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EDITORIAL COLUMN

Trees with High Wood Carbon is a Good Source of Bioenergy and Sink of Atmospheric Carbon Dioxide: a Viable Strategy to Reduce Carbon Pollution

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Increasing global warming with constant emission of carbon dioxide (CO_2) owing to burning of fossil fuels has reached alarming situation to he scientists. Different strategies are adopted throughout World to reduce atmospheric carbon pollution. Forest trees have good capacity to capture CO_2 through leaves and solar energy during the process of photosynthesis. Finally carbon is stored in aerial parts and woods. Therefore, a viable strategy is the extensive plantation of trees in factory areas as well as city streets. Various studies are also undertaken in different countries in this direct to curb this global menace. In advanced countries, emitting CO_2 is captured with instrument and then pushed deep in soil where it is stored for long time. This costly technique hardly can be popularized to non-developing countries.

In this endeavor Maiti et al., 2015 have evaluated carbon fixation of 42 trees and shrubs and finally selected few species with high capacity of carbon fixation. 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 withhigh 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%. Few of these species may be selected for plantation in highly CO_2 polluted areas in cities, road sides and factory areas with high emission of CO_2. This result is highly encouraging. Therefore, it is recommended that every country should select trees and shrubs with high ability of CO_2 and promote plantation of these species in deforested areas and damaged forest by firing etc.

On the other hand, several studies are undertaken to select trees and shrubs conataing high wood carbon in different countries. Carbon can be stored in wood for a long time if woods are buried deep in soil profile. This another encouraging strategy to reduce carbon pollution.

In this venture, Maiti and his team has undertaken recent study to select trees and shrubs with high wood carbon in Northeasern Mexico (Maiti et al. in press, Pakistant Journal of Botany, 2019). In this study, they selected species with high wood carbon and shows large variations among species (37-51 %) and nitrogen content (0.56-1.97). The five species selected with very high carbon percentage are such as *Bernardia myricifolia* (51.12); *Acacia berlandieri* (51.00); *Leucophyllum frutescens* (50.84); *Berberis chochoco* (50.56); *Havardia pallens* (50.36). Similarly the species show variations in nitrogen content (0.56-1.97). The species containing high wood nitrogen are *Acacia greggii* (1.98%), *Ebenopsis ebano* (1.97%), *Sideroxylon celestrinum* (1.75%), *Diospyros texana* (1.56%), *Guiacum angustifolia* (1.52%). The species with high wood carbon are potential sources of bioenergy. These species store high amount carbon after carbon fixation by leaves. These species may be planted in deforested forest areas to reduce atmospheric CO_2. This technique can be recommended for other countries.

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Thirty three trees and shrubs show large variations both in wood caron and nitrogen which gives an opportunity of selection of species for different purposes such as sources of high bioenergy and high nitrogen. Species having high wood carbon have great potential of bioenergy and wood charcoal. On the other hand, these species containing high wood carbon could serve as potential source of bioenergy which could be confirmed in future studies.

It is highly recommended that the five selected species having 50% or more wood carbon mentioned above may be potential in cities, factories, sports, parks polluted with high carbon to reduce carbon from atmosphere. Besides these could be recommended for incorporation in agroforestry for higher productivity of crops and timber. The leguminous Woody species such as Acacia and Leucophylum could improve soil fertility by nitrogen fixation capacity.

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