Department of Sociology and Anthropology
Faculty of Humanities and Social Sciences
Mahasarakham University
Khamriang Sub-District , Kantarawichai District
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PEISOR Model and Perspectives of Human Security & Peace Ecology

Hans Günter Brauch
Adj. Prof., Free University of Berlin (Germany) ret.
Chairman, Peace Research and European security Studies (AFES-PRESS)
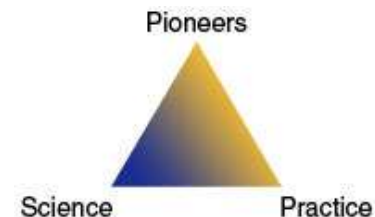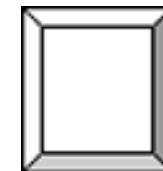Editor, Hexagon Series on Human, Environmental Security and Peace
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Science   Practice

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5. Relevance of the Model and the Two Perspectives for Thailand?
6. We are the threat and victims and should become the solution

1. Research Question & Structure of the Presentation

1. Research Question & Structure of the Presentation

Structure of the presentation

– **Assessment of climate change impacts**

– **PEISOR Model**: Stimulus & response model

– **Human Security Approach**: freedom from hazard impacts

– **Peace Ecology Perspective**: sustainable peace.

1.1. We are the threats! we are the victims!

1.2. We do not seem to care
UN Climate Change negotiations are blocked

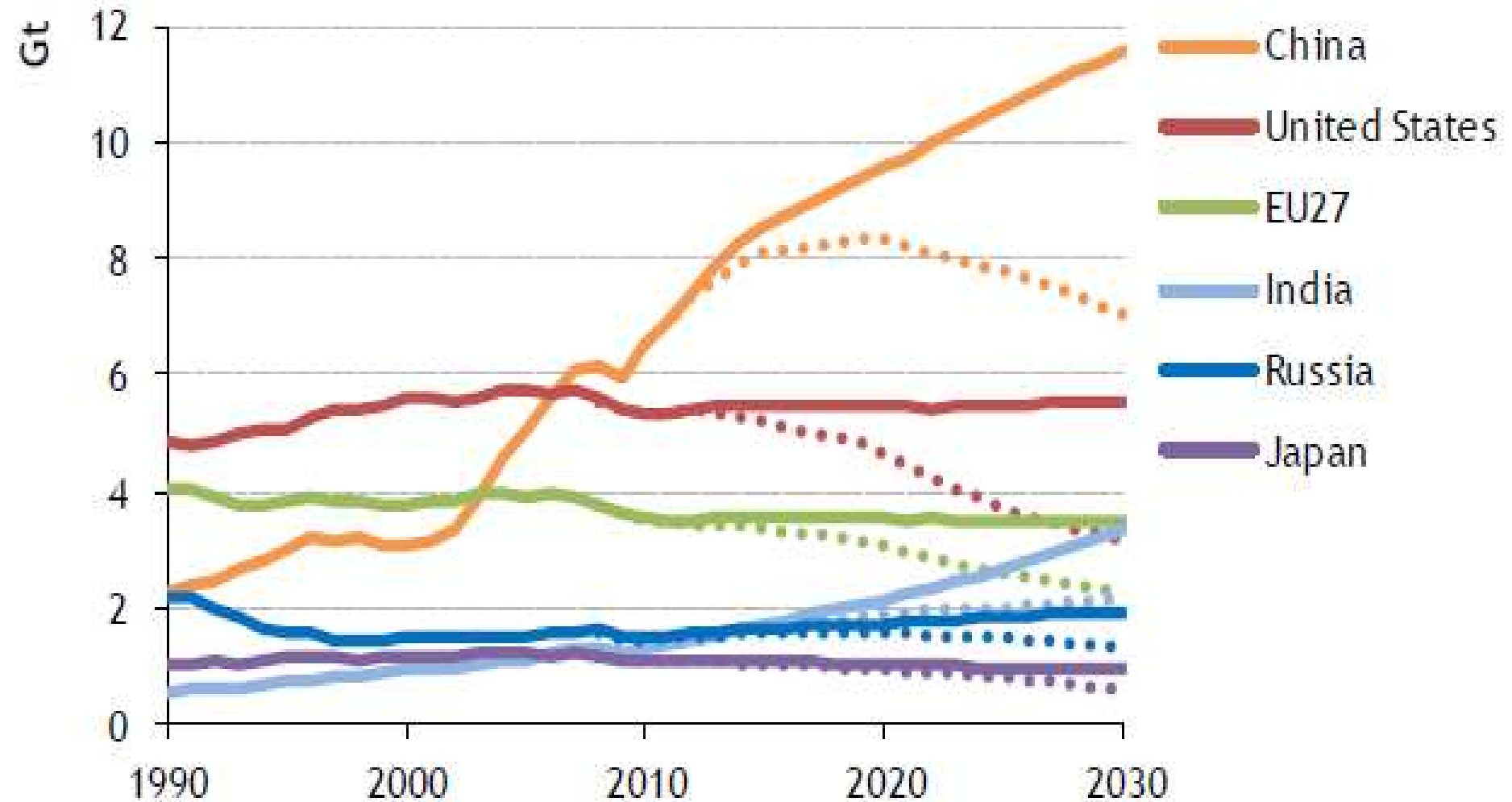- UNFCC (1992)
- Kyoto Protocol (1997)
  - Annex I country: -
  - Non-annex I countries: no reduction obligations
- COP 15 (Copenhagen) 2009
- COP 16 (Cancun) 2010
- COP 17 (Durban) 2011
- COP 18 (Doha) 2012)
- COP 19 (Warsaw) 2013

Goal by 2015 agreement to enter into force by 2020-

: At present doubtful

1.3 Energy-related CO2 Emissions for EU27, US, Japan, Russia, China & India (1990-2030)

1.4. Internat. Energy Agency, 2011, Global GHG Emissions (1970-2050)

Figure 7.5. **Global GHG emission pathways: Baseline and mitigation cases to 2050 compared to 2100 stabilisation pathways**

Emissions ($GtCO_2eq$)

Baseline
OECD-2008
Delayed-2020
Phased-2030
All-2008
450 ppm
650 ppm
550 ppm
450 ppm
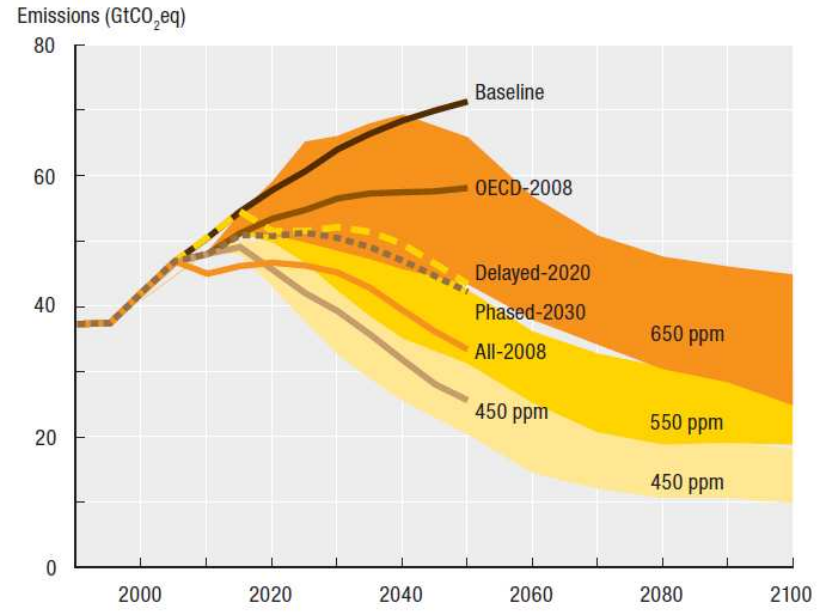
Figure 0.2. **Total greenhouse gas emissions (by region), 1970-2050**

