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Agriculture, GM and Ethics: The Case of India

Successive Indian governments have considered and continue to view GM crops as the next saviour, following the Green Revolution of the 1960s, to feed India's increasing population, already huge at 1.38 billion. Scientists at India's agricultural research centres point to the country's shrinking land and water resources, the degrading quality of its soils together with high input costs that have stagnated production considering this new technology necessary to maintain India's food security.¹

However, GM crops in agriculture, introduced in the 2000s through Bt (*Bacillus thuringiensis*) cotton, remain highly controversial, with NGO-led protests and lawsuits that have stalled the introduction of GM food crops, such as brinjal and mustard for years now, citing environmental, health, inadequate regulatory monitoring of corporate monopolies over seeds that jeopardise India's majority small-farmers as significant reasons for concern.

Meanwhile, the inadequate administrative monitoring of this sector, together with several governments and legal moratoria on the use of GM crops, have certainly aided Bt seed companies to quietly spread the use of Bt seeds. Activists fear that multinationals are taking advantage of lax monitoring to push their own sales, such as in Monsanto's Bt cotton 'HT', to be used together with Monsanto's herbicide Roundup Ready containing glyphosate, a proven toxin already banned in certain South Asian countries. Or Bayer's patent over DM H11 mustard, engineered for use with Bayer herbicide Basta!, containing glufosinate, another known toxin.

India is the 7th largest country in the world, measuring approximately thirteen times the UK, or nine times the size of Japan. It shares its borders with Pakistan and Afghanistan in the northwest, China, Nepal, and Bhutan in the north and northeast, and Myanmar and Bangladesh in the east. Its population is huge, increasing from

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1 Genetically Modified Crops and its Impact on Environment. 301st Parliament Report, New Delhi. Aug 2017.

1.2 billion in the census of 2011 to 1.35 billion in 2018². It is one of the world's 8 Vavilovian centres for biodiversity; for instance, it possessed nearly 110,000 traditional varieties of rice, while over half the country's workforce (54.6%) is in the agriculture sector.

Agriculture is critical to the Indian economy, with 54.6%³ of the workforce in the agricultural sector. Starting with famine in the 1940s during British colonial times, to acute food shortages in the 1950s, the 'Green Revolution' (using hybrid rice and wheat varieties) of the 1960s and 70s brought India back from the brink.

The Green Revolution of the late 1960s averted food shortages by using high-intensity inputs of groundwater and fertilisers causing a rapid increase in pests and thereby the use of chemical pesticides. Over a span of thirty years, India's soils have degraded by the overuse of chemicals and salinity from overuse of groundwater for irrigation, resulting in low or stagnant productivity, even greater use of chemicals, while groundwater depletion is at crisis-level.

The high costs of needed intensive inputs, together with the failing productivity and increasing pests, including the significant use of GM Bt cotton, have now resulted in the enormous suicides of farmers.⁴

Furthermore, now, along with farmland declining because of population pressures, food security is fragile, with only 8-10% of the country producing the majority of the food. India's total farmlands of 141m ha have remained unchanged/un-increasing despite a steep increase in population in the last few decades⁵.

The contribution of the agriculture sector to India's GDP has fallen steeply from 30% in 1990-91 to 14.5% in 2011-12. The government (2016-17) has statistics that include 'gross value added' services in agriculture together with its allied services at 17.32% of GDP⁶.

The government is aware of the crisis. In a Parliamentary Standing Committee Report of August 2017, the government acknowledged the 'limited land and water resources, high input cost, worsening soil quality, dependence on rain, increasing

2 UN data pub in worldpopulationreview.com.

3 The Last Drop? Compiled by Keya Acharya for the International Water Management Institute, 2013.

4 There is an entire body of literature on the subject of farmer suicides and bt cotton failure in India. The most recent, prominent story and book is as under (the author is the former deputy editor of one of India's most respected news dailies): A Frayed History. The Journey of Cotton in India. Meena Menon and Uzamma. Oxford University Press. 2017.

<https://scroll.in/article/856906/a-litany-of-miseries-after-crop-failure-and-debt-pesticides-are-killing-farmers-in-vidarbha>

5 As above.

6 Annual Report, 2016-17. The Ministry of Agriculture, Government of India. http://agricoop.nic.in/sites/default/files/Annual_rpt_201617_E.pdf.

indebtedness, stagnant productivity, and climate changes' in agriculture as the need for a new policy for improvement.

The government, however, sees the use of GM crops as the answer to alleviating its problems in agriculture, ensuring food security and a livelihood for the farming sector. In the past 15 years or more, GM seeds have found their way in the farmers' fields, mostly by private parties, with the apparent consent of the government.

The use of GM seeds in agriculture was first approved by the government of India in 2002, on a 'case by case' basis, according to the Ministry of Environment, Forests and Climate Change (MoEFCC)⁷, wherein field trials by Monsanto on Bt cotton were permitted with the latter to provide feedback to the government on its soil and environmental impacts. The Parliamentary report of 2017, however, reported that field trials, wherein the private concerned party is asked to send its own assessments to the government, are neither independent nor necessarily credible.

