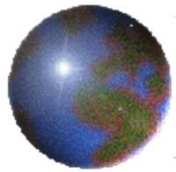


International Workshop on Air Quality in Asia- Impacts of Land Cover/Land Use Changes on Greenhouse Gases/Short Lived Climate Pollutants and Aerosols

Meeting Objectives

Krishna Prasad Vadrevu
University of Maryland College Park
USA

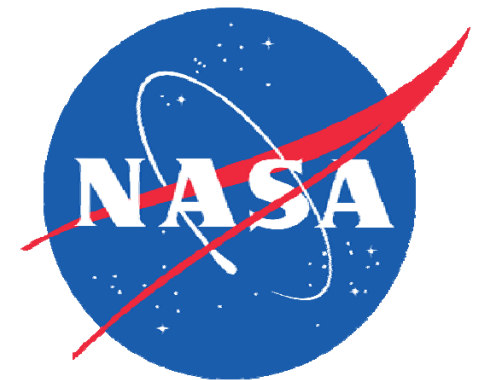


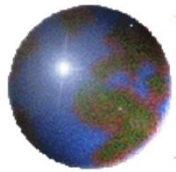


Thanks to Meeting Sponsors



global change SysTem for Analysis, Research & Training





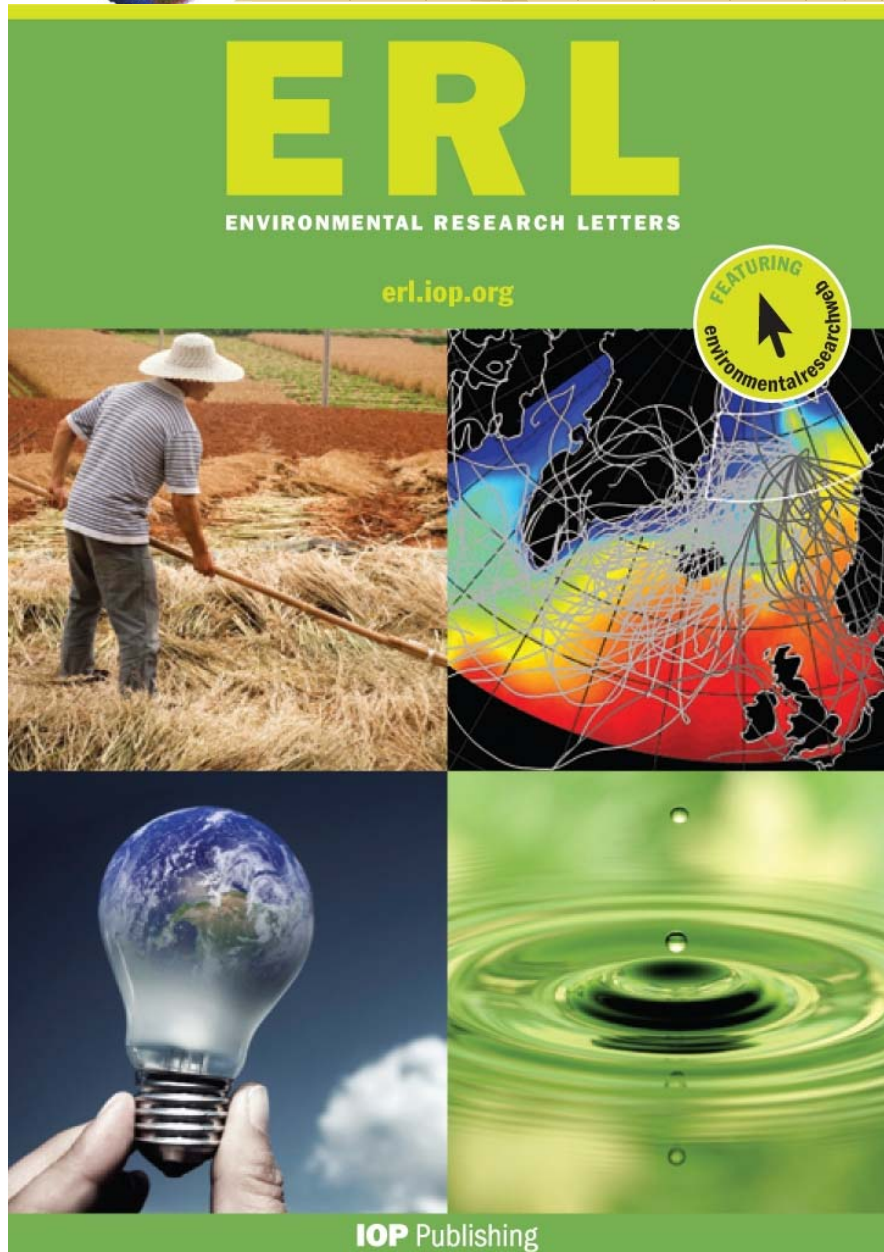
***GHG and Remote Sensing Meeting, June, 2014
Hanoi, Vietnam***



110 participants from 12 different countries in Asia



Previous Meeting Outputs



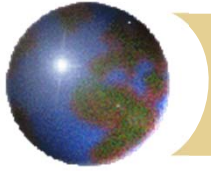
Journal Impact Factor: 4.0

All participants were invited to submit articles;

-Each article underwent a regular peer review process of the journal.

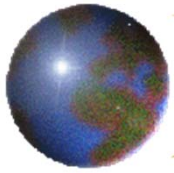
Published:

July, 2015; few pending final papers.

