

Standing Committee Report Summary

Cultivation of Genetically Modified Food Crops – Prospects and Effects

- The Standing Committee on Agriculture (Chairperson: Basudeb Acharya) submitted its 37th report on the Cultivation of Genetically Modified Food Crops – Prospects and Effects. The report was tabled in Parliament on August 9, 2012. It assesses the benefits and drawbacks of the introduction of genetic modification in food crops.
- A major finding of the report was that the regulatory framework for GM crops has several shortcomings. It also noted that the current framework does not provide for mandatory consultations with state governments or seek their permission to conduct open field trials on GM crops, such as Bt cotton and brinjal. In light of these findings, the report recommended that all research and development activities on transgenic crops be carried out only in laboratories and that ongoing field trials in all states be discontinued.

Background

- Transgenic crops were introduced in India a decade ago with the commercial cultivation of Bt cotton. The area under cotton cultivation increased from 24,000 hectares (ha) in 2002 to 8.4 million ha at present. Productivity has also increased with the cultivation of transgenic cotton. As per the government, input costs have also decreased since it requires lesser use of pesticides, etc.
- The Committee also noted the concerns of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD). Commissioned by the United Nations, the IAAST report discusses some shortcomings and negative aspects of the use of transgenics or genetical engineering in the agriculture and allied sectors.
- The Committee also visited Vidarbha to study the cultivation of Bt cotton. They learned that farmers cultivated Bt cotton on a large scale because initial production was high given that the crop was pest resistant. However, eventually small and marginal farmers suffered losses because of high input costs and yield loss due to the development of resistance in the

targeted pests. Moreover, the cultivation of Bt cotton caused traditional local cotton varieties to be wiped out. These factors combined with indebtedness caused 7,992 farmer suicides in the region between 2006 and 2011.

- With respect to Bt brinjal, the Committee found that the regulators approved Bt brinjal for environmental release despite toxic content in the crop. The environmental risk assessment for the crop was also flawed. Moreover, all the recommended tests and protocols had not been followed. Given that Bt brinjal was the first GM food crop in the country, stakeholders felt that it should have been put through a more vigorous assessment and evaluation regime by the regulatory authorities in view of the health dimensions.

Present regulatory mechanism

Genetically modified organisms (GMOs) and crops are regulated under the Environment (Protection) Act, 1986 and rules notified under it.

The regulatory mechanism to enforce these rules consists of six committees, which are as follows:

- i. Genetic Engineering Appraisal Committee (GEAC) – functions under the Ministry of Environment and Forests. It is the apex body to accord environmental approval of activities involving large scale use of hazardous micro-organisms and recombinants in research and industrial production. It is also mandated with approving the release of genetically engineered organisms and products into the environment, including experimental field trials.
- ii. Review Committee on Genetic Manipulation (RCGM) – functions under the Department of Biotechnology (DBT), Ministry of Science and Technology. RCGM is mandated with monitoring and regulating safety related aspects of ongoing research projects and activities, including small scale field trials.

- iii. Recombinant DNA Advisory Committee (RDAC) – operates under the DBT, functions are mostly advisory in nature. It reviews developments in biotechnology, nationally and internationally.
 - iv. State Biosafety Coordination Committees (SBCC) – tasked with monitoring at the state level. It has the power to investigate and take punitive action in case of violations of statutory provisions.
 - v. District Level Committees (DLC) – responsible for monitoring at the district level.
 - vi. Institutional Biosafety Committees (IBSC) – The Committee is established under the institution engaged in GMO research. It oversees this research and acts as an interface between the institution and RCGM.
- Of these committees, the GEAC and the RCGM are the most crucial in the regulatory chain.

Procedure for approval of GMOs

- i. Initially, the company involved in the development of the GM crop undertakes several biosafety assessments including, environmental safety, food and feed safety assessments in containment.
- ii. This is followed by Bio-safety Research Trials in two stages Biosafety Research Level-(BRL) trial I and BRL-II which require prior approval of RCGM and GEAC respectively.
- iii. Approval for environmental release is accorded by the GEAC after it considers the findings of the bio-safety and agronomic studies as well as recommendations of the RCGM and other committees.
- iv. Finally, commercial release is permitted by the GEAC for only those transgenic crops that are found to be safe for humans and the environment.

The Committee found that in both Bt cotton and Bt brinjal, the requisite numbers of tests were not carried out in the country. The tests performed were conducted by the company itself. Bt cotton was also found to be pest-resistant proving that the technology is unsustainable. The death of cattle in Andhra Pradesh in 2007, that fed on Bt cotton fields also raised doubts about the crop's safety as feed. The regulatory mechanism also approved Bt brinjal for environment release without considering its toxicity content.

Problems with the Indian regulatory framework

The Committee found several problems with the Indian framework for the regulation of GMOs. It made the following recommendations:

- The Committee recommended that the regulatory framework be given statutory backing so that there is no scope for ambiguity on the part of authorities

responsible for the oversight of GMOs. It suggested that the GEAC should be constituted under an Act to give it the status, power and autonomy to function as a statutory regulator. The Committee also recognised the need for an overarching legislation on biosafety and a Bio-safety Authority to ensure that biotechnology is introduced without compromising the safety of biodiversity, human and livestock health, and environmental protection.

