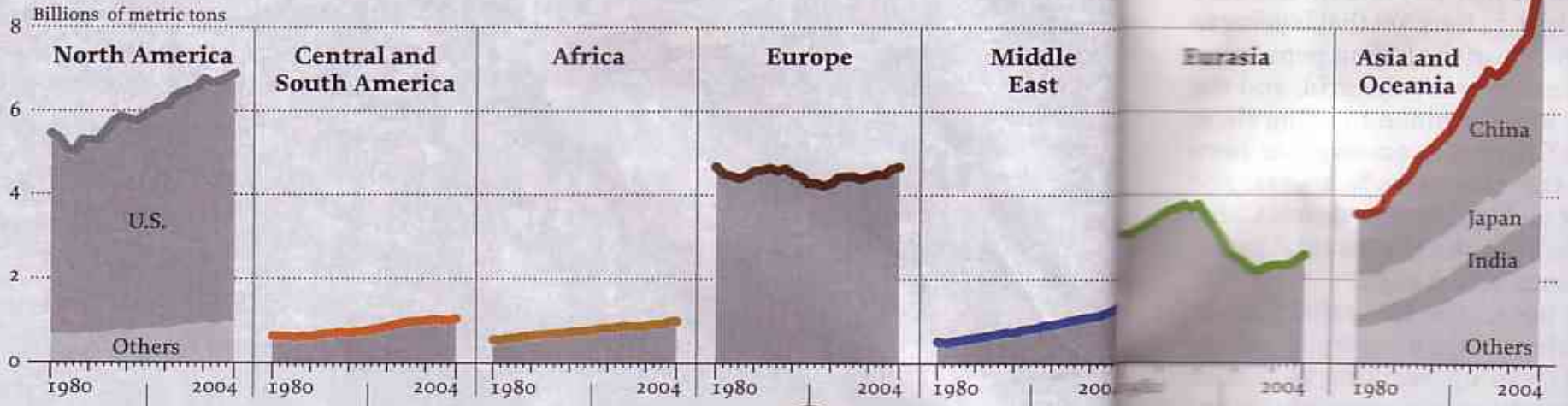
A Dangerous Experiment

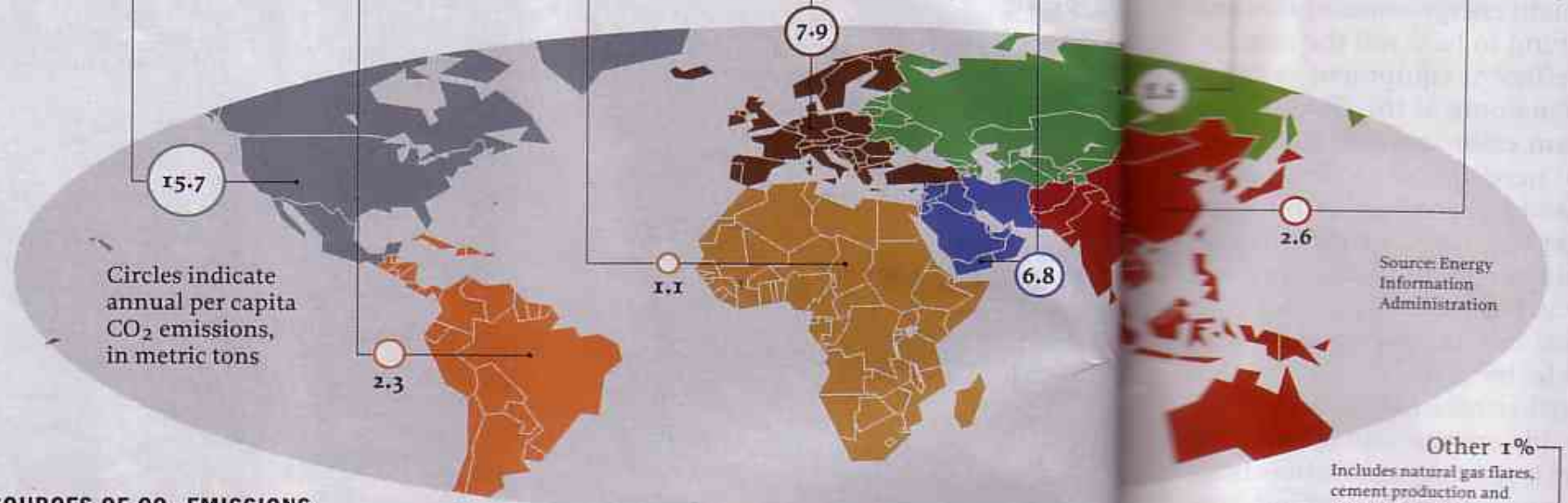


Correlation between atmospheric CO_2, CH_4 concentrations and temperature over the last 440,000 years

A World of Trouble

Total carbon dioxide emissions from the burning of fossil fuels, by region



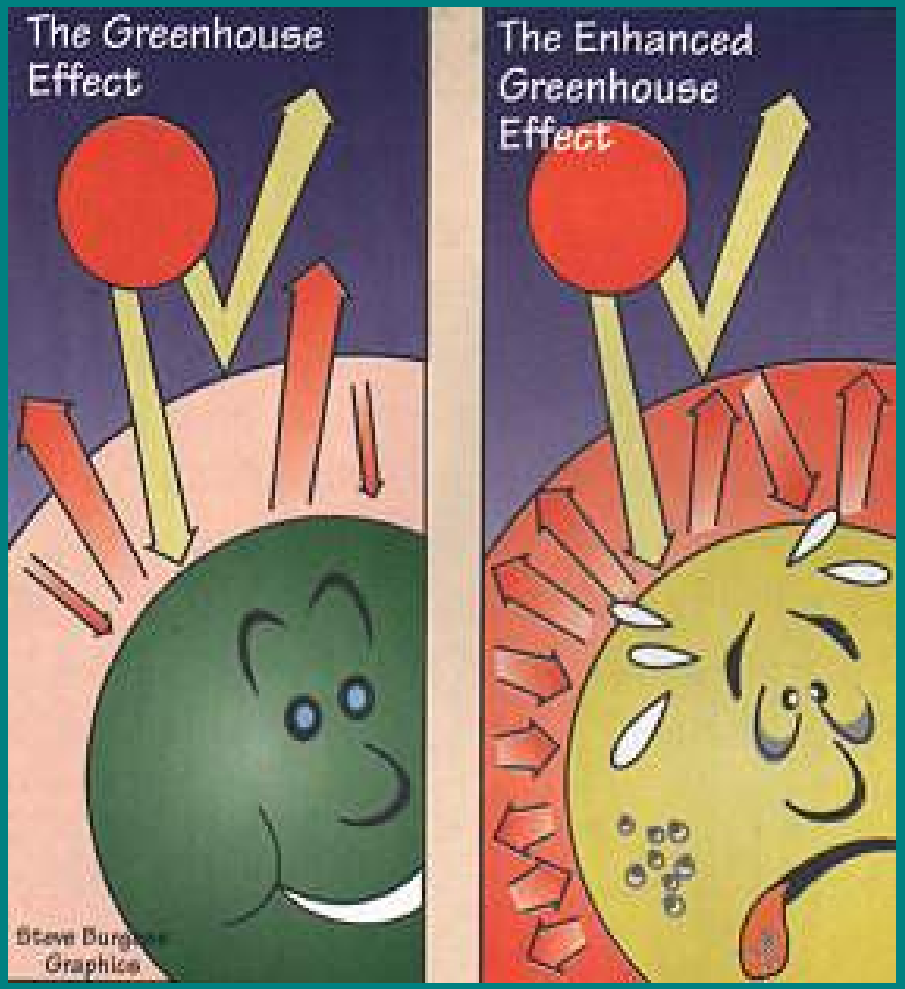


SOURCES OF CO_2 EMISSIONS IN THE U.S.

Transportation	33%	Industry	28%	Homes	21%	Businesses	17%

Other 1%

Includes natural gas flares, cement production and nonfuel emissions



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.

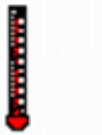
Direct Observations of Recent Climate Change

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

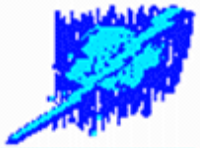
Source: IPCC 4th Assessment Report: Summary for Policy-makers

Potential Climate Change Impacts

Climate Changes



Temperature



Precipitation

Sea Level Rise

Health Impacts

Weather-related Mortality
Infectious Diseases
Air Quality-Respiratory Illnesses

Agriculture Impacts

Crop yields
Irrigation demands

Forest Impacts

Change in forest composition
Shift geographic range of forests
Forest Health and Productivity

Water Resource Impacts

Changes in water supply
Water quality
Increased Competition for water

Impacts on Coastal Areas

Erosion of beaches
Inundate coastal lands
Costs to defend coastal communities

Species and Natural Areas

Shift in ecological zones
Loss of habitat and species

EPA

United States Environmental Protection Agency

Agricultural Lands | Coastal Zones | Forest Lands | Freshwater Systems | Arid Lands & Grasslands

Food and Fiber Production

Provision of Clean and Sufficient Water

Maintenance of Biodiversity

Maintenance of Human Health

Storage and cycling of Carbon, Nitrogen, Phosphorus

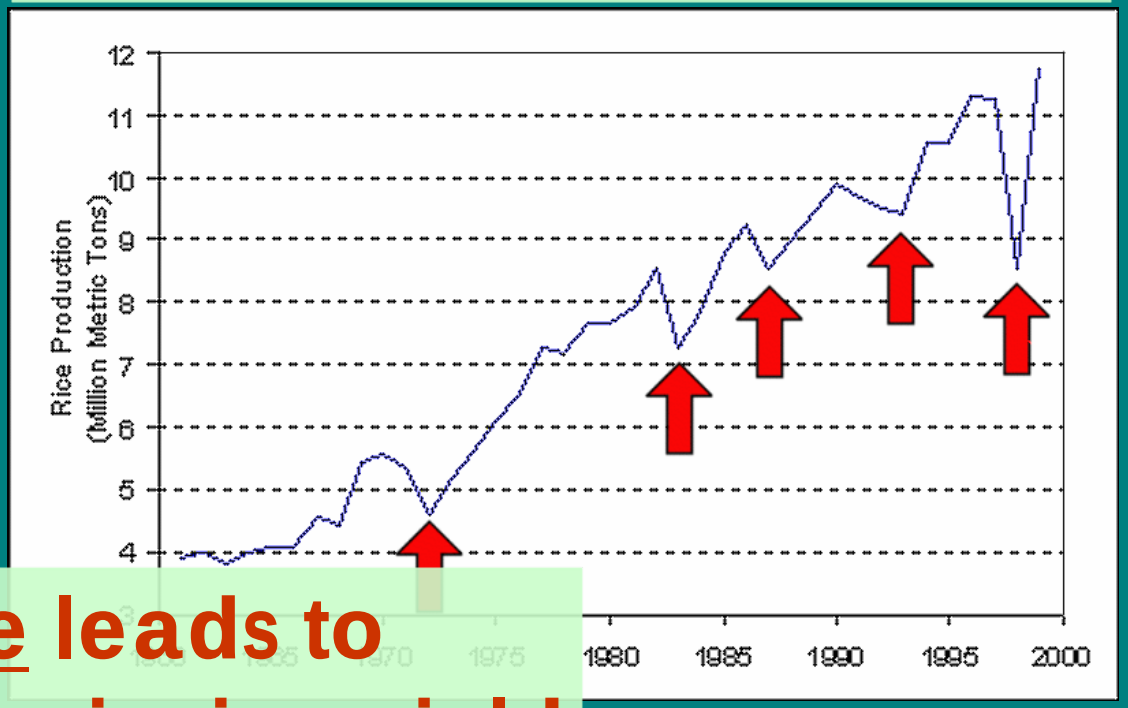
Climate change will affect the ability of ecological systems to provide a range of essential ecological goods and services

