

2.3 Carbon footprinting is based on the LCA approach but focuses only on greenhouse gas emissions.

2.3.1 Defining terminologies.

GHG = greenhouse gases

IPCC provide a list of gases that contribute to global warming. The most important for food production are carbon dioxide, methane, nitrous oxide and refrigerant gases

Expressed in terms of 20, 100 or 500 years:

Methane = 34 x more potent than CO₂ (over 100 year time-period)

Nitrous oxide = 298 x more potent than CO₂ (over 100 year time-period)

Refrigerant gases = thousands x more potent than CO₂

Most discussion about GHGs outside the food and agricultural sector focuses on carbon dioxide (CO₂). However, there are other greenhouse gases too, such as methane and nitrous oxide and the food system is a particularly significant source of these.

The Kyoto Protocol includes 6 main GHGs : carbon-dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆)

Different GHGs have different potency – that is, the strength of their contribution to radiative forcing (a measure of global warming) differs.

Measured over a time-period of 100 years, the global warming potential of methane is 34 times more potent than carbon dioxide; nitrous oxide is nearly 300 times more so.

The total global warming impact can be expressed in aggregated form, known as carbon dioxide equivalent (CO₂ eq.). This is often also referred to as the carbon footprint (CFP), global warming potential (GWP), or simply greenhouse gases (GHG). Throughout these chapters, the term GHG is used. There are also other climate change metrics such as the Global Temperature Potential (GTP).

2.3.2 GHGs arising from the food system.

The most important GHGs arising from the *food system* are methane (CH₄), nitrous oxide (N₂O) and carbon dioxide (CO₂).

Agricultural emissions are dominated by methane and nitrous oxide, although land-use change for agriculture is a major source of carbon dioxide emissions.

Post-production stages (such as food processing, transport, storage, refrigeration) give rise to notable carbon dioxide emissions, due to more significant energy and fossil-fuel use.

The food system is different from many of the sectors and activities (such as construction, heavy industry and transport) because agricultural emissions are dominated by methane and nitrous oxide. In industrial processes carbon dioxide arising from energy use tends to dominate.

This said, agriculturally induced land use change (for example deforestation, or conversion of peatlands to crop production) leads to very significant releases of carbon dioxide.

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