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**University College Cork, Ireland**  
 Coláiste na hOllscoile Corcaigh

**The Legitimation of Risk and Bt Cotton:  
A Case Study of Bantala Village in Warangal,  
Andhra Pradesh, India**

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## Abstract

This article ~~provides an empirical exploration of~~ Ulrich Beck's ~~theory~~ theorisation of a 'risk society' (1992; 2009). ~~This is undertaken through examining focussing on~~ the way in which the risk of Bt cotton is legitimated by six cultivators in Bantala, a village in Warangal, Andhra Pradesh, in India. The fieldwork for this study was conducted between June, 2010 and March, 2011, a duration chosen to coincide with a cotton season. The study explores the experience of the cultivators using the 'categories of legitimation' defined by Van Leeuwen (2007; 2008). These are authorization, moral evaluation, rationalization and mythopoesis. As well as permitting an exploration of the legitimation of Bt cotton by cultivators themselves within the high-risk context of the Indian agrarian crisis, the categories also serve as an analytical framework with which to structure a discourse analysis of participant perspectives.

The study examines the complex 'trade-off' which Renn (2008: 284) argues the legitimation of ambiguous risk, such as that associated with Bt technology, entails. The research explores the way in which legitimation of the technology is informed by wider normative conceptualisations of development. This highlights that, in a context where indebtedness is strongly linked to farmer suicides, the potential of Bt cotton for poverty alleviation is traded against the uncertainty associated with the technology's risks, which include its perceived links to animal deaths. The study highlights the way in which the wider legitimation of a neoliberal approach to development in Andhra Pradesh serves to reinforce the choice of Bt cotton, and results in a depoliticisation of risk in Bantala. The research indicates, however,

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that this trade-off is subject to change over time as economic benefits wane, and risks accumulate. It also highlights the need for ~~extreme~~ caution in relation to the proposed extension of Bt technology to food crops, such as Bt bringal (aubergine).

**Keywords:** risk; legitimization; discourse analysis; Bt cotton; India; development; democracy

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### Introduction

In his theory of 'risk society' (1992; 2009), Ulrich Beck (1992: 19) argues that the 'social production of *wealth* is systematically accompanied by the social production of *risks*' (ibid.) [italics in the original]. He (ibid.: 41) also asserts that '[t]here is a systematic 'attraction' between extreme poverty and extreme risk.' This is given the fact that the 'trade-off' (2008: 284) which Renn (2008: 284) argues is associated with risk is legitimated differently depending upon the inherent risks of the context. Beck (1992: 42)(ibid.: 42) argues that in contexts-situations where there is a 'visible threat of death from hunger and [an] invisible threat' associated with risky technologies, the ambiguous, 'invisible' risk will be 'victorious' (ibid.).

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~~Although highly influential, Beck's work on risk society has been critiqued due to its 'striking absence of empirical research' (Campbell and Currie, 2006: 162), as well as its lack of a 'broader discussion of risk construction' (Lacy, 2002: 59). The current study seeks to address this, through applying the theory of risk society to an in-depth exploration of the way in which risk is legitimated in high risk contexts.~~

Renn (2008: 180) claims that genetically modified (GM) crops fall within the category of risk classified as 'ambiguous' given that they are linked to 'unresolved uncertainty' (ibid.: 179). Bt cotton is a GM crop which has been modified to incorporate one or more *Cry* genes from the soil bacterium, *Bacillus thuringiensis* (Stone, 2011: 387). This is purported to render the plant resistant to a variety of cotton pests, the most destructive of which is the American bollworm (*Helicoverpa armigera*).

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The current study examines the way in which the adoption of Bt cotton is legitimated by cultivators themselves [in the high-risk context of the Indian agrarian crisis](#). According to Habermas (1973: 3, as cited in Pile, 1990: 15), legitimation refers to the 'practices of people and how they understand the situation of which they are a part.' The need for greater attention to the way in which cultivators rationalise their adoption of the technology is highlighted by Ho et al. (2009: 345) who claim, 'we know little about farmers' experiences and perceptions of GM crops' potential risks and benefits'.

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Bt cotton was officially approved for cultivation in Andhra Pradesh in 2002. The crop had, however, been cultivated illegally in the state since 1999 (Herring, 2012: 48). The US multinational, Monsanto, is primarily associated with the research and promotion of Bt technology in India. It would appear that the wider diffusion of the technology arose as a result of a failure to adequately regulate field trials which began in 1995 and were conducted by Monsanto's Indian affiliate, the seed company, Mahyco (Scoones, 2005: 252-253). The spread of the technology was, therefore, highly reminiscent of Giddens' (2003) portrayal of globalised society as a 'runaway world'. However, Giddens' work

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itself fails to provide an empirical account of the legitimation process which informs the rapid diffusion of inadequately tested technologies in particular contexts.

