

Addressing SLCPs in the Himalaya: ICIMOD's Atmosphere Initiative



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Japan Side Event on SLCPs

National Stadium

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**8 member
intergovernmental
organization**

- Afghanistan
- Bangladesh
- Bhutan
- China
- India
- Myanmar
- Nepal
- Pakistan

ICIMOD's Regional Programme 4 Cryosphere and Atmosphere

ICIMOD

- Cryosphere Initiative
- Atmosphere Initiative

The team:

Arnico Panday (coordinator)

Vanisa Surapipith

Bidya Banmali Pradhan

Renate Fleiner

Sandro Blumer

Linda Maharjan

Liza Maharjan

Maheswar Rupakheti (visiting scientist)

+ 2 new hires

- Established in January 2013

1. Improve scientific knowledge about emissions sources, atmospheric processes, atmospheric change and impacts in the region.
2. Identify, pilot, and disseminate effective mitigation options.
3. Build capacity in the region.
4. Facilitate trans-boundary collaboration and sharing.
5. Contribute to national, regional, and global policy.





What is black carbon's contributions to melting Himalayan snow and ice?

1973



Photo: ICIMOD archive

2011



Photo: A. Panday

What fraction of the melting is due to:

- Greenhouse gas induced warming
- Black carbon warming of the air
- Black carbon deposition onto white surfaces?
- Changes in precipitation due to aerosol effects?

- ⇒ High altitude observatory (Langtang, Nepal)
- ⇒ Atmospheric modeling
- ⇒ Airborne measurements over snow and ice (in collaboration with NASA)

What is the contribution of the Indo-Gangetic Plains to pollution in Himalayan valleys?



- ⇒ Ridge-top observatories on top of foothills in Bhutan and Nepal
- ⇒ Atmospheric modeling

Are high altitude forest fires a big source of black carbon reaching the glaciers?



- ⇒ High altitude observatory (Langtang, Nepal)
- ⇒ Atmospheric modeling
- ⇒ Airborne measurements over snow and ice (in collaboration with NASA)

Haze in the cross-Himalayan Kali Gandaki Valley

- 
- ⇒ Observatory in Jomsom, Nepal (in collaboration with University of Virginia)
 - ⇒ Atmospheric modeling

Why has there been a big increase in winter fog covering the northern Indo-Gangetic Plains?

