Global Warming, 
Carbon Trading and 
Opportunities for South Asian Countries

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Greenhouse Effect

- 50% of incoming solar radiation reaches the surface of the earth
- 90% of the infrared radiation reflected by the earth’s surface is absorbed in the atmospheric trace gases
- These gases and clouds re-emit this radiation back to ground
- Short wavelength radiation escapes, long wavelength radiation is held back
- Earth will be 60°F cooler without this
Natural Greenhouse Gases

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF₆)

2007 carbon emissions from fossil fuels:
8 billion tons
Figure 5.
SEVERAL TRACE GASES CONTRIBUTE TO GREENHOUSE WARMING
Temperature rise, in °F
Global Carbon Cycle
GLOBAL CONTRIBUTIONS TO THE GREENHOUSE EFFECT

DECADE OF THE 1980s

- OTHER CFC's
  - 7%
- CFC's 11 & 12
  - 17%
- N₂O
  - 6%
- CH₄
  - 15%
- CO₂
  - 55%
- OTHER
  - 10%
- WATER VAPOR
  - 90%

NOTE: OZONE, THE EFFECTS OF WHICH MAY BE SIGNIFICANT, IS NOT INCLUDED.
SOURCE: "SCIENTIFIC ASSESSMENT OF CLIMATE CHANGE", IPCC POLICY MAKER'S SUMMARY, 1990
GLOBAL CO₂ EMISSIONS
BY REGION

OTHER DEVELOPING COUNTRIES
18%

CHINA AND CENTRALLY PLANNED ASIA
11%

EASTERN EUROPE AND C.I.S.
26%

REST OF OECD
23%

UNITED STATES
22%

CO₂
55%

SOURCE: MANNE AND RICHELS, 1991
US Anthropogenic Carbon Emissions

- Electric Power Plants (33%)
- Transportation (33%)
- Direct Industrial Use (20%)
- Residential & Commercial Use (12%)

One kWhr of coal-based electricity releases 2 lbs of CO2

One gallon of gasoline releases 25 lbs of CO2 from manufacture to consumption in a vehicle
<table>
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<th>Growth since Industrial Revolution (1765-2007)</th>
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<td>- CO(_2) from 280 ppm to 380 ppm</td>
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<td>- Methane concentration has doubled</td>
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<td>- N(_2)O has risen by 15%</td>
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<td>- Earth has warmed by about 1(^\circ) C since mid-19(^{th}) century</td>
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<td>- Earth was the warmest (in 1998) compared to last 2000 years</td>
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The balance of evidence suggests that there is a discernible human influence on global climate change.

- CO₂ level will reach 600 ppm by the end of this century.
- More than double the level held for 10,000 years.
- Global temp rise by 1°C to 3.5°C.
Impacts of Climate Change

- Changes in precipitation
- Extreme weather
- Sea level rise
Coastal Zone Vulnerability in Sri Lanka
Kyoto Protocol Issues

- Industrialized countries to reduce CO₂ equivalent emissions by 5 to 8% from 1990 levels by 2008 to 2012
- Allowance for CO₂ emissions trading
- Developing countries are exempt
- But China’s CO₂ emission will equal that of US soon
Conclusion

South Asian countries, specially India, are playing an increasingly significant role in greenhouse gas emissions. These countries need to examine both mitigation and adaptation opportunities necessary to address the greenhouse gas emissions and their resulting impact on and from climate change.
Thank you for Your Attention

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