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Carbon capture by biomass and soil are sound: CO_2 burial wastes energy

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We suggest sound ways to improve the capture of CO_2 including the conservation of U.S. crops, forests, grasses, and soil conservation. Currently, U.S. crops, forests, and grasses collect an estimated 9 billion tons of carbon per year. This could be increased by eliminating the annual subsidies of $23 billion for biofuels that contribute an estimated 124 billion kg of carbon to the environment each year. Agriculturists and others could effectively increase the carbon sequestration by U.S. biomass to an estimated 10 billion tons per year by augmenting crop, forest, and grass biomass production.

A major source of U.S. carbon released to the atmosphere is its loss from soil through mineralization of organic matter and accelerated soil erosion on croplands and pasture lands. Annually, the nation's crop and pasture land suffer from erosion loss of an estimated 1.8 billion tons of soil effecting 27 million hectares (Mha) of cropland by water erosion and 22 Mha by wind erosion. The carbon released during soil erosion by water is estimated to be 15 million tons in the U.S. and about 1 gigaton (billion ton) worldwide. This loss could be eliminated with a concerted effort by farmers while at the same time improving soil productivity of U.S. cropland and pasture land. The technical potential of carbon sequestration in soils of the U.S. is about 300 million tons/year. The cost of carbon sequestration in soils and biota is negative, because of numerous co-benefits of this natural process, compared with ~$100 (€60)/ton of CO_2 for carbon capture and storage.

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Additional benefits relate to water conservation, improvements in the environment and public health aspects of soil conservation.

At the same time, increasing the use of wind power, photovoltalics, solar thermal, and other solar technologies will help in electrical generation and reduce the need for coal and natural gas. In addition, biological wastes sent to dumps or sewage plants are biomass being allowed to biodegrade reemitting GHGs needlessly and often to be causing costly pollution problems from germs, toxics, and drugs. These hazards would be destroyed by using pyrolysis on the wastes, and it would stop the reemitting of GHGs while getting useful energy via refining the expelled crude oil mix. The inert charcoal represents both energy and carbon removal from their biosphere overloads and can be utilized as a valuable soil amendment.

In the use of biowastes for composting or collecting methane, CO_2 is just being recycled, not removed from the biosphere. In either of these two cases, the biowastes accumulate and could cause serious pollution to water resources because of escapes of hazardous materials that would be destroyed by pyrolysis.

But CO_2 burial related to coal use can be a disaster because of highly flammable and toxic chemicals required as well as the possible leakage of CO_2. If CO_2 burial is used for "Clean Coal", the amount of energy used to get more than 50–60% of the CO_2 captured and buried is estimated to cost almost half of the coal energy. At the same time, the heat energy overload, the ash piles, and the contaminated scrub water will continue growing unabated.