

A Study in Pink

Gramscian reflections on Bt cotton, the pink bollworm and bio-hegemony in the Warangal District, India

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Master thesis in Development, Environment and
Cultural Change

Centre for Development and the Environment

UNIVERSITETET I OSLO

15.05.2019

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May 2019

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Trykk: Reprosentralen, Universitetet i Oslo

Abstract

The use of genetically modified (GM) crops in agriculture is an ongoing scholarly and public debate, which has been dominated by a polarization between proponents and opponents: the pro- and the anti-GM sides. In 2002, Bt cotton was approved as the first GM crop in India and today more than 95% of the total cotton area in India is cultivated with Bt cotton, but recently Indian cotton fields have come under attack of the dreaded cotton pest: pink bollworm. Based on in-depth interviews, field visits, and textual sources, I employ in this thesis the concept of “bio-hegemony” in the context of Indian cotton production. In doing so, I enter into dialogue with an extensive field of academic literature on the use of Bt cotton in the Warangal District in the state of Telangana, India. The main research question raised in this endeavor is: *How is the resurgence of pink bollworm attacks discursively managed within the Indian bio-hegemony?*

The genetic modification of Bt cotton consists of insertion of a gene from a soil bacterium called *Bacillus thuringiensis* (Bt) producing two types of Cry proteins, which are poisonous to certain insects, including bollworms. However, the pink bollworm has at least since 2015 started creating resistance towards the toxins and is now troubling cotton farmers all over India. In the light of this recent challenge to the country’s only GM crop, using a discursive approach while drawing on Gramscian insights, I discuss how the portrayal of the pink bollworm issue by key actors and the media discloses the discursive embeddedness of bio-hegemony in India. In addition, I discuss the impediments of the anti-GM discourse in challenging the hegemonic pro-GM discourse as a coherent counter-hegemony. Based on my empirical material, I conclude that the bio-hegemonic pillar of discursive power has been maintained despite the pink bollworm issue.

Key words: Bt cotton; hegemony; India; agricultural biotechnology; GMO; genetically modified crops; Gramsci; discourse; Warangal District; pink bollworm

Acknowledgements

This thesis marks the end of five academic years at the University of Oslo, and it would not have been possible without support and assistance from many people to whom I owe my deepest gratitude. My supervisors, Jostein Jakobsen and Kristi Anne Stølen, deserve special thanks for their encouragement and guidance as well as honesty during this process and for gently pushing me in the right direction when needed. Thanks to the amazing student advisors, Anne-Line and Gudrun. SUM would not be the same without you.

I also owe thanks to the people who made my fieldwork in India possible and to my informants who took time to meet with me and share their perspectives. Some went out of their way to help me, for which I am very grateful. Thank you especially to Christabel and Ilika from the Nordic Centre in India (NCI) who facilitated my stay and provided me with important contacts in Hyderabad. Fieldwork in India was both an incredible and challenging experience, and the staff and fellow students at Tagore International House helped to make it unforgettable.

I owe a very personal thanks to my family and especially my parents, Trille and Henrik, who have supported me and believed in me from the other side of the sea. In addition, I could not have done this without my extended Norwegian family. Thank you to Marte for being in this with me all the way and for Monday mornings. Thank you to Aurora, because one small thing said can make all the difference. Thank you to Sabina for academic as well as emotional support. And thank you to Ingalill for feeding me, cheering for me and generally keeping my head above water. You four are the best.

Finally, these past two years would not have been the same without my fellow SUM'ers and Sonqo. Therefore, I extend a very special thanks to the SUper norMals: We read the syllabus!

Oslo, May 2019.

Anna Schytte Sigaard

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Abbreviations and acronyms

| | |
|---------|--|
| BCI | Better Cotton Initiative |
| BMPs | Better Management Practices |
| Bt | Bacillus thuringiensis |
| CESS | Centre for Economic and Social Studies |
| CICR | Central Institute for Cotton Research |
| CIFA | Consortium of Indian Farmers Association |
| CROPS | Centre for Rural Operations Programmes Society |
| CSA | Centre for Sustainable Agriculture |
| FISEC | Field Inspection and Scientific Evaluation Committee |
| FSSAI | Food Safety and Standards Authority of India |
| GEAC | Genetic Engineering Approval Committee |
| GE | genetically engineered |
| GM(O) | genetically modified (organism) |
| ICAR | Indian Council of Agricultural Research |
| ICRISAT | International Crops Research for the Semi-Arid Tropics |
| IPR | Intellectual Property Rights |
| ISAAA | International Service for the Acquisition of Agri-biotech Applications |
| ISB | India School of Business |
| KVK | Krishi Vigyan Kendra |
| MARI | Modern Architects for Rural India |
| NGO | non-governmental organization |
| NIRD&PD | National Institute of Rural Development and Panchayati Raj |
| NPM | Non-Pesticidal Management |
| PAN | Pesticide Action Network |
| Rs | Indian Rupees |

UoH University of Hyderabad

WWF World Wildlife Fund

1 Introduction

The colour pink is associated with love, beauty and fashion, but in Yavatmal district of Maharashtra, pink has become synonymous with death and destruction. The pink bollworm has ravaged the cotton crop in the district, where farmer suicide is rampant (Wadke, 2017).

In 2015, the Central Institute for Cotton Research (CICR) in India started receiving the first reports about the pink bollworm, a cotton pest, once again infesting crops in the major cotton growing states of the country (Hardikar, 2018). In the 1970s and 80s, the pink bollworm troubled Indian farmers to the extent that new pesticides were introduced to combat the issue. However, pink bollworm continued to cause major damage in several of the main cotton-growing countries, including India, and Bt cotton, a genetically modified (GM) cotton variety, was proposed as a solution (Naik, Kumbhare, Kranthi, Satija, & Kranthi, 2018). Bt cotton secretes a toxin poisonous to several species of bollworms, but pink bollworm has now started creating resistance to the toxin and has been seen infesting cotton crops in the major cotton states in India. In Telangana, it was estimated that the pest damaged 30% of the cotton crop across the state in the harvest year of 2015/16 (Times News Network, 2016) and in the latest harvest year of 2018/19, yields have in some places in the state been halved due to pink bollworm attacks (Kurmanath, 2019). Since 2015, national media has covered the development of the pest closely and accounts from farmers across India about the pink bollworm devastating cotton plants and ruining harvests have been a major news story (see for example Buradikatti, 2016; Pulla, 2018; Seetharaman, 2018). These accounts are often connected to the gruesome statistics of farmers' suicides and agrarian distress claiming that the pink bollworm is killing, not only the infant cotton bolls, but also their farmers (Wadke, 2017).

This thesis is a contribution to the ongoing debate about the use of GM crops in agriculture, specifically in India. The focus on GM technology as a resource in agricultural production is not something entirely new as it emerged with the birth of the first genetic modifications in 1983 (Stone, 2010, p. 382). In addition, there has been an increased focus since the late 1990s, when biotechnology companies turned

their attention to the developing world, on the potentials of GM crops to increase agricultural production and food security in developing countries (Stone, 2002a, p. 611). India is important in this context as the country, due to its size, was predicted to play a significant role in determining the future for GM technology in developing countries. This made it an important target for biotech companies such as the American multinational corporation for agricultural biotechnology; the Monsanto Company (Newell, 2003, p. 1).

India has a long history of promoting agricultural biotechnology, as this has been a project of its developmental state since the mid-1980s (Herring, 2014, p. 159; Huda, 2018, p. 51). For cotton production, the matter became even more pressing in 1998 when a round of severe bollworm attacks led several hundreds of cotton farmers to commit suicide (Stone, 2011a, p. 760). Prior to the introduction in 2002, however, public opposition to Bt cotton in India was great (Herring, 2006; Stone, 2002a). GM crops continue to be a topic of controversy, and opposition now includes resistance against GM food crops such as GM eggplant and GM mustard, which have been suggested for commercialization in India (Haq, 2018; Huda, 2018). Bt cotton is the only GM crop currently approved for commercial cultivation in the country. At the same time, India is among the top ten biotech countries in the world and accounted in 2017 with 11.4 million hectares of Bt cotton for 6% of the total area cultivated with GM crops worldwide (ISAAA, 2017, p. 5).

Within the framework of political ecology, I employ a qualitative approach to analyze the implications of the resurgence of pink bollworm attacks in the Warangal District in Telangana, India. Through analysis of in-depth interviews, field data and textual sources and utilizing a discursive approach while drawing on Gramscian insights, I seek to answer the following question:

How is the resurgence of pink bollworm attacks discursively managed within the Indian bio-hegemony?

The purpose of this study is threefold. Firstly, it is to analyze how the resurgence of the pink bollworm attacks has been integrated into already existing GM discourses. Secondly, I analyze how portrayals of farmers are narratively framed in different ways within the discourses and argue that each frame is shaped by the discursive standpoint of the narrator and in turn helps to legitimize the standpoint as a rhetorical

technique. Thirdly, I argue that my findings indicate that the hegemony of the pro-GM discourse is maintained in India, and that the pink bollworm issue, though serious, has not properly challenged it to the degree of causing what Gramsci (1971) called an “organic crisis”: a crisis of the entire hegemonic regime.

1.1 The Pink Bollworm

When attempting to understand the pink bollworm issue in India, it is necessary to take the developments of cotton production in the country into account, as the issue is intrinsically bound with these events. The pink bollworm issue is used by the anti-GM side as proof that the technology has inevitably failed, by the pro-GM side to argue for a move forward to new technologies, and arguments at both sides are connected to ideas about what Indian cotton production has been or should be. On the pro-GM side, the pink bollworm is viewed as an indication that a new generation of genetic technology is needed in agriculture in India. It has been argued that the increased use of illegal herbicide tolerant (HT) cotton seeds is a sign that cotton farmers are desperate for new technologies (Bhosale, 2018). The most recent report from the ISAAA (International Service for the Acquisition of Agri-biotech Applications) states that in the harvest season of 2017, a large number of farmers in the central and southern parts of India planted unauthorized HT cotton (ISAAA, 2017). Others argue that farmers are turned into advocates for HT because Monsanto wants to bring these new seeds to the market (Stone & Flachs, 2018, p. 18).

The main vision of the future on the anti-GM side is a move back to *desi* cotton, the indigenous Indian cotton type used before the Industrial Revolution when *desi* cotton was substituted for long-stapled American cotton (Kranthi, 2013). Pink bollworm becomes an argument in this agenda because *desi* cotton is considered more enduring towards insect pests, such as the bollworm than American cotton. Bt cotton was introduced as a solution to the bollworm epidemics, but as Menon and Uzramma (2017, p. 198) argue: “[w]e have a biotechnological solution for a problem that did not exist in the first place – both the problem and its ‘solution’ were introduced into the country”. To understand this argument, it is important to consider the meaning that cotton production has had for India historically. It was for example used as a symbol of self-sufficiency in the country’s fight for independence from the British by

the Swadeshi movement who used the crop as a symbol of nationalism and anti-colonialism (Beckert, 2015, p. 420). Even today, cotton is considered to be one of India's most symbolic crops (Desmond, 2013, p. 4). In this way, the pink bollworm issue is considered an unnecessary menace and threat caused by a substitution of the proud Indian cotton tradition for an outside, non-Indian technology.

Before leaving for fieldwork, I followed the pink bollworm issue through the online Indian news media, which gave me a certain impression of how the situation was looking in the cotton fields of Telangana. Articles of how farmers were switching to other crops due to huge economic losses (Kulkarni & Wadke, 2018), experiencing sudden skin issues (Reddy, 2018), and committing suicide because of deep debts (Reddy, 2017) painted a clear picture of the despair experienced by farmers. I expected to encounter anger against the technology and direct action being taken to find an alternative. It seemed to me that the resurgence of the pink bollworm attacks had the potential of being integrated neatly into the already existing anti-GM discourse. What I instead came to understand through interviews and field visits was that the GM discourse, I had seen in the media, differed substantially from the discourse expressed by agricultural scientists and NGOs.

1.2 The Hegemonic Discourse

The thesis is positioned within the framework of political ecology as it draws on the field to analyze the current challenge to the hegemonic GM-discourse in India: the pink bollworm issue. Watts (2000, p. 257) defines political ecology as a way “to understand the complex relations between nature and society through a careful analysis of what one might call the forms of access and control over resources and their implications for environmental health and sustainable livelihoods”. Political ecology is, among other things, concerned with analyzing the political dynamics surrounding the discursive struggle over the environment (Bryant, 1998, p. 79), as it integrates analysis of political-economic power relations in analyses of human-environment interactions (Turner & Robbins, 2008). In regards to technology, political ecology stresses the importance of looking at the regional processes of agrarian change that determine who performs agriculture, under which circumstances and with what livelihood implications (Taylor, 2019, p. 3).

The introduction of genetically modified seeds into cotton production in India can definitely be considered a human-environment interaction but it should not solely be interpreted as such. As Harvey (1993, p. 25) argues, “all ecological projects (and arguments) are simultaneously political-economic projects (and arguments) and vice versa”. The ecological project of enhancing yields by introducing Bt cotton in India was indeed also a political-economic project, and it continues to be so. Furthermore, political ecology stresses not only that ecological projects are political and economic, but also that political and economic processes direct our perceptions of ecological projects and systems. Therefore political ecology often seeks to critically unravel these processes by exposing flaws in the dominant approaches to the environment. In this way, political ecology “works to “denaturalize” certain social and environmental conditions, showing them to be contingent outcomes of power, and not inevitable” (Robbins, 2004, p. 12). It is, however, not the intention of this thesis to act as a critique of GMO in general or to question the legitimacy of the pro-GM discourse. Instead, referring to my research questions, it is to ask: why does the pink bollworm issue, in spite of its seriousness as a challenge to Bt cotton, not seem to pose a substantial threat to the GM hegemony, or in Gramscian terms; an “organic crisis”?

In addition to political ecology, the thesis touches upon recent scholarship in the related field of political agronomy as it considers the future of Indian cotton production and the existence and continuation of GM hegemony to be contingent on Indian agricultural research. Formal agricultural research plays an important role in innovation processes as well as decision making about technology use (Sumberg, Thompson, & Woodhouse, 2013, p. 72) and will therefore contribute to determining the future for agricultural technology and cotton production in India. In addition, as the discussion of hegemony below will indicate, Indian agricultural research may play a part in maintaining the GM hegemony. Political agronomy is concerned with the way in which actors in development oriented agricultural research and frame potential problems and solutions (Westengen, Nyanga, Chibamba, Guillen-Royo, & Banik, 2018, p. 258). A political agronomic perspective, furthermore, highlights the fact that organizations engaged in agricultural research and development are political actors, and it attempts to understand the link between the way an issue is framed and the solutions proposed to this issue (Westengen et al., 2018, p. 266). This thesis is focused on the way in which the pink bollworm issue is integrated into the existing

pro- and anti-GM discourses in India and attempts to understand how this discursive framing affects the proposed solutions to the issue. However, though I incorporate perspectives from agricultural researchers in this thesis, I do not solely focus on agricultural research but also on other sectors and actors speculating about the future for cotton production in India.

Following Peet and Watts (1996), Adger, Benjaminsen, Brown, and Svarstad (2001, p. 682) argue that discursive approaches to an analysis of development and the environment are central to political ecology, and that a general approach to the field entails “linking underlying discourses of environmental change to policies and institutions engaged in implementing environment and development”. In addition, Cook, Pieri, and Robbins (2004, p. 443) argue that the GM debate is a prime example of the important role of language in decision making as they consider the debate primarily discursive, meaning that it will be won or lost by linguistic choices. In the following section, I will argue for the benefits of using a discursive approach to studying the pink bollworm issue in cotton production in India.

The Power of Discourses

In a broad sense, a discourse can be thought of as a shared way of apprehending the world, and it enables those who subscribe to it to interpret bits of information and organize them together in coherent accounts (Dryzek, 2013, p. 9). When it comes to discourse analysis, Hajer (1995, p. 43) notes that this approach “has come to mean many different things in as many different places”. Consequently, there have been many suggestions to the definition of discourse and the way to do discourse analysis (see for example Fairclough, 1992; Jørgensen & Phillips, 1999; van Dijk, 1993). For the purpose of this thesis, I find that leaving out the very strict definitions of discourse found, for example, in the linguistic approaches and adopting a broad definition of the concept to be most advantageous as my focus is on how the interviewees attribute meaning to situations through their accounts, rather than their specific use of words. In defining the concept of discourse, I therefore follow Hajer and Versteeg (2005, p. 175) and define discourse as a collection of ideas, concepts and categories used as a way of attributing meaning to the world, which is produced and reproduced through the actions of those who subscribe to it.

In addition, I take a discourse to be characterized by its homogeneity in message, which constitutes a truth system for the actor expressing the discourse. Homogeneity in message refers to the way a shared understanding of knowledge about and perceptions of a phenomenon is understood (Adger et al., 2001, p. 685). Studying discourses therefore allows the researcher to understand how a variety of actors try to influence the definition of a problem by studying how they frame the problem based on certain ideas, concepts and categories, which they employ to assert a specific meaning to the problem (Hajer & Versteeg, 2005, p. 177). In defining discourse analysis, I follow Adger et al. (2001, p. 684) who consider three elements to represent the main aspects of discourse analysis: identifying discourses through analysis of regularities in expressions, analyzing the actors who produce, reproduce and transform discourses, and analyzing the social impacts and policy outcomes of discourses.

An example of the importance of discursive framing is contestation over the terminology of agricultural biotechnology. Agricultural biotechnology is a broad term defined by the U.S. Department of Agriculture (USDA) as “a range of tools, including traditional breeding techniques, that alter living organisms, or parts of organisms, to make or modify products; improve plants or animals; or develop microorganisms for specific agricultural uses. Modern biotechnology today includes the tools of genetic engineering” (USDA quoted in Huda, 2018, p. 50). Terms such as *Genetically Modified (Organism) (GM(O))*, *Genetic Engineering (GE)*, *transgenic crops* and *biotech crops* are often used interchangeably both by researchers and in the media, but using one terminology instead of another holds a certain significance. The original descriptor, and the most exact, is *recombinant DNA (rDNA)*, but since this is a rather clumsy term it has not received common use (Stone, 2010, p. 382). Stone (2010), one of the leading contributors to the Bt cotton literature, uses the GM term arguing that this is a neutral term with the same meaning as GE, except that the GE term implies a greater degree of control. Herring (2009, p. 18), another leading contributor, argues, however, that GMO is a political framing that incorrectly lumps together many different agricultural biotechnologies and prefers instead the term *transgenic plants*. Herring (2008a, p. 460) argues further that the GMO framing created a separation of one form of agricultural biotechnology from all others as new and unique in addition to being fundamentally different from those framed as natural.

According to Stone (2010, p. 382), however, transgenic plants, along with biotech crops, a term often preferred by corporate media as a nickname, are inaccurate terms. This contestation and disagreement on proper terminology highlights the importance of discursive framing. In India, “GM crops” is the term most commonly used by the media and other stakeholders (Huda, 2018, p. 50). Therefore the GM crops terminology is preferred in this thesis.

Considering the use of terminology is an important part of a discursive approach as it recognizes at the most basic level that the language we use to address issues makes a difference, and the strength of the approach is to reveal this embeddedness of language in practice (Hajer & Versteeg, 2005, p. 177). In this thesis, a discursive approach is adopted to show how the use of language constrains the solutions proposed for issues by identifying certain discourses in the GM-debate, comparing their differences and controversies, and connecting this to their proposed solutions. Adger et al. (2001, p. 709) argue that, in this way, a discursive approach can “contribute to a political ecology sensitive to the political construction and use of scientific knowledge and multi-level nature of interactions between institutions and environmental change”. In this thesis, I contend that a discursive approach to the pink bollworm issue can contribute to a perspective in the Bt cotton debate in India that acknowledges the importance of how different actors discursively frame the issue in different ways, and the way in which power, in the Gramscian understanding of hegemonic power, is created through discourse. In the subsequent section, I will explore the Gramscian concept of hegemony, but first I move on to define the two ideal type pro- and anti-GM discourses.

Ideal Type Discourses

In a study of discourses regarding global environmental issues, Adger et al. (2001) identify two clusters of main discourses: Global Environmental Management (GEM) discourses and populist discourses. These discourses may serve as a starting point for defining the pro- and anti-GM discourse ideal types. In these discourse clusters, a key feature is to identify and attribute blame to certain actors, and they therefore contain strong notions of “heroes” versus “villains”. Another commonality of the GEM and populist discourses is that they perceive the environmental problems as a

crisis, and that they believe that changes to the environment will have severe social, economic and political consequences.

Where they differ, however, is on whom they perceive as responsible, and what they present as a solution. The populist discourses portray global capitalism, transnational corporations and colonial powers as villains and see external interventions as part of the problem itself. This has strong resemblance to the anti-GM discourse expressed, for example, through the biopiracy discourse of Vandana Shiva, a prominent spokesperson on the anti-GM side, as it expresses “vehement resistance to the commercial collection, development and patenting of modern medicines from biodiversity and traditional knowledge in the South” (Adger et al., 2001, pp. 695-696). In the same way, the anti-GM discourse claims that exploitation of resources of the South is taking place through patenting and commercialization. Here, it is important to keep in mind the history and symbolic power attributed to cotton in India, as I will elaborate on in the context chapter.

In contrast, in the GEM discourses local farmers, peasant and landless poor are seen as the principal causal agents of environmental problems. However, like in the populist discourses, farmers are simultaneously perceived as victims of the problems as they undertake their damaging activities through no fault of their own. The GEM discourses present external interventions, such as technology, as a key feature of the solution (Adger et al., 2001, p. 704). The idea of technology as a solution resonates with the pro-GM discourse as the use of GM crops has often been promoted based on its potential to solve problems related to social and environmental issues. The Bt technology was, for example, promoted in India due to its potentially pesticide reducing effects, which would allegedly benefit the environment as well as increase economic gains for cotton farmers (Bennett, Ismael, Kambhampati, & Morse, 2004; Morse, Bennett, & Ismael, 2007). Farmers have not been portrayed as villains in the pro-GM discourse, however, but rather as victims of low yields and poverty as a way of arguing for the need for the technology. Glover (2010a, 2010b) has, for example, argued that GM crops often have been framed corporately as “pro-poor” and environmentally sustainable. Cook (2004) also identifies this as one of the main themes of the pro-GM discourse: the potential of GM crops to increase production and reduce environmental damage.

The ultimate aim of discourse analysis is attempting to reveal and understand power structures (Pearson, 2006, p. 309). I understand power in this thesis through a Gramscian approach as hegemonic power. According to Hajer (1995, pp. 60-61), a discourse is considered hegemonic if it structures the actions and thinking of actors in a certain domain, and if it is translated into concrete policies and institutional arrangements. Adger et al. (2001) consider the GEM discourses to be hegemonic as they dominate in terms of influence over environmental policy. In addition, the GEM discourses have many characteristics in common with the concept of ecological modernization, which Hajer (1995) argues is a hegemonic discourse regarding environmental issues of the North. The populist discourses are considered to be challenging the hegemonic discourses. Correspondingly, I consider the pro-GM discourse as hegemonic regarding cotton production in India and the anti-GM discourse to be challenging. I shall discuss this further in chapter 4, but first I move on to introduce properly the concept of hegemony.

Hegemony, Organic Crisis and Bt Cotton

The basis of a Gramscian understanding of hegemony is that a class gains as well as maintains state power through a combination of coercion and persuasion but always involving obtained consent of the subordinate classes (Simon, 2015). The Gramscian concept of hegemony places analytic emphasis on the strategies used by the dominant groups in repeatedly obtaining this consent to their rule as power relations, which may lead to inequality, are produced and reproduced in this process (Schnurr, 2013, p. 640). A project may be labelled hegemonic if its understanding of reality dominates all layers of a given society. Brown (2018, p. 9) argues for example that the Green Revolution in India can be thought of as a hegemonic project, and Newell (2009) argues that the adoption of GM crops in agriculture in Argentina as a central accumulation strategy can be thought of as a bio-hegemonic project.

Bio-hegemony is defined as “the alignment of material, institutional and discursive power in a way which sustains a coalition of forces which benefit from the prevailing model of agricultural development” (Newell, 2009, p. 38). In this thesis, I lean on Newell’s (2009) description of the Argentinian agricultural model as a bio-hegemony but transfer the term to describe instead the context of Indian cotton production.

According to Newell (2009), the bio-hegemony of Argentina rests on three pillars of power: material power, which involves control over agricultural productions, institutional power, which is manifested in access to bureaucratic structures and decision-making procedures within the state institution, and discursive power, which is important for the bio-hegemony in order to deflect challenges and promote the achievements of biotechnology. Newell (2007) studied the three pillars of bio-hegemonic power in an Indian context and concluded that large biotech and agro-chemical companies have considerable material, institutional and discursive power in India. Drawing on Newell's (2009) approach, Schnurr (2013, p. 642) argues that "[t]he desirability of GM is secured through these three arenas of power, each of which is critical to understanding how biotechnology is positioned as the dominant technological possibility for increasing agricultural production in new markets".

In this way, bio-hegemony constitutes an alignment of interests needed to move forward the bio-agenda by making up a strategic and coherent social structure (Newell, 2009, p. 38). Building on the Gramscian term "historic bloc", Andrée (2011, p. 177) has coined the term "biotech bloc", which refers to a "multifaceted alliance rooted in the material capabilities of genetic engineering and led by agrichemical companies in corporation with promotional and regulatory arms [...] as well as key civil society organizations". Andrée (2007, p. 27) posits that the biotech bloc in Canada is engaged in a "war of positions" to gain influence across civil and political society in order to "normalize their own perspectives as hegemonic". This entails a framing of the interests of the biotech bloc as general interests and that benefits and values of biotechnology for agriculture acquire the status of "common sense" (Newell, 2009, p. 38). According to Gramsci, common sense refers to the internalization of ideas and taken-for-granted knowledge (Crehan, 2016, p. 43). Common sense is the collection of people's often contradictory conceptions of the world, which are internalized and lived uncritically (Forgacs, 2000, p. 421).

In this thesis, I focus on the third pillar of bio-hegemony: discursive power. In the same way as a hegemonic project, a discourse can become hegemonic if it dominates common thinking about a topic and is translated into institutional arrangements (Adger et al., 2001, p. 685). An important group of actors in this project is "organic intellectuals" who specialize in the elaboration of the hegemonic ideology (Simon,

2015, p. 60). In addition, organic intellectuals function as mediators in the struggle over hegemony as they unite the ideas of subaltern classes with the ideas of the hegemony, which leads to a manifestation of hegemony (Morton, 2007, p. 92). According to Schnurr (2013, p. 644), scientists serve as the organic intellectuals of bio-hegemony as they use their credibility as experts to advance arguments in favor of GM technology.

Discursive power of bio-hegemony relates to the social construction of the commercial potential of biotechnology (Newell, 2003, p. 28). It is important because of its ability to dominate the framing of ideas about biotechnology in a way that secures the supremacy of bio-hegemony by promoting triumphant narratives while deflecting challenges and critiques (Newell, 2009, p. 52; Schnurr, 2013, p. 651). In regards to discursive power, Gramsci emphasized the role of the media and suggested that the press constitutes the most prominent and dynamic part of the ideological structure of the ruling class in that it has the potential to influence public opinion (Forgacs, 2000, pp. 380-381). Media framings of biotechnology may help to promote the potentials of the technology and ensure high levels of government interest. The framing of biotechnology in the media in India has been constructed based on an association with the success story of the IT sector in the country through the slogan “from IT to Bt” (Newell, 2003, pp. 28-29). By constantly reinforcing and repeating this framing through the media the association becomes uncritically accepted as part of the public discourse.

