A Sustainable Environment: Our Obligation to Protect God's Gift

by

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Livestock: An Overlooked Source of Greenhouse Gas Emissions

As you may have learned from newspapers, television or radio, the two-week Copenhagen Climate Change Conference ended last month with President Obama claiming an "unprecedented agreement" with the other major contributors to carbon dioxide emissions. Most people that attended this conference state that very little was accomplished other than to establish some kind of treaty later this year. This will lead to specific targets for the reduction of greenhouse gas emissions from the major sources. The term greenhouse gases (GHG) consists of carbon dioxide and five other pollutants that have a similar effect on the warming of the earth – one of which is methane. When we think about the largest contributors to GHG, we usually consider transportation, coal fired power plants, and other major industries like cement and aluminum plants. However, one of the largest emitters of GHG is the livestock industry.

The World Watch Institute has studied this source of GHG and includes attributable emissions from cattle, buffalo, sheep, goats, camels, horses, pigs and poultry. The amount of GHG attributed to, say, cattle can be from several different sources. The most common source considered for cattle is the methane emitted intermittently by the animals. However, also included in the total emissions by cattle is the land use for grazing which may have been a rainforest cleared for the animals. An acre of rainforest actually stores about 80 tons of carbon dioxide that has been sequestered by the trees. If this land is cleared for grazing, it can only store about 2.5 tons and the difference is the amount of GHG attributed to cattle. The study also considers the land necessary for growing the feed for the cattle and includes this lost forest from absorbing the carbon dioxide. Just as humans exhale carbon dioxide when they breathe, so do cattle and other animals. Consequently, this study includes all of the carbon dioxide given off by animals while breathing, but perhaps human breathing should also be included in any compilation of sources of carbon dioxide.

The most interesting contribution by animals such as cattle is the methane given off. Not only is the volume considerable, but methane has a much greater warming effect than carbon dioxide, technically known as the global warming potential (GWP), which compares their warming potency to that of carbon dioxide (with a GWP set at 1). The generally accepted GWP for methane is 25, but that assumes that methane has an impact over 100 years just like carbon dioxide. The half-life of carbon dioxide (a measure of the time it takes for the quantity to decompose by 50%) is 100 years while that of methane is only 8 years. This study therefore used an accepted time-frame of 20 years, and under that assumption, the GWP for methane is 72 – significantly greater than carbon dioxide.

After considering these various sources, the study concluded that the total GHGs attributable to livestock products was over 32 billion tons of carbon dioxide equivalents. The quantity of methane emitted by the livestock was multiplied by 72 to determine the carbon dioxide equivalent. This total quantity of GHGs represents about 51% of the worldwide total of GHG emissions from all sources. Basically, this means that reducing the GHG emissions to meet any kind of protocol resulting from following meetings of the Copenhagen conference will not be that easy.

An interesting side-note is that I teach the capstone course that focuses on business strategy and in lieu of a final exam, the students must develop a business plan based on a sustainable strategy learned in the classroom. One of my students came up with a business plan for on how to capture methane emissions from a cattle farm in Mexico and convert that gas to a usable energy. He called the product of his new business “mootrient”. With this kind of creativity, there is a chance that we can reduce carbon dioxide emissions and its impact on climate change.