

Agrarian Crisis and Malnutrition: GM Agriculture Is Not the Answer

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M S Swaminathan is often referred to as the 'father' of India's Green Revolution. In 2009, he said that no scientific evidence had emerged to justify concerns about genetically modified (GM) crops, often regarded as stage two of the Green Revolution.

In a December 2018 [paper](#) in the journal Current Science, however, it was argued that Bt insecticidal cotton (India's only officially approved commercial GM crop) is a failure and has not provided livelihood security for mainly resource-poor, small and marginal farmers.

The paper attracted a good deal of attention because, along with scientist P C Kesavan, Swaminathan was the co-author.

They concluded that globally both Bt crops and herbicide-tolerant crops are unsustainable and have not decreased the need for toxic chemical pesticides, the reason for these GM crops in the first place. Attention was also drawn to evidence that indicates Bt toxins are toxic to all organisms.

Kesavan and Swaminathan mounted a general critique of the GM paradigm. They noted that glyphosate-based herbicides, used on most GM crops in the world, and their active ingredient glyphosate, are genotoxic, cause birth defects and are carcinogenic. They also asserted that GM crop yields are no better than that of non-GM crops.

The authors concluded that genetic engineering technology is supplementary and must be need based. In more than 99% of cases, they said that time-honoured conventional breeding is sufficient.

In fact, Kesavan and Swaminathan argued that a sustainable 'Evergreen Revolution' based on a 'systems approach' and 'ecoagriculture' would guarantee equitable food security by ensuring access of rural communities to food.

Part of the pushback against Kesavan and Swaminathan has come from Dr Deepak Pental, developer and promoter of GM mustard at Delhi University. He responded to their piece with [an article](#) in September 2019, again in Current Science.

He argued that Kesavan and Swaminathan have unequivocally aligned themselves with overzealous environmentalists and ideologues, who have mindlessly attacked the use of GM technology to improve crops required for meeting the food and nutritional needs of a global population that is predicted to peak out at 11.2 billion. Pental added that the two authors' analysis of modern breeding technologies is a reflection of their ideological proclivities.

By resorting to such statements, Pental was drawing on industry-inspired spin: criticisms of

GM are driven by ideology not fact and GM is required to 'feed the world'. Both assertions are baseless but are employed time and again across the globe by the pro-GM lobby in an attempt to discredit inconvenient scientific findings and campaigners who forward valid criticisms.

In response to Pental, Andrew Paul Gutierrez, Peter E. Kenmore and Aruna Rodrigues hit back with a piece in a November 2019 edition of the same journal, '[When biotechnologists lack objectivity](#)'. In it, they argue:

"The need to counter Pental is critical because of his influence as part of a lobbying force for unbridled legislation for GE technologies and as a purveyor of scare tactics that food security in India will be compromised without them."

They continue:

"We question his failure to consider whether genetically modified crops (GMOs) are safe for human and ecological health, increase yield and quality, are rigorously tested using proper risk assessment biosafety protocols, and whether biosafety research level (BRL) mechanisms for GMOs field testing under various programmes are being implemented? These are the major themes of our rebuttal."

The authors indicate the adverse impacts on human health of GMOs and associated agrochemical inputs and the very real risk of gene flow and other ways by which non-GM crops and seeds can be contaminated by their GM counterparts:

"Genetic contamination is of special concern in India which has rich genetic diversity of crops/plants, and yet there are ongoing efforts to release GMO herbicide tolerant mustard (*Brassica juncea*) in India, which is a centre of diversity and domestication of over 5,000 wild and domesticated varieties of mustard and the wider 'family' of brassicas that includes 9,720 accessions... We must question why regulators would ever consider approval of GMOs of native species (e.g. of Desi cottons, brinjal eggplant, mustard, rice, among others)."

As alluded to in the above extract, India has a wealth of plant species that have evolved and been adapted over millennia. The country has good-quality traditional seeds which are ideally suited for local soils, climates and pests. And these seeds are less resource intensive. We must therefore question why Pental's GM mustard is being pushed so hard when it does not out-yield certain mustard species that India has already.

While touching on serious conflicts of interest within regulatory bodies, the authors also discuss Bt cotton and GM mustard, the commercialisation of which is currently held up due to a public litigation case with Aruna Rodrigues acting as lead petitioner.

They provide data to highlight the [myth of Bt cotton success in India](#). However, GM promoters continue to peddle the story of Bt cotton success and aim to drive the full-scale introduction of GM crops into Indian agriculture on the back of this false narrative.