Hegemony can never be considered complete, however, and Gramsci was aware of the vulnerabilities, fragilities and opportunities embedded in the concept and placed therefore emphasis on how the relations of forces are in continuous motion (Newell, 2009, p. 39). Hegemony cannot be taken for granted but has to be continually reproduced as it needs to adapt to the changing conditions surrounding it as well as the activities of opposing forces (Simon, 2015, p. 35). This need for constant reconfiguration might open for possibilities for destabilizing or re-orienting the bio-hegemony as this is fragmented and constantly shifting in reaction to new challenges to its dominance (Schnurr, 2013, pp. 655-656). Hegemony may be challenged, for example, when the dominant group fails to deliver its promises to the subordinate groups, or when new ideas begin to develop amongst the general population

challenging the dominant view. In Gramscian terms, this creates a “crisis of authority”, which may present an opportunity to introduce a new hegemonic regime (Brown, 2018, p. 9).

According to Gramsci, in order to succeed in overthrowing one hegemony and developing a new, an “organic crisis” is crucial as it entails the chronic disrepair of the structures and practices that constitute the current hegemony (Carroll, 2010, p. 170). A situation where development of new collisions of opposition is combined with a generalized weakening of the social identities, which define the social and political spheres, can be labelled an organic crisis (Laclau & Mouffe, 2001, p. 136). In relation to bio-hegemony, Gottweis (1998, p. 264) argues that:

[...] any probing of the established framings of reality, such as the nature of the risks involved in genetic engineering, could potentially lead to the proliferation of new antagonisms that might trigger a crisis of the dominant rationalities justifying the process of policymaking.

In this thesis, I discuss the potential of the pink bollworm issue to reframe the GM-debate and thereby challenge the bio-hegemonic pillar of discursive power in Indian cotton production. I argue that instead of constituting an organic crisis, the pink bollworm issue portrays the complex practice aimed at negotiating a “compromise equilibrium” (Nielsen & Nilsen, 2014, p. 206) between on the one hand those who worry about the negative effects of the GM technology and on the other hand those who have interests linked to the maintenance of the bio-hegemony. Compromise equilibrium entails that account has been taken of the interests of the subordinate groups and that the leading group has made sacrifices to accommodate for this but only to a certain extent since hegemony must ultimately be based on the decisive function of the leading group (Gramsci, 1971, p. 161). The negotiation of compromise equilibrium within the arena of discursive power in this case is intended to conserve consent for the bio-hegemony by making smaller discursive sacrifices to accommodate for the interests of the subordinate side without touching the essentials. I argue that the sacrifice made by the pro-GM side is a discursive sacrifice in that it acknowledges the problems of resistance creation related to the Bt technology presently in use in India.

1.3 Field Setting

The initial adoption of Bt cotton in the Warangal District happened so fast that Stone (2007, p. 68) refers to it as more than innovation adoption, more than a tipping point: it was a craze. When Bt cotton was introduced in 2002, the Warangal District was part of the region of Telangana, which was a part of the state of Andhra Pradesh until June 2nd 2014. On this day, region and state were separated, and Telangana therefore constitutes the youngest state in India (Government of Telangana, 2019a). The state capital is Hyderabad, a city of about 6.8 million people, where I was based at the University of Hyderabad (UoH) during my almost two months of fieldwork in September and October 2018. Telangana and especially the Warangal District located in the eastern part of the state have attracted much attention from the media as well as from researchers in relation to agricultural distress and farmers' suicides. The main economic driver in the Warangal District is agriculture, which used to be dominated by food crops, but now many farmers have switched to cotton as the primary cash crop due to promises of good profits (Shiva, Emani, & Jafri, 1999, p. 603; Stone, 2011a, p. 760). In Kharif¹ 2016, cotton was the main crop covering almost 50% of the cultivated land followed by paddy rice and maize which together covered almost 40% of the area (Government of Telangana, 2019b). The Warangal District is one of the main cotton growing areas in India but also an area that has experienced many challenges (Stone, 2007, p. 67). The alleged surge of farmers suicides in 1998 was for example centered in Warangal (Roy, Herring, & Geisler, 2007, p. 158). I will discuss this further in the context chapter.

The Warangal District is located in the semi-arid region with thin red soil, which makes it extremely risky to grow cotton in this area (Herring, 2008b, p. 150). Rainfall in Telangana is uncertain both in quantity and in timing, irrigation for cotton is limited, and crop failures are common. According to the Statistical Year Book India 2017 more than half of the total cultivated land in Telangana was under irrigation in 2013-14. However, paddy rice was the main receiver of irrigation while only a small part of the total cotton area was under irrigation as the paddy area under irrigation was almost two thirds (62%) of the total irrigated area while the cotton area

¹ Kharif refers to the cropping season during the monsoon while Rabi refers to the cropping season during the dry season. Cotton is grown in the Kharif season. During Rabi season 2016-17 paddy rice and maize were the main crops in the Warangal District (Government of Telangana, 2019b).

under irrigation was only 7% of the total (Government of India, 2018)². As the Bt cotton hybrids are a highly water-intensive variety, the irrigation status of cotton in Telangana may be problematic.

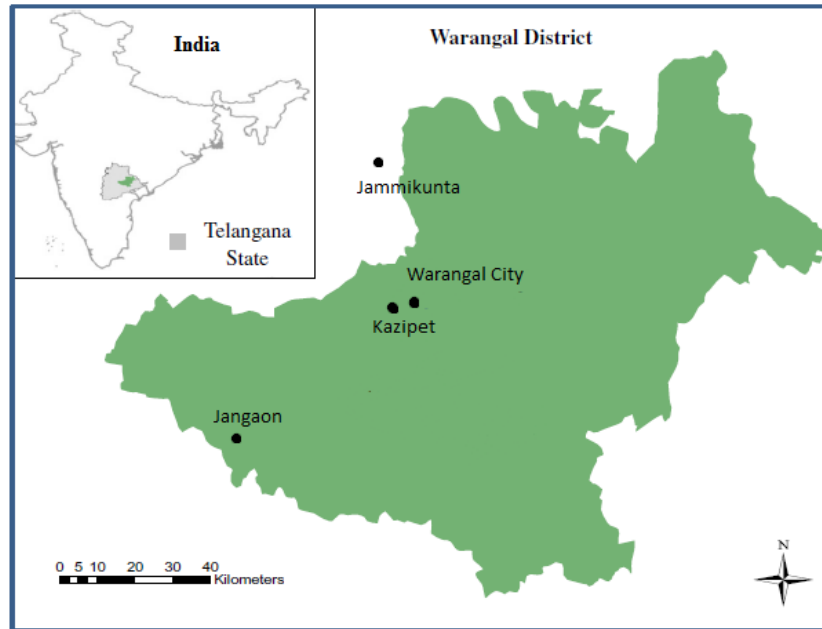


Figure 1: Map of the Warangal District in the state of Telangana, India

Source: Map adapted from Flachs, Stone, and Shaffer (2017, p. 144)

1.4 Outline of Thesis

In this chapter, I have set the scene for the development of the pink bollworm issue. In addition, I have outlined the theoretical aspects and introduced the field context of the Warangal District. In chapter 2, the methods chapter, I address the methodology behind the thesis beginning with the wider research design followed by the specific methods used for data collection; open-ended interviews, field visits and secondary sources. In chapter 3, I contextualize Bt cotton by going through the stages of development for cotton production in India. I argue that these are important to consider when attempting to grasp in full the GM debate in India today. In addition, I introduce previous research on Bt cotton in the Warangal District as I base my thesis on this massive research contribution. Chapter 4, 5 and 6 consist of my analysis and discussion. In chapter 4, I identify how the issue of the pink bollworm has been integrated into the pro- and anti-GM discourses by analyzing secondary sources in

² These numbers are results of calculations based on the Statistical Year Book India 2017

the form of English-language online India news articles together with open-ended interviews. In chapter 5, I analyze how “farmers” are discursively framed in the discourses as victims, rational agents and non-abiders and discuss the implications of using a pro-farmer approach as a rhetorical technique. In chapter 6, I discuss the effects of the pink bollworm issue in regards to challenging the bio-hegemony of Indian cotton production. In chapter 7, I summarize my findings and discuss the challenges for the anti-GM side in constituting a discursive counter-hegemony.

2 Methods

In this chapter, I will present the methodology for this thesis and the methods I have ended up using, halfway intentionally and halfway by incidence in a need to adapt to the situation in which I found myself. I expected fieldwork in India to be a rather chaotic and confusing experience, but even when prepared for chaos and confusion it is hard to prevent it. In this chapter, I describe how I have used open-ended, in-depth interviews, field visits and secondary, textual sources in my data collection as a relatively straightforward process, and even though the reality felt quite different I believe that the data ties together as a mutually fulfilling basis for analysis. In addition, I discuss the use of English-language online news article as secondary sources.

2.1 Research Design

The starting point for my interest in this thesis topic in the spring of 2018 was food production in India. This led me to the debate about field-testing of Bt Brinjal (eggplant) and GM Mustard and from there to the debate on Bt Cotton and the new issue of the pink bollworm attacks. As I dug deeper into the controversy using online sources such as news articles, reports and anti-GM websites, I became increasingly interested in trying to understand, not only what was being portrayed through the media, but also what was actually going on in the country. What I became most interested in was trying to understand how the people who are affected by this issue experienced the situation. This led me to start out with a rather broad research interest, which was narrowed down later in the process.

With this topic, it seemed appropriate to use qualitative interviews as a research method as this method is claimed to provide the researcher with an insight into how people understand and view the world (Hammersley, 2008, p. 91). A key feature of qualitative research as a methodology is an interest in subjectivity and the attempt to obtain an understanding of the human experience (Silverman, 2010, p. 119). Furthermore, I adopt a constructivist approach in this thesis in that I perceive the accounts of the interviewees, not as facts, but as a part of the world they describe (Silverman, 2006, p. 129), and I recognize that it is through the discursive conflicts

between opposing perspectives that societies are transformed (Strydom, 2002, p. 151). In particular, I find it interesting that the understanding of an issue related to GM crops, a technological/biological phenomenon that arguably exists objectively outside of the subjective world, can be constructed socially through interactions. I attempt to understand this process by looking at the discursive conflicts imbedded in the GM debate in India.

The constructivist approach aligns well with the use of a discursive approach to the analysis and the use of discourse as a concept as these emphasize the way people produce (or construct) events or versions of the world through discourse (Potter, 1997, p. 188). As I have elaborated on in the introduction, discourse analysis as a methodology within certain disciplines has a rather specific procedure for how to approach data (Silverman, 2006, p. 7), which will not be beneficial in regards to the aims of this thesis. Instead, I apply discourse analysis in a broader sense where the aim is to identify homogeneity in accounts and compare these using the pro- and anti-GM discourses as ideal types. In addition, I draw on multiple sources for the thesis and have included secondary sources in the form of English-language news articles from the major online Indian newspapers. Some researchers warn against this kind of triangulation of data in qualitative research as it often implies counterposing different contexts and thereby ignoring the contextuality of social interaction (Silverman, 2006, p. 292). The reason for this choice, however, is that I wish to highlight the difference between the portrayals of the issue in the media, which I came across before leaving for fieldwork with what I encountered when I came to Telangana.

2.2 Open-Ended Interviews

One of the major sources of information used in this thesis is open-ended, in-depth interviews. During fieldwork in and around Hyderabad, I carried out 11 interviews with agricultural researchers and NGOs and ended up using 10 of these for this thesis. One interview with an NGO representative was omitted, as the organization does not operate within the state of Telangana. The people I interviewed may be considered key actors in cotton production in Telangana, as they are agricultural researchers engaged in research on cotton cultivation and NGOs who work with

cotton farmers. I relied on a (very) short interview guide mainly made up of topics that I wished to cover and tailored the questions to each specific interview.

A reason for using interviewing as a method is that it allows the researcher to access the attitudes and values expressed by individuals (Silverman, 2006, p. 114). In open-ended interviews, the key role of the researcher is to engage in active listening while also keeping in mind the broader aim of the research. This has the intent of giving the interviewee freedom to talk and simultaneously ascribe meaning to their accounts (Silverman, 2006, p. 110). The broader aim of research using open-ended interviews as a method has been described as: “understanding the language and culture of the respondents” (Fontana & Frey, 2000, p. 654). Similarly, the broader aim of this thesis is to understand the discourses of the interviewee, which are imbedded in the language they use to speak about Bt cotton and the pink bollworm issue.

In addition, my method for conducting interviews was inspired by elite interviewing for several reasons. Firstly, elite interviewing provides the researcher with an insight into the mindset of people in a privileged role (Richards, 1996, p. 199). Even if the interviewees in this thesis are not considered “elites” in the general understanding of the term, they do hold important positions in the context of cotton production in Telangana and could therefore contribute valuable information and insights to my research. Secondly, elite interviewing helps the researcher to establish a network (Richards, 1996, p. 200). I used snowball sampling to establish contact with people who worked in field dealing with cotton production. The disadvantage of this approach is that it has a potential sampling bias since people often refer to others with similar opinions and positions as themselves. This bias may, however, easily be minimized by starting the “snowballing” from different fronts.

The initial contacts were reached in several different ways. Some I found through contacts of my supervisor, some by reaching out to researchers who had recently done fieldwork in the same area and some even by reaching out through Facebook pages and LinkedIn profiles. I attempted to do what Aberbach and Rockman (2002, p. 673) refer to as being “politely persistent” in my communication with possible contacts, and the responses were mainly positive, and only a few did not respond at all. Prior to my fieldwork, I expected my role in the field to be affected by my nationality as well as my age and gender. I did not directly have trouble getting

access to informants based on these factors, and they did not contribute to any immediate difficulties, but it is impossible to know what I might have experienced under different circumstances.

Thirdly, elite interviewing as a method provides the researcher with certain modes of conduct, which I found suitable for my research design. In elite interviewing it is, for example, common to let the interviewee control the terms of the interview situation in relation to deciding what is relevant to discuss. This resulted in divergence between the topics discussed during each interview, but as I did not need to compare questions and answers directly, I found it more important and interesting to let the interviewees guide me through their interpretations of the situation than to force through my own questions. In my fieldwork journal, I noted down the following after my first interview:

I wrote down some important questions and ended up using most of them in the interview. They turned out to not be as important and good as I had thought but they got the professor talking about what he found important so I guess they worked out anyway.

This describes quite precisely how I ended up conducting most of my interviews. I noted down questions based on research I did before the interview on the person I was interviewing or the organization they represented and used these questions during the interview but often found that it was not the answers to these questions in particular that turned out most interesting but rather the topics or themes these questions elicited.

Due to lack of access to information prior to the interviews, I had no choice but to use a largely unstructured interview style comprised of open-ended questions. Even without this limitation, however, I would have chosen an unstructured because, as Aberbach and Rockman (2002, p. 674) note, elites and highly educated people in general like to articulate and explain their views and this opportunity is provided by using open-ended questions and a semi- to unstructured interview style. In addition, it provided me with flexibility in choosing suitable follow up questions for each interview. As each interview was substantially different from the next, this need for flexibility turned out to be crucial. The challenge with using this style was, however, that the interviewees often used this opportunity to tell me what my research should

focus on, and it was often difficult to get them back on track. One time, the interviewee even ended the interview by telling me to go discuss the possibility of changing my topic completely with my supervisor before getting back to him. The other interviewees did, however, not respond this drastically to an unstructured interview style, and I quickly learned to use the role of the unknowing researcher from the West or, as I termed it in my field work journal, the “I think what we hear in the West is not the real truth, please tell me what the truth is”-position to my advantage.

I recorded most on the interviews upon acceptance of the interviewees and later transcribed them using HyberTranscribe and coded them by hand. The codes were devised based on empirical knowledge from interviews and fieldwork as well as the Bt cotton literature. Some interviewees, however, due to issues of anonymity did not wish to be recorded. During these interviews, I took notes, which I filled in as soon as possible after the interview had ended. I also noted down some main points and immediate reflections after all interviews, usually in the Uber ride back. The limitation of not recording interviews is, of course, that something may have been left out in my notes. For some situations, however, notetaking turned out to be more practical, such as when I was moving between offices and speaking to several people at a time.

Limitations of the Open-Ended Interview

One of the main methodological issues related to the qualitative interview method is the question of reliability. As Silverman (2006, p. 117) notes, interviews do not give researchers direct access to facts or events, and they do not tell directly about people’s experiences but instead offer indirect representations of those experiences. It has therefore often been debated what interviews can actually tell us as researchers (Hammersley, 2008, pp. 89-91), or as Dean and Whyte (1958, p. 34) note, “[h]ow do you know if the informant is telling the truth?” When speaking about the truth in a constructivist approach, however, the meaning is usually a subjective truth; the social world as experienced by the informants. As Sandberg (2010) argues in relation to narrative analysis, it is not important whether people tell the truth as the stories they tell reflect how they perceive their reality. When, for example, I above mentioned the

possibility of assuming a “tell me the truth”-position, I refer to using an unstructured interview style as a tool to elicit accounts of the pink bollworm issue, which the informants experience as the truth. In addition, it is important to keep in mind that what interviewees say is not always the same as what they do (Jerolmack & Khan, 2014). This is not to say that interviewees lie, but rather that it is important to keep in mind that what people say is contingent on how they understand the situation.

A methodological issue related to elite interviewing is the issue of exaggerated roles (Berry, 2002, p. 680). I experienced this very explicitly during an interview with the head of an organization working with cotton farmers. On my question of whether the state was supporting the project, he laughed and answered: “Well, I am the state!” receiving laughter from his two assistants who were also present. I was informed of his importance as a state representative (something I had not been prior to the interview) and the importance the project was given by the state government. Later, I have chosen to omit the interview from my thesis as the project is carried out in a different state. Therefore, I did not have to deal with the issue of determining whether he was exaggerating his role, but the issue revealed itself during several other interviews as well. For example, I highly doubt that as a lawyer in India you have the power to “tell the Prime Minister to shut up” or “go to the Chief Justice and say can you please keep quiet” and then “[h]e can’t do anything”, as one of my interviewees claimed.

A way of minimizing the issue of exaggerated roles is for the researcher to “[d]o your homework” (Berry, 2002, p. 681), which entails researching the interviewees and their affiliations beforehand. This leads me to a different issue, which I assume to be especially relevant when doing research in India: the issue of unpredictability. It was more often the rule than the exception when showing up for an interview that I was unsure about what to expect from the interview or even whom I would be interviewing. Even after attempting to be “politely persistent” in requesting more information, I was often just provided with a name and a phone number to contact or even just an address and a time to show up. After a few interviews like this, I learned to just go with it and even came to view it as an advantage that the situation had not already been defined because this created flexibility and freedom. This also meant, however, that the interview situation came to be very much predefined by the

interviewee. It also created certain challenges for me as an interviewer as I to a very large extent had to think on my feet and “formulate follow-up questions on the fly” (Berry, 2002, p. 679) without much or even any time to prepare. It also created considerable practical challenges, as I seldom knew how much time the interviewee would grant me, when the interview would start or if the interview would even happen. This issue may have been related to the lack of importance I was attributed by the interviewees as “just” a master’s student. However, it may also have been related to what my contact, Christabel, at the Nordic Centre in India formulated very accurately: “this is something about India... time is fluid and people are not bound by appointments”.

This reality, combined with the fact that transportation in Hyderabad is a time-consuming activity due to traffic jams and general chaos, came to determine the frequency of my interviews, and I found that I was able to carry out no more than one interview a day. In addition, gaining access to the informants was a challenge. I spent much of my time during fieldwork simply trying to get in touch with people on either email or phone. The problem with emailing was that I often did not receive an answer, and the problem with calling was that the secretary often did not speak English. These issues unfortunately limited the number of interviews I was able to carry out substantially, which is a limitation of this thesis. I have attempted to tackle this limitation by including secondary sources and by depending on the impressive amount of research that has been done on Bt cotton in Warangal by researchers such as Ronald J. Herring, Glenn D. Stone and Andrew Flachs.

Informants and Affiliations

During fieldwork, I met with 10 representatives of nine different institutions who all did work within the field of agriculture. In this section, I will present the affiliations of the representatives, as these are important to consider when mentioned later in the thesis. I met with all of the representatives at their respective institutions for about one hour each. I have chosen to anonymize all of my informants even though only two requested anonymization specifically.

Centre for Economic and Social Studies (CESS). CESS is located in Hyderabad and is established as an autonomous research institute funded by the Government of

Telangana (CESS, n.d.). The person I talked to from CESS is an agricultural researcher at CESS. He formerly worked with a proclaimed anti-GM NGO.

Centre for Sustainable Agriculture (CSA). CSA is a Hyderabad-based, Independent Research Organization working with NGOs in 150 villages in rainfed areas in several states in India to establish ecologically and economically sustainable models of agriculture as well as promote Non-Pesticidal Management (NPM) and organic farming (Centre for Sustainable Agriculture, 2017).

Consortium of Indian Farmers Association (CIFA). CIFA is a Hyderabad-based, pro-industry farmers' organization directly supporting the use of biotechnology in agriculture in India and working to create awareness amongst farming communities about such modern agricultural methods (CIFA, 2018).

Indian Council of Agricultural Research (ICAR). ICAR is the apex body for coordinating, guiding and managing research and education in agriculture in India and functions as an autonomous organization under the Ministry of Agriculture and Farmers' Welfare, Government of India. There are 101 institutes and 71 agricultural universities under ICAR across India (ICAR, 2017). ICAR was instrumental in starting the Green Revolution in India and, as will be described later, played a central part in the process of considering the approval of Bt cotton in India (Scoones, 2006, p. 252). The representative I interviewed works as a principal scientist at ICAR.

Indian School of Business (ISB). ISB is located in Hyderabad and is funded entirely by private corporations, foundations and individuals (ISB, n.d.). The person I talked to from ISB is an associate professor who has previously worked on research within environmental politics in South Asia.

National Institute of Rural Development and Panchayati Raj (NIRDPR or NIRD). NIRD is an Indian institute for research on rural development based in Hyderabad. The institute functions as an autonomous organization acting as a "think-tank" for the Ministry of Rural Development, Government of India and assisting the ministry in policy formulation (NIRD&PR, 2019).

Pesticide Action Network (PAN) India. PAN India works in collaboration with PAN International Community, which is a coalition of around 600 actors in about 60

countries advocating the adoption of ecologically sound agricultural practices in place of pesticide use. The mission of the organization is to “*eliminate the human and environmental hazards caused by pesticides*” (PAN India, n.d.).

University of Hyderabad (UoH). UoH is commonly known in Hyderabad as Hyderabad Central University (HCU) and is a Public Research University. The person I talked to is a professor of sociology affiliated with the Department of Sociology at UoH.

World Wildlife Fund (WWF) India. WWF is an international environmental organization working in more than 100 countries. WWF India has a specific focus on fresh water conservation and in relation to cotton, the organization works on the project Better Cotton Initiative (BCI) to introduce Better Management Practices (BMP). In addition, WWF India works with two of the NGOs who accompanied me during field visits as described in the following section.

2.3 Field Visits: Warangal District

As explained in the introduction, the Warangal District constitutes a special case for studying Bt cotton as the agrarian crisis of India (which will be discussed further in the following chapter) has clearly manifested itself here. Particularly for cotton farmers, this becomes apparent in the statistics of low yields of cotton and high levels of farmers’ suicides. In the Warangal District, I visited villages around Kazipet and Jangaon for three days talking to cotton farmers and two NGOs working in the areas. I also visited a research extension program and villages around Jammikunta in the district of Karimnagar, but as the villages are located less than 20 km from the Warangal District (see Figure 1) they experience similar climate conditions to those in Warangal. Farmers in Jammikunta will therefore have approximately the same conditions for cultivation as farmers in Warangal.

In the villages around Kazipet, I spend two days with the NGO Modern Architects for Rural India (MARI) who is working with cotton farmers in the area on a project entitled *Sustainable Production of Cotton for Economic growth, Farm livelihood and Ecosystem health in Warangal District of Andhra Pradesh*. I talked to three farmers responsible for trial plots, a group of eight members of a farmers’ society, nine field

facilitators and the two heads of the project. The farmers who become part of this project are divided into learning-groups where one farmer is assigned responsibility for a trial plot and is given the job of teaching what he learns on the plot to the other farmers in the group. This idea came from WWF India who is working with MARI in the area. On the trial plots, they test intercropping of green gram, red gram and maize together with cotton as a way of reducing pests. In addition, they test six varieties of cotton (all Bt) to analyze which seed is best suited for cultivation next season as well as different spacing between the plants.



Figure 2: Cotton trial plot in Kazipet. Fields are marked with cotton type and spacing

They were also identifying common pests for cotton using pheromone traps for, among others, the pink bollworm. Around Jangaon, I talked to two farmers while accompanied by the local NGO Centre for Rural Operations Programmes Society (CROPS). In Jammikunta, I talked to five farmers and visited the local agricultural research extension program, Krishi Vigyan Kendra (KVK), funded by ICAR and managed by a local voluntary organization called Grama Nava Nirman Samithi (GNNS). KVK is also working on the BCI initiated by WWF India.

Validity and Ethical Concerns

When doing fieldwork as an “outsider” in other cultures it is important to keep in mind how certain characteristics of the researcher such as gender, age and nationality may affect data collection as well as interpretation. I attempted to keep these aspects in mind both in relation to how the participants viewed me as well as how I might

understand the situation based on my personal point of departure. However, unpredicted challenges related to fieldwork among cotton farmers also arose. I have conducted 10 interviews with cotton farmers (see appendix) in addition to the group of eight farmers from the farmers' society in Kazipet. For a while, I struggled with finding a way to use these interviews as data for my analysis. For several reasons, this group of informants is not representative for cotton farmers in the Warangal District in general, and there are major issues related to the validity of an analysis based on this data as regular interviews. The first issue has, among other things, to do with the fact that all the farmers I interviewed were male. This poses an issue of representativeness because studies have shown that women have increasingly taken over in the sector of agricultural work in rural India (Agarwal, 2003). Women in agriculture in India continue to derive their livelihood primarily from agricultural labor and less from cultivation, though it is common that women cultivators in addition undertake agricultural work for others. There does, however, seem to exist a substantial gap between land operation among men and women in India as statistics from the latest Agricultural Census of 2010-11 show that out of the total persons operating land, around 87.5% were men (Pattnaik, Lahiri-Dutt, Lockie, & Pritchard, 2017, p. 146). As I only interviewed farmers belonging to the category of cultivators and landowners, it is not surprising that all of my informants were male, but this circumstance must still be kept in mind when considering my findings.

This leads me to the second issue: caste. During field visits, I was continuously told that caste is not an issue in India anymore, and therefore I was unable to collect data on caste about my informants. As Corbridge, Harriss, and Jeffrey (2013, p. 257) argue, this idea, that caste does not matter anymore, is prominent among the Indian middle class, but groups such as the Dalit, the former untouchables, are nevertheless still experiencing discrimination based on caste. The most recent Agricultural Census in India shows that members of the Dalits, or Scheduled Castes (SC), and Scheduled Tribes³ (ST) operate only 9% and 11% of the cultivated land, respectively, even though their population share in rural areas in total is about 40% (Agriculture Census

³ Scheduled Caste, Scheduled Tribe and Other Backward Class are categories used by the Indian state to promote proportionate representation through employment quotas, deliver extra services, etc., for groups regarded as disadvantaged due to their caste, class or tribal background. The implementation of this system traces back to pre-Independence when the British created lists of formerly Untouchable castes and tribes deemed eligible for special state assistance (Corbridge et al., 2013, p. 245).

Division, 2015c). I discuss the issue of representativeness for Indian farmers further in chapter 5.