Across Society

Vulnerable sectors

- Agriculture
- Freshwater
- Health
- Biodiversity
- Forests

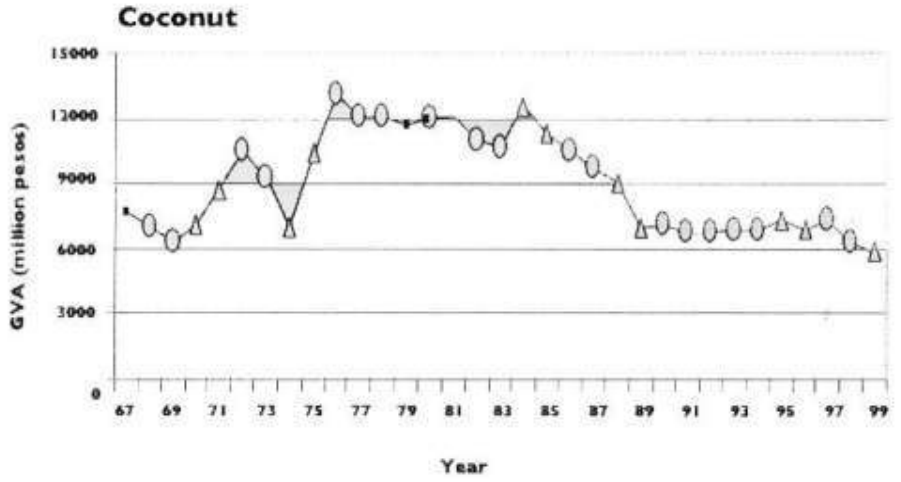
ENSO drought events and rice

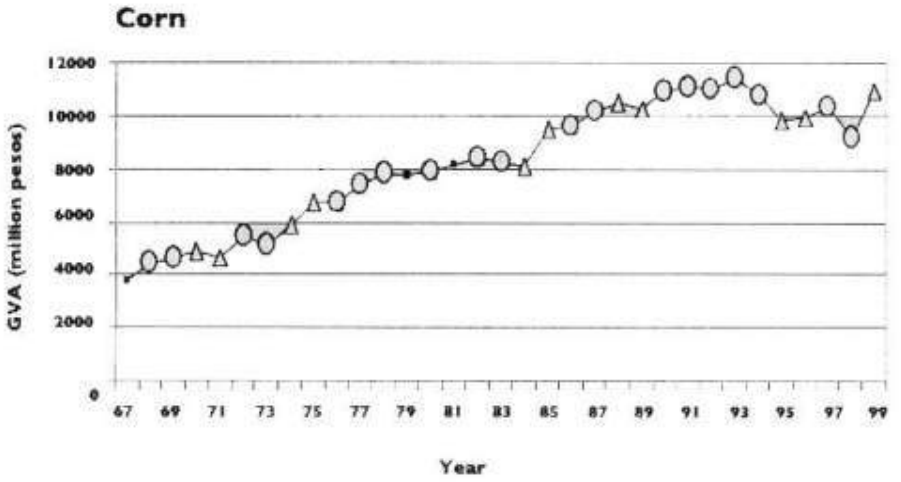


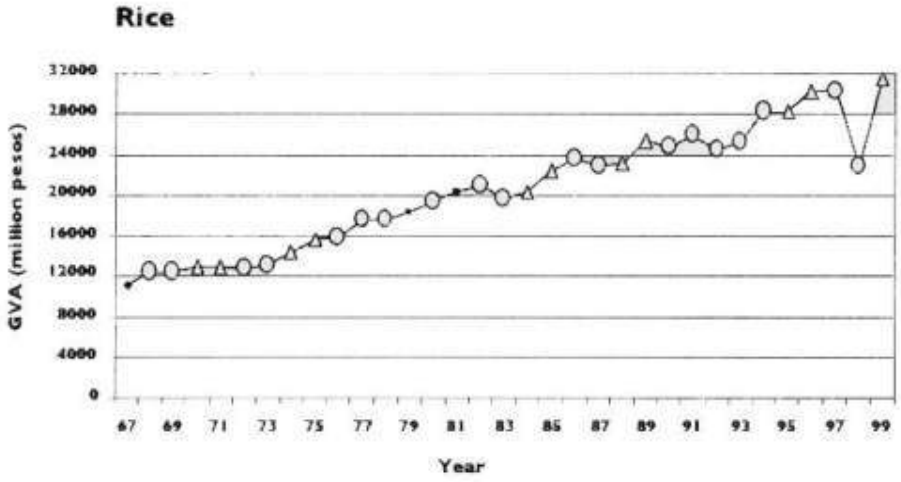
1 ºC increase leads to
15% decrease in rice yield

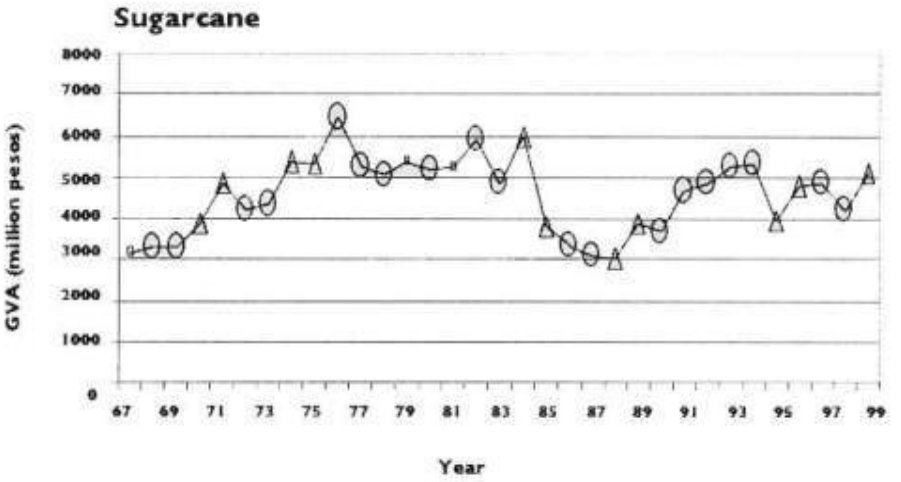
From: www.sciencentral.com: Cassman, IRRI, National Academy of Sciences

El Niño and Philippine Crops









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

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**

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)

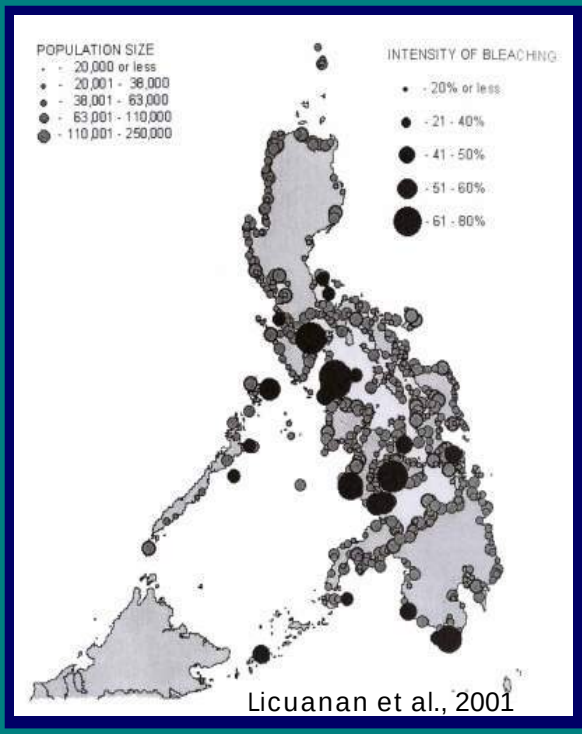
Seeking shelter *The streets of Jakarta vanished underwater after torrential rain displaced 190,000 people in February. Bigger storms make the world's floodplains even more vulnerable*

Climate Change Impacts

- **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)



Licuanan et al., 2001

- **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.

ANDRE MACLENNAN—STILL PICTURES

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.

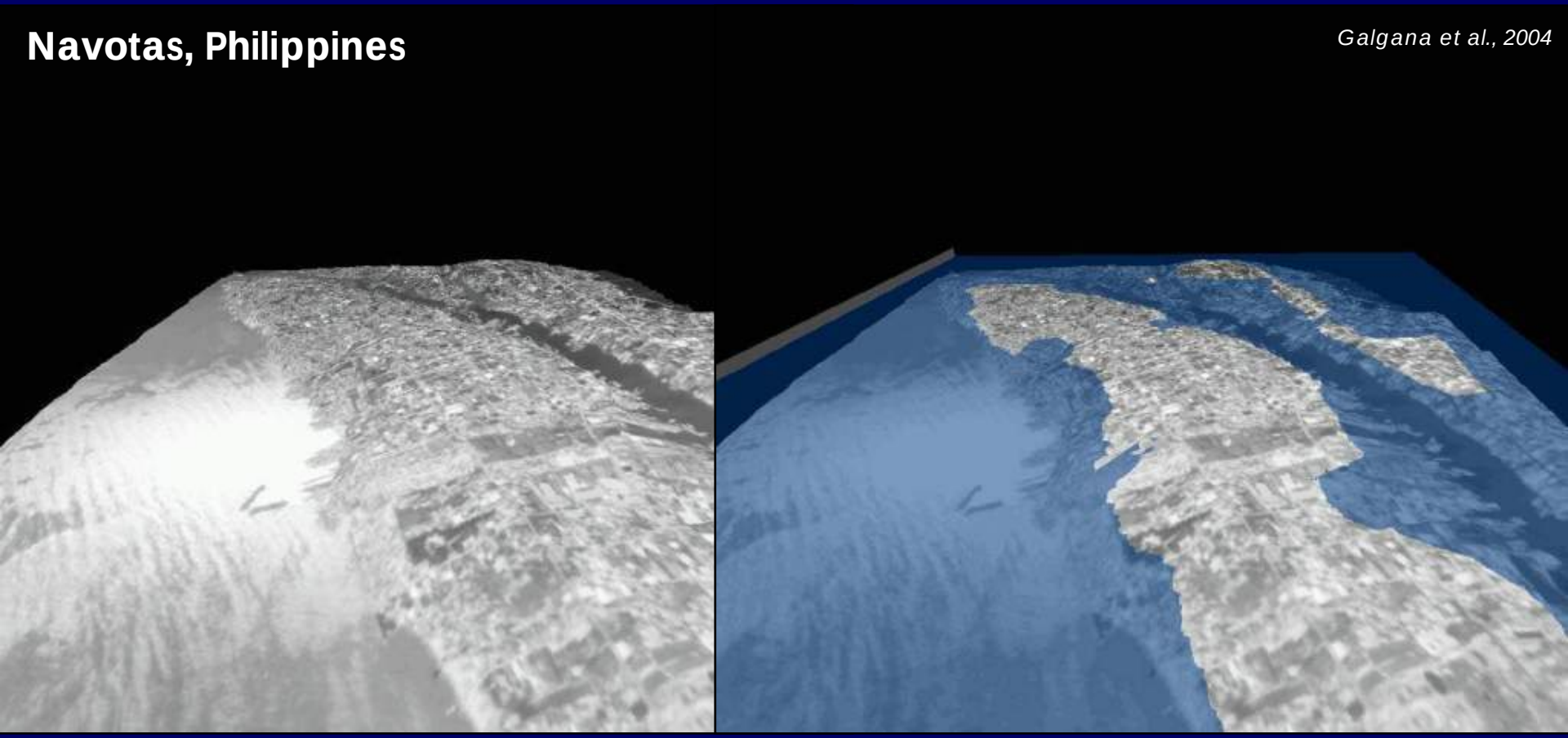
With FERNANDO DE FREITAS in Darwin and KARLA BRUNING in New York

