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The Legitimation of Development and GM Crops:
The Case of Telangana, India

Abstract

This study explores the relation between Bt cotton adoption and farmer suicides in India. This is undertaken through comparing the debt levels of Bt cotton cultivators with those adopting alternative organic and Non-Pesticide Management (NPM) methods. The study involves a total of 26 participants in three villages in Telangana, India. It argues that measures of indebtedness need to be adopted as part of assessments of both Bt cotton and development policy.

The issue of genetically modified (GM) crops and their potential contribution to global development remains controversial worldwide. Bt cotton, currently India's only officially approved genetically modified crop, was passed for commercial cultivation in 2002. Bt crops are genetically modified to incorporate one or more *Cry* genes from the soil bacterium, *Bacillus thuringiensis.* This is purported to render the crops resistant to Lepidopteran bollworms, of which the most destructive is the American bollworm *(Helicoverpa armigera).*

Despite its official approval, Bt cotton continues to attract protests throughout India. The central concern is whether Bt cotton increases the incomes of India's resource-poor small and marginal farmers, or whether it instead contributes to an exacerbation of their debt exposure. This relates, in particular, to the issue of farmer suicides, deaths which have been strongly linked to indebtedness (Sridhar, 2006: 1560; Deshpande and Shah, 2010: 134).

This study compares the indebtedness of Bt cotton cultivators with debt levels of those adopting alternative approaches to cultivation in Telangana, a state located to the south-east of peninsular India. Participants are differentiated according to their caste, gender and land-holding. This acknowledges that the poor are not homogenous, and that 'development' is a social process whose interpretation and impact is mediated through power relations in particular contexts. Ideas concerning development are diffused through emulation of those regarded as more advanced. This relates to a tendency which Henrich (2001, as cited in Stone, 2007: 71) refers to as a 'prestige bias' which occurs when 'a farmer emulates another on the basis of prestige, regardless of that farmer's actual success' (ibid.).

As a region, Telangana is noted for its particular exposure to agrarian risk, most notably that associated with water scarcity, ecological degradation, and climatic catastrophes such as flooding, droughts, and cyclones. This study is located in three villages (pseudonyms have been used for villages and participants) in the Warangal district of the state. These villages have adopted markedly different approaches to negotiating the risks of cultivation. In Bantala, all cultivators have adopted Bt cotton varieties; in Orgampalle, an organic village, the use of fertilisers, pesticides and Bt cotton varieties are banned; and, in Nandanapuram, 90 per cent of cultivators adopt Bt cotton varieties; the remainder, however, have opted for Non-Pesticide Management (NPM), a cultivation practice which prohibits the use of Bt cotton varieties and pesticides.

Until 2014, Telangana formed part of the state of Andhra Pradesh, from which it has since separated. Prior to secession, Andhra Pradesh ranked among the top five states in India with regard to farmer suicides. In 2010, the *Times of India* reported that 93 per cent of Andhra Pradesh's rural poor was in debt (Srivasta, 2010). This was despite a Vision 2020 initiative launched by the state government in 1999 which vowed to eradicate poverty by 2020 through a development policy which emphasised wealth creation, globalised trade and technological innovation.

The approach to development associated with Vision 2020 contributed to the increased privatisation of public services such as education and health, and heightened expenditure on dowries and house construction. The latter was stimulated by the launch of the Indiramma (Integrated Novel Development in Rural Areas and Model Municipal Areas) initiative in Andhra Pradesh in 2006 which provided funding for home building. Many beneficiaries of the scheme accessed loans in order to build homes whose costs exceeded those covered by the grant.

A 2014 Government of India report found that the new state of Telangana ranked second in India for farmer suicides (Goyal, 2015: 267). Of the 898 farmer suicides reported, 69 per cent were by males, and small and marginal cultivators accounted for 55 per cent (ibid.: 383). The new state also had the highest number of female farmer suicides in India (ibid.: x). The report did not, unfortunately, include an analysis by caste.

The villages were visited on alternate weekends between June, 2010 and March, 2011. Participants were selected along the dimensions of caste, land-holding and gender with the assistance of villagers with access to data on village composition. These included a school-teacher, and government and NGO employees. Participants were interviewed in their homes up to three times over a nine-month period chosen to coincide with a cotton season. Villagers were also observed at work in the fields.