$GtCO_2eq$

A. **OECD Environmental Outlook Baseline**

ROW
BRIC
OECD

$GtCO_2eq$

B. **450 ppm stabilisation policy simulation**

Total Baseline
ROW
BRIC
OECD
GHG reduction of 39% by 2050, compared to 2000

StatLink http://dx.doi.org/10.1787/258472880870
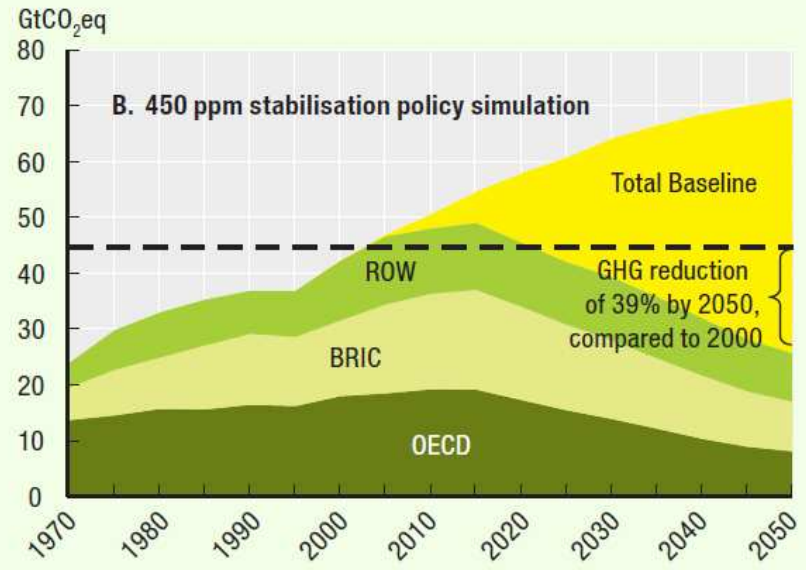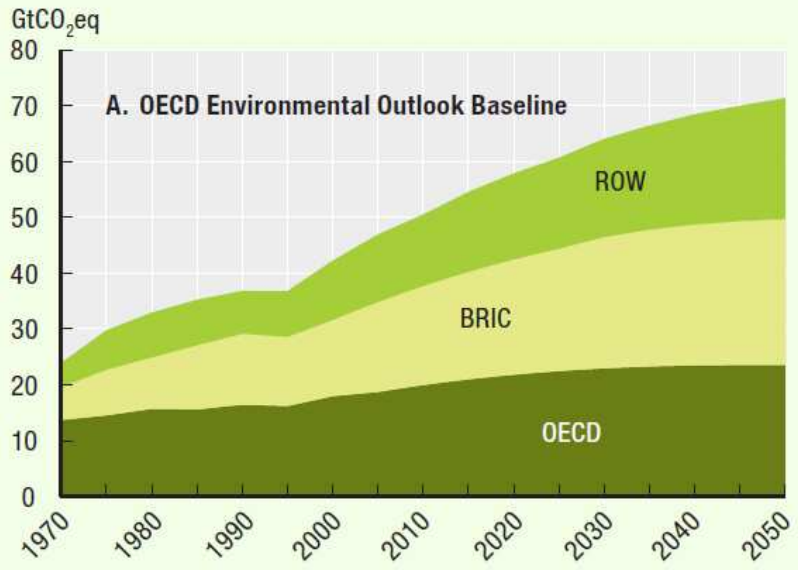
1.5. IPCC, 5th Assessment Report, 2013
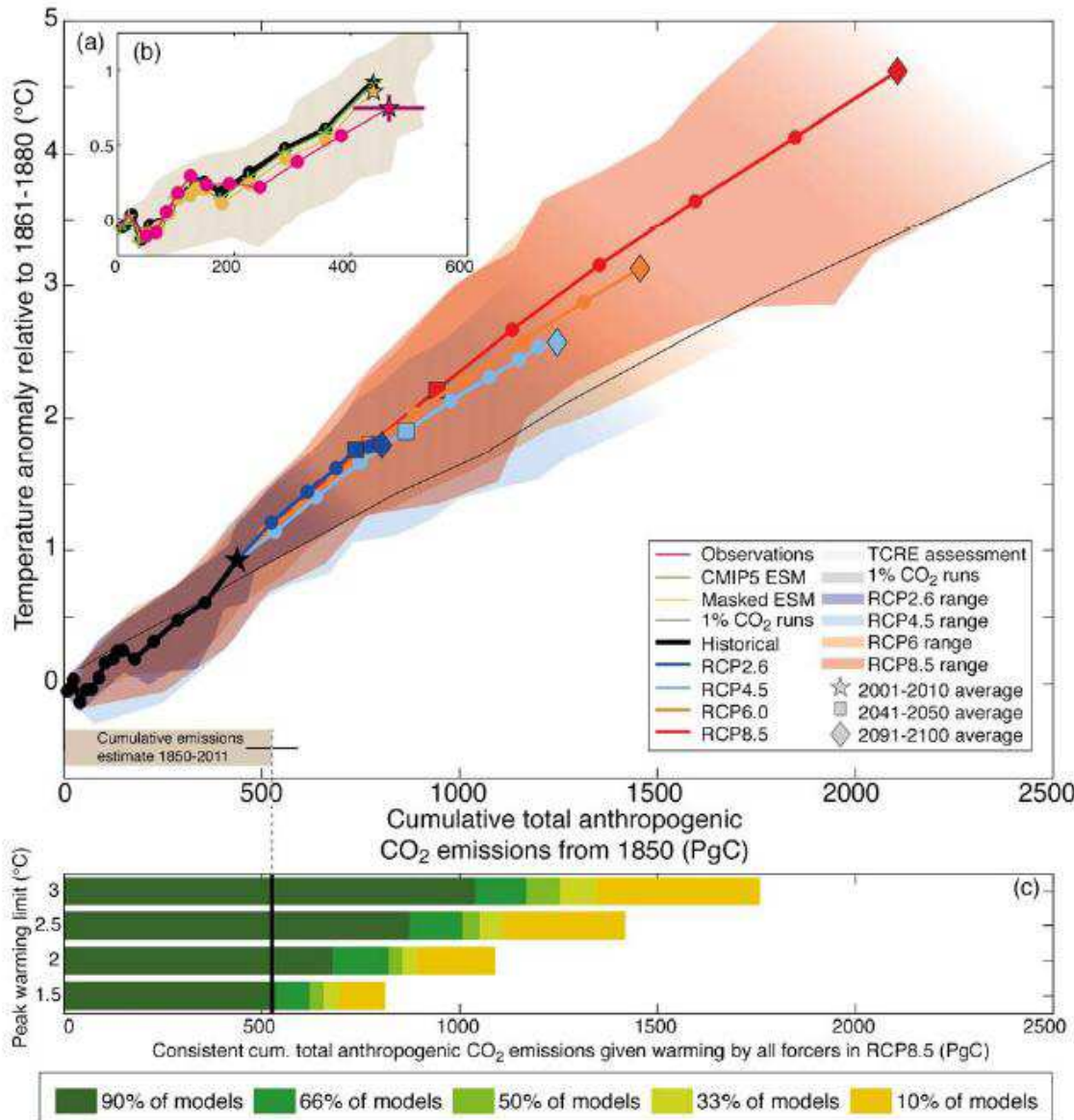
4 Physical affects:

- Temperature increase
- Precipitation change
- Sea level rise: to up to 1 metre is possible 2100
- Extreme events
  – Tropical storms (typhoons, Cyclons, Hurricanes)
  – Winter Storms
  – Floods
  – Land slides
  – Droughts
- Societal effects

1.6. What and Who is the Cause and Victims?

What is the cause?

- Burning of hydrocarbons:
  - Coal. Oil and gas
- Modern economy:
  - Energy, transportation
  - agriculture

Who is responsible?

- **Historically: industrialized countries**
- **But increasingly: threshold countries**
  - **2007: China overtook USA**

Who is the victim?