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

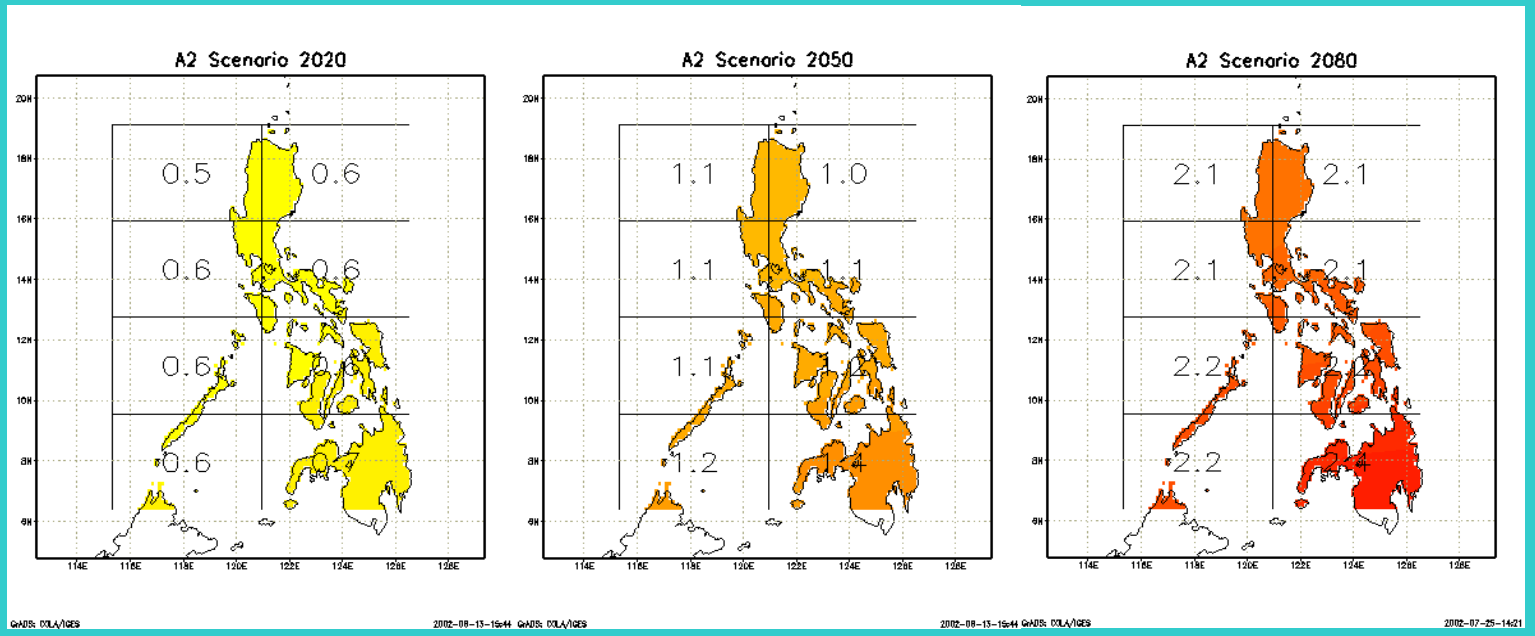
Philippines and Disasters: Mapping Risks

Disaster Language

Risk	**likelihood of harm, loss, disaster**
Hazard	**physical impact of disturbance or damaging event**
Exposure	**elements affected by hazard**
Vulnerability	**susceptibility of a community to experience harmful effects of hazards**

