

Climate Change and Agroforestry

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Rajendra K. Pachauri was the chairman of the IPCC delegation that received the Nobel Peace Prize in 2007. He has won various awards and outstanding recognitions and has been active in several international forums dealing with the subject of climate change and its policy dimensions.

Abstract The worst victims of climate change will be the poorest communities in the world, especially the vulnerable in Africa, where 75–250 million people are projected to live in water-stressed conditions by 2020. Agroforestry should be a key component in climate change mitigation measures. If we work together, collectively, there is no reason to believe that agroforestry cannot bring about mitigation of greenhouse gases but also produce a substantial set of cobenefits.

Keywords Greenhouse gas emissions • Biodiversity • Energy security

At the outset, let me emphasize the enormity of the challenge that we are facing with respect to climate change. We know now that climate change is unequivocal. The impacts that are being felt all through the world, and which are now being observed and recorded very carefully, point clearly to a future that is frightening if not disastrous. If we do not take action, it is now obvious, as the fourth assessment report of the IPCC has brought out, that the impacts of climate change could cause untold hardship and misery to a very large number of people.

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The unfortunate reality is that the worst victims of climate change are going to be some of the poorest communities in the world, and the continent of Africa in particular is very vulnerable. Our projections indicate, for instance, that the stress caused by climate change, together with the existing stresses such as water scarcity, is likely to affect 75–250 million people in Africa as early as 2020. This is something that obviously can lead to a great deal of conflict and will certainly lead to a huge loss of human welfare. It is something that we must prevent. Mitigation of the emission of greenhouse gases (GHGs) is the only way to accomplish that globally.

There are various ways by which we can bring about the level of mitigation that is required, and certainly agroforestry is one such important component. In fact, we have underrated the advantages and the benefits of using biomass cultivation as a means to mitigate GHG emissions. We have been doing just the reverse, i.e., the large-scale deforestation and degradation of forests all over the world has substantially diminished the ability of these natural systems to absorb CO₂. We need to reverse that trend; we need to make sure that we plant more and more trees.

We need to carry out larger scale agroforestry and make sure that this natural bounty of trees that fix atmospheric CO₂ is proliferated and expanded on a much greater scale. Through the efforts of agroforestry, and by ensuring optimal land use changes, we should be able to bring about a revival of biodiversity, and we would certainly be able to make a major impact in terms of water availability as well. It is no mystery that if we bring about resuscitation and revival of any part of an ecosystem, the benefits will be really widespread such that the benefits will be accrued to several other links of the ecosystem.

As in the case of most mitigation measures, there are huge cobenefits from agroforestry as well. Indeed, if we look at mitigation in general, in terms of the greater use of renewable sources of energy and improvements in the efficiency of energy use, there are several cobenefits such as lower levels of pollution at the local level, which bring about major health benefits. Arresting or limiting the impacts of climate change that would take place in the future will certainly bring about a higher level of energy security globally and minimize or avoid the negative impacts of climate change on agriculture. Furthermore, through mitigation measures, we would also be able to expand employment because a large number of these mitigation measures bring about large-scale employment generation.

These benefits of climate change mitigation apply specifically to agroforestry. If we expand agroforestry activities, there would be substantial benefits in terms of the local environment, and as a result, there would be accrued health benefits. There would be much greater energy security too, because agroforestry can also lead to biofuel production, particularly in respect of second-generation biofuels, where the target clearly is to bring about a conversion of cellulosic material to liquid fuels that could ultimately and substantially substitute for petroleum-based products.

There would also be great benefits in terms of agriculture. And we must not also minimize the importance of the revival of biodiversity. After all, all the known food that we get and all the crops that have been developed for human consumption are really the gift of what we obtained by way of the biodiversity that occurs naturally in our ecosystems. Finally, we also know that agroforestry is an important source of great employment.

As far as climate change is concerned, we have two very clear choices which must run in parallel. First, we have to adapt to the impacts of climate change, and some of these adaptation measures can also be carried out through agroforestry activities, particularly in the case of sea level rise that is already affecting several coastal areas and several small island states. Plantation of mangroves can make an enormous difference in terms of providing protection to storm surges, to cyclonic events, and coastal flooding in general.

Agroforestry activities, if carried out in the right locations, will bring about means of adapting to the impacts of climate change. But at the same time agroforestry also gives us an extremely attractive option for mitigation of emissions of GHGs because the net effect of agroforestry would be to see that a large part of the CO₂ that is emitted from our factories, transport vehicles, households, etc., can be absorbed through whatever we grow as a part of agroforestry programs.

It is important to look at not only the direct benefits of agroforestry to mitigation of emissions of GHGs but also the cobenefits that are not always apparent. In any economic decision-making and in any enlightened approach to deal with problems faced by human society, we must examine the totality of costs and benefits. If agroforestry provides substantial net benefits, then it is essential that we clearly identify them, evaluate them, and estimate their contributions. On the basis of that, we would be able to take much more enlightened decisions.

Last, but not the least, this will also give us a basis for informing the public. Each of these programs will require substantial public support, and one way to bring that about is through the presentation of the right facts in the right framework. Informing the public at large about these potential benefits will lead to the generation of a great deal of public support for agroforestry activities. Thus, the challenge is exciting, and the task is very clear. If we work collectively, there is no reason to believe that an option like agroforestry will not only be able to bring about mitigation of GHGs and thereby help in meeting the threat of climate change, but it also will produce a substantial set of other cobenefits for the whole of human society.