The adoption of Bt cotton in Andhra Pradesh followed a wider ideological shift to a neoliberal focus on economic growth through science and technology as the basis for development. This was documented as part of the *Vision 2020* initiative launched by Chandrababu Naidu's Telugu Desam government in 1999. The *Vision 2020* blueprint claimed: 'We will need to be far more aggressive in acquiring and applying advanced technologies in a wide range of fields, including agriculture' (Gupta, 2002: 12). The government vowed that the adoption of such an approach would permit it to alleviate poverty by the year 2020 (Gupta, 2002; Frankel, 2005: 616).

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The risks associated with poverty in Andhra Pradesh are significant. Sixty-six per cent of the population is involved in agriculture. However, the state is also subject to an acute agrarian crisis. This is linked to water scarcity, soil degradation, escalating cultivation and food costs, highly erratic monsoon rains, and the unequal distribution of key resources, such as land and political influence (Le Mons Walker, 2008: 557; Rao, 2009; Deshpande and Shah, 2010; Singhal, 2010). Reddy and Mishra (2010: 43) observe that this crisis has created a situation where 'a growing proportion of the farming community [is unable] to meet their basic consumption needs from their dependence on agricultural income.'

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The extent of the risk associated with such poverty is evident from the farmer suicides in the state. Andhra Pradesh has ranked among the top five states in India with regard to such suicides.<sup>1</sup> Studies indicate that ~~these~~ farmer suicides are strongly linked to indebtedness (Sridhar, 2006: 1560; Deshpande and Shah, 2010: 134; Iyer and Arora, 2010: 266; Sreedhar, 2010: 227). The legitimization of the risk of Bt technology is, therefore, strongly reliant upon its potential to alleviate the very real risks associated with poverty.

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The Andhra Pradesh government has increasingly sought to secure its own legitimization through poverty alleviation measures. These have included initiatives such as the Indiramma Housing Initiative<sup>2</sup> and the Public Distribution System (PDS).<sup>3</sup> This study highlights the way in which these wider attempts to secure state legitimization influence the legitimization of the risk of Bt cotton in Bantala. This supports the view of Douglas and Wildavsky (1982: 8) that the ‘choice of risk and choices of how to live are taken together.’ This research explores the way in which such choices are informed by both material, and ideological, considerations.

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The uptake of Bt cotton in Andhra Pradesh has been significant. In 2010, nearly ninety per cent of the total area under cotton in Andhra Pradesh was cultivated using Bt seed varieties (Gaurav and Mishra, 2012: 2). Proponents argue that this adoption is evidence of the technology’s legitimization due to its success in increasing yields, minimising pesticide use, and improving incomes for all categories of cultivator (Karihaloo and Kumar, 2009: 15; Choudhary and Gaur, 2010: 20).

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The technology is, however, also subject to ongoing protests which assert its risks. Quite apart from the ecological damage associated with the ongoing use of chemical inputs and borewell irrigation which Bt cotton cultivation entails, opponents argue that the technology exacerbates the risk of indebtedness, particularly for small and marginal farmers. This is due to the high cultivation costs it entails in a context where the risk of crop failure is endemic due to unpredictable climatic conditions [\(Shiva, 1991; Reddy D.N. and Mishra, 2009: 15-17\)](#)~~(Shiva, 1991; Reddy D.N. and Mishra, 2009: 15-17)~~.<sup>4</sup>

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There are also concerns related to the toxicity of the plant itself, given claims by cultivators and NGOs that it is linked to animal deaths. These are dismissed by observers, such as Ronald Herring [\(2008: 155\)](#), as 'biologically impossible'.

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The perceived foreclosure of discourses on risk has led opponents to raise concerns for democratic legitimacy.<sup>5</sup> —In Indian villages, institutionalised democratic praxis is primarily associated with the *Gram Sabha* meeting as a gathering of the entire village aimed at collective decision-making,<sup>6</sup> and elections. The central question with regard to Bt cotton cultivation in Warangal has thus become why the apparent legitimisation of the technology by cultivators in terms of its widespread adoption should simultaneously be subject to significant protests which assert its risks?

### **Methodology and Methods**

The research for this article is extracted from a doctoral thesis in Sociology submitted in 2013. This wider study involved three villages in Warangal, two of which were highly mobilised against Bt cotton. Only in Bantala was the technology strongly legitimated.

The district of Warangal is described by Herring (2008: 145) as 'the most controversial district in India' due to the conflict with which Bt cotton is associated. Herring (2008: 150) also highlights that the risks associated with cotton cultivation in the district are significant given that Warangal is drought-prone, and cotton is often grown on unirrigated, thin red soils.<sup>7</sup> Despite this, Warangal's Department of Agriculture estimates that ninety-five per cent of cotton in the district is sown to Bt seed varieties (Herring, 2008: 148).

