20 years of climate change negotiations: Are we moving in the right direction?

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Inconvenient truth

- Climate change is real
- The world needs to cut emissions drastically and urgently
- Poorest – not responsible for climate change – are worst impacted
- We will lose development dividend
The face of India’s farmer
Grief, despair, desperation
Unseasonal rain, hail, freak storms have destroyed crops over millions of hectares

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Figure 1.1: The greenhouse effect

Solar radiation powers the climate system.

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

Around half the solar radiation is absorbed by the Earth’s surface and warms it.

Longwave radiation is emitted from the Earth’s surface.

Gases: annually released and annually absorbed

Forest, oceans, land: absorb emissions but now we emit far beyond what they can ‘clean’

Graph 2.1: Global GHG emissions by gas in 2005 (inclusive of land use changes and forestry and international bunkers) (all values in million tonne of CO₂ equivalent)

<table>
<thead>
<tr>
<th>Gases</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>28,484.80</td>
</tr>
<tr>
<td>CH₄</td>
<td>6,407.50</td>
</tr>
<tr>
<td>N₂O</td>
<td>3,285.60</td>
</tr>
<tr>
<td>PFC</td>
<td>107.9</td>
</tr>
<tr>
<td>HFC</td>
<td>380.6</td>
</tr>
<tr>
<td>SF₆</td>
<td>59.5</td>
</tr>
<tr>
<td>Total</td>
<td>38,725.90</td>
</tr>
</tbody>
</table>

Source: Climate Analysis Indicators Tool (CAIT) Version 6.0, World Resources Institute, Washington, DC, 2009
Life is long

- CO2 once emitted stays in atmosphere for over 100-150 years
- Other gases have shorter lives – 10-20 years
- So what is not ‘cleaned’ naturally by sinks – forests, oceans or atmosphere -- stays
- Lead to ‘forcing’ – concentration increases and this forces temperature rise
Emissions = Concentration = temperature
Humans are causing climate change

- Recent anthropogenic emissions of greenhouse gases are highest in history
- Atmospheric concentration of key greenhouse gases is “unprecedented” in at least the last 800,000 years,
- Warming of climate system is unequivocal

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A first in human history

Carbon dioxide levels have crossed 400 ppm. This means the impacts of climate change will be even more pronounced—droughts, floods and sea level rise, for instance. If the world does not act to limit carbon dioxide emissions, climate change will cause devastation worldwide, and more so in South Asia. The poor will end up with a raw deal.

**Keeling curve**
Carbon dioxide concentrations at Mauna Loa are documented in a graph called the Keeling Curve, named after Charles Keeling, who began measurements there in 1958. The measure of carbon dioxide concentration then was 317 ppm.

**World GHG emissions by sector in 2007**
(excludes land use change)

- Industrial Processes: 4%
- Transportation: 15%
- Agriculture: 16%
- Manufacturing and Construction: 15%
- Other Fuel Combustion: 8%
- Electricity and Heat: 35%
- International Bunker fuel: 3%
- Waste: 4%

Increasing emissions: 1950 onwards

Global anthropogenic CO₂ emissions

Quantitative information of CH₄ and N₂O emission time series from 1850 to 1970 is limited

- Fossil fuels, cement and flaring
- Forestry and other land use

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Rising concentration: 400 ppm

- Since 1750, concentrations of CO$_2$, CH$_4$ and N$_2$O have increased by 40%, 150% and 20%, respectively.
Temperature: 0.85°C over 1880-2012; last 3 decades warmest

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75% warming due to CO$_2$
Negotiations on economy
Not ecology

Climate change is about **economic growth**
No country has built a low carbon economy
So action is little and too late
Convention signed in 1992
25 years later world is still talking; procrastinating; **finding excuses not to act**

Economic growth on line

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Emissions are about economy

Total: 49 Gt CO₂eq (2010)

- Energy: 14%
- Industry: 11%
- Transport: 14%
- Buildings: 12%
- AFOLU: 24%
- Electricity and Heat Production: 25%
- Other Energy: 9.6%
Growth has to be reinvented

- Drastic reduction requires transformation
- Energy basket to be changed – from fossil to non-fossil
- Consumption to be reduced drastically
- As yet, world talks about low-carbon growth but has not found answers
Soft options used
Needed is transformation
Growth has to be shared

Climate change is about sharing growth between nations and between people.

The rich must reduce so that the poor can grow. Create ecological space.

Cannot freeze inequity.
Who is emitting how much? Who is responsible?
Present emissions: 2012

- China (29%)
- US (16%)
- European Union-27 (11%)
- India (6%)
- Other Annex I (20%)
- Other Non-Annex I (14%)
- International Transport (4%)

Source: NEA-EC Report
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Who is emitting how much?

2012

- China: 8.3 Gt (26.4%)
- USA: 5.4 Gt (17.5%)
- EU: 3.7 Gt (13.3%)
- India: 2.1 (6.5%)
- Russia: 1.75 (5.5%)
Africa’s emissions: 2012

<table>
<thead>
<tr>
<th>Country</th>
<th>Emissions in MT CO₂ eq (excluding land-use change and forestry)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>462.60</td>
</tr>
<tr>
<td>Egypt</td>
<td>288.19</td>
</tr>
<tr>
<td>Nigeria</td>
<td>296.68</td>
</tr>
<tr>
<td>Kenya</td>
<td>59.48</td>
</tr>
<tr>
<td>Ghana</td>
<td>27.34</td>
</tr>
<tr>
<td>Congo (Dem. Republic)</td>
<td>36.31</td>
</tr>
<tr>
<td>Madagascar</td>
<td>27.09</td>
</tr>
<tr>
<td>Africa (total)</td>
<td>2,679.37</td>
</tr>
<tr>
<td>Africa (per capita)</td>
<td>2.52</td>
</tr>
</tbody>
</table>

Whole of Africa is equal to India – total emissions as well as per capita

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Historical emissions - 1840-2006:
A tonne of CO\textsubscript{2} emitted in 1840 same value as tonne of CO\textsubscript{2} emitted in 2008

- Since 1840, 7 out of every 10 tonnes of CO\textsubscript{2} have been emitted by the rich countries

Historical emissions amount to about 1100 tonnes of CO\textsubscript{2} per capita for the UK and the US, compared with 66 tonnes for China and 23 tonnes for India

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Who has contributed how much to climate change?

% of global CO₂ emissions: Past and present (1850-2011)

- China: 10.7%
- EU-28: 18.4%
- India: 2.8%
- Japan: 3.3%
- Russia: 7.4%
- South Africa: 0.9%
- Rest of the world: 28.7%
- Brazil: 4.4%
- Canada: 2.2%

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Per Capita Emissions: 2012

- USA: 17.3
- Japan: 9.8
- Canada: 16.2
- Australia: 19.0
- EU-15: 7.6
- Germany: 9.9
- France: 5.7
- UK: 7.5
- Russia: 12.8
- China: 7.2
- India: 1.6
- Brazil: 2.3
- Mexico: 3.9

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Science is politics

- Climate change is about economy, not ecology
- It is about dividing the carbon budget – how much the world can emit to stay below 2 degree C
- Already 0.8° C rise + 0.8° C emitted and will ‘force’ temperature
- Now the challenge is to stay below 2° C
- Limited carbon budget – who can now ‘occupy’
How to divide the budget?

- What kind of climate regime can enable this to happen...?