

Securing India's Seed Diversity

Dr. Debal Deb, an ecologist and a farmer, is on a mission to protect India's traditional varieties that are fast vanishing from the Indian fields. With his untiring efforts, Dr. Deb has helped to preserve 920 varieties of indigenous rice using traditional methods. He founded Vrihi, the first and the largest rice seed bank in eastern India, to distribute folk rice seeds free to farmers. Dr. Deb strives to preserve India's biodiversity without sacrificing India's food sovereignty. Working with local communities, he hopes to make farmers independent of large corporations and GM crops, and help secure their access to local seed varieties. In an interview with Agriculture Today, Dr. Deb discusses his experiences and opinions on India's agriculture scene.

Tell us something about Vrihi.

I founded Vrihi, the first rice seed bank in eastern India, in 1997 to distribute folk rice seeds free to farmers. All seed samples I had collected from indigenous farmers from around the State of West Bengal (and later, other States as well), were multiplied on the farm of a farmer volunteer, and stored in Vrihi for distribution to any and all farmers in need. In 2002, I bought 0.3 acre of farm land for Vrihi to grow all these varieties. After 2011, Vrihi has been shifted to Rayagada district of Odisha. However, over the past 17 years, Vrihi has established numerous small seed banks in different districts, and inspired several farmer organisations to establish their own seed banks in different States – including Assam, Meghalaya, Odisha, and Maharashtra.

What instigated you into the collection and conservation of land races?

As an ecologist, I was astonished by the general ignorance and abysmal apathy of agriculturists, policy makers and conservationists towards the value, and the need of conservation, of crop genetic diversity. Even on the international level, there were few publications to indicate any serious concern for the disappearance of the thousands of crop land races from farm fields, until the late 1990s. Despite the agriculturists' knowledge



of the Irish potato famine in the nineteenth century, no one seemed to do anything about the rapid genetic homogenization of rice varieties in India propelled by the advent of the Green Revolution. No one cared to save the vanishing genetic wealth of our heirloom crop diversity. My preliminary field survey in 1995 revealed that West Bengal had already lost more than 90% of its farmer land races

of rice from the farmers' fields, and the remaining varieties were critically threatened with extinction. So I thought of starting somewhere before it was too late, and hope for some more competent people to come forward in the future. Vrihi was born out of this objective.

How do you feel about the current agriculture policy of India?

There are a few sections in the national policy documents that seem to encourage zero external input agriculture, and foster crop genetic diversity conservation. In practice, none of the agricultural institutions- the scientists and extension officers in the State Agriculture Department, as well as researchers in different agricultural universities -have neither any motivation nor programs to save the heirloom crop genetic diversity. Everyone seems to be mesmerized by the spell of molecular genetics research and transgenics. Even today, it appears rice scientists are going overboard to develop “novel” transgenic rice, importing specific genes from other organisms. When I see that these same people are completely oblivious of the availability of the hundreds of useful genes within the rice genome, I stop to wonder how much technophilia has taxed on the basic intelligence and common sense of these scientists. They won't give a fig for conservation of any rice variety until they are informed that a valuable gene exists in that particular variety. This extreme instrumental value of the genetic wealth is surely expected in the world of commerce, but totally undesirable among scientists, who are expected to give the highest importance to the intrinsic value of biodiversity and the knowledge of nature's intricacies. In any case, the agriculture policy enhances this instrumental value of crop diversity, with awful changes in the directionality of research in agronomy and agrobiodiversity. An important agenda – both in national and State agriculture policies – is its focus on commerce and export of crops, rather than production of food. This policy of shifting away from food production to production of cash crops is preposterous indeed, in view of the shrinkage of arable land area through industrialization and urbanization, and a growing proportion of cultivators increasingly diverging from food production prospects.

Traditional varieties are often snubbed for their low productivity. Can India be food secure riding on the back of traditional varieties?

It's only a myth that all traditional crop varieties are characterized by “low productivity”. Today's politics is food politics, and it pays agribusiness – the key players of food politics - to perpetuate this myth. There are quite a few agronomists who know very well that there are hundreds of crop varieties that can out-yield modern varieties on marginal environmental conditions. Even on optimal conditions of soil nutrients and water availability, several rice varieties outperform the so-called “high yielding varieties” (HYVs). I have at least 10 such varieties growing on Basudha farm. Moreover, none of these folk varieties need any external inputs of agrochemicals. However, such information seldom hits the headline because that would serve to enlighten our farmers, and dissuade them from buying HYV seeds and agrochemicals for years together. That would be bad omen for agribusiness and hence bad for GDP growth! Thus, mainstream agronomists, economists and agriculture bureaucrats alike, stick to the corporate lies and institutional myths.

How can India achieve food security in a sustainable manner?

I can only mention the possible, even probable, means toward long term food security of the country, but cannot vouch for its practicability until (i) there is a sincere political will of the government, and (ii) there is at least some environmental literacy among our media people and politicians. The essential prerequisites of sustainability in agriculture are (a) zero external inputs of materials and energy; (b) integration of all types of life forms coexisting in the farm ecosystem; (c) the farmers' conscious care for all natural resources – water, plants, soil organisms; and (d) freedom from big market. That means the farmer must

not pump out groundwater; poison the soil and water by using synthetic fertilizers, insecticides and herbicides; nor reduce biological diversity at species and genetic levels on-farm. That also means the farm produce ought to be bought and sold on local farmer markets. This last is being practised in a growing number of communities in Europe, South America, Africa and Asia. Unfortunately, the Indian electorate are kept away from such information. The great chain of farmers markets in Cuba, the Transition Movement in UK, the Via Campesina movement in Mexico, or the farmers cooperatives in the US – are all unknown to the common people in India. There are hundreds of such sustainable agricultural systems existing in India and other countries, and IAASTD has already recommended such systems as the best bet for food security. There is no paucity of publications that demonstrate the high productivity and ecological efficacy of ecological agriculture, but again, such information never comes to the media limelight.