- **South: especially Asia**
  - **China**
  - **India**
- **But also the North**
  - **USA (Katrina, Sandy)**
  - **Germany (2002, 2013) floods**
- **We are all responsible:**
  - **North and South**
- **We both have to act**
  - **North and South**
  - **Germany & Thailand**

1.7. Thailand – UNFCCC National Communications (2000->1994, 2011->2000)

Thailand's Initial National Communication under the United Nations Framework Convention on Climate Change

Ministry of Science, Technology and Environment THAILAND

Thailand's Second National Communication under the United Nations Framework Convention on Climate Change
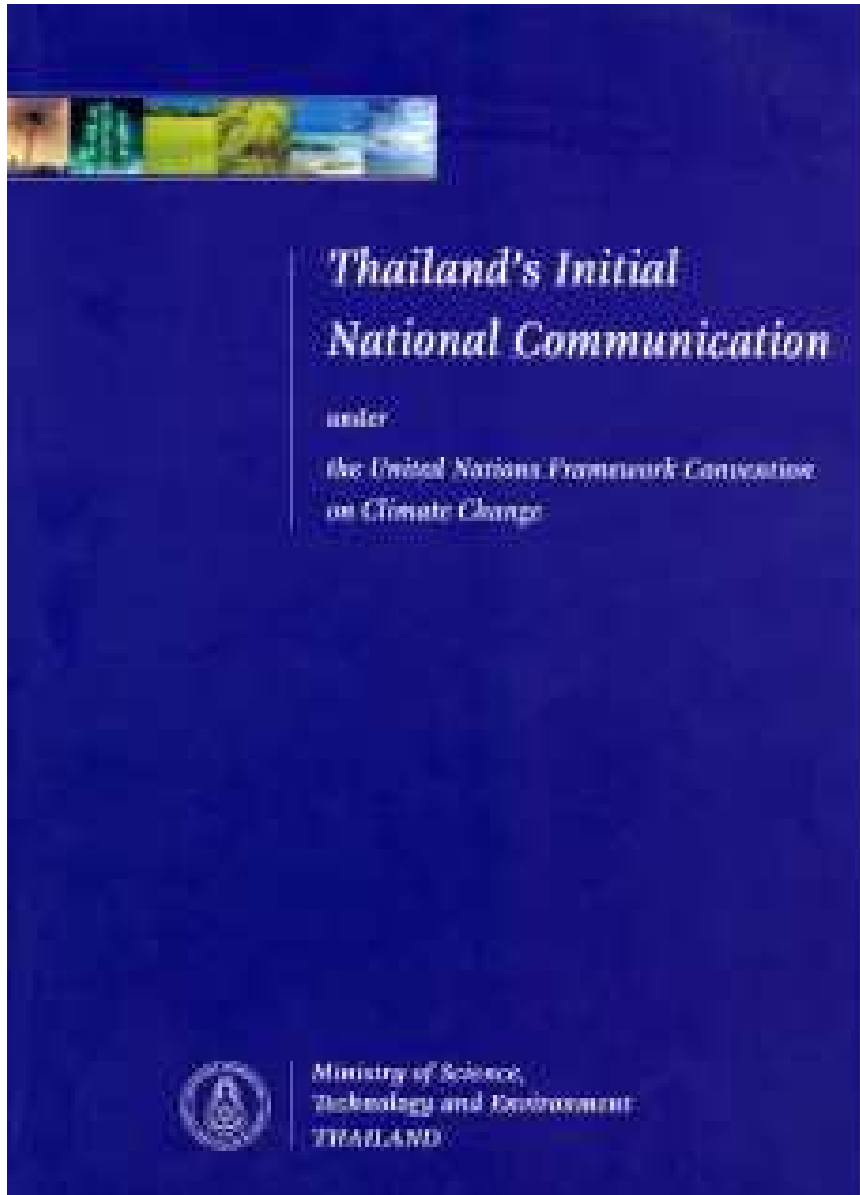
Office of Natural Resources and Environmental Policy and Planning
Ministry of Natural Resources and Environment

1.8 Thailand National Communications to UN Framework Conv. Climate Ch. (2000, 2011)

In 2000, Thailand emitted 210.23 million tons of CO_2 and absorbed 52.37 million tons of CO_2. Thus, Thailand's net CO_2 emission in 2000 was 157.86 million tons. The amount was lower than in 1994, when 202 million tons net of CO_2 was emitted. Of the total CO_2 emission in 2000, power generation emitted 150 million tons or more than 90% of net CO_2 emission. The remaining amount was mainly emitted by industrial processes (16 million tons), while an insignificant amount was emitted by waste management (see table below).

In the energy sector, power generation was the largest emitter of CO_2 (64.2 million tons), followed by transportation at 44.4 million tons, and industry at 30.3 million tons. As for industrial processes, almost all CO_2 emission from this sector was emitted by cement production.

1.9 Second National Communication to UNFCC (2011)

Main Greenhouse Gas	CO_2 emissions (Gg)	CO_2 removals (Gg)	CH_4 (Gg)	N_2O (Gg)
Total national emissions and removals	210,231.2	-52,374.0	2,801.5	40.0
1. Energy	149,914.6	0.0	413.9	2.5
2. Industrial processes	16,059.3	0.0	6.4	0.6
4. Agriculture			1,977.0	33.4
5. Land use change and forestry	44,234.1	-52,374.0	10.4	0.1
6. Waste	23.3		393.8	3.3

GHG emission in 2000 (Mt CO_2 eq) – by gas type

Total GHG Emission = 229.08 MtEq

N_2O (Mt) Eq.
12.39, 5.4%

CH_4 (Mt) Eq.
58.83, 25.7%

Net CO_2
157.86, 68.9%
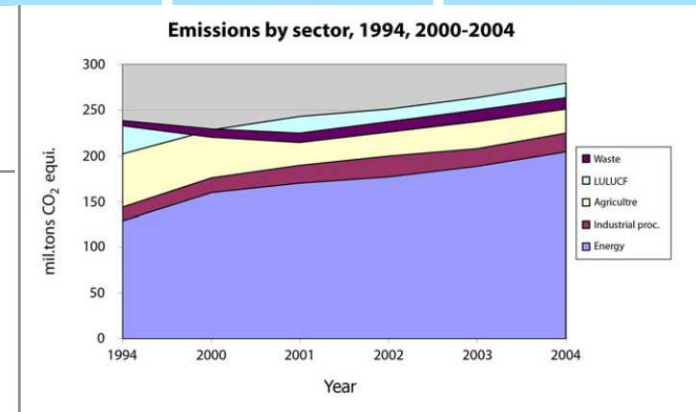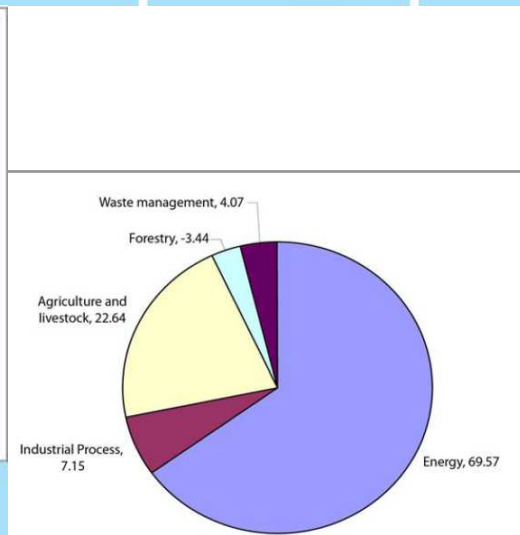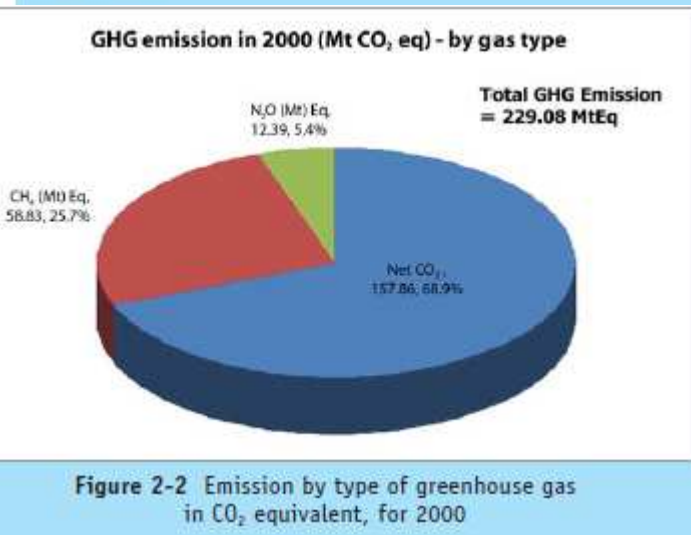
Figure 2-2 Emission by type of greenhouse gas in CO_2 equivalent, for 2000

Waste management, 4.07
Forestry, -3.44
Agriculture and livestock, 22.64
Industrial Process, 7.15
Energy, 69.57

Figure A GHG emission by source in CO_2 equivalent, for 2000 (%)

Emissions by sector, 1994, 2000-2004

mil.tons CO_2 equi.

