

## Reconciling biodiversity conservation with agricultural intensification



Prof. M. S. Swaminathan  
(Photo: N. A. Aravind)

The following is an interview with Prof. M. S. Swaminathan, considered as the 'Father of Green Revolution in India', on his views on how there can be a reconciliation between biodiversity conservation and agricultural intensification in the country. Swaminathan along with his colleagues, ushered in a phase of agricultural intensification in the 1960s and 70s that India had never seen before. Within just a couple of decades, the country turned from a food importer to a food exporter and went on to become a food-secure nation. However, this was not without several negative externalities, one of which was the loss of biodiversity due to expansion of cultivable area. No wonder then, one of the ardent champions of conserving biodiversity in its entirety, is Swaminathan himself. He strongly believed that, from pollination services to soil health services, biodiversity needs to be conserved for agriculture to be sustainable. In his own words, 'If conservation of natural resources goes wrong, nothing else will go right'. In recent years he has been advocating for the 'Evergreen Revolution', which involves sustainable development using environmentally sustainable agriculture through preservation of biodiversity.

*Can we ever reconcile biodiversity conservation with agricultural intensification, considering that the latter is perhaps the single most important driver of biodiversity loss?*

Agricultural intensification means really increasing productivity of agriculture. Population growth makes it essential that we produce more food, and other agricul-

tural products from diminishing per capita land and water resources. At the same time, we have to ensure that intensification should not lead to a loss of biodiversity. How to conserve it and how to use it should be our aim.

*How do you address the conflict between biodiversity and agriculture?*

First of all, I don't agree that there is conflict. Rather there is a complementarity, whereby both agriculture and biodiversity can go together to strengthen food security. In fact, biodiversity provides inputs for successful and sustainable agriculture. Therefore, they are mutually reinforcing and not one against the other.

*Is there sufficient interest and drive in the government and institutions to address this as a national goal?*

Yes, there is growing interest, but I won't say it is adequate. More and more universities and institutions are dealing with biodiversity and people have become aware now of the need for conservation of biodiversity.

*Are models of coexisting agriculture (nature=biodiversity and nurture=cultivation) present elsewhere in the world?*

Yes, there are many models around the world. For example, in many crops like wheat, rice, millets and pulses, genetic diversity has contributed to the development of new varieties. In fact, the success depends on the existence of biodiversity. In India itself there are a number of examples of such coexistence.

*If one has to evaluate the contribution of biodiversity to agriculture (wild and weedy species, land races, soil and phyllospheric microbes, insect pollinators and services, etc.), how does one go about?*

I will not attempt to quantify because you cannot compare the non-comparable. Both are important. Without agriculture, involving conversion of sunlight into energy (food), we cannot survive. Therefore, the very fact that we are living shows that agriculture is essential. Bio-

diversity is also important, so let's not put one against the other. Conservation, sustainable use and equitable sharing of benefits is what our Biodiversity Act says and at the same time, let's improve the productivity of agriculture so that we don't have to take more land out of the wild.

*Can the contribution of biodiversity to agriculture be monetized? And can such numbers be more impressive to policy makers and the government to give impetus to biodiversity-friendly agricultural practices than mere rhetoric?*

Yes, take the simple example of natural rubber, from which Kerala farmers derive much of their income. Even without such numbers, given the existing evidence, I would request our policymakers to give maximum support for the conservation of biodiversity at all levels – *in situ* on farm, *ex situ* on and off farm, and in gene banks. In particular, given the key role of women in identification of plants for domestication and conservation of biodiversity, they need to be given adequate recognition. In fact, the origin of agriculture can be traced to women, who identified rice varieties that can be cultivated.

*Looking back and looking forward, what do you think is one of the most important takeaways for the next generation with respect to meeting food security needs with the least impact on the landscape and its biodiversity?*

My message for the younger generation is to emphasize that our future depends upon biodiversity, for both agricultural progress as well as for managing emerging new challenges and diseases such as the coronavirus. Our future quality of life depends upon our conservation of biodiversity.

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