I shall discuss the issues of caste and gender below, but first I wish to say something about the question of validity related to the way the data is analyzed. Both before and during fieldwork, I was determined to include the perspectives of farmers by conducting interviews with cotton farmers. Even though it seems I carried through this determination, there are certain limitations that I needed to consider when analyzing the data, both related to whether the informants are representative for cotton farmers in the area, as mentioned above, and to the validity, or “truth” (Silverman, 2010, p. 275), of the analysis. There are several difficulties related to interviewing Indian farmers. I found it to be both inappropriate and inconvenient to use a recorder and chose instead to make notes during the interviews as a part of my field notes. This type of ethical consideration about research structure is always necessary, but it becomes especially important when the researcher steps into the everyday lives of the participants (Madden, 2010, pp. 33-34).

As I do not speak Telugu, it was crucial to have an interpreter but due to practical and financial issues, I had to rely on representatives of NGOs who accompanied me to the fields, which was far from an optimal research situation. After my first day of field visit in Kazipet, I have noted the following in my field journal:

[The representative] shows the first trial plot with intercropping and border crops. I try to talk to a farmer but talking through [the representative] makes it difficult. Lunch in the field office, break, then oversee a meeting between [the representative], [the other representative] and the field facilitators and then talk to the field facilitators. This is again made difficult as [the representative] seems to want to decide what is important to ask, tell and translate. Much of the info was [the representative] promoting his and MARI's cotton project. It was rather difficult to speak with the farmers since everything was “censored” through him.

Similarly, in my field notes from Jammikunta I have noted down whenever I clearly understood that the interpreter was answering my question on his own instead of asking the farmer. Researchers before me have experienced similar challenges related to fieldwork in rural areas of India. When studying Bt cotton in Andhra Pradesh, Pearson (2006, p. 309) found himself too restrained in time and resources to

find a skilled translator and refrained from using a local interpreter due to concerns of validity and chose therefore not to carry out farmer interviews altogether. Similarly, Bownas (2016, p. 83) notes that he left out interviews with farmers in his final analysis as he found their answers to be sensitive to the presence of his different research companions.

In addition, during my field visit in Jangaon I noted down another issue, which was prevalent during all field visits:

It seems like farmers are very used to being under some sort of surveillance by the organizations I have been visiting. They are very used to talking in numbers, which made it a bit difficult to do the interviews as they were trying to give me what they thought I wanted when what I actually wanted was opinions.

It became clear to me that farmers were used to answering questions from the organizations about yields, number of plants, numbers of pesticide sprays and so on. Therefore, they seemed to find it difficult or perhaps irrelevant to answer the questions I was posing about methods for pest control or reasons for growing cotton over other crops. This issue limits the usefulness of the data considerably. Instead of leaving farmers' interviews out completely, however, I have chosen to include the interviews in a way that considers what they can actually tell me. The question of what information an interview can truly provide should always be considered in qualitative research (Hammersley, 2008, pp. 89-91), but in a case like this with such obvious limitations this question becomes even more urgent. Instead of interpreting the interviews with farmers as the farmers' individual accounts of reality, I have therefore chosen to include the field visits in the analysis in their entirety. I use the field visits as a basis for critically discussing whether and how the work these NGOs do with cotton farmers' to eradicate the pink bollworm issue contributes to the maintenance of bio-hegemony within cotton production in India.

Does Caste Matter?

India is one of the most stratified countries in the world (Gupta, 2005, p. 410), and when researching topics in an Indian context it is almost impossible to not think of caste as the caste system has often come to be viewed as a central symbol for the country (Dirks, 2001, p. 5). Even though the caste system is becoming increasingly

less important in India, caste identities still remain important in the fields of politics, education, work and marriage (Corbridge et al., 2013, p. 240). In addition, even though discrimination based on caste was made illegal after independence, caste continues to have a functional role in maintaining the rural village social system since a system of caste, class and gender relations has defined and continues to define rural India (Brown, 2018, p. 103). Caste performs certain crucial economic functions as it distributes benefits such as access to land and controls the labor process (Prasad, 2015, p. 77). Therefore, it is important to consider caste as a factor when discussing the framing of farmers.

It is, for example, argued that certain agrarian classes benefitted disproportionately from the developments of the Green Revolution as profits for small scale farmers disappeared in the increased cost of inputs while large landholders experienced substantial increases in aggregate income even with just small increases in output (Brown, 2018, pp. 42-43). The innovations of the Green Revolution were not even intended for the more resource-poor farmers in resource-poor areas such as the semi-arid areas. Instead, seeds were produced that required irrigation and intensive use of inputs, which resulted in a “yield gap” between smallholder and large holder farmers (Lerche, 2011, p. 106; Patel, 2013, p. 19). Similarly, the initial adoption of Bt cotton may have been affected by caste. Shah (2008) argues, for example, that in Gujarat, it was initially the resource-rich and historically advantages groups of farmers who experimented with Bt cotton, and this knowledge was then passed on through a caste-based social system.

In Telangana, the ownership of agricultural land continues to be an important aspect of rural power hierarchies based on caste. In the Warangal District, a number of aspects related to farming are determined by the caste system. The distribution of permits for cottonseed purchases in 2012 was, for example, intended to be organized fairly through a lottery system, but the actual distribution was highly influenced by caste (Flachs, 2016b). In addition, caste affiliation has a spatial aspect as the Scheduled Caste (SC), or Dalits, often live in special parts of the village away from the higher castes (Corbridge et al., 2013, p. 242). In villages in Warangal members of the Telugu caste system often reside within the villages whereas members of the

lower caste, Scheduled Tribes (ST), live outside of town in little hamlets (Flachs, 2016a, p. 687).

As mentioned, I do not have specific data on caste in this thesis, but something may nevertheless be possible to assume regarding the specific group of farmers, which I encountered. It is very likely that the NGO representatives who accompanied me on field visits took me to meet only farmers whom Western researchers are usually taken to meet, which is not representative for cotton farmers in general in that area. Pearson (2006, p. 309) describes a similar concern when reflecting on his research in Andhra Pradesh. Farmers, who Westerners are taken to meet, may be described using the term “good farmers”, which has been reported from other parts of India as a local term to describe a farmer who adheres to scientific methods of crop production, and who is a good student of the outside experts who possess this knowledge (Kumar, 2016, p. 72). In addition, the good farmers often belong to the upper-castes and are primarily male. Therefore, it may be argued that the same is true for the farmers I have interviewed as well as the farmers who are portrayed through the interviewees’ account. These caste and gender biases are important to keep in mind throughout this thesis.

Patriarchy and Feminization

Caste often intersects with other markers of social difference such as class and gender in privileging some and disadvantaging others (Corbridge et al., 2013, p. 257). In addition, gender as a factor in itself influences the social system of India, and even though the Government of India has recognized the gender inequality of the country and taken measures in an attempt to deal with them, women are still given particular disadvantages because of the way local gender relations are constructed (Corbridge et al., 2013, p. 259). For urban, educated women from better-off households things have improved quite a lot, however, but for rural women the development has not been as positive (Corbridge et al., 2013, p. 285). Gupta (1998) showed, for example, how the pervasion in rural villages of taken-for-granted, commonsense notions of patriarchy had serious implications for gender inequalities, and how caste and gender interacted to specify which jobs women did. Lower-caste women usually worked as wage-laborers outside of the home whereas women from

high-caste households seldom left their homes for work and never worked as laborers (Gupta, 1998, p. 186).

Some argue that the field of agriculture in India today has experienced a feminization as the agrarian crisis has encouraged men to move to urban areas in search of job opportunities outside of agriculture, and women begin to undertake traditional male tasks (Agarwal, 2003, p. 192). In relation to Bt cotton, Subramanian and Qaim (2009) argue that the introduction of Bt cotton has generated a substantial increase in rural employment opportunities. They argue that this primarily benefits female agricultural labors as Bt cotton is associated with higher yields, and picking and harvesting of cotton (which is undertaken as manual labor usually by family members or on larger farms by hired workers) are considered female activities. However, women in agriculture operate as disadvantaged workers compared to men (Agarwal, 2003, p. 193), and as increases in employment for women in certain occupations are often associated with underpayment and lack of stability, the increased share of female labor in agriculture does not necessarily imply women's empowerment (Pattnaik et al., 2017, p. 151). Picking of cotton has, for example, been associated with health issues such as skin problems, eye irritation and headaches because of pesticides (Bakhsh, Ahmad, Kamran, & Hassan, 2016).

With the use of Bt cotton, which requires less pesticides, these problems should be reduced, but now with the resurgence of the pink bollworm farmers and agricultural labors are experiencing skin problems after contact with infected plants (Reddy, 2018). In addition, even though women are playing an increased role in agriculture as workers, and 65% of women in India rely on agriculture as their primary source of income, only 13.5% of land holdings are owned by women (Pattnaik et al., 2017, p. 146). Rao (2018) argues that the share of women in the total female rural workforce who are employed in agriculture is declining and that women are primarily and increasingly engaged in reproductive labor. The fact that even though women are increasingly being employed in agriculture, they primarily take the marginal role of agricultural workers doing potentially health-damaging work makes it difficult to argue for a feminization of agriculture implying women's empowerment. Pattnaik et al. (2017) argue that the substantial increase in the share of farm work undertaken by women in India is instead better understood as feminization of agrarian distress.

This discussion shows that when studying cases in the Indian context consideration must be given to the aspect of gender. When doing interviews, I found that several of the interviewees referred to farmers as “he”, and no one referred to the farmer as “she”. This tendency may represent a gender bias, but it is also a reflection of the rural reality as most landholders are still male and women primarily carry out domestic and care giving roles. This is important to keep in mind when analyzing the portrayals of farmers.

2.4 Secondary Sources

This thesis, in addition, draws on various textual secondary sources collected before, during and after fieldwork, primarily news articles from the online English-language Indian news media. As the analysis will show, the majority of the news articles selected were biased towards the anti-GM discourse. An explanation for this may be the way I searched for and selected articles. Firstly, I searched for articles using Factiva⁴, the international news database, by punching in the search word “pink bollworm” and choosing only English-language Indian newspapers as the selected sources. I searched for articles from all years and found, as expected, that articles about the pink bollworm had mainly been published during the past three years with only a few articles a year before 2015. It can be argued, that by using this particular search word, “pink bollworm”, the results will necessarily be primarily anti-GM as the pink bollworm issue is difficult to use as an argument for the benefits of GM. This is at least true for the past three years. I did a new search with “bollworm” as the search word, and the results were quite different. Even though the main number of articles had been published in the last three years, there were also two other spikes in the statistics; one around 2002 when Bt cotton was first released in India and one around 2006 when Monsanto’s second generation was released. This indicates that even though bollworms have been an issue for many years, the pink bollworm in particular has only just come into the spotlight after 2015.

Secondly, due to linguistic limitations only English-language articles were selected. I chose to search only through the major Indian online newspapers: *The Hindu*, *Hindu Business Line*, *Times of India*, *Economic Times of India*, *Indian Express*, *New Indian*

⁴ As Factiva has an almost complete database, selection of sources based on this research tool provides credibility and the selection should appear as sufficient.

Express, *Financial Express* and *Hindustan Times*. This may have contributed to the anti-GM bias as these media often represent a ‘middle-class’ bias dominated by the failure narrative of Bt cotton sourced by NGOs (Bownas, 2016, p. 78). Bownas (2016) did a study on the database of *The Hindu* from 2001 to 2010 and found that the ‘positive’ stories of GMO were mainly reports on increases in yields due to Bt cotton, and the sources were either government spokespeople, corporations (mainly Monsanto) or agricultural universities. The majority of publications contained ‘negative’ stories where Bt cotton was linked to exploitation of farmers by Monsanto, farmers’ suicides and health and environmental risks. These sources were usually NGOs members and independent activists. Bownas (2016, p. 79) argues therefore that “the ‘framing’ of GMOs in the media has come to be dominated by dramaturgical and mono-causal narratives that ‘sell’ in lucrative urban markets”.

The Hindu along with the *Indian Express* are considered to contain a largely critical coverage of Bt cotton whereas the *Business Line*, the *Economic Times* and the *Financial Express* are considered more pro-biotech by promoting the attractiveness of investments in the sector (Newell, 2003, p. 29). By including articles from all of these sources, I attempt to reduce the potential bias of only including English-language news articles. I have included 25 articles in an in-depth analysis and discussion from the previously mentioned media sources as well as 74 articles in a briefer analysis of the general content of articles regarding the pink bollworm from 2015 to 2018. In the brief content analysis, I chose certain themes based on a smaller selection of articles and noted down when an article was dealing with one or more of these in order to get a better overview of the general content of the media related to the issue. The themes were farm level interview, farmers’ suicides/agrarian crisis, farmers’ not following protocol, the notion that the technology has failed, rainfall/drought, politics and BG-III/HT cotton. Based on this, I choose 25 articles, which represent these themes, and I found them helpful in making my arguments. In addition, I have included an article from *People’s Archive of Rural India* (PARI), a journalism website reporting on rural India, and one from *Reuters*, an international news organization, as I assessed their contents to be important for the analysis.

As described in the introduction, I employ a discursive approach to understanding the pink bollworm issue and the Bt cotton debate in India. This approach was also

applied to the news articles. The different contents of these articles and their portrayal of the debate were compared and related to the pro- and anti-GM discourses, which have been recognized as “ideal types”. Contributors to this debate come from various parts of the society ranging from the general public to scientists and politicians, and the debate therefore brings together many different discourses in a sociological sense (Cook et al., 2004, p. 434). In relation to secondary sources and following Gramsci, I recognize that the media plays an important role in maintaining the discursive power of hegemony (Newell, 2009, p. 52).

3 Contextualizing Bt Cotton

Cotton is one of the main products for export in India (World's Top Exports, 2019). In Telangana, cotton is cultivated in the Kharif season and sown mainly in June-July before the onset of the monsoon. Harvesting of cotton is usually done in two to five rounds meaning that there will be two to five pickings of cotton in one field, as maturing of the bolls is not synchronized since the hybrid cotton varieties overlap in duration, flowering and maturation. The picking will start in September and finish approximately in January due to the use of long-duration Bt-hybrid varieties, which has led to a practice among cotton farmers of extending the picking season (Naik et al., 2018). In India, cotton is handpicked by laborers in contrast with cotton harvest in countries such as Australia and the US, which is completely mechanized (Vithal, 2018). Cotton is primarily grown for fiber, but byproducts of cotton cultivation include cottonseed oil used for cooking and cottonseed cakes used for feed for both dairy and meat animals (Herring, 2012). The Food Safety and Standards Authority of India (FSSAI) has stated, however, that blending Bt cotton oil into edible industrial processed oil is not allowed, and is it contested whether this practice is actually taking place (Singh, 2017).

India constitutes a special case for studying genetically modified crops for at least three reasons. Firstly, the introduction of Bt cotton met much resistance and happened under irregular conditions, as exemplified by the case of stealth seeds being planted in large numbers in several states prior to the official introduction. Newell (2007) has argued that this resistance was in part due to distrust and general skepticism towards scientists and technology created by the Green Revolution. Scoones (2006) has argued that suspicion towards Monsanto specifically, based on rumors of Terminator technology, also played a part in creating initial opposition to GM crops. Secondly, India is the only country in the world growing Bt cotton hybrids, which prevents farmers from saving and reusing seeds. Thirdly, Bt cotton was introduced into a context of agricultural distress that has evolved into a crisis of farmers' suicides. When discussing the future for Bt cotton in India, it is important to keep these factors in mind. The debate has been and remains to this day a complex debate, which is beyond the capacity of this chapter to present in full. Therefore, I

will briefly depict the most essential parts of the development of Indian produced cotton from untended indigenous plant to genetically modified cash crop.

3.1 Developments of Indian Cotton Production

Cotton production in India has been through several stages of development since the commercialization of the crop and each stage has enabled the next. Therefore, when attempting to understand the status of cotton production it is essential to keep in mind the previous events that have facilitated this state. In addition, the GM debate in India has not developed in isolation but is part of a global debate about agriculture and GM technology as well as corporate and political strategies. According to Flachs (2016b, p. 50), cotton farming in India has been defined through three main stages of development since cotton was commercialized: the colonial period, the Green Revolution in the 1960s and 70s, and latest the stage of genetic modification. In this section, I will introduce these three stages as they all play a part in the facilitation of the pink bollworm issue experienced by Indian cotton farmers today.

Desi Cotton and the Green Revolution

As an ancient cotton producer, India was famed in the past for its cotton textiles and for making the finest cloth in the world, the Dacca muslin (Menon & Uzramma, 2017, p. 3). This fine cotton clothing is even mentioned in the very first reports by foreign travelers to South Asia in 445 BCE, and well into the 19th century the Indian subcontinent (present day India, Pakistan, Bangladesh) was the world's leading cotton manufacturer (Beckert, 2015, p. 7). Muslin was made from the cotton type *Gossypium arboreum* (*G. arboreum*), which is indigenous to India, and along with *Gossypium herbaceum* (*G. herbaceum*) it is known in India as *desi* cotton (Menon & Uzramma, 2017, p. 344). Previously, cotton growing, spinning and weaving in India were intrinsically connected processes. This changed with the British Industrial Revolution and the invention of the spinning mill to process cotton at the end of the 1700s, which set in motion an enormous demand for raw cotton material resulting in the commodification of a crop previously left to grow untended (Menon & Uzramma, 2017, p. xx). As Indian cotton production came to play an important role as a buffer for fluctuations in cotton supply to the British Empire, food security was

sacrificed for cotton exports, which exacerbated the famines of rural India in the 1800s (Davis, 2002).

The British Industrial Revolution also changed cotton production in India in relation to preferred cotton type. Since the long-stapled cotton varieties were better suited for the spinning mills, these were promoted by the British who campaigned to introduce *Gossypium hirsutum*, popularly known as American cotton, in India. One of the strategies of Indian nationalists in opposition to the British was encouragement of consumption of domestically manufactured textile. However, as Indian industrialists had an interest in furthering the colonial project of turning rural cotton spinners and weavers into producers and consumers of commodities, the introduction of long-staple cotton was suggested to enable domestic manufacturers (Beckert, 2015, pp. 420-421). After Independence in 1947, agricultural research in India turned its focus to the improvement of the long-stapled American varieties and released the world's first cotton hybrid during the Green Revolution in 1970 (Menon & Uzramma, 2017, p. xxiii). Cotton had evolved into a major cash crop even before Independence, but this project was continued and today cotton remains a major cash crop in India (Menon & Uzramma, 2017, p. xxii).

According to Beckert (2015, p. xi), the Industrial Revolution in Europe gave rise to a European-dominated empire of cotton, but this came crashing down in the 1900s and by 1960, most raw cotton came again from China, the Soviet Union and India. What followed was the Green Revolution, which is commonly understood to have run from the early 1940s to 1970 though important events and innovations of this period both predate the 1940s and continued after 1970 (Patel, 2013, p. 2). The introduction of high-yielding seed varieties and modern chemical inputs, which accompanied the Green Revolution, was primarily aimed at increasing food production to make an end to national-level food shortages in India at the time (Scoones, 2006, p. 18). Whether these innovations actually had an impact on agricultural productivity has been contested as several crops produced in India experienced increases in this period without the benefits of the Green Revolution, and statistics from Green Revolution crop varieties have been found to have been overstated (Patel, 2013, p. 13). It did affect the way cotton is produced in India, however. During the Green Revolution, the desi varieties, which required low external inputs, were substituted almost

completely for the fertilizer- and water-intensive American cotton type, which requires heavy insecticide applications (Stone & Flachs, 2018, p. 1) in addition to being dependent on high quantities of water and therefore ideally requires access to modern irrigation systems (Brown, 2018, p. 35). This is despite the claims made about the Green Revolution innovations supporting smallholders that the technology is scale-neutral and that the technology is suited for poorer farmers in marginal areas (Patel, 2013, p. 19).

Furthermore, the new seeds were highly vulnerable to the Indian insect pests as they lacked the natural defenses of desi cotton, which intensifies the need for spraying with insecticides. Stone and Flachs (2018, p. 5) argue that this locked Indian cotton farmers into an insecticide treadmill as heavy long-term insecticide application created resistance development in the insects resulting in a situation where farmers had to either escalate sprayings or seek new insecticides. The latter option provides an incentive for the industry to develop new insecticides continuously to maintain the treadmill. Therefore, even though cotton is a profitable cash crop in India, it is also unreliable because in addition to being input-intensive it is vulnerable to various pests (Stone, Flachs, & Diepenbrock, 2014, p. 26). The introduction of Bt cotton has been justified by its proponents on the ground that it offers a solution to this one major problem of the cotton sector by reducing the need to apply pesticides, which creates benefits for both farmers and the environment (Scoones, 2006, p. 251).

Agrarian Crisis, Farmers' Suicides and Bt Cotton

The statistics of India's development have, for long, looked impressive in terms of foreign exchange and economic growth rate (Corbridge et al., 2013; Scoones, 2006), and the country has now established itself firmly as one of the world's major economies (Banik, 2016, p. 30). However, annual agricultural growth rates in India have been steadily falling (Lerche, 2011, p. 104). The agricultural sector in India is in many aspects experiencing a crisis, which manifests itself through features such as decline in output from agriculture, increase in the number of marginal holdings, declining incomes from farm households and, at the most extreme, farmers' suicides (Mishra, 2008). Some argue that this has occurred after the liberalization of the Indian economy in the 1990s, which entailed economic reforms that decreased state

support (Kennedy & King, 2014; Lerche, 2011). The lower castes, in particular, suffered due to these reforms as the previous state-led agriculture with subsidies and rural employment programs had decreased poverty and social exclusion (Louis, 2015, p. 588).

There were also extreme inequalities between those benefitting from the country's economic boom and those on the margins. The agricultural sector employs around 50% of the total workforce of the country but contributes only 17-18% to the gross domestic product (GDP) (Sunder, 2018). The technical developments of the Green Revolution succeeded in raising productivity, but the side effects included reduced labor requirements and declines in prices for farm products (Scoones, 2006, p. 20). In addition, cheap food and raw agricultural products can be provided largely by the world market reducing the dependency on domestic agriculture (Lerche, 2011, p. 105). The lurking agrarian crisis also manifests itself as resistance movements such as the farmers' march, which took place during my last days of fieldwork, when thousands of farmers gathered in Delhi to protest these developments in the agrarian sector (Nilsen, 2018).

The agricultural crisis becomes painfully evident in stories from across the country of farmers' suicides. Suicide rates in India are among the highest in world⁵. Furthermore, suicide rates in rural area are almost double those in urban areas, and the most common method for suicide is ingestion of pesticides (Kennedy & King, 2014). There is a substantial geographic variation in suicide rates in the country. Patel et al. (2012, p. 2346) found that in 2010 more than 40% of suicides occurred in the southern states of Tamil Nadu, Kerala, Karnataka and Andhra Pradesh (including Telangana). Much of the research done on farmers' suicides concludes that marginal farmers with landholdings of less than one hectare who cultivate capital intensive cash crops, such as cotton, are more likely to commit suicides because they often obtain great debts that they are unable to pay back (Kennedy & King, 2014). Therefore, it is argued that suicide rates will be higher in states where there are more marginal farmers, where more cash crops are grown and where more farmers are indebted. Kennedy and King (2014) argue, however, that even though there is a

⁵ Suicide rates in India are a highly controversial topic. Both because the patterns are quite different from those observed in industrialized countries, and because media coverage has been biased towards male farmers' suicides and largely neglected other suicides such as housewives' suicides even though these rates are thrice as high as for farmers' suicides (Mayer, 2016).

correlation between high numbers of marginal farmers and high numbers of suicides in a state, this correlation only exists when controlling for either or both cash crop production and indebtedness.

Small and marginal farmers, tenant cultivators and agricultural workers in Telangana are amongst those who have been hit hardest by the agricultural crisis (Sridhar, 2006, p. 1560), and the Warangal District has in particular seen its share of farmers' suicides (Stone, 2002b). In addition to being the home of a large share of small and marginal farmers (see table 1), the Warangal District has some of the lowest yields in the world of its primary cash crop, cotton, and a round of severe bollworm attacks in 1998 led several hundreds of farmers to commit suicide (Stone, 2011a, p. 760). There is much disagreement about why this is happening in Warangal, and the introduction of Bt cotton quickly got incorporated into the debate as both sides interpret the suicides of Warangal as supporting their case (Stone, 2002b). The pro-GM side attributes the suicides to crop destruction by bollworms and offer Bt cotton as a solution whereas anti-GM activists blame the suicides on globalization and increased prices for farm inputs and technologies. Bt cotton has even been accused of being directly responsible for an increase in farmers' suicides, and Shiva (2009, 2013), a prominent anti-GM spokesperson whom I will introduce more fully below, has accordingly named the Bt cotton seeds "Seeds of suicide".

Gruère and Sengupta (2011) argue, however, that there is no evidence in available data suggesting that Bt cotton has led to a resurgence of farmers' suicides and that the Bt cotton technology overall has been effective but may in specific districts and years have indirectly contributed to farmers' indebtedness. Indebtedness to dealers or moneylenders is one of the main reasons for strain and distress amongst cotton farmers (Parthasarathy, 1998; Stone, 2002b). This indebtedness only becomes a severe problem, however, if crops fail, and farmers are not able to repay their loans. Gruère and Sengupta (2011) argue that in the cases where Bt cotton failed, it was mainly the result of the context or the environment in which it was introduced, and the technology can therefore not be blamed. The initial high seed prices gave rise to a market for spurious seeds, which are inferior to the real Bt cotton seeds (Herring, 2007). In addition, due to a lack of information farmers sprayed their fields excessively with high-priced pesticides leading not only to high input costs for the

farmers but also to development of resistance in bollworms, which meant that pest infestations returned and consequently yields decreased (Shetty, 2004). Menon and Uzramma (2017, p. 197) therefore argue that even though Bt cotton may not be directly responsible for farmers' suicides, the introduction of the Bt technology exacerbated an already fragile situation.

3.2 The Introduction of Bt Cotton

On the 26th of March 2002, Bt cotton was approved for commercial cultivation by the Genetic Engineering Approval Committee (GEAC) as the first GM crop in India (Scoones, 2006, p. 242). Following Flachs' (2016b, p. 50) three stages of cotton production, cotton farming in India has now moved into the third stage, the stage of gene modification. This third stage has sometimes been called the second Green revolution or the Gene Revolution as it takes over the role of the first Green Revolution in transforming the productivity of agriculture and reducing losses due to crop pests but now with the utilization of transgenic applications (Scoones, 2006, p. 19). In contrast to the Green Revolution, the Gene Revolution in India has been met with caution and skepticism towards scientists, government and industry as well as towards the potential risks and benefits of biotechnology (Newell, 2003, p. 4). Bt cotton is so far the only feature of the Gene Revolution in India, and the release of Bt cotton for commercial cultivation came after 5 years of intense testing and debating (Stone, 2007, p. 67). This process is still contended by GM opponents who claim it to have been "irregular in terms of procedure" as well as lacking transparency and hence the possibility for public debate (Menon & Uzramma, 2017, pp. 199-200).

Prior to the introduction, Monsanto approached the Government of India in 1990 with an application to release cottonseeds carrying their newly patented Bollgard technology into the country. After three years, this application was rejected, but two years later, in 1995, the Indian seed company Mahyco was given permission to import Monsanto's transgenic seeds, and between 1996-98, Mahyco crossed the imported varieties with the company's own and developed three lines of transgenic cottonseeds. In 1998, Monsanto bought a 26% share in Mahyco creating Mahyco Monsanto Biotech (India). This same year the transgenic seeds were approved for field trials in nine states (Scoones, 2006, p. 252). In addition, in 1998 the anti-GM

movement “Operation Cremate Monsanto” launched opposition to the introduction of GM crops in India on the basis of threats to national independence, farmers’ free seed choice, nature and human health (Herring, 2006, p. 468). Nonetheless, the seeds were further approved for larger-scale field trials in 2000, but when results were presented in 2001, the GEAC denied approval for commercialization.