- Waste
- LULUCF
- Agricultre
- Industrial proc.
- Energy

Year

1.10. CO2 Emissions in Energy Sector

Emission in 2000 in 'Energy Sector' (Mt CO₂ eq, %)

Waste, 9.3, 4.1%

LULUCF -7.5, -3.4%

Agriculture, 52.1, 22.6%

Energy, 159.4, 69.6%

Industrial processes, 16.4, 7.2%

Manufacturing industries & construction, 30.8, 19.3%

Energy Industries, 66.4, 41.9%

Transport, 44.7, 28.0%

Oil and natural gas, 4.6, 2.9%

Residential, 5.6, 3.5%

Solid fuels 0.7, 0.4%

Agriculture/Forestry /Fishing, 6.7, 4.2%

Total GHG Emission = 229.08 MtEq
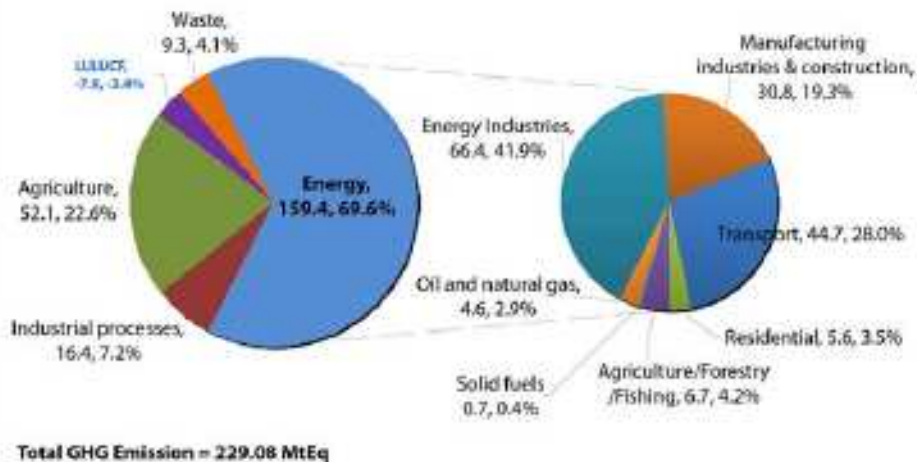
Figure 2-3 Emissions from the energy sector in CO₂ equivalent, for 2000

- **Source:** Second national communication of Thailand to UNFCC of 2011 (data of 2000). **From 2000-2012 CO2 emissions increased probably more than 50%)**

CO₂ form energy sector, 1994, 2000-2004

Millions

| | 1994 | 2000 | 2001 | 2002 | 2003 | 2004 |

Year
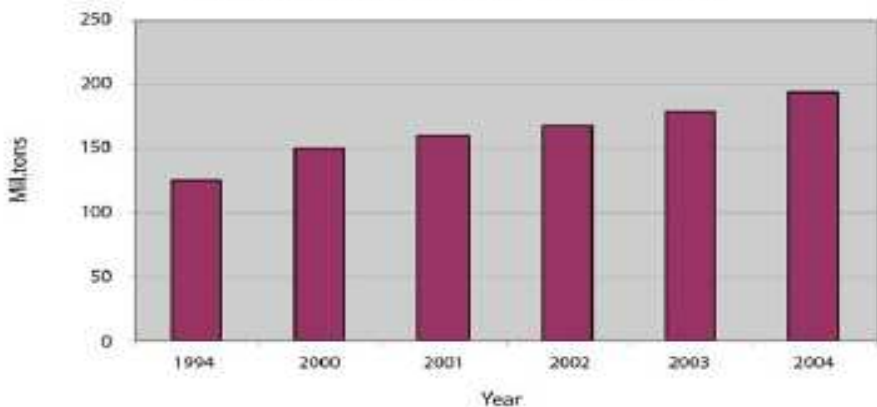
Figure 2-10 Thailand CO₂ emissions from the energy sector, 1994, 2000-2004 (million tons)

Emission from 'Agriculture' in 2000 (Mt CO₂ eq, %)

Industrial processes, 16.4, 7.2%

LULUCF -7.5, -3.4%

Waste, 9.3, 4.1%

Energy, 159.4, 69.6%

Agriculture, 52.1, 22.6%

Rice cultivation, 29.9, 57.5%

Agricultural soils, 7.8, 15.0%

Field burning of agricultural residue, 1.0, 1.9%

Enteric fermentation, 8.3, 15.9%

Manure Management, 5.1, 9.7%

Total GHG Emission with LULUCF = 229.08 MtEq
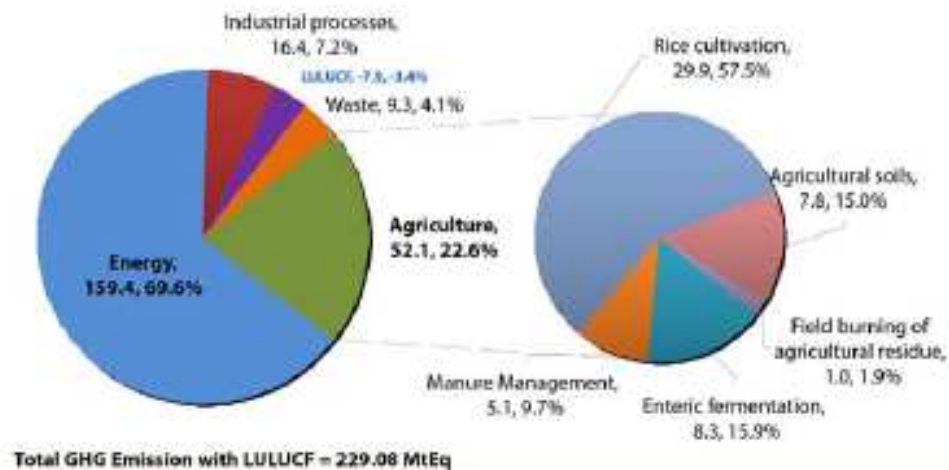
Figure 2-5 Greenhouse gas from all sectors and agriculture, by source in CO₂ equivalent, in 2000

1.11 International Energy Agency (2013) on Thailand's Emissions (1990-2010)

IEA (CO$_2$ Emissions from Fuel Combustion, 2012 (3/2013).
1)GHG emissions (sec. approach) 1990-2010: **World:+44.4%**

- Malaysia: +272%, Vietnam: +658%, China: +223.5%; **Thailand: +208.7%,** Singapore: 114.1% , **Asia: +160.4%**

•**Thailand 1990: 80.5; 2000: 158.1; 2010: 248.5 mio. tons of CO2**

2) Total primary energy supply (Mio. ton, oil equivalents)

Malaysia: +237.1%, Vietnam: +231.5%, China: +183.3%; **Thailand: 180,0+%,** Singapore: 184.3% , **Asia: 115.3+%**

3) Per capita emission by sector in 2010 (kg CO 2 / capita)**:**
Total CO2 Emissions from fuel combustion: 6 514, Vietnam: 1 501, China: 5 395; **Thailand: 3 596,** Singapore: 12 395 , **Asia: 1 494**

Transportation: Malaysia: 1494, Vietnam: 348, China: 382; **Thailand: 801,** Singapore: 1580, **Asia: 237**

1.12 Tropical Cyclones: Threat to Megacities

Tropical cyclones: rising intensity and frequency

Population density, 2004

0 1 5 10 25 50 100 150 200 250 300

Inhabitants [millions]