The data for this study was collected using semi-structured interviews involving six cultivators in Bantala (a pseudonym) between June, 2010 and March, 2011. Interview data was corroborated using 'triangulated' methods (Johnson, 2007: 113). These included the observation of cultivators at work in the fields, library and newspaper research, and attendance at Sociology seminars offered as part of the Master's degree at the University of Hyderabad between July and December, 2010. The researcher also attended Telugu classes at the university (the language of participants). These involved three two-hour lessons each week for ~~six-three~~ months, followed by intermittent classes for a further three months as field-work permitted.

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Schwartz and Jacobs (1979, as cited in Miller and Fox, 2004: 37) characterise the ethnographic approach as ‘reality reconstruction.’ The current study seeks to ‘reconstruct’ (Strydom, 2011: 137) the legitimization of Bt cotton as articulated by cultivators themselves. Discourse analysis has been selected as a method due to the recognised centrality of discourse in the social construction of risk (Strydom, 2002; 2008). Given the researcher’s limited knowledge of Telugu, interviews were conducted with the assistance of translators. Because of this, the discourse analysis featured here is less critical of the language used, but instead seeks to foreground the reasons offered by cultivators for their adoption of Bt cotton.

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Van Leeuwen’s ‘categories of legitimation’ (2007; 2008) have been adopted in order to explore the way in which the choice of Bt cotton is legitimated. These categories are as follows:<sup>8</sup>

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**Authorization:** relates to legitimation by reference to persons in whom authority is vested (Van Leeuwen, 2008: 106-109). In the current study, this ~~relates to~~ explores the authorities to whom cultivators referred in legitimating their adoption of Bt cotton.

**Moral Evaluation:** refers to legitimation by reference to ‘discourses of values’ (Van Leeuwen, 2007: 91). In the research featured here, this relates to the ‘life [which people have] reason to value’ (Sen, 1999: 74) as part of normative conceptualisations of development;

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**Rationalization:** entails legitimation by reference to the ‘goals, uses and effects’ of practices (Van Leeuwen, 2008: 113). In this study, this relates to the reasons provided by cultivators for their legitimation of Bt technology;

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**Mythopoesis:** involves legitimation by reference to narratives that reward legitimate actions (Van Leeuwen, 2008: 117). Within this category, the current study explores the interrelation between narratives associated with democratic praxis in Bantala, and the way in which the risk of Bt cotton is legitimated.

The village of Bantala is located in south Warangal, approximately one hundred kilometres from the Andhra Pradesh state capital, of Hyderabad. It has a population of two thousand eight hundred people. Cotton accounts for sixty-one per cent of the cultivated area, and only Bt cotton varieties are cultivated. While it is recognised that generalisation is problematic given the small sample size of this study, as well as the recognised diversity of Indian villages, it is argued that an in-depth exploration of the legitimation of ambiguous technologies in high-risk micro contexts provides valuable insights into the complexity of the trade-off which such legitimation entails.

The researcher was introduced to Bantala by a local NGO, Crops Jangaon. This NGO had visited Bantala once previously in 2008 following reports of animal deaths. On this occasion, thirty buffaloes had escaped to graze on the cotton fields. By morning, more than half were dead. All villagers attribute these deaths to the animals having grazed on Bt cotton. NGOs, politicians and scientists visited the village at the time of the deaths, and conducted post mortems. Villagers have received no feedback, however, as to the

results of these tests. Soon afterwards, an advice was issued by the then Director of Animal Husbandry in Warangal that farmers should not allow their animals to graze on Bt cotton.<sup>9</sup>

Prior to the research being undertaken, signed consent was obtained from the village *sarpanch* (head person), as well as from the participants themselves. This was translated into Telugu prior to signing. The six participants featured here were selected with the assistance of ‘key informants’ (LeCompte and Schensul, 1999: 86). These included the Village Secretary (an official council or *Panchayat* position), and the head-master of the village school. The selection aimed at ensuring a cross-section of the village along the dimensions of caste, gender and land-holding.

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Bantala was visited by the researcher for two days each week for the first three months of the research, and at least once per month from October 2010 to March 2011.<sup>10</sup> Village participants were interviewed two to three times, and each interview lasted approximately one hour. This included the time for the translation. All interviews were recorded in the participant’s home using a digital dictaphone, and transcribed by the researcher verbatim. The dates in parenthesis following interview excerpts refer to the date on which the interview was conducted.

