

Co-benefits Approach for Short-lived Climate Forcers (SLCFs) コベネフィット・アプローチによるSLCF対策の推進

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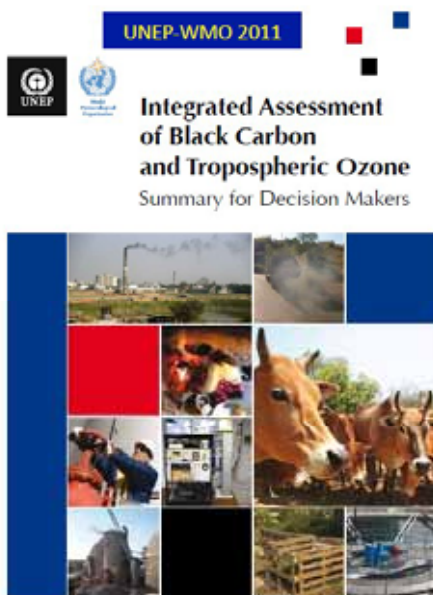
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Significant attention to SLCFs SLCFに対する著しい注目



Synthesis Report



“Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers”.

The Report is directed primarily at policy makers and other stakeholders who have an interest and possible impact on policy decisions in respect of air quality and near term climate protection.

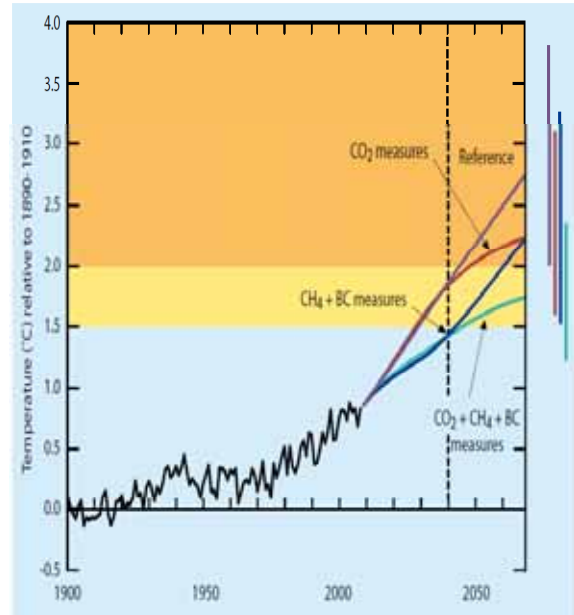
www.unep.org/publications/ebooks/SLCF/

- ❑ Significant attention to short-lived climate forcers (SLCFs) especially after 30years anniversary of CLATAP in 2009.
- ❑ Two important reports by UNEP in 2011.

