EDITORIAL

Strategies to Mitigate Climate Change and Carbon Pollution

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Increasing global warming associated with continuous emission of greenhouse gases (GHGs, mainly CO_2) and abiotic stresses such as drought, salinity have direct impact on the productivity of trees and shrubs and crops. This is aggravated with deforestation, illegal logging, expansion of agriculture and urbanization leading to climate change across the globe. This situation is of great concern to adopt strategy to mitigate climate change and carbon load from the atmosphere. In view of the facts that trees have capacity to capture solar radiation and CO_2 from the atmosphere leading to the production of timber and biomass, thereby reducing atmospheric temperature. Therefore, the plantation of trees and reforestaton is considered a viable strategy to mitigate climate change and carbon pollution. Recently Paris Climate Change summit has recommended to reduce 2 °C globally. Different countries have given emphasis to implement this strategy. FAO Newsletter has recommended the cultivation of tress and transplantation to mitigate climate change and carbon pollution. Plants have capacity to capture solar radiation during the process of photosynthesis, thereby reducing atmospheric temperature.

Apart from the reduction of CO_2, release of oxygen for our respiration, forests supply various forest products, timbers for wood industry and nutrients for ruminants. Therefore, conservation and protection of forests is essential for the security the lives of human beings and animals. Developed countries adopt efficient technique to capture atmospheric CO_2 and inject it in deeper layer of soil profile, thereby reducing billion tons of CO_2 from the atmosphere. The industry emitting a large amount of gas is heavily taxed to pay carbon credit. To avoid this the industries have enhanced the plantation of trees around the factory sites.

In the context of above facts various possible/conceptual strategies could be adopted to mitigate climate change. We suggest following few adoptive strategies-

1. Adopting measures to reduce the use of fossil fuels, such as use of solar energy, electric oven, cars driven by electricity.

2. Cultivation and reforestation of fast growing trees with capacity of high carbon sequestration. We selected in Northeastern Mexico with high carbon fixation capacity viz. *Eugenia caryophyllata* 51.66%, *Litsea glauscensens* 51.34 %, *Rhus virens* 50.35%, *Gochantia hypoleuca* 49.86%, *Forestiera angustifolia* 49.47%, *Pinus arizonica* 49.32%, *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. Similar research needs to be directed in different regions of the World to identify native trees and shrubs with high carbon fixation capacity. Native trees require less water and less maintenance. It is expected that the plantation of trees and shrubs with high carbon sequestration in factory sites, city streets, in urban planning, parks, sport ground could reduce carbon load and reduce atmospheric temperature which needs to be confirmed.

We observe tat trees with open leaf canopy (all leaves exposed to solar radiation) have greater capacity in the capture of solar radiation leading to high productivity of trees compared to those with closely overlapping, multilayered leaves. These trees grow taller with high branching habit and highly productive which needs to be confirmed.

3. Adoption of agroforestry associated with *Acacia*, leguminous, coconuts, palms crops could mitigate climate and increase crop productivity. Climate smart agriculture needs to be adopted. Use of solar energy, biofuels and other methods need to be encouraged.

4. Selection of trees and shrubs tolerant to drought and salinity needs to be emphasized. Certain species possess xero-morphic leaf traits such as waxy laves, thick leaves, abundant trichomes, absence of stomata on the upper leaf surface and the presence of sunken stomata which help in maintain water budget , thereby reduce transpiration. We selected few species in Northeasteern Mexico. Research needs to be directed on forest trees and shrubs.

5. Carbon capture by soil microorganisms. Various microorganism have capacity to capture CO_2 and store them in soils which needs to be exploited.

6. Propagation and plantation of mangroves in sea beaches. Mangroves help in the harbor and breeding of sea fish, crabs and abodes of migratory birds which need to be conserved. Mangrove populations are deforested owing to expansion of urban civilization in sea coasts. Propagation and reforestation of mangroves are necessary to control soil erosion in sea beaches. Some species have capacity of carbon sequestration documented in the literature.

7. Training and motivation of students and youngsters are needed who will take care about the conservation of forests and aforestation.

8. Muti-disciplinary research team needs to be built up at the regional, national and international level dedicated to develop research technologies to mitigate climate change and reduce carbon pollution.

Forests are saviors of our lives. Let us conserve and protect forests.