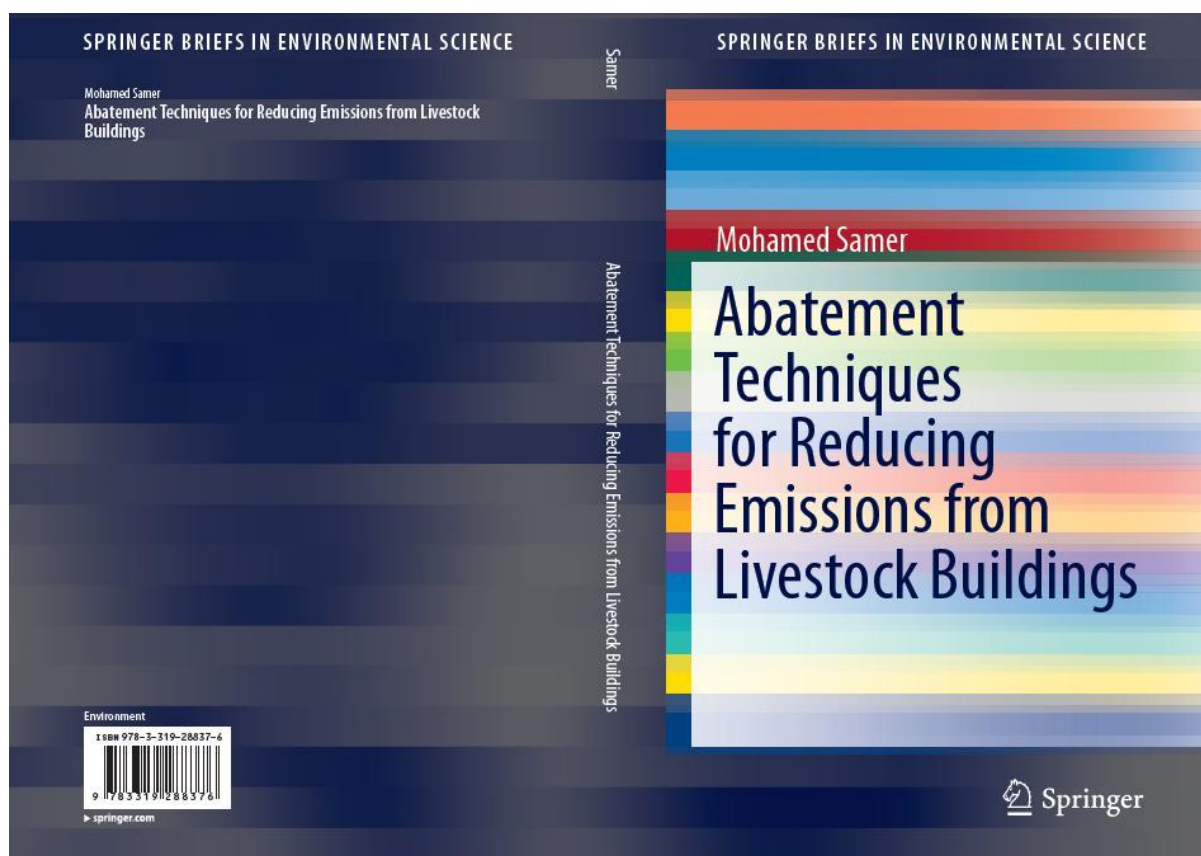


FULL-TEXT



Abstract

The air pollutant emissions from agriculture have negative environmental impact and pertinent political importance (Kyoto Protocol and Gothenburg Protocol). Animal production is a major source of atmospheric pollutants, such as: methane (CH_4), nitrogen oxides (NO_x), carbon dioxide (CO_2), and ammonia (NH_3). Methane, nitrogen oxides, and carbon dioxide are greenhouse gases (GHGs) that contribute to the global warming and, therefore, the climate change. Ammonia is responsible for eutrophication and soil acidification. This study elucidates and illustrates the theoretical background of the development, release, and spreading of NH_3 , CH_4 , NO_x , hydrogen sulfide (H_2S), dust, and odors in livestock buildings. Subsequently, the emissions abatement techniques for reducing air pollutants (e.g., GHGs, NH_3 , H_2S , dust, odors) emissions from livestock buildings have been clarified and discussed. The emissions abatement techniques presented in this study focuses on the manure handling especially inside livestock buildings, dust mitigation, biofiltration for pollutants and odor control, biofilter design and operating parameters, and bioscrubbers. Furthermore, this study identifies future scientific research priorities for developing emissions inventories, emissions abatement techniques, and mitigation strategies in order to improve and sustain livestock production to be in line with the climate change adaptation.

Keywords Abatement techniques • Ammonia • Animal buildings • Biofilters • Dust • Emissions • Greenhouse gases • Livestock housing • Mitigation strategies • Odor