The GEAC then requested the Indian Council of Agriculture (ICAR) to become involved, and the council started conducting field trials together with a number of agricultural universities, which culminated in the conclusion that Bt was both economic and effective when compared to non-Bt varieties (Scoones, 2006, p. 252). Nevertheless, the final decision to approve Bt was stalled. Scoones (2006, p. 253) argues that this deferral may have been related to general suspicion and mistrust of Monsanto. In particular, the global controversy about “Terminator” technology may have damaged Monsanto’s relation to cotton farmers (Newell, 2003, p. 6). The Terminator technology entails the genetic engineering of plants that do not produce viable seeds, which makes farmers dependent on firms due to the need to repurchase seeds each year (Herring, 2007, p. 131). Even though there has never been production of a single Terminator seed, many farmers in rural India were at the time convinced that all GM seeds were Terminator seeds (Stone, 2002a, p. 613). The delay may also be accredited as a success, however limited, to the mobilization against GM crops by a strong NGO sector in India (Herring, 2006; Stone, 2011b).

The final approval came after news had broken about unapproved Bt cotton being grown in several cotton growing states, particularly Gujarat where it was estimated that 10.000 hectares were planted with illegal cotton (Menon & Uzramma, 2017, p. 200; Scoones, 2006, p. 253). The illegal cotton fields were discovered in 2001 when harvest of the traditional cotton failed due to infestations of bollworms whereas fields cultivated with the illegal seeds were standing untouched by the insects. The seeds had been supplied by the company Navbharat Seeds in a number of states but mainly Gujarat (Scoones, 2006, p. 254). The GEAC ordered the Gujarat Government to act on this violation of biosafety regulations and instructed that the plants be burned and that unsowed seeds be destroyed (Herring, 2007, pp. 132-133). Farmers and farmers’ organizations refused, however, and in the end the state backed down and farmers were given permission to keep their plants and their harvest. One year

later, in 2002, Mahyco Monsanto Biotech's Bt cotton was approved as the first commercial release of GM crops in India (Scoones, 2006, p. 242).

What is Bt Cotton?

The GM technology has been dominated primarily by two types of genetic modifications: herbicide tolerance and insect resistance (Stone, 2010, p. 382). Bt cotton has been modified to contain insect resistance by inserting a gene from a bacterium called *Bacillus thuringiensis* (Bt), which occurs naturally in soil (Herring & Rao, 2012, p. 45). It produces *Cry* proteins, which are poisonous to certain insects, including cotton bollworms (Flachs, 2016b, p. 50). The toxins act by blocking the insects' mid-gut receptors resulting in loss of appetite and eventually leading to death (Scoones, 2006, p. 251). The first Bt cotton seeds, which were released in 2002 for production in India, were called Bollgard I (BG-I) and contained a *Cry1Ac* gene in the gene construct MON 531 (Singh, Kumar, Kant, Burma, & Pental, 2016, p. 2).

India is the only country in the world where the Bt technology has been applied to hybrid cotton. The high-yielding hybrid cotton varieties were introduced in the country during the Green Revolution as a solution to the poor cotton yields as hybrids are a cross between two crops that often experience higher yields than their parents (Menon & Uzramma, 2017, pp. 188-190). This ability owes to what is called the heterosis effect. Heterosis represents a phenomenon where the first generation of hybrid plants experience more rapid growth and higher fertility, but this effect is only sustained for one generation (Taylor, 2019, p. 5). Therefore, hybrids are financially attractive to Indian seed companies as the intellectual property laws of the country do not allow patenting on plants or seeds, and farmers are not restricted from saving or selling seeds (Pulla, 2018). Because the seeds of hybrid plants cannot economically be saved and replanted the next year as it exhibits a considerable reduction in yields, farmers must return to the market every year for fresh supply (Kloppenborg, 2004, p. 93). The Bollgard technology has therefore been applied exclusively to hybrid cottonseeds in India.

An issue related to Bt cotton is the bollworms' ability to create resistance to the Bt poison. The pink bollworm started creating resistance to the first generation of Bt cotton only a few years after the release (Menon & Uzramma, 2017, p. 188). In 2009,

the worm had created resistance to Cry1Ac and was found on BG-I cotton plants but was successfully controlled by releasing Bollgard II (BG-II), the second generation of GM cotton in India (Naik et al., 2018). As of 2013, the vast majority of cotton in India is BG-II, which contains the gene construct MON 15985 expressing two different types of the insecticidal Cry protein (Flachs, 2016b, p. 50). In addition to Cry1Ac, BG-II contains the gene encoding from a second Cry protein, Cry2Ab, which targets the insects differently as a poison and the technology is therefore claimed to build resistance against several species of caterpillars (ISAAA, 2016, p. 29).

When India took to Bt cotton in 2002, more than 120 million acres were already planted with GM seeds worldwide (Pringle, 2003, p. 2). The beginning of GM crops happened in 1983 when both corporate and university biologists had succeeded in transferring genes into plants. In 1988, China became the first country to grow genetically modified tobacco, and in 1994 the US released their first GM crop: tomatoes with a gene inserted to delay rotting (Stone, 2010, p. 382). The first GM foods were ready for market in the beginning of the 1990s (Pringle, 2003, p. 61). Bt cotton was approved in the US in 1996, and in 1996-97 Bt cotton was released in China (Scoones, 2006, p. 252).

By the late 1990s, however, the initial success of GM crops had started to turn around as opposition was mobilized (Pringle, 2003, p. 3; Stone, 2010, p. 382). In western Europe, the market for GM products collapsed completely in 1998 causing Monsanto to withdraw and change strategic course towards a focus on the need for GM crops in developing countries (Stone, 2002a, p. 612). This entailed a surge of publicity for GM crops to benefit the poor, such as vitamin-enhanced rice and high-protein sweet potato (Stone, 2010, p. 382). Glover (2010a) argues that the pro-poor rhetoric utilized by Monsanto from 1998 should not, however, be regarded as purely a PR stunt as the potential of modern biotechnology to be pro-poor has been part of considerations regarding GM technology from its beginning. As mentioned above, Bt cotton was introduced in India on the basis that it would create a range of significant benefits for small-scale farmers. The development of pest resistant crop varieties has been regarded as pro-poor; positive for and benefitting poorer farmers due to their potential in reducing farm-level risk (Patel, 2013, p. 20). In 2017, the total area under

Bt cotton in India was 11.4 million hectares, equivalent to 93% of the total cotton area in the country (ISAAA, 2017, p. 29), but debates about the actual realization of the promised benefits have been extensive.

The Bt Cotton Controversy

Bt cotton was initially introduced in India upon the promises of reducing farmers' dependency on pesticides and increasing harvest by controlling the worst predator of Indian cotton: the bollworm (Herring, 2006, p. 468). Biotechnology in general is often regarded by governments of developing countries as a tool for boosting economic growth and combating food insecurity, and due to the size of the country India had the potential to play an important role in determining the future for biotechnology in the developing world (Newell, 2003, p. 1). This is one of the main reasons why a major struggle between biotech companies on the one side and anti-GM activists on the other about the future for biotechnology in agriculture has taken place in India.

Whether Bt cotton has kept its promises to Indian cotton farmers has been highly contested. Due to the capacity and scope of this chapter, I will not attempt to make any conclusions regarding the success or failure of Bt cotton. I will present a brief outline of the debate including some of the most important participants from a social science perspective. Ronald J. Herring, Glenn D. Stone and Andrew Flachs have worked over many years on researching adoption and cultivation of Bt cotton through extensive periods of fieldwork in the Warangal District. Herring is a political scientist who works in the field of agrarian political economy on social conflicts around science and genetic engineering. Stone is an environmental anthropologist whose work has focused on ecological, political and social aspects of agriculture as well as biotechnology and GMOs. Flachs was a student of Stone and is trained as an environmental anthropologist with a focus on alternative agriculture including GMOs and organic agriculture. It is among others the work of these scholars that I enter into dialogue with in this thesis.

Numerous studies and publications have been announcing both the success and the failure of Bt cotton in India. On the success side, the adoption of Bt cotton is praised for the concomitant pesticide use reductions and yield advantages (Bennett,

Kambhampati, Morse, & Ismael, 2006; Qaim, Subramanian, Naik, & Zilberman, 2006; Sadashivappa & Qaim, 2009) and even for the unintended benefit of being employment generating due to higher yields and thereby contributing to poverty reduction (Subramanian & Qaim, 2009, 2010). It is argued that India is among the six countries, which have benefitted the most economically from GM crops (ISAAA, 2017). Krishna and Qaim (2011) argue that between 2002 and 2008, Bt was effective in reducing total pesticide use for cotton farmers in India even when considering the increase in sprays for secondary pests. Shiva et al. (1999, p. 610), however, argue that the potential gain for farmers related to reductions in sprays is mitigated by the additional costs of technology fees, pesticides and other agricultural inputs necessary for the cultivation of Bt cotton.

The head writer of this article, Vandana Shiva, has been the most prominent spokesperson and activist in the opposition to the introduction of GM crops in India (Herring, 2006, p. 471). Shiva has in her writings depicted her concerns over GM technology as threatening the idyllic traditional agrarian culture (Stone, 2002a). In general, Shiva and Jafri (2003) have declared the failure of Bt cotton and contend that the technology has not provided farmers with higher yields and has not proven to be income generating. In her book *Biopiracy: The Plunder of nature and Knowledge*, she compares today's developments of biotechnology and intellectual property rights with piracy and colonialism of the past (Shiva, 1997). In addition, Shiva (2013) argues that there has been a systematic removal and destruction of non-Bt seed varieties from the market, which has created a corporate monopoly for Monsanto's Bt seeds. She calls this the destruction of choice and claims that "[f]armers are not choosing Bt. cotton. They have no choice left" (Shiva, 2013).

Herring (2006, p. 472), however, argues that the claim of a monopoly does not hold in India where there is no patent protection for seeds. In addition, Herring argues that the fast and extensive adoption of Bt cotton among farmers in the Warangal District serves as an indication that the technology is not as flawed as some studies suggest and that the reports of the failure of Bt cotton in India are not sustainable scientifically (Herring, 2008b, 2009; Herring & Rao, 2012). He argues that the NGOs' sentiment about Bt failure falls into the trap of paternalistically regarding farmers as puppets rather than active agents negotiating new technology (Herring,

2006, p. 473). To assume failure of Bt cotton is therefore to assume peasant gullibility and that farmers are incompetent and incapable of learning since they continue to use a failed technology (Herring, 2009). Instead, it is argued that the reports of failure stem not from the technology itself but from other problems such as fraudulent practices in an unregulated seed market and drought or general water shortages (Herring & Rao, 2012).

As a counter position to Herring's (2008b) argument that farmer behavior can be used as a measurement to settle contradictory findings about Bt cotton, Stone et al. (2014) argue that the process of deskilling resulting from quickening technological change in Bt seeds is relevant to this debate. They argue against using adoption rates as an index of positive farmer assessment of the technology because this argument assumes that farmers' decisions regarding seed choices are based on experimentation and evaluation. Instead, they argue that farmers rely increasingly on social emulation when they have never used a certain type of seeds before, and when there is little information available due to the rapidly changing Bt technology (Stone et al., 2014, p. 36) as well as misleadingly labelled seeds (Flachs et al., 2017, p. 146).

This pattern of actions has led to "a faddish, cyclical seed choice pattern" where farmers overwhelmingly "herd" towards particular seeds for no economic reason based on social conformism (Flachs et al., 2017, p. 145). This causes each type of seed to go through a shared pattern of one year of ascension, one year of popularity and one year of decline. Stone (2007) argues that farmers are being compelled to make seed choices like this because of the process of agricultural deskilling. He argues further that this process is taking place in the Warangal District. In contrast to agricultural skilling, which refers to the ability of farmers to acquire information about a technology and use that information to perform with the technology under variably conditions, agricultural deskilling is characterized by a lack of opportunity to acquire this type of environmental learning because of inconsistency and overly rapid technology change (Stone, 2004). Herring argues, however, that empirical work in Gujarat has shown Bt hegemony in cotton fields to be the result of farmers' experimentation and sharing of information (Herring's comments in Stone, 2007, p. 90). He argues, further, that it is difficult to maintain that skills in traditional

agriculture should be superior as cotton yields in India have been among the lowest in the world and have begun to increase after the introduction of Bt.

Furthermore, in April 2018, the Delhi High Court ruled that Monsanto would not be able to assert patent rights over Bt cotton in India. The Court held that Monsanto's patent was against section 3(j) of the Indian Patents Act, which states that "plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals" are not considered inventions and can therefore not be patented (Chawla, 2018). Chawla (2018) argued that because of this ruling, Monsanto would no longer be able to assert monopoly rights over seeds. This could have created a shift in the biotech bloc where the influence of international corporations such as Monsanto and Bayer decreased, creating space for Indian seed companies to take over production.

However, Bayer (the owner of Monsanto since 2018) appealed the decision, and in January 2019 they won in India's Supreme Court, which means that Monsanto (under Bayer) can once again claim patent on its GM seeds (Jadhav, 2018). Still, even without the Monsanto seed patent it could be difficult to argue for the existence of a free choice for farmers. Stone and Flachs (2018) argue that farmers are locked into technology treadmills where the use of genetically modified cotton necessitates increased use of the GM technology. As bollworms created resistance to the first generation of Monsanto's Bt seeds, the company announced the release of the second generation as a solution, but today Bt resistance in bollworms is widespread in India (Stone & Flachs, 2018, p. 8). The question therefore emerges whether the GM technology treadmill will be interrupted or maintained through further introductions of biotechnology.

The Pink Bollworm

In 2015, the Central Institute for Cotton Research (CICR) in India received the first reports about the return of the pink bollworm in the major cotton growing states (Hardikar, 2018). Recent studies have shown that the pink bollworm has developed increased resistance to both Cry1Ac and Cry2Ab between 2010 and 2017, especially in the southern parts of India (Naik et al., 2018). The American bollworm has as well

shown increased CryAc resistance in Telangana and Andhra Pradesh where Bt cotton is grown extensively (Kukanur, Singh, Kranthi, & Andow, 2018). Naik et al. (2018) argue that this resistance creation is caused by poor compliance with the requirement for refuge planting in India, which is specified by the Government of India to be at least five border rows of non-Bt cotton or 20% non-Bt cotton of the total cotton area, whichever is greater. The reason for the refuge requirement is that the bollworms, which have created resistance, may mate with susceptible partners who are surviving on the non-Bt cotton, which will make their offspring susceptible to Bt toxins as well (Kloppenburg, 2004, p. 316). However, Bentley (2003) has argued that the use of refuge to avoid resistance creation has little empirical justification since it is unknown how large a refuge has to be to work. If refuge planting proves to be insufficient in evading resistance creation, this problem may be the beginning of the end to the GM technology treadmill.

As I have argued above, it is important to consider the development in cotton production in India both leading up to the introduction of Bt cotton and subsequent developments in order to understand the current situation of the pink bollworm issue. Understanding the technology behind Bt cotton hybrids is also important to better grasp the issue. As described, Bt cotton is a genetic modification of the American cotton type, and in India this has been done exclusively on hybrid seeds. Menon and Uzramma (2017) have argued that without American cotton, Indian agriculture would not be experiencing its current pest problems such as the pink bollworm as these varieties are highly susceptible to many of the cotton pests in the country.

It has also been argued that the use of hybrids for genetic modification may have contributed to an exacerbation of the issue because the toxin production declines in hybrids during the growth period allowing for some insects to survive on the plants, which leads to faster resistance creation (Kukanur et al., 2018, p. 38). In addition, Bt hybrid cotton is a long-duration variety, which has caused the practice of extending the cropping season, as mentioned in the beginning of this chapter. This may have played an important role in the resurgence of pink bollworm as it allows for multiple generations of the pest to survive on the plants and thereby affecting subsequent cotton crops (Kranthi, 2015; Naik et al., 2018). These issues are important to keep in mind when moving into the following chapters of analysis and discussion.

4 Talking About the Pink Bollworm

Before leaving for fieldwork, I found that I was being presented with an image of a highly divided debate through the online news media regarding the pink bollworm attacks on Bt cotton crops, seemingly adding fuel to the fire of the extremely contested issue of the use of GM crops in India. It seemed comparable to how the general GM-debate has often been portrayed; as a polarization between proponents and opponents of genetically modified crops, the pro- and the anti-GM sides. The public debate about GM crops has been dominated by the opposition between the potentially catastrophic dangers of the technology against the promise of a solution to an approaching Malthusian crisis (Herring, 2005, p. 203). In this thesis, I employ the ideal type pro- and anti-GM discourses to make sense of the debate regarding the pink bollworm issue.

Newell (2007, p. 195) argues that despite opposition in civil society, bio-hegemony is prevalent in India in the way that developments of biotechnology are considered to be in the country's national interest. In terms of political discourse, he argues that the central narrative for government officials has been that of biotechnology as the "only way" forward, the only solution to the challenges of Indian agriculture today (Newell, 2007, p. 199). In addition, he argues that media discourses have helped to frame positively the material potential of biotechnology. Based on Newell's findings as well as India's history of promoting agricultural biotechnology as a project of its developmental state (Herring, 2014, p. 159; Huda, 2018, p. 51), I take the notion of bio-hegemony as my starting point for the analysis and accordingly hold the pro-GM discourse to be hegemonic in India.

In this chapter, I will first analyze the presentation of the pink bollworm issue by the online Indian English-language news media and then in interviews with agricultural researchers, academics and NGOs and relate these analyses to the ideal type pro- and anti-GM discourses. The purpose of this analysis relates to the first purpose of the thesis, as described in the introduction, as the aim is to understand how the pink bollworm issue is integrated into discourses already existing in the GM debate in India. In addition, I discuss how the issue is used on either side of the debate as an argument supporting either agenda.

4.1 Media and the Pink Bollworm

A massive expansion of a free and uncensored media has taken place in India since Independence in 1947 (Drèze & Sen, 2013, p. 10). The English-language news media in India has often played an important part in attracting the attention of the State to certain topics (Bownas, 2016, p. 78), and the portrayals of the GM-debate by these media are therefore important to consider as they play a part in structuring the debate. In addition, it has been argued that the media in general has considerable influence on what people think, meaning what political preferences and evaluations they develop (Entman, 1989) and how their realities are constituted (Talbot, 2007, p. 3). The way the media frames stories supplies citizens with basic ideas about how to think and talk about politics, and therefore journalists can influence how people understand an issue (Price, Tewksbury, & Powers, 1997, p. 482). Framing refers to the way some aspects of a situation are selected and made more prominent as a way to promote a certain definition of the situation (Entman, 1993, p. 52). In relation to the GM-debate, Bownas (2016) argues that the media has preferred a portrayal of the debate through either negative, anti-GM stories or positive, pro-GM stories. This reflects the polarization of the debate, as mentioned above. I will now move on to analyze the narrative structure of media accounts of the pink bollworm issue in order to identify discourses and in turn compare these to the ideal type GM discourses.

According to Adger et al. (2001, p. 685), an important aspect of analyzing discourses in terms of their narrative structure is the identification of a certain cast of actors, which is often present in narratives defined through the same archetypes as are found in stories and fairytales: villains, heroes and victims. As a rigid understanding of these concepts would be unbeneficial to this analysis, I employ an understanding where “villains” means those who are held responsible for the perceived problem, “heroes” refers to those who play a part in creating solutions to the problem and “victims” are those who are suffering because of the problem. The reason for using these concepts as an analytical tool in discourse analysis is to analyze the way in which these are utilized to tell a story with a certain message (Pearson, 2006, p. 307). By identifying the messages of media accounts of the pink bollworm issue, these can be compared with the messages of the ideal type GM discourses.

Heroes, Villains and Victims

In the media coverage of the pink bollworm, a set of important actors involves the agricultural biotech company Monsanto and the Government of India. As the developer of the Bt technology, it is perhaps not surprising that Monsanto is mentioned in many articles about the pink bollworm issue. What is surprising, however, is that in the analyzed articles the Government of India, and not Monsanto, is being held responsible for the problem. This is surprising since one of the main characteristics of the anti-GM discourse, as identified above, is that it villainizes corporations, such as Monsanto, who commercialize the resources of the South. Following Vandana Shiva's concept of biopiracy, which signals an activity implying plundering of poor people and countries (Adger et al., 2001, p. 695), and considering that Monsanto created the technology, which is now failing, the corporation would have been an apparent choice for the villain of the narrative. The discourse regarding the pink bollworm attacks differs from the ideal type anti-GM discourse on this feature.

Blame is instead attributed the Government of India for allowing the technology to be introduced in the country in the first place and for the way this was done. In an article from *People's Archive of Rural India*, the Government of India and its ministries are continuously throughout the article assigned responsibility for the development of the issue. The article mentions how "warnings [about resistance creation] were never taken seriously" by the government, how "[n]either ICAR nor the Union agricultural ministry seemed alert to the potential devastation" and how the government and the state after becoming aware of the problem "have not come up with a solution" (Hardikar, 2018). These last quotes all point to the Government of India as responsible for the development of the issue, and the government thereby becomes the "villain" of the narrative. These arguments resemble those used by GM opponents about the process preceding the approval of Bt cotton in India. Menon and Uzramma (2017), for example, criticize this process for being irregular and lacking the possibility for public debate. This shows how the pink bollworm issue is used to underpin arguments on the anti-GM side, which have existed irrespective to and long before the development of resistance in pink bollworm.

Similarly, an article from *The Hindu* emphasizes the way Bt cotton was introduced as part of the pink bollworm problem. A section of the article reads: “Even though Bollgard 2, or BG-2, Monsanto’s second generation insecticidal technology for cotton, was supposed to protect crops against the pink bollworm, the pest has grown resistant to the toxins produced by this trait” (Pulla, 2018). This quote emphasizes the failure of Monsanto’s technology, but it does not portray Monsanto as a villain. Instead, it can be argued that this part presents Monsanto as a failed or fallen hero; Monsanto developed the technology as an attempt to solve an issue, but it failed. The article goes on to blame the conditions on which Bt cotton was introduced as the reason for the development of issue. The main condition emphasized in the article is the fact that the government restricted the introduction of the technology to hybrids. As noted in the previous chapter, a major critique from the anti-GM side is the use of cotton hybrids, which were introduced during the Green Revolution and came to almost completely replace indigenous Indian desi cotton when Bt was introduced because the technology restricts farmers from saving their seeds.

The victims in these media accounts constitute another important group of actors. As described in the methods chapter, a small survey through 74 articles about the pink bollworm issue from the main providers of English-language online news in India revealed a dominating theme to be that of the struggling farmer. In 24 of the 74 articles, the narrative includes a mentioning of cotton farmers’ suicides or agrarian distress in general, and 28 of the 74 articles includes interviews with one or several farmers about the issue. The farmers are described as angry (Hardikar, 2018), as being forced to switch to other crops (Buradikatti, 2016) or to increase pesticide costs (Jadhav, 2018) and as driven into indigence (Pulla, 2018) due to the pink bollworm attacks. However, even though the articles claim to describe cotton farmers in India, this is a highly diverse group, and the farmers mentioned are primarily medium to large-scale farmers, which is problematic for the representativeness of the portrayals. It is problematic to group farmers of different sizes together to describe a common problem because the challenges they are facing will differ substantially depending on size of landholding as well as risk-capacity. I will deal further with the portrayals of farmers and, related to this, the challenges of talking about farmers as a group in an Indian context in chapter 5.

Framing the Issue, Fueling the Fire

According to Adger et al. (2001, p. 685), another important aspect of narratives in general, apart from the cast of actors, is that they are structured in a chronological order, meaning that they have a beginning, a middle and an ending (Adger et al., 2001, p. 685). The analyzed articles follow the common definition of a story because the narratives revolve around a series of events in which something happens from which other events follow as a consequence (Roe, 1991, p. 288). The articles about the pink bollworm issue are not always structured in a chronological way. They often take a starting point in the ongoing situation, setting the scene of farmers' distress, and then go back in time to tell the full story. The narratives expressed in these articles usually take a point of departure in the events of 2002 when Bt cotton was first approved for commercial production in India. Sometimes this involves a more or less technical explanation of the Bt technology. They continue with a description of the development for cotton farmers: how many adopted Bt in the first years, how many use Bt now, did yields increase and pesticide use decrease? Usually, they end up where they started, back with the farmer in the field looking at destroyed cotton bolls and wondering anxiously about the future.

Unsurprisingly, the primary message of the narratives in the articles that I have analyzed seems to be that farmers are distressed and the distress is caused by the pink bollworm. About a third of the articles relate the pink bollworm issue to a general agrarian crisis in India and even to the issue of farmers' suicides. In a few articles, there is even information provided about a farmers' suicide helpline. The distress is emphasized through graphic portrayals of the pink bollworm's actions and the adjectives used to describe it. The worm is being described as having "slashed crop yields" (Jadhav, 2018), "destroyed" cotton bolls (Seetharaman, 2018) and created "devastation" (Hardikar, 2018), and it is called an "epidemic" (Singh, 2016), a "menace" and a "lethal pest" (Hardikar, 2018). This together with the mentions of agrarian crisis and farmers' distress creates a discourse of immediate emergency and irreversible damage. This is similar to the anti-GM discourse, which portrays a crisis promoted by the institutions and interests of capitalism (Adger et al., 2001, p. 702).

In addition, the discourse of the media draws on themes from the entire context of Bt cotton by continuously referring to the process of introduction and the debate

revolving around Bt cotton in India for the past almost 20 years. In this way, the framing of the current problem, the pink bollworm issue, helps to reproduce the framing of what is considered the overall problem in the anti-GM discourse in India; Bt cotton. By framing it within the conditions of the general GM debate, it becomes an argument, fueling the fire of the anti-GM side. As noted in the introduction, Gramsci placed particular emphasis on the role of the media and its potential to influence public opinion (Forgacs, 2000, pp. 380-381). Therefore, as this discourse was present in articles created by the news media it may be argued that the discourse would be present in society. Not only because the media in a given society affects what people in that society think (Entman, 1989), but also because the shared knowledge frameworks for a given society affect what the news producers produce (Talbot, 2007, p. 7).

As mentioned above, I hold the pro-GM discourse to be hegemonic and the anti-GM discourse to be challenging. As Gottweis (1998, p. 264) argues, however, if the dominant framings of reality are sufficiently challenged this may trigger a crisis for the hegemony. If this crisis develops into an organic crisis, this may offer a possibility for the challenging discourse to disrupt the hegemonic regime and establish a new. In other words, when I travelled to India to research the pink bollworm issue, I was interested in exploring the possibility of the issue creating substantial opposition to the use of Bt cotton to create a change and in trying to understand what this change might look like. I expected to find what these articles had described: anger from farmers and anti-GM NGOs and an atmosphere of crisis related to the future of Indian cotton production. I also expected the GM-debate to be burning hotter than ever, due to this recent addition of firewood on the anti-GM bonfire. However, as I will discuss in section 4.2, I found something quite different.

Where is the Pro-GM Discourse?

As mentioned, I found the pro-GM discourse to be much less dominating in the media coverage of the pink bollworm issue. This is perhaps not surprising, as it may seem difficult to argue for the benefits of a technology that no longer seems to be functioning, according to an overwhelmingly large group of anti-GM actors. Traces of the pro-GM discourse are, however, still to be found. Some accounts, especially

from papers considered more pro-biotech such as the *Business Line*, the *Financial Express* and the *Economic Times*, include a perspective of the pro-GM discourse. Some argue that the pink bollworm attacks are a proof that India needs to move towards the new generation of technology created by Monsanto called Bollgard 3 (BG-III). This is an herbicide tolerant (HT) generation of cottonseeds, and pro-GM actors argue that since the world is adopting BG-III this should be the future for cotton production in India as well. It is argued that since the new generation is already being illegally grown, it is an indication that farmers are desperate for this new technology in order to overcome the pink bollworm issue (Bhosale, 2018; The Financial Express, 2018). The overall argument is that market forces should be allowed to prevail and that farmers should be allowed to plant the seeds they consider most beneficial to them (Kulkarni & Wadke, 2018). I discuss this perspective further in chapter 6.