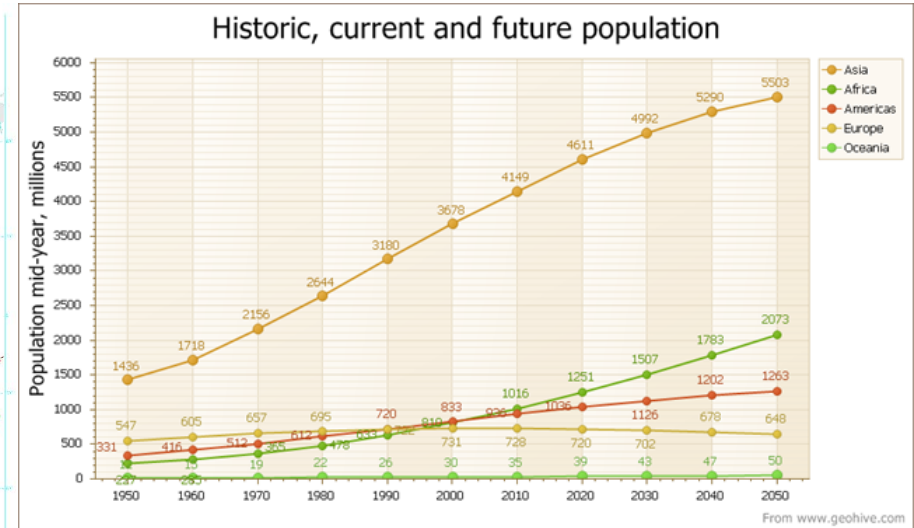
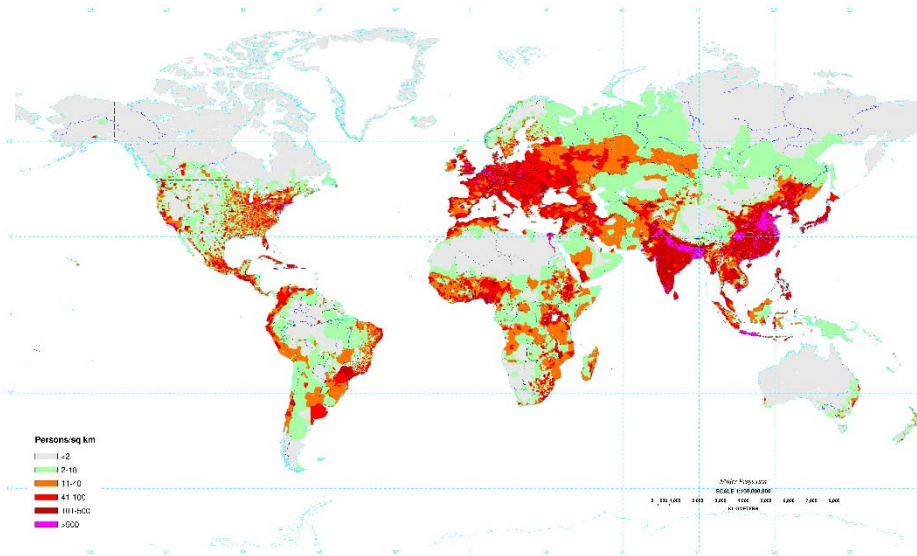


Background to the Meeting

- ✚ In Asia, there is an increasing concern that Land Cover/Land Use Changes have been increasing due to population growth, urbanization, deforestation, agricultural intensification, etc.
- ✚ Greenhouse gas (GHG) emissions and short lived climate pollutants (SLCP) from the Asian region have been increasing rapidly.



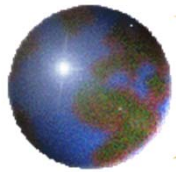
Population and Pollution



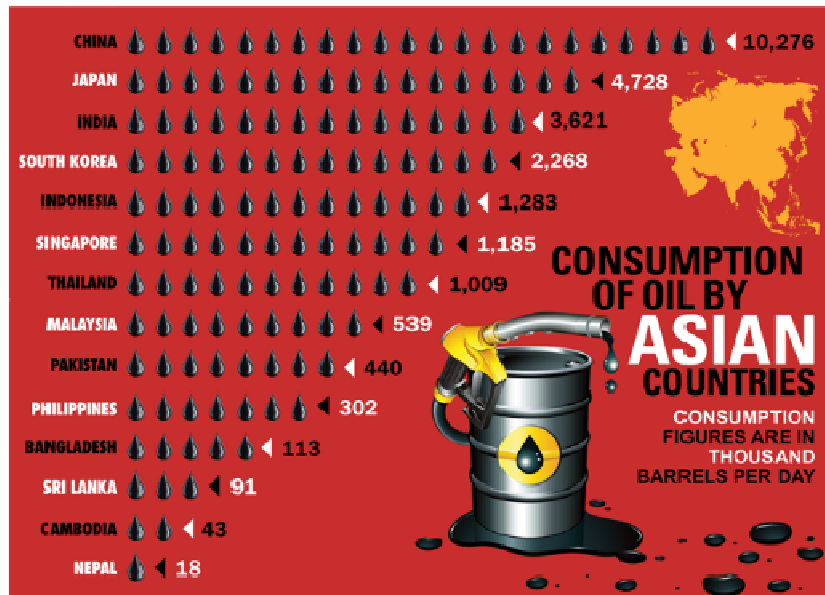
Nearly 60% of worlds population is in Asia (4.5 billion people)