- The Committee recommended a review of the organizational set-up and infrastructure of the GEAC and the RCGM. The absence of certain infrastructure negatively impacts their functioning as regulators. The Committee also recommended evaluating the composition of the GEAC.
- Due to the dearth of biotechnology scientists in the country, the same scientists were found to develop technologies as well as assess, evaluate and approve them. The GEAC also approved Bt brinjal on the basis of its own assessments as the apex regulatory body. After approving the crop, it was also responsible for evaluating its own decision to approve the crop. This led to a conflict of interest within the regulatory process. To avoid such a conflict, the Committee recommended the speedy evaluation of reports on GM crops by an agency other than the GEAC, such as the Council of Scientific and Industrial Research.
- The Committee was concerned about the use of anti-biotic resistant marker genes in developing GMOs. In their opinion, any transfer of such genes from GM crops to cells of the body or to bacteria in the gastrointestinal tract would be harmful. The Committee was informed that any decision to prohibit the release of GM crops with antibiotic resistant genes would make almost all transgenic plants under consideration of the GEAC and the RCGM, ineligible for release. In light of its hazard to health, the Committee urged the use of anti-biotic resistant marker free technology during the development of GMOs. However, they realize that permission to use such technology is a matter of policy. Therefore, they recommended that the government devise a clear-cut policy in this regard.

Role of the states in regulation of GM food

- The Committee studied the position of states on transgenic crops and field trials, given that agriculture is a state subject under the Constitution. It learned that, until recently, state governments were not mandatorily consulted for field trials. Although nine states allowed field trials, Bihar, Kerala and Madhya Pradesh objected to them. The Committee recommended that a mandatory consultation process with state governments culminating in seeking their permission for field trials be built into the regulatory mechanism. Further, it suggested the government assign appropriate responsibilities to states in the Biosafety Law recommended by the Committee.

International regulations

- India is a signatory to the Nagoya– Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety. The supplementary Protocol provides international rules and procedures on liability and redress for damage to biodiversity resulting from Living Modified Organisms (LMOs). India failed to meet its obligations under the Protocol. It did not develop the necessary scientific expertise, infrastructure and manpower to ensure compliance to these treaties. To remedy the situation, the Committee recommended that legislation relating to liability and redress for damage from LMOs be enacted.

Scientific studies and reports

- The Committee urged the government to adopt the recommendations of the IAASTD Report. A major finding of the report is that although modern biotechnologies have proved advantageous when they have been used in containment, their efficacy, safety and sustainability is yet to be proven when used outside containment, such as in GM crops. The Committee concurred with the findings of the report. It was particularly concerned about whether the benefits of GMOs will extend to most agro ecosystems or be sustainable, given that resistance to herbicides and insecticides will develop in the long run.

System preparedness

The Committee analysed and evaluated the performance of some of the departments, ministries and agencies responsible for regulating the introduction of transgenics in agricultural crops.

- About 70% of the Indian population survives on agriculture against 2% in the U.S. and Canada. In terms of size of land holdings, 70% of farmers in India are small and marginal ones with average land holding of about 1.25 acre against hundreds of hectares owned by individual farmers in the U.S. Beside these factors, there are differences in farmers' incomes, levels of mechanization, and the availability of irrigation facilities.
- The Committee opined that the Department of Agriculture and Cooperation (DAC) failed to discharge its mandated responsibility with respect to GM crops. In its evaluation, the DAC did not consider how India was different from countries that have transgenic cultivation and how such differences influence cultivation of transgenics in Indian agriculture.
- The DAC also failed to consider the cost of seed and other inputs entailed in the introduction of transgenics.

On a cost benefit analysis, it is evident that the industry receives more benefits than the farmers. Additionally, the decline in yield after the initial two/three years caused additional distress to the farmers. It was also found that Bt cotton is not a sustainable agriculture technology. Its cultivation requires massive quantities of water and other outputs.

- The cultivation of a cash crop such as Bt cotton also diverted land that would have otherwise been utilized for the cultivation of food crops. It was also found that many traditional varieties of cotton have been affected by the cultivation of Bt cotton. On the basis of these findings, the Committee recommended a thorough probe into approval of Bt brinjal.
- The Committee examined the roles of the Departments of Food and Public Distribution, Consumer Affairs and AYUSH (Indian System of Medicines viz. Ayurveda, Unani, Siddha) in GMO matters. It learned that the departments failed to take necessary action with respect to storage and distribution of food derived from GM crops; consumer rights and regulation of imported GM crops; and evaluating the medicinal impact of GM crops, respectively. The Committee wanted the departments' views on these issues.
- The National Biodiversity Authority of India (NBA) advises the government on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising out of utilization of biological resources. With respect to its infrastructure and manpower, the Committee recommended the NBA be sufficiently strengthened with scientific, technical and legal human resource of the best quality so it can adequately fulfil its role.
- The Food Safety and Standards Authority of India is responsible for ensuring the food safety of imported GM food. The Committee found that the authority has been functioning without sufficient funds, infrastructure, and manpower. It urged the government to allocate the requisite funds to the authority on a priority basis. Additionally, the labelling of GM processed food is currently overseen by the GEAC although it should be regulated by the FSSAI. Due to this ad-hoc allocation of responsibilities, there is no check on imported GM food.

Regulation and labelling of transgenic food products

- The Committee recommended that the government issue regulations for labelling of GM products including food crops and processed food so that consumers are able to make informed choices.

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