4.2 Discursive Hegemony and the Pink Bollworm

The media is not the only domain of influence in which the GM-debate often has been portrayed as highly polarized. In the scientific literature dealing with Bt cotton in India, this portrayal has been extremely popular. Stone (2012, pp. 62-63) argues that scientific writing about Bt cotton has a tendency to fall into two polarized narratives, the “triumph narrative” that claims Bt to be a success in raising cotton yields and the “failure narrative” that depicts Bt as a farce and the cause for farmers’ suicides. Similarly, Pearson (2006) argues for the existence of conceptual opposition in environmental narratives about Bt cotton exemplified through two key actors: Monsanto and Deccan Development Society, an NGO that has produced several reports dismissing the benefits of Bt technology for Indian cotton farmers.

Traces of the ideal type discourses were easily recognized in the interviews regarding the pink bollworm issue. The most explicit example of this was the conceptual oppositions found between the applied discourses of two interviewees: the representative of the Consortium of Indian Farmers Association (CIFA) and the representative of the Centre for Sustainable Agriculture (CSA), but themes of the pro- and anti-GM discourses were also found in the other interviews. As might be expected considering their opposing views regarding the GM technology, the

discourses and related narratives of the representatives differed notably. In order to compare these, I will again identify heroes, villains and victims in the pink bollworm narratives and discuss how they are used within the narratives to legitimize the narrator's perspective. In addition, I will relate the discourses to the characterization of the ideal type discourses. I use the accounts of the CIFA and CSA representatives as a starting point for the analysis. In addition, I use examples from interviews with an agricultural researcher from the Indian Council of Agricultural Research (ICAR), two agricultural researchers from the National Institute of Rural Development (NIRD), a representative of the World Wildlife Fund (WWF) India, a researcher from the Centre for Economic and Social Studies (CESS) and a representative of Pesticide Action Network (PAN) India.

The Pro-GM Discourse

The CIFA representative adhered notably to a pro-GM discourse in his account of GM crops. CIFA has before been called a pro-industry organization, and the then leader of the organization was cited for insisting that the responsibility of choosing modern agricultural technologies should be left completely to the farmer (Stone, 2007). The representative confirmed this position of the organization even now when the technology is facing difficulties and argued that the people who are voicing concerns about resistance creation are mainly activists who have no personal knowledge of either technology or farming. The representative argued that the technology can be trusted since “[t]he research is done by scholars, scientists, eminent people, not you and me.” He continued by contending that it is unnecessary to worry about where the technology came from and who made it as long as it has been approved for use. To make this point, he used his own medication as an analogy, stating that he rightfully refrains from speculations about the origin of the medicine he takes as long as the doctor has prescribed it. According to Cook (2004, p. 10), comparing the GM technology to other medical advances is a key feature in the pro-GM discourse. The researcher from ISB also brought up this point. At the very beginning of the interview, he said:

There is a difference between being anti-GMO and anti-corporate control. These two issues get conflated. I am not anti-GMO in general, unlike most at the university. Insulin is, for example, very

important for the world as more and more people will get diabetes and need it, and it will not be enough to get insulin from cows or pigs. The GM technology is needed for this.

Creating a parallel between biotechnology and other developments, which are considered obviously beneficial, portrays the anti-GM side as opposed to reducing human suffering, and the opponents to GM thereby evidently become the villains. Sometimes this argument is taken as far as calling opposition to GM crops a crime against humanity (Stone, 2015, p. 30). A more common use of the argument is to call GM-opponents out as hypocrites for opposing genetic modification in agriculture but allowing it in pharmaceuticals as insulin, for example, is produced by a genetically modified organism (Herring, 2005, pp. 204-205).

In the narrative of the CIFA representative, non-government organizations (NGOs) in particular seemed to constitute a set of villains. He argued that “an NGO is a business activity in India. See, for them it’s [profitable]”. He argued further that NGOs are spreading rumors about technology failure through the pink bollworm stories, as this is more profitable for them in regards to support and funding. NGOs in India are often led by urban middle-class activists and rely on transnational donors for financial support (Brown, 2018, p. 5). These facts combined may contribute to the preference of an anti-GM discourse amongst NGOs as it may create opportunities for funding. In addition, the anti-GM discourse has been most prevalent among the urban middle-class, the same group that has promoted ideas about organic farming. This will be discussed further in chapter 5 and 6.

The notion of NGOs as businesses is similar to what Pearson (2006) finds in the Monsanto narrative, which considers NGOs to be hypocritical villains as they seek to prevent farmers from participating in a wider economic system, which they are themselves benefitting from. This narrative resembles the GEM discourses as it considers the market as the rightful judge of the success or failure of a product (Pearson, 2006, p. 311), such as Bt cotton. The CIFA representative expressed this standpoint through the mentioning of farmers’ right to choose: “[f]armer must be given total liberty to use any technology of his choice”. He explained that if farmers find the technology useful, they will continue using it, if not they will change. He called this a “simple logic, which we farmers follow”. Therefore, the technology must still be useful in spite of the pink bollworm issue, otherwise farmers would not

continue to use it, he argued. Herring (2009), similarly, argues for the simple logic of farmers' choice regarding Bt cotton. If it is assumed that farmers are counting costs and returns in the field and farmers then continue to use Bt cotton, this must mean that they find it profitable.

In the narrative of the CIFA representative, the roles of hero and victim were dynamic and changed throughout the narrative. The representative described himself personally and CIFA as heroes of the narrative working to promote the best interests of farmers. I found the same portrayals in the accounts of the representatives of WWF India, NIRD and ICAR and in the anti-GM discourses of CSA and PAN India. It is, however, unsurprising that organizations portray themselves as heroes who work in the best interest of farmers, as this is the whole foundations for their existence. Another group of heroes in the narrative of the CIFA representative was farmers who at the same time were portrayed as victims. Pearson (2006, p. 311) finds the same representation in the Monsanto narrative and notes that:

[farmers] are dynamic, hard-working and intelligent enough to exploit the new opportunities available to them in a liberalized economy. However, they can also be the victims of a hypocritical, backward-looking elite (*viz.* NGOs) who are content to take advantage of economic development for themselves whilst denying its benefits for others.

The CIFA representative similarly spoke of this hypocrisy:

Somebody says don't use fertilizer, don't use hybrids, somebody says don't use computers, some rascal says don't use machines. I said: "okay I won't use it, and then you don't use it either." But in the end they all want it.

His argument was that there will always be someone opposing the use of a certain technology, but in the end, they all want the benefits provided by that same technology. According to the representative, the issue of the pink bollworm is just another argument in a long line of arguments created by NGOs and the media to oppose the Bt technology. This argumentative twist can, however, be considered a discursive strategy "allowing public opposition to be explained as entirely created by the media and NGOs, rather than as ever being a spontaneous, considered or autonomous response" (Cook, 2004, p. 41). This strategy is often used by scientists

in the GM-debate to undermine the participation of GM-opponents considered as self-interested non-experts acting upon a passive public (Cook et al., 2004). In addition, in resemblance with the pro-GM online news articles, the representative used the issue of the pink bollworm attacks as an argument for farmers' need for GM technology to deal with such issues. He argued strongly for the introduction of the new generation of herbicide tolerant (HT) cotton and contended that eventually the technology will be approved because "the government has to approve it". In his opinion, the attacks show the need for a technology, which today is being denied farmers, but the government will eventually have to approve it since farmers will continue to grow it illegally until they do.

The Anti-GM Discourse

In contrast with the dissatisfaction expressed by the CIFA representative about the lack of support for the technology is the dissatisfaction of the representative of CSA. He claimed that there is a lack of appreciation for traditional Indian knowledge about cotton production, which could present a solution to the pink bollworm issue. The researcher from CESS similarly described the traditional cultivation methods and desi cotton as something farmers consider the right choice but which has now been lost with this new technology. He claimed that the solution to the pink bollworm issue entails "reviving the old varieties. Some of them used to do very well; it used to give very good yields. One variety used to give 10-12 quintals⁶ whereas Bt doesn't give that kind of yield in any case". This opinion resonates with the ideal type anti-GM discourse's wish to reintroduce the indigenous ways of cotton production along with desi cotton. The CSA representative presented Bt cotton farmers as victims of political processes of which the farmers have no control. However, he presented the farmers working with CSA through farmers' cooperatives as heroes for complying with the traditional methods and CSA as the overall hero of the narrative for working to promote the good (i.e. non-Bt) varieties of cotton, which are claimed to perform better in organic conditions. This notion resembles the populist discourses as these consider interventions by NGOs necessary because of their role of re-educating and organizing farmers (Pearson, 2006, p. 311).

⁶ Quintal is a unit for measuring mass commonly used in India where 1 quintal = 100 kg.

In the narrative of the CSA representative, agricultural scientists constituted the group responsible for the development of the pink bollworm issue, and the government, according to the representative, depends too heavily on this group for decisions. The representative held that “agricultural scientists, particularly the mainstream agricultural scientists, are clueless about the whole issue. They always prefer technology as a solution”. Instead, the representative complied with an agrarian perspective where ideally all farming would be organic and based on traditional methods, with inputs derived from animal waste and anti-pest procedures (Bownas, 2016, p. 73). In addition, his narrative resembled that of the failure narrative, which depicts Bt cotton, not just as a failure, but as the cause of other complications for farmers such as health issues, indebtedness and suicides (Herring, 2009).

According to the representative, the pink bollworm issue was inevitable and easily predictable. He compared it to previous incidents of massive pest attacks in cotton and described a ten-year-cycle from 1986 to today. In 1986, cotton farmers experienced a whitefly crisis, which led to the introduction of new pesticides. Around 1996, bollworms became a major issue, which led to the start of field trials with Bt cotton and introduction in 2002. Around 2006, mealy bugs became a serious issue, which led to an increase in pesticide use, which had initially gone down with the introduction of Bt. In this narrative, the pink bollworm issue becomes the latest epidemic, which the government should have predicted. Similarly, the PAN India representative argued that: “[t]he problem is agricultural researchers. They insist that the technology works. Pink bollworm is just the latest indication of the failure of Bt”.

In addition, the CSA representative considered the pest-cycles to have been caused by previous government interventions in attempts to control pests. Here, the connection to the development of cotton, as described in chapter 3, again becomes eminent. The interventions the representative talked about, in addition to the approval of Bt cotton, were the introductions of new pesticides and fertilizers during the Green Revolution, and he connected these with many of the horror stories from the Bt-failure narrative such as farmer suicides and animals dying after eating cotton plants. Similarly, the researcher from CESS even connected the failure of Bt with work migration claiming that the reduction in yields due to pink bollworm attacks

has decreased work opportunities for farm laborers who are therefore now migrating to the bigger cities to find work outside of agriculture. This is reminiscent of the Bt-failure narrative where “all evils of cotton production [...] are loaded onto a single Cry gene” (Herring, 2009, p. 17). The pink bollworm issue in this context becomes another evil of Bt cotton creating serious negative ramifications for cotton farmers.

“Sound Science”

Even though the narratives of the interviewees differ substantially in some aspects, in other aspects their narratives are remarkable for their similarities. Firstly, they all claimed to represent the views of farmers as well as to promote their best interests. This will be explored further in the following chapter. Secondly, they all based their arguments on what they claimed to be “objective science” (Pearson, 2006, p. 307). Even though the antagonists obviously disagreed they all subscribed to a simple causal relationship between scientific evidence and action, which entails the premise that scientific evidence is the whole truth and should make up the whole debate (Cook, 2004, p. 78). Important in objective science is the use of numbers as semiotic devices to provide credibility to arguments. Herring (2009, p. 18) argues that the anti-GM side uses numbers as arguments as “they lend an air of precision to generalizations that have no basis in empirical studies” and calls it “pseudo-precision”. However, I found the use of numbers as an argument to be equally present in interviews with pro-GM as well as anti-GM representatives. According to Stone (2015, p. 31), it is problematic that the “GMO wars” have created a demand for such scientific certainty and that both sides make such allegedly certain claims when actually science is characterized by uncertainty. When claims express such certainty, they should therefore be questioned.

Thirdly, the interviewees seemed to assume that arguments of the opposing side were not grounded in proper research. Pearson (2006, p. 312) argues that the approach of rejecting the opposition’s perspective on the grounds that their biases influence their scientific results ends up being harmful for the farmers it pursues to help. The representative of CIFA rejected the notion of the pink bollworm as a devastating plague for farmers because, as he argued, it is created by NGOs to whom it is beneficial to make up a story like this in terms of support and funding. According to

him, scientific evidence, performed by distinguished American researchers, showed Bt cotton to be completely safe, and they should be trusted, not NGOs or the media. The CSA representative, however, rejected research done by agricultural researchers because, as he argued, this is biased towards solutions purely based on genetic technology, which is what has caused the pink bollworm issue. He saw this development as evidence of the wrongfulness of the approach and instead claimed the research done by CSA to offer a solution. Both sides may run the risk of ignoring important aspects of the pink bollworm issue because of this.

A Third Discourse?

So far, I have identified traces of the ideal type pro- and anti-GM discourses in interviews and analyzed these in terms of their narrative structure and cast of actors. Interestingly, Bownas (2016) argues for the existence of a third discourse, which he claims has often been marginalized in the debate due to its lack of international support: the equitable development discourse. Bownas (2016, pp. 76-77) argues that the institutional backing for the equitable development discourse constitutes a rather disarticulated coalition and comes from various sources such as agricultural scientists, academics and activists associated with the political left wing, parts of the Indian bureaucracy and NGOs. A common trait of the narrators of the equitable development discourse is that they tend to present Bt cotton as broadly beneficial but not as some magic cure to rural distress (Bownas, 2016, p. 74), or as Herring (2009, p. 14) puts it: “neither a miracle seed, nor a suicide seed”. Herring (2008b) argues that neither of the diametrically opposed conclusions, which studies on Bt cotton in India have come to, are scientifically sustainable. Therefore, the presence of this third discourse could possibly offer a bridge in the gap between the polarized pro- and anti-GM discourses.

Instead of focusing on the success or failure of Bt cotton, one of the key characteristics of the equitable development discourse is that its narrators are concerned with the contexts and institutional structures where GMOs potentially are embedded (Bownas, 2016, p. 74). This concern was one of the main themes in the interviews with agricultural researchers. Instead of portraying Bt cotton as inherently good or bad, saving or destroying, the scientists focused on the role of different

actors such as the Indian government, the state government and Monsanto in introducing the technology. Moreover, they connected what they perceived as flawed institutional structures in this introduction to the creation of resistance in pink bollworm and the issue of increase in pest attacks. The accounts of the agricultural scientists appeared therefore more as exclusively a transfer of information than as an attempt of persuasion or participation in a discursive battle (Cook et al., 2004, p. 443). It is, however, not particularly surprising that scientists would use a scientific language when discussing the implications of a technology, and I therefore find it difficult to attribute this to the existence of a third discourse.

Moreover, instead of viewing the market as the rightful decision maker of whether a product is good or bad as the pro-GM discourse (Pearson, 2006, p. 311), the equitable development perspective supports intervention from the state aimed at increasing the potential productivity gains from technology, for example by ensuring better quality and more affordability of inputs (Bownas, 2016, p. 75). This viewpoint came out in the interview with the ICAR representative as he argued that resistance creation is caused by a lack of regulations on seeds, which has created a large market for spurious seeds. In his opinion, the state should ensure the availability of good quality seeds as well as supplement cotton cultivation, for example by increasing access to irrigation. The concern with regulations was also present in the interviews with academics. The representative of ISB was not concerned with what type of cotton should be grown, if it should be Bt or traditional cotton, but instead emphasized creation of social security for farmers. He added that “agricultural researchers should not be concerned with whether or not to continue with Bt. They should be concerned with policies to protect the farmers’ interests”. This quote contains two of the key characteristics of the equitable development discourse as focus revolves around institutional structures surrounding the technology and interventions from the state are promoted.

Similarly, both of the NIRD representatives emphasized that it is no longer a question of whether or not to use Bt, not even the issue of the pink bollworm attacks will change this. Instead, focus should be on institutional structures such as state regulations of pesticide use and seed production. As Bownas (2016, p. 75) found in interviews with agricultural scientists, the representative of ICAR expressed regret

over the fact that the Indian government refused to buy the Bt gene construct when Monsanto made an offer in the mid-1990s since this would have given ICAR an opportunity to make use of it however they saw fit for the Indian conditions. Bownas (2016, pp. 75-76) interprets these arguments as indicators for the existence of the equitable development discourse but, once again, I do not consider this conclusion to be congruent with my data. Instead, I contest that the ICAR representative used this statement as a way of mitigating blame for lack of action being taken by ICAR sooner to eradicate the pink bollworm problem since it is implied that if only ICAR had been allowed to take action much sooner this situation would never have happened.

That agricultural scientists representing state-run research institutions use a predominantly pro-GM discourse is not surprising. As described in the methods chapter, NIRD and ICAR are government research institutions working under the Ministry of Rural Development and the Ministry of Agriculture and Farmers' Welfare, respectively (ICAR, 2017; NIRD&PR, 2019). ICAR was instrumental in facilitating the introduction of Bt cotton and as the Government of India has a long history of promoting agricultural biotechnology, it makes sense that representatives of state-run research institutions will present pro-GM arguments. In addition, I do not find it surprising that government-employed agricultural scientists would argue for the role of government regulations and institutional structures.

Therefore, I will not follow Bownas' (2016) conclusion about the existence of the equitable development discourse. Instead, I argue that the appearing existence of a third discourse, which involves a belief in the benefits of Bt cotton along with an acceptance of the limitations of the technology, shows how deeply embedded the pro-GM discourse is among agricultural scientists and academics in India. The fact that the benefits of Bt are presented as a type of "common sense" shows that the ideas and realities of the pro-GM discourse have penetrated the general ideas, which is indicative of the existence of bio-hegemony. Furthermore, acceptance of the limitations of Bt cotton among agricultural scientists regarded as organic intellectuals may be interpreted as a "discursive sacrifice" aimed at renegotiating compromise equilibrium.

4.3 Conclusion

In this analysis, I have attempted to show how the portrayal of the pink bollworm issue by some of the main English-language online newspapers in India largely has been framed by the ideal type anti-GM discourse with some smaller contributions from the pro-GM side. I have argued that these media accounts incorporate events from the development of cotton production in India in order to present a portrayal of crisis and immediate emergency of cotton cultivation in the country. Furthermore, the analysis of discourses in interviews shows how the issue of the pink bollworm can be utilized as an argument for both camps and as a way of creating legitimacy to either agenda. The anti-GM side uses it to support the narrative of Bt failure whereas the pro-GM side argues that the attacks are an indication of the need for the next generation of Bt technology and that the notion of technology failure has to do with misunderstandings or even propaganda from the anti-GM side. Finally, I have argued against the existence of the equitable development discourse but argue instead that the seeming existence of a third discourse supports the argument of bio-hegemony. In chapter 6, I will discuss this last point further. In the following chapter, I will analyze and discuss a concurrent theme in the accounts about the pink bollworm issue: the focus on farmers.

5 Talking About “Farmers”

This chapter deals with the portrayals of farmers as these were expressed by different actors who work in the field related to Bt cotton. The chapter thereby elaborates on the previous chapter’s notion of how farmers are attributed a central role in the discourses and portrayed as either victims or heroes. Thereby, the following analysis relates to the second purpose of this thesis as I analyze how portrayals of farmers are narratively framed within the ideal type discourses. Furthermore, I argue that each frame is simultaneously shaped by the discursive standpoint of the narrator as well as working to legitimize this standpoint. I include data collected through field visits in the Warangal District, in addition to interviews and secondary sources, which provides insights into how NGOs wish to present themselves and their work.

In the following, I argue that the anti-GM discourse largely tends to portray farmers as victims of either large international corporations such as Monsanto, a failed technology or failed institutional structures. In the pro-GM discourse, on the other hand, farmers are portrayed as rational agents with the capacities and abilities to choose their own agricultural technologies. The third portrayal relates specifically to the issue of the pink bollworm attacks. In this portrayal, farmers are considered responsible for the failure of the Bt technology. I argue that this third portrayal is consistent with the use of a discursive technique for legitimizing the projects of actors adhering to the pro-GM discourse. At the end of each section, I discuss the potential issues related to each portrayal, and at the end of the chapter, I discuss the implications of the pro-farmer approach and the rhetorical technique of invoking the voice of others.

5.1 Farmers as Victims

Farmers have often been portrayed through a role of subordination and exploitation. Herring (2006, p. 474) argues that “[d]enigration of “the peasantry” has historically defined farmers as a class”. In the case of Indian cotton farmers, it has often been argued that these farmers have been deceived by large corporations into adopting a technology, which is not profitable for them without even noticing (Herring, 2009, p. 15). In addition, the media has often portrayed farmers as victims of a failed

technology through the “Bt failure narrative” where Bt cotton seeds have been labelled as not only “suicidal” but even “homicidal” and “genocidal” (Herring & Rao, 2012, p. 51). Even before 2002, Shiva et al. (1999, p. 602) suggested that the introduction of Bt heralded the beginning of Monsanto’s commitment to exploit third-world farmers, the launch of a neo-imperialism of seeds and food. In the following section, I will discuss the portrayal of Indian farmers as victims in the anti-GM accounts of the pink bollworm attacks.

Victims of Bt Cotton

The portrayal of farmers as victims of the actions of large corporations was prevalent in several of my interviews. The representative of PAN (Pesticide Action Network) India, for example, described what he perceived as one of the main problems in the Bt debate: the disparity in power between actors. He emphasized several times during the interview how important it is to look at who is gaining from introducing this technology, and how “it has been a strategy of the seed companies, applying force over the farming community to ensure adoption”. It is unclear exactly what the representative was referring to by using the term “force”, but I take it to indicate allegedly unjust interventions in the seed market, such as the corporate seed monopoly with which Shiva (1997, 2013) is concerned. I discuss the issue of “force” in a Gramscian perspective in chapter 6.

The perspective of the PAN India representative is, in addition, reminiscent of that of Shiva et al. (1999, p. 601) who predicted that the introduction of Bt only would create benefits for seeds and chemicals corporations while the risks and costs would be borne by small scale farmers. On the question of the resurgence of the pink bollworm attacks, the PAN India representative answered that this is just the latest indication of the failure of Bt technology. This point is in accordance with the “failure narrative” identified by Stone (2012), which depicts Bt as a farce and the cause of farmers’ suicides, as well as “the failure of Bt cotton in India” story described by Herring (2009), which tells of agro-economic catastrophes ending in suicides, deaths of livestock grazing in Bt fields and allergies. The representative described how farmers, once again, have become victims of corporations pushing the technology. The first time was when they adopted the Bt technology, which he

argued happened against their will, and now farmers become victims for a second time as this same technology is failing.

Similarly, the researcher from CESS (Centre for Economic and Social Studies) expressed his regret about the continued use and promotion of Bt cotton in spite of evidence that it is not working anymore. During the interview, he said: “[p]ink bollworm attacks have been very serious for the last two years. What farmers are telling is that [...] because of these pink bollworm attacks, they don’t get anything in the second and third picking for the last couple of years”. Due to the use of long-duration hybrids, farmers in India have become accustomed to extending the cultivation season in order to get more picks from their cotton plants. The researcher argued, however, that the bollworm attacks have become so serious that farmers do not get anything out of their later pickings.

One of the main concerns of the researcher was how corrupt input dealers continued to push a non-functional technology to farmers. Input dealers serve an important part as informal lenders, and farmers get locked to particular dealers through credit (Aga, 2018, p. 665). The CESS researcher claimed that large corporations control dealers through bribes. According to the researcher, the technology continues to be sold to farmers because it is made profitable for the dealers by the corporations. This seems like an exaggeration of speculations, and even though interactions and transactions between farmers and input dealers are connected to the machine of agribusiness capital, this situation has been shown to offer not only restraints but also opportunities to farmers (Aga, 2018). However, the statement does exemplify specifically how the anti-GM side often perceives the victimization of farmers: as exploitation of small-scale third world farmers by large, transnational corporations.

Another example illustrates as well the portrayal of farmers as victims of large corporations in a very explicit way. The professor from the Department of Sociology at the University of Hyderabad (UoH) described the process of resistance creation in pink bollworm as intentional from the producers’ side. He compared the production of seeds to the production of cars using the concept “planned obsolescence”:

You plan it, plan it, obsolescence, you make something obsolete. So like what happens in the automobile industry. So, an old car they say is no longer available, parts are not available, they are

obsolete. So you buy a new car. That's the kind of logic that obsolescence means, right? So similarly, they are trying to do this so that they continuously are in the business of seed production and also, every time they produce, they claim there is a new seed, they can increase the price, right?

What this statement shows is that, according to the professor, the seed industry uses the development of resistance as an excuse to produce and profitably sell new generations of seeds. Farmers in this narrative become victims of a business strategy, which uses biological processes to create a continued demand for a product. Similarly, Shiva (1997) argued that the proposed use of genetically modified crops should be regarded as Northern corporates' attempt at exploiting natural resources of the global South as well as of its people. The argument is that farmers have been driven into debt traps by a corporate control of the seed market and a system of Intellectual Property Rights (IPR) (Shiva, 2013).

The issue of potential IPR damage was also a theme in the interview with the representative of CSA (Centre for Sustainable Agriculture) who claimed that even though the Indian law forbids patenting of seeds; Monsanto was able to deal with this issue in an indirect way

[...]with an agreement, a license agreement in terms of trade fees. They call it a trade fee so when providing that trade to the company they charge 50 lakh [i.e. 100,000] Rs as a deposit and then some amount every month, every year and every packet so it's about 1200 Rs on every packet.

Shiva (2013) similarly claims that royalties on seeds have exacerbated the agrarian crisis in India by increasing the cost of seeds tremendously. Both Shiva and the CSA representative describe the government's role in this development as giving in to corporate control, or to Monsanto's "power to arm twist governments", as Shiva (2013) writes. In addition, the CSA representative argued that the Government of India has further responsibility in regards to the introduction of Bt cotton in the country. He claimed that the government has been making interventions in the agricultural practices that function against the interests of the farmers:

When bollworms became a problem, the government said [...] bollworms cannot be managed by these pesticides, now we'll bring in new pesticides and Bt cotton. So Bt cotton field trials started

around 1998, and there was a lot of opposition for field trials because the biosafety rules and regulations were not followed, and the companies tried to sell them illegally as well. So showing that as an excuse in 2002, they got the permission.

What is described here is the approval process of Bt cotton from the perspective of the CSA representative. He claimed that the government approved the technology on the premise that Bt seeds were being sold illegally anyway and that the approval was carried out even though there was strong opposition due to safety concerns. This makes farmers victims of the government's allegedly wrongful decision, as they are the ones suffering the consequences. The pink bollworm problem is integrated into the narrative of the introduction of Bt through a timeline where the creation of resistance is described as inevitable:

So the last four decades, if you see, there is a ten-year cycle. Basically, the pest status is changing, and this pest status is changing because of the interventions the government makes. So what is not a problem today is becoming a problem ten years later.

The CSA representative stated quite explicitly how the creation of resistance in pink bollworm is a consequence of the interventions carried out by the government in the agricultural sector.

Are Farmers Only Victims?

