SHORT-LIVED CLIMATE POLLUTANTS AND THE AGRICULTURE SECTOR

Nathan Borgford-Parnell
Science Affairs, CCAC

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The Focus of the Coalition

- Multiple-Benefits
  - Climate, health, agriculture
  - Near-term
  - Existing scalable measures
  - Benefits in a few years to decades

- Black Carbon and co-pollutants
- Methane
- Tropospheric Ozone
- Hydrofluorocarbons
TODAY
11 Initiatives
114 Partners
52 countries
17 IGOs
45 NGOs
Source: CCAC & UNEP. Assessment of SLCPs in Latin America & the Caribbean (forthcoming in 2017)
SLCPs and Agriculture

- Agriculture sector responsible for ~55% of all anthropogenic non-CO₂ GHG emissions (5.4-5.8 GtCO₂eq/yr)
- Agriculture and forestry sectors contribute ~40% of global black carbon emissions
- Methane’s contribution to O₃ formation magnifies the impact on agriculture and ecosystems.
- Impact on crop losses vary 5-15% in regions with elevated ozone

<table>
<thead>
<tr>
<th>Factor</th>
<th>Response to CO₂</th>
<th>Response to CH₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Drought</td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Fertilization</td>
<td>↑</td>
<td>–</td>
</tr>
<tr>
<td>Ozone</td>
<td>–</td>
<td>↓</td>
</tr>
</tbody>
</table>

# SLCP Measures in the Agriculture Sector

<table>
<thead>
<tr>
<th>Measure</th>
<th>Emission reduction potential in 2030</th>
<th>Non-climate benefits of measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm-scale anaerobic digestion on large farms with liquid manure management</td>
<td>2.2 Mt CH₄</td>
<td>Energy efficiency, crop protection</td>
</tr>
<tr>
<td>Feed changes for dairy and non-dairy cattle</td>
<td>3.9 Mt CH₄</td>
<td>Improved meat quality</td>
</tr>
<tr>
<td>Intermittent aeration of continuously flooded rice paddies</td>
<td>9.1 Mt CH₄</td>
<td>Crop protection</td>
</tr>
<tr>
<td>Ban of field burning of agricultural waste.</td>
<td>0.4 Mt BC</td>
<td>Health protection, crop protection, improved visibility</td>
</tr>
</tbody>
</table>

Enteric Fermentation

1) Supply-Side Mitigation Measures – Increasing Efficiency

<table>
<thead>
<tr>
<th>Impact</th>
<th>Unit</th>
<th>OECD90</th>
<th>REF</th>
<th>MAF</th>
<th>LAM</th>
<th>ASIA</th>
<th>GLOBAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in ozone concentration (characterised as the highest 6 month mean max hourly ozone)</td>
<td>ppbv</td>
<td>-0.4</td>
<td>-0.3</td>
<td>-0.4</td>
<td>-0.3</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Change in premature mortality</td>
<td>#/year</td>
<td>-359</td>
<td>-105</td>
<td>-89</td>
<td>-86</td>
<td>-965</td>
<td>-1,605</td>
</tr>
<tr>
<td>Change in crop yield loss (for 4 staple crops)</td>
<td>metric Tonnes</td>
<td>-790,000</td>
<td>-360,000</td>
<td>-110,000</td>
<td>-21,000</td>
<td>-600,000</td>
<td>-1,900,000</td>
</tr>
</tbody>
</table>

2) Demand-Side Measures – Changing Consumption

3) Emissions Reduction Technologies

Concentrate feeding; Increasing the concentration of oils in ruminant diets; Tannin containing forages; Nitrate supplementation; Plant derived bioactives e.g. garlic, essential oils Direct fed microbials e.g. yeasts

1) Livestock & manure management
2) Open agricultural burning
3) Paddy rice cultivation
4) Enteric fermentation

METHANE & BLACK CARBON EMISSIONS FROM AGRICULTURE
Thank you!

Contact me at:
Nathan.Borgford-Parnell.affiliate@unep.org
+41 79 174 21 01

Agriculture Initiative Coordinators:
Catalina Etcheverry
Catalina.Etcheverry.Affiliate@unep.org

James Morris
James.morris@unep.org