Basic knowledge on SLCFs

SLCFに対する基礎知識

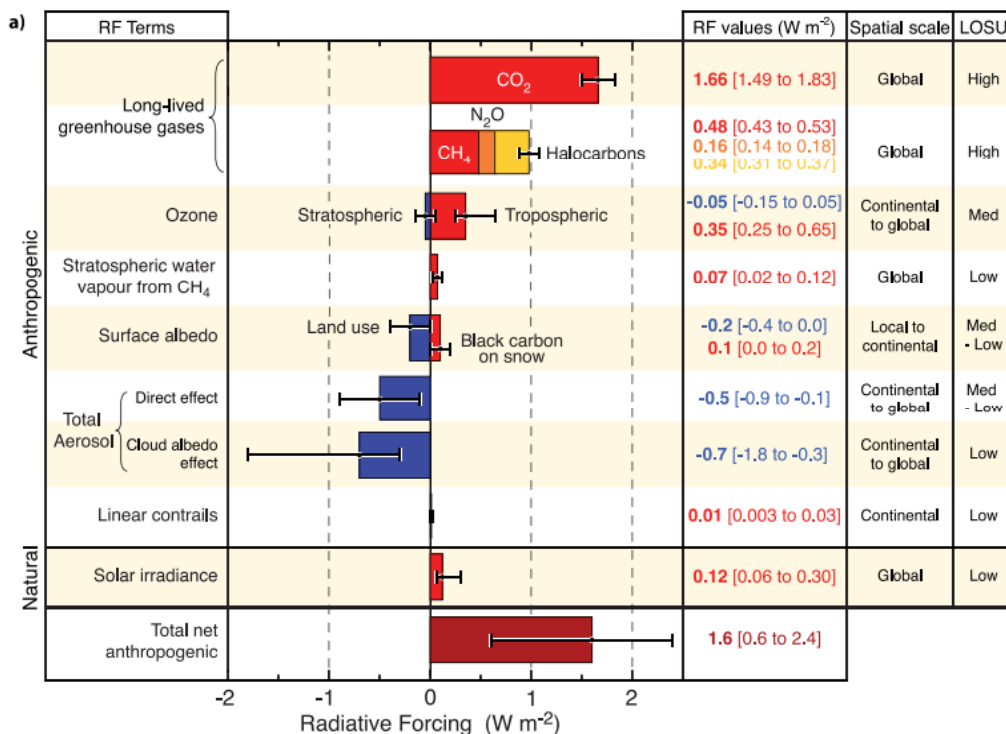
- ◆ CO2 mitigation actions are essential for long-term climate protection.
- ◆ However, for short-term achievement, it is difficult to limit global mean temperature within 2 from pre-industrial level only with CO2 mitigation actions.
- ◆ It is necessary to address short-lived climate forcers (SLCFs) such as tropospheric ozone, black carbon and methane on the top of CO2 mitigation actions.



Radiative forcings of various gases

様々なガス・粒子の放射強制力

GLOBAL MEAN RADIATIVE FORCINGS



Co-benefits and co-control

コベネフィット(共便益)とコ・コントロール(共制御)

- ◆ Black carbon has positive radiative forcing, but other aerosols such as organic carbon, SO₂ have negative radiative forcing.
- ◆ Air pollution control measures, such as reduction of SO₂ emissions, might enhance climate change by removing negative radiative forcing.
- ◆ It is, therefore important to consider co-control of air pollutants enhancing climate change (e.g., SO₂) and those reducing climate change (e.g., black carbon, tropospheric ozone etc.) in a well considered manner.

Effects of co-benefits approach calculated by GAINS model

GAINSモデルによるコベネの効果試算

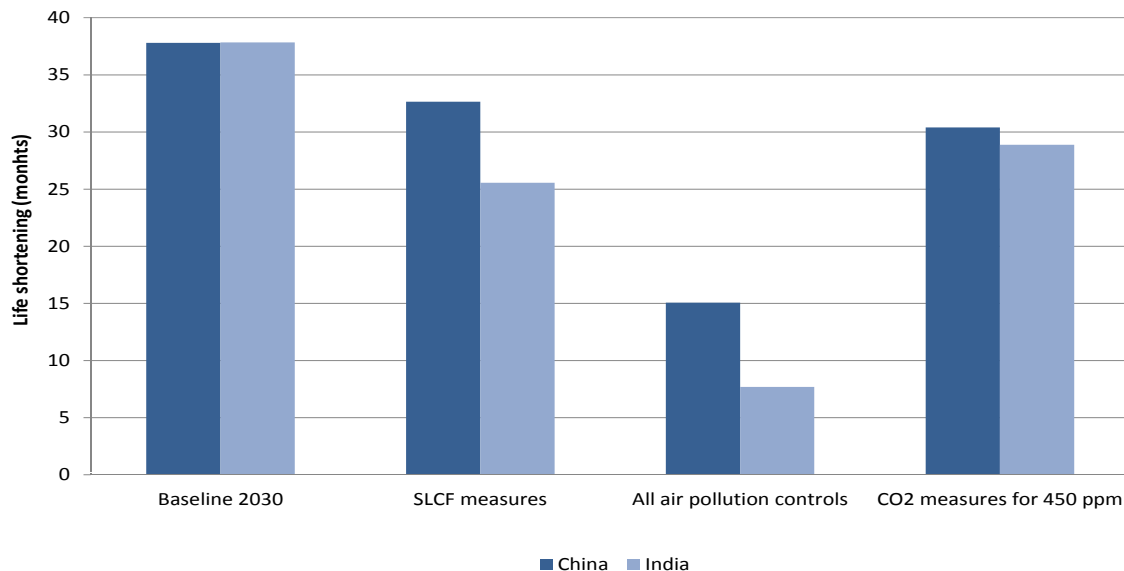
Global Impacts of Additional Emissions Controls on Methane and Products of Incomplete Combustion
1. Methane measures, 2: 1+BC technical measures, 3: 2+Non-technical measures



