

The GMO-Suicide Myth

Opponents of genetically modified cotton in India claim that the technology has resulted in the suicides of hundreds of thousands of farmers. They appear to be wrong, and the real reasons why Indian farmers take their own lives remain largely unaddressed.

In October 2013, rallies against genetically modified organisms (GMOs) drew thousands of protesters in dozens of countries around the world. The synchronized events were called the March against Monsanto, a reference to the agribusiness company based in St. Louis, Missouri, that has pioneered the crop biotechnology industry. Many GMO opponents view Monsanto as an evil Goliath that is messing with nature, crushing small farmers, and poisoning the world with “frankenfoods.”

But of all the dirty deeds Monsanto is routinely accused of (which include using patented seeds and monopolistic behavior to destroy farmer’s livelihoods), one awful indictment stands out, and is often repeated in social media and news outlets as received truth. An *Al Jazeera* online story that reported on the anti-Monsanto protests cited it matter-of-factly halfway through its piece, when it mentioned Monsanto’s “link to hundreds of thousands of Indian farmer suicides.” The article went on to say: “More than 250,000 farmers have committed suicide in India after Monsanto’s Bt cotton seeds largely failed. Many farmers decided to drink Monsanto pesticide, ending their lives.”

Bt stands for *Bacillus thuringiensis*, a naturally occurring bacterium in soil that has insecticide properties. Over a decade ago, Monsanto (in partnership with Indian seed companies) produced genetically engineered cotton seeds with the Bt protein, which helps the crop ward off insects, particularly the bollworm. Since then, there have been widespread charges that the seed technology has failed, resulting in lower crop yields.

The sole attribution for the suicide claim in the *Al Jazeera* story is a hyperlink for “250,00 farmers,” which takes readers to a 2012 opinion column by writer Belen Fernandez (who actually reports the number of suicides as “nearly 300,000”), which she supports by linking to a 2009 op-ed by Vandana Shiva in the *Huffington Post*. Shiva is a prominent Indian-born environmentalist who, for the past decade, has said repeatedly that Monsanto’s “suicide seeds” have triggered a “genocide” in rural areas of India.

The Monsanto-Indian farmer suicide connection is a recurring motif for Shiva. She raises it when she references Monsanto or GMOs in her many writings, media interviews, and public talks. I heard her expound on it during a recent talk on sustainability that she gave at the Brooklyn Botanical Garden in New York City.

Shiva’s words are treated with earnest respect in liberal and environmental circles, where she is held in great esteem. If she insists that Monsanto and its GMO seeds have driven hundreds of thousands of Indian farmers to suicide—and

she has said this frequently—then there must be something to it.

After all, a much-acclaimed 2011 documentary called *Bitter Seeds* chronicled this heartrending phenomenon and Monsanto's culpability. As the popular environmental news site *Grist* put it, *Bitter Seeds* revealed the "tragic toll of GMOs in India." Michael Pollan, a professor of journalism at the University of California, Berkeley, and author of the best-selling *Omnivore's Dilemma* and other food-related books, told his 300,000 followers on Twitter that *Bitter Seeds* was not to be missed, and lauded it as "a powerful documentary on farmer suicides and biotech seeds in India."

By now, the "failure of Bt cotton" and Monsanto's "suicide seeds" are memes firmly embedded in the media ecosystem. Countless blog posts, tweets, and news stories state it as established fact. Monsanto employees get asked about it by their friends and families. The company has a page on its website that discusses the topic. During the 2013 March against Monsanto rallies, protesters held aloft signs that read "Indian farmer suicides."

If you had heard of this issue only from fleeting headlines or from friends on Facebook, or from Bill Moyers on PBS, who was told about it when he interviewed Shiva in 2013, you would be inclined to believe that Monsanto is guilty as charged, that the company was indeed responsible for the deaths of a quarter-million Indian farmers.

But there is one problem with this story. Bt cotton has been all the rage in India since it was officially approved in 2002. The technology has been adopted by over 90% of Indian cotton farmers. Multiple studies point to significant reduction in pesticide spraying and subsequent cost savings for cotton farmers. (Similar findings attest to the same in China, where Bt cotton accounts for 80% of its crop.) India's agricultural minister said in 2012 that the country "has harvested an average of 5.1 million tons of cotton per year, which is well above the highest production of 3 million tons before the introduction of Bt cotton." India is the world's second-biggest cotton producer, behind China.