0.5–1   1–5   > 5
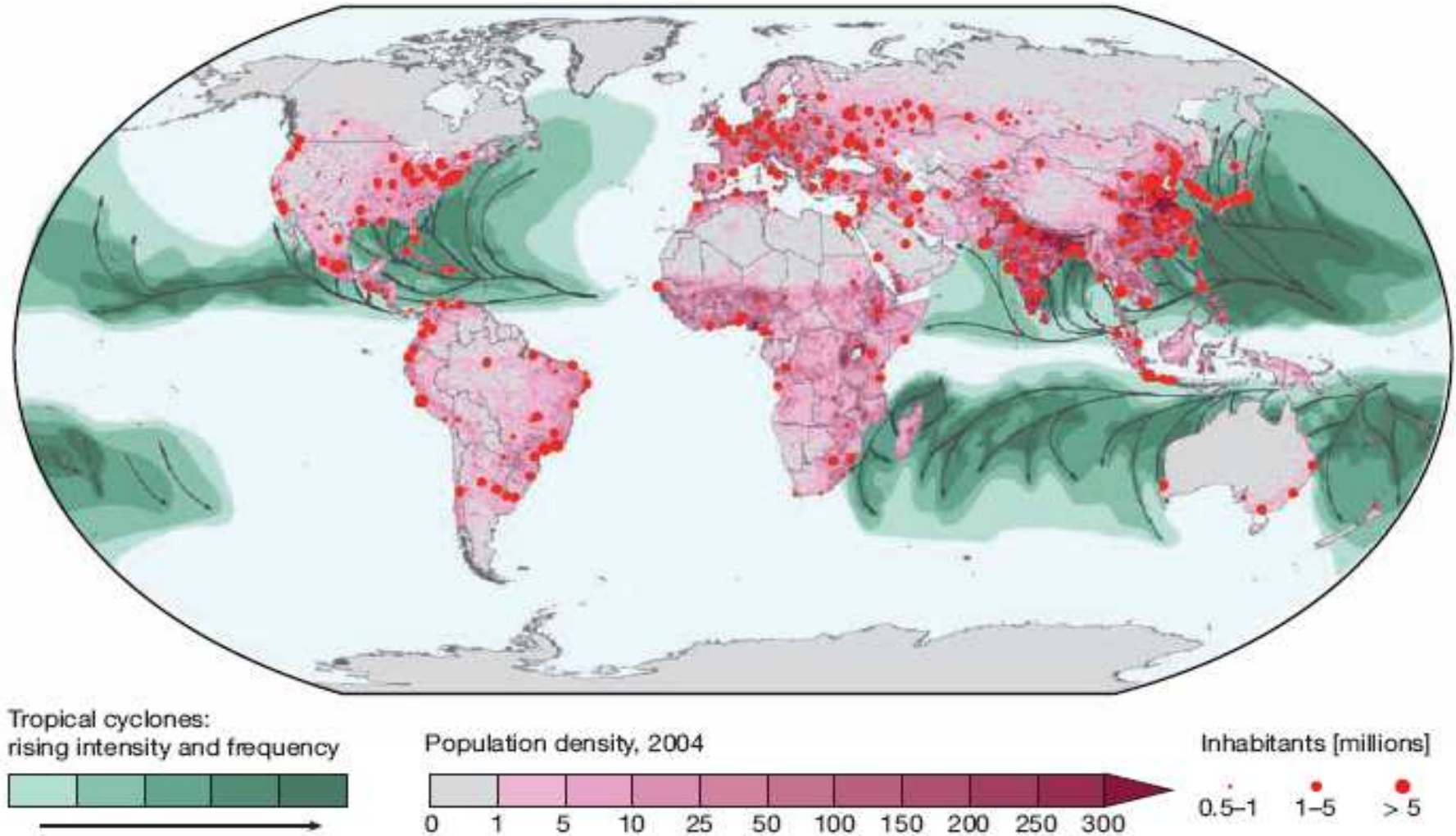
Figure 6.4-1
Tropical cyclone threat to urban agglomerations.
Cartography: Cassel-Gintz, 2006.
Source: WBGU

1.13 Disasters: Killed, Affected & Economic Damage

Disaster	Date	No Killed
Earthquake (seismic activity)	26-Dec-2004	8,345
Flood	5-Aug-2011	813
Storm	27-Oct-1962	769
Flood	19-Nov-1988	664
Earthquake (seismic activity)	Jun-1955	500
Storm	3-Nov-1989	458
Flood	10-Oct-2010	258
Flood	3-Jan-1975	239
Flood	1-Aug-1995	231
Flood	20-Aug-2006	164

Disaster	Date	No Total Affected
Drought	Apr-2008	10,000,000
Flood	5-Aug-2011	9,500,000
Flood	10-Oct-2010	8,970,653
Drought	Mar-2010	6,482,602
Drought	Jan-1999	6,000,000
Flood	30-Jun-1996	5,000,000
Drought	Feb-2002	5,000,000
Flood	1-Aug-1995	4,280,984
Flood	Oct-2002	3,289,420
Flood	3-Jan-1975	3,000,093

Disaster	Date	Dammage (000 US$)
Flood	5-Aug-2011	40,000,000
Flood	27-Nov-1993	1,261,000
Earthquake	26-Dec-2004	1,000,000
Storm	3-Nov-1989	452,000
Drought	Jan-2005	420,000
Flood	Dec-1993	400,100
Flood	Aug-1978	400,000
Flood	19-Jan-1984	400,000
Flood	10-Oct-2010	332,000
Flood	31-Oct-1993	319,850

Main Disasters in Thailand: recent & CC-related

1.14 2nd National Communication (2011)

Table 3-2 Disaster and damages in Thailand, 2001-2006

Year		2001	2002	2003	2004	2005	2006
Storm	Frequency (times)	1,061	594	3,213	3,834	1,313	1,883
	Provinces (number)	70	67	76	76	57	65
	Household (number)	32,100	23,070	146,024	70,818	32,449	30,296
	Public utility loss (mil.baht)	501.0	213.3	457.4	398.4	148.9	92.4
Drought	Provinces (number)	51	68	63	64	71	61
	Household (number)	7,334,816	2,939,139	1,399,936	1,970,516	2,768,919	2,960,824
	Loss (mil. Baht)	72.0	508.8	174.3	190.7	7,565.9	495.3
Flood	Provinces (number)	60	72	66	59	63	58
	Household (number)	919,699	1,373,942	485,436	619,797	763,847	1,673,822
	Loss (mil.baht)	3,666.3	13,385.3	2,050.3	850.7	5,982.3	9,627.4

Source: Department of Disaster Prevention and Mitigation, Ministry of Interior

1.15 IPCC Special Report of 2012 (SREX)

MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE ADAPTATION

SPECIAL REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

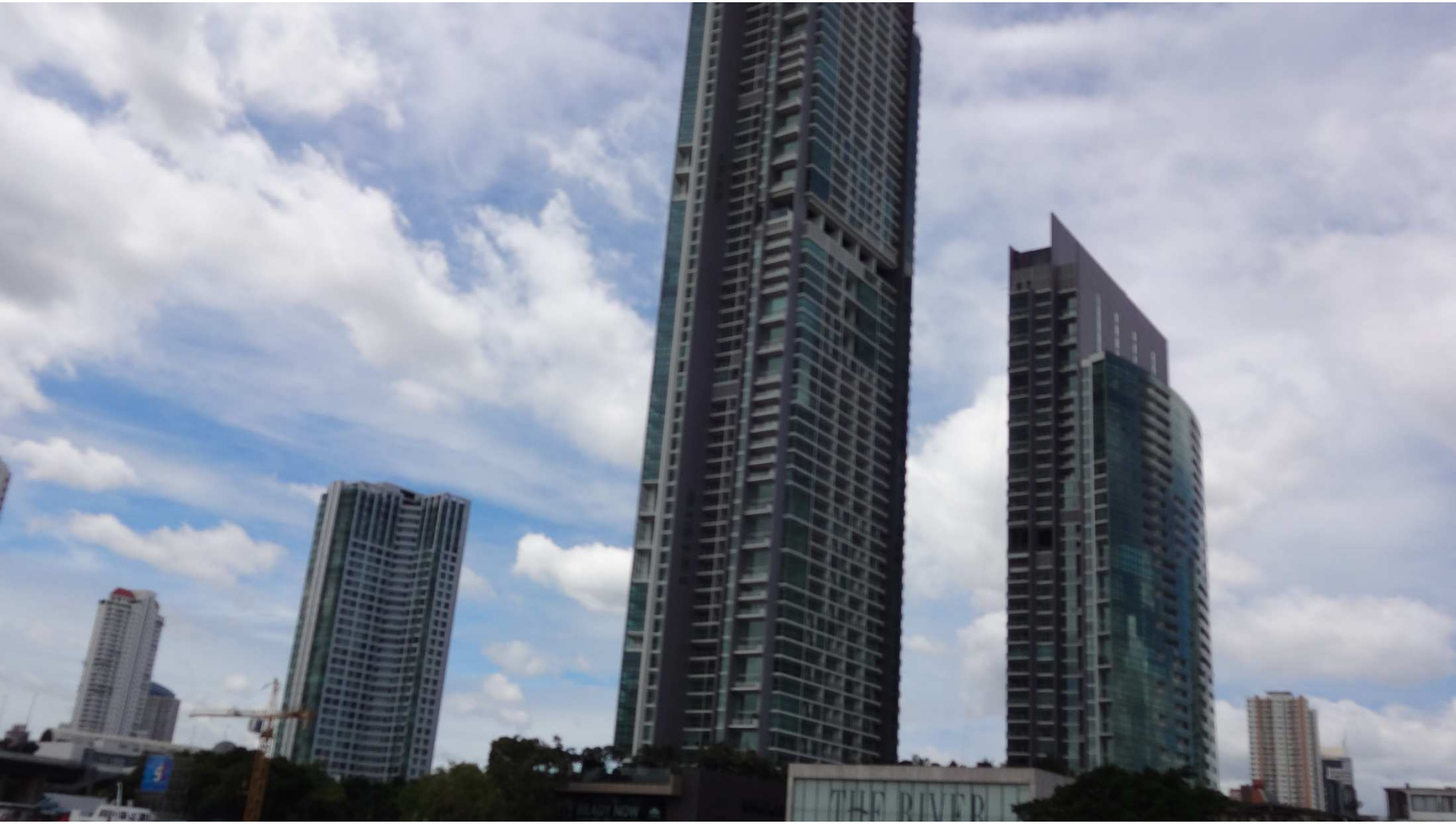ipcc

Task of scientific community (**knowledge**) is to analyse, monitor, evaluate, learn, innovate & produce **social and technical knowledge**