I have argued that the anti-GM discourse contains a portrayal of farmers as victims. However, I will now proceed to show, that this portrayal is problematic in at least two ways. First, the potential existence of farmers' agency is largely omitted from the accounts, which therefore run the risk of portraying farmers as puppets with no capacity as active agents. According to Herring (2006, p. 473), this tendency is especially prevalent in the anti-GM discourses of NGOs and he considers it the key weakness of elite interpretation of rural dynamics. Herring (2007) argues that a problem with portraying farmers as lacking agency and capability is that it does not correspond with reality. Instead, the actions of farmers related to underground and illegal production and distribution of Bt cotton seeds, or "stealth seeds", suggest a more active, creative and autonomous farmer. In addition, Herring (2009, p. 20) argues that the spread of the genetic technology in India is rooted in the agency and

rationality of farmers. Concerning the introduction of Bt cotton, the narrative of the CSA representative presented farmers as passive victims of the illegal actions of companies pushing unapproved seeds through the market, which led to the approval of the technology. In contrast, Herring (2007, p. 133) argues that the series of events preceding the introduction in 2002 was not characterized by a passive farming community but instead showed active farmers taking a stand against regulative authorities. Farmers, for example, refused to carry out the order of the GEAC to burn illegal cotton plants in their fields, which had been discovered before the approval of the Bt technology, and in the end they were permitted to keep their crops.

Another example of this contrast is when the representatives of WWF (World Wildlife Fund) India and PAN India as well as the professor from UoH talked about the use of illegal Herbicide Tolerant (HT) cottonseeds (also known as Bt-III or BG-III). According to the WWF India representative, “there is a misconception by farmers. Farmers think it is moving one standard up to use Bt-III. Bt-III must be better than Bt-II”. He argued further that because farmers trust seed dealers blindly to manage their needs when it comes to this new technology, the dealers are able to swindle farmers regularly by selling them Bt-II seeds labelled as Bt-III. The professor of UoH, however, blamed the companies for pushing seeds to farmers and the state for not regulating properly because, as he said:

The government did not approve herbicide tolerant seeds. Some company will have pushed it to the farmers [...]. That's where the regulatory part, the surveillance part is important, you know. The surveillance part of regulations, right, it totally is a reflection of the state apparatus, right? State agencies, they failed to see what is happening.

Similarly, the PAN India representative claimed that HT cotton is being cultivated illegally now because Monsanto has realized that there will not be another approval. Therefore, the company is instead spreading the technology through illegal sources. While these statements lack proof and may seem close to conspiracy thinking, it may be interesting to compare the use of illegal HT cotton today with the use of illegal first generation Bt cotton before the introduction in 2002. Herring (2009, p. 18) describes this situation as having involved “Robin Hood” tactics as the technology was illegally spread amongst farmers by farmers themselves. Acknowledgement of

this ability of farmers to operate beneath the radar of both state and companies is what Herring (2009) argues is missing from the discourse of the opposition. He argues that the portrayal of farmers as duped by corporate propaganda or lacking agency can be recognized in groups opposing Bt cotton such as anti-GM NGOs where corporations and states are attributed all power exclusively, and farmers become nothing but simple, gullible peasants (Herring, 2009, pp. 18-19).

Secondly, the anti-GM discourse's portrayal of victimized farmers has often entailed a romanticization of agricultural life where the ideal farmer is pictured as a subsistence-oriented producer living in harmony with nature. In this perspective, the farmers' right to control their seeds is central, and the interference of multinational corporations is regarded as enslavement of farmers by forcing them to comply with market forces (Omvedt, 2005, p. 193). A perspective reminiscent of this Gandhian⁷ image of harmonious agricultural life based on self-sufficiency was expressed several times during my interview with the CSA representative. He presented for example the switch from desi cotton to American cotton as if the introduction of American cotton had exterminated traditional Indian knowledge tied to the use of traditional cotton. He described how the CSA is working on establishing "farmers' cooperatives which produce from seed to cloth in the village itself" in order to reintegrate the farmer into the entire process of production. As described in the context chapter, before the introduction of long-staple American cotton during the British Industrial Revolution, different aspects of cotton production were intrinsically connected. The project of the CSA seems to be an attempt to reinstitute this traditional arrangement of having the full process of production taking place in the village.

The CESS researcher expressed a similar romantic idea of agricultural life when he claimed that farmers possess an inherent ability to stay "happy" even when faced with challenges such as the pink bollworm attacks. As he said:

SR: They are so disappointed but still farmers are so nice people.

Still they talk to you very happily.

A: Yes.

⁷ Gandhism and especially neo-Gandhism are the ideologies of most environmental movements in India, which distrust industrialization and romanticize traditional village life with all its limitations (Omvedt, 2005, p. 181).

SR: Like we people in urban areas, if we lose some money now we will just be in such a bad mood. We don't feel like talking to anybody. But the farming community is not like that. So even if they lose one crop, okay, they manage that. They will go ahead with it like...

A: Very optimistic?

SR: Ah, very optimistic.

This becomes similar to the neo-Gandhian perspective, which portrays the traditional subsistence community, not as poor, but instead argues that wealth is found in other factors (Omvedt, 2005, p. 184). So even if farmers lose yields and thereby income, they will still be happy and content. It can be argued that this portrayal of the ever happy farmer may represent what Herring (2009, p. 19) refers to as an urban cultural bias against the rural community. Surely, farmers are not just going obliviously and joyfully along with their business as usual when faced with huge and overwhelming challenges. If nothing else, the waves of farmers' protests and suicides, as described in the context chapter, should constitute an obvious indicator of this. In addition, the Gandhian perspective ignores the negative consequences of factors such as gender and caste, which still play an important part in the social system of the Indian countryside. Gandhism sometimes even romanticizes the caste system as part of traditional village life (Omvedt, 2005, p. 181).

5.2 Farmers as Rational Agents

In the pro-GM discourse, I found a remarkably different portrayal of farmers. Where the anti-GM discourse seems to assume that Indian cotton farmers do not possess simple market rationality (Herring, 2006, p. 474), the pro-GM discourse instead portrays farmers as rational agents who are in fact counting costs and returns in the field as modern, conscious and rationally minded producers for the market (Omvedt, 2005, p. 194). Similarly, Evenson and Gollin (2003, p. 758) in relation to Green Revolution technology presented farmers as rational actors by claiming that “[w]hen a farmer chooses to adopt a new variety to replace an older variety, it reflects the farmer's judgment that the new variety offers some net benefit or advantage”. This portrayal has also often been used by GM proponents to argue that farmers are capable of making decisions about technology adoption dependent on whether the technology is perceived as useful (Stone, 2007, pp. 71-72). Herring (2009) argues

that since there has been no evidence of dis-adoption of the Bt technology among farmers one must either assume that farmers are incapable of learning or sufficiently innumerate to not know about their losses if one insists on keeping the Bt failure narrative alive. Similarly, Herring and Rao (2012) argue for a refutation of the “failure of Bt cotton” narrative as Bt cotton has spread almost universally among farmers of all sizes and classes. In the following section, I will look at two arguments I identified in interviews and the media of why cotton farmers in India should be perceived as rational agents: the ability of farmers to choose their own agricultural inputs and the ability of the market through the forces of demand and supply to regulate the continued sale of products.

Farmers’ Right to Choose

The portrayal of farmers as rational agents was expressed several times during my interview with the representative of CIFA (Consortium of Indian Farmers Association) who stated that “if I ever get an opportunity, I just tell people: you give them [the farmers] a chance, let the choice be left to the farmer. You don’t decide what is good. He will decide what is good”. In his opinion, “farmers must be given total liberty to use any technology of his choice”. Rooted in the argument is the assumption that farmers indeed will counter calculate costs and returns of using the technology, and that the continued use of Bt technology signifies its usefulness in terms of profits for farmers. In the representative’s own words: “they are using it, obviously they must have been benefitted. So there must be some good. Otherwise you won’t use it all that”. This assumption entails that farmers’ decision making is regarded as a process of environmental learning based on empirical observation and experimentation (Stone, 2016, p. 5). In relation to Bt cotton, this means that farmers have tested the new seeds, possibly on smaller plots of their farms, and that the subsequent increasing adoption of Bt proves that farmers have found the technology to be relatively more profit generating compared with non-Bt varieties. As the CIFA representative said:

In 2002, we got the genetic technology of Bt cotton. Actually, I don’t know what it is. So when the Government of India called me in for discussions I said: look, it is a technology. Whether good or bad, how [...] am I to decide? All that I decide is if I get the seed

tomorrow and plant it, if it gives me good yields I will use it otherwise I will reject it. Because that was my logic all along.

In this quote, the “I” represents the CIFA representative first as a GM expert being consulted by the government and later as a farmer as he claimed to share this logic with the cotton farmers. This quote exemplifies how banally the logic of the rational farmers is presented: farmers test the technology; if it works, they keep using it, if not they stop. The argument of allowing farmers the freedom to test any technology therefore seems simple but in reality, it ignores a number of factors, which I will discuss later.

The argument of farmers’ right to choose is also found among farmers’ movements in the country. For example, Sharad Joshi, the then president of the largest farmers’ organization in India and pro-Bt farmers’ movement, Shetkari Sanghathana, used it during the protests of 2001. The court had ordered fields planted with illegal Bt cotton to be uprooted and burned when he called the farmers’ protests “a question of the farmer’s freedom to select his seed and access technology” (Herring, 2005, p. 212). Joshi compared the ability of one seed company to smuggle and plant illegal Bt seeds in Gujarat before the approval to playing Robin Hood (Herring, 2007, p. 132). One of the arguments of Shetkari Sanghathana in supporting the introduction of the Bt technology was that the development of technology is a part of human advance and they hoped, as many others, that biotechnology would increase production while decreasing the dependency on pesticides (Omvedt, 2005, p. 194).

Today, with the reports of failure of the Bt technology, Shetkari Sanghathana is using the argument in a similar way to argue for the approval of the third generation of Bt seeds, the HT cotton seeds. Ajit Narade, a leader of the organization today, has said about the rapid spread of the illegal seeds that it is a proof of how desperate farmers are for this technology and if farmers are choosing to use HT seeds, then Shetkari Sanghathana will support them (Bhosale, 2018). This is concurrent with the organization’s view on access to technology as a crucial right for farmers as producers (Omvedt, 2005, p. 195). Raghunath Patil, another organization leader, claims that the restrictions posed on the technology is forcing farmers into stealth practices of buying and planting HT cotton seeds, which could be avoided with an approval of the technology (Kulkarni & Wadke, 2018).

Let the Market Decide

The proponents of HT cotton assert that market forces should be allowed to prevail and that farmers should be allowed to use the seeds without interference from the government (Kulkarni & Wadke, 2018). This is coherent with other arguments identified in the pro-GM discourse for the portrayal of farmers as rational consumers of agricultural products and producers for the market. In this perspective the market becomes the final regulator and decider of whether a product is useful and beneficial (Pearson, 2006, p. 311). Herring (2008b, p. 148) argues that, assuming the market works and that companies and farmers are rational, the fast adoption of and high demand for Bt cotton experienced during the initial years cannot be reconciled with the narrative of a failed technology. The representative of CIFA expressed the opinion that the market is in fact functioning in the way intended and that actors are using it in a way that benefits them individually:

As I told you, the simplest way of spreading [agricultural products] in the Indian farm sector is only because of some of the seed companies, fertilizer companies, [...] pesticides companies. They all market their product. And if I am benefitted I will use it, if I am not benefitted I will stop using it. It is also cost factors that are involved. So that is how it goes.

In his opinion, the companies are utilizing the market to promote and sell their products, and farmers have a free choice between products and may choose to use them depending on whether they find them beneficial. Throughout the interview, the representative continuously based his arguments on a discourse where he did not rigidly promote Bt cotton as much as he argued for the free market and the farmers' right to choose. He even stated that if the government agreed to ban GM crops he would support the decision: "Last year one member of the parliament committees said "no genetics". Okay, good. Everybody says no genetics; I also say no genetics. But they go on importing". The representative argued that he was not interested in whether the chosen agricultural technology is GM or not. All he claimed to be interested in was the possibility for farmers to choose whichever technology they want in order to compete fairly on the market. If the government decided to ban GM crops, he claimed not to resist as long as this entailed a complete ban. One of the major arguments for the representative was that a ban on GM should include imports

because otherwise Indian farmers will not be able to compete equitably in the market with imported products. Thus, it seems that the representative prioritizes arguments of the free market over strictly pro-GM arguments.

However, the argument of the market was not used only in the pro-GM discourse, but this may be considered a deviant case. The researcher from ISB (Indian School of Business) argued that researchers should not be concerned with the issue of whether Bt cotton has failed in India because the technology should not and cannot be regulated and controlled by law. Instead, farmers will experiment with the technology and use it if they find it beneficial. Resembling the idea of the invisible hand acting as an unobservable market force regulating demand and supply of goods, the ISB researcher postulated that the rational actions of farmers within a functioning market will determine the success or failure of Bt technology. Contrary to the claims of the CIFA representative, the ISB researcher argued that Bt cotton will prove to be unsuccessful as farmers will stop using the technology and Bt seeds, accordingly, disappear from the market as demand decreases. In the ISB researcher's argument, the same logic of the rational farmer and functioning market is visible, even if the predicted outcome is different.

Are Farmers Always Rational?

I have shown two arguments, which were used to argue for the portrayal of cotton farmers as rational agents: farmers' ability to choose whichever inputs they find suitable and beneficial, and the ability of the market to regulate whether Bt cotton seeds will continue to be sold through the forces of supply and demand. These arguments come with the assumption that since Bt cotton has been adopted almost universally by Indian farmers, this is indicative of the benefits the technology brings about for the farmers using it. However, there is a problem with using the actions of farmers as indicative of the success of Bt cotton. The perspective assumes farmers' experimentation and leaves out the possibility of farmers' learning being non-experimental or even maladaptive as well as the consideration that even if farmers do experiment, key aspects of farming may be too complex and uncontrollable for effective experimentation (Stone, 2016, pp. 5-6). The ISB researcher, for example, argued that "farmers do not always know what they are growing. But they know that

they don't know". His argument was that even though farmers do not understand the technology, they will still experiment to find out if it is beneficial. The researcher hereby seemed to assume that farmers base agricultural decisions predominantly on experimentation and environmental learning. According to Stone and Flachs (2014), however, farmers' decision making and opinions in regards to genetically modified crops are sensitive to different biases. They argue that "[c]laims about the "farmers' voice" tend to obscure the complexities of agricultural decision making" (Stone & Flachs, 2014, p. 652).

Furthermore, Stone (2016, p. 9) argues that social learning plays an increasingly important part in adoption of new technology as farmers often depend on social emulation for their seed choices. When farmers have never used a certain type of seed before, they copy the actions of other farmers. I came across a symptom of social emulation during a field visit to cotton farmers around Jangaon in the Warangal District. A farmer told me that this year (Kharif 2018) he was using RCH 659 BGII cotton seeds from the Indian seed company Rasi Seeds (see figure 3). He explained that his reason for using this specific type was that it was the best. He used a different type last year because this better type was not available. I asked him how he knew it was the best, and he answered that he knew because everyone in the village was using this type. Even though this process of widespread conformity, or "herding", among farmers was going on before 2002, the adoption of Bt cotton coincided with an intensification of seed herding (Stone et al., 2014), and this pattern of extensive social emulation has led to what Flachs et al. (2017) have called "a faddish, cyclical seed choice pattern" amongst farmers in the Warangal District. Stone (2007) argues that the Bt cotton fad indicates that the process of farmers' experimentation has been interrupted and that the actions of cotton farmers in Warangal are instead characterized by agricultural deskilling.

In addition, agri-input retailers from whom farmers purchase seeds, fertilizers and pesticides play an important part in shaping why farmers resort to social emulation for their seed choices. The relationship between farmers and retailers who represent large corporations and travel around rural areas to promote agricultural products is therefore of importance. Aga (2018, p. 665) argues that retailers are the principal source of knowledge about purchase and application of agricultural products and that

retailers have different techniques to persuade farmers to buy products and use the confusion and knowledge gaps caused by rapid technology changes to push the products they want to sell to farmers.



Figure 3: Jangaon farmer showing me used package of Bollgard II cottonseeds

Another aspect relates to the idea of the existence of free choice for farmers in the market. As mentioned in the context chapter, Shiva (2009) argues that due to the corporate monopoly of the seed market created by Monsanto, farmers have been left with no choice but to cultivate Bt cotton. During a field visit to villages around Kazipet I asked a farmer why he was growing Bt cotton. He answered that this was because Bt was what was available in the market. Is it correct to dub Bt cotton a farmers' preference if farmers in reality do not have much of a choice? Alternatively, should the reality of the market be interpreted as the result of farmers' choice instead of as a reflection of corporate monopoly? These questions are central aspects of the cleavage between the portrayals of farmers as either victims or rational agents in the anti- and pro-GM discourses.

5.3 Non-abiding Farmers

In addition to these two farmer portrayals, I identified a third portrayal of farmers in interviews and during field visits. This third portrayal relates specifically to the issue of resistance creation in the pink bollworm towards the Bt toxins as farmers are portrayed as being responsible for this development. Often farmers are portrayed as indirectly responsible as it should ideally have been the responsibility of the

government or the companies to instruct farmers on how to use the technology, according to the interviewees. There seemed to be consensus among most interviewees that resistance creation is a reality and a serious issue as only the representative of CIFA argued directly against this. The difference, however, is whether farmers are blamed for this development. I will discuss how and why actors are using this portrayal purposely later in this section. First, I will account for the existence of the portrayal in the interviews by looking at the main themes connected to the portrayal of “non-abiding farmers”.

Profits, Pesticides and Purugu (పురుగు)

Purugu is the Telugu word for worm. During a field visit to five villages located in the area around Jammikunta, a farmer informed me that I might as well learn this word if I was going around talking to cotton farmers. He said I would be hearing this word repeatedly as it refers specifically to pests troubling cotton farmers in the area such as the pink bollworm. The issue of purugu was definitely present as a theme during all my field visits. Therefore, during a field visit around Jammikunta, I intended to ask a farmer why he stopped growing refuge for his cotton crops, as this has been suggested as a contributing cause to the pink bollworm issue (Kukanur et al., 2018; Naik et al., 2018). However, instead of translating my question, the interpreter informed me that farmers stopped growing refuge because they found it unprofitable. Since pink bollworm almost exclusively attacks cotton plants, it is not possible to plant other crops for refuge. In addition, cotton fiber from border crops cannot be sold, or it sells at a very low price, and therefore farmers have neglected to plant refuge due to an economic calculation. The interpreter stated that farmers failing to comply with the refuge requirements were the main reason for the development of resistance in pink bollworm since the pest had no other option than to attack Bt cotton plants.

Similarly, the representative of WWF India stated that “farmers have made some errors with cotton cultivation that have facilitated the pink bollworm attacks such as mono-cropping and lack of resistance management”. These two examples indicate a perspective on farmers as having failed to abide to their agricultural duties. As the representative of MARI (Modern Architects for Rural India), who was my interpreter

in Kazipet, said about the work they do with cotton farmers: “This is not new knowledge. Farmers used to do these things. We are giving the knowledge back to them”. This idea of farmers possessing knowledge about agriculture that they have forgotten or failed to act by and which is now causing the pink bollworm issue was a consistent theme during field visits as well as the interview with the WWF India representative. The role played by each NGO to, as the MARI representative said; give the knowledge back to farmers was emphasized even stronger during both interviews and field visits. In Jammikunta, the interpreter stressed how the research extension program KVK (Krishi Vigyan Kendra) had instructed farmers to plant refuge and use pheromone traps whereas the WWF India representative emphasized the importance of decreasing pesticide usage among farmers by convincing them to change their spraying habits.

The issue of farmers acting as entirely profit seeking was also a theme in the interviews with agricultural scientists. One representative of NIRD (National Institute of Rural Development), for example, stated that “if it is profitable, farmers will grow anything”. She added that since farmers are not aware of the more serious consequences of their cultivation practices this has led to resistance development in pink bollworm because of excessive spraying of pesticides. The issue of unnecessary pesticide use was also a theme in the interview with the other NIRD representative who added the issue of farmers’ debts and suicides to the consequences of this misconduct. The representative of ICAR (Indian Council of Agricultural Research) argued that many farmers had switched to cotton because of the profitability of the crop, but since they had no experience with cotton cultivation they were spraying too many as well as the wrong pesticides, which has led to resistance development.

These accounts consist of a pattern of events, which create a portrayal of farmers as responsible for the pink bollworm issue as the agricultural scientists emphasized the inability and/or ignorance of farmers in implementing scientific recommendations. The argument seemed to be that farmers choose to grow cotton because of promises of good returns, then they fail to meet certain standards for cultivation and this in turn causes the pest to develop resistance. Another part of this pattern, as was discussed above, is that each of the interviewees emphasized the way in which they and their research institutions are working to eradicate the issue. The NIRD

representatives explained how the institute has been working to increase awareness among farmers of important issues related to cotton cultivation through capacity building of, especially illiterate, farmers by training them in certain rules of agricultural practice.

Are Farmers Non-Abiding?

As I discussed in the previous chapter, it is perhaps not surprising that agricultural scientist are utilizing a very scientific discourse when discussing Bt cotton and the pink bollworm issue. The portrayal of farmers as failing to abide, however, is much less scientific and not unproblematic. On the one hand, the portrayal seemingly permits farmers' agency by allowing for farmers the ability to choose their preferred cultivation practices. On the other hand, it simultaneously removes farmers completely from the political, economic, social, ecological and cultural context within which they act. The consequence of this is a de-politicization of agriculture, which leaves out factors such as poverty and power structures. Therefore, I will argue that the interviewees utilize this portrayal as an argument for their individual projects.

For the agricultural researchers this portrayal seems to function as a way of transferring responsibility or blame for the pink bollworm issue from the government to farmers. This distinction becomes clearer when compared to, for example, the account of the researcher from CESS where farmers were portrayed as nothing but victims of the actions of larger and more powerful institutions. The researcher agreed that farmers have failed to comply with the correct agricultural practices but in addition, he claimed that:

[Farmers] were told that monocropping⁸ is suitable for spraying of pesticides, application of fertilizers. Conducting all agricultural operation, if there is one crop, it's convenient. That is the logic, which they were taught. [...] The [Ministry of Agriculture and Farmers' Welfare], the Department of Agriculture, for a long time they have promoted that. Now everybody speaks of intercropping, mixed cropping. The same scientists, now they come back after realizing all of these things.

⁸ Monocropping refers to the agricultural practice of growing the same crop in a field year after year without rotating with other crops or growing multiple crops in the same field.

According to the CESS researcher, though farmers have failed to act according to the correct practices for cotton cultivation, they are not responsible for the development since agricultural scientists had instructed them on other practices. On top of this, the same scientists are now telling them to do the opposite. In contrast, the agricultural researchers blamed farmers for the development and regarded the work of research institutions as an attempt to find solutions to problems caused by others.

This scientific understanding of agriculture is based on an understanding of “agriculture as planned” which entails a predetermined set of activities that farmers follow. Instead, Richards (1993) argues that the agricultural practices of small-scale farmers are better understood as a type of performance which involves planning and experiential knowledge but also improvisation and adaptation. Flachs and Richards (2018, p. 640) argue that “[a]gricultural performances emerge spontaneously as improvisations when farmers struggle to keep their land, plants, households, projects, and livelihoods viable”. Performances, in this way, function as a skillset, which helps farmers take advantage of new markets, technologies and development interventions (Flachs, 2018). Kumar (2016, p. 81) suggests that the understanding of agriculture as strictly planned makes it easier for scientist to blame poor yields on the capabilities of the farmers. In the same way, this understanding arguably makes the agricultural scientists able to blame farmers for the issue of the pink bollworm attacks due to their ignorance about scientific techniques or their disregard of the recommended agricultural practices.

The understanding of agriculture as planned was shared by the NGOs who regarded farmers’ agricultural practices as a type of indigenous practices grounded in local knowledge which should be preserved (hence the statement from my Kazipet-interpreter about giving knowledge back to the farmers). Therefore, I argue that the portrayal of the non-abiding farmer functions as a way for NGOs to legitimize their interference in local cultivation and their projects with cotton farmers. As mentioned above, when I visited villages around Kazipet I was accompanied by a representative for MARI. During the two-day field visit, I talked to three farmers in charge of three of MARI’s trial plots and, based on this experience, acted as teachers for learning groups of 40 farmers each. A term often used for this type of farmer is “model farmer”, as it describes a farmer chosen by an agricultural extension agency to

demonstrate new cultivation methods and technologies to other farmers in the area (Taylor & Bhasme, 2018, p. 1).

In addition, model farmers in Kazipet had field facilitators working with them. The field facilitators described their responsibilities as involving decision-making about agricultural practices on behalf of farmers, which made it seem less like a collaboration between field facilitators and farmers and more like a model for top-down technology transfer where communication runs one way only; from staff at MARI to field facilitators to farmers (Taylor & Bhasme, 2018, p. 3). The Kazipet model farmers were only in charge of the more low practical aspects of cultivating the trials plots and not decision-making and experimental aspects. At the trial plots, I asked the farmers about their reasons for using different methods or seeds for the plots, and their answers were always the same: “Because MARI has told me this was the best”. The NGOs portrayed farmers as having somehow forgotten their local agricultural knowledge of cultivation practices and therefore are not able to prevent a development such as the resurgence of the pink bollworm attacks. This portrayal, in turn, legitimizes the actions taken by NGOs such as MARI to, in a sense, “reskill” farmers.

5.4 The Pro-Farmer Approach

Since the beginning of the GM-debate in India, different actors, usually NGOs and farmers’ movements, have claimed to be speaking on behalf of farmers (Herring, 2005, p. 204). In the following section, I will argue that even though portrayals of farmers differ substantially between the interviewees, their discourses are similar in the way that they all claim to be representing transparently the views of farmers and their best interest. In addition, I argue that the interviewees are tapping into this “pro-farmer approach” in order to legitimize their arguments and projects. This can be considered a rhetorical technique as part of a discursive strategy since they use the technique of invoking the voices of others to make an argument (Cook, 2004, p. 25).

This technique becomes especially obvious in the news media where journalists are literally invoking the voices of farmers. In a considerable number of articles, as mentioned above, statements made by farmers related to the pink bollworm issue constituted a major part of the article. Farmers describe firsthand the consequences of

the pink bollworm attacks like how much income they expect to lose (Seetharaman, 2018), how many pesticides they have had to apply (Jadhav, 2018; Singh, 2016) and how they may be forced to switch to other crops (Buradikatti, 2016) or even flatten their farms (Hardikar, 2018). This rhetorical technique functions as a way of enrolling farmers into the respective projects of the interviewees (Pearson, 2006, p. 312) By invoking the voices of farmers and by presenting themselves as being “pro-farmer” the interviewees position themselves as “the good guys”, the heroes of their own narratives. I will go on to present my analysis of how the interviewees are utilizing the pro-farmer approach and then I will discuss the possible implications of invoking the voice of the farmer as a rhetorical technique.

Farmers as Justification

The offices of the Centre for Sustainable Agriculture (CSA) in Hyderabad are located in a small dead-end street in the Eastern suburbs of the city above the organic food store Sahaja Aharam, which is a part of the Sahaja Aharam Producer Company, a CSA partner with the slogan: “Connecting Farmers to Consumers” (Sahaja Aharam, 2017). To reach the CSA offices you need to enter the store and go to the back where a staircase leads to the upper levels. Moving through the tiny store it is difficult not to notice the many posters of happy farmers covering the walls (see figure 4). Many of the posters have a picture of a farmer in his (all were male) field and a text of why he had switched to organic agriculture, usually stating his initial skepticism and how he had now been convinced by experiencing the positive results. The message is clear: organic farming is in the best interest of the farmer, and this is what CSA works to promote. During the interview with the CSA representative, he described the interests of the organization as always revolving around solving the problems for cotton farmers. This main interest is also expressed through the CSA slogan: “Caring for those who feed the nation” (Centre for Sustainable Agriculture, 2017). Several times during the interview, the representative commented on the opinions of farmers as if he was speaking for them directly. He stated for example that farmers are definitely interested in switching to organic agriculture.

