EDITORIAL

# Plantation of Trees and Shrubs in Carbon Polluted Areas Could Reduce Carbon Dioxide from the Atmosphere

COLUMN

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The increasing global warming associated with the constant emission of carbon dioxide by combustion of fossil fuels from the factories and burning of woods poses a great menace in increasing pollution in the atmosphere; thereby, endangering the security of mankind and animals. Besides, this increased global warming is associated with incessant logging, illegal anthropogenic activities and conversion of forest to agriculture. The constant emission of greenhouse gases (GS), in particular the $CO_2$ load in the atmosphere have increased several folds leading to pollution and climate change. This has direct impact on climate changes in enhancing and increased global warming. This has caused a great concern to the security of mankind and animal life, thereby leading to reduced crop productivity Worldwide. Concerted research activities have been directed worldwide to mitigate it. Plants capture carbon and store it in various reserves. Different technologies are being adopted in different countries for $CO_2$ capture and sequestration but attained little success to reduce $CO_2$ load from the atmosphere.

Carbon sequestration is the process of capturing $CO_2$ from the atmosphere derived from various anthropogenic (human) activities and its constant emission from large-scale factories. Once captured, the $CO_2$ gas (or the carbon portion of the $CO_2$) is compressed and put into long-term storage. There exists two major types of $CO_2$ sequestration: terrestrial and geologic. Terrestrial sequestration include land management practices that maximizes the amount of carbon that remains stored in the soil and plant material for the long term.

The U.S. Environmental Protection Agency (EPA) has undertaken action plan using sophisticated technology to reduce carbon pollution from power plants. Carbon capture and sequestration is one of the technologies that new power plants can employ to meet the standards. $CO_2$ capture and sequestration (CCS) has been adopted in developed countries to reduce greenhouse gas emissions. Factories producing high amount of carbon pollution are sanctioned to pay carbon tax, carbon credit.

Plants contribute a lot in the capture of $CO_2$ load from the atmosphere in the process of photosynthesis, synthesis of carbohydrate and store carbon in its biomass. Variation in carbon fixation by photosynthesis is related with the variation of carbon deposition in plant species. Carbon is the source of energy for plants. Sufficient research inputs have been directed to estimate carbon fixation and carbon concentration in different species across the World (papers in process).

Reforestation is a novel technique adopted by EPA to reduce carbon load emitted by factories coal mine areas from the atmosphere. Storing carbon in forests is cheaper than paying carbon tax. This technique is implemented in coal mining areas in Eastern United States and South East Colorado project is an ideal example. At present, several factories adopt project to plant trees around the factory sites to reduce carbon pollution and to avoid to pay carbon tax.

In the context of the facts relating to carbon pollution and greenhouse emission, it may be concluded that carbon sequestration technology used in developed countries is quite efficient to reduce carbon pollution, but it cannot be adopted in wide scale. On the other hand, the adoption of this technology is beyond the reach of underdeveloped countries. Therefore, plantation of trees and reforestation could have great potential to reduce carbon pollution. This technology is promoted by EPA.

We promoted the concept in NRM (National Resource Management group, LinkedIn) that plantation of trees with high capacity of carbon fixation (carbon sequestration) could have high potential in reducing $CO_2$ pollution in carbon polluted

areas, cities and urban planning. This concept is appreciated by many of the eminent members and few of them have take-up this novel project.

In this juncture, we have taken up a project in The Forest Science School, UANL. Mexico in growing more than 40 trees and shrubs for carbon fixation (carbon sequestration) and finally selected few trees and shrubs with high carbon fixation up to 51%.

The carbon fixation/carbon concentration estimated in certain trees and shrubs indicated that there are certain tree species with high ability to fix atmospheric $CO_2$ into their biomass. The trees and shrubs selected with high carbon concentration were *Eugenia caryophyllata* (51.66%)*, Litsea glauscensens* (51.34%), *Rhus virens* (50.35%), *Forestiera angustifolia* (49.47%)*, Gochantia hypoleuca* (49.86%), *Forestiera angustifolia* (49.47%), *Pinus arizonica* (49.32%), *Cinnamomum verum* (*49.34%*)*, Bumelia celastrina* (49.25%), *Tecoma stans* (48.79%), *Acacia rigidula* (48.23%), *Eryobotria japonica* (47.98%), *Rosamarinus officinalis* (47.77%). In our opinion, some of these species may be selected for plantation in highly $CO_2$ polluted areas.

Plantation of native trees with high carbon sequestration capacity and good landscape architecture may be planted in carbon polluted areas, cities, town planning, children parks, sport ground, high way sides could reduce carbon pollution. This is open to criticism.