Risk = Hazard x Exposure x Vulnerability

REFERENCE: *Where is Harm's Way? (Mapping Disaster Risk in the Philippines)*



Direct Physical Changes

Temperature

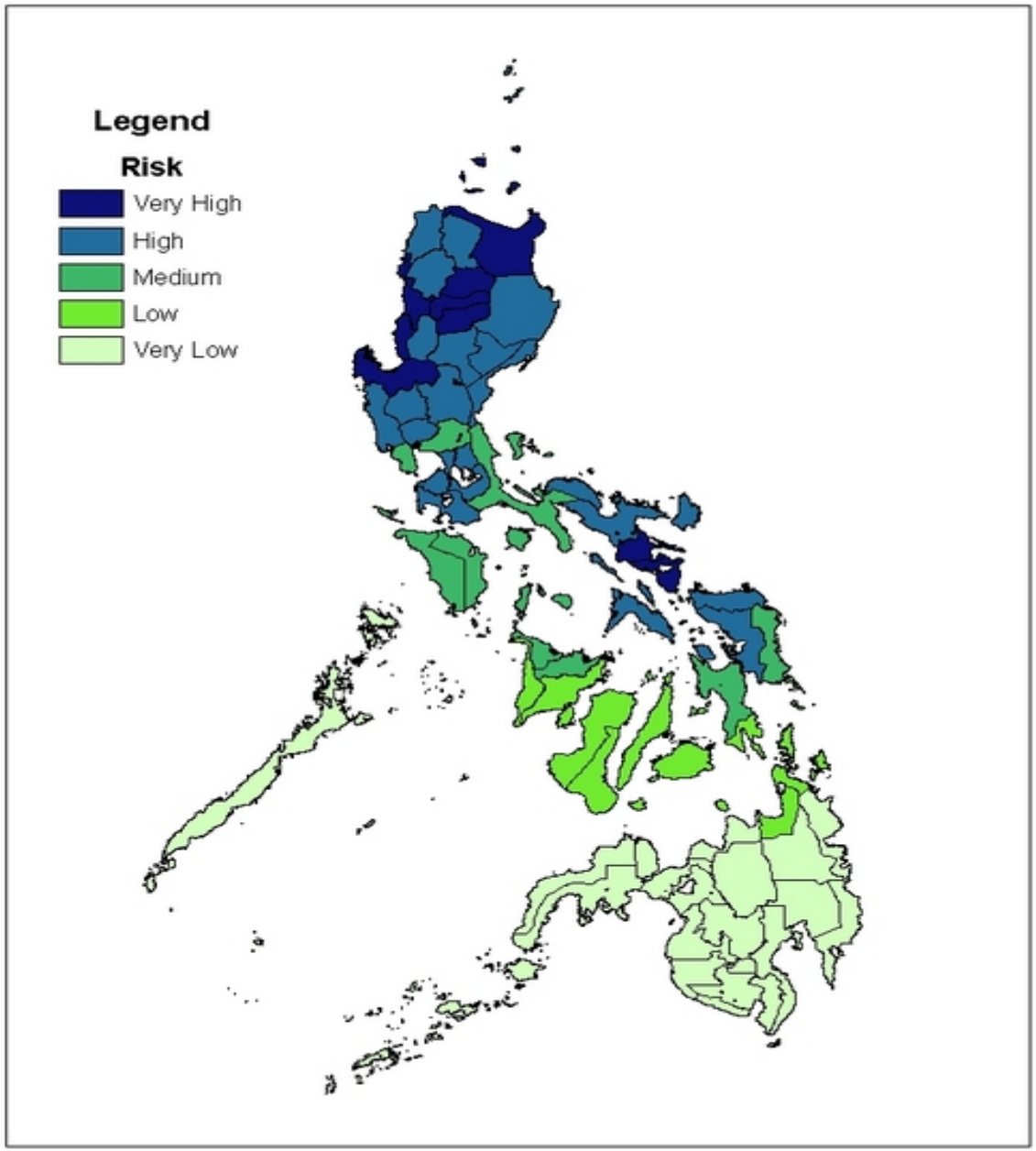
Rainfall

Sea level

Wind and Typhoons

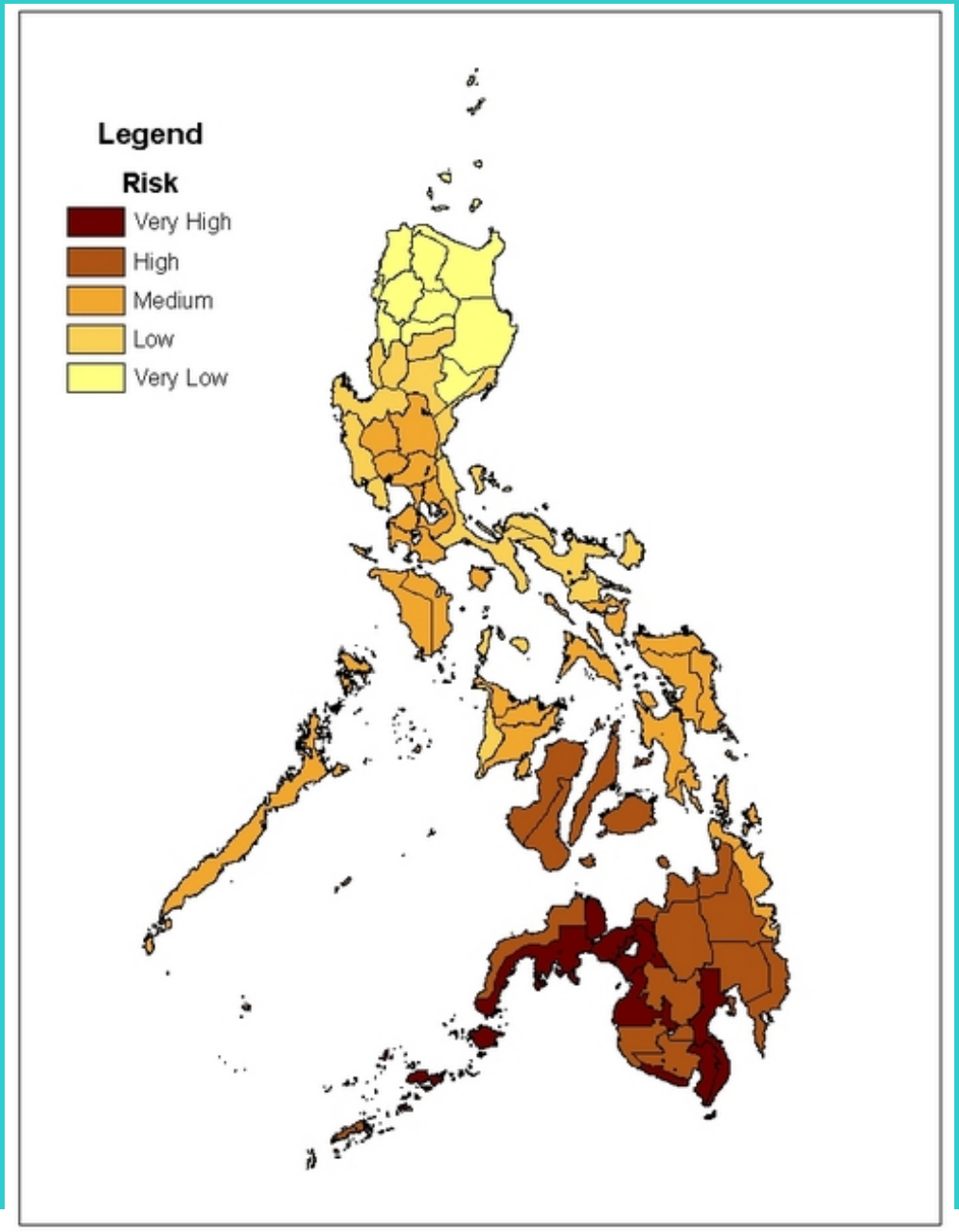
Ocean circulation

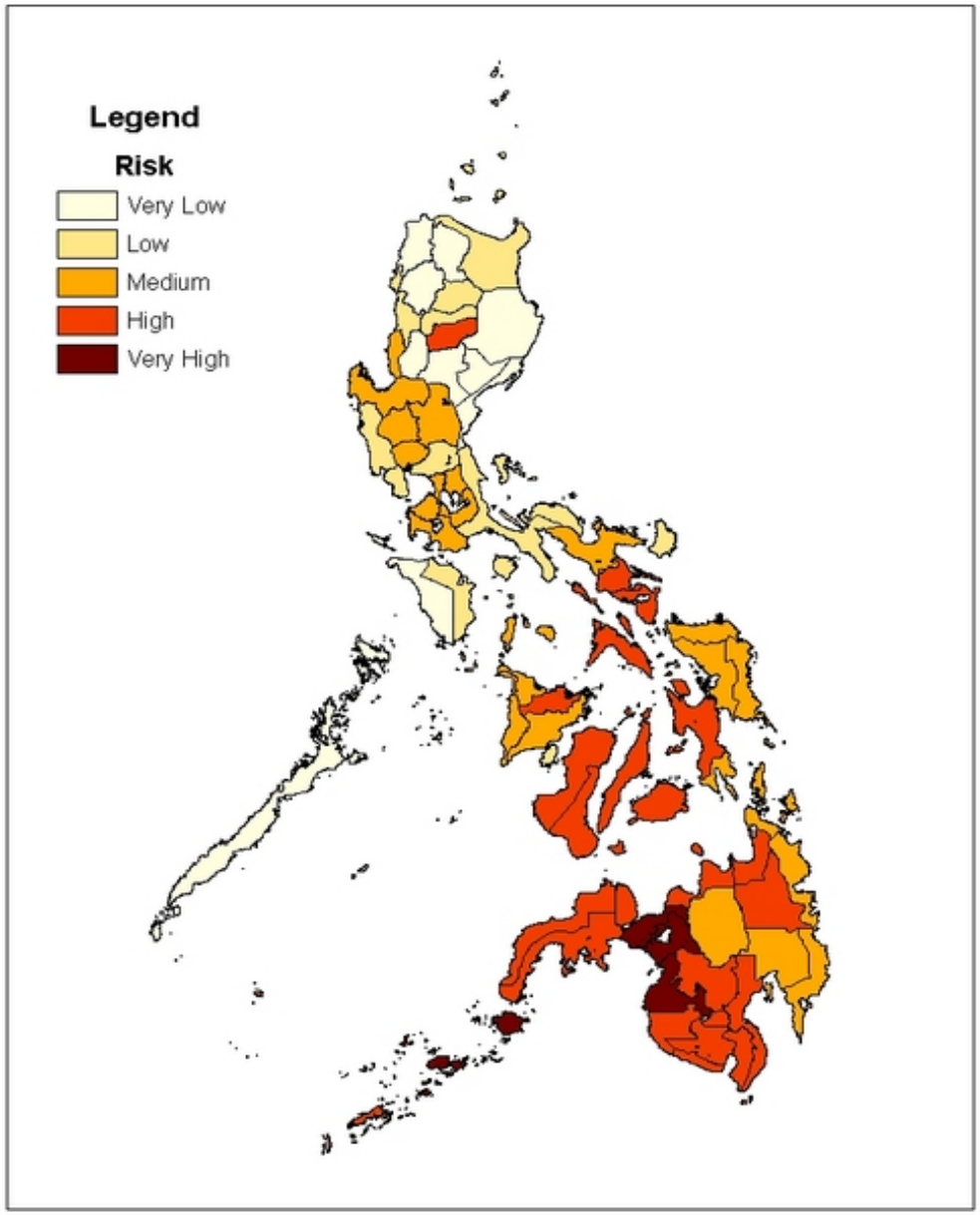
How **bad** will it be?



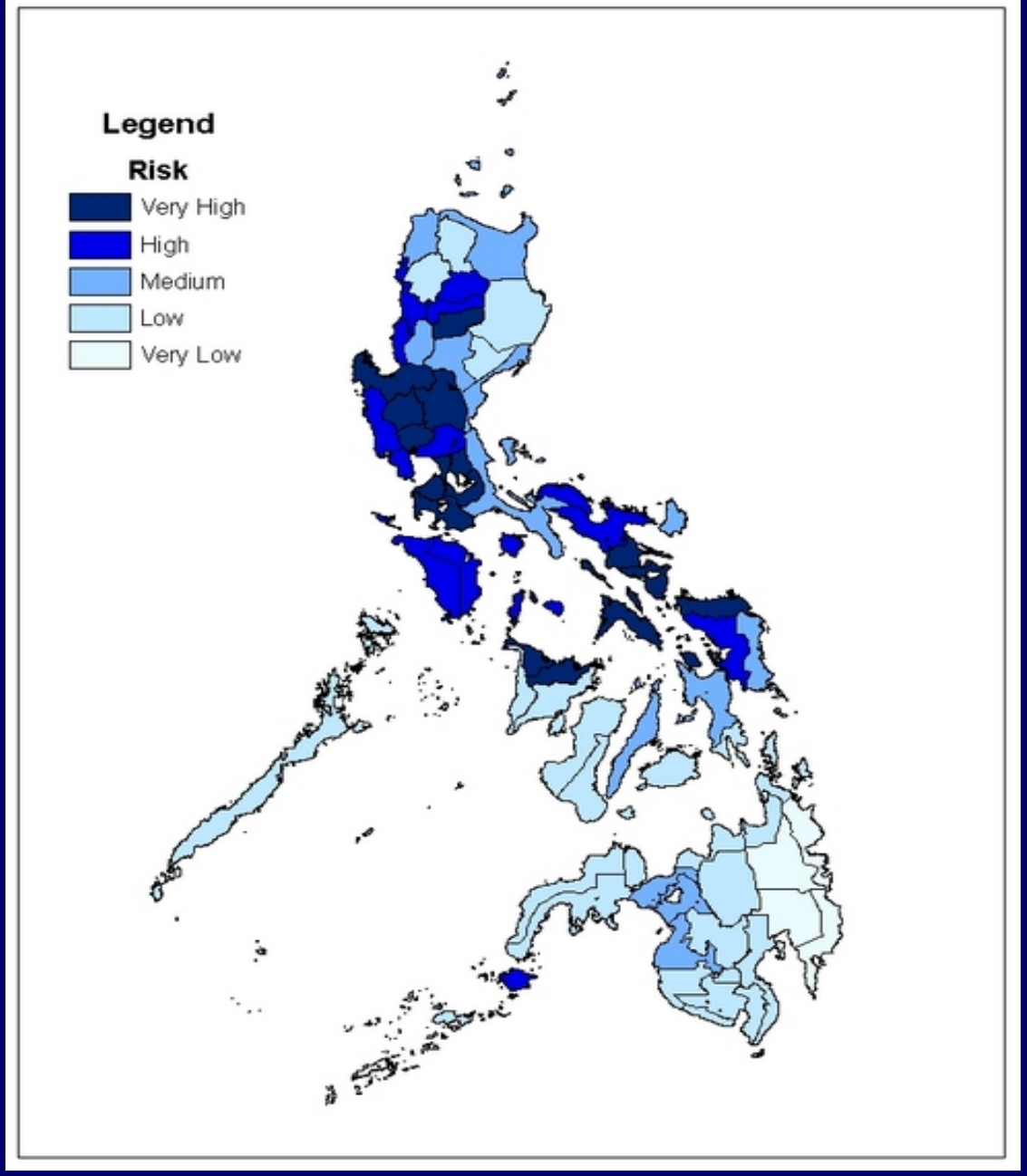
Risk: Typhoon

Risk: Drought (El Nino)





Risk: Climate Change (Temperature)



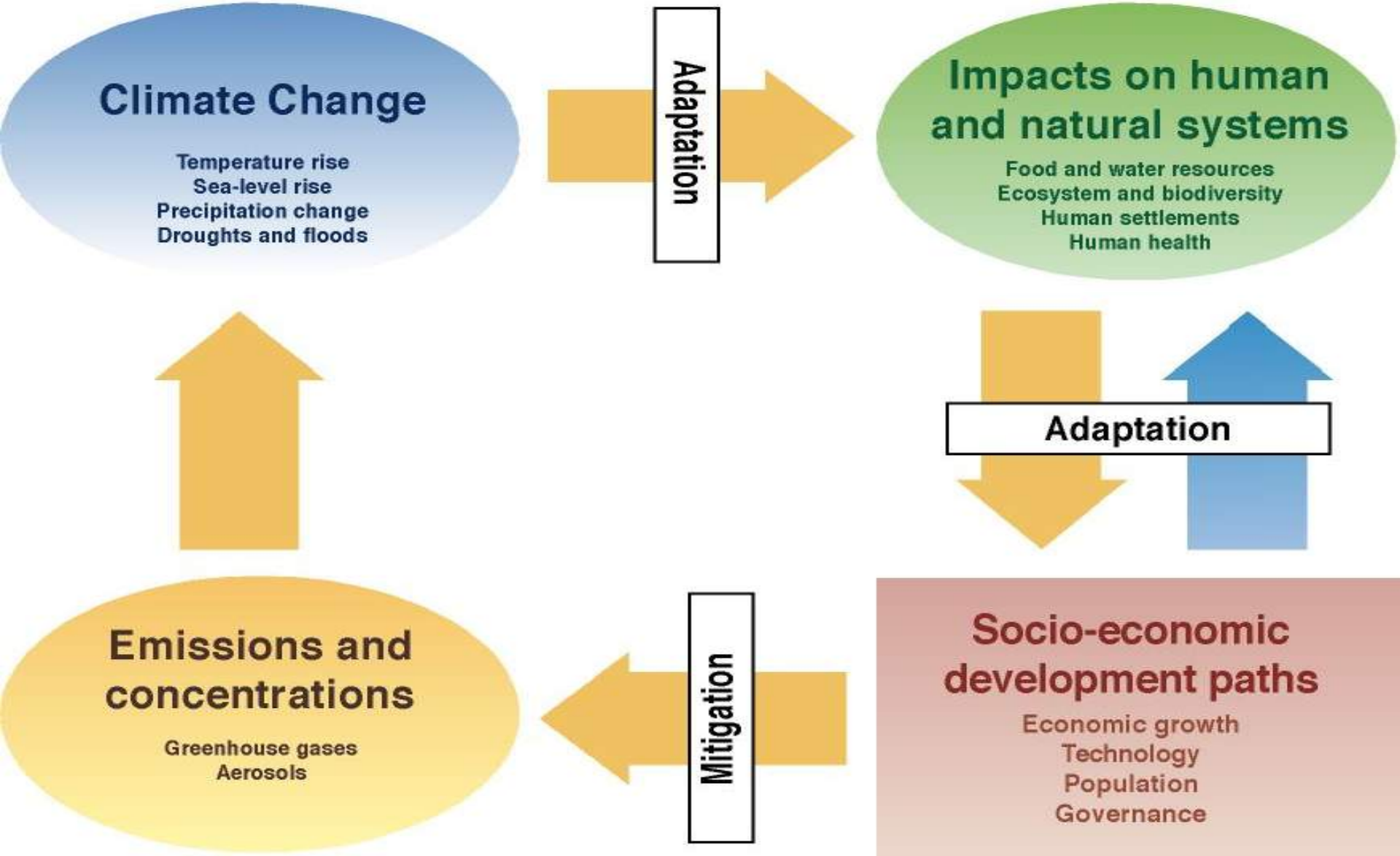
Risk: Climate Change (Rainfall)

In summary, harm's way:

- Typhoon
  - Luzon (north, southeast), Visayas (east)
- Drought (El Nino)
  - Mindanao (central, west)
- Climate Change
  - Temperature: Mindanao, Visayas (central)
  - Rainfall: Luzon (central, south, southeast), Visayas (east)

What can/should we do?

Climate Change – An integrated framework



What can/should we do?

Mitigation

- Actions which are adopted to reduce the effects of anthropogenic activities on the global climate.