Apparently, Indian farmers have come to overwhelmingly embrace genetically modified cotton. Yet there is an enduring belief that Bt cotton has failed in India, with tragic consequences.

This failure, the story goes, has resulted in burdensome debt and caused more than a quarter-million Indian farmers to take their own lives. Ronald Herring, a political scientist at Cornell University, has studied the seeming paradox and written on it extensively. As he observed in one paper, "It is hard to imagine farmers spreading a technology that is literally killing them."

Of suicides, seeds, and society

Agriculture, according to the Indian government, "is unquestionably the largest livelihood provider in India, more so in the vast rural areas." Seventy percent of India's 1.2 billion people live in the countryside. Many eke out a living on marginal lands.

Still, India is a top agricultural producer. The government crowns on a state-sponsored website that "India is the largest producer of pulses [a high protein grain], milk, tea, cashew and jute; and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds."

The larger picture is not so rosy. India's agricultural sector, which contributes only 21% of the country's gross domestic product, is highly inefficient, wasteful, and hobbled by inconsistent government policies that, as *The Economist* pointed out several years ago, "still fixes prices and subsidizes inputs, when public money would be far better spent on infrastructure and research." Lack of mechanization and irrigation, for example, are two key shortcomings. Many Indian farmers depend on erratic monsoonal rains.

As in much of the developing world, small-holder Indian farmers (those with less than two hectares of land) are most vulnerable to the vagaries of weather and climate change. They also have little access to institutional credit. As the World Bank has noted: "While India has a wide network of rural finance institutions, many of the rural poor remain excluded, due to inefficiencies in the formal finance institutions, the weak regulatory framework, high transaction costs, and risks associated with lending to agriculture." Consequently, when purchasing seed, fertilizer, and other crop-related items, poor farmers often turn to private money lenders who charge high loan rates.

This financial burden is commonly cited for the wave of farmer suicides that the media—particularly in India—have been reporting the past decade. However, researchers studying the phenomenon also note that it has struck unevenly in cotton-growing regions of central and southern India, where the social and economic stressors vary. For example, a 2012 paper in *The Lancet* that surveyed India's suicide mortality rate noted: "Studies from south India have shown that the most common contributors to suicide are a combination of social problems, such as interpersonal and family problems and financial difficulties, and pre-existing mental illness."

Still, this much is known: More than 270,000 Indian farmers have taken their own lives since the mid-1990s, according to India's National Crime Records Bureau. And that number is believed to be higher, although firm data is hard to come by. These deaths are real and they are tragic for the surviving families.

In April of 2013, I attended a conference at Cornell (which Herring helped to organize) on Indian agricultural issues. Several of the panels examined the phenomenon of Indian farmer suicides, and one of them specifically addressed the question, “What do we know about the incidence, distribution, and causes of the personal tragedies?”

What we know is that many of the farmer suicides have been concentrated in five of India’s 28 states. (Anti-GMO activists call this the “suicide belt.”) At the conference, Anoop Sadanadan, a political economist at Syracuse University, identified the role of Indian banking policies, rather than the alleged GMO crop failure, in contributing to the suicides. In a paper forthcoming in the *Journal of Developing Areas*, he argues that “the increase in suicides among Indian farmers is an unanticipated consequence of the bank reforms the country undertook since the early-1990s. In particular, the entry of foreign and new generation private banks has made banking in India competitive and led to fewer loans to agriculture and farmers. With increased competition, banks saw lending to the farm sector as unprofitable and unreliable.”

Banking practices vary across India. Sadanadan found that states with the highest incidence of farmer suicides were those that offered the least institutional credit to farmers. This forced small farmers into the hands of private lenders who charge exorbitant interest rates (as high as 45%). In those states where farmers had better access to institutional credit and farm insurance, there were markedly fewer suicides. Indian banks also offer credit to farmers with irrigated land, as this makes farming more viable. “Irrigation does drive bank lending,” Sadanadan said at the panel. “In states where there is greater irrigation, they [banks] lend money to the farmer.”

