

biosafety assessment should be done on a case-by-case basis. The Task Force has suggested changes in the existing review mechanism for approval of GM crops to prevent avoidable loss of time and promote concurrent biosafety and agronomic performance studies.

With rapid growth in R&D efforts in biotechnology, a statutory and autonomous National Biotechnology Regulatory Authority will soon become necessary. The NBRA should have two wings – one for agricultural and food biotechnology, and the other for medical and pharmaceutical biotechnology. NBRA is essential for generating the necessary public, political, professional and commercial confidence in the science-based regulatory mechanisms in place in the country. The NBRA should be autonomous and professionally led but could be attached for necessary administrative support to an appropriate Ministry/Department.

The Monitoring and Evaluation Committees should report to GEAC, which may continue to handle biosafety and environmental safety issues of GM crop candidates until the proposed National Agricultural Biotechnology Regulatory Authority comes into existence.

An All India Coordinated Research Project solely for the testing of GM group varieties should be organized by ICAR with the requisite technical expertise and safety arrangements.

Farmers and consumers should have complete information on the benefits and risks associated with GM crops. The evaluation procedure should include farmer participatory assessment, as is the case of non-GM crop varieties. The procedure of transparent evaluation should apply equally to both private and public sector varieties. A special insurance scheme for GM crops may be devised and introduced by the Ministry of Agriculture. An inte-

grated GM Seed-cum-Crop Insurance System will help to ensure that desirable new technologies confer benefits to resource poor small farm families, without undue risks.

Pre-breeding to generate novel genetic combinations at Advanced Research Centres, coupled with participatory breeding with farming families will help to demystify new technologies and make farm women and men effective partners in biotechnological research.

There are uncommon opportunities for facing successfully the current and future challenges faced by farming families through synergy between technology and public policy. There is need to strengthen both our technological capability and public policy framework especially in the areas of regulation, surveillance and monitoring, as well as in the areas of promotion, facilitation and mentoring. This is the pathway to an era of biohappiness.

The Agbiotech Task Force Report

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The report of the Task Force on application of Agricultural Biotechnology, headed by M. S. Swaminathan, has collated inputs provided by a variety of stakeholders. It is an important step forward in trying to improve the system for implementing Agbiotechnology in India. Its importance lies in the fact that this is the first recommendation for change from a high-powered source and the first effort to formulate a policy. Civil society organizations have been frustrated in the past by the recalcitrance of the Department of Biotechnology (DBT) and its refusal to engage in any dialogue on public concerns or be receptive to any suggestions for improving a clearly unsatisfactory system. The former head of DBT is famously on record for doggedly insisting that India did not need a biotechnology policy when all around her, from the most exalted in the scientific establishment, the most vocal protagonists to the most determined opponents, were demanding a national policy.

The report contains many positive features that should be built upon, especially

by civil society groups. Its basic recommendation is that the national policy should seek the 'economic well-being of farm families, food security of the nation, health security of the consumer, protection of the environment and the security of our national and international trade'. If the recommendations of this Task Force are upheld, no policy implementation can deviate from these goals.

The report is critical of the prevailing gung-ho climate when any proposal for research on a GM crop, however nonsensical the goal, is likely to get sanctioned, often at the cost of solid, conventional research which is more likely to yield results of relevance. It recommends that all alternatives to GM technology should be examined and the GM route used only when other options are not available.

The report highlights the connection between transgenic research in India and the international market. It recommends that transgenic research should not be done on crops that we sell in the international market, like soybean, Basmati rice and Darjeeling tea. Readers will recall

the hare-brained schemes of the DBT to promote *Bt* Basmati and introduce the beta-carotene construct of Golden Rice into Basmati rice. Nobody seemed to be thinking that we are exporters of Basmati (and other) rice as well as soybean (to special niche markets) and that our major trading partners are all rejecting GM foods. So who would buy our *Bt* Basmati or our GM Soya?