Monitoring

Innovation

Evaluation

Learning

Learning-by-doing and low-regrets actions can help *reduce risks now* and also promote future adaptation

2. Early Pressure – Response Models

2. Early Pressure – Response Models

Early Stimulus Response Models: OECD, UNCSD, EEA

- **OECD: PSR-Model** distinguished 'pressure' (P), 'state of environment' (S), & 'response' (R) indicators.
  - '*pressure*' key factors are listed (population growth, consumption, poverty),
  - '*state*' refers to environmental conditions that emerge from this pressure (air pollution, deforestation, degradation) that influence human health, well-being
  - '*response*' manifold activities of society to avoid, prevent, reduce negative impacts on environment, and to protect natural resources from these effects.
  - Between these three elements of the PSR model there are many complex interactions (resource transfers, information, decisions).
  - **UN-CSD** (Committee for Sustainable Development) used with its **DSR** (*Driving Force-State-Response*) model a slightly modified framework.

2.1 PEISOR Model: Linking Global Environmental Change with Environmental Effects, Impacts, Societal Outcomes and Policy Responses

PEISOR: Result of pressure and response models and of debates on environmental security and on natural hazards.

The PEISOR model combines five stages:

- *P* (*pressure*) refers to 6-8 drivers of global environmental change
- *E* **to the** *effects* of the linear, non-linear or chaotic interactions within the 'hexagon' on environmental scarcity, degradation, and stress;
- *I* **to extreme or fatal** *impacts* of human-induced and climate-related natural hazards (storms, flash floods, flooding, landslides, drought);
- *SO* **to** *societal outcomes*: internal displacement, migration, urbanization, crises, conflicts, state failure, and
- **R to** *response* **by society**, business community, state where both traditional & modern technological knowledge can make a difference.

Hazards cannot be prevented, their **impact** in terms of deaths, affected people, economic & insured damages can be reduced by policies & measures that link protection with empowerment of the people to become more resilient.

Workshop: P: Urban Climate Change; R: Community Resilience

2.2 PEISOR Model on Climate Change: Geophysical Effects & Societal Outcomes

- **4 geophysical effects will most likely increase**
  - Temperature change (2°C stabilization goal by 2100??)
  - Sea-level Rise much higher and longer lasting (threat)
  - Precipiation change (impact on drought, food security)
  - Increase in hydro-meteorological, climatological hazards

  Likelihood of crossing tipping points in climate system may rise
- **2°C world increasingly unlikely, 4°-6°C world more probable: dangerous,catastrophic Climate Change**
  - People's movement (displacement, distress migration)
  - Domestic, regional crisis & violent conflicts may increase
- **How to analyse these changes: models?**

2.3 Global Environmental Change & Impacts: PEISOR Model

Pressure	Effect	Impact	Societal Outcome	(Policy) Response
Causes of *Global Environmental Change* (*GEC*)	Socio-economic interaction Environmental scarcity, degradation and stress	Natural and human-induced hazards	Individual choice (*survival dilemma*) Societal response	National and international political process, state, societal and economic actors and knowledge

Direct natural link: climate change and extreme weather events
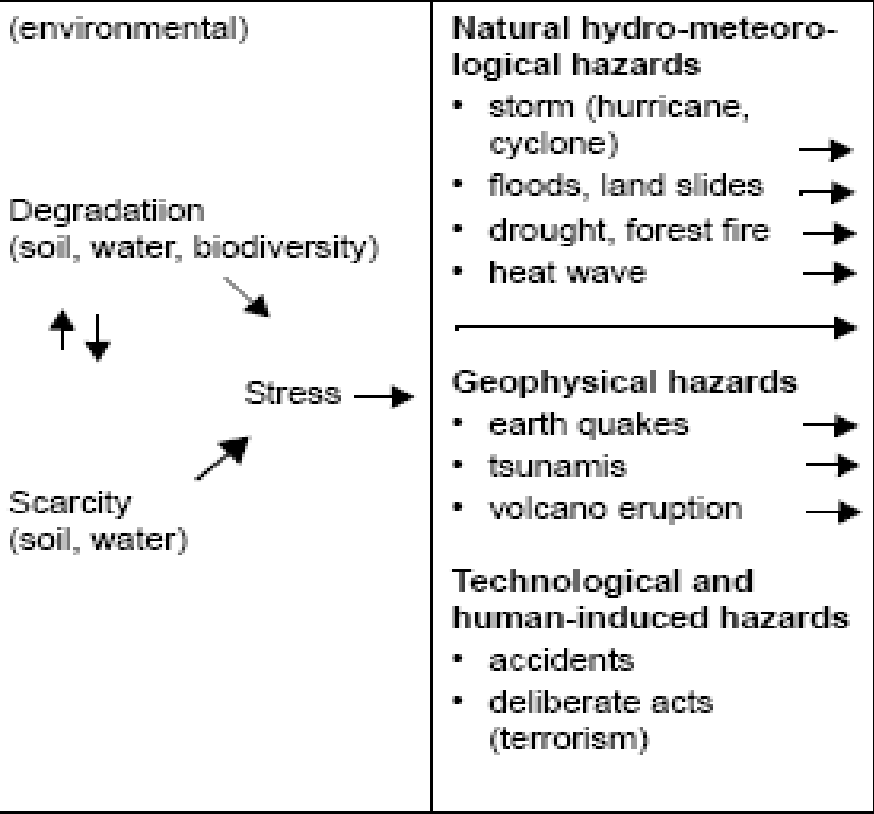
GLOBAL ECONOMIC AND POLITICAL CONTEXT AND CONDITIONS
(*security dilemma between states in the international system*)

Water   Soil
Biodi-versity
EARTH SYSTEMS
Climate Change
HUMAN SYSTEMS
Population
Rural Systems   Urban Systems
Socio-economic process

(environmental)

Degradation (soil, water, biodiversity)

Stress →

Scarcity (soil, water)

Natural hydro-meteoro-logical hazards
· storm (hurricane, cyclone) →
· floods, land slides →
· drought, forest fire →
· heat wave →

Geophysical hazards
· earth quakes →
· tsunamis →
· volcano eruption →

Technological and human-induced hazards
· accidents
· deliberate acts (terrorism)

Individual/family/community choice (*survival dilemma*)
· stay at home & suffer
· move (migrate)
· protest & fight (violence)

Migration   Conflict Avoidance Prevention Resolution
Political process
Crisis   Conflict

Societal response
· massive migration (rapid urbanization rise)
· internal crisis
· violent conflict
· conflict avoidance, prevention, resolution

State
Decision
Society   Economy

Coping with GEC & environmental stress (adaptation & mitigation)

Knowledge (traditional & modern Scientific/technological)

NATIONAL ECONOMIC AND POLITICAL CONTEXT AND CONDITIONS)

Socio-economic process (human forces and human systems)

Feedback

2.4 Applying the Model to Thailand

- **Human pressure: population growth (demand side),**
  - **rural (agriculture, food) & urban systems (industry)**
  - **socio-economic processes (production & consumption)**
- **Environmental pressure:** Global Environmental and Climate Change: Soil, water, biodiversity & **climate change**
- **Effects:** env. scarcity, degradation & stress (water, soil)
- **Impacts: heat waves, storms, floods**
- **Societal Outcomes: death, affected, economic damage (e.g. big flood of August 2011)**
- **Policy Response: proactive vs. reactive**
  - **Infrastructure, early warning & societal community resilience**