In his upcoming paper, Sadanadan writes that he also found “no evidence to suggest that the cultivation of a particular crop was related to suicides in India.” Some states with high agrarian suicide rates do not include cotton farmers. “Further, cotton was cultivated in some 10 other states that did not witness high incidence of farmer suicides,” he writes.

I asked Sadanadan if there are sociocultural factors that might also explain why Indian farmers have taken their own lives? “So farmers have a choice,” he responded. “In America, a farmer could just default on a loan and say, ‘come after me.’ But in India, they commit suicide. Why? There has to be something cultural there. Is it shame?” But the proximate cause of many suicides, he reiterated, is the “debt burden” associated with the loan sharks, especially in states where farmer credit is tight.

There is also a larger context to the tragedy of these farmer suicides. Nearly 1 million people are reported to take their

own lives each year worldwide. China and India account for almost half that total. According to Chinese government statistics, 80% of the 280,000 annual suicides in China occur in rural areas. Some of the main causes include social isolation, lack of economic opportunity, and inadequate access to mental health services.

The World Health Organization (WHO) estimates that approximately 170,000 deaths by suicide occur annually in India. Another *Lancet* study also published in 2012 found that young women in rural areas of India and China “are at especially high risk of dying by suicide.” The authors of this paper were surprised to find “that suicide was higher in India’s richer states and that divorce, separation, and widowhood in women were protective [that is, mitigating] factors for suicide.” Why would that be? One of the paper’s coauthors said in a press interview that “interpersonal violence” (such as “marital violence”) and “economic difficulties” in India are the “main social determinants for suicide in women.” A common method of suicide is ingesting pesticides.

Moreover, as horrific as India’s farmer suicide numbers may be, only about 10% of the total annual number of suicides in India are those of farmers. To further put these numbers in perspective, every year in India more than 200,000 children under the age of 5 die from diarrhea, a toll that could easily be reduced by improving the infrastructure for drinking water and sanitation.

Surely this larger cultural and economic context is not news to those who have been closely monitoring human rights and social justice concerns in India. Yet since the mid-2000s, advocacy organizations, international media, and even some academic groups have latched onto to the plight of small-holder Indian farmers.

As highlighted in a 2011 report by the New York University School of Law’s Center for Human Rights and Global Justice, one Indian farmer commits suicide every 30 minutes—a number based on Indian government data that listed 17,638 farmers as having killed themselves in 2009. The report’s title, *Every Thirty Minutes: Farmer Suicides, Human Rights and the Agrarian Crisis in India*, was picked up (in shortened form) as a tagline for the *Bitter Seeds* documentary. “Every Thirty Minutes” has since become a useful rhetorical device for activists who have melded it into their screeds against Monsanto and GMOs. One organic foods advocacy website writes: “Every 30 minutes an Indian farmer commits suicide as a result of Monsanto’s GM crops. In the last decade more than 250,000 Indian farmers have killed themselves because of Monsanto’s costly seeds and pesticides.”

That website links to and posts an excerpt of a 2008 story

in the *Daily Mail* (a newspaper published in the United Kingdom) headlined, “The GM Genocide: Thousands of Indian farmers committing suicide after using genetically modified crops.” The *Daily Mail* is a notorious tabloid, but it is also the world’s largest English language newspaper site. That particular article is omnipresent on the Internet, referenced (and linked to) by many articles on Monsanto, especially those at alternative health websites that promote “natural” cures and organic foods.

Joseph Mercola, a controversial alternative medicine vendor who has been featured on *The Dr. Oz Show*, a popular TV talk show, runs one such high-traffic site. He advises his readers to avoid foods “laced with genetically modified ingredients.” In 2011, Mercola penned a long article about a two-week trip he took to India, where he “experienced the Indian farmers’ plight firsthand.” Mercola’s web chronicle has gotten over 180,000 online views and has been emailed 1 million times. At the article’s outset are embedded videos of Vandana Shiva discussing the Monsanto-GMO link and a trailer for *Bitter Seeds*. Mercola goes on to say that “a farmer commits suicide by pesticide every 30 minutes in India,” and explains that genetically modified seeds are the fundamental reason for the “GM genocide.” Monsanto, he writes, “has blood on its hands.”