A total of 26 participants were interviewed. Table 1 provides an overview of the villages and distribution of participants:

Table 1: Overview of the Villages and their Participants

Village	**Population**	**Caste Composition: %**	**% of land allocated to cotton**	**Cultivating Participants**	**Landless Participants**
Bantala	2,800	Forward Castes: 1; Backward Castes: 59; Scheduled Castes: 40	61	6 (all Bt cotton cultivators)	2
Nandanapuram	3,500	Forward Castes: 1; Backward Castes: 59; Scheduled Castes: 40	63	8 (6 Bt cotton and 2 NPM cultivators)	2
Orgampalle	202	Forward Castes: 0 Backward Castes: 100 Scheduled Castes: 0	17	7 (all organic cotton cultivators)	1

The majority of land-holding participants cultivate cotton on marginal (0.1 – 2.5 acres) and small-holdings (2.6 – 5 acres) - 43 and 33 per cent, respectively. Fourteen per cent of land-holding participants (three) cultivate cotton on semi-medium holdings (5.1 – 10 acres). Only two of the land-holders (10 per cent), one in Bantala and one in Orgampalle, operate medium holdings (10.1 – 20 acres). Fifty-six per cent of participants are Backward Castes, 24 per cent are low caste Scheduled Castes and 20 per cent are upper

caste Forward Castes. The village of Orgampalle comprises solely of Backward Castes. Thirty-two per cent of participants are female, half of whom are widows.

Details of the accumulated debt levels up to the 2010/2011 season by land-holding, caste, and gender, as reported by participants themselves, are provided in Table 2.

Table 2: Average Accumulated Debt Levels per village by Land-holding of Cotton, Caste and Gender

	BT	**NP (Bt)**	**NP (NPM)**	**OR**
Participant Numbers	**N = 8**	**N = 8**	**N = 2**	**N = 8**
Average Debt Levels (Rupees)	**239,375**	**188,750**	**12,500**	**48,625**
Average Debt Level per Land-holding of Cotton				
Marginal (0.1 – 2.5 acres)	25,000	215,000	25,000	47,250
Small (2.6 – 5 acres)	382,500	180,000	0	50,000
Semi-medium (5.1 – 10 acres)	150,000	110,000	-	-
Medium (10.1 – 20 acres)	400,000	250,000	-	-
Landless	62,000			
Average Debt Level per Caste				
Forward Caste	550,000	236,667	-	-
Backward Caste	105,000	110,000	0	42,375
Scheduled Caste	24,667	60,000	25,000	-
Average Debt Level per Gender				
Male	263,000	138,000	12,500	31,500
Female	58,000	156,667	-	75,000

BT = Bantala; NP (Bt) = Nandanapuram Bt cultivators; NP (NPM) = Nandanapuram NPM cultivators; OR = Orgampalle (organic)

As Table 2 highlights, the average debt levels of Bt cotton cultivators in both Bantala and Nandanapuram are significantly higher than those for NPM cultivators in Nandanapuram, and organic cultivators in Orgampalle. Average debt levels for Bt cotton cultivators in Bantala are higher than those for their counterparts in Nandanapuram. The high levels of

debt in Bantala are surprising, given that Bt cotton was strongly legitimated by participants due to their assertions of its high yields, reduced pesticide use, and positive contribution to income. These benefits were traded against concerns for its purported links to animal deaths and future sustainability due to soil erosion and ongoing pesticide requirement.

The break-down in Table 2 indicates that male, Forward Caste medium land-holders in Bantala have the highest debt exposure. A closer analysis at the individual level shows that Pavan (male, Forward Caste, medium land-holder), a powerful land-holder who introduced Bt cotton to the village, has the second highest individual debt exposure of the study (he is Rs 400,000 in debt). Sudhakar (male, Forward Caste, medium land-holder) in Bantala has the highest individual debt exposure (Rs 700,000).

These highly indebted Forward Caste participants in Bantala have assets such as land to sell should they be required to do so. Pavan also operates a successful village shop and Sudhakar owns a tractor. The small and marginal cultivators who seek to emulate the lifestyles of these Forward Castes as part of the development process, however, possess small tracts of land which are sufficient to secure loans, but their vulnerability to pauperisation and landlessness is far greater given their more limited asset base. For the landless, emulation of Forward Castes is out of the question given their restricted ability to access loans as a result of their lack of collateral for borrowing.

Table 2 highlights that, apart from the marginal land-holders in Bantala, cultivators with marginal and small-holdings of Bt cotton have a significantly higher average debt exposure than those in the same categories adopting organic and NPM methods. The average exposure of marginal cotton cultivators in Bantala is lower given that both Scheduled Caste cultivators in this category have alternative sources of income (a male Scheduled Caste, Sudeep, owns an auto-rickshaw, and Ashna, a female Scheduled Caste, has a husband who works in construction). Even with this additional income, however, Ashna was obliged to source a loan in the 2010/2011 season to pay for labour costs, and hospital care for her daughter. Her entire crop was destroyed due to flooding, and she was left Rs 50,000 in debt.

