



environment, forestry & fisheries

Department:
Environment, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

In the case of Wildfires, the amount of biomass burnt can be estimated based on:

- Total biomass: input by the user
- fraction damaged: input by the user or default provided based on type of damage (slight loss - 1% lost; serious damage - 60% lost, and total loss - 100% lost according to SA NIR 2017).
- Biomass burnt (t C) = M_B (t d.m.) x Fraction biomass lost

Emissions of CH₄ and N₂O are converted to CO₂eq applying GWP of IPCC third assessment report (TAR).

Box C.14. Emission estimates due biomass burning: wildfires, forest fires

Sheet Wildfires in the MRV tool

Applying tier 1, the biomass loss and gases emissions due to a wildfire affecting 5 ha, producing serious damage in a forest management of Extra tropical forest with a total biomass (living biomass and DOM) per ha of 150 t d.m. ha⁻¹ are:

Area disturbed = 5 ha

$M_B = 150 \text{ t d.m. ha}^{-1}$

Fraction damage = 0.6 (SA NIR 2019)

$G_{\text{ef-CO}_2} = 1569 \text{ g (kg d.m. burnt)}^{-1}$ (default IPCC 2006)

$L_{\text{fire-CO}_2} = 5 \text{ ha} \times 150 \text{ t d.m. ha}^{-1} \times 0.6 \times 1569 \times 10^{-3} = \mathbf{706.05 \text{ t CO}_2}$

$G_{\text{ef-CH}_4} = 4.7 \text{ g (kg d.m. burnt)}^{-1}$ (default IPCC 2006)

$L_{\text{fire-CH}_4} = 5 \text{ ha} \times 150 \text{ t d.m. ha}^{-1} \times 0.6 \times 4.7 \times 10^{-3} = \mathbf{2.12 \text{ t CH}_4}$

$G_{\text{ef-N}_2\text{O}} = 0.26 \text{ g (kg d.m. burnt)}^{-1}$ (default IPCC 2006)

$L_{\text{fire-N}_2\text{O}} = 5 \text{ ha} \times 150 \text{ t d.m. ha}^{-1} \times 0.6 \times 0.26 \times 10^{-3} = \mathbf{0.12 \text{ t N}_2\text{O}}$

$L_{\text{fire-CO}_2\text{eq}} = 706.05 + 2.12 \times 23 + 0.12 \times 296 = \mathbf{789.3 \text{ t CO}_2\text{eq}}$

Note that emission factors are expressed in g/kg, therefore 10⁻³ needs to be included in the calculation of emissions.

CO₂, CH₄ and N₂O are first estimated and reported separately. The emissions are then converted to CO₂eq and reported as a summed total. CO₂ emissions have to be reported in case of deforestation, while it is assuming short term recovery of C in all C pool in the case of forest Management and Afforestation, and therefore CO₂ emissions are not reported.

The estimates must be reported by wildfire.