The village participants are as follows:

**Table 1: Village Participants by Caste, Gender and Land-Holding of Cotton**

Participant	Caste*	Gender	Land-Holding of Cotton**
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Pavan	Forward	Male	Medium
Chitta	Backward	Male	Semi-medium
Natesh	Backward	Male	Small
Sudhakar	Backward	Male	Small
Ashna	Scheduled	Female	Marginal
Sudeep	Scheduled	Male	Marginal

\* Forward Caste (high-caste); Backward Caste (middle castes); Scheduled Caste (low-caste, previously 'Untouchables');

\*\* Land-holding Categories: Medium land-holding: 10.1 to 20 acres; Semi-medium: 5.1 to 10 acres; Small: 2.6 to 5 acres; Marginal: up to 2.5 acres.

## Research Findings

### Authorisation:

A number of participants highlighted that seed dealers were a significant influence in their choice of Bt cotton. This is clear in assertions such as: 'When the seeds came to the shop, the dealers told us' (Chitta, 23 August 2010); 'I don't know Bt varieties. I just pick whatever the dealer sells me' (Ashna, 24 November 2010).

Participants also highlight the role of the state in their legitimation of Bt cotton. This is evident in claims such as: 'The government is praising those who opt for cotton... Cotton farmers are richer farmers' (Chitta, 23 November 2010); and: 'Once the government introduced Bt, we started growing it' (Natesh, 23 November 2010).

Similarly, ~~the~~ conformist bias identified by Stone (2007: 71) where Bt cotton was adopted as a practice by farmers because it had been adopted by many others, is also

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evident. Ashna claims, '[e]verybody is growing Bt, so I am also growing it' (24 November 2010). Similarly, Sudeep asserts, 'Because others were getting more yields with Bt cotton, I also tried it' (29 August 2010). This conformist bias is reinforced through the media—~~This is, as~~—highlighted in Sudhakar's claim: 'We have seen the difference [between Bt and non-Bt yields] in newspapers and through TV advertising' (15 August 2010).

### **Moral Evaluation**

With regard to legitimation through Moral Evaluation, the adoption of Bt cotton involves villagers in making normative judgements with regard to the wider neoliberal development model within which Bt cotton is embedded.

For Pavan, the ~~shift to neoliberalism~~ neoliberal shift in government policy has led to a widescale legitimation of a focus on wealth creation. ~~Thus, He~~ claims: 'On TV, the news and the whole world are mainly concentrating on money. Earning more money, getting work to earn more money' (15 August 2010). The English word 'money' is used in conjunction with Telugu's '*dabbu*' to highlight his assertion. 'Market', 'market rate' and 'money' are some of the limited English words which most participants in Bantala know. Pavan also notes the increased concentration of land, claiming 'we used to cultivate three or four acres. Now it has increased to twenty' (15 August 2010).

All participants note that there has been an improvement in their quality of life. In particular, the improved access to food and housing is highlighted. Chitta, for instance, asserts: 'There was scarcity of food because of drought....Now we have borewells. Earlier we used to have huts....[n]ow it has become like this [cement or *pakka* houses]' (23 August 2010). Sudeep also observes, '[b]efore we had small huts. Now everybody is constructing houses' (29 August 2010).

Natesh argues: 'It was difficult to get food to eat. Nowadays, it's easy. The government has given support' (14 August 2010). He also asserts, 'the government funds and schemes are bringing houses and all these things' (14 August 2010). Likewise, Ashna claims: '[w]e used to strive hard. Now we are living happily' (24 August, 2010). Sudeep notes: 'Earlier there were no bt [bitumen or asphalt] roads, only concrete. And the school building...*gram panchayat* [office] and water plant we initiated' (29 August 2010).

Natesh, however, highlights concerns regarding the decline in crop diversity. He observes, '[w]e used to grow jowar,<sup>11</sup> wheat, things like that. Now we mainly grow paddy<sup>12</sup> and Bt cotton' (14 August 2010).

### **Rationalisation**

Legitimation through rationalisation focusses on whether the action (here, the adoption of Bt cotton) can be justified in terms of valid reasons. This rationalisation is strongly influenced by the normative assessment of development just explored— ~~This is~~ due to the

influence of the appraisal of what is valued on the trade-off which the legitimization of risk entails.

Pavan claims, '[t]here has been a twenty-five per cent increase in income with Bt cotton' (15 August 2010). He also notes, '[b]ecause fewer pesticide sprays are required, Bt cotton is better for the land' (15 August 2010). Natesh asserts the influence of wider environmental factors, claiming '[w]e're growing Bt cotton because if we go for groundnut or something else, insects...will attack and we'll incur losses' (14 August 2010). He also asserts, 'I used to spend more on pesticides' (14 August 2010). Ashna claims, '[w]e are getting more yield, so we are getting more money' (24 August 2010). Likewise, Sudeep argues, '[f]inancially we benefitted. We're sending my brother to school, we've built a house and we're not relying on others for loans' (29 August 2010).