Airplane view on 29 Dec 2012 →

Satellite view on 29 Dec 2012 ↓



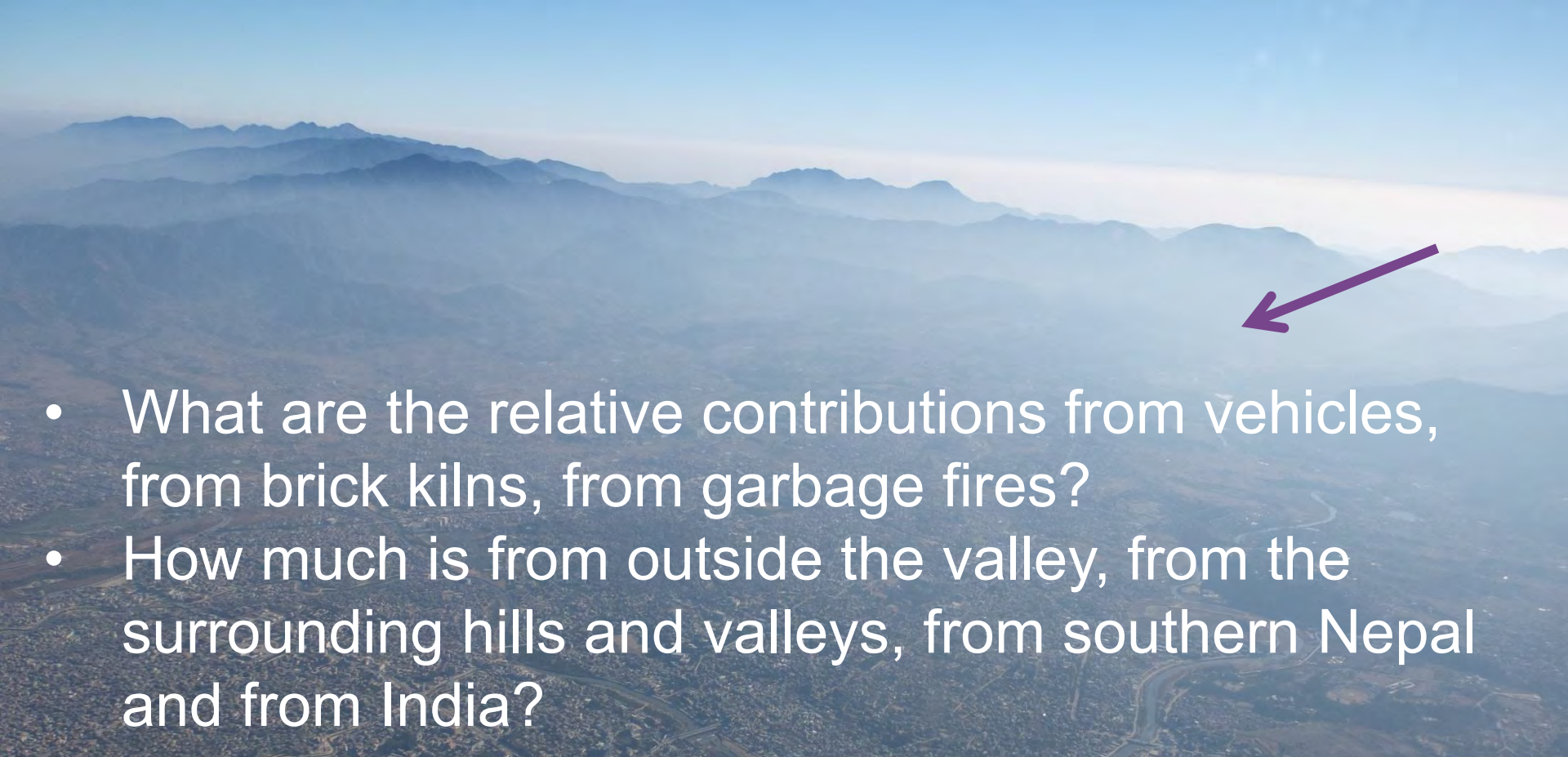
- ⇒ Atmospheric modeling
- ⇒ (Upcoming) winter field campaign
- ⇒ Observatory in Lumbini, Nepal

Are increases in black carbon and other aerosols changing the monsoon?



- ⇒ Ridge-top observatories on top of foothills in Bhutan and Nepal
- ⇒ Atmospheric modeling

What fraction of Kathmandu's air pollution is local?

- 
- What are the relative contributions from vehicles, from brick kilns, from garbage fires?
 - How much is from outside the valley, from the surrounding hills and valleys, from southern Nepal and from India?

- ⇒ “Sustainable Atmosphere for the Kathmandu Valley” (SusKat-ABC) field campaign (Jan-June 2013) and follow-up activities.
- ⇒ Atmospheric modeling (in collaboration with multiple groups)
- ⇒ Establishment of permanent air pollution monitoring station.