Similarly, in the *CIFA Mandate to Farmers of India – 2018-2019* the pro-farmer approach becomes apparent. It is stated that “CIFA will be a TRUSTED FRIEND;

PHILOSOPHER & GUIDE TO THE FARMERS OF INDIA” (CIFA, 2018). In addition, the mandate uses the pronoun “we” interchangeably to mean “we, the country of India”, “we, the farmers’ association” and “we, the farmers”. I received the mandate as a pamphlet after the interview. The representative of CIFA insisted that he knew what farmers want and emphasized continuously how he was from a farming family and still owned land outside the city. He repeatedly insisted that what farmers want is GM technology. He mentioned what he considered the benefits of the technology for farmers and claimed to speak directly on behalf of farmers. After the interview, he insisted that I should go and talk to farmers to get his statements confirmed. He even invited me to join a meeting with farmers to demonstrate for me the close bond between CIFA and the farmers. As it turned out, however, the three women farmers I met were not at the CIFA offices for a meeting but just there to pick up some chickens. I was told that the staff had summoned them upstairs for me to meet when I asked what the meeting was regarding.



Figure 4: Example of poster found in Sahaja Aharam Organic Store

Invoking the Voice of Others

The act of invoking the voice of farmers can, as mentioned above, be a rhetorical technique as part of a discursive strategy used to back up the statements of the speaker (Cook, 2004, p. 24). Furthermore, when the speakers used farmers to create validity in their arguments they arguably perceived farmers as a source of legitimacy. However, since they spoke to me it may also be that they assumed that I would believe their statements more if they utilized the pro-farmer approach especially if

they perceived me as considering the voice of farmers to be the central or most important voice in the debate. A third possible interpretation is that the discourse of the interviewees was affected by the way GM crops have often been framed from a corporate side. As a way of attacking the GM opponents, proponents often cite the potential benefits of the technology for the poor and are thereby frame GM crops as “pro-poor” (Glover, 2010a).

Invoking the voice of others as a rhetorical technique comes with certain problems, which should be considered. As Cook (2004, p. 25) writes: “the speaker who constantly incorporates the voices of others necessarily both colours what they say, and the words remain, even when attributed to others, in an important sense the speaker’s own, despite an illusion to the contrary”. When the interviewees invoke the voices of farmers, they will inevitably be promoting their own viewpoints even when presumably speaking on behalf of farmers, and it is difficult to know how “colored” the statements are by these viewpoints. The larger discursive strategy of the CSA representative arguably aims at highlighting the advantages of organic agriculture and the disadvantages of the GM technology. He invokes the voice of farmers to show how they have lost their traditional knowledge and require re-education in the sustainable way of living. The discursive strategy of the CIFA representative, on the other hand, aims at highlighting the benefits of the technology. He invokes the voice of farmers who are able to utilize this new technology for maximizing their own benefit. Therefore, even though the discursive strategies of the two are similar in that both purport to represent the views of farmers, *how* they are portraying these farmers contrasts.

In addition, there is a specific issue of invoking the voice of farmers related to the idea of talking about “farmers” as one distinct group. Farmers in India are highly diverse, experience different challenges, and have conflicting interests depending on holding size, crops and climatic conditions. The factor of landholding size, in addition, is highly structured by caste, as I mentioned in the methods chapter, as farmers belonging to the Scheduled Castes and Scheduled Tribes operate only a small part of the cultivated land in India compared to the size of the groups. This makes it near impossible to make a statement about the opinion of farmers in general.

The main section of farmers in the Warangal District consists of marginal and small farmers whereas there are comparably few large-scale holdings (88.5% of all farm holdings in the area are marginal or small whereas less than 0.5% are large holdings). In the district of Warangal in 2010/11, the average size of landholding by marginal farmers was 0.43 hectares whereas the average landholding size for large farmers was 16.78 hectares. Due to the high number of marginal and small farm holdings in the area, however, the total average size for all farmers in Warangal was 1.01 hectares (see Table 1). The problem of invoking the voice of farmers as one distinct group is that the different size classes experience very different issues and have different, conflicting interests. The percentage of irrigated area⁹ under cotton cultivation is, for example, much higher for the large and medium size farmers than for the small and marginal farmers, and almost all the large size farmers have access to tube wells whereas this is only true for about 1 out of 10 of the marginal farmers (Agriculture Census Division, 2015c). The implications of this is that there are vast differences between invoking the voice of a large size farmer of 30 acres (12.4 hectares) as Buradikatti (2016) and a 4-acre farmer (1.6 hectares) as Hardikar (2018).

State: Andhra Pradesh

District: Warangal

| Farming class | Individual holdings | |
|----------------------------------|---------------------|-----------------------|
| | Number | Average size (in ha.) |
| Marginal (below 1.0 ha.) | 444.884 | 0.43 |
| Small (1.0-2.0 ha.) | 141.880 | 1.40 |
| Semi-medium (2.0-4.0 ha.) | 57.387 | 2.65 |
| Medium (4.0-10 ha.) | 17.050 | 5.57 |
| Large (above 10 ha.) | 1853 | 16.78 |
| All classes | 663054 | 1.01 |

Table 1: Number and average size of landholding by size group in Warangal, Andhra Pradesh 2010-11 (Agriculture Census Division, 2015a, 2015b)

⁹ I have described irrigation status among cotton farmers in Telangana in the introduction

Another issue of talking about farmers in India as a distinct group is that in addition to size differences there are noticeable differences between farmers who are part of an NGO project and those who are not. During field visits, I talked to farmers with landholdings between 1 and 4.5 hectares¹⁰. Firstly, these farmers differ from the majority of farmers in Warangal as all had holdings at or above the average size for farmers in Warangal. Secondly, they differed as they all had connections to projects led by NGOs. In Kazipet, farmers were even consigned 0.5 hectares of land, more than a marginal farmer possesses in total, by MARI as a trial plot. In addition, the Kazipet farmers obtained access through MARI to certain resources, such as irrigation and bio-fertilizers, which would not be available to “normal” farmers. Flachs (2017, p. 28) argues that this type of selected farmers receive economic benefits as access to loans, urban consumers and part time work in the project and social benefits including a network that provides support and resources and recognition by peers and visitors. In addition, the landholding compositions of the farmers (see appendix) tells of farmers with access to irrigation and with a certain risk and input capacity as crops like chili and saffron are highly input intensive and require irrigation and intense labor is needed to harvest saffron.

The description of the Kazipet farmers coincides with the idea of the “good farmer”, as described in the methods chapter, who adheres to scientific methods of crop production and usually consists of upper-caste male farmers (Kumar, 2016). The idea of the “good farmer” was also present in my interview with the CSA representative who considered “good farmers” to be farmers who are willing to switch to organic cultivation. It can, however, be argued that it is only realistic for farmers with high levels of risk capacity or farmers who are involved in organic projects initiated by NGOs to switch to organic cultivation, and the farmers the CSA representative was referring to may therefore not be representative for farmers in Warangal in general.

In the more explicit case of invoking the farmers’ voice, the CIFA representative several times spoke on behalf of farmers using “we” to describe how farmers think. He spoke, for example, of the “very simple logic, which we farmers follow” and mentioned that “farmers, we are not able to put pressure on the government for technologies”. Firstly, this is problematic as the representative himself, judging by

¹⁰ An overview of farmers is included in the appendix

his surname, belongs to one of the traditionally highest castes in the state which is considered a forward caste in government terminology and is one of the castes, which historically has had control of land in Telangana (Prasad, 2015, p. 79). Secondly, CIFA is an organization with the goal of making India an agricultural economic power and on introducing modern agricultural technologies to increase yields (CIFA, 2006). This makes it rather difficult to accept the claim that they would be speaking on behalf of the majority of farmers: the small and marginal farmers.

5.5 Conclusion

In this chapter, I have presented three portrayals of cotton farmers, which I identified through interviews and online news articles dealing with the issue of the pink bollworm attacks: farmers as victims, farmers as rational agents and non-abiding farmers. In addition, I have discussed problematic issues related to each of these portrayals. I have argued that the portrayal of farmers as victims, predominantly prevalent in the anti-GM discourse, runs the risk of ignoring the agency of farmers. The portrayal of farmers as rational agents on the other hand, though it permits farmers' agency, fails to take into account the biases related to agricultural decision making. Finally, I have argued that agricultural scientists and NGOs use the portrayal of non-abiding farmers as a way of transferring blame for the pink bollworm issue from agricultural researchers to farmers and as a way of legitimizing interventions by NGOs.

In the case of bio-hegemony in India, the subordinate groups include small and marginal farmers, and it is therefore important to consider the ways farmers are portrayed. The portrayals of farmers as rational agents and as indirectly responsible for the pink bollworm issue, the dominant portrayals of the hegemonic pro-GM discourse, must be viewed within the boundaries of the bio-hegemonic "common sense". If these portrayals constitute implicit parts of the internalized ideas and taken-for-granted knowledge this is an indicator of the embeddedness of the bio-hegemony of cotton production in India.

6 Talking About the Future

By now, I have discussed how the issue of the pink bollworm attacks in the Indian cotton fields has been integrated into the pro- and anti-GM discourses and emphasized the portrayal of farmers in the discourses. In addition, I have argued that the pro-GM discourse is hegemonic in India and, using Newell's (2009) concept, that it constitutes a *bio-hegemony*. In the following chapter, I will discuss how the hegemonic pro-GM discourse deals with the challenge of the pink bollworm issue. Looking at how actors perceive and present ideas about the future can provide indications about whether the bio-hegemony has been challenged and how compromise equilibrium is negotiated.

According to Gramsci, "hegemony is in continuous motion, constantly reconfiguring and reacting in response to new challenges to its authority" (Schnurr, 2013, p. 655). I discuss the possibility of the pink bollworm issue posing such a challenge for the pillar of discursive power in the Indian bio-hegemony. First, however, I present the explicit perceptions of the future for Indian cotton production, which I identified in interviews, during field visits and in secondary literature.

6.1 Framing the Future of Cotton Production

In the pro- and anti-GM discourses, the future for cotton production in India is framed in remarkably different ways, and the interviewees are making use of the portrayals of farmers from the previous chapter in arguments for their envisioned futures. In the following sections, I will identify and discuss different ideas about the future for cotton production in India as expressed by different actors. The first section deals with the pro-GM discourse, which promotes a future framed by biotechnology. The second section focuses on the perceived futures of NGOs. These differed, as CSA (Centre for Sustainable Agriculture) is an anti-GM organization whereas the other NGOs are not profoundly pro- or anti-GM. These NGOs are not imposing GM technology on farmers, but they are not strictly opposing it either as they work within the agricultural context that already exists in the rural areas. Later I will discuss how this contributes to maintaining bio-hegemony. In the third section, I look at arguments in the anti-GM discourse related to the future, primarily the idea of

reintroducing the indigenous *desi* cotton, and discuss the possibility of a negotiating a compromise between the pro- and anti-GM discourses.

The Future is GM

The pro-GM discourse frames the future exclusively within the context of biotechnology and does not regard a move towards organic cotton, as discussed in the next section, as a possibility. As a representative for the National Institute of Rural Development (NIRD) said, “I can’t believe that organic cotton will actually work. There is no proof of it being upscaleable. It is too difficult to grow without using pesticides”. The representative for CIFA (Consortium of Indian Farmers Associations) called the idea of switching to organic cotton “romantic”. Instead, there is widespread agreement on the pro-GM side for moving forward with GM cotton in India, and different proposals on how to do this. The former director of the Central Institute for Cotton Research (CICR), Dr. Keshav R. Kranthi, has argued for the possibility of going back to the first generation of Monsanto’s cotton, Bollgard I. His argument is that this will permit the development of short-duration varieties of cotton by Indian seed companies, which will negate the pink bollworm attacks as bollworms mainly attack during winter (Hardikar, 2018; Pulla, 2018). Others claim that this would be a step backwards and argue instead for new solutions within biotechnology. One article from *The Hindu Business Line*, for example, covers the attempt of the Hyderabad-based seed company, Nuziveedu Seeds Ltd, to develop an alternative trait in order to combat the pink bollworm by combining the Cry1Ac gene, which was used in both BG-I and BG-II, with a Cry1Ec gene since both genes are toxins, which function as insecticides (Kurup, 2017). Cottonseeds bearing this new trait have, however, not been approved for commercialization in India yet.

The envisioned future development for cotton biotechnology, which has received primary attention in the media, is Monsanto’s newest generation of GM cotton: Roundup Ready Flex cotton, the herbicide tolerant (HT) cotton variety also known as Bollgard III (BG-III). This variety combines the Bt traits from BG-II with glyphosate tolerance (Stone & Flachs, 2018, p. 8). In addition, along with the Cry1Ac and Cry1Ab proteins from BG-II, a third protein is added to the composition; the Vip3A protein. Monsanto argues that this new variety is in fact resistant towards, among

other pests, the pink bollworm (Subramani, 2011) and that BG-III will increase the sustainability of the technology as the insertion of the third protein allegedly creates further difficulty for the pests in creating sustainability to either of the genes (Monsanto, 2016). In 2014, Monsanto was granted permission to begin with field testing of this next generation of seeds in India, but even though biotechnologists are encouraging an approval of HT crops this has so far been met with resistance, and the Supreme Court has even recommended a ban on HT crops (Stone & Flachs, 2018, p. 2). Monsanto has, in addition, been criticized for promoting herbicide tolerance as the next step for Indian cotton farmers as this trait in itself has no effect on bollworms, and it is therefore argued that it does not represent a solution to the BG-II resistant bollworms (Naik et al., 2018).

HT cotton has not received approval by the GEAC for commercial cultivation in India (Kurmanath, 2018). Nevertheless, the most recent report from the ISAAA (2017) states that in Kharif 2017, a large number of farmers planted unauthorized cotton varieties in the central and southern parts of India. The ISAAA (2017) estimates that in 2017 an area of 800,000 hectares was planted with illegal cotton varieties, including HT cotton expressing two types of Roundup Ready events created by Monsanto. The Department of Biotechnology in the Ministry of Science and Technology in India assembled in the spring of 2018 a Field Inspection and Scientific Evaluation Committee (FISEC) to investigate the matter of illegal cultivation of HT cotton (Chandrashekhar, 2018).

After collecting samples of the illegal varieties, the committee concluded that it is prevalent in all the cotton-growing states of India. Because of this degree of prevalence the committee decided to recommend complete eradication of the plants as the only viable solution (Chandrashekhar, 2018) as well as strict regulations of the sale of herbicide (Fernandes, 2018). As discussed in the previous chapter, the representative of CIFA as well as the farmers' movement Shetkari Sanghathana argue that if farmers want to use this new technology they should be allowed and the state should not impose restrictions on its use. In contrast, the anti-GM side claims that farmers do not know that they are growing BG-III and blame instead the seed companies for producing and selling the seeds illegally to innocent farmers (Kurmanath, 2018).

NGOs and the Future

Common for the interviews with representatives of KVK (Krishi Vigyan Kendra), MARI (Modern Architects of Rural India) and WWF (World Wildlife Fund) India was that their focus was not on the choice between Bt or non-Bt cotton varieties. Instead, a prevalent perspective on the future among the NGOs was the focus on changing the agricultural practices among cotton farmers. In both Jammikunta and Kazipet, the NGOs (KVK and MARI) worked with implementations of the initiative Better Management Practices (BMPs) developed by WWF India in order to balance farm inputs with increased yields (WWF India, 2010a). BMPs are agricultural practices suggested by WWF India, which supposedly combine social responsibility, environmental integrity and economic viability. The main focus for WWF India is on reducing pesticide and water inputs, and they claim to have achieved an 81% decrease in pesticide use and a 49% decrease in use of water in the Warangal area (WWF India, 2010c). The initiative does not involve supporting farmers financially or providing subsidies, but it entails technical guidance and capacity building (WWF India, 2010b). In addition, in the manual for BMPs formulated by WWF India it is stated that the implementation of BMPs needs to be monitored in order to keep track of activities in the field (WWF India, 2010a).

Even though this initiative started before the resurgence of the pink bollworm attacks in 2015, the NGOs still suggested BMPs as a solution to the issue during my field visits. Furthermore, the need for interventions of the NGOs such as implementation of BMPs was justified by using the issue as an example of the need to guide farmers on agricultural practices. This is part of a much more complex discussion of how NGOs work, of course. NGOs need to monitor progress in order to follow the development of their projects and to show results to (potential) donors. In addition, farmers should not be regarded as solely passive recipients of aid from NGOs. Instead, it has been argued that farmers actively shape the interventions and development programs offered by NGOs to their own needs (Flachs & Richards, 2018, p. 640). In India, NGOs have been found to play an important role in fostering inclusive social development while, at the same time, the issue of NGOs as spheres for participation primarily for middle- and upper-classes has been problematized (Corbridge et al., 2013).

As mentioned above, a term for farmers who, as a part of NGO projects, train in certain agricultural practices and pass these on to other farmers is “model farmers” (Taylor & Bhasme, 2018). Another role that the model farmers from Kazipet seemed to be assuming is the role of “show farmers”, a term used by Flachs to describe a group of farmers in Telangana who were recruited to “reliably perform for visiting funders, scientists, media, NGOs, corporations and other interested parties to demonstrate the viability of agricultural technologies” (Flachs, 2017, p. 25). On the trial plots in Kazipet, farmers experimented with different techniques for pest management such as intercropping, border cropping and different types of insect traps. These techniques are all suggested as solutions to the pink bollworm issue. They also tested different varieties of cotton (all Bt) as well as different spacing between the cotton plants. Seemingly, the pink bollworm issue has created a window of opportunity for NGOs. The issue constitutes a way for NGOs to frame the future for cotton production in a way that creates space for the projects of NGOs because it justifies interventions such as the implementation of BMPs. I will discuss this point further in section 6.2.

Unlike MARI, KVK and WWF India, the Centre for Sustainable Agriculture (CSA) represents an anti-GM NGO as their focus on implementing the concept of Non-Pesticidal Management (NPM) among cotton farmers involves the use of non-GM seeds. CSA works on implementing NPM among farmers in general but as the representative mentioned, cotton farmers are a specific focus for the organization as most farmers’ suicides involve cotton farmers. As GM cotton, organic agriculture has been promoted for its potential to reduce the overuse of chemicals in agriculture in India, but in spite of this similarity the two have come to represent two mutually exclusive alternative agricultures (Flachs, 2016a, p. 685). Agricultural scientists at NIRD argued that organic cotton would not be able to compete with Bt because it does not provide farmers with equally high yields. According to the representative of CSA, however, the issue of increasing the use of organic cotton is not the quality of the seeds because:

Developing a product, which can compete with Bt cotton, is easy. That is not difficult. [...] But Monsanto cannot be fought by becoming Monsanto. So if I also establish a big seed company that will not be a solution because the bigger I become as a company

the more I also need to look for my own profits rather than for others welfare.

The CSA representative argues here that the advantage of working as an NGO to promote organic cotton instead of establishing a seed company to produce the product is that it allows a focus on farmers' welfare instead of on profits. However, it has been argued that the need for regulatory compliance among organic farmers has created a market for NGOs to translate regulations to farmers (Flachs, 2016b, p. 61). This means that the implementation of NPM and organic cotton in itself creates a source of profits for NGOs such as CSA. In addition, anti-GM NGOs are often funded transnationally and promote organic agriculture as a way to attract this funding (Bownas, 2016, p. 82). This makes the notion of the CSA representative about NGOs working without regards to profit questionable. Instead, the claim that CSA's sole regard is for the welfare of farmers could be a way of creating credibility for the work of the organization.

The Return of Desi Cotton?

Organic cotton cultivation constitutes for its proponents in India a distinctly Indian form of production, which characterized Indian agriculture before the days of colonialism (Flachs, 2016a, p. 685). This traditional form of cultivation entailed the use of the region specific, traditional Indian, short-stapled cotton varieties known as *desi* cotton. As described in the context chapter, the American long-staple variety replaced *desi* cotton almost completely in the late 1700s during the Industrial Revolution, as these were a better fit for the cotton mills of the British to whom India exported the raw material. Today, only a small portion of cotton grown in India is *desi* cotton (Menon & Uzramma, 2017, p. xxii). The potential revival of these traditional varieties was a reoccurring theme in several of my interviews, especially with the representative from CSA and the researcher from CESS (Centre for Economic and Social Studies). The researcher from CESS explained how farmers have figured out what they lost when *desi* cotton was replaced:

Farmers moved away from their own thing, but later they realized that the earlier things were the best things because their father, their forefathers, they did it. They are realizing what they lost, what was

correct for them, what was not correct for them. The kind of mixed cropping system was lost and desi cotton was totally lost.

In this rather nostalgic quote, the researcher portrays the traditional practices such as mixed cropping systems and desi cotton as the farmers' "own thing". This portrayal entails an idea of farmers as possessing an internal knowledge of agricultural practices, which is "correct for them", as the researcher described it. This is similar to the notion of an "indigenous agricultural knowledge system", which Richards (1993, pp. 61-62) critically notes is celebrated by "anthropological romantics". As mentioned above, it has been argued that agricultural practices are better understood as performed rather than as strictly planned based on indigenous knowledge (Flachs, 2018; Flachs & Richards, 2018; Glover, 2018; Richards, 1993). This understanding, however, interferes with the image of farmers as victims. Instead of the romantic idea of the superiority of indigenous knowledge and need to conserve it on the one side and the technology-centered idea of a need to replace it on the other, Richards (2018) suggests applying an approach of development, which is sensitive to indigenous social practices.

This suggestion may be a way of bridging the gap of the anti- and pro-GM discourses and thereby decreasing the polarity of the debate. Today, the Bt genes have been inserted into hybrids developed from the American long-staple cotton variety (Menon & Uzamma, 2017, p. 188). There has, however, recently been research on the potential for developing a desi Bt cotton variety, which is proposed to be able to solve the issue of seed saving related to Bt cotton today (Menon & Uzamma, 2017, p. 247). This variety, if developed, may have the potential to serve as a compromise between the two poles of the GM-debate in India as it fulfills the demand for technological development while remaining sensitive to the traditional practices of Indian cotton farmers. This compromise would obviously not satisfy the adherents of a strictly organic cultivation approach as Indian guidelines deny organic certification when GM products are used (Flachs, 2016a, p. 685), but if the issue of seed saving was addressed this would mean that at least one of the major critiques from the anti-GM side was met. In addition, another prevalent theme in my interviews was the notion that Bt cotton is not "*fit*" for Indian agricultural conditions. The professor from HCU (Hyderabad Central University) mentioned how Bt cotton is not suited for the dryland areas of the cotton growing regions in India. Similarly, the researcher

from ISB (Indian School of Business) claimed that the introduction of Bt technology has played a major in expanding cotton cultivation to landscapes where it should not be grown. Desi cotton, on the other hand, has region specific varieties in addition to better drought resistance. The use of desi cotton varieties for GM crops, therefore, meets two of the major critiques of the anti-GM side.

To summarize, in addition to a reintroduction of desi cotton, the future within the anti-GM discourse seems to involve finding solutions to certain critiques, the major ones being the issue of seed saving and the applicability of Bt cotton to Indian conditions. If the critiques of the anti-GM side have the potential to be met within the framework of biotechnology, it can be argued that this implies the potential of compromise equilibrium to be negotiated and that bio-hegemony will be maintained in the GM-debate in India. In the following section, I will argue that the pro-GM discourse remains hegemonic in the GM-debate in India in spite of the threat of the pink bollworm issue and discuss how bio-hegemony is maintained.

6.2 A Bio-Hegemony

Once hegemony has been achieved it cannot be taken for granted but has to be continually reproduced as it needs to adapt to changing conditions surrounding it as well as the activities of opposing forces (Simon, 2015, p. 35). This need for constant reconfiguration of hegemony might open for possibilities for destabilizing or re-orienting the bio-hegemony as this is fragmented and constantly shifting in reaction to new challenges to its dominance (Schnurr, 2013, pp. 655-656). If the issue of the pink bollworm constitutes an indicator of a failure of the Bt technology, the only GM technology currently approved in India, the issue could create such a challenge and even potentially cause a destabilization of the bio-hegemony by creating an “organic crisis”. However, in this section I will argue that even though the issue of resistance creation in the pink bollworm appears to provide a certain victory for the anti-GM side in destabilizing the dominance of bio-hegemony, the discursive power of the pro-GM side seems to be maintained.

According to Gramsci, an organic crisis is crucial in overthrowing one hegemony and developing a new, and it entails the chronic disrepair of the structures and practices that constitute the current hegemony (Carroll, 2010, p. 170). An organic

crisis, thereby, creates the possibility of social transformation (Jakobsen, 2018, p. 2) but, as the case of the pink bollworm issue exemplifies, a threat to the hegemony is not always sufficient to create a full born organic crisis. For this to manifest there needs to be a revelation of irredeemable structural contradictions in the hegemony, which seem impossible to eradicate (Simon, 2015, p. 36), and it needs to be a crisis of the whole hegemonic system (Forgacs, 2000, p. 427). In the following, I will discuss how interviews show that bio-hegemony has been discursively maintained, how the concept of “force” is used by interviewees against the Gramscian concept of hegemonic power and the role of the media in “[c]reating valid zones of conflict in public debate” (Newell, 2009, p. 53) related to the pink bollworm issue. Based on this, I argue that the pink bollworm attacks have not sufficiently challenged the discursive pillar of bio-hegemony.

Maintaining the Bio-Hegemony

The importance of discursive power in maintaining hegemony derives from its “ability to construct and reinforce prevailing framing of issues, in order to secure the supremacy of a particular ideology” (Schnurr, 2013, p. 650). In regards to biotechnology, discursive power acts as the provider of triumphant narratives of the achievements of biotechnology while simultaneously deflecting challenges and critiques (Newell, 2009, p. 52). Andrée (2011, pp. 177-178) argues, for example, that in order to minimize opposition from the public to GM crops, the biotech bloc in Canada adopted certain discursive strategies and employed the narrative of a “biotechnology continuum”: GM as just another step in human manipulation of nature. Following Gramsci’s concept of “organic intellectuals” (agents who specialize in elaboration of a particular ideology), the role played by scientists in maintaining bio-hegemony is that they use their credibility as experts to advance arguments in favor of biotechnology (Schnurr, 2013, p. 644). As discussed above, a general theme related to the future for Indian cotton production in my interviews with agricultural scientists was how to facilitate properly for the continued use of biotechnology amongst farmers. The issue of Bt cotton versus desi or organic cotton was swiftly brushed aside, and in one interview I was even told the following by a representative for NIRD: “You have come too late. [laughs] We are not discussing about Bt cotton or traditional cotton anymore in India. Everything is Bt”.

In addition, as I argued in chapter 4, the notion of the introduction of Bt cotton as creating benefits for cotton farmers was mentioned as part of the “common sense”, the collection of people’s often contradictory conceptions of the world which are internalized and lived uncritically (Forgacs, 2000, p. 421). The representative for ICAR (Indian Council of Agricultural Research) mentioned how Bt cotton has proved to be an effective technology, which has made cotton farming in India profitable by increasing yields and controlling pink bollworm. Similarly, both representatives from NIRD as well as the representative from ISB asserted that the Bt technology had indeed brought along higher yields for cotton farmers as well as a decrease in pesticide usage. The representative from WWF, in addition, held that Bt cotton had decreased the need for pesticides.

I found, in addition, that agricultural scientists did not deny that the problem of the pink bollworm is taking place, but this does not necessarily indicate that the hegemony is threatened. As Gottweis (1998, p. 272) notes: “hegemony is not about the elimination of opposition; it focuses on the re-absorption of polarities into a system of “legitimate differences””. In the case of maintaining bio-hegemony in India in the face of the issue of the pink bollworm, this entails a framing of the challenge to the technology as manageable within the existing structures (Newell, 2009, p. 53). The agricultural scientists’ focus on “the real problems” may be a way of doing precisely this such as focusing on the problem of distribution of spurious seeds by crooked seed dealers, which comprises a manageable challenge to the cotton bio-hegemony. Making seed dealers the villains of their discursive narratives, enables the agricultural scientists to construct a problem, which is both manageable and for which the technology cannot be blamed. As Herring and Rao (2012, p. 50) write: “[f]ailure to control bollworms on those plants is not a failure of Bt technology, but a failure of information in an unregulated seed market.” The crooked seed dealers become scapegoats in the narrative, which culminates in a deflection of the challenge to biotechnology. As the representative for ICAR noted, “[f]armers don’t know that they are buying bad seeds and they blame the technology and the seed companies when it doesn’t work. But it is not the fault of the companies”. This quote is an example of how blame is transferred from the technology to the issue of spurious seeds.