The rationalisation of these actors of their choice of Bt cotton is, however, also associated with a profound uncertainty given the potential risks involved. Thus, Pavan observes, '[m]any people say the land becomes spoilt (15 August 2010). He states, 'I don't know specifically [if Bt cotton damages the soils]. It is something I feel' (23 November 2010). Ashna too claims, 'people told me that it [Bt cotton] damages the environment, but I don't know if that's true or not' (24 November 2010).

There is also a sense among participants of escalating costs. Natesh claims, 'we feel that we are spending more, and it's too costly. And if we get a low price when we sell, we feel it' (14 August 2010). Similarly, Sudhakar asserts, '[t]hough we are yielding more, labour costs have increased' (15 August 2010). And Ashna states, 'we get more, but our expenses are more' (24 August 2010). Participants also argue that yields are decreasing. Natesh claims, '[t]he height of the plant is reducing, so yields are declining' (14 August 2010). The animal deaths are also a particular cause for concern. Natesh states categorically, 'buffaloes died from eating the cotton' (14 August 2010). Likewise, Sudhakar asserts, 'once buffaloes ate Bt cotton, and twenty of them died' (15 August 2010).

Sudhakar is aware of the delegitimation of Bt cotton by other cultivators in Warangal. He claims, '[t]he non-Bt fellow will say Bt is harmful. We listen and that's it. We don't know if it's really harmful or not' (24 November 2010). The potential for risk of Bt cotton is rationalised as a legitimate gamble, [however](#), within the wider precariousness of the context. Ashna observes, '[i]t's pure luck. If you get the crop, you benefit. Otherwise, you lose' (24 November 2010). This does not, however, preclude a profound concern for the sustainability of Bt cotton cultivation as a praxis. Thus, Chitta states, 'I heard the land is getting spoiled, so in the future we may not get good yields' (23 August 2010). This leads him to question: '[e]verybody grows cotton. But tomorrow what will happen?' (23 August 2010).

### **Mythopoesis**

Van Leeuwen's (2007: 105) category of legitimation, mythopoesis, is here used to explore perspectives on the *Gram Sabha* meeting and voting in terms of the way in which narratives on democratic praxis intersect with the legitimation of [the risk of Bt cotton](#).

All participants in Bantala vote in *panchayat* (local council), state and parliamentary elections. However, only fifty per cent of (three of six) participants attend the *Gram Sabha* meeting. These include two of the five male participants and the female (Ashna).

Pavan does not participate in *Gram Sabha* meetings. He argues, '[a]ll this [*Gram Sabha* meetings] comes under politics, so since I'm a farmer I have to go for my work [in the fields]' (15 August 2010). Chitta, however, participates in meetings and votes. He claims, '[e]verybody who has the right will cast their vote' (23 August 2010). Sudhakar asserts, 'if I cast my vote, I may get benefit' (15 August 2010). He does not, however, attend *Gram Sabha* meetings.

Natesh attends the meetings and votes. He claims, 'I'll participate in every activity as I'm an elder in the village' (14 August 2010). He takes a cynical view of the Indian democratic process, however, arguing, '[i]f we spent the amount which is spent on elections in constructing a dam..., that would be more beneficial' (14 August 2010). Sudeep asserts, '[s]ince we are living in a democratic country, this has given us the right to ask for our rights and fight for our rights. Now I have enough freedom to go and ask what rate I'm getting [for my cotton] and why I'm getting it. I can fight for my own

sustenance' (24 November 2010). Ashna argues, 'if I believe that politicians can do something to help me, then I will vote for them' (24 August 2010).

### **Discussion of Findings**

The analysis of the legitimation of Bt technology by cultivators highlights the 'trade-off' (Renn, 2008: 284) which the legitimation of the ambiguous risk associated with Bt cotton entails. In the case of participants in Bantala, this involves a complex interplay between the need to create wealth in order to alleviate poverty within a high-risk context, and the profound uncertainty associated with the adoption of an ambiguous technology in order to accomplish this.

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The study highlights the authority granted to seed dealers by Bantala participants with regard to the legitimation of their seed choice. In an interview conducted with a seed dealer in Warangal (22 November 2010), he confirmed that the commission for Bt cotton seeds was higher than for non-Bt seeds, and claimed that he had not stocked non-Bt seeds for more than three years due to lack of demand. The difficulty in obtaining non-Bt seeds in Warangal is noted by Stone (2011: 390). This study highlights, however, that cultivators rely strongly on the advice of seed dealers in their choice of seed. This suggests that the purported absence of demand for non-Bt cotton varieties in Warangal is likely to be strongly related to the promotion of Bt varieties by seed dealers themselves.

