The burden of biomass burning on air quality in Asia and potential benefits from policy interventions

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Haze and Biomass Burning in Asia,
4-5 October, 2018, ITB, Bandung, Indonesia
Air pollution is a major public health crisis

- Air pollution causes annually 5.5-7 million cases of premature deaths, about half from ambient pollution
- World Health Assembly passed resolution on air pollution in 2015
Biomass burning image
PM2.5 concentrations in 2015, 2030 baseline, and 2030 mitigation potential

More than half of the population exposure improvement in this region could be achieved by measures addressing biomass combustion and fires.

Source: IIASA, GAINS
The current efforts will not be sufficient for reaching the AQ standards for 50% of Asian population.

Source: IIASA, GAINS
Summary

AIR POLLUTION IN ASIA AND THE PACIFIC: SCIENCE-BASED SOLUTIONS
Benefits of the Top 25 Measures on population exposure to PM2.5, emissions for climate forcers and other SDGs

Source: UNEP/CCAC, IIASA-GAINS model

<table>
<thead>
<tr>
<th></th>
<th>Climate forcers</th>
<th>SDG benefits</th>
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</thead>
<tbody>
<tr>
<td>Post-2015 legislation</td>
<td>+16%</td>
<td>-24%</td>
</tr>
<tr>
<td>relative to 2015</td>
<td>+17%</td>
<td></td>
</tr>
<tr>
<td>Conventional controls</td>
<td>0%</td>
<td>-8%</td>
</tr>
<tr>
<td>relative to 2030 baseline</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Next stage measures</td>
<td>0%</td>
<td>-56%</td>
</tr>
<tr>
<td>relative to 2030 baseline</td>
<td>-29%</td>
<td></td>
</tr>
<tr>
<td>Development measures</td>
<td>-19%</td>
<td>-72%</td>
</tr>
<tr>
<td>relative to 2030 baseline</td>
<td>-44%</td>
<td></td>
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</tbody>
</table>
Changes in pop weighted exposure due to packages of policies/measures

![Graph showing changes in PM2.5 exposure in different regions (East Asia, South Asia, Southeast Asia, High income, Pacific Asia) over years 2015 and 2030. The graph illustrates the impact of measures addressing biomass combustion and open fires, compliance with recent legislation, and remaining anthropogenic sources.]
The SDG portfolio could achieve the air quality standards for 90% of the Asian people.

Source: UNEP/CCAC, IIASA-GAINS model
Southeast Asia

Reduction of population exposure to PM2.5 in 2030 (µg/m³)

More than 50% of the potential exposure reduction linked to measures addressing biomass burning

Source: UNEP/CCAC, IIASA-GAINS model
South Asia

Reduction of population exposure to PM2.5 in 2030 (µg/m³)

- Already implemented measures
- Recent legislation
- Further potential

More than 50% of the potential exposure reduction linked to measures addressing biomass burning

Source: UNEP/CCAC, IIASA-GAINS model
Dr. Dhaliwal from PAMETI reports results from CCAC-funded project in Punjab:

90% of farmers did **NOT** burn wheat residues in April-May 2018

When 75% of farmers **DID** burn wheat residues in April-May 2017

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The farmers in the adopted villages of Bhoewali, Rajian and Qiampur of Amritsar district under the PAMETI-UNEP Project are being regularly visited by the project staff and informed about the harmful effects of stubble burning. The project team comprising of project fellow, Mr. Navjot S. Samra and demonstrators, Mr. Jagdeep Singh and Mr. Gurinder Singh have also involved the print as well as electronic media in popularizing their extension activities. Also, the project staff has actively involved Department of Agriculture, Krishi Vigyan Kendra (KVK), Amritsar of PAU, Ludhiana and local farmers in carrying out the activities of the project. It is in this regard that the news about the events in the newspapers, both in English and vernacular language, are being covered regularly. The snapshots are as follows:
Agroecology means **no** burn, No till.

Farmers need equipment, like happy seeders.

Free/affordable financial tools.

And solutions to impacts by combines. 🔥

Alternatives to that also yields.

*Improve air quality.*
*Improve livelihoods.*

Prepping field to burn in Lumbini Region, Nepal after combine harvest, November 2016. (pic credit: ICCI)
Key selected findings

• More than 50% of Asian population face air quality exceeding the even the highest WHO standards

• We estimate that over 20% of premature deaths in Asia, and over 30% in South and Southeast Asia, are due to biomass combustion and open fires

• Effective enforcement of recent legislation will not be sufficient to reach present air quality standards in large areas, and will not reduce the number of people exposed to excess pollution

• The measures of the multi-sector scenario would attain the air quality standards for 90% of the Asian population

• In South and Southeast Asia, over 50% of the overall potential to reduce the population weighted PM2.5 exposure could be realized with measures addressing biomass combustion

• This will result in significant health improvements and other development benefits; short- and long-lived GHG emissions will be reduced as well