Adaptation

- Adjustments in practices, processes, or structures of systems to projected changes of climate

Energy

Waste

Industry

Forestry

Agriculture

Adaptation Measures and Response Strategies

- **Agriculture: new suite of crops, water mgt in irrigation, diversification, integrated pest management, improved land management and use, soil conservation, and economic options: liberalization of trade barriers, subsidies/incentives, traditional agriculture and agroforestry, quarantine, monitoring/surveillance of invasive and introduced species**
- **Coastal zones: hard options (seawall), and soft options (beach nourishment), coral reef protection, marine conservation, coastal planning, zonation, shoreline stabilization, restoration, rehabilitation**
- **Water resources: flood control/mitigation, conservation, increase reservoir capacity, groundwater resources, watershed management, desalination, management of water demand for irrigation**

Source: G. Sen, UNFCCC

Mitigation Measures and Strategies

- Energy and Transport:
  - Renewable energy (solar, wind, biomass, tide, hydro, etc.)
  - Energy efficiency, conservation
  - Alternative fuels (e.g. biofuel)
  - Public and alternative transport, traffic management
- Waste
  - Solid waste and wastewater management
  - Methane capture
- Land use and forestry
  - Reforestation, afforestation
  - Urban land use planning
- Agriculture
  - Agriculture residue management
  - Animal waste management

Adaptation Measures and Response Strategies

- **Human health: awareness programs, monitoring, surveillance of vectors, improved living standards, and emergency response systems**
- **Terrestrial ecosystems and forests: conservation of biodiversity, forest conservation, plantation forestry, soil seed banks, efficient use of forest resources, prevention of forest fires, development and trials of new and faster growing trees/plants, rehabilitation and protection of degraded lands**
- **Fisheries: data collection, research, monitoring and surveillance of fish stocks, management and sustainable use of marine resources**

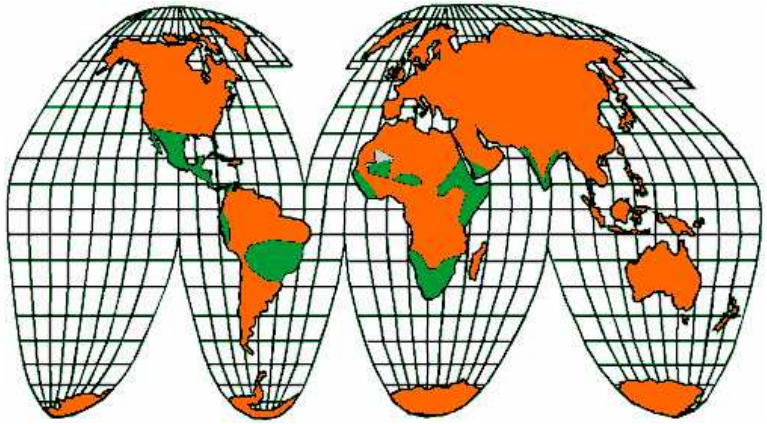
Source: G. Sen, UNFCCC

Mga Solusyong Pinoy

Biofuels: Ethelyne - galing sa tubo at mais?
Methylene – galing sa basura ng logging
Biodiesel – galing sa niyog, jatropha (??), iba pang halaman.

Jatropha

http://toptropicals.com/pics/garden/shrubs/pics_shrubs2/5017.jpg



http://www.jatropha.de/jatropha-world-map.jpg

http://www.jatrophaseeds.com/images_files/jatropha.jp

Ang paggamit ng commercial fertilizer sa daigdig kada taon, x 1,000 tonelada

	Nitrogenous Fertilizers	Phosphate Fertilizers	Potash Fertilizers	Total Fertilizers
1961/62	11,588	10,931	8,664	31,182
1971/72	33,536	22,435	17,340	73,310
1981/82	60,452	30,946	23,749	115,147
1991/92	75,633	35,241	23,732	134,606
2001/02	81,970	33,050	22,711	137,730

Sa paggawa ng bawat kilo, kailangan ng 1.4 litrong diesel.

81,970,000 x 1.4 = 114,758,000 litro.

Source: Food and Agriculture Association (FAO), Quoted by The Fertilizer Institute http://www.tfi.org/Statistics/USfertuse2.asp


Hayop; kabayo, baka, kalabaw
Tao : mga traysikel, palitan ng lakad o pedicab
2004 © Sandra J. Colby

Mga Solusyong Pinoy: Hangin!

http://www.gmapinoytv.com/sidetrip/blog/uploads/Banguitop.JPG

Mga Solusyong Pinoy Geothermal!

http://geothermal.marin.org/GEOpresentation/images/img018.jpg&imgrefurl=http://geothermal.marin.org/GEOpresentation/sld018.htm&h=384&w=575&sz=71&tbnid=bOGml9xEE0YJ:&tbnh=88&tbnw=132&hl=en&start=2&prev=/images%3Fq%3DPhilippines%2B%252B%2BGeothermal%26svnum%3D10%26hl%3Den%26lr%3D%26sa%3DG

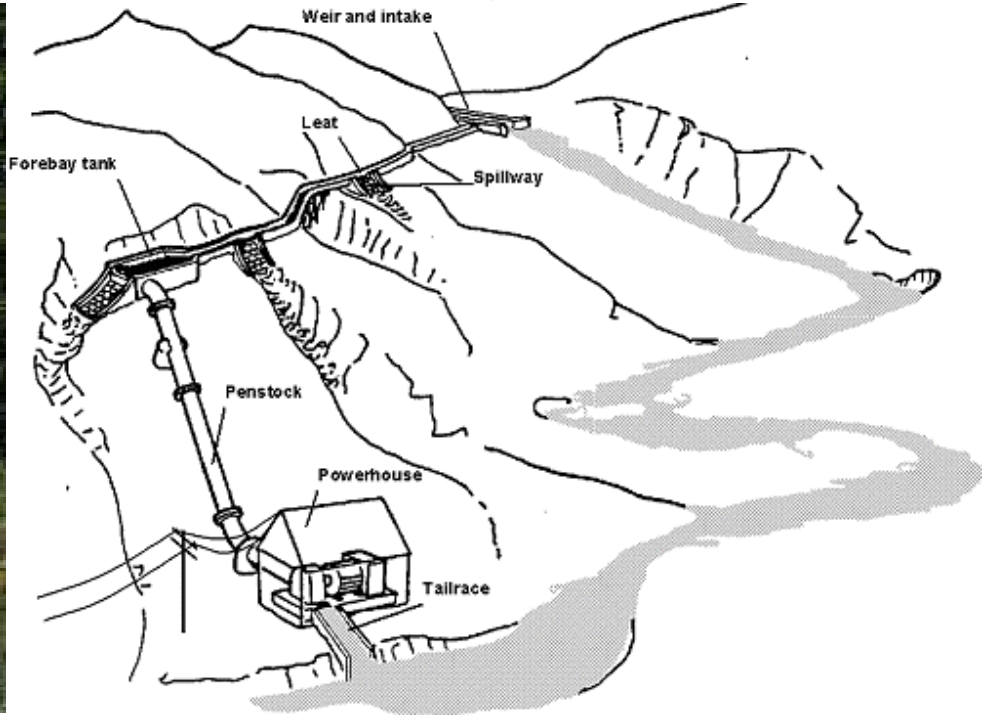
http://www.energy.com.ph/Geoscientific/projects.htm.

Table 2: Global Development: Installed Geothermal Generating Capacity

	Country	Current (2000) & Projected (2005) Installed 2000 (MWe)	Generated 2000 (GWh)	Projected 2005 (MWe*)
	Argentina[a]	0	0	n/a
	Australia	0.17	0.9	n/a
	China	29.17	100	n/a
10	Costa Rica	142.5	592	161.5
9	El Salvador	161	800	200
	Ethiopia	8.52	30.05	8,52
	France	4.2	24.6[b]	20
	Greece[a]	0	0	n/a
	Guatemala	33.4	215.9	33.4
8	Iceland	170	1,138	186
5	Indonesia	589.5	4,575	1,987.5
3	Italy	785	4,403	946
6	Japan	546.9	3,532	566.9
	Kenya	45	366.47	173
4	Mexico	755	5,681	1,080
7	New Zealand	437	2,268	437
	Nicaragua	70	583	145
2	Philippines	1,909	9,181	2,673
	Portugal	16	94[b]	45
	Russia	23	85	125
	Thailand	0.3	1.8[b]	0.3
	Turkey	20.4	119.73[a]	250
1	USA	2,248	15,470	2,376
	TOTAL:	**7,974.06**	**49,261.45**	**11,141.385**

Mga Solusyong Pinoy

Mini Hydro: dapat, barangay o municipal scale



P = h r g Q H where:

P = mechanical power produced (Watts).
h = hydraulic efficiency of the turbine.
r = density of water (1000 kg/m^3).
g = gravitational acceleration (9.81 m/s^2).
Q= flow rate through the turbine (m^3/s).
H = pressure head across the turbine (m).

For 70% typical water-to-wire efficiency:
P (kW) = 7 **Q** (m^3/s) **H** (m)

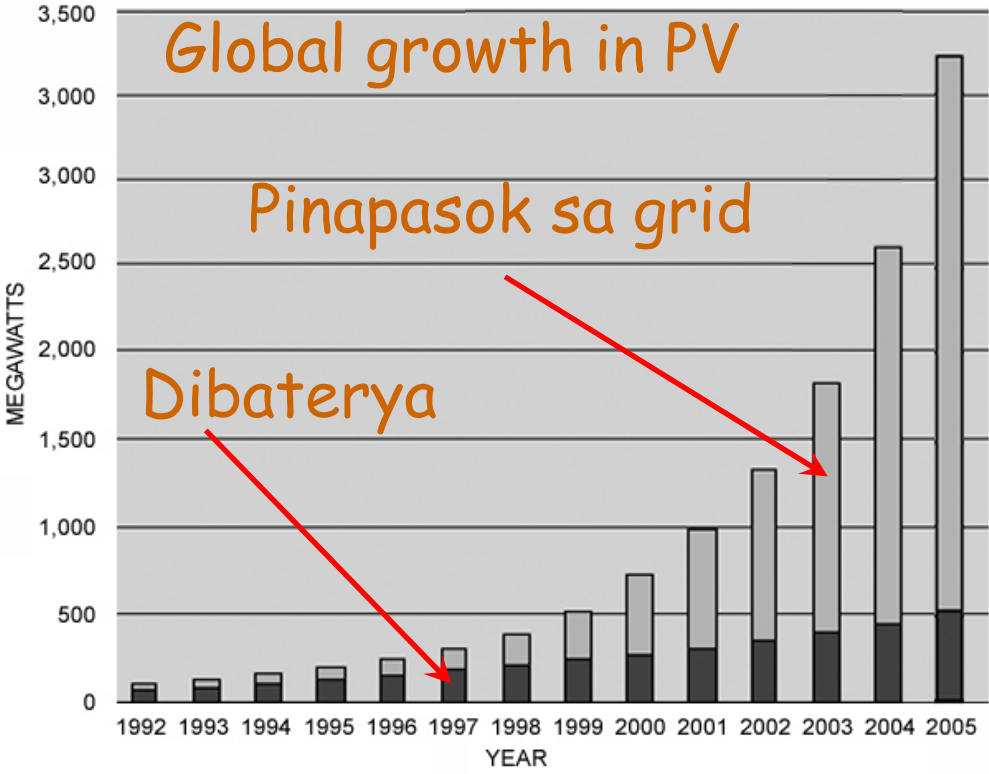
http://www.british-hydro.org/mini-hydro/infopage.asp?infoid=361

Solar

Thermal? Photovoltaic (PV)?