The authors explain that the current GM Bt cotton hybrids in India were indeed developed as

a 'value capture' mechanism that enabled the seed industry to side-step intractable legal intellectual property rights: the interests of poor farmers were sacrificed for corporate commercial benefit.

In the article, data is also presented for GM mustard and the authors argue that it shows no yield advantage and its testing and evaluation have involved protocol violations.

In India, various high-level reports have advised against the adoption of GM crops. Appointed by the Supreme Court, the 'Technical Expert Committee (TEC) Final Report' (2013) was scathing about the prevailing regulatory system and highlighted its inadequacies and serious inherent conflicts of interest. The TEC recommended a 10-year moratorium on the commercial release of all GM crops.

Kesavan and Swaminathan, in their piece, also criticised India's GM regulating bodies due to a lack of competency and endemic conflicts of interest and a lack of expertise in GM risk assessment protocols, including food safety assessment and the assessment of environmental impacts. They also questioned regulators' failure to carry out a socio-economic assessment of GM impacts on resource-poor small and marginal farmers and called for "able economists who are familiar with and will prioritize rural livelihoods, and the interests of resource-poor small and marginal farmers rather than serve corporate interests and their profits."

As we have seen with the push to get GM mustard commercialised, the problems described by the TEC persist. Through her numerous submissions to the Supreme Court, Rodrigues has asserted that GM mustard is being pushed for commercialisation based on [flawed tests \(or no tests\) and a lack of public scrutiny](#). In effect, she argues, there has been [unremitting scientific fraud and outright regulatory delinquency](#). It must also be noted that this crop is herbicide-tolerant (HT), which, as stated by the TEC, is [wholly inappropriate](#) for India with its small biodiverse, multi-cropping farms.

Rodrigues has for a long time contended that GM 'regulation' in India occurs in a system dogged by serious conflicts of interest: funders, promoters and regulators are basically one and the same. She argues that agricultural institutions and numerous public sector scientists working within these bodies along with a powerful lobbying force are joined at the hip in pushing for GM.

GM Silver bullet misses the target

If the pro-GM lobby is genuinely concerned about 'feeding the world', it should really be questioning why the world already [produces enough to feed 10 million](#) people but [over two billion](#) are experiencing micronutrient deficiencies (of which over 800 million are classed as chronically undernourished); why we are seeing rising rates of obesity, diabetes and a range of other health-related conditions; and why, post-Green Revolution, the range of crops grown has narrowed and the nutrient content of food and diets [has diminished](#).

The answers lie with the practices, processes and toxic inputs that are integral to the prevailing model of chemical-intensive, industrial agriculture and the dynamics of the globalised capitalist food system. Throughout the world, this model has become tied to agro-export mono-cropping (often with non-food commodities taking up prime agricultural land), sovereign debt repayment and World Bank/IMF 'structural adjustment' directives, the outcomes of which have included a displacement of a food-producing peasantry,

the [consolidation of rapacious global agri-food oligopolies](#) and the transformation of many countries into food deficit areas.

Global food insecurity and malnutrition are therefore not the result of a lack of productivity.

As for India, although it fares poorly in world hunger assessments, the country has more than enough food to feed its 1.3 billion-plus population and with appropriate policy support measures could draw on its own [indigenous agroecological know-how](#) to do so.

Where farmers' livelihoods are concerned, the pro-GM lobby says GM will boost productivity and help secure cultivators a better income. This too is misleading and again ignores crucial political and economic contexts. For instance, to gain brief insight into the nature of India's agrarian crisis and why farmers are leaving the sector, let us turn to renowned journalist [P Sainath who says](#):

"The agrarian crises in five words is: hijack of agriculture by corporations. The process by which it is done in five words: predatory commercialisation of the countryside. When your cultivation costs have risen 500 per cent over a decade, the result of that crisis, that process in five words: biggest displacement in our history."

Little surprise, therefore, that [even with bumper harvests](#), Indian farmers still find themselves in financial distress.

India's farmers are not experiencing financial hardship due to low productivity. They are reeling under the effects of neoliberal policies, years of neglect and a deliberate strategy to displace smallholder agriculture at the behest of the World Bank and global agri-food corporations. And people are not hungry in India because its farmers do not produce enough food. Hunger and malnutrition result from various factors, not least poor food distribution, lack of infrastructure, (gender) inequality and poverty.

However, aside from putting a positive spin on the questionable performance of GM agriculture, the pro-GM lobby, both outside of India and within, has wasted no time in wrenching these issues from their political contexts to use the notions of 'helping farmers' and 'feeding the world' as lynchpins of its promotional strategy.

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