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Sequestration of greenhouse gases for sustainable agriculture

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The world's population has grown rapidly with a corresponding increase in demand for natural resources, energy, food and goods and this exploding population burdened on agriculture heavily, therefore, to meet the consumption needs, farmers have to really depend upon the inorganic fertilizers and pesticides. No doubt, these inorganic inputs have increased the production of almost all the crops on one hand, but harmful effects on the other hand. Apart from this, chemical based intensive agricultural practices are contributing significantly in the production of GHGs and thus degrade the environment adversly. As a consequence of increase in consumption, vast quantities of gases and effluents are discharged that may change the climate composition of the atmosphere. The rise in the global temperature is caused by the accumulation of the so called GHGs namely, carbon dioxide (CO_2) , methane (CH_4) , nitrous oxide (N_2O) and chlorofluorocarbon.

In intensive crop production, only a small amount of the fertilizers applied to fields are actually taken up by the plants and the rest is washed off with rains or with excessive watering of the crop. The fertilizers are thus washed off and end up in water bodies like lakes, pounds etc. Since most fertilizers are quite rich in nitrogen, they cause spontaneous algae growth in lakes that can lead to the problem of eutrophication. This kills off aquatic life and thus, disrupts the aquatic ecosystem dynamics. The fertilizer may also accumulate on the field ground causing problems like water logging and salinity, if not controlled.

Chemical fertilizers may also affect human health, especially, if high concentrations of toxic substances found in them seep into the groundwater that may be used for drinking purpose and lead some serious diseases like cancer and chronic diseases in human being. However, Agriculture is often considered a victim of climate change while its contribution to green house gas emission has largely been overlooked. At global level, farming is contributing 14% of GHGs and thus creating hazardous effect on environment and considered for global warming. While in India, farming contributes 28% of the national GHGs emission.

Indeed, agriculture is the primary source of methane (from livestock) and nitrous oxide (from inorganic fertilizers), and mechanization of agricultural activities responsible for emission of carbon dioxide and thus the farm sector offers significant opportunities for carbon sequestration and emission. These gases contribute to the greenhouse effect; some of them are naturally occurring such as water vapors, carbon dioxide, methane, nitrous oxide and ozone. Global concentrations of the three most important long-lived GHGs in the atmosphere have increased measurably over the past 255 years. Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) concentration in the atmosphere have increased by approximately 35%, 155%, and 18% respectively, since 1750. There is an estimated 3.2 billion metric tons of CO_2 added to the atmosphere, annually. Healthy agriculture and forest management can offset GHGs by increasing capacity for carbon uptake and storage in biomass, wood products and soils and thus promoting carbon sequestration. The adoption of agro forestry practices live windbreaks and riparian forest buffers, which incorporate trees and shrubs into ongoing form operations, represent a potentially large GHGs sink nationally.

Further, zero tillage, tree restoration, reduced tillage, organically cultivation, change crop mixes and crop rotations, agro forestry, anaerobic composting, social forestry, conservation agriculture, mulching, intercropping, and multi-cropping may decrease the green house gases emission and thus enthuse sustainable lives on the earth. Low carbon farming supports sustainable farming by encouraging farmers to adopt practices that reduce/minimize/remove the use of synthetic fertilizer while, at the same time, improving soil carbon content. Planting fuel, fodder and fruit trees, and protected those that are already there on the farms.

In an effort to combat against sequestration of GHGs issues related to agricultural development, agricultural research scholars as a future generation of agricultural development need to possess general about awareness and perception about GHGs emission issues and problems. Forced and timely efforts to apply knowledge by the agricultural research can enable them to stand successfully against the emission of GHGs problems to play a leadership role in overall development of agriculture. The opportunity offered by scientists and media in terms of useful information should to be detained deliberated by agricultural research experts. To get complete benefit using the knowledge of GHGs, climate change and global warming, agricultural research scholars must prepare themselves to act as a leader of future generation in the development process as a change agent to save earth and agriculture.

Therefore, Sequestration of Greenhouse Gases is challenging for human being and scientists have to found suitable stretgic aleternatives for reducing the green house gases.

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