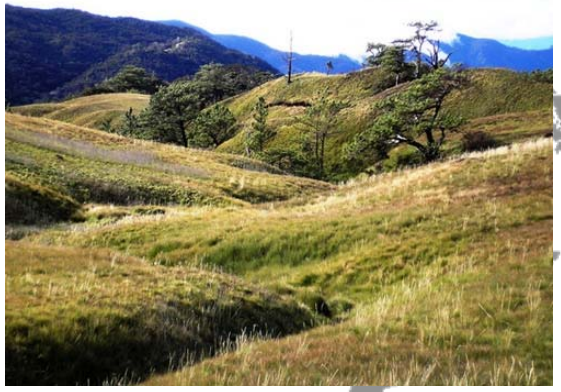
Large scale? Small scale?

Iimbak sa baterya, o ipasok sa grid?




Agriculture: Adaptation options

Managing Marginal Lands in the Philippines to Augment Food Production Supply and Improve Environmental Security in the Country: A Climate Change Adaptation Strategy


Leonardo M. Florece[1] , Maria Victoria O. Espaldon[1], Rogelio E. Concepcion[1], Arnold R. Salvacion[1]
Jose Nestor M. Garcia[2], Cynthia M. Medina[2], Amparo M. Wagan[2]

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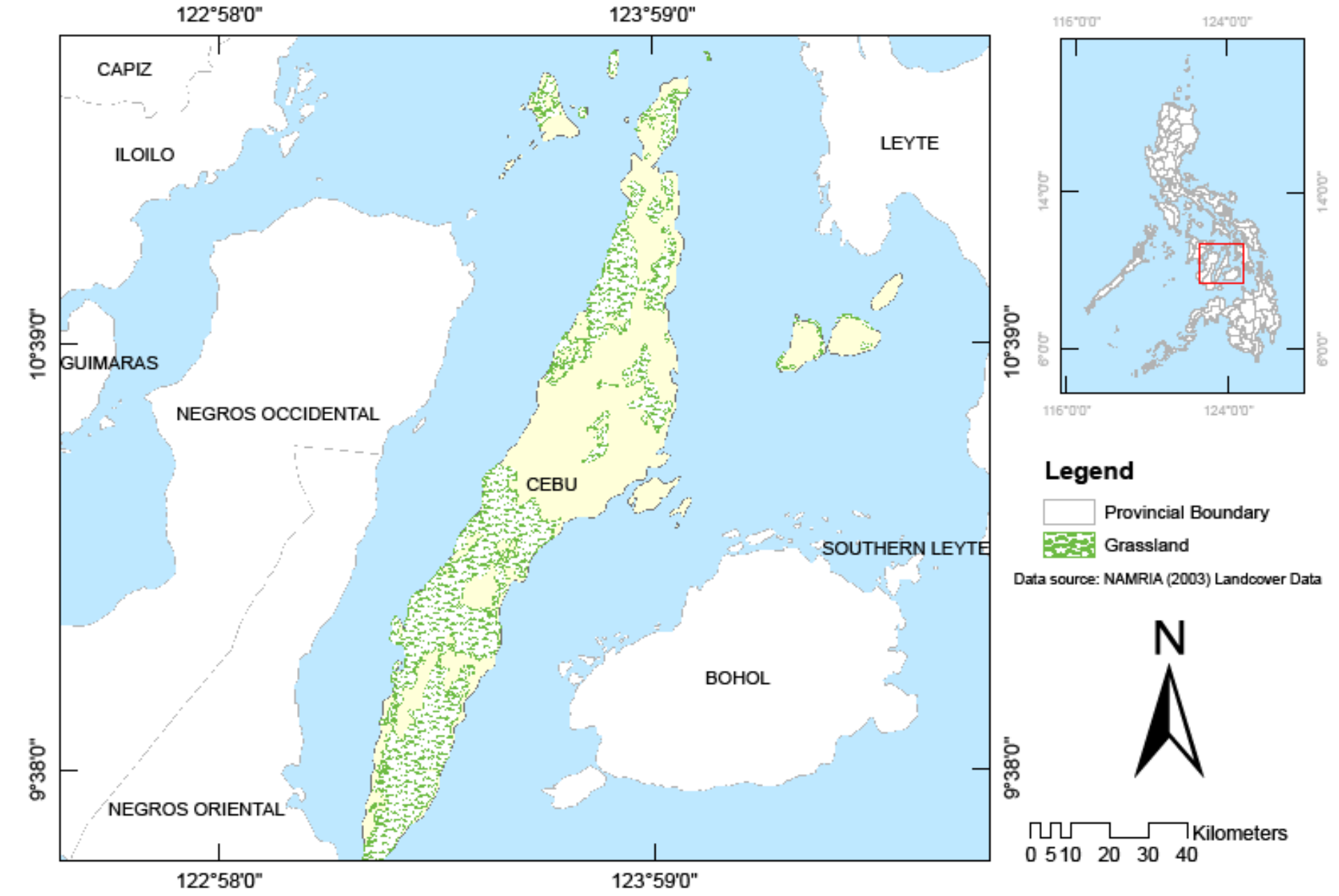
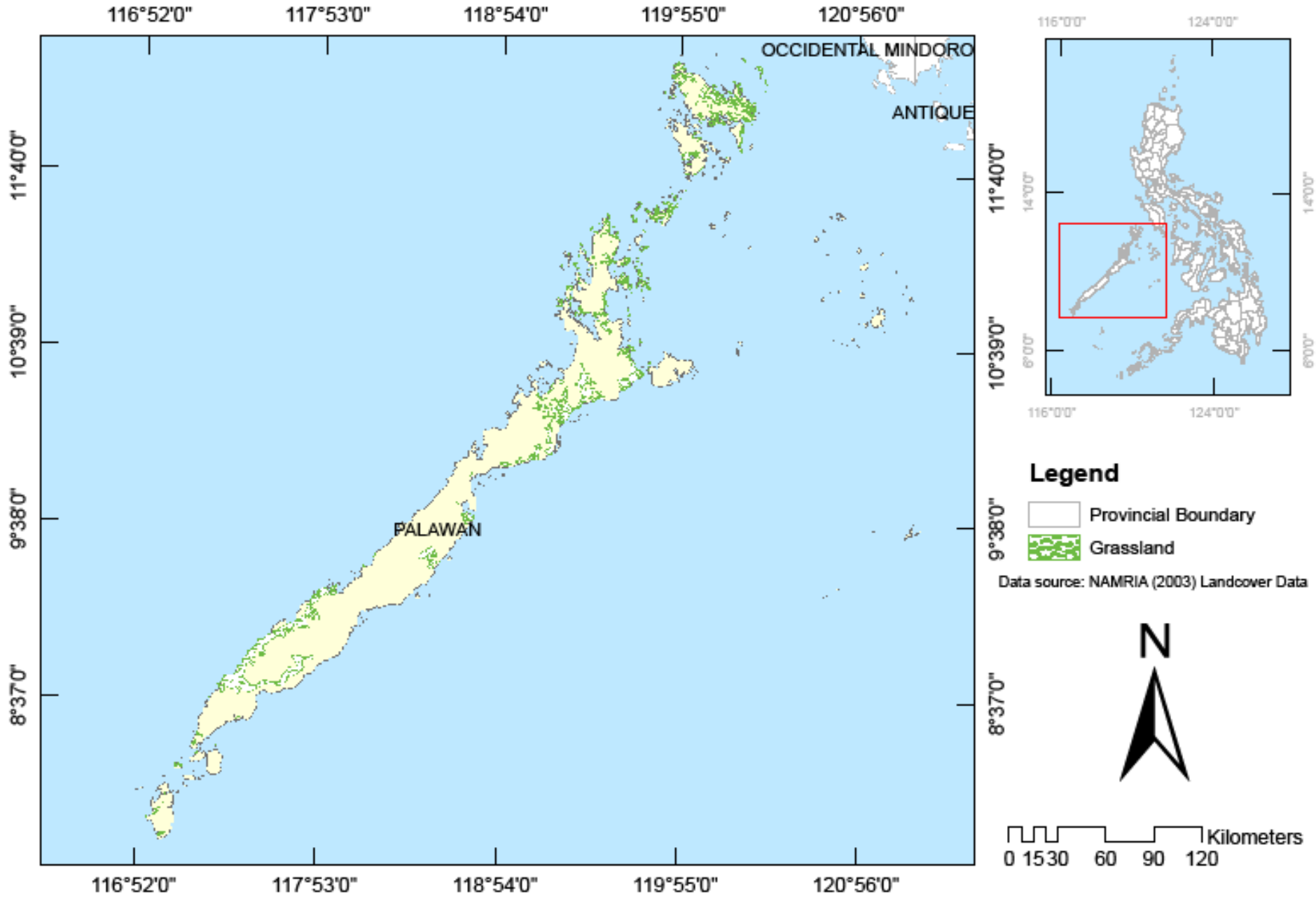
Grasslands Areas in the Philippines

- There are about **1.8 Million** ha of grasslands (considered marginal lands) in the Philippines
- Around 60% of these grasslands could be found in 10 provinces of the country.
- These provinces include Cebu, Palawan, Oc. Mindoro, Negros Oriental, Zamboanga del Note, North Cotabato, Sarangani, Negros Oc., Zamboanga del Sur, and Nueva Ecija