The socio-economic aspects of GM crops find mention. The report says that our policy on transgenics should be sensitive to biodiversity conservation and the socio-economic context of our composite agrarian system. In other words, small farmer interests have to be protected. In recommending the breeding of both varieties and hybrids and supporting apomixis as a strategy, the recommendation is clearly in favour of the farmers' right to save seed from previous harvests. The report comes out clearly against GM traits like herbicide tolerance that can reduce employment (by taking away the opportunity to earn wages by weeding) and impinge on rural livelihoods (by de-

stroying vegetation that is used as nutritious leafy greens or fodder to support livestock).

The recommendation that Centers of Origin and Diversity like the Jeypore tract for rice must be protected, is an important one. However the proposed mechanism for earmarking GM and non-GM zones does not appear to be feasible. If the cultivation of GM rice is permitted in certain areas but not in the diversity-rich areas of Orissa, Jharkhand and Chattisgarh, there is no way of preventing GM rice landing up there. Foreign genes in that case are bound to move to wild relatives of rice in its center of origin. We have seen the speed with which the illegal *Bt* cotton originally put out by Navbharat seed company has spread to almost all cotton growing areas, despite the fact that its planting is illegal. Similarly, contamination of native corn in Mexico has taken place in spite of the ban on the cultivation of GM corn in the country. Zoning or segregation is unlikely to work. The only way of protecting native germplasm from foreign genes with likely negative impacts is to disallow the GM version of that particular crop.

I have a disagreement on the edible vaccine strategy that forms part of the report. I do not believe India should invest in edible vaccines since it will be impossible to keep vaccine-bearing fruit separate from ordinary fruits. Mixture with the food chain is inevitable since one bunch of bananas looks like another. It would be even harder to segregate grains. In the US, Starlink corn, which was not allowed as food but only animal feed, was found mixed up with food corn. In the Prodigene case in the US, a GM corn carrying pig vaccine was found mixed up with soybean for human use, showing that segregation is not possible

even in the highly regulated conditions of US agriculture. India should have a strict policy of allowing the expression of pharmaceutical molecules like vaccines only in non-edible plants.

With respect to regulation, the report has suggested much-needed technical competence and transparency. I would have liked to see a greater role for civil society, as is the case in the Philippines and other ASEAN nations. The structure of the regulatory authority would benefit from greater autonomy. The regulatory structure should be demonstrably competent and independent to inspire confidence. It should be able not just to assess biosafety, environmental and long term ecological impact but also other aspects like social and economic impacts, particularly the impact on small farmers, of the introduction of a particular GM crop. In my view, it would be best to divide the regulatory function into two parts, one Advisory, the other Statutory.

Advisory body

The Advisory body should have a broad based multidisciplinary membership that includes all relevant scientific disciplines, social scientists, environmentalists, civil society groups, members of farming and *adivasi* communities, representatives of panchayati raj institutions and legal experts. A person of the highest technical calibre who has experience in the regulation of GM crops should head the body.

Statutory body

The statutory body should be an independent body staffed by people skilled in Biosafety Assessment, Environmental

Assessment and Environmental Impact Assessment. This body should have overall responsibility for all aspects of risk assessment, risk management, risk communication leading up to decision-making about the safety of a GM crop for the environment, human and animal health and post release monitoring. It is important to ensure that there is no conflict of interest and rules should be framed in a clear and unambiguous manner so that it is not possible to stack the Agency with any particular kind of people. Clear-cut channels should be created for the public to participate in the decision-making process and to voice concerns. There should be an annual review of the decisions taken on GM products and the rationale for these decisions. This review should be presented to Parliament.

Overhauling the regulatory system from its currently appalling state should be high priority. After repeated unsuccessful attempts to engage with the government on the need for improvements and after the DBT rebutted every single recommendation to emerge from a Multistakeholder national symposium on GM technology, Gene Campaign had filed a PIL in the Supreme Court in January this year, asking for a Multistakeholder discussion to formulate a national policy and a thorough overhaul of the regulatory system. Hopefully the process begun by the Task Force will help to establish a competent and participatory system and a more responsible way of evaluating which GM crops could be relevant for Indian farmers.

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