Nearly 2/3rd of world population growth is in Asia

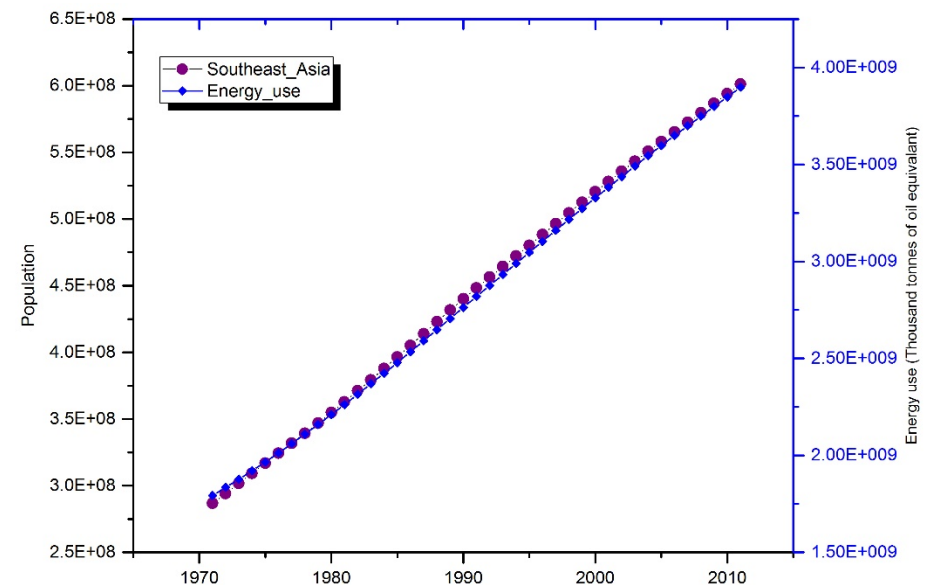
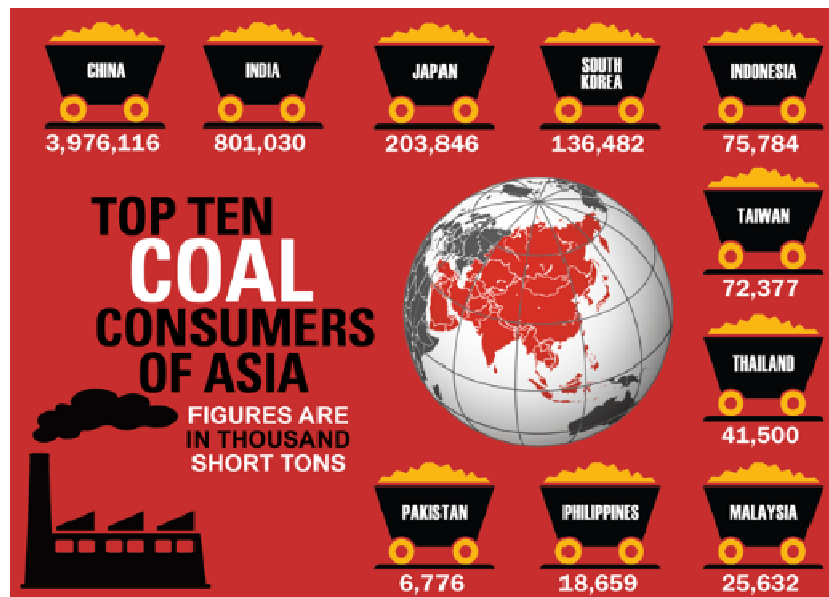
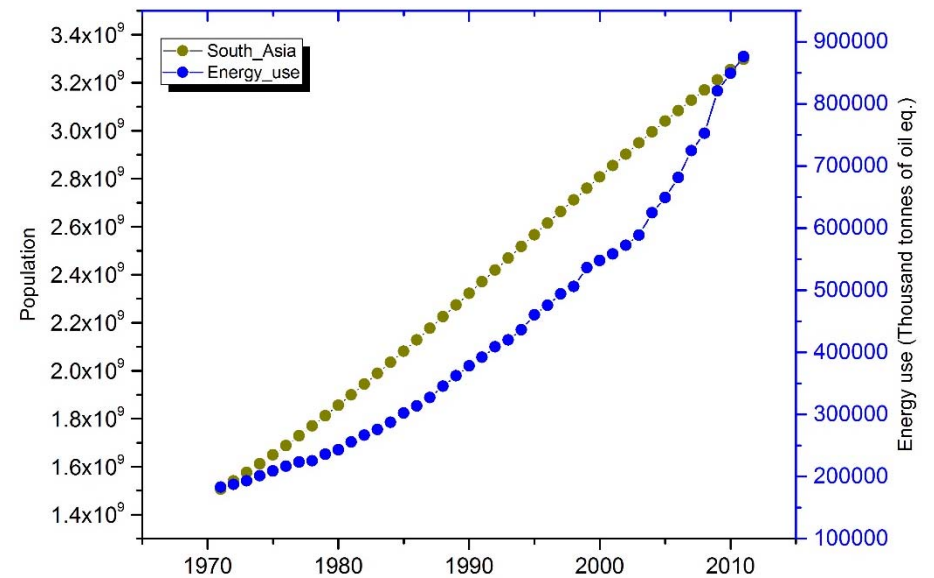
Nearly 50 million people are being added every year!

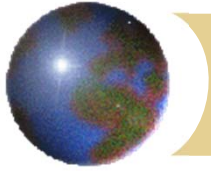


Population and Energy Use



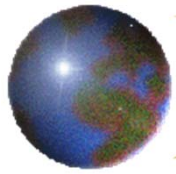
(SOURCE: US ENERGY INFORMATION ADMINISTRATION, 2012)





Background to the Meeting

- Six of the world's most polluted cities are in Asia and region generates a third of the world's CO₂ emissions.
- CO₂ emissions are responsible for 55-60% of anthropogenic radiative forcing.
- SLCP's include black carbon, tropospheric ozone, methane, and hydrofluorocarbons (HFCs). These pollutants have atmospheric lifetimes of only days to a decade and a half.
- CO₂ mitigation must be combined with fast and aggressive reductions of the pollutants causing the other 40-45% of forcing which are short-lived climate pollutants (SLCP's).