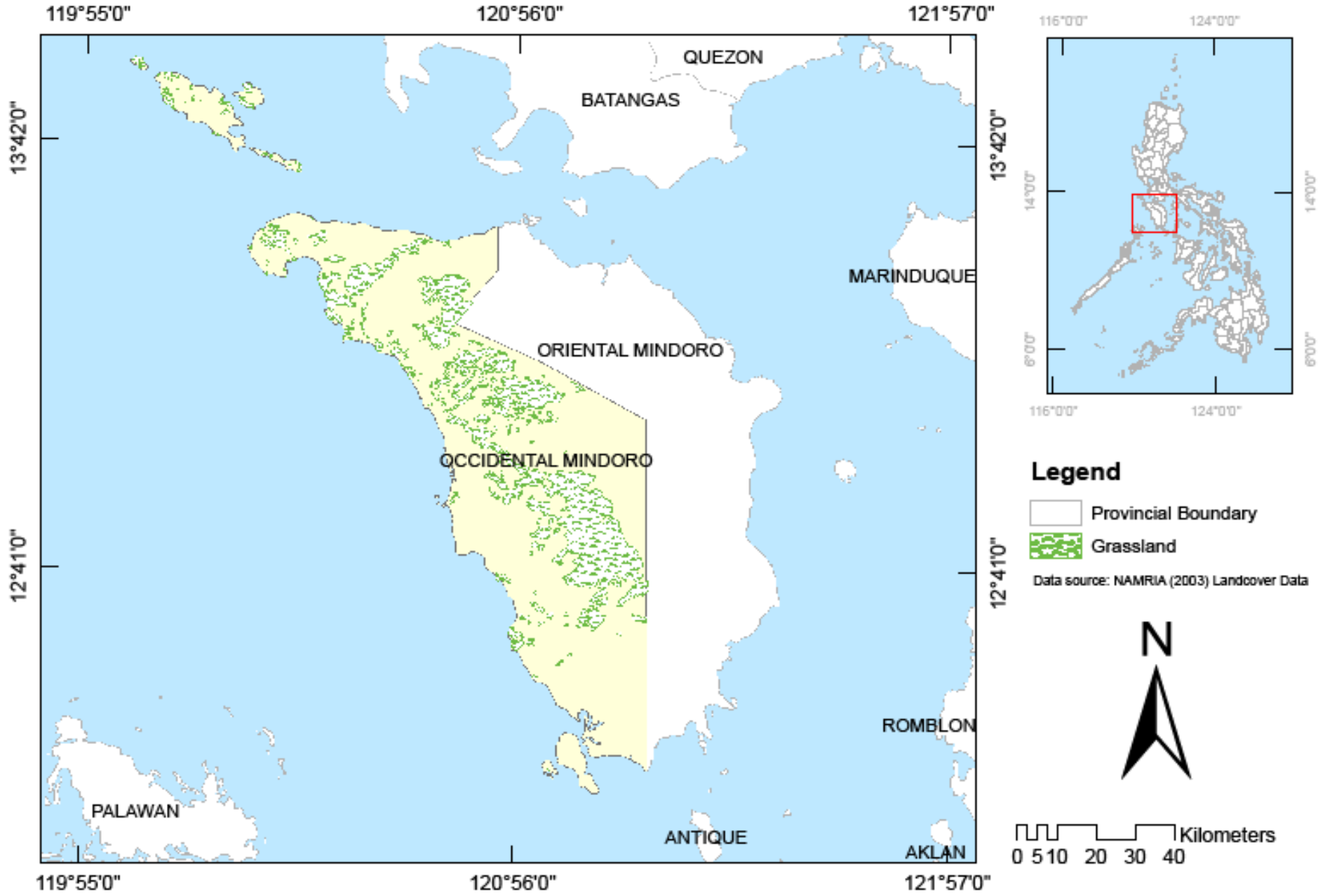
Cebu Grassland



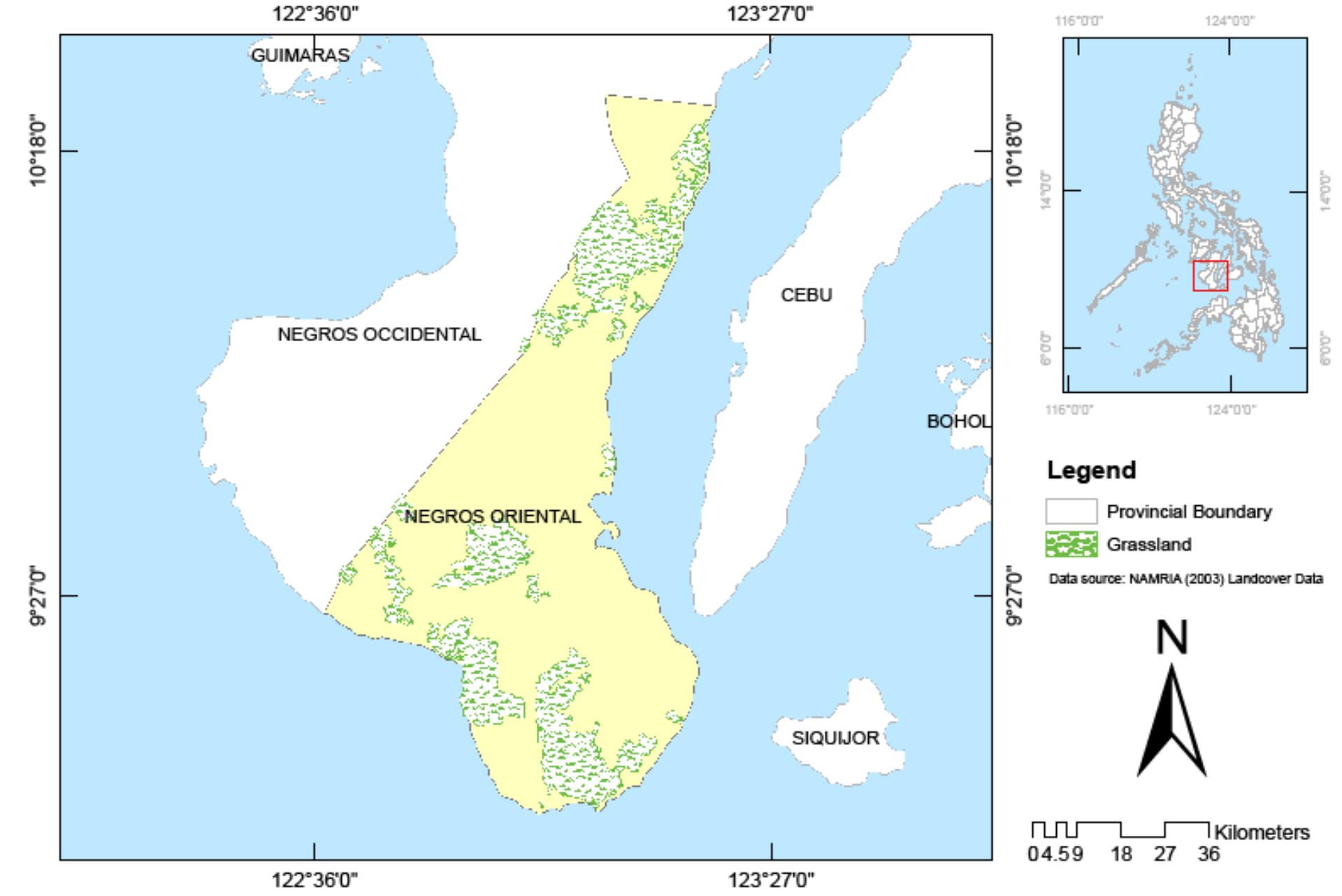
Palawan Grassland



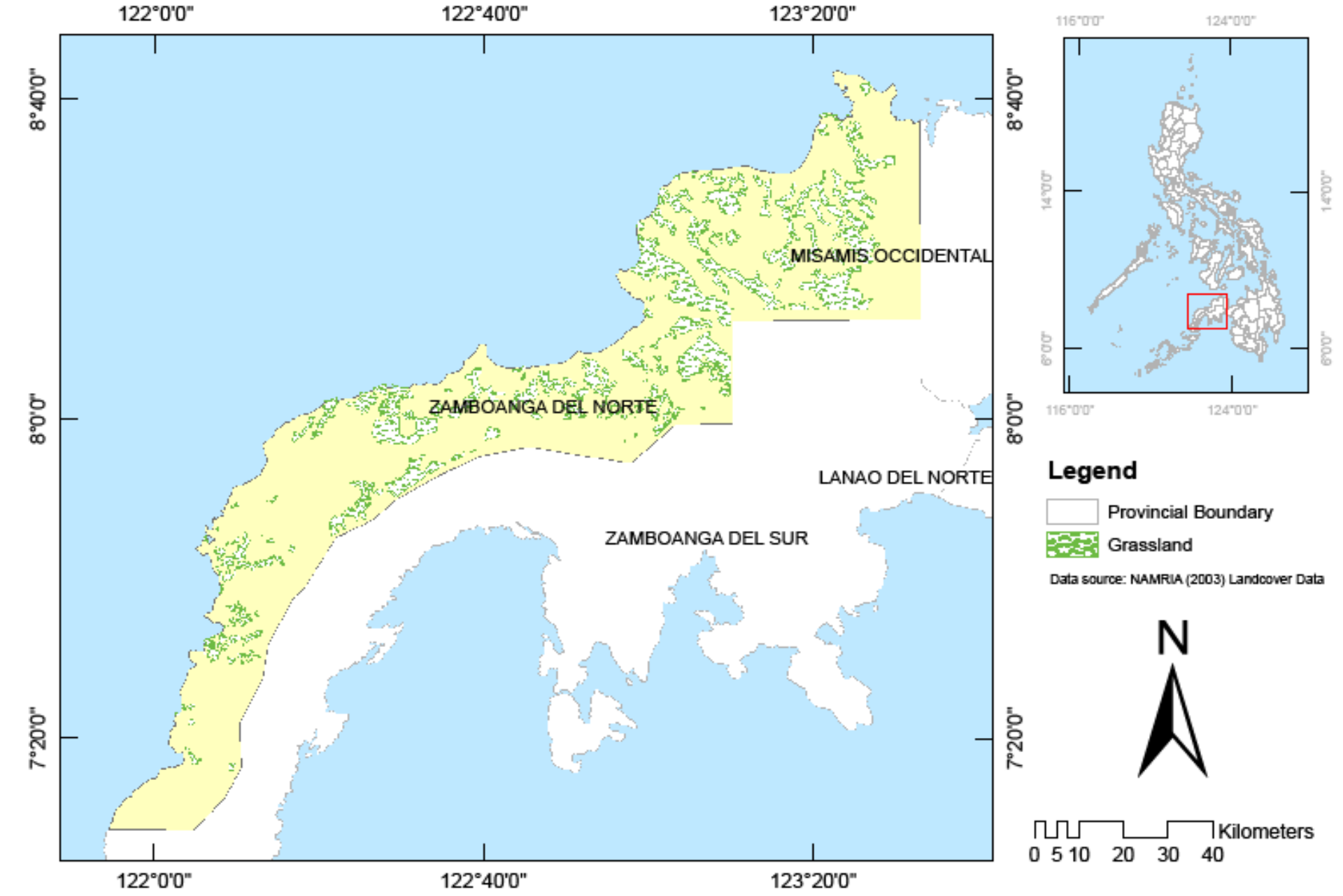
Occidental Mindoro Grassland



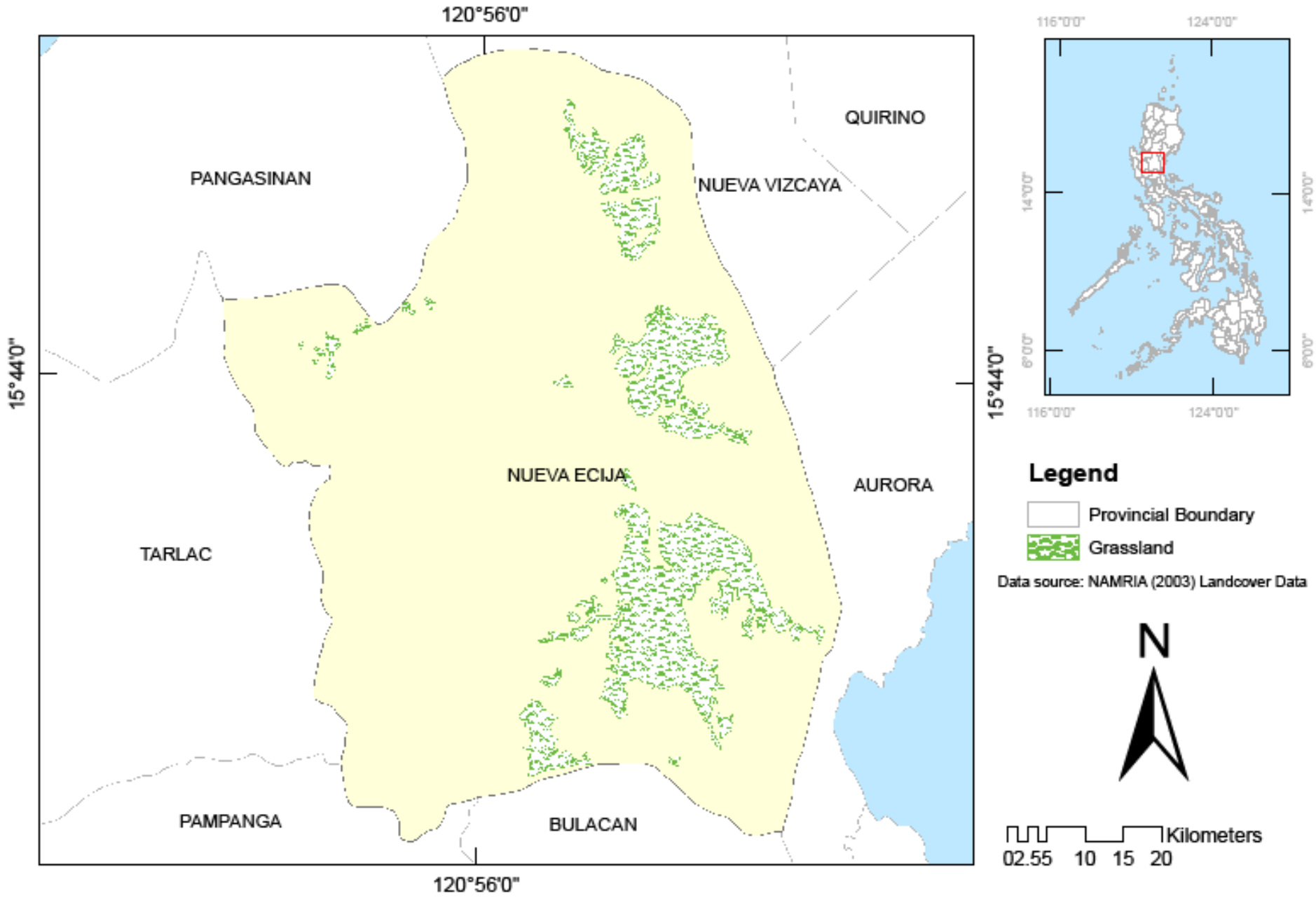
Negros Oriental Grassland



Zamboanga del Norte Grasslands



Nueva Ecija Grassland



Grasslands as Source of Food and Livelihood

- Assuming that only 50% of the 1.8M ha of grassland areas can be utilized for agriculture, which is about 0.9M ha, it would generate approximately additional production of:
  - Rice – 2.3 tons/ha × 0.9M ha = 2.07M tons/season
  - Corn – 2 tons/ha × 0.9M ha = 1.8 M tons/season
  - Additional Crops

