

Case Study II: Global Warming

Background

The United Nations Framework Convention on Climate Change of 1992 (UNFCCC 1992) has the objective of “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” The Kyoto Protocol to the UNFCCC (UN 1997) is a key policy tool to be used to achieve that Convention objective. The protocol contains legally binding commitments to either reduce or limit the emissions of six key greenhouse gases (GHGs).²⁰ In addition, the Protocol contains agreed emission reduction targets for the so-called Annex I countries (i.e., the already industrialized states), which collectively amount to a 5.2 % reductions below the 1990 levels to be reached during the first commitment period – that is between 2008 and 2012. The Annex I countries are encouraged to reach these targets mainly by developing and implementing various emission-reducing projects in industrial and economic sectors. Progress must be demonstrated by 2005.

Further to the emission-mitigation projects in industry, a number of Articles within the Protocol make provision for the use of biological sources and sinks²¹ to help parties to meet their commitments. The Protocol actions pertaining to biological sources and sinks center on Land Use, Land Use Change and Forestry (LULUCF) activities. The Protocol in addition makes provisions for countries to obtain (and trade) carbon credits (and debits) via the so-called “flexible mechanisms”. These are governed by the Joint Implementation scheme in the developed world, and by Clean Development Mechanism (CDM) for the rest of the world. In the former case, developed countries may obtain emission reduction credits by implementing forestation projects within the territory of other Annex I countries and, in the latter case, by implementing them in developing countries (known as the “Kyoto Forests”).

Kyoto Verification System

The verification system has been aptly described as “the backbone for the effective implementation of the Kyoto Protocol”.²² The prime objective of this system is to measure whether and to what extent States-Parties meet their emission reduction commitments. It is furthermore intended to provide reassurance that the reductions countries claim are genuine and not exaggerated or fictitious.

The Protocol’s verification system builds on the provisions for monitoring, reporting and review established under the UNFCCC. Article 5.1 of the Protocol obliges Annex I countries to establish by 2007 “a national system for estimation of anthropogenic emissions by sources and removal by sinks of all greenhouse gases not controlled by the Montreal Protocol”. Article 7 requires them to submit an annual report, including a national inventory, of all GHG emissions by sources and removals by sinks. Other articles specify the types of data for estimating national levels of GHG emissions and removals when compiling the annual inventories. Thus, Article 3.4 calls on countries for “data to establish its levels of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years.” Article 3.3 requires measurement data pertaining to the “net changes in greenhouse gas emissions by sources and removal by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation (ARD) since 1990”. National inventories will be subject to in-depth reviews, as stipulated by Article 8, and in cases where the inventory data is missing or is deemed to be inaccurate national figures will be adjusted according to standard methodology defined in Article 5.2.

The Protocol’s insistence on national systems for verification, reporting and accountability results in specific information requirements for its signatories. Earth Observation (EO) technology represents in that context a valuable source of environmental data, most notably in two areas of specific application:

²⁰ These are: Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur Hexafluoride (SF₆).

²¹ A carbon sink is a place where carbon is removed from the atmosphere. A forest ecosystem may be a sink if its assimilation of carbon through photosynthesis exceeds the levels of carbon emissions through harvest, fire or respiration.

²² Molly Anderson, “Verification Under the Kyoto Protocol,” ch. 9 in: Trevor Findlay and Oliver Meier (eds.), *The Verification Yearbook 2002*. London: VERTIC, 2002, p. 149.