The debt exposure for Bt cotton cultivators with small-holdings in Bantala is almost as high as for the medium land-holders, whose cultivation practice they are emulating. The reasons cited for the indebtedness of the Forward Caste Bantala participants include leasing and cultivation costs (seeds, inputs and labour), and dowry and the education of children (Pavan); cultivation costs, the purchase of land and a tractor, and drilling for a borewell (Sudhakar). Indebtedness can therefore be progressive where it involves attempts to improve a cultivator's situation (e.g., buying land and a tractor). However, this outward display of success among Forward Castes serves to legitimate their cultivation practice to lower castes, despite the fact that it is being funded by borrowing.

In Nandanapuram, it is again the Forward Caste medium Bt cotton cultivators who are most indebted. These debts are due to cultivation costs (seeds, inputs and labour),

education of children and, for Rashi (Forward Caste, female, small-holder), health care, and house construction (Rs 500,000 is being spent on a sizable house to be shared in a joint family arrangement with her sister). In Rashi's case, even the vulnerability associated with her widow status and gender does not eliminate this Forward Caste tendency towards conspicuous consumption, funded by debt.

The difference between the debt exposure of Bt cotton and organic cultivators suggests the impact of the additional costs of Bt cultivation in addition to the other reasons for indebtedness in the Telangana context. Participants in Orgampalle incur neither input costs, nor those for irrigation (borewells are banned in the village). The main reasons for indebtedness include dowry, labour costs, house construction and hospital charges. Although small and marginal cultivators in Orgampalle are still in debt due to reasons other than cultivation costs, they are significantly less exposed to debt than Bt cotton cultivators in these categories. In Orgampalle, Forward Castes are absent. Pradnesh (male, Backward Caste, medium land-holder), an influential village elder who strongly challenges both Bt cotton and globalisation as the means to development, is debt-free.

The NPM cultivators in Nandanapuram (both male: one, Nand, a Backward Caste semi-medium land-holder; the other, Nishok, a Scheduled Caste small-holder) were both debt-free prior to the 2010/2011 season. Nishok was, however, obliged to access a loan for labour charges during the research period. Nand has bought land, constructed a house and cleared debts inherited from his father, and is debt-free. He does, however, also have access to a salary as an NGO employee.

As Table 2 highlights, females are more indebted than males in both Nandanapuram and Orgampalle. The three female participants in Nandanapuram are widows. Two have incurred debt due to house construction, dowry, and health care, as well as input and labour costs. This includes Rashi (the Forward Caste female small-holder) who is Rs 350,000 in debt. It also includes Salma, a Scheduled Caste landless female, who accessed a loan from a Self-Help Group (a female collective) to lease land on which she suffered crop loss and now owes Rs 10,000.

In Orgampalle, one of the cultivating females, Amita, is a widow; the other, (Aruni), has a husband who is a herder. Both females have incurred debt due to dowry, and Amita, additionally, due to health issues. Their debt levels are, however, significantly lower than those incurred by the Bt cotton cultivating females in Nandanapuram.

The research suggests that the development model within which the adoption of Bt cotton is embedded is being spear-headed by influential land-holders, often Forward Castes. This has contributed to a legitimation not only of their cultivation practice, but also of indebtedness. The additional financial risk-taking associated with Bt cotton adoption is evident from the heightened indebtedness of Bt cotton cultivators relative to those adopting organic and NPM methods.

The debt levels of participants in Orgampalle indicate that Bt cotton is not the only reason for cultivator indebtedness. This is particularly the case for females in the village whose debt has largely arisen from dowry payments. The absence of an aspirational

Forward Caste in Orgampalle and the presence of an influential elder who shuns the consumerist approach of the wider development model have contributed to the lower debt levels of the village; they have not, however, eliminated indebtedness entirely.

The study suggests that Bt cotton is embedded within, and contributes, to a market-driven globalised approach to development. While the technology may present opportunities for higher incomes, these are not guaranteed. The expenditure on seeds, pesticides and fertilisers which Bt cotton specifically entails adds to the higher costs of the aspirational development model associated with privatisation and social practices, such as dowry and house construction, particularly in the far from atypical event of crop loss.

The combination of Bt cotton with the escalating costs of living meant that Bt cotton cultivators in both Bantala and Nandanapuram were significantly more indebted than organic and NPM cultivators. This was particularly the case for the resource-poor small and marginal cultivators who proponents argue benefit most specifically from the technology. The heightened indebtedness associated with this form of development is being legitimated by the prestige bias associated with Forward Castes and more influential land-holders who support this model.

The study highlights the urgent need for analyses of development which include measures on indebtedness. This is particularly essential for economic studies on Bt cotton given the links between farmer suicides and indebtedness. Such analyses should include longitudinal micro studies, differentiated by caste, gender and land-holding,

which recognise both the erratic nature of Bt cotton performance and the complexity of the social process through which the adoption of new technologies and understandings of development are variously legitimated and challenged in local contexts.

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