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Bt cotton adoption is also legitimated by villagers in Bantala due to its perception as a method which is supported by the government as part of the state's modernisation, and associated with wealthier farmers. This is a finding also noted by Yamaguchi and Harris (2004: 486) who observe that a cultivation praxis adopted by those perceived as 'progressive' farmers is more likely to gain widespread legitimation. The fact that the high costs of cultivating Bt cotton may make it a more viable risk for land-owners who are already wealthy is not considered.<sup>13</sup> The power of advertising in reinforcing the 'conformist bias' identified by Stone (2007: 71) is also highlighted. Here, the risk is legitimated by virtue of the fact that many others are taking it, and the government itself is supporting it.

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The study highlights the way in which the legitimation of Bt technology is influenced by a wider normative legitimation of the neoliberal development model as a means of poverty alleviation. Here, the influence of state initiatives in legitimation is also highlighted. All participants in Bantala emphasise those aspects of the current development model which they associate with progress - improved access to food, new housing, availability of roads and schools, and enhanced education.

Although these aspects are supported by state funding, they also serve to boost the legitimation of Bt cotton given that the technology is regarded as part of the overall thrust towards modernisation as a means of alleviating poverty.<sup>14</sup> While concerns related to the loss of crop diversity associated with this form of development are highlighted, the risk

of the technology is legitimated given the potential for wealth creation with which it is associated. This is a prioritisation which receives widespread legitimation in a context which is strongly informed by a neoliberal rationale.

At a material level, the constraints associated with other crops are highlighted as part of the legitimation of Bt cotton. These include the risk of predators associated with vegetable crops. Bt cotton is also legitimated due to its potential to provide higher yields with fewer pesticide sprays than were required with non-Bt varieties.<sup>15</sup> Despite this, however, participants also highlight their concerns with regard to the sustainability of Bt cotton cultivation as a praxis. This relates not only to escalating costs and declining yields, but also to an awareness of a wider discourse of risk with regard to Bt cotton in Waranagal related to its potential contribution to soil degradation. —Similarly, all participants assert the animal deaths, which they categorically ascribe to their having grazed on Bt cotton. Here, the uncertainty associated with Bt cotton is incorporated as part of the trade-off which the adoption of the technology entails. This is regarded as a legitimate downside in attempts to secure wealth in an already high-risk context.

The narratives associated with democracy in the village suggest evidence of the ‘patronage democracy’ identified by Corbridge et al. (2013: 176). Here, democratic praxis is instrumentalised as a means for securing resources in order to negotiate risk, and

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this has [also](#) become the basis for the legitimization of democratic praxis in the village. There is also evidence of a rights discourse in this regard, and the enlistment of the normative ideal of social justice in the fight for survival (notably, in the discourse of Sudeep). While the patronage and rights narratives related to democratic praxis are central to securing the resources required to negotiate material risk, the focus on securing wealth has diminished the epistemic potential of the *Gram Sabha* as a site where the risks associated with [such](#) attempts to secure wealth creation could be deliberated upon, problematised and escalated.

The study highlights that cultivators in Bantala have themselves become complicit in the legitimization of uncertainty as part of a perceived need to prioritise wealth creation as a means of poverty alleviation. Thus, the uncertainty of participants is used as the basis for legitimating the ongoing adoption of Bt cotton, rather than for its delegitimation. This serves to further depoliticise risk, and to preclude the involvement of participants in Bantala in protests against Bt cotton.

The discourse of cultivators highlights, however, that the trade-off entailed in the legitimization of Bt technology is changing over time. Participants in the current study highlight the declining yields and escalating costs associated with Bt cotton cultivation. Without intervention, such risks will become progressively more pronounced, as indebtedness rises, and soil fertility and the water table declines. There is also uncertainty as to what future knowledge on the animal deaths may reveal. Thus, the trade-off explored here is, as cultivators themselves recognise, highly contingent upon the

future consequences of their current cultivation praxis. This interplay between the future and present as the basis for the uncertainty of risk is also highlighted by Luhmann (1993: 42) who argues: '[o]ut of the future we will in retrospect certainly come to a different understanding of the risk situation we are experiencing in the present. But how we will see it remains uncertain.'

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This changed understanding ~~will also have implications~~ result from the accumulated outcomes of ~~for the~~ trade-offs ~~being involved in risk taking over time~~ legitimated in the present. However, given the uncertainty which is already being expressed with regard to Bt cotton, this study suggests that the decision by the Indian government to place an indefinite moratorium on the approval of Bt brinjal (aubergine) (Gupta, 2011: 738) is a pragmatic one.