India has a broad regulatory framework for the introduction and propagation of GMOs and its products, primarily by the MoEFCC under the Environment Protection Act 1986, then by the Department of Biotechnology through the Review Committee on Genetic Manipulation (RCGM), the Genetic Engineering Manipulation Committee (GEAC), the Institutional Biosafety Committee, and Recombinant DNA Advisory Committee (RDAC). Additionally, the matter then goes to the States, under the State Biotechnology Coordination Committee and the District Level Committee.

In addition, there are several related rules and policies that are connected to GMOs in agriculture, such as the Plant Varieties Protection Act 2001, Biological Diversity Act 2002, Revised Guidelines for Research in Transgenic Plants 1998, Food Safety Standards Act 2006, Guidelines & Standard Operating Procedures (SOPs) for Confined Field Trials of Regulated, GE Plants, 2008, Guidelines for the Safety Assessment of Foods Derived from Genetically Engineered Plants, 2008-ICMR, and Protocols for Food and Feed Safety Assessment of GE Crops, 2008.

Nevertheless, the introduction of GM crops into India has seen an acrimonious debate, civil society protests, and a spate of lawsuits in the last two decades. The first GM food crop, eggplant, was stalled under a moratorium by then Environment Minister Jairam Ramesh in 2010 following stormy protests and memoranda sent to the Minister from across the country.

In 2017, after nearly a decade in development through public funding and spearheaded by Indian plant scientist Deepak Paintal, ex-Vice Chancellor of the University of Delhi, India approved the commercial release of GM mustard seeds.

⁷ Parliamentary report, as per ref. number 1.

A week later, India's then Environment Minister, Anil Dave, died of a heart attack under severe pressure from both pro and anti GM groups. Tarun Vijay, a former Member of Parliament from the BJP, wrote in his blog that Minister Dave would have stopped the release of GM mustard, had he not passed away.⁸ The blog spoke of serious opposition within the BJP to the use of GM mustard, a ubiquitous spice in Indian foods. Others in the BJP contested the claim that GM mustard was indigenously developed from Indian strains of the crop, showing the inherent need to use Bayer's herbicide *Basta!*, containing glufosinate, a known neurotoxin that is currently banned in the EU.

Civil society has claimed for years now that the cultivation and propagation of GM in agriculture are seriously flawed. Despite the extensive network of regulations, there remains a vast difference between regulatory monitoring and actual field reality.

In 2001, the author visited Bt cotton field trials in the southern Indian state of Karnataka, conducted by Monsanto, and found a complete lack of transparency by the agencies involved in any matter regarding the trials underway in the field. Monsanto, the company involved in propagating Bt cotton seeds, would not divulge the names of the farmers involved in the sowing, and the then MD for Monsanto, based in Mumbai, would not respond to calls made by the author.

However, Monsanto's company policy stated that it was open to sharing information publicly, and its Public Relations officer from Mumbai telephoned the author thereafter, trying to lay down stipulations about journalist's 'neutrality' and went so far as to ring up the author's publication in London and complain about the author's visits to the field.⁹

In this confusing scenario, all nine visited farmers reported that the Bt cotton seeds had been given to them far too late in the planting season, raising doubts about the accuracy of its results because late-sowing had escaped the seasonal pest-cycle. Agricultural scientists at the University of Agricultural Sciences also commented on the lack of transparency in details of the seeds given to them by Monsanto for trials in their fields.

The inaccuracy of GM field trials has been highlighted over the years by scientists, such as Vandana Shiva and others too. Their field reality is borne out by the 2017 Parliamentary report (*see footnote 1*), which notes the discrepancy and asks for laboratory trials and not field trials. Furthermore, the data on these field trials are

8 06/06/17 'Minister's death disrupts India's GM mustard plans' by Ranjit Devraj, <https://www.scidev.net/global/gm/news/india-biosafety-gm-food-crop-politics.html>.

9 Personal experience. Ms. Ranjana Smetacek, then PRO of Monsanto at Mumbai, complained about the author's field visits to her editor at Panos Features, London.

being furnished by the private company conducting these trials, thereby bringing their credibility into question.

Meanwhile, the release of GM mustard, approved by the government in 2016, has been stalled by an urgent lawsuit filed by environmentalists, charging plant-geneticists of deceiving the public about the benefits of GM mustard.¹⁰ Aruna Rodrigues, the lead petitioner in the case, sees an advantage in the fact that the government has admitted in court that it has no proof that GM mustard can produce better yields than non-GM hybrids.

While the court has ordered publication of the full test data of GM mustard, its promoters have pleaded that the issue involves “commercial confidence trade secrets or intellectual property, the disclosure of which would harm the competitive position of the third party”.

India’s mired dilemma with GM, its proven scientific basis, and its unethical means of propagation continue.

¹⁰ <https://www.nature.com/news/india-s-first-gm-food-crop-held-up-by-lawsuit-1.21303>.