In the same way, employing a portrayal of farmers as having failed to comply with recommended modes of agricultural practice and thereby being responsible for the development of the pink bollworm issue supports the framing of the problem as manageable. Solutions suggested to this problem involve changing the agricultural practices of farmers, and the responsibility for doing this is easily transferred to NGOs. As I argued in the previous chapter, this portrayal of farmers works in the favor of both agricultural scientists and NGOs as it releases the state, by which the scientists are employed, from blame while also justifying the work being done by NGOs to eradicate the issue. In this way, the portrayal creates a legitimate space in the framing of the future for the work of agricultural scientists and NGOs to resolve the issue. Speaking in narrative terms, it enables the portrayal of the agricultural scientists and NGOs as heroes. The representative of KVK in Jammikunta, for example, explained how the organization has trained farmers on how to control pink bollworm attacks by planting refuge and using pheromone traps. The KVK representative made use of the pink bollworm issue as a justification for the interventions of the organization and based it on the idea of the farmer as someone in need of training and guidance. It is desirable for organizations to frame the issue of the pink bollworm as something that needs interventions but at the same time in a way that is manageable in order to justify their work. This in turn aids the maintenance of the bio-hegemony since an issue that could have been framed as a problem with biotechnology is instead framed as an issue related to agricultural practices.

Another example is the BMP initiative developed by WWF India, which both MARI and KVK are working to implement among farmers in Kazipet and Jammikunta. The representative of WWF India explained during the interview that the organization is not concerned with whether farmers grow Bt or non-Bt because of their primary focus on water management and pesticide usage. In addition, the fact that ICAR funds the initiative arguably influences which stand the organizations takes towards GM crops. According to their webpage, ICAR played a pioneering role in initiating and steering the Green Revolution (ICAR, 2017) and prides itself as the organization that delivered the Green Revolution to India (Scoones, 2006, p. 253). In fact, Brown (2018, p. 39) argues that the circulation of development discourses promoted by institutions such as ICAR, which positioned everything traditional as inferior and

backwards, played an important part in mobilizing the participation of peasants in the Green Revolution. Stone and Flachs (2018) argue that the introduction of Bt cotton was made possible by the introduction of and creation of dependency on pesticides during precisely the Green Revolution. In addition, according to my interview with the representative from ICAR, the council is promoting the Bt technology as the modern and superior mode of cotton cultivation in India today. In this way, the activities of NGOs such as KVK and MARI as well as of agricultural scientists work to maintain bio-hegemony.

The Concept of “Hegemonic Power”

I have found use of the concept of “force” to be prevalent in the anti-GM discourse, especially in the context of portraying farmers as victims. When speaking about force it is, however, important to consider this in the context of power and consider the type of power, which is exercised in the bio-hegemony. According to Gramsci, power is best understood as relational in the way that social relations are also relations of power (Simon, 2015, p. 25). Power plays an important part in framing an issue within the interests of the dominant groups (Newell, 2009, p. 38), but this is not achieved solely by force. Instead the dominant group uses a combination of persuasion, coercion and deceit to win the support of subordinate groups (Brown, 2018, p. 9). The hegemonic class thereby gains consent of other classes through creating a system of alliances (Simon, 2015, p. 19).

“Wherever there is power there arises resistance to it” (Simon, 2015, p. 76). In the case of bio-hegemonic power, the anti-GM side constitutes the resistance, and this side does not seem to share the conception of bio-hegemonic power as being consensual. I contend that implicit in the portrayal of farmers as victims, is an association between the exercised power of bio-hegemony and force understood as exclusively involuntary. In my interview with the representative for PAN (Pesticide Action Network) India, this association was expressed very explicitly when he talked about how the seed companies use force as a part of their strategy to ensure adoption of Bt cotton. When talking about force he referred to the removal of alternatives and thereby forcing the choice of Bt onto farmers, not direct physical force. As

mentioned above, this is similar to Shiva's (2013) concept of "destruction of choice", which she claims is being misunderstood as farmers' acceptance of Bt cotton.

The concept of hegemonic power does not only entail force, however. It also entails the internalization of ideas and taken-for-granted knowledge or "common sense", as Gramsci terms it (Crehan, 2016, p. 43). Even though hegemonic power relies heavily on this internalization of ideas about the world based on consent, this does not mean that it remains unproblematic, however. One issue relates to the idea of Indian farmers as a single, homogeneous group. Brown (2018, pp. 9-10) argues that the Green Revolution succeeded as a hegemonic project in India by enlisting the consent of medium and large-scale farmers. Furthermore, Newell (2009, p. 34) argues that the biotechnology boom experienced in Argentina in the 1990s can be attributed to a form of rural class politics where large scale farming predominates. If similarly the introduction of biotechnology in India is based on consent from a farming community represented by the larger farmers, marginal farmers constituting the majority of farmers in India may be characterized as subalterns who are not able to articulate their own condition (Crehan, 2016, p. 10). The portrayal of farmers as rational agents needs therefore be viewed within the boundaries of the bio-hegemonic common sense, which is the site on which the biotech bloc is constructed.

The Discursive Power of the Media

In chapter 4, I identified the anti-GM discourse in the English-language online Indian news media's portrayal of the pink bollworm issue. The notion that I had come "too late" to participate in the GM-debate in India, as mentioned above, therefore came as quite a surprise for me after spending months reading about the failure of Bt technology rooted in the reoccurring pink bollworm attacks in the online Indian news articles covering the topic. The agricultural scientists I interviewed seemed to claim that the debate was over; Bt had won, whereas the news media claimed the case to have been reopened by this recent development. As I argued in chapter 4, this dichotomy may have been the result of the urban middle-class bias, which dominates mainstream media versus the pro-GM discourse of agricultural scientists. Mayer (2016, p. 51) argues that alternative portrayals of farmers' suicides in India, such as those caused by mental illness or drug abuse, have been excluded from the media as

they do not fit into the dominating anti-globalization frame. Similarly, Herring (2009, p. 20) argues that a “reciprocal authenticity dynamic” develops between ex-colonial and local global narratives as the press uses and presents local stories to authenticate and confirm global narratives. However, below I will argue that another explanation may be that the media is presenting the issue of the pink bollworms within a “manageable” framework.

In regards to discursive power, Gramsci emphasized the role of the media and suggested that the press constitutes the most prominent and dynamic part of the ideological structure of the ruling class in that it has the potential to influence public opinion (Forgacs, 2000, pp. 380-381). In regards to the bio-hegemony in Argentina, Newell (2009, p. 53) argues that the role of the media is “played through managing a potentially unruly discursive terrain in a way which promotes the social acceptance of the technology”. Newell (2009) argues that the media helps to ensure that biotechnology remains a non-issue in Argentina by reinforcing business framings of biotechnology and its benefits for the country in overcoming the fiscal crisis and enhancing national development. In this way, the media helps in securing that the bio-hegemony maintains its position of dominance while remaining largely unquestioned and unchallenged (Schnurr, 2013, p. 640). The fact that the anti-GM discourse is found in media coverage may indicate that the bio-hegemony in India does not remain as unquestioned or unchallenged as the bio-hegemony of Argentina.

There are, however, important differences between Argentina and India in this regard. The majority of the population in Argentina is literate, and therefore the written media is accessible for everyone. The fact that the anti-GM discourse is found in the media in India is therefore not necessarily an indication that the bio-hegemony is more challenged than in Argentina. Instead, I contend that a more accurate interpretation of the role of the media in India is that it helps in maintaining bio-hegemony by portraying its challenges as manageable. Even though the portrayals of the issue in the media seem to be challenging the bio-hegemony, the challenges are portrayed in a way that makes them manageable within the existing structures of the bio-hegemony. As mentioned above, hegemony does not involve the complete elimination of opposition but instead that polarities are integrated into a system of “legitimate differences” (Gottweis, 1998, p. 272).

An example of this is the coverage of the Gujarat cotton farmers in the media. Running parallel to the portrayals of farmers in distress due to pink bollworm attacks is the coverage of Gujarat cotton farmers who have allegedly managed to overcome the threat of the pink bollworm epidemic. In one subheading this is even stated directly: “The insect pest, which wreaked havoc two years ago, is viewed today as a threat that can be ‘managed’” (Kateshiya, 2018). The article argues that farmers have figured out how to use chemicals at the right time as well as pheromone traps which ensures high protection from the worms. The article contains an interview with a large-scale farmer with a landholding of 20 hectares, which, as I discussed in the previous chapter, is problematic as a representation for farmers in general.

In addition, the article contains the portrayal of failed farmers through an interview with an agricultural scientist who argues that resistance creation in pink bollworm has happened because farmers have failed to follow protocols provided by Monsanto on cultivation of Bt cotton. This coverage of the Gujarat farmers ensures that the issue is framed as manageable even if it has not been solved in all cotton growing areas yet. The Gujarat farmers constitute a success story where cotton farmers who had initially failed to comply with the guidelines for correct Bt cotton cultivation are saved by being reskilled in their agricultural practices. This again legitimizes the role played by agricultural scientists as heroes with the ability to solve the pink bollworm issue as it justifies the need for experts to advice or even force farmers to follow protocol (Kasabe, 2018; Kateshiya, 2018). This means that even though the bio-hegemony seems challenged by the media discourse regarding the pink bollworm issue, in reality it remains unchallenged as the challenges are framed as manageable and are thereby integrated into the hegemonic discourse.

The issue of the pink bollworm attacks arguably even ends up creating further support for the bio-hegemony as it creates a space in the public debate for discussing the future of biotechnology in India. As described above, HT cotton or BG-III has received increased media coverage as a possible solution to the issue. It is even argued by some that if farmers do not get access to this alternative variety they will face serious problems with bollworm attacks similar to those of the 1990s before BG-I was introduced (Avadhani, 2017). Field-testing of HT cotton ended in 2013, however, when Monsanto withdrew its application for approval from the GEAC due

to concern about the patentability of the product in India. In 2009, Bt brinjal (eggplant) became the first GM food crop to be approved by the GEAC for commercialization in India, but only a year later, in 2010, this decision was rejected due to strong public opposition (Huda, 2018, p. 51). The decision regarding field testing of GM mustard has been deferred in India several times (Damodaran & Sinha, 2016; Jayan, 2018). The crop was approved for limited field testing in the fall of 2018 (Sharma, 2018), but opposition to GM mustard is still strong (Haq, 2018). Both Bt brinjal and GM mustard are locally developed in India by Maharashtra Hybrid Seeds Company (Mahyco) and a scientist team at the University of Delhi, respectively (Haq, 2018; Huda, 2018).

Andrée (2011, p. 174) refers to the rejection of approvals of bio-products due to widespread public resistance “biotech failures”. He argues that the so-called biotech failures of Canada, recombinant Bovine Growth Hormone (rBGH) and Roundup Ready (RR) wheat, both products of Monsanto, indicate that the biotech bloc was not really hegemonic in North America but still attempting to establish hegemony without having yet attained it (Andrée, 2011, p. 187). I argue, however, that since GM mustard has been approved for field testing, though limited, it cannot be deemed a biotech failure and that Bt brinjal should not be deemed a biotech failure yet as agricultural scientist are still arguing for the benefits of switching to the Bt technology for eggplant cultivation (Padmanaban, 2018; Times News Network, 2019). Instead, I argue that the issue of the pink bollworm attacks has created a space in the public debate in India for GM crops, which demonstrates that the discursive pillar of bio-hegemony is maintained.

6.3 Conclusion

In this chapter, I have discussed how the future for cotton production in India is framed within the pro- and anti-GM discourses. Not surprisingly, the pro-GM discourse frames the future within the boundaries of biotechnology and suggests moving forward with new varieties of GM cotton such as HT cotton, Monsanto’s newest generation of Bollgard seeds. The anti-GM discourse favors desi cotton as the solution for the pink bollworm issue. In addition, I have argued that the pro-GM discourse remains hegemonic in the GM-debate in India in spite of the threat of the

pink bollworm. I have discussed why the pink bollworm issue has proven insufficient in causing an organic crisis in spite of anti-GM media coverage. Based on this, I have argued that bio-hegemony in cotton production in India is maintained at least in terms of discursive power, which constitutes the third pillar.

7 Conclusion

Even though the pink bollworm has received much media attention, it is important to remember that this pest is not the only concern of cotton farmers. Rather, it is part of a wide spectrum of challenges related to cotton farming in India. Epidemics of whiteflies and mealy bugs, for example, have caused serious havoc in previous seasons, and in Kazipet, field inspectors mentioned an insect, which they called “scissor moth”, as the main pest concern this year. Another main concern for Indian cotton farmers is rain. This most recent season, rain came late, which meant that the freshly sown cottonseeds received too little water. When the rain came, however, it came in plenty, which resulted in overwatering of the cotton plants. During my field visits, water always came up as one of the farmers’ main concern. As the daughter of a farmer in Jangaon said, “If there is no water, there is no harvest”. Rainfall is a factor in agriculture, which farmers cannot control (without irrigation), and it is therefore a source of worry for farmers of all crops. At the National Institute of Rural Development (NIRD), researchers explained that unpredictable rainfall was a major reason for farmers switching from other crops to cotton, as maize plants for example would die during droughts whereas cotton plants can be revived through irrigation. Still, cotton, and especially the hybrid varieties of the Green Revolution, does require some water. Several of my interviewees as well as Menon and Uzamma (2017) have argued that the introduction of Bt cotton led to a spread of cotton cultivation to areas, which are not suited for this type of agriculture due to frequent rainwater deficits.

Despite many menaces to choose from, focus of this thesis has been the pink bollworm as this is a problem directly related to Bt cotton, unlike whiteflies and drought, as Bt was introduced as a solution to the bollworm problem in cotton production in India. It is, however, important to recognize that the pink bollworm issue has not emerged in isolation and disconnection from other issues of cotton cultivation but is the result of several contributing factors. As I have discussed, the use of hybrids and long-duration varieties may have exacerbated the issue, and the reasons for using these technologies connect to political and social aspects. This is where the potentials of looking at the issue from a political ecology perspective become apparent as analysis of access to and control over nature exposes such interactions between biological/technological aspects and political/ social aspects.

7.1 Summary of Findings

Using a Gramscian approach to studying cotton production in India I have highlighted the discursive embeddedness of bio-hegemony among agricultural researchers and other actors in this sector and how these aid in maintaining the third pillar of power in the face of challenges. In addition, I have discussed why, despite its popularity in the English-language news media, the pink bollworm issue has not managed to challenge the hegemonic pro-GM discourse. In my empirical material, I found proof of deviation from the ideal type pro- and anti-GM discourses, which led me to discuss the possible existence of a third discourse. I based this discussion on Bownas' (2016) arguments for the equitable development discourse but concluded that the seeming existence of a third discourse instead indicates the embeddedness of bio-hegemony as the benefits of Bt cotton were presented as a type of common sense, unquestioned and taken-for-granted knowledge.

Agricultural researchers presented the challenges of Bt cotton but in a way that portrayed the issues as manageable. This corresponds with their roles as organic intellectuals who use their credibility as experts to argue for the benefits of the technology while simultaneously functioning as mediators in the struggle by being sensitive to the ideas of the opposition. In addition to the portrayal of farmers as victims and rational agents, I identified a third portrayal of farmers as partly responsible for the pink bollworm issue due to failure to abide to guidelines for cultivation. I interpreted this portrayal of non-abiding farmers as a way of explaining the shortcomings of the technology within the boundaries of bio-hegemony as it simultaneously admits to an existing problem while framing this problem as manageable. Therefore, even though the portrayal of farmers as non-abiding does not match the ideal type pro-GM discourse it still works to maintain bio-hegemony.

7.2 A Counter-Hegemony?

In the hegemonic order of GM-discourses in India, I have previously argued that the anti-GM discourse is subordinate to the hegemonic pro-GM discourse. The anti-GM discourse may be considered a counter-hegemonic discourse as counter-hegemony refers to the creation of an alternative hegemony looking to replace the current (Pratt, 2004, p. 332). In Gramscian terms, the anti-GM discourse has the potential to

challenge the biotech bloc through a “war of positions”. According to Gramsci, a subordinate class can only become hegemonic if it manages to win support outside of its own class by also taking into account the interests of other classes and groups and build up a network of alliances (Simon, 2015, p. 27). A problem for the anti-GM discourse in challenging the hegemonic pro-GM discourse may lie in the inability of the discourse to move beyond the interests of its own group. There seems to be a tendency for those adhering to the anti-GM discourse, often anti-GM NGOs, to direct their discourse towards a global or at least globalized upper middle class audience (Bownas, 2016, p. 82). As discussed in chapter 5, the idea of the existence of an inherent wish within the farming community to go back to traditional agricultural practices seems to be a part of the anti-GM discourse but may in fact be a reflection of an urban cultural bias (Herring, 2009, p. 19) entailing a romanticization of agricultural life (Omvedt, 2005, p. 193).

In addition to an urban bias, the discourses of NGOs like CSA (Centre for Sustainable Agriculture) arguably offer a Western bias in the Indian GM-debate and key participants on the anti-GM side, such as Vandana Shiva, are primarily participating in a GM-debate directed towards audiences in the West. Herring (2009) argues that since anti-GM activists in India have a class interest in being connected to a global anti-GM network, they favor a reproduction of already existing transnational GM discourses and neglect the perspectives of farmers. Even though both organic and GM agriculture offer farmers a foreign technology (Flachs, 2016b, p. 51), the pro-GM side seems successful in promoting the association between the anti-GM side and Western neo-colonization by integrating it into the discourse. This is exemplified through the way the representative of the pro-industry farmers’ association CIFA (Consortium of Indian Farmers Association) during the interview mentioned how people from the West, such as Prince Charles, are trying to deny India the right to use the GM technology. The situation, which the CIFA representative referred to, was the famous statement in an article from 1999 made by Prince Charles entitled *My 10 Fears for GM Food* (Cook, 2004, p. 19).

Another problem for the anti-GM discourse’s potential to challenge the discursive power of the bio-hegemony may be related to the diversity of the discourse. As I showed in the previously chapter, the anti-GM discourse is seemingly united in its

opposition towards GM crops but when taking a second look, the perspectives of the future do not seem to be in agreement. A prominent group in the discourse is the pro-organics, represented in this thesis by CSA. They believe in reviving the traditional desi varieties of cotton and, in addition, in pesticide-free agricultural practices. Another group, represented here by the scientist from CESS (Center for Economic and Social Studies), also believe in the revival of these varieties but does not necessarily insist on pesticide-free agricultural practices. A third and very unique perspective, was expressed by the professor from HCU (Hyderabad Central University) who is against genetic modification as it has been done in regards to Bt cotton and suggests instead a method based on Marker Assisted Selection (MAS)¹¹. If the discourse does not actually constitute a congruent discourse in itself, but rather is created solely as an opposition to GM, or even vaguer as an opposition to Monsanto, without a clear agenda of its own, does it have a realistic chance of challenging the hegemonic discourse?

Gottweis (1998, p. 264) argues that in order to dominate in the field of discursivity, a discourse needs to be unified through the construction and institution of certain nodal points and relational identities. The anti-GM discourse seems to be characterized by an overflow of meanings, which do not seem to be in conjunction. In the pro-GM discourse, even though the future is perceived differently, as discussed above, it is always framed within the biotechnology narrative. In contrast, the anti-GM side embraces a number of different perspectives regarding the future, which are all framed within an anti-GM narrative but not within a shared pro-narrative. This shortcoming of the anti-GM side has perhaps become particularly clear in the debate about the pink bollworm issue, as the discourse has been lacking a coherent framing of the future. Even though the counter-narrative of the anti-GM discourse contains critique and a deconstruction of the practices of biotechnology (Gottweis, 1998, p. 230), it does not offer a coherent alternative to these practices and does therefore only constitute a counter-hegemony without the ability to sufficiently challenge the hegemonic pro-GM discourse to the point of a war of positions. As Laclau and Mouffe (2001, p. 112) argue, “[a]ny discourse is constituted in an attempt to dominate the field of discursivity, [...], to construct a centre”, but if the discourse

¹¹ MAS is used in plant breeding programs and involves selection of traits of interest such as productivity or disease resistance from the gene pool of the plant. The gene is then transferred from one variety to another to create optimal plants for cultivation.

does not manage to fix itself on a center and construct a coherent meaning, the flow of differences will hinder the anti-GM side in mobilizing counter-hegemony.

7.3 The Three Pillars of Bio-Hegemony

In this thesis, I have focused on the aspect of discursive power. However, discursive power constitutes only one pillar of bio-hegemony because, as Newell (2009) argues, bio-hegemony rests on an additional two pillars of power: material and institutional power. Material power derives from and is expressed through control over agricultural production and technologies whereas institutional power derives from and is manifested in access to bureaucratic structures and decision-making procedures within the state institutions that have responsibility for governing agricultural biotechnology. Bt cotton was introduced in India to boost production of one of the main export products for the country. ICAR (Indian Council of Agricultural Research) and the GEAC (Genetic Engineering Appraisal Committee) both working under the Government of India played instrumental roles in carrying out the final approval of the GM crop. As Newell (2007) concludes, large companies such as Monsanto along with other industry actors have had significant material influence as well as institutional access, which allowed them to play an important role in evolving the initial regulatory regime of GM crops in India.

The situation has, however, changed remarkably in India since the initial introduction of Bt cotton in 2002. Mahyco Monsanto Biotech is no longer the only developer of Bt seeds in India. Today there are a myriad of different Bt cotton seeds on the market developed by Indian seed companies such as Nuziveedu Seeds Ltd. in Telangana and Rasi Seeds in Tamil Nadu. This may entail another challenge for the anti-GM side as a key feature of the anti-GM discourse has been to blame globalization of trade (Mayer, 2016, p. 47) personified through the agricultural biotechnology corporation Monsanto. Creation of counter-hegemony becomes additionally challenging when production is spread between several smaller biotech companies, as there will no longer be one single actor to mobilize against.

Furthermore, if the anti-GM side is to become hegemonic, it will not only need to dominate in the field of discursive power but it will also, and perhaps more importantly, need to secure a foothold within the arenas of material and institutional

power. Even though this may entail resorting to speculations, I argue that in order for this to happen, there needs to be an economic incentive for government and business coming from outside of India. Similarly, Newell (2007) argues that government support for the introduction of Bt cotton rested partly on the success of biotech companies in aligning their own commercial interests with national interests by demonstrating their strategic importance to the country's economy. As consumers in the West are becoming increasingly more aware of issues related to production of cotton fabrics, and more design houses are introducing organic cotton as part of their assortment, this may affect cotton cultivation in India, one of the largest exporters of cotton in the world. In Norway, chains such as Cubus, H&M and Dressmann have introduced clothing lines with 100% organic cotton as partners of the Better Cotton Initiative (BCI), which WWF India works on. The retailers emphasize on their webpages that this entails no use of GMO (Cubus, n.d.; Dressmann, n.d.; H&M, n.d.).

However, organic cotton produced in India has been under inspection due to concerns of the product containing traces of GMO, and organic cotton cultivation still only constitutes about 1% of cotton production in the country (Textile Network, 2017). Cotton farmers in the country generally have issues related to achieving organic certification, and without this cotton cannot be sold as organic or at organic cotton price levels. Moreover, the anti-GM stance of Europe since the 1980s may not continue to remain as sturdy. In April 2019, the Danish Council of Ethics, for example, released a new statement regarding genetically modified crops entitled *GMO and Ethics in a New Time*¹². The council recommends in this statement to change the laws for approving GMOs since the technology has improved enormously since its invention, and because it is now possible to produce GMOs, which may aid in reaching the Sustainable Development Goals (SDGs) (Det Ethiske Råd, 2019). These challenges make the idea of the majority of cotton production in India turning organic questionable as the organic side, in addition to lacking material and institutional power, lacks an economic incentive for farmers as well as governments.

The continued bio-hegemony of cotton production in India may have implications for other parts of the agricultural sector as well. As discussed above, both Bt brinjal

¹² Translated from the Danish title: “*GMO og Etik i en Ny Tid*”

(eggplant) and GM mustard have been suggested for approval for cultivation in India, but neither has so far been approved (Haq, 2018; Huda, 2018). According to the latest report from ISAAA (2017, p. 31), field trials of GM mustard in India confirm the potential of the crop in “revolutionizing mustard farming and edible oil production” in India. GM mustard is an Indian produced hybrid developed to increase domestic productivity of mustard as demand for edible oil in the country is increasing. In addition, the crop is herbicide tolerant. The anti-GM side, however, claims that GM mustard is not needed in India as production is already increasing, and the problem is not low production but rather over-production and lack of buyers (Ghosh, 2016). About Bt brinjal developed by Mahyco, the ISAAA (2017, p. 129) mentions that it has been concluded that the technology is profitable and cost-saving due to savings on insecticides and labor costs for spraying, and the report argues that refusing approval of Bt brinjal means denying 1.4 million smallholder farmers the benefits they would have enjoyed. However, though the crop has not received approval for cultivation in India, reports have been filed about Bt brinjal circulating fields in the country (Sushma, 2019).

Herring (2014) argues that whereas interests of state and farmers dominated the Bt cotton debate prior to introduction, the Bt brinjal debate has been dominated by concerns of risk. These concerns originate in concerns related to Bt cotton such as reports of livestock dying after ingesting Bt cotton plants and allergenic effects among farm laborers, especially cotton pickers. In addition, Herring (2014, p. 163) argues that the failure of the GEAC (Genetic Engineering Approval Committee) to detect and control the use of illegal GM cotton before introduction has created issues of trust of the regulatory system among the public. This shows how residues from the Bt cotton debate have come to dominate the discourse surrounding the public debate on Bt brinjal, which has contributed to the moratorium on the crop. Therefore, though the pink bollworm issue has not been sufficient in challenging the hegemony of the pro-GM discourse regarding cotton production in India, this could indicate that concerns in general related to cultivation of Bt cotton create an anti-discourse of GM crops in India which entails reluctance to repeat the Bt cotton story.

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Appendix

List of farmers from field visits to Kazipet, Jammikunta and Jangaon

| Farmers | Gender | Age | Landholding size | Landholding composition |
|-----------|--------|-----|------------------|---|
| Farmer 1 | Male | 35 | 4.5 hectares | 2 for cotton, 2 for paddy, 0.5 test plot |
| Farmer 2 | Male | 42 | 4.5 hectares | 2 for cotton, 1.5 for saffron, 0.5 for chili, 0.5 test plot |
| Farmer 3 | Male | 53 | 5 hectares | 2 for cotton, 2 for maize, 0.5 for chili, 0.5 for test plot |
| Farmer 4 | Male | 30 | 1.2 hectares | 0.4 for cotton, 0.8 for paddy |
| Farmer 5 | Male | 58 | 1 hectare | 0.5 for cotton, 0.5 for paddy |
| Farmer 6 | Male | 73 | Unknown | 0.8 for cotton, rest is unknown |
| Farmer 7 | Male | 49 | 1 hectare | 0.4 for cotton, rest is unknown |
| Farmer 8 | Male | 65 | 4 hectares | 0.8 for cotton, rest is paddy, maize, chili, tobacco and turmeric |
| Farmer 9 | Male | 45 | 2 hectares | 0.8 for cotton, 0.8 for paddy, 0.4 for chili |
| Farmer 10 | Male | 47 | 1.6 hectares | 1.2 for cotton, 0.4 for chili |