### Conclusion

This study highlights that cultivators in Bantala ~~have adopted~~ legitimate Bt technology given on the basis of their perception that it represents a more advanced farming method which is widely adopted and promoted by both seed dealers and the state as a means of ameliorating the risks of poverty; however, within this legitimation, the technology is also associated with significant uncertainty related to its future sustainability, not least given its perceived connection to animal deaths in the village, and the wider discourse of risk with which it is associated in Warangal. This illustrates Beck's (1992: 19) view, highlighted earlier, that the 'social production of *wealth* is systematically accompanied by

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the social production of *risks*' (ibid.) [italics in the original]. [In this way, the legitimization of an emphasis on the short-term creation of wealth as the means to development simultaneously serves as the basis for the legitimization of the uncertainty concerning Bt cotton as an agricultural praxis. ~~It also~~This](#) demonstrates the way in which risks are diffused as part of wider conceptualisations of development, particularly in high-risk, [poverty-stricken](#) contexts.

The research suggests that, while the widespread adoption of Bt cotton in Warangal continues to be highlighted unproblematically by proponents as evidence of the legitimacy of a neoliberal technocratic response to agrarian risk, there is a strong likelihood of future regret that the uncertainty which cultivators are currently asserting with regard to Bt cotton was not heeded more adequately, nor acted upon more effectively.

It is clear even from this small-scale study that the assumption that the legitimization of Bt cotton through its adoption implies that it represents a normatively satisfactory response to agrarian risk is highly problematic. Instead, it raises profound issues related to social and epistemic justice in the negotiation of risk in high-risk contexts given that already vulnerable cultivators are presented with an impossible dilemma. Here, Bt cotton is rationalised by cultivators as the best available option to address the poverty of their context. This is despite the fact that their choice is fraught with profound concerns for its future sustainability.

~~This study suggests, therefore, that given the degree of uncertainty associated with Bt cotton, the decision by the Indian government to place an indefinite moratorium on the approval of Bt brinjal (aubergine) (Gupta, 2011: 738) was a pragmatic one. It also indicates~~ This study also strongly suggests that attempts to address poverty through the creation of wealth in high-risk contexts need to be informed by in-depth research ~~on~~ into the risks taken in this regard, including measures on indebtedness. -This would allow greater understanding of the trade-offs required in the legitimation of such risks, and as a concern of social and epistemic justice. ~~It would also seek to~~ ensure that poverty alleviation measures are informed by considerations of justice, sustainability and equity, ~~and~~. This would aim to do not expose ~~avoid exposing~~ those already vulnerable to impossible dilemmas involving the legitimation of ambiguous risks as part of a precarious trade-off for their ~~their~~ survival.

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**Notes:**

<sup>1</sup> Along with Andhra Pradesh, the states of Maharashtra, Karnataka, Madhya Pradesh and Chhattisgarh account for over half of all farm suicides in India. Available at: (<http://www.thehindu.com/opinion/columns/sainath/farmers-suicide-rates-soar-above-the-rest/article4725101.ece>). Viewed on 24 May 2013.

<sup>2</sup> Indiramma is an acronym for Integrated Novel Development in Rural Areas and Model Municipal Areas. This was launched in Andhra Pradesh in 2006 and aimed to upgrade the houses of those who had ration cards and lived in *kacha* houses (those made from mud with roofs of rice straw or other thatching material).

<sup>3</sup> The Public Distribution System was introduced in 1972 as a means of delivering subsidised food items to the most vulnerable.

<sup>4</sup> The Disaster Management Department of the Andhra Pradesh government reported fifty-five natural disasters related to flooding, droughts and cyclones in the thirty-three years from 1977 to 2010. Available at: (<http://disastermanagement.ap.gov.in/website/history.htm>). Accessed on 10/8/2013.

<sup>5</sup> Attempts to define a legitimate democratic praxis capable of securing a just recognition of risk have led to ongoing protests calling for a separate state of Telangana, the region in which Warangal is located. This was agreed to in July, 2013. The new state is to be created in 2014, despite ongoing protests against the bifurcation in Andhra Pradesh.

<sup>6</sup> According to the Indian Constitution, a *Gram Sabha* meeting of the entire village must be held at least twice per year. As Kumar (2006: 213) notes, the *Gram Sabha* is envisaged as a forum to 'facilitate dialogue [and] introduce people to the art of negotiation and collective decision making.' This is regarded as essential to securing the decentralised inclusiveness necessary for securing democratic legitimacy in decision-making on development policy.

<sup>7</sup> Thick black soils which retain moisture are considered ideal for the cotton crop (Stone, 2011: 390). In the current study, most cultivators operated holdings with a mixture of both red and black soils.

<sup>8</sup> The American spelling of the categories of legitimation used by Van Leeuwen is adopted when Van Leeuwen is cited directly. Otherwise, the British spelling adopted by the current author as standard is used.