Life shortening by PM2.5 (estimated by GAINS)

PM2.5による早期死亡数 (GAINSによる試算)

- **Traditional ozone and BC mitigation measures may be insufficient.**
- Climate mitigation measures such as energy efficiency improvement is also effective for air pollution control.



Asian Co-benefits Partnership (ACP)

アジア・コベネフィット・パートナーシップ

www.cobenefit.org

- A platform to improve **information sharing** and **stakeholder dialogue** on co-benefits in Asia.
- Goal: to support the **mainstreaming of co-benefits into decision-making processes** in Asia.

The screenshot shows the homepage of the Asian Co-benefits Partnership (ACP) website. The header includes the IGES logo and navigation links: Home, About, Activities, Partners, Publications/Tools, and Contact us. The main content area features the ACP logo and the tagline "Asian Co-benefits Partnership: Bringing Climate and Development Together". Below this, there is a date "11 November" and a "What's New?" section with three items: "2nd Advisory Group Meeting (July 2011, Yokohama)", "UNU-IAS-IGES-ACP Joint Meeting: Greening Growth in Asia Making Co-benefits Mainstream (July 2011, Yokohama)", and "1st Advisory Group Meeting (July 2011, Kuala Lumpur)". The "About" section lists "About the ACP", "Goals", "Major Functions", "Governance", and "How to Become a Partner". The "Activities" section shows images of meetings. The "Partners" section lists "Brochures & Flyers", "Work Plan", "Newsletter", "Conference Proceedings", "Factsheet", "Reports", and "Tools". The "Contact us" section provides the address: "Asian Co-benefits Partnership (ACP), Secretariat, The Institute for Global Environmental Studies (IGES), 2150-11 Komaba, Setagaya, Tokyo, Japan", along with phone and fax numbers and an email address. A footer note states: "The Asian Co-benefits Partnership (ACP) website is hosted and maintained by the Institute for Global Environmental Studies (IGES)." © 2011 IGES

New report in 2012

Reducing Black Carbon Emissions in South Asia

2012年における新たな報告:南アジアにおけるBC排出量の削減

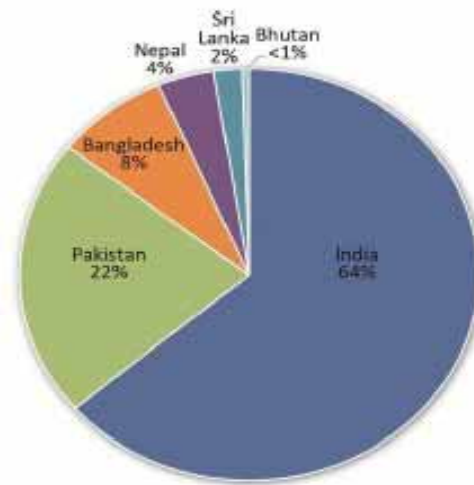
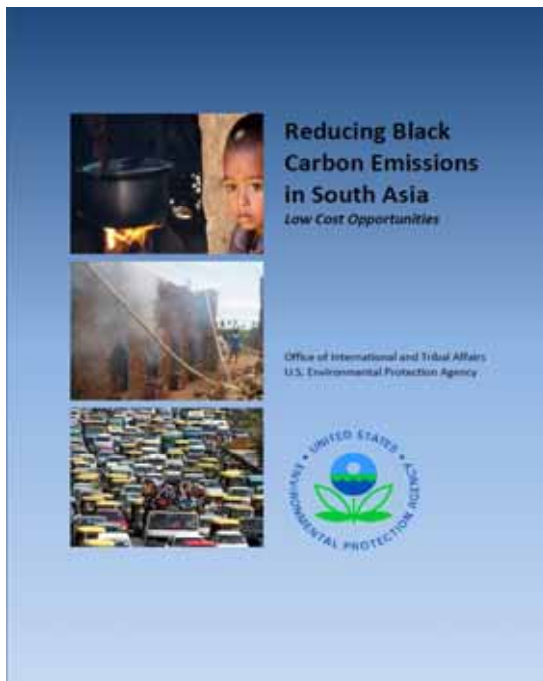