So the Monsanto-farmer suicide story has been accepted, repeated, and amplified by a widening range of people and organizations, including many major environmental groups, such as Greenpeace; mainstream media figures, such as the respected Bill Moyers; and academic groups, such as the human rights center at New York University. It has even found its way into the scientific community. In October of 2013, when the subject of food security arose during a panel at the Adelaide Festival of Ideas in Australia, Paul Ehrlich, a biologist at Stanford University, author of the 1968 classic *The Population Bomb*, and a member of the National Academy of Sciences, stated that Monsanto had “killed those farmers in India.”

Anatomy of a myth

No one has done more to promote the narrative of Monsanto’s “seeds of suicide” than Vandana Shiva. A leader of the antiglobalism movement in the 1990s, Shiva often depicts the peasant agrarian lifestyle as a sacred stewardship of the land, and she views the patenting of agricultural seeds as part of a plot by multinational corporations to dominate the world’s food supply and enslave small farmers. She is the author of numerous books, including *Biopiracy: The Plunder of Nature and Knowledge*, published in 1997. Her idyllic view of traditional farming and the nefarious threat to

it created by GMOs is itself a popular item on the antiglobalism agenda, and is shared among many people in the environmental community.

Shiva’s fixation on the suicides of Indian farmers grew after the Indian government in 2002 officially approved Monsanto’s genetically engineered Bt cotton crop. By the mid-2000s, Shiva and her allies in the anti-GMO movement were advancing a storyline that coincided with increasing media coverage of Indian farmer suicides. In a 2006 report published by her organization, Navdanya, Shiva asserted that the higher seed cost and purported failure of “Monsanto’s Bt. cotton has already pushed thousands of Indian farmers into debt, despair and death.” This “failure” was asserted for Bt crops that were ruined by pests or drought, causing the farmer to pile up debts. The report states: “Genetic engineering is killing Indian farmers.”

Other influential voices would soon echo this claim. “I blame GM crops for farmers’ suicides,” said Prince Charles in 2008. That year, at an event in India sponsored by Shiva, the Prince of Wales gave a widely publicized speech that reinforced the Indian farmer suicide-GMO connection.

The *Daily Mail* piled on with its 2008 “GM Genocide” article, and since then, a steady drumbeat of similarly embellished claims (most of which continue to live on the Internet) has sustained and promulgated the Monsanto Bt-cotton-kills-Indian farmers narrative. The story garnered even greater cultural cache and wider audiences with the 2011 release of *Bitter Seeds*, which was screened at film festivals around the world and won many accolades.

The movie’s director, Michal X. Peled, had previously made two documentaries with a social justice/globalization theme and was searching for a third idea to round out a planned trilogy when he met Vandana Shiva in the late 2000s at a film festival in Greece. As he recounts in an interview with *Filmmaker* magazine: “She said, ‘you should come to India for your third one.’ And I told her, ‘Well actually that’s kind of what I had in mind. But what do you got?’ And she said, ‘The farmer suicide crisis. Every 30 minutes a farmer kills himself.’ And I thought she must be exaggerating, because I had never heard of it. So I started investigating it, and I asked her, ‘What’s the globalization angle?’ And she told me, ‘It’s because of the seeds that Monsanto sells.’ And three months later I went to India, and she made the arrangements for me to meet people and start traveling around.”

Bitter Seeds is an affecting film that captures the marginal existence of poor farmers in India and the sociocultural circumstances that defines their lives. But like every moral fable, it needed a villain, in this case Monsanto’s GM cotton seeds. The film is set in a rural Indian village “at the

center of a suicide epidemic.” In its review, *Grist* wrote: “As *Grist* and others have reported, the motivations for these suicides follow a familiar pattern: Farmers become trapped in a cycle of debt trying to make a living growing Monsanto’s genetically engineered Bt cotton. They always live close to the edge, but one season’s ruined crop can dash hopes of ever paying back their loans, much less enabling their families to get ahead.”

Cornell’s Herring, who has done extensive fieldwork in India, has closely tracked the Indian farmer suicide issue since the late 1990s. In a 2006 paper, well before *Bitter Seeds* came to movie screens, he noted that Shiva had shaped the public narrative and that she “provided the main frames for the connection between globalization and transgenics.”