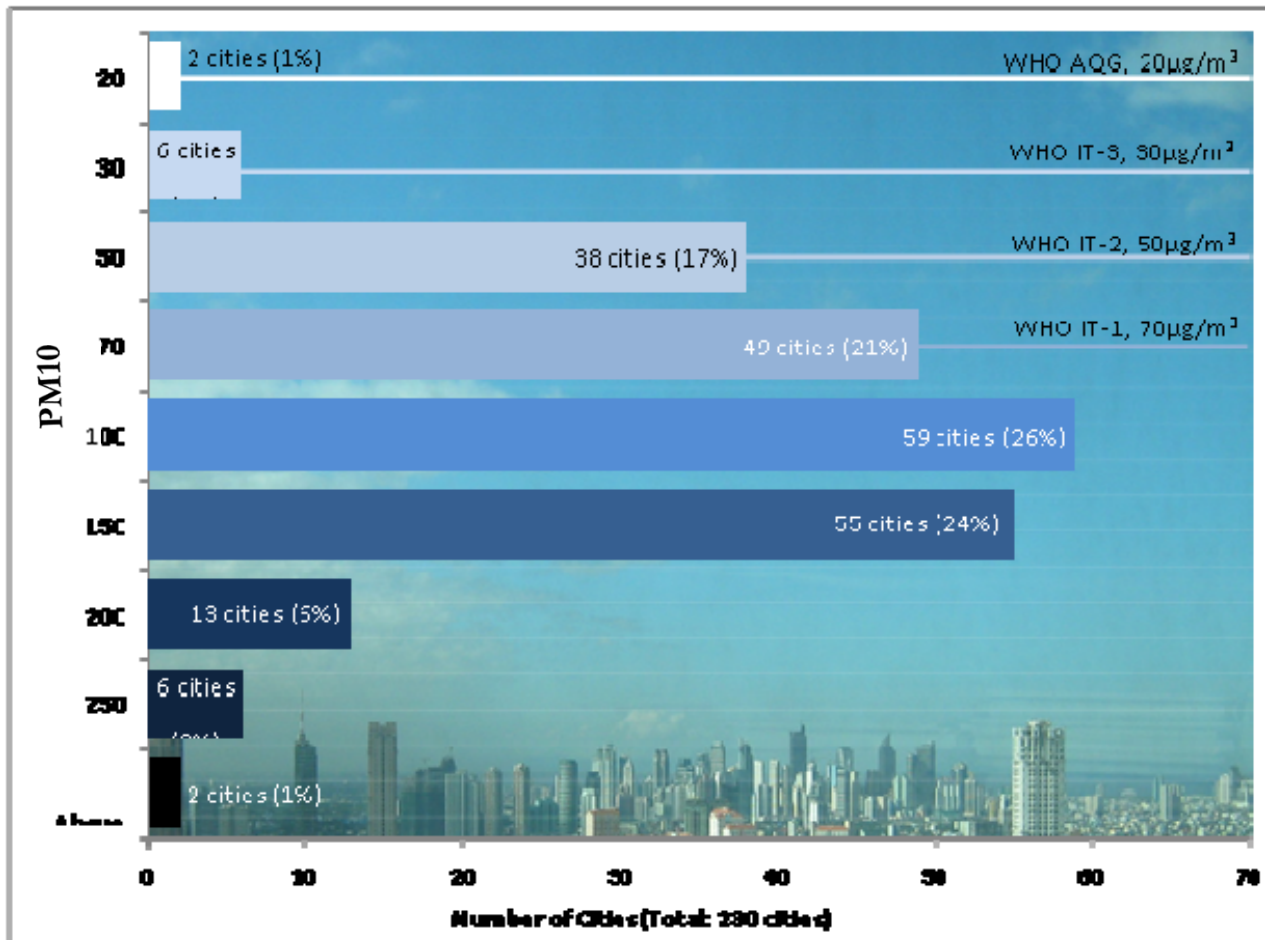


Pollutant limits exceed WHO standards

PM2.5 - 10 micrograms/meter cube (annual mean)
- 25 micrograms/meter cube (daily mean)

PM10 – 20 micrograms/meter cube (annual mean)
- 50 micrograms/meter cube (daily mean)

• With high levels of air pollution in Asian cities ($>100 \mu\text{g}/\text{m}^3$), this could mean a substantial public health impact



Source: Clean Air Asia, 2010

New Delhi, India



Beijing, China

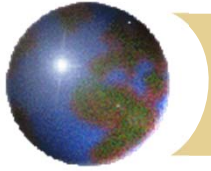


Jakarta, Indonesia

Japanese in India warned of air pollution

Posted by weekly on February 28, 2013 in GREEN | 0 Comment





In addition...

- ✚ Repeated trans-boundary pollution events have raised policy questions and debate as to sustainable solutions;
- ✚ Monitoring systems available but not well understood resulting in mixed reception to their findings;
- ✚ Crisis management leads to a immediate reaction but later forgotten;
- ✚ Effective long term solutions are needed.

Fires and smoke in Indonesia (6/19/2013)

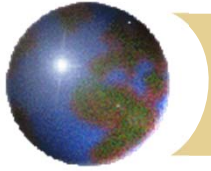
Vadrevu et al., 2014, Environmental Pollution, (195) 245-256.

Fires, Riau province, Indonesia, June 18, 2013



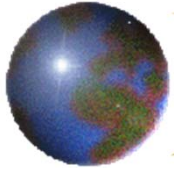
Haze in Singapore, and Malaysia, June 20, 2013





Key points

- ✚ Emission sectors/sources are well known (urban, industries, biomass burning, livestock, etc.), however emissions in general and their impacts are poorly quantified;
- ✚ Various measurement systems are in place
 - ▣ Satellite measurement of sources (e.g. Fire)
 - ▣ Satellite measurements of land cover/use change
 - ▣ Satellite measurements of products (e.g. Aerosols and Trace Gases)
 - ▣ Airborne measurement systems
 - ▣ Ground based measurement of Aerosols and Trace gases
- ✚ But few of the these are truly operational
- ✚ Relatively little integration and coordination of these systems