Figure A.1. Percent South Asian black carbon emissions contributions. Source: Adapted from [60].

Regional contribution of global BC emissions 世界のBC排出量に対する各地域の貢献

Region ^d	Black carbon emissions (in Tg)	Percent of total
Non-biomass burning anthropogenic emissions		
East/Southeast Asia/China ^c	1.5	18.3
North America	0.4	4.9
Europe	0.5	6.1
South Asia	0.6	7.3
Other (South America and Africa)	1.5	18.3
Biomass burning		
South America	1.2	14.6
Africa	1.5	18.3
Other (North America, Europe, South Asia, and Southeast Asia)	1.0	12.2
Total	8.2	100.0

a. The Koch et al. estimates are based on global black carbon emissions estimates from [15].

b. Estimates for major emitting regions are provided for each of two source types: non-biomass burning and biomass burning; minor emitters for each source type are subsumed under the category "other." Koch et al. define six major emitting regions: North America, South America, Africa, Europe, South Asia, and Southeast Asia.

c. Koch et al. define Southeast Asia as being approximately equal to China in geographic area.

Source: [85].

Europe and North America's approach 欧米のコベネ・アプローチ

- ◆ Europe and North America pay much attention to CH₄ and black carbon (BC).
- ◆ This is because actions for Nox mitigation have been promoted in Europe and CH₄ reduction measures seem to be crucial in the European future.
- ◆ UNEP Report identified 16 mitigation measures for CH₄ and BC emissions reduction.

Measure ^a	Sector
CH₄ measures	
Extended pre-mine degasification and recovery and oxidation of CH ₄ from ventilation air from coal mines	Extraction and transport of fossil fuel
Extended recovery and utilization, rather than venting, of associated gas and improved control of unintended fugitive emissions from the production of oil and natural gas	
Reduced gas leakage from long-distance transmission pipelines	
Separation and treatment of biodegradable municipal waste through recycling, composting and anaerobic digestion as well as landfill gas collection with combustion/utilization	Waste management
Upgrading primary wastewater treatment to secondary/tertiary treatment with gas recovery and overflow control	
Control of CH ₄ emissions from livestock, mainly through farm-scale anaerobic digestion of manure from cattle and pigs	Agriculture
Intermittent aeration of continuously flooded rice paddies	
BC measures (affecting BC and other co-emitted compounds)	
Diesel particle filters for road and off-road vehicles	Transport
Elimination of high-emitting vehicles in road and off-road transport	
Replacing coal by coal briquettes in cooking and heating stoves	Residential
Pellet stoves and boilers, using fuel made from recycled wood waste or sawdust, to replace current wood-burning technologies in the residential sector in industrialized countries	
Introduction of clean-burning biomass stoves for cooking and heating in developing countries ^{1,2}	
Substitution of clean-burning cookstoves using modern fuels for traditional biomass cookstoves in developing countries ^{2,3}	Industry
Replacing traditional brick kilns with vertical shaft kilns and Hoffman kilns	
Replacing traditional coke ovens with modern recovery ovens, including the improvement of end-of-pipe abatement measures in developing countries	
Ban of open field burning of agricultural waste ⁴	Agriculture

Climate and Clean Air Coalition : CCAC 気候変動-大気連合SLCF削減イニシアチブ

- ◆ Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants Initiative: CCAC) was set up in February 2012.
- ◆ The Coalition intends to accelerate and scale-up action, catalysing new actions as well as highlighting and bolstering existing efforts.
- ◆ 13 partners as of June 2012: Bangladesh, Canada, Colombia, the European Commission, Ghana, Japan, Mexico, Nigeria, Norway, Sweden, USA, the World Bank and UNEP.