The Green Revolution changed India's status from being a begging bowl to food basket. Is the Green Revolution overrated?

When India imported cheap rice from Southeast Asia in the Deregulation era, 30 years after the Green Revolution brouhaha, nobody said, “India has become a begging bowl!” India was not begging for food. Of course India used to import some rice, but she was also exporting some food oil. In the 1960s, the international arbiters of food politics projected India's food situation to indicate as if Indians would die of starvation unless the food productivity increased. And everyone was scared, because Big Brother was warning you of the burgeoning population (a fact) and an impending food production deficit (a speculation). The Ford Foundation, Rockefeller Foundation and the US government invested huge money in building institutions

for developing HYVs of cereal crops. The two Foundations and the World Bank were specifically interested in strengthening the Green Revolution in areas susceptible to communism. They aimed to stop political turmoil in those areas by locating the international crop research institutions – such as the IRRI in the Philippines and CIMMYT in Mexico. Another objective behind founding these research centres was to ensure gene flow from the gene-rich South to the industrialized North, to foster agro-industry in the US and Europe. Both these objectives have been amply documented, and both have been more than successful, thanks to the earnest support from national governments of the South, including India.

The first breed of HYV, Taichung, and subsequently, IR 8, did give bumper yields in wet paddy farms with adequate irrigation facility. Yet, the same varieties had to be presently withdrawn and replaced with a series of new varieties, because they showed prominent yield drag. None of the HYVs have ever shown considerable yield stability, compared to any locally adapted folk rice variety. IRRI's own study in 2010 proves that the yield of the "miracle rice" IR 8 showed reduction by 15% over 30 years. Aside from yield stability, none of the Green Revolution varieties have ever been successful in marginal farm conditions – rain-fed upland farms, deepwater farms, and coastal farms washed by saline water. Considering that about 40% of Indian's arable land is marginal, the Green Revolution has failed to improve productivity of any of these farms, where traditional locally-adapted varieties alone can grow.

If traditional farmers have sustained themselves on their marginal farms, relying on their heirloom varieties, where is the role of the Green Revolution in their food security? If your farm is fertile, and has adequate irrigation, your crop would surely yield much greater than on other farms, and

no farmer would consider this knowledge to be revolutionary. Yet, the greater yield on fertile, irrigated farms is hyped as a Revolution! The FAO in its 2010 Report also admits that the Green Revolution seeds have been showing yield stagnation and deceleration, while the cost and amounts of inputs are rising. Given the totality of unbiased data, anyone can infer the success of the Green Revolution.

The funniest fallacy in the argument of the Green Revolution boy-scouts is that they now want to promote a Second Green Revolution. Why that "second" necessary, if the first has been so successful? They also call for a "permanent" Green Revolution – admitting that the Green Revolution success was only temporary!

How do you plan to bring about awareness regarding the relevance of traditional varieties to national forum?

I don't have any plan to bring the issue to any national statutory forum. I have no hope from the governmental outfits, manned predominantly by people with ostensible links to industry and/or faith in technological quick fix for food security issue. Nevertheless, I am willing to discuss the issue if the government is willing to listen to voices from the fields. I have already presented, on invitation, on a plenty of national level conferences and meetings, including a high level technical meeting with the Hon'ble President office on 27 February 2012, discussing "sustainable measures to enhance agricultural productivity", without recourse to the Green Revolution model of agricultural development. None of such meetings have borne any tangible results, quite yet.

Are you ready to share varieties that you have collected to any research bodies – public/private?

As a scientist, I am always open to share the genetic materials with researchers as much as with farmers.

However, I learned some hard lessons over the past 17 years. Initially, most of the institutional scientists were unwilling to work on folk rice varieties, because the topic was not fashionable, because the folk varieties would not attract funding, because I and Vrihi are non-governmental. Later, when FAO and Bioversity International endorsed the importance of folk crop varieties, and when our scientists suddenly realized these heirloom crops are a mine of valuable genes for transgenics, they began to scramble for the genetic material.

When I had donated some seed samples to one or two such scientists, they first wanted to appropriate both the germplasm and the morphological data that I had provided them, and later claimed both were their "innovations". On one occasion, the scientist even wanted to pass on the seeds to a multinational seed company for a handsome sale price. Today I am willing to share the folk rice genetic material and database, only after the recipient signs a material transfer agreement (MTA), which stipulates, inter alia, that (a) the research shall be considered and published as a collaborative project, incorporating me as a co-author; and that (b) neither the genetic material nor any results from the collaborative research can be transferred to any individual or organization affiliated to, or sponsored by, any corporate entity.

What is your message to seed companies and farmers?

My primary message to farmers is two-fold: Keep all seeds of your own heirloom crop varieties alive and unpolluted; and don't sacrifice your economic freedom, cultural dignity, and political sovereignty over your farm ecosystem to either the State or seed companies for any short term gain.

To the seed companies, I would only reiterate Raja Rammohan Roy's dictum: "Enemies to liberty and friends of despotism have never been, and shall never be, ultimately successful."