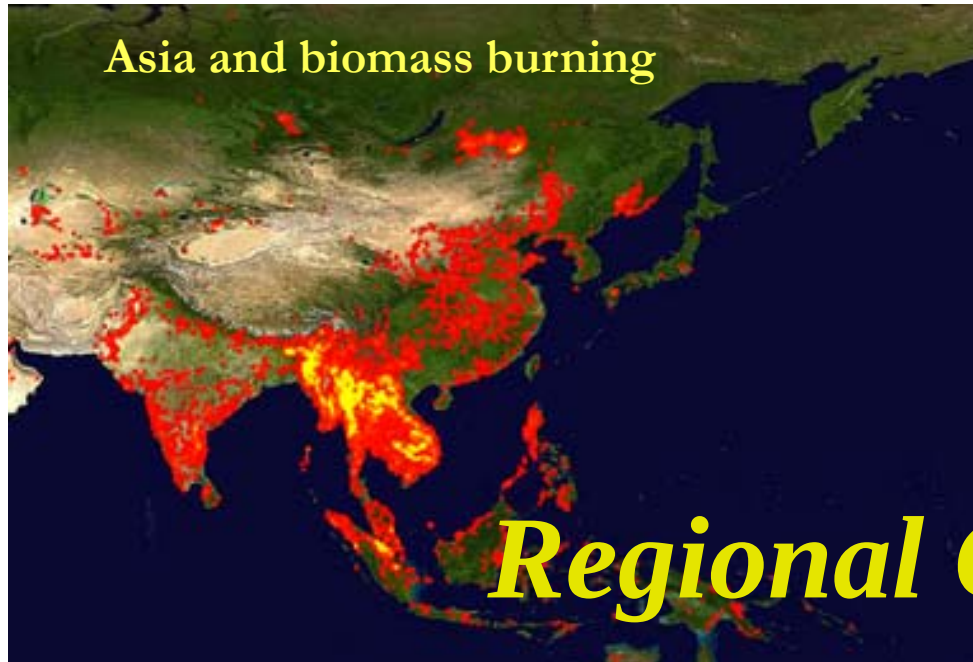


Environmental laws already exist in several countries

#	Title	Countries
1	Act Providing for a Comprehensive Air Pollution Control Policy and for other Purposes	Philippines
2	Approving the Plan for Thoroughly Handling Establishments Which Cause Serious Environmental Pollution	Vietnam
3	Approving the Planning on Development of Vietnam's Automobile Industry till 2010, with a Vision to 2020	Vietnam
4	Biofuels Act of 2006 (RA 9367)	Philippines
5	DECREE No. 23/2004/ND-CP of January 13, 2004 prescribing the use duration of trucks and passenger cars	Vietnam
6	Executive Order No. 774, Reorganizing the Presidential Task Force on Climate Change	Philippines
7	Implementing Rules and Regulations for RA 8749 (CLEAN AIR ACT) (DAO 2000-81)	Philippines
8	Law on Environmental Protection 2005	Vietnam
9	Motor Vehicle User's Charge (RA 8794)	Philippines
10	National Policy on Sustainable Development	Sri Lanka
11	National Road Transport Policy	India
12	Nepal Environmental Policy and Action Plan (NEPAP)	Nepal
13	Philippine Clean Air Act of 1999 (RA 8749)	Philippines
14	Reorganizing the Presidential Task Force on Climate Change (Executive Order No. 774)	Philippines
15	Revised Emission Standards for Motor Vehicles Equipped with Compression-ignition and Spark-Ignition Engines (DAO 2007-27)	Philippines
16	Revising the Documentary Requirements for the Application of Certificate of Conformity for New Motor Vehicles (DAO 2008-09)	Philippines
17	Task Force on Integrated Transport Policy	India
18	Three Year Interim Plan (August 2007-October 2009), Unofficial Translation	Nepal

Implementation seems the biggest challenge!

Asia and biomass burning

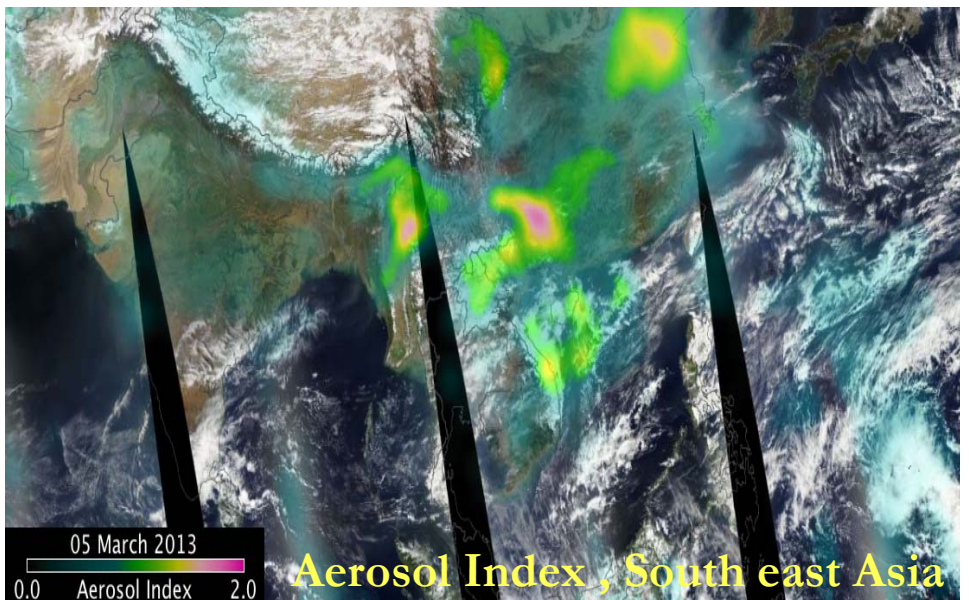


Northeast India and Myanmar Haze

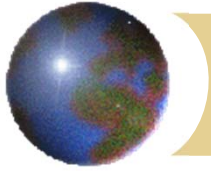


Regional Context

Riau Province, Indonesia



Aerosol Index, South east Asia



Regional Context

- ✚ Biomass burning, and greenhouse gas emissions are regional issues
- ✚ Regional solutions are needed to address transboundary issues
- ✚ Regionally relevant and applicable measurement systems are needed
- ✚ We see benefit in regional cooperation amongst scientists – mechanisms for exchanging experience and ideas are needed

GOFC-GOLD

Global Observation of Forest and Land Cover Dynamics

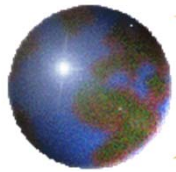


*Providing the International
Coordination needed for
Global Observation
of Forest and Land
Cover Dynamics*

