



Estimation of carbon emissions from crown fires in Turkey

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Forest biomass consumption is an important index for carbon cycling. Forest fire represents one of the important sources of greenhouse gas (GHG) emissions due to biomass burning processes. Forest fire contribute to increasing atmospheric CO₂ concentration therefore, role of forest fires in the global carbon cycle has received increasing interest. Various methods were used to estimation of carbon emission. IPCC methodology is commonly used for the calculation of GHG amounts released at forest fire in Europe especially on a national basis. Many European countries have done many studies relation to estimation of carbon emissions from forest fires. However, carbon emissions from forest fires were not estimated in Turkey. The objective of this paper was to estimate carbon emission from forest fires from 1997 to 2006 in three forest district directorate of Turkey. We have used IPCC methodology for estimation of carbon emission form forest fire in Turkey. The emission calculations associated with forest fires were carried out using the IPCC methodology for estimating emissions from biomass burning. According to IPCC methodology, the annual carbon release of gas is the product of parameters: Annual biomass loss by burning (kt), fraction of biomass oxidized on-site, carbon content (CC), emission ratio, N/C ratio. A set of forest fire data during 1997-2006 obtained from the Turkish Ministry of Environment and Forestry-General Directorate of Forestry Service. Fuel biomass and fuel consumption data were provided from experimental fires and biomass studies in Turkey. The highest carbon emission amount was CO₂ gas. A wide range in carbon emissions of 0.37–94.85 Gg was caused by variability in pre-fire fuel characteristics (fuel size, distribution, fuel moisture and total load), fire type, fire season and fire weather, which affected fuel moisture and fire behavior.

Keywords: Carbon emissions, Forest fire, Fuel consumption, IPCC, Turkey