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# Evaluation of Bt Cotton Scenario in India

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***Abstract***

Bt cotton is a genetically modified crop that has been commercially cultivated in India since 2002. It was introduced with the promise of increasing yields and reducing the use of pesticides, which would lead to higher profits for farmers. However, the performance of Bt cotton in India has been a subject of controversy, with some studies claiming that it has not lived up to its promises. This article evaluates the Bt cotton scenario in India by analysing its performance in terms of yield, profitability, and sustainability, and examining the socio-economic impacts on farmers and the environment. The article concludes that while Bt cotton has had some positive impacts, there are also several challenges that need to be addressed to ensure the long-term sustainability of cotton farming in India.

## Introduction

Cotton is an important cash crop in India, providing livelihoods to millions of farmers. However, cotton farming is plagