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[Book review] Flachs, Andrew. Cultivating Knowledge: Biotechnology, Sustainability, and the Human Cost of Cotton Capitalism in India

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Cultivating Knowledge. Biotechnology, Sustainability, and the Human Cost of Cotton Capitalism in India. Andrew Flachs. Tucson: The University of Arizona Press, 2019. 225 pp., maps, photos, diagrams, notes, index, bibliography. £27.08 cloth (ISBN-13:978-0-8165-3963-5).

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Genetically modified (GM) cotton is currently the dominant commercial crop planted on small farms in the global south. Ever since its introduction in India in 2002, GM cotton has been the subject of a bitter controversy between supporters, who have credited it with a threefold increase in cotton yields over the following decade to the benefit of smallholder livelihoods, and opponents who view these laboratory designed crops as environmentally toxic, a danger to both human and planetary health due to their high use of hazardous pesticides, and responsible for the loss of local farmer knowledge and agency. Andrew Flachs' study is a timely and crucial contribution to the debate.

The author approaches the subject as an anthropologist, his doctoral research having involved an extended period of living and working amongst the cotton farmers in the villages of Warangal District, Telengana State in southern India. Being an observer-participant in the daily lives of local communities enables deeper insights as compared with conventional development-focused approaches, into how smallholders build up the knowledge that shapes their choice of GM cotton seeds and the resulting impact on their livelihoods and aspirations. However, what particularly sets this work apart from other studies devoted to GM cotton is the use of a comparative method whereby the experiences of GM cotton farmers are compared with those of smallholders who have moved to organic cotton cultivation. As the GM/Organic opposition is also the main ideological faultline in current approaches to Indian

agriculture, with each being offered as the solution to the challenges faced by smallholders, this method gives a voice to local farmer experiences of cotton seed choices and of these contrasting value-systems espoused in the process.

The study reveals the major disadvantages faced by small farmers in their attempts to secure sustainable livelihoods from GM cotton farming. In the main, this is because they are unable to draw on customary local knowledge to learn about the hybrid cotton seed brands developed and sold by agribusiness; indeed the constantly evolving GM seed system is largely designed to be 'unknowable' to farmers. As a result, when selecting and buying cotton seeds, farmers rely on the uncertain promise of confusing seed advertisements, the persuasion of vendors in local shops, and the choices made by socially influential richer farmers. This is a hugely disempowering experience, turning smallholders into consumers of knowledge and technologies produced by remote agribusiness companies, rendering obsolete their local farming knowledge and considerably increasing the risks to successful crop outcomes. These risks are amplified by the unsuitability of many of the laboratory engineered cotton hybrids to the non-irrigated, drought-prone lands of the majority of the smallholders. Moreover, they are encouraged by government to grow these crops in dense, anti-biodiverse monocultures with heavy chemical inputs, particularly pesticides, which damage both human health and agrarian environment. All this makes GM cotton farming an anxious gamble for smallholders, potentially incurring cycles of debt and feelings of failure which sometimes lead to suicides. Nonetheless, these small farmers persist in cotton cultivation in the hope of good yields and consequent profits that will enable their families to live well. This, the author suggests, is an economistic view of success promoted by the dominant global neoliberal agricultural environment.

An alternative understanding of ‘living well’ is expressed by other local farmers who have abandoned GM in favour of organic cotton. For them, farming success does not primarily depend on higher income from yields (which tend to be lower than from GM production) but on non-economistic, anti-commodity values such as good health, sustainable soils, and care for the local community and environment. In partnership with organic agriculture NGOs, these smallholders cultivate cotton as part of a biodiverse array of crops which includes sorghum mainly grown from preserved heirloom seeds for food security, rice, maize, and a wide variety of vegetables and useful plants. Moreover, the NGOs are attentive to local village needs, returning profits for education and infrastructure projects while also providing financial safety nets which mitigate farmer debts. However, the study also suggests that in Telengana, NGOs direct most aspects of organic cotton production programmes, leaving farmers with little opportunity to make their own seed planting choices. Thus while GM cotton farming is a high-risk, high-stakes venture, sponsoring NGOs render organic cotton production virtually risk-free in the interests of developing a persuasive narrative that will increase the appeal of this cotton to international ethical consumers ‘as a symbol of sustainable development’ (p. 123). The author argues that in this scenario, most smallholders have little incentive to develop detailed knowledge of their cotton seeds, relying instead on emulating and adapting the practices of a small group of influential farmers who have successfully converted to organic farming. However, given the exceptionally high level of organic farming skills amongst this group which includes the preservation and reproduction of cotton seeds, this may be viewed as quite a normal process of knowledge transmission.

The title ‘Cultivating Knowledge’ might appear a trifle confusing, given that much of the study is devoted to explaining how farmers cultivate in the absence of any detailed knowledge of the cotton seeds they are compelled to use. In a previous article on farmer knowledge in Telengana, Flachs and Stone (2019) showed how levels of farmer knowledge

closely reflected the extent to which the seeds used had to be purchased as commodities, and in particular how farming care and expertise, based on traditional knowledge, tend to coalesce around the least commodified, mainly food crops that are culturally important to rural communities. In contrast local knowledge and farmer agency were least in evidence in relation to branded GM cotton, the most commodified product in the households. While its importance is occasionally acknowledged, the wider context of the entire cropscape might have featured more prominently in this study, potentially yielding deeper insights on farmer knowledge which are here derived from a tight focus on cotton alone. Moreover, such knowledge tends to be viewed as emanating entirely from contemporary processes as ‘social learning’, with little attention given to historically and heritage derived aspects of smallholder capabilities. Yet, in India, one of the attractions of organic cotton cultivation that resonates particularly with older farmers is that it is consistent with cultural values and many traditional farming practices they are familiar with. There is a rare glimpse of the potential significance of heritage when one young farmer interviewed expresses regret at losing the ecological knowledge his parents possessed, and this aspect might have been further explored given, as the author himself points out, its crucial epistemological importance to sustainable farming.

The study offers a theory of knowledge that draws on the concept of ‘performance’ to explain the subjective and motivational aspects of smallholder practices in Telengana. Once again this is quite original and persuasive, though perhaps the realisation of the full potential of this approach would require a closer engagement with the cultural aspects of farming lives such as festivals and celebrations, including their non-secular dimensions (In India, there are occasions during the agricultural season when the farm *actually* becomes a musical stage!). There are also occasional statements that betray an over-cautious even handedness between the respective claims of GM and Organic farming that appears to be at odds with the ethnographical evidence presented. For instance, the author states that ‘My political ecology

lens suggests that organic agriculture is not inherently better for farmers, debts, landscapes, or suicide rates than GM cotton, but will depend on local social institutions and the learning process of environmental managers' (p. 139). Yet both this and other studies such as Eyhorn (2007) provide a wealth of evidence which indicates that organic farming programmes are also *intrinsically* about strengthening local institutions, addressing farmer debt, and disseminating agroecological knowledge which make them more successful and sustainable than GM agriculture. Particularly from a political ecology perspective, the success of organic farming's endeavours to develop agroecologically diverse local crop (and particularly food) systems fitted to the capacities of landscapes and serving local and regional markets, will be crucial if we are ever to overcome our current crises.

Still, *Cultivating Knowledge* remains a superbly original study of GM cotton farmers which deserves a wide readership. My comments are mainly offered as food for thought for future research directions.

References

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