Website: www.unep.org/ccac

Major actions to be taken by CCAC CCACによる主な活動分野

- Reducing black carbon emissions from heavy duty diesel vehicles and engines;
- Mitigating black carbon and other pollutants from brick production;
- Mitigating short-lived climate pollutants from the municipal solid waste sector;
- Promoting HFC alternative technology and standards; and
- Accelerating methane reductions from oil and natural gas production.

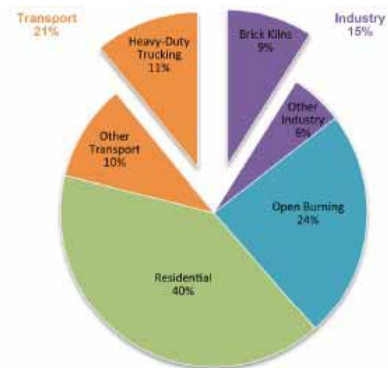


Figure 2. Sectoral black carbon emissions in India.
Sources: [16, 17, 18].

Rio+20: The Future We Want リオ+20成果文書における記述

222. We recognize that the phase-out of ozone depleting substances (ODS) is resulting in a rapid increase in the use and release of high global warming potential hydrofluorocarbons (HFCs) to the environment. We support a gradual phase-down in the consumption and production of HFCs.

