CLIMATE CHANGE & DISEASE?

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Greenhouse Effect

Solar radiation powers the climate system.

Some solar radiation is reflected by the Earth and the atmosphere.

About half the solar radiation is absorbed by the Earth's surface and warms it.

Infrared radiation is emitted from the Earth's surface.

The Greenhouse Effect
Some of the infrared radiation passes through the atmosphere but most is absorbed and re-emitted in all directions by greenhouse gas molecules and clouds. The effect of this is to warm the Earth's surface and the lower atmosphere.
Sources of the man-made greenhouse effect

Production and use of CFC gases, HCFC gases and HFC gases (CFC and HCFC gases are being phased out due to their destructive effect on the ozone layer).

Rice fields (CH₄)
Chemical fertilizers (N₂O)
Cattle farms (CH₄)
Refuse dumps (CH₄)

Felling and burning of tropical forests (CO₂)

Burning of fossil fuels (CO₂, NOₓ, CO, CH₄, N₂O)
Concentrations of Greenhouse Gases from 0 to 2005

- **Carbon Dioxide (CO₂)**
- **Methane (CH₄)**
- **Nitrous Oxide (N₂O)**

CO₂ (ppm), N₂O (ppb)
CH₄ (ppb)

Year
Global warming affects ALL

• No human or ecosystem is immune
• We ALL contribute in many ways
• ALL are starting to pay the costs which will RISE over time
• Some are MORE culpable & should ACT now
• Malaysia is 3rd highest emitter per capita within ASEAN.
POTENTIAL CLIMATE CHANGE IMPACTS

Climate Changes

Temperature

Precipitation

Sea Level Rise

Health

Agriculture

Forests

Water Resources and Aquatic Life

Coastal

Species and Natural Areas

Source: Anne Grambsch (1998)
Linkages Among Environmental Issues

- Ozone Depletion
  - Air Quality
  - Sulfate Aerosols
- Climate Change
  - Desertification
  - Water
  - Biodiversity Loss
- Forests
Objectives of Framework Convention on Climate Change [UNFCCC]

To achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with climate system to allow ecosystems to adapt naturally, to ensure food production is not threatened and to enable sustainable development.
EVEN BEFORE ‘92

• Scientists were warning that GHG emissions had to be reduced 80% below 1990 levels by 2000;

• They [& others] also stated that concentrations of CO2equiv in the GH belt had to be kept below 350 ppm;

• BUT these have already reached 398 ppm & are rising!

• Global emissions have not even dropped by 5% below 1990 levels.
UNDERLYING PRINCIPLES OF THE UNFCCC

• PRECAUTIONARY – has been undermined by USA and others waiting for absolute scientific consensus reached;

• COMMON BUT DIFFERENTIATED RESPONSIBILITIES – basis for Kyoto Protocol and Annex I grouping;

• HISTORICAL LIABILITY – currently being ignored as major developing country emissions growth used to force them to cap & reduce.
THE REALITY?
EMISSIONS

"RIGHT! NOW CLEAN IT UP!"
Outlook for the future

Annual CO₂ emissions in gigatons (from 2010 linear growth estimation)

Data source: IEA, World Energy Outlook 2000
Outlook for the future

Cumulative CO₂ emissions in gigatons
(from 2010 linear growth estimation)

Data source: IEA, World Energy Outlook 2000
THE FUTURE according to IPCC
THE LINK WITH DISEASE

• IPCC has indicated that vector borne diseases will spread esp to the upper latitudes
• Water borne diseases will spread esp if flooding continues to worsen in severity and frequency
• Heat stroke and related diseases are already rising as heat waves increase both in severity & intensity
DESPITE DISPUTES [among scientists, EL NINO & LA NINA gave rise to

- Cardiovascular disease & eye irritations rose;
- Upsurge of cholera, malaria & Rift Valley fever;
- Outbreaks of rodent-borne hantavirus [S.Ame], Murray Valley encephalitis & Ross River virus [Aust.];
- Perishing of predators & flourishing of predators;
- Compromising of immune systems & corals – leading to growth of harmful bacteria & viruses in their tissues.
OTHER FINDINGS

• Spread of Bluetongue virus to Europe linked to warming due to CC;
• Climate Change will expand prevalence & distribution of infectious diseases;
• Some studies that increases will occur in diseases like Guinea worm, leishmaniasis, lymphatic filiasis, onchocerciasis, and Chagas’ disease.
PAUCITY OF LOCAL/REGIONAL STUDIES

• Of the link between climate change & diseases, especially in ASEAN countries;
• Leads to little awareness within the mass media and the general public of the link;
• Underlines disinterest among scientists and poor funding for such work.
BEYOND CANCUN!

- The last COP in Cancun outcomes are weak and vague;
- Will action be taken at COP17 in Durban at the end of this month?
- USA, still shows no ability to take drastic action needed;
- The next G8 meeting must move Beyond Cancun;
- Decarbonisation of global economy begun??
CANCUN WAS A WASTE??
ARE SCIENTISTS DOING ENOUGH?

• You should ask yourselves & colleagues;
• Does the Academy of Medicine care?
• Are you helping to mobilise tangible action in Malaysia & Asia Pacific?
• Which Malaysian enterprise has undertaken to reduce emissions?
NOTHING COMES EASY

• If we want to help curb global warming, we just cannot keep pointing fingers
• We must ACT - at our personal level, at our jobs, within our nation, & globally
• Sustainable development [& sustainability] will NOT occur if global warming worsens esp. exceeding 2 degree C rise within this century
• AND DISEASES WILL WORSEN AND SPREAD as climate change worsens, including worsening weather extremes!