The link between climate change and Australia’s tropical savanna

Three percent of Australia’s greenhouse gases come from the burning of the Australian tropical savanna.

How is this so and what does it mean?

Well most of the Earth’s atmosphere is filled with nitrogen and oxygen. Nitrogen is represented by the symbol N2. Two atoms of nitrogen are joined together. N2 makes up 78% of the atmosphere.

Oxygen makes up 21% of the atmosphere. Oxygen is represented by the symbol O2 and two atoms of oxygen are also joined together.

The atmosphere has other gases, but only in much smaller amounts.

Water vapour which includes clouds is also in the atmosphere.

Carbon dioxide, methane, nitrous oxide and even chemicals that were used in spray cans and fridges are also in small amounts in the atmosphere.

The sun light reaches the Earth and warms the air, plants, sea and all the other things the light shines on.

Slowly some of this heat filters out through the atmosphere and escapes back into space.

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Some of the other gases like carbon dioxide hold onto heat longer than oxygen and nitrogen.

When atmospheric carbon dioxide levels increases, less heat can escape back into space and the atmosphere becomes warmer.

Carbon dioxide is referred to as a greenhouse gas.

There are other greenhouse gases. Each gas has its own warming properties. The amount of additional heat a gas can hold onto is called a CO2 equivalent often written as CO2_e. Methane has a CO2 equivalent of 25. Methane can hold onto heat 25 times better than CO2.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Chemical formula</th>
<th>CO2 equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>CO2</td>
<td>1</td>
</tr>
<tr>
<td>Methane</td>
<td>CH4</td>
<td>25</td>
</tr>
<tr>
<td>Nitrous oxide</td>
<td>NO2</td>
<td>310</td>
</tr>
<tr>
<td>Various Hydrofluorocarbons</td>
<td>Eg. C2HF5, CHF3</td>
<td>From 140 to 11,700</td>
</tr>
</tbody>
</table>

Methane, nitrous oxide and hydrofluorocarbons are in very low concentrations but have big contribution to heating the atmosphere.

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When the savanna has a cool burn most of the gas is carbon dioxide, CO2.

When the savanna has a hot burn towards the end of the dry season other gases are also produced. As well as the hot burns, smouldering logs produce some other gas instead of CO2. Methane, CH4 and nitrous oxide NO2 are produced and make a big contribution to the greenhouse gases.

This a fire map of northern Australia for 2007. The green shaded area represents cool burns at the start of the dry season. The red shaded area covers the hot burns later in the dry season. Any way of reducing the hot burns will help reduce Australia's greenhouse gas emissions.

By making sure there are less hot burns later in the dry season will reduce the amount of greenhouse gases produced by Australia. It is been shown that the Aboriginal practice of cool burns is the easiest way of reducing hot burns.

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