Indoor Air Pollution 室内大気汚染

Initiatives for Cookstoves in South Asia

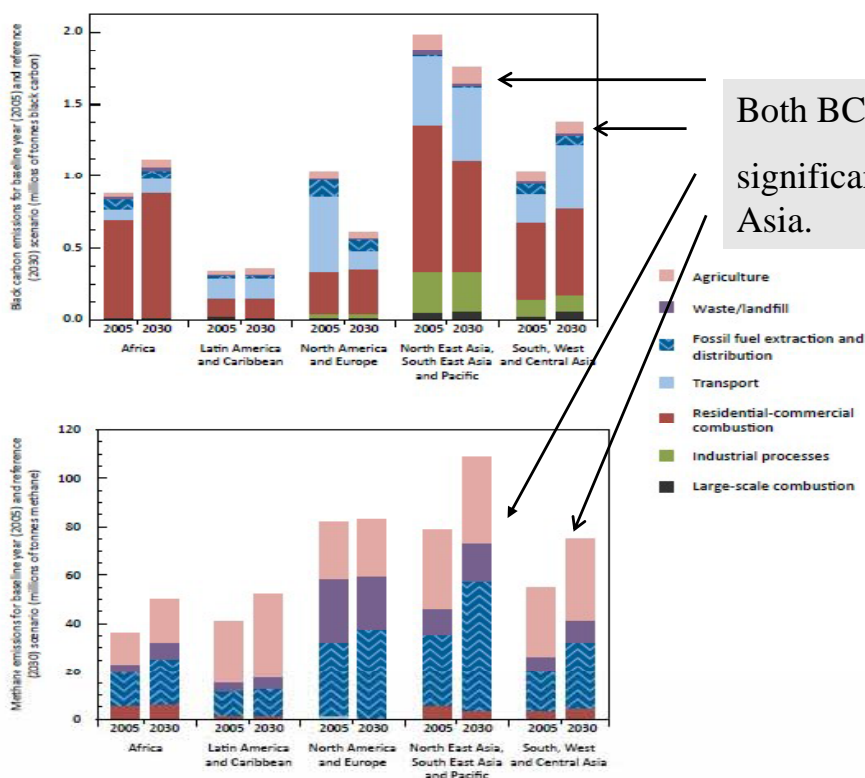
南アジアの料理用コンロからの大気汚染対策

Country	Lead organization	Link
India	Appropriate Rural Technologies Institute	http://www.arti-india.org/index.php
India	Gram Vikas	http://www.gramvikas.org/chullah.php
India	SKG Sangha	http://www.skgsangha.org/activ_eco.html
India	Swayam Shikshan Proyog	http://www.sspindia.org/SSP-WhatWeDo2.html
Nepal	Centre for Rural Technology	http://www.crtnepal.org/?option = projects&pjtid = 3033333637
Nepal	Child Welfare Scheme	http://www.pciaonline.org/content/breathing-spaces-asha-stoves
Nepal	Practical Action-Nepal	http://www.pciaonline.org/practical-action-nepal
Sri Lanka	Integrated Development Association	http://www.ideasrilanka.org/our%20initiatives.html
Sri Lanka	Practical Action – Sri Lanka	http://practicalaction.org/wherewework_srilanka

BC reduction from open burning AECEN
Asian Environmental Compliance and Enforcement Network

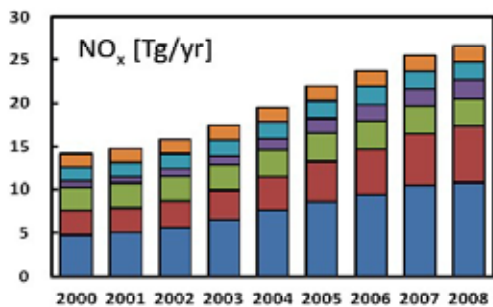
Global BC and CH4 emissions by sector

世界のBCとメタンのセクター別排出量

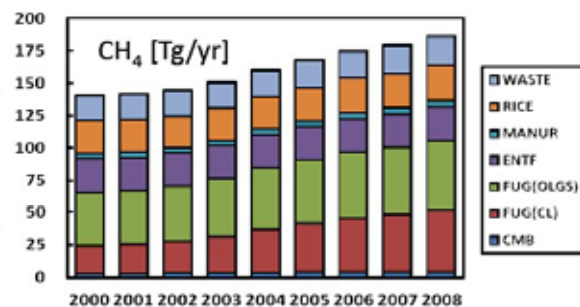
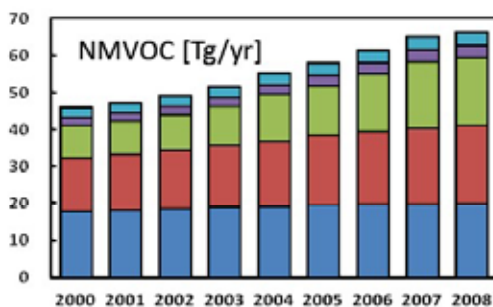


Air pollutants emission trends in Asia

アジアのSLCF排出量の推移



Nox and NMVOC are major causes of tropospheric ozone in Asia.

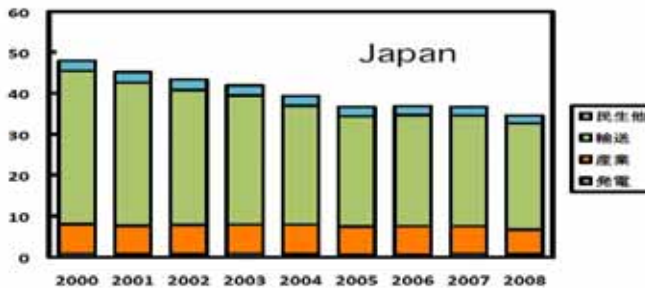
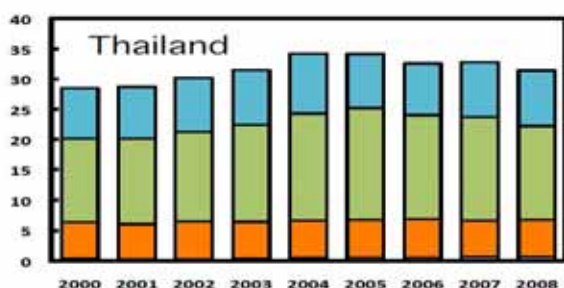
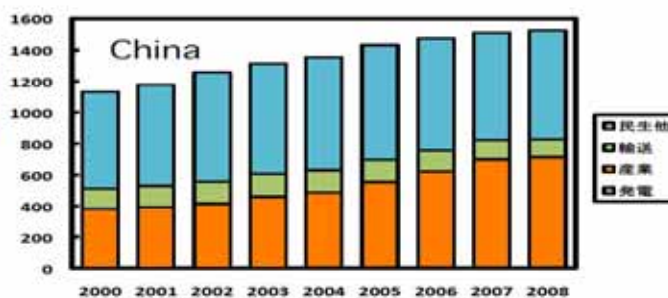


