How India's changing cotton sector has led to distress, illnesses, failure

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Andrew Flachs, an assistant professor of anthropology at Purdue University and standing on the far left, studied cotton growing in Telangana, India, for six years, talking with the same farmers year after year. One of his findings was that many farmers were only planting certain seeds for about a year and a half before moving on to a new kind, leading to uncertainty about yields. Credit: Purdue University

India is the No. 1 cotton producer in the world, but its crop is in distress. Heavy use of pesticides, new genetically modified seeds, suicides, and an overabundance of seed choices have interacted within the past decade to create an environment for farmers that is dangerous and potentially even fatal.

Andrew Flachs, Purdue University assistant professor of anthropology, studied the changing landscape of cotton growing over six seasons in Telangana, India. He was seeking to understand the issues at play for cotton farmers and identify potential solutions to the crisis. His findings are published in a book titled "Cultivating Knowledge: Biotechnology, Sustainability, and the Human Cost of Cotton Capitalism in India."

By the time Flachs began his research in 2012, around 95% of the cotton farmers sowed was genetically modified cotton to kill pest caterpillars. This popular cotton was not without its flaws, however.

"When you take one major pest out of an ecology, you open up a niche for another pest," Flachs said. "Other pests moved in to take over the niche, and pesticide spraying rates rose higher than they were before the genetically modified cotton was introduced."

Nonfood-grade pesticides, like those used for cotton, have been linked to DNA damage, hair loss, nausea and chronic endocrine disorders. Women and children picking the cotton are most exposed, as are the men who spray.

"The concern is that it doesn't matter what the pest populations are because when one farmer sees another farmer spray, they spray too," Flachs said. "In practice, agriculture is a kind of performance. Farming in this region is very much influenced by what farmers observe their

neighbors doing. The farm is a public stage that shows everyone how successful you are or not. A farmer once told me that if he saw his neighbor spray four times, he'd spray five to keep up, be competitive."

In the early 2000s, when genetic modification of cotton seeds was legalized in India, three genetically modified seeds had been released. By 2016, an estimated 1,600 different seed options had cropped up. Seed ads were displayed on the sides of public buses and blew up the airwaves. Seed trucks drove around neighborhoods and played jingles. The choices for farmers were overwhelming.

"Because of the overwhelming choices, many farmers were apt to ask for whatever seeds everyone else was buying," Flachs said. "Despite all the advertising, the yields from all the different seeds were essentially the same. Farmers stuck only with certain seeds for about a year and a half before switching to something new."

From 2013-16, Flachs noticed that crops in Telangana were being planted increasingly more densely, in tight, straight lines, as opposed to the traditional grid pattern. Because of this, more seeds were being planted and each plant flowered fewer times. The cycles were faster, more fertilizer and pesticides were being used, and plowing oxen couldn't get through. So, weeding had to be done by hand, which could be expensive, or through the use of herbicides now linked to increased cancer risks, Flachs said.

"Agriculture is a gamble. It's speculative, and many people who are betting big came from a caste community that historically could not own land," he said. "There's a generation that now has to live with that story, wanting to bring success to their families but often lacking the resources. That disjuncture can be devastating and can lead to existential crises of masculinity and suicide. In Telangana, there are as many as 20,000 suicides per year. The most common form of suicide in the area is,

tragically, to drink pesticide."

Flachs, however, remains optimistic. There are ways, he says, to combat what has happened to the cotton sector in Telangana and redefine success in farming.

Historically, the idea of success has always been tied to yield. That narrative is good at selling cotton seeds; after all, India is the No. 1 cotton producer in the world and more than 95% of that land is planted to genetically modified seeds. But groups supporting organic farming, including NGOs and private companies, are finding other ways to be successful. The yields in organic cotton farming are not great, but costs are actively subsidized, and the decisions and risks are taken collectively. Flachs says incentives are needed to make the organic program work. Incentivizing those other routes to success is key to making organic farming work. Though only about 3% of India's cotton is organic, about three-quarters of the world's organic cotton comes from there. This isn't just true for organic agriculture, which almost always uses cooperative buying and selling models—farmers planting genetically modified seeds as part of cooperatives reduce their risks, enjoy higher yields, curb their chemical use, and prevent suicides.

Flachs believes that there is a need for policies focused around agriculture rather than growing as much cotton as possible. Non-organic farming would be much more stable if similar ideas were applied. Cooperatives, whether organic or not, filter seed options in a methodical and trustworthy way by turning to scientific literature and democratic voting to combat the anarchic market.

"There's no debate that there is a crisis," Flachs said. "We want people to live a good life. This data in this context shows that farmers aren't able to live those kinds of good lives; the policies in place aren't solving that problem."

More information: Cultivating Knowledge: Biotechnology, Sustainability, and the Human Cost of Cotton Capitalism in India. uapress.arizona.edu/book/cultivating-knowledge

Provided by Purdue University