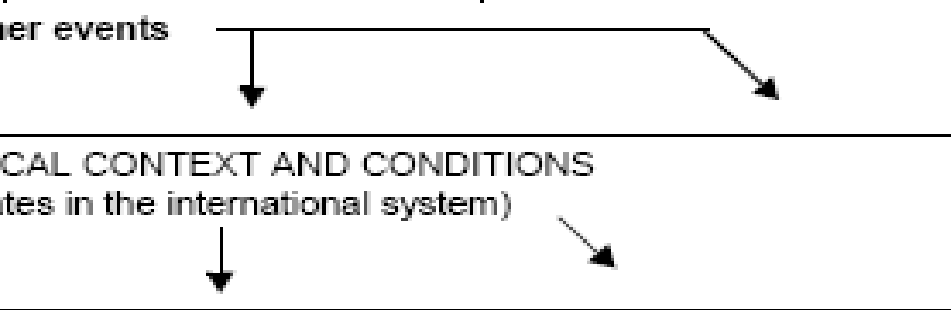| Effect	Impact
Socio-economic interaction Environmental scarcity, degradation and stress	Natural and human-induced hazards

Direct natural link: climate change and extreme weath

↓   ↓

GLOBAL ECONOMIC AND POLITI
(*security dilemma* between sta

(environmental)	Natural hydro-meteoro-logical hazards • storm (hurricane, cyclone) • floods, land slides • drought, forest fire • heat wave
Degradatiion (soil, water, biodiversity) Stress → Scarcity (soil, water)	Geophysical hazards • earth quakes • tsunamis • volcano eruption Technological and human-induced hazards • accidents • deliberate acts (terrorism)

NATIONAL ECONOMIC AND POLITI

2.5 E: <u>E</u>ffect & I: <u>I</u>mpact

- **E: Environmental security debate of 1990s**
  - Toronto school (Homer-Dixon)
  - Swiss school (G. Bächler):
  - Soil scarcity > degradation > environmental stress
- **I: climate change -> extreme weather events**
  - Hydrometeorological hazards
    - **Drought (wind erosion)**
    - Heatwaves
    - Forest fires
    - Storms (hurricanes, typhoons
    - **Flash floods & landslights (wind & water erosion)**

Societal Outcome	(Policy) Response
Individual choice *(survival dilemma)* Societal response	National and international political process, state, societal and economic actors and knowledge

...er events

...CAL CONTEXT AND CONDITIONS
...tes in the international system)

Individual/family/ community choice *(survival dilemma)*
- stay at home & suffer
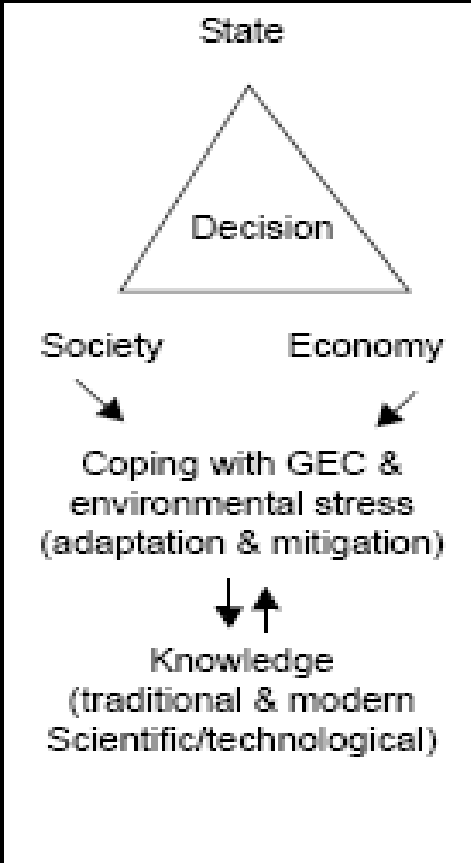- move (migrate)
- protest & fight (violence)

Migration — Conflict Avoidance Prevention Resolution

Political process

Crisis — Conflict

Societal response
- massive migration (rapid urbanization rise)
- internal crisis
- violent conflict
- conflict avoidance, pre-vention, resolution

State

Decision

Society — Economy

Coping with GEC & environmental stress (adaptation & mitigation)

Knowledge (traditional & modern Scientific/technological)

2.6 SO: Societal Outcomes

- **Individual level (choice)**
  - Human security perspective
  - Survival dilemma of humans
- **State/society level**
  - Rural-urban migration
  - Foreign immigration (Myanmar, Cambodia, Laos)
    - Seasonal (labour)
    - Permanent
  - Residence (flood prone areas)
  - Crises: domestic (related?)
  - Conflicts:
    - Peaceful protests
    - Violent clashes
  - Complex emergencies (2004: Sri Lanka, Indonesia: Aceh)

2.7 R: Policy Response to Security Dangers posed by Global Environmental Change: Object

- **How? Responsive vs. proactive action**
  - **Response:** cost of non-action (Stern Report)
  - **Proactive:** anticipatory knowledge, learning, action
- **What? Addressing Causes (Pressure)**
  - **Earth system:** environmental quartet
  - **Human:** productive & consumptive behaviour
- **Responding to Effects and Impacts**
  - **Environmental stress**
  - **Climate-related natural hazards**
- **Addressing Societal Outcomes:** Migration & Conflicts

2.8 Climate Change & Security: Challenges for New Peace & Security Policy in the Anthropocene

- **New security challenges require new security & peace policy for the Anthropocene**

- **We are the threat! Impossibile to fight against oneself !**
  - **threat:** our fossil energy consumption and way of life
  - **solution: GHG reduction by 2050: -50% (global), -80% ICs**
    - Electricity, heating, transportation, industry
    - Incrase in energy efficiency and renewable energy
  - **Global responsibility and global action**
  - **Proactive vs. reactive Policy and Crisis Management**
    - **Reactive: Welt financial crisis: no price is too high**
    - **Dominance of mindset and Worldview of business as usual (BAU) Short term horizon: Reactive political & economic action**
    - **International Climate Policy since 2009, failure of Rio+20**
    - **Proactive: climate change response: sustainability transition strategies**

3. A Human Security Approach to Climate Change and Community Resilience

3. A Human Security Approach to Urban Climate Change and Community Resilience

Human Security: UNDP (1994), HSN (1999), CHS (2003)

- Dual goal:
  - Task of the government: protection: early warning & infrastructure (shelters, urban planning)
  - Empowerment; capacity-building and training

Four Pillars of human security

- Freedom from fear (Canadian, Norwegian approach)
- Freedom from want (Japanese, Thai approach)
- Freedom to live in dignity (Kofi Annan: In Larger Freedom, 2005)
- **Freedom from hazard impact** (UNU-EHS: Bogardi/Brauch (2005)

3.1. Deepening: State- vs. People Centred Human Security

- **UNDP Human Security Report (1994: 3) by Mabhuq ul Haq, Pakistan: *New Dimensions of Human Security***
  - Security … means safety from the constant **threat of hunger, disease, crime and repression.** It also means protection from **sudden and hurtful disruption in the pattern of our daily lives** – whether in our homes, in our jobs, in our communities or in our environ-ment.

- **Human Security Commission: Human Security Now, 2003 (Ogata/Sen)**
  - **Human security complements state security, enhances human rights and strengthens human development.** It seeks to *protect* people against a broad range of threats to individuals and communities and, further, **to *empower* them to act on their own behalf.** And it seeks to forge a global alliance to strengthen the institutional policies that link individuals and the state – and the state with a global world. Human security thus brings together the human elements of security, of rights, of development.
  - The Commission on Human Security's definition of human security: **to *protect* the vital core of all human lives in ways that enhance human freedoms and human fulfilment.** Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means *protecting* **people from critical (severe) and pervasive (widespread) threats and situations.** It means using processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building **blocks of survival, livelihood and dignity.**

Photo by Osamu Honda 2003

3.2 Human Security Commission Report: Sadago Ogata & Nobel Laureate Amartya Sen: Human Security Now (2003)

- *Commission on Human Security* **(CHS)** established in January 2001 at initiative of Japan. The Commission consisted of twelve persons, chaired by Sadako Ogata (former UNHCR) Amartya Sen (1998 Nobel Economics).

- **CHS goals:** a) promote public understanding, engagement and support of human security; b) develop the concept of human security as an operational tool for policy formulation and implementation; c) propose a concrete program of action to address critical and pervasive threats to HS.