Different emission patterns in different Asian countries

アジア諸国におけるBC排出パターンの違い

Emissions of BC (200-2008年)

Unit: 1000 t / yr



Existing air pollution networks in Asia

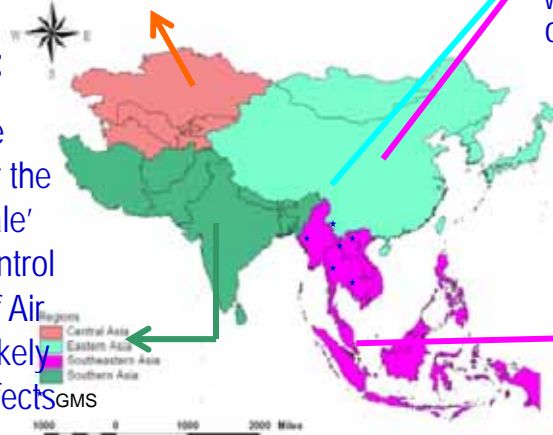
既存の大気汚染に関するアジアのネットワーク

Central Asia

5 Central Asia countries formulated the Framework Convention on Preservation of Environment for Sustainable Development of Central Asia

South Asia:

8 countries are cooperating under the framework of Male' Declaration on Control and Prevention of Air Pollution and Its likely Transboundary Effects for South Asia



East Asia:

3 countries, which includes Northeast and Southeast Asia, working under the framework of East Asia Network on Acid Deposition

Southeast Asia:

10 ASEAN member countries are working under the framework of ASEAN Haze Agreement

UNEP established the Joint Forum for Asia and the Pacific to promote exchange of experiences and cooperation among sub-regional initiatives

Recommendations 勧告

- ◆ SLCF co-benefits receive growing attention.
- ◆ New initiatives such as CCAC have been emerging.
- ◆ Promotion of co-benefits approach should link with various existing air pollution control initiatives. Model SLCF projects may be developed and implemented.
- ◆ Mechanisms to promote SLCF co-benefits, esp. funding mechanisms, are yet to be developed.
- ◆ Regional efforts may be more effective and efficient if they are supported by global initiatives, such as information sharing mechanisms, funding mechanisms for SLCF.
- ◆ UNEP may take initiatives for global actions on co-benefits, esp. on SLCF, taking into account various regional/sub-regional initiatives.

Issue on Developmental Equity

開発に関する公平性の問題について

Observation by a former climate negotiator
過去に気候変動交渉に参加した者のオブザーベーション

Two Rio Principles to be recognized

認識されるべき2つのリオ原則

- ◆ Principle 2: [applied for transboundary pollutions since Stockholm]
[States have](#), in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and [the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction](#).
- ◆ Principle 7:
States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Observation by a former climate negotiator 過去の気候変動交渉従事者によるオブザベーション

We recognize, for more than a decade, that:

- ◆ Scientists and engineers always send a message that there are technologies to well address climate change problems;
 - ◆ Nobody disagree to take climate actions. The problem is the burden sharing among the countries.
 - ◆ CBDR is a compromise, which may not solve the climate problem.
 - ◆ We need a new principle to guide the climate negotiations.
-
- ◆ How we should interpret the phrase “in accordance with their common but differentiated responsibilities and respective capabilities“