Yet Herring at the time was also puzzled by a disconnect between what was literally happening on—and in—the ground in India, and what was being claimed by Shiva. For it was already clear by the mid-2000s that Indian farmers had enthusiastically embraced Bt cotton over conventional cotton seeds. Indeed, there was such a demand for the transgenic cotton by the early- and mid-2000s that counterfeit Bt seeds were being sold by unscrupulous parties; these spurious seeds were cheaper, but they did not contain the advertised Bt pest-resistant gene, which led some farmers to “honestly but mistakenly believe that their Bt crop has failed,” Herring says.

Meanwhile, Shiva and others ignored such nuances and kept insisting that Bt cotton had failed—that it did not produce higher yields and increase farmers’ incomes. In his paper, Herring pondered the contradiction: “Rather than asking why there is such a sharp adoption curve of both small and large farmers, and commercial seed firms, across all cotton areas of India, activists continue to declare ‘the failure of Bt cotton.’”

“Why then do farmers not only buy the seeds, but sometimes save and replant them, and cross them into new Bt hybrids?” he asked. “Why do capitalist firms buy expensive licenses to produce a failed technology?”

Shiva and her anti-GMO and anti-Monsanto allies were unfazed by these contradictions. Indeed, their rhetoric would become more charged in the coming years and the number of suicides attributed to Monsanto and Bt cotton would increase ten- and twentyfold. “Every [Indian cotton farmer] suicide can be linked to Monsanto,” she told *The Independent*, a British newspaper, in 2011. Why was she doubling down in the face of contrary evidence? As Herring explained, “If overwhelming farmer adoption has in effect settled the agro-economic questions around Bt cotton in India, new claims are needed to justify continuing the struggle.”

This would be the struggle against the globalized, neoliberal system of free trade, which Shiva and like-minded critics oppose. To them, such a system benefits only large corporations such as Monsanto, which use their political influence and patented GMO technology to corner the seed market. So when India approved Bt cotton (thus far the only GMO crop permitted in the country), it quickly became a surrogate cause in the larger ideological battle.

In this battle, the Bt cotton-Indian farmer suicide narrative that Shiva helped to craft proved to be powerfully seductive and immune to contradiction or correction. Not only does there seem to be no evidence that farmers using Bt cotton seed are more likely to commit suicide than others, but farmers that do use the seeds appear on the whole to be benefiting from them. A 2008 meta-review of data between 2002 and 2006 “suggests that Bt cotton has been quite successful in most states and years in India, contributing to an impressive leap in average cotton yields, as well as a decrease in pesticide use and increase in farmer revenue.” The authors of this paper, published by the International Food Policy Research Institute, say that their analysis “is sufficiently well documented to discredit the possibility of a naïve direct causal or reciprocal relationship between Bt cotton and farmer suicides.”

These conclusions have since been corroborated by additional studies that found that Indian farmers using Bt crops spend less money on pesticides and earn more money from higher yields. In fact, a 2013 study in *PLOS ONE* found that in India “the adoption of GM cotton has significantly improved calorie consumption and dietary quality, resulting from increased family incomes.”

In 2013, after attending Shiva’s talk at the Brooklyn Botanical Garden, I asked her about the mounting evidence that contradicted her “suicide seed” claims. She dismissed them breezily and said, “Those are the Monsanto studies.” But neither Monsanto nor the biotechnology industry funded any of the aforementioned studies.

Never mind; that same week, she went on a news program in the United States and said: “Two hundred and seventy thousand Indian farmers have committed suicide since Monsanto entered the Indian seed market. That’s more than a quarter-million. It’s a genocide.”

The unresolved plight of Indian farmers

Humans have been altering agricultural plants for thousands of years. Relatively recent advances in recombinant DNA technology has brought a new precision to the process, enabling plants to be more resistant to pests and diseases.