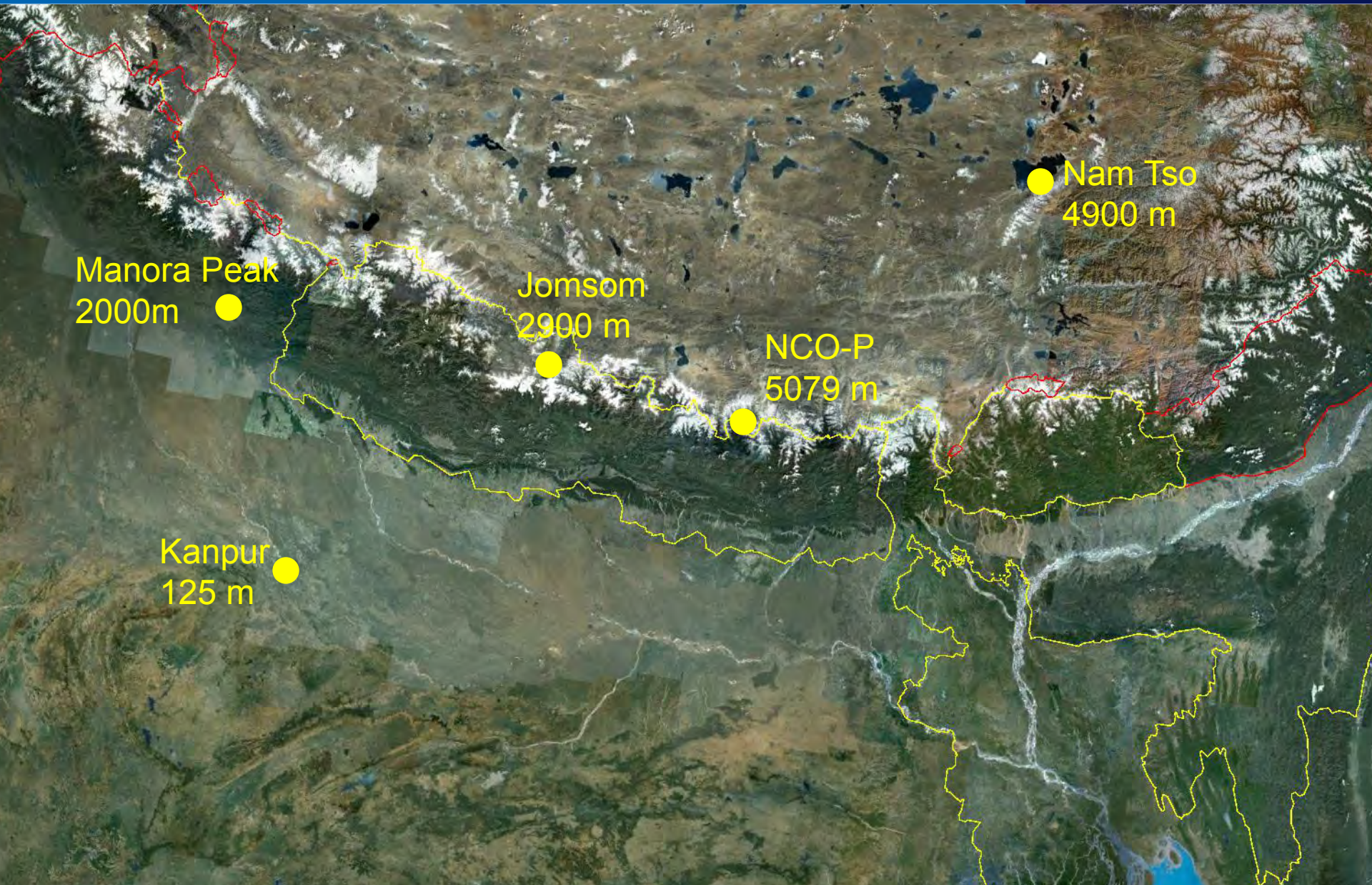
To what extent does the time of day of fires matter?