<sup>9</sup> In a telephone interview (17 February 2011), the former Director of Animal Husbandry who had issued the advice to farmers to keep animals off Bt cotton fields confirmed that he had done so as a precaution. In his view, the animal deaths were more likely to be due to the misuse of pesticides, than the Bt crop itself. The fact that pesticide use has declined since the introduction

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of Bt cotton suggests either that there has been a change in the strength of the pesticides which farmers are using, or that the deaths are due to a broader spectrum of toxicity in the plant than is asserted by proponents. Either way, reports of the deaths raise alarm with regard to the use of Bt technology in food crops.

<sup>10</sup> The first three months of the fieldwork focussed entirely on Bantala. However, the scope of the research was later extended to include two other villages, at which point visits to Bantala were alternated with trips to the other villages.

<sup>11</sup> *Sorghum bicolor*. An edible drought-resistant grain used in the making of Indian breads (*rotis*).

<sup>12</sup> Paddy refers to rice still in the husk.

<sup>13</sup> The wider study confirmed that the costs associated with Bt cotton cultivation are significantly higher than those associated with alternative methods, such as organic and Non-Pesticide Management (NPM) cultivation.

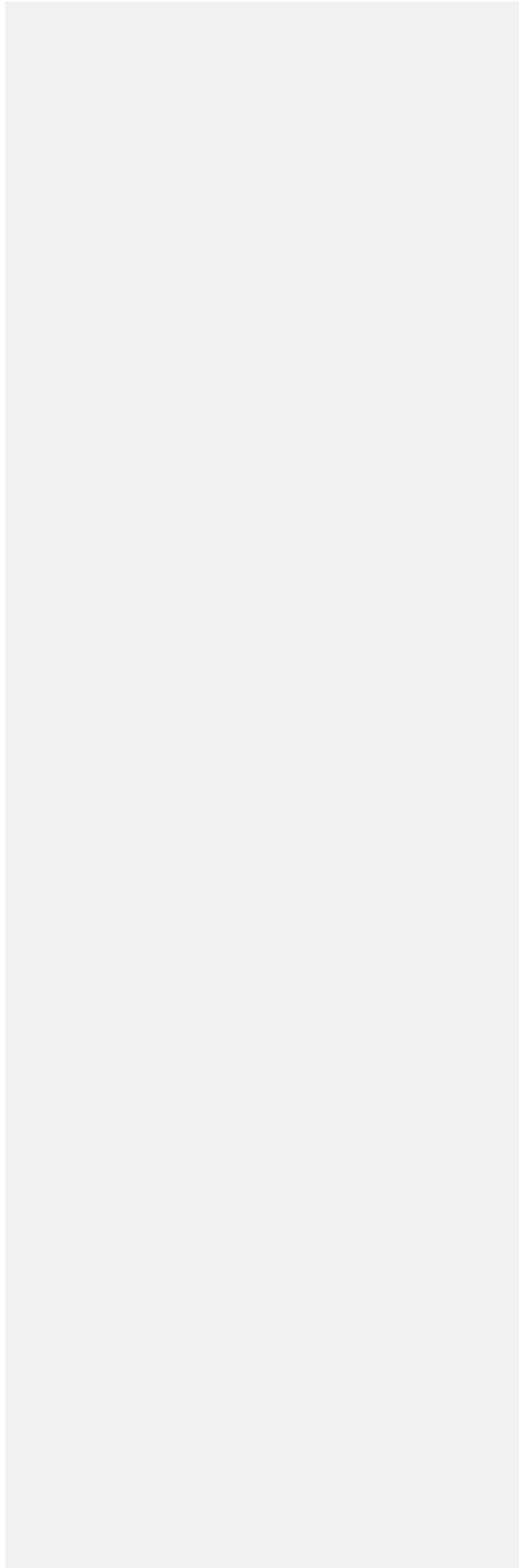
<sup>14</sup> In fact, the Andhra Pradesh government has adopted a highly ambivalent stance on Bt cotton. It has been described as the 'most troublesome' in India (Jishnu, 2010) given its intervention in the prices charged for Bt seeds, as well as attempts to regulate seed supply. Available at: (<http://business.rediff.com/column/2010/apr/01/guest-bt-cotton-monsanto-is-back-in-courts-over-royalty.htm>) Accessed on 27/4/2013. This can be seen as part of an attempt to secure its legitimization given the high degree of contestation related to Bt cotton's contribution to poverty alleviation in the state.

<sup>15</sup> The wider study supports the view of Stone (2011: 391) that pesticide use declined in Warangal as a result of Bt technology. However, it also highlighted that pesticides continue to represent a significant cost for Bt cotton farmers, who are significantly more indebted when compared to than cultivators adopting alternative methods such as organic and NPM cultivation. It is noted, however, that the supply of non-Bt seeds required for these methods must can only be secured through NGO coordination.

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