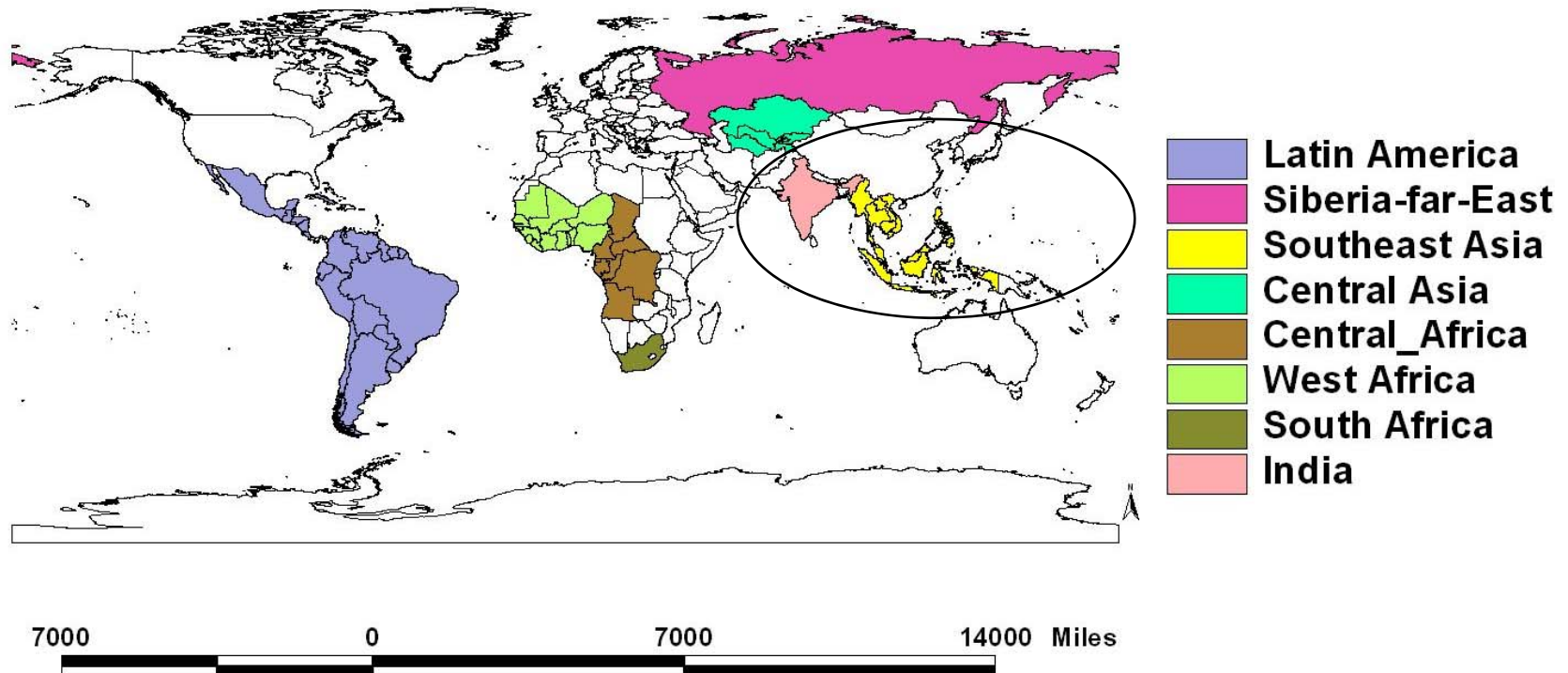


GOFC-GOLD Overview



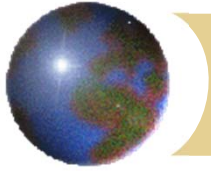


Regional Networks and Coordinators



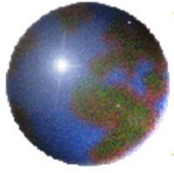
The principal role of GOFC/GOLD is to act as a coordinating mechanism for national and regional activities. To achieve its goals GOFC/GOLD has developed a number of regional networks across the world.

Regional networks cater the regional users needs and foster lateral transfer of technology and methods within and between regions relating to Land and Fire activities.



Meeting Focus

- ✿ Review regional and national science initiatives relating to LCLUC activities and GHG emission inventories.
- ✿ Review the causes and impacts of LCLUC in the Asian region;
- ✿ Review GHG and SLCP emission estimates from different sources in the Asian region;
- ✿ Biomass burning – mapping and monitoring using remote sensing, causative factors and impacts;
- ✿ Remote sensing Aerosols and radiation – measurements, monitoring and impacts.
- ✿ Strengthen the GOFC SEARRIN activities in the region.



Organized in Six Sessions

Day-1

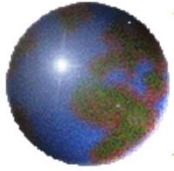
- ✿ **Session I. Regional and national science initiatives**
- ✿ **Session II. LCLUC, forests and GHG emissions**

Day-2

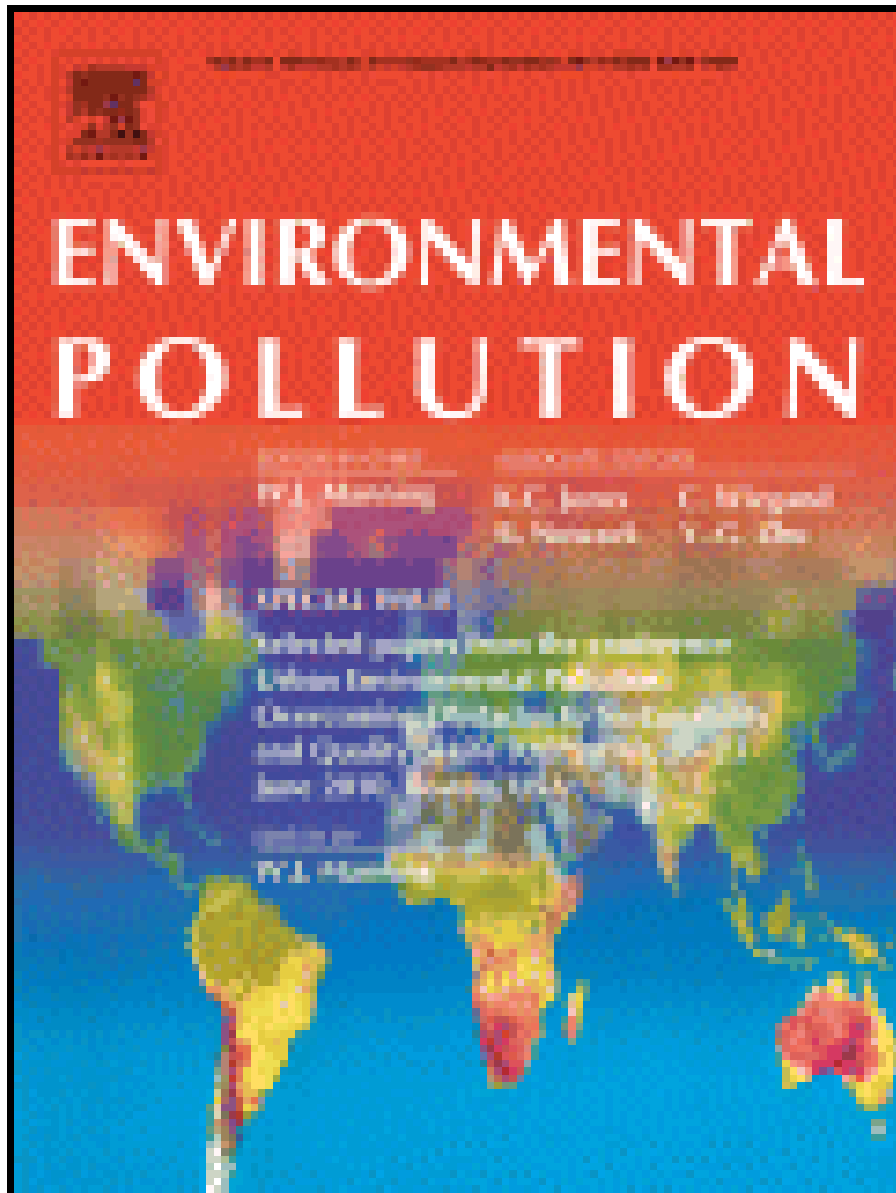
- ✿ **Session III. Inventories, monitoring and modeling of GHG's and air pollution**
- ✿ **Session IV. Vegetation fires and biomass burning emissions**