In 2014, transgenic crops account for roughly 10-15%

of the world's agriculture. Much of the corn, soybean, cotton, and canola produced today are genetically modified. These crops are mostly used for animal feed, biofuels, and fiber. Biotechnology is expected to play a larger role in food production in the coming years and decades. Its advocates also say that crops genetically engineered to withstand harsh environmental conditions will help the world adapt to extreme weather and higher temperatures resulting from global warming, and feed a global population that is projected to reach 9 billion people in 2050.

But ever since the introduction of biotechnology into agriculture more than two decades ago, activists in the environmental, social justice, and food movements have passionately opposed it. Environmental groups such as Greenpeace and Friends of the Earth played a major role in successfully demonizing biotechnology in Europe in the 1990s and have imported their anti-GMO campaigns to Asia and Africa. These campaigns have rested, in part, on claims about adverse human health affects that are groundless. The other main pillar of anti-GMO campaigns is built on anticorporate and anti-big business philosophy.

Much of the criticism of Monsanto, for example, revolves around its patenting of genetically modified crops. This "bio-piracy" (as Shiva calls it) has enabled the company to monopolize the seed market with its products, critics charge. Corporate domination of agriculture (which, the argument goes, perpetuates an industrial-sized, profit-incentivizing system) makes many people uneasy, particularly those who care deeply about what is in their food, how it is produced, and who makes the money from producing it.

When concerns about GMO foods combine with this deep distrust of a globalized, corporatist agricultural system, the result is what Herring identifies as the two main strands of GMO resistance. The proliferation of these GMO fears is made possible, he says, by "knowledge claims" circulated by transnational advocacy groups and activists (such as Greenpeace and Shiva). These claims are, in turn, funneled through the media and high-profile sources (such as the *Daily Mail* and Prince Charles and Bill Moyers). The socially conscious director of *Bitter Seeds* made a documentary premised on Shiva's claims and relied on her advocacy network to provide the farmers featured in his film. It is a self-validating closed loop.

Monsanto, for its part, has recently decided to engage its critics more directly in public forums. One such event took place in Montreal in November 2013 when Trish Jordan, Monsanto's Canada's director of public and industry affairs, faced off against Eric Darier, Greenpeace International's senior campaigner on agriculture. During the debate, Darier

railed against the "huge concentration around food" and, hitting a familiar theme of GMO opponents, said that "those who control the food supply, whatever part of it, will control the rest of society."

In its coverage of the event, Canada's *National Post* reported: "The evening that started with anti-GMO pamphleteers outside ended for Ms. Jordan with students from the audience questioning her about why Monsanto is driving Indian farmers to suicide.

And so the narrative persists, firmly embedded in popular knowledge, against all evidence to the contrary. "I seldom give a presentation on agricultural biotechnology anywhere in the world in which someone does not bring up the farmer suicides in India," Herring says in one paper. The sensationalist stories of Bt disaster, he believes, play into broader anxieties about GMOs stoked by activists and "may assist in delaying diffusion of biotechnology" to farmers around the world.

One consequence in India appears to be the decade-long delay of Bt brinjal (a variety of eggplant), a staple food crop. A number of nongovernmental organizations in India have fiercely campaigned against Bt brinjal, using the stories of supposed Bt cotton "failure" as ammunition. While a moratorium on Bt brinjal remains in effect in India, neighboring Bangladesh has just approved the crop.

Meanwhile, farmers in India continue to take their own lives. The Indian media covers such suicides on a near daily basis. A story in the *Hindustan Times* on November 22, 2013, reports that seven farmers killed themselves after "unseasonably heavy rains destroyed their crops." This article, attempting to put the recent spate of suicides in a larger national context of the past decade, paraphrased a finding from a 2012 Indian government report on rural development: "Indebtedness and lenders confiscating land have been attributed as the main causes of the farmers deaths."

The need for Indian policy reforms that provide rural farmers with much better financial and social service resources seems clear enough. And when drought or floods victimize these farmers, the lack of a state-level safety net appears to drive some of them to suicide. Blaming farmer suicides on Bt cotton thus seems not only to be incorrect but also a distraction from the real causes of a tragic problem. One is left wondering what problem Vandana Shiva and other like-minded activists are actually interested in solving, since it does not seem to be the livelihoods of Indian farmers.

Keith Kloor (keith.kloor@gmail.com) is a freelance journalist based in Brooklyn, NY.