- *Human Security Now* (2003) proposes a **people-centered** security fra-mework that focuses "**on shielding people** from critical and pervasive threats and **empowering them to take charge of their lives**. It demands creating genuine opportunities for **people to live in safety and dignity and earn their livelihood**. Its final report highlighted that:

- More than **800,000 people a year lose their lives to violence**. Ca. **2.8 billion suffer from poverty, ill health, illiteracy &** other maladies

3.3 Human Security Commission: Human Security Now (2003)

Independent Commission on Human Security (CHS), led by Sadako Ogata and Amartya Sen, in 2001 reached a new consensus on security threats facing contemporary societies in 21stcentury. CHS in its 2003 report Human Security Now: Protecting and Empowering People, defined HS as

- to *protect* **the vital core of all human lives in ways that enhance human freedoms and human fulfilment**. Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means *protecting* **people from critical (severe) and pervasive (widespread) threats and situations**. It means using processes that build on people's strengths and aspirations. **It means creating political, social, environmental, economic, military and cultural systems** that together give people the building blocks of survival, livelihood and dignity.

- *Urban Climate Change* requires protection and *Community Resilience* relies on process of empowerment of the people!

3.4 Fourth Pillar of Human Security: Freedom From Hazard Impacts

- **UNU-EHS**: Bogardi/Brauch (2005), Brauch (2005)
- **Goal:** reduce dual vulnerabilities & enhance capacity building & coping capabilities of societies faced with natural & hum. hazards
- **Threats/Hazards:**
  - Environmental: floods, droughts, other natural disasters, environmental degradation, lack of water, human-induced climate change
  - Societal: poverty, improper housing, insufficient food and water, malfunctioning of technical systems, traffic accidents, population explosions, terrorism and organized crime
- **Develop vulnerability indicators & vulnerability mapping** to apply to operational realm: working on solutions
  - improved early warning systems capacity-building for early warning
  - disaster preparedness (education and training, infrastructure)
  - coordinated rapid disaster response by local, regional and national level
  - developing clear guidelines for post hazard reconstruction
  - long term strategies: e.g. Kyoto, Montreal Protocol
  - adaptation measures: e.g. dams, switching to renewable energy
  - mitigation measures: restrict housing in hazard areas (coastal areas-flooding, mud slides), charging more for garbage disposal and energy usage, birth control measures
- **Support community resilience, sustainable development & sustainability transition (e.g. urban energy, transport)**

3.5 Climate Change as a Human Security Challenge

- From a human security perspective, climate change was addressed by the *Global Environmental Change and Human Security* (**GECHS**) programme of IHDP in June 2005.

- Focus of the **Greek Presidency of the Human Security Network (2007-2008)** "to raise the international community's awareness of the impact of climate change and global warming on hu-man security, with regard to vulnerable groups, particularly women, children and persons fleeing their homes due to climate change".

- **Barnett and Adger (2005)** discussed how climate change may under-mine human se-curity, and how human insecurity may increase the risk of violent conflict; as well as the role of states in human security and peace- building.

- **Scheffran, Brzoska, Brauch et a. (2012): Climate Change, Human Security and Violent Conflict**

- **The linkage between climate change and human security is addressed by *Working Group* (WG) II of the IPCC, that will be released in its fifth assessment report will be released in 2014.**

4. Reflections from an Emerging Peace Ecology

4. Reflections from an Emerging Peace Ecology

– **Conceptualising Peace**
- **European concept**: Greek & Roman origins: **Eirene & pax**
- **Asian**: Hindu concept of **Ahimsa**: peace with nature
- Is there a similar concept in **Teravati Buddhism**?

– **Conceptualizing Ecology: The many ecologies**
- 'deep ecology' (Leopold 1949; Naess 1973, 1989),
- 'human ecology' (Marsh 1864; Young 1974),
- 'social ecology' (Bookchin 1988, 2005),
- 'political geoecology' (Brauch/Dalby/Oswald Spring 2011).
- **'peace ecology'** (Kyrou 2007, Oswald Spring/Brauch/Tidball)

– **Peace Ecology: A new approach**
- Environmental peacemaking
- **5 pillars of peace ecology:**
  - negative peace
  - positive peace
  - cultural peace
  - **sustainable peace**
  - engendered peace

4.1. Ecology: Term & Concept

- Ecology is based on Greek terms household, house or family and 'logos' speech, philosophy or science.

- The *ecology* concept was coined by Ernst Haeckel (1834-1919) for the study of living species and their physical and biotic surroundings.

- In late 19th century it was used for animals, plants, in hydrobiology, while a modern definition includes a) the interactions between organisms (individuals, populations), b) in their abiotic and biotic environment and c) links in energy, material and information flow.

- Ecology concept "has been centrally concerned with the concept of adaptation and with all properties having a direct and measurable effect on demography, development, behaviour and spatio-temporal position of an organism." (Ellen 1996)

- *Human ecology* is used in human geography, urban sociology and anthropology. Ellen (1996) argued that "the other major impact of ecological concepts in the social sciences has been in the relation of political environmentalism, and to environment and development…".

4.2 Manifold Ecological Approaches

- The ecology concept has been conceptualized by many social scientists as
  - 'deep ecology' (Leopold 1949; Naess 1973, 1989),
  - 'human ecology' (Marsh 1864; Young 1974),
  - 'social ecology' (Bookchin 1988, 2005),
  - 'ecofeminism' (d'Eaubonne 1974; Shiva/Mies 1997),
  - 'political ecology' (Thone 1935)
  - urban ecology
  - 'political geoecology' (Brauch/Dalby/Oswald Spring).
  - **Peace ecology (Kyrou 2007, Oswald Spring/Brauch/ Tidball 2014)**

4.3 Peace Ecology

- Peace ecology calls for "peace with nature" that is increasingly being challenged by the manifold anthropogenic interventions into the earth system during the Anthropocene (Crutzen 2000): To achieve 'peace with nature' is a domestic and international task.

- How human beings respond to these new dangers to the survival of the species but also of plants and animals through a declining biodiversity depends on the worldview of the scientists but also on the mindset of the elites and on whether the carbon lobbies succeed.

- Business-as-usual prevails when the political, economic and military elites are unwilling or unable to act to address the root causes of global environ-mental and climate change. Many religious leaders, scientists, policymakers have called for an alternative vision aiming for a new scientific revolution, for a fundamentally different worldview shifting to an alternative paradigm of sustainable development and sustainable peace (Scheffran 2011; OECD 2011), where the ethical goal of 'peace with nature' can be achieved.

4.4 Five Pillars of Peace Ecology

4.5 Conceptual Pillars of Peace Ecology

- Peace ecology in the Anthropocene may be conceptuallized with 5 conceptual pillars consisting of peace, security, equity, sustainability & gender.

- *Sustainable peace* refers to links among peace, security & environment, where humankind and the environment as 2 key parts of global Earth face the consequences of destruction, extraction and pollution.

- **Sustainable peace** includes also processes of recovering from environmental destruction, reducing the human footprint in nature through a less carbon-intensive - and in the long-term possibly carbon-free and increasingly dematerialized production processes that future generations may still be able to decide on their own resources and development strategies.

5 Relevance for Climate Change and Social Impact Analysis?

5 Relevance for Thailand?

- GHG emissions in the energy sector increased by 200% (1990-2012). Urbanization is projected to rise from 33 to 55% between 2010 and 2050. Thus urban GHG and CO_2 emissions will prevail in Thailand.

- Urban CO_2 emissions are projected to rise significantly in the energy, transport, industry and housing sectors if strategies of BAU dominate.

- **Thus, in Thailand the urban centres are both a threat to and a victim of global environmental change.**

- **The rural areas and farmers have been affected severely by both floods and drought: drop in crop yield and income!**

- This poses potential human security consequences due to the dual environmental & social vulnerabiltiy.

- **The knowledge sector can rise awareness on these linkages, develop the infrastructure and enhance community resilience by capapacity building and training activities. Architecture matters!**

5.1 Relevance for Thailand

- Stimulus-response and the PEISOR model offer a tool for a systematic analysis of climate change impacts for urban centres and for bottom-up policy responses through community resilience.

- With a human security approach the linkages between urban climate change and community resilience may be upgraded as issues of „utmost importance" that need „extraordinary measures".

- The urban and peace ecology approaches may offer different tools for an empirical and normative ana-lysis of these complex linkages.

6 We are the threat and victims and should become the solution!

- The Atmopshere does not distinguish GHG emis-sions from North and South. The social impacts can be deadly and lead to conflicts
- The impacts will be more severe where environ-mental and social vulnerability are high and will affect the poorest most, also in Thailand
- There are alternatives of a transition to sustainable development: in energy (efficiency, renewables), transportation and also in agriculture
- Moving towards sustainability transition and sustain-able peace: peace ecology as a possible framework
- This is a challenge and task for universities globally and also for Thailand and **Mahasarakham University**

Thank you for your attention and patience

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