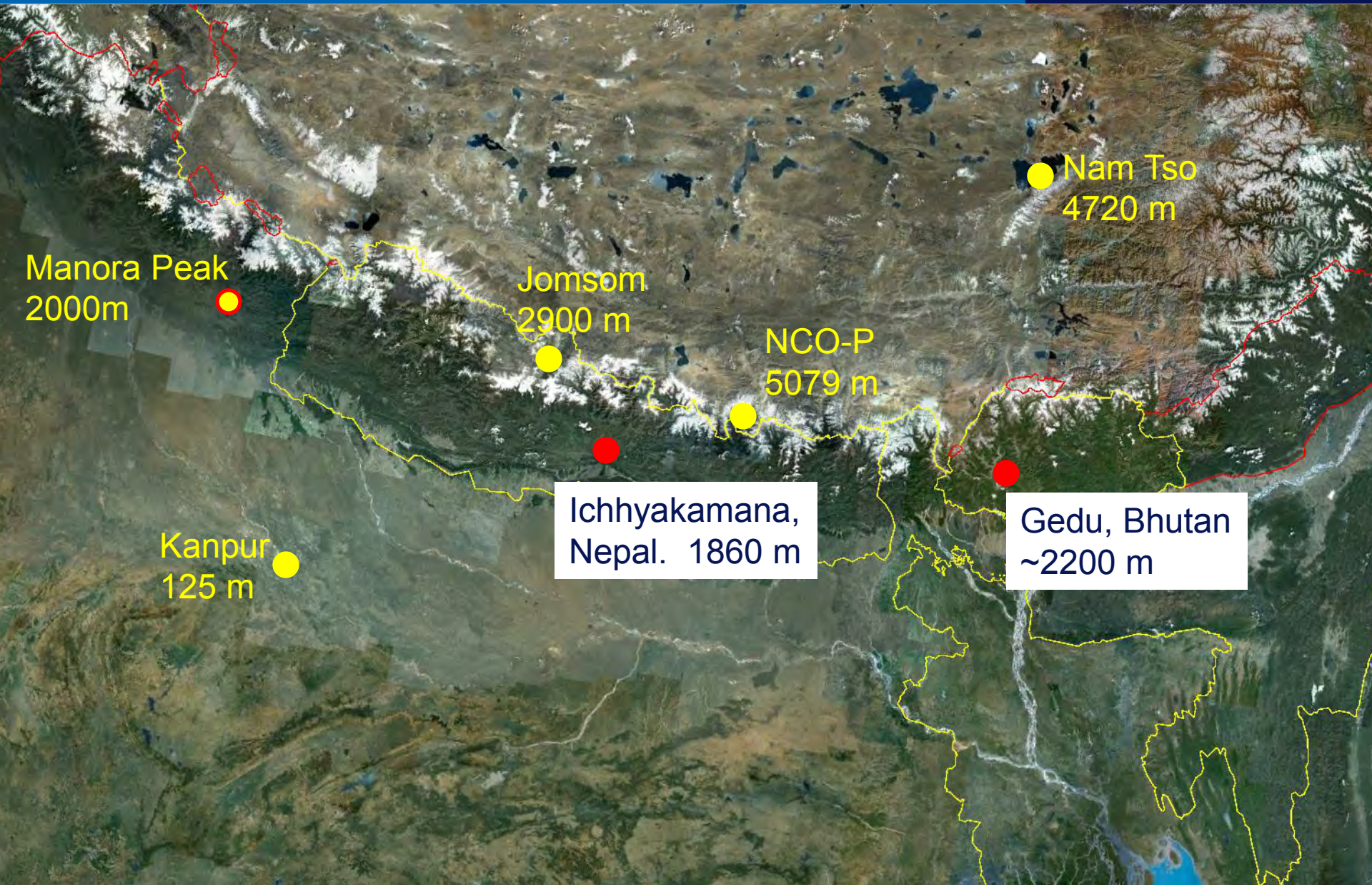
Garbage fires at dusk

- ⇒ Measurement of emissions sources (proposed collaboration with U. Montana)
- ⇒ Atmospheric modeling

Planned ICIMOD-initiated atmospheric observatories



The upcoming two ridge-top observatories



BHUTAN SITE

Gedu pass

Proposed site