Managing Marginal Lands in the Philippines to Augment Food Production Supply and Improve Environmental Security in the Country

Objectives

1. To ground truth the priority grassland areas in the Philippines

2. To assess potential of grasslands areas for agricultural production

3. To design and pilot test agricultural production system for grassland environment

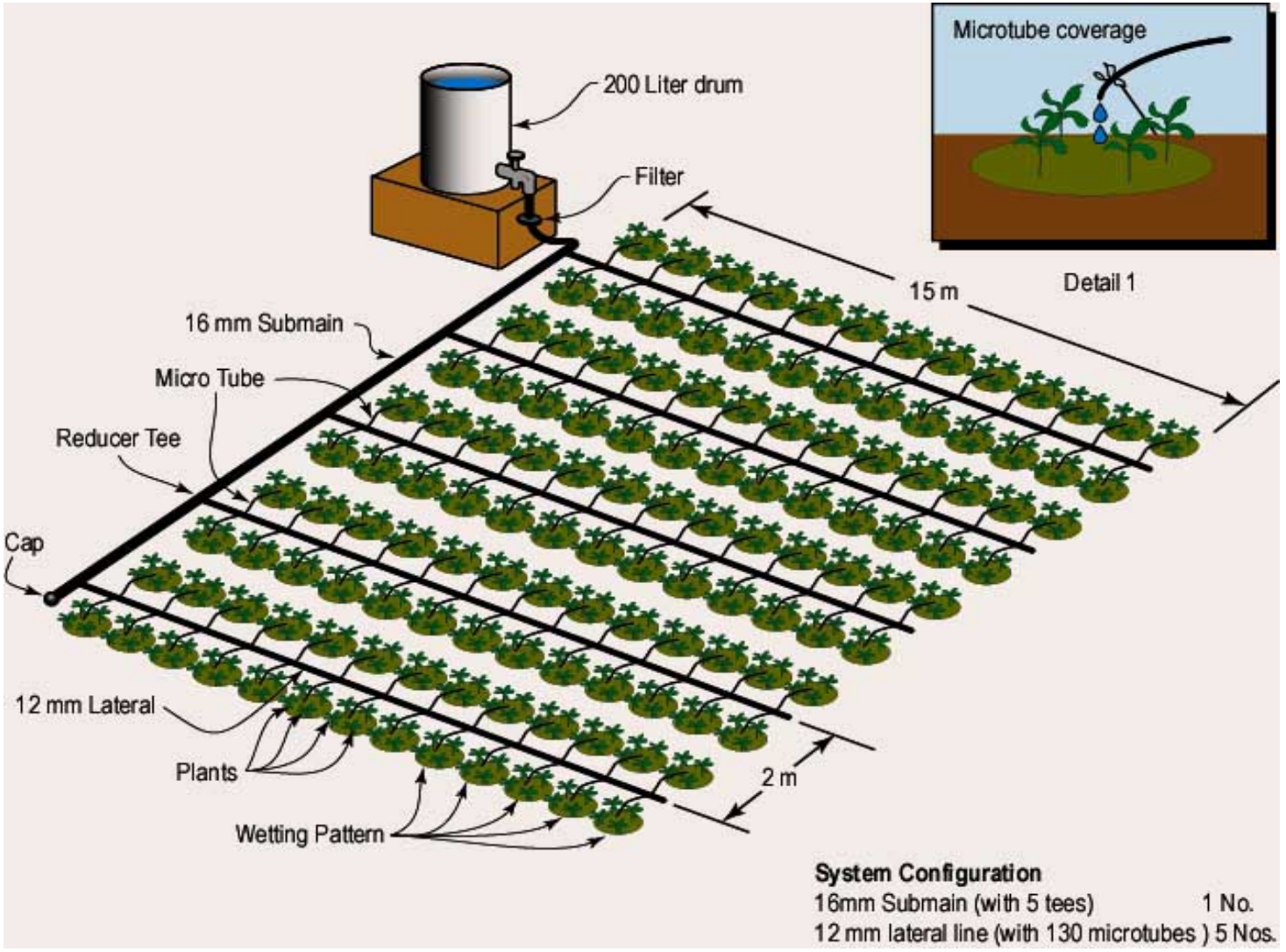
4. To analyze socio-economic factors and impacts related to improving productivity of marginal lands

2.07M tons/season

<

1.8M tons/season

Water saving technologies: The IDE Easy Drip Kit (Source: Ella et al 2008)



Typical view of cultivated upland watershed (Lantapan, Bukidnon)

SANREM Farmers Field Day, Lantapan, Bukidnon, September 2007

Conclusion

WHY IS CLIMATE CHANGE A SUSTAINABILTY DEVELOPMENT ISSUE?

Climate change affects not only the well-being of the Earth's ecosystems, but also our health, livelihoods, social systems, and the economy.

Its impacts will be felt for generations to come. While we must drastically reduce greenhouse gas emissions, we must also find ways to adapt to new realities of a warmer world.

http://www.iisd.org/climate

TIME

SPECIAL DOUBLE ISSUE

The Global Warming Survival Guide

51 Things You Can Do to Make a Difference

9 771064 030005 13

GO LOW CO_2

the ‘Low Carbon Diet for a Healthy Climate’ campaign

HOW DO YOU ACHIEVE THE LOW CARBON DIET?

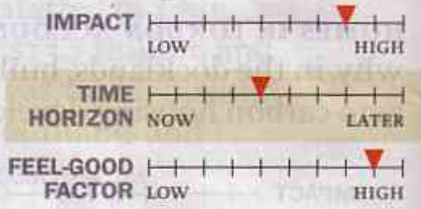
Concepts

- Do not burn your waste including agricultural waste
- Support reuse and recycling programs

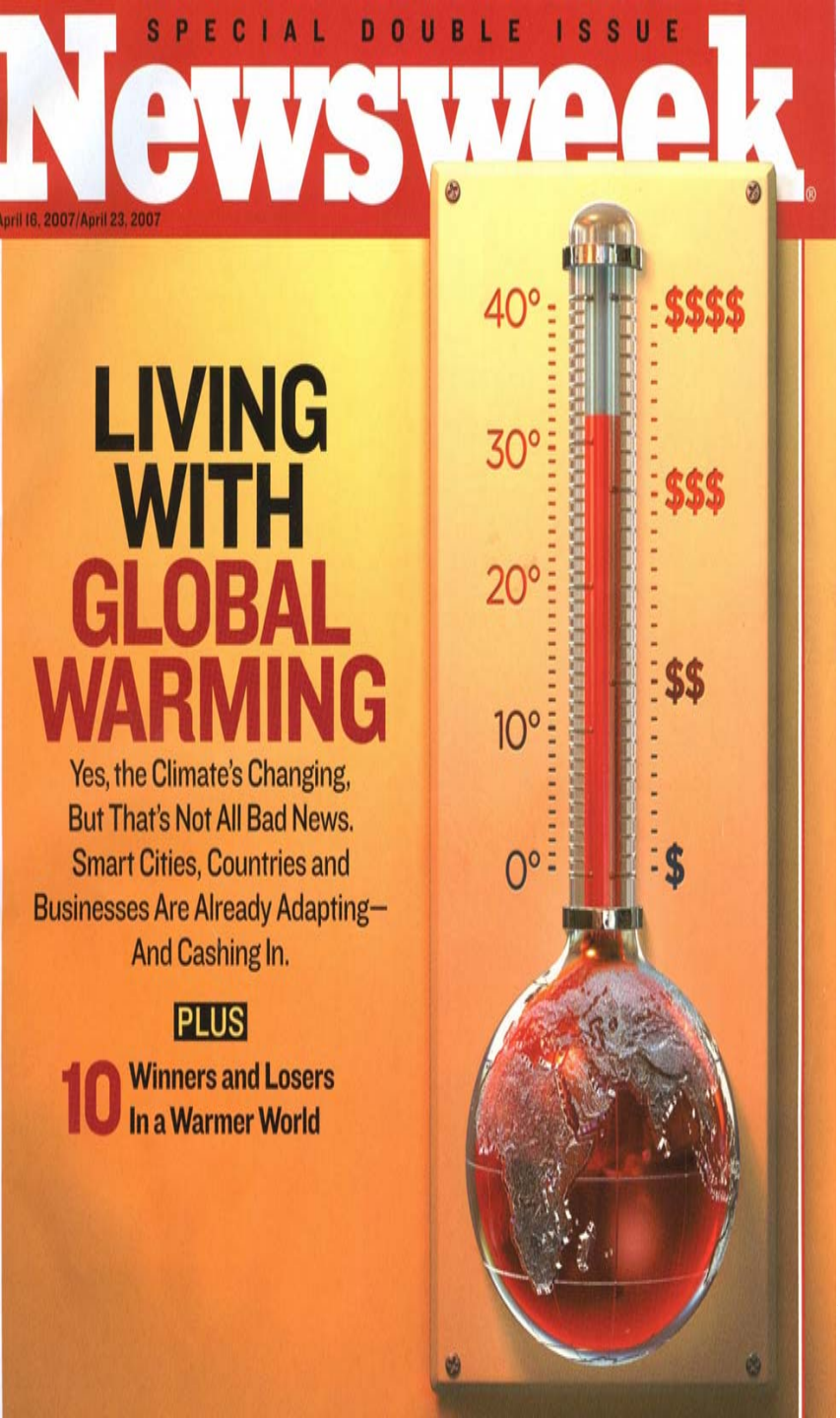
46 Plant a tree in the tropics

Picture of destruction
Hurricanes damage forests. After one tore through southern Sweden in 2005, cleared logs leave the image of a tree

IT SEEMS LIKE SIMPLE ARITHMETIC: A TREE CAN ABSORB UP TO A TON OF CARBON dioxide over its lifetime, so planting one should be an easy way to mitigate climate change. Turns out it's not so simple. Recent studies have shown that trees in temperate latitudes—including most of the U.S.—actually have a net warming effect on the climate. The heat that dark leaves absorb outweighs the carbon they soak up. —B.W.



Consume responsibly



What can/should we do? In summary…

- **Change our carbon-based way of working and living**
- **Manage (conserve, optimize) our food and water and energy supplies**
- **The role of local governments in disaster management and in environmental enforcement**
- **Move people out of harm's way**

- Protect remaining forest resources


Is This Really the Kind
of Future We Want?