Day-3

- ✿ **Session IV. Vegetation fires and biomass burning emissions**
- ✿ **Session V. Aerosols and Radiation**
- ✿ **Session VI. South East Asia Regional Information Network**



Previous Meeting Outputs



Journal Impact Factor: 3.73
5-year impact: 4.09

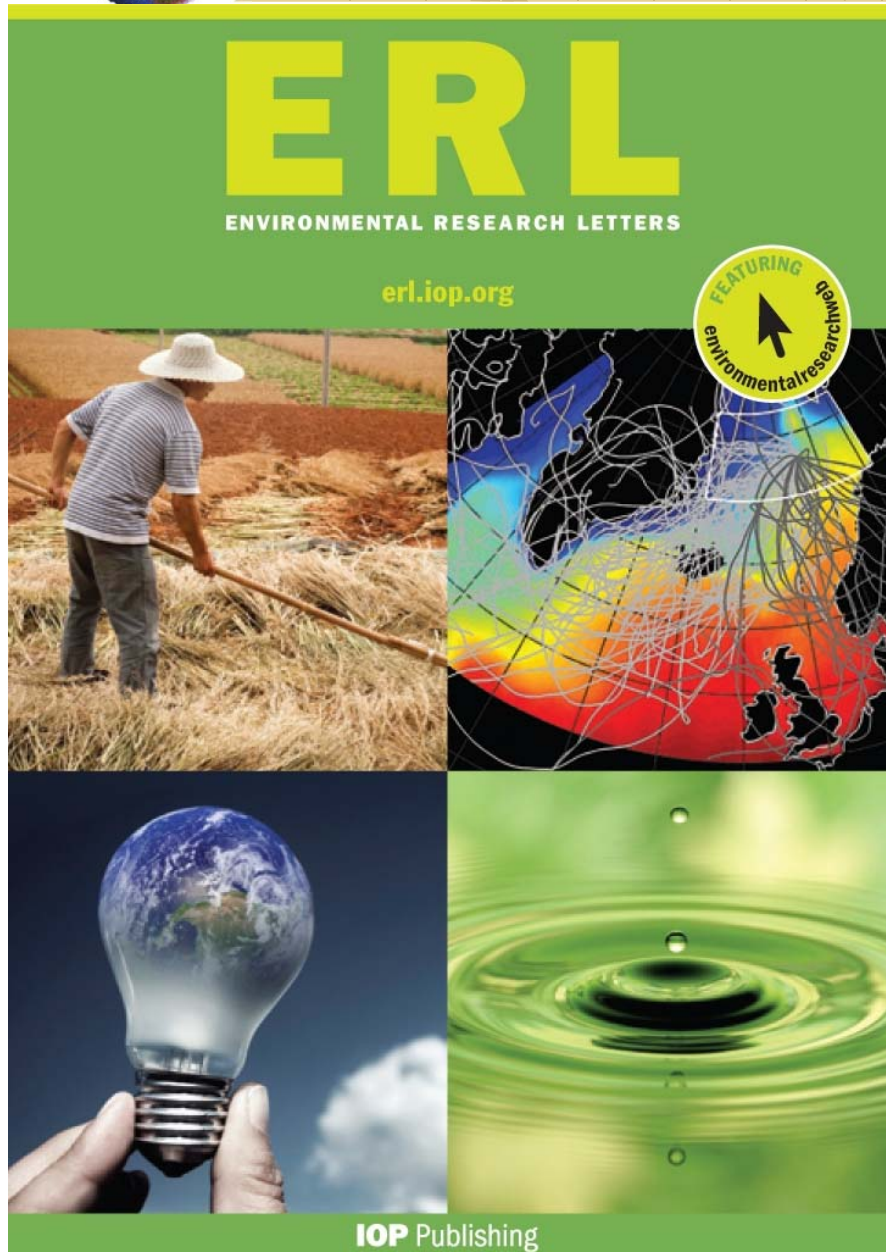
**Selected papers are
published after peer review;**

Timeline:

Published: July, 2014



Previous Meeting Outputs



Journal Impact Factor: 4.0

All participants were invited to submit articles;

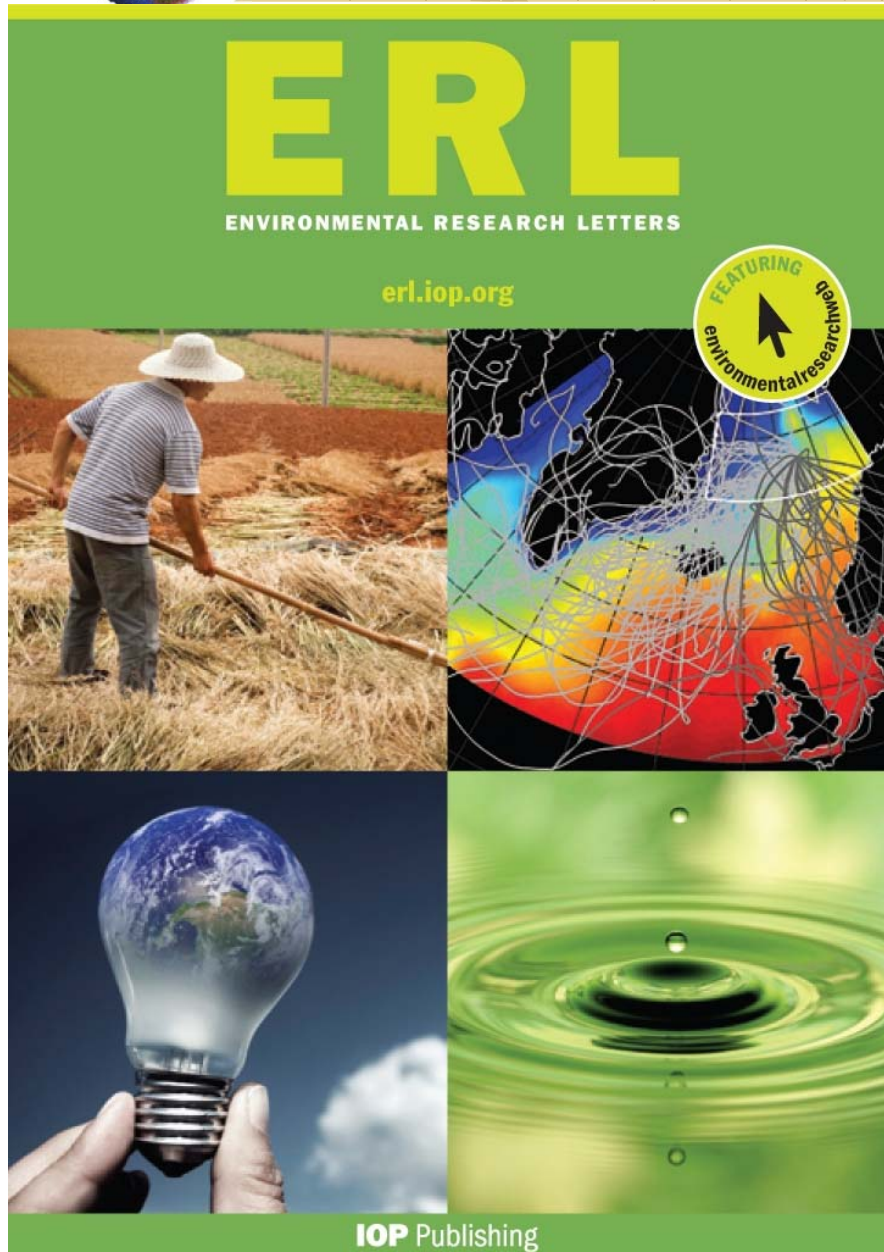
-Each article underwent a regular peer review process of the journal.

Published:

July, 2015; few pending final papers.



This year outputs – ERL Special Issue-II



Journal Impact Factor: 4.0

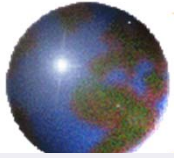
All are invited to submit articles – no restrictions;

-Each article will undergo a regular peer review process of the journal.

Eds: Dr.Krishna Vadrevu (UMd) and Dr.Toshimasa Ohara (NIES)

Deadline:

November 15th (tentative)



Springer

springer.com

This year outputs – Book Articles (too)

Land – Atmospheric Interactions in Asia

Eds:

Krishna Vadrevu (UMd)
Toshimasa Ohara (NIES)
Chris Justice (UMd)

Deadline:

**December 31st, 2015
(tentative)**

Land-Atmospheric Interactions in Asia

Book Series: Springer Remote Sensing/Photogrammetry

Editors: Krishna Prasad Vadrevu, Toshimasa Ohara, Chris Justice

Forthcoming, Summer 2016

- Maximizes reader insights into the quantification of land cover/land use changes (LCLUC) and greenhouse gas emissions in Asia.
- Focuses on large spatial scales integrating satellite remote sensing and ground based approaches.
- Broadens understanding on integrated approaches combining top-down and bottom up methodologies including modeling for characterizing LCLUC and emissions.
- Explores the causative factors and impacts of LCLUC and emissions due to population growth, industrial activities and energy demand in Asia.

In Asia, high population growth together with rapid economic development are causing immense pressure to convert land from natural and agricultural areas to residential and urban uses with significant impact on emissions and ecosystem services. This edited volume sheds new light on the causative factors and impacts of LCLUC on the greenhouse gas (GHG) and aerosols in Asia. The volume will also focus on the use of remote sensing, geospatial technologies, and integrated approaches to characterize LCLUC and emissions.

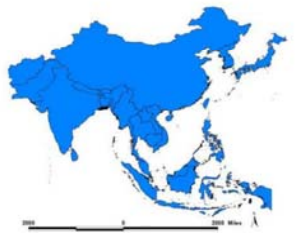
Articles are invited from international researchers working on remote sensing of LCLUC, fires, GHG emission inventories, aerosols, and land-atmospheric interactions in Asia.

Submission Deadline: December 31st, 2015
Email: krisvvp@umd.edu

Dr. Krishna Prasad Vadrevu (krisvvp@umd.edu), Associate Research Professor, Department of Geographical Sciences, University of Maryland, College Park, USA.

Dr. Toshimasa Ohara (tohara@nies.go.jp), Researcher, National Institute of Environmental Studies (NIES), Japan.

Dr. Chris Justice (cjustice@umd.edu), Head, Department of Geographical Sciences, University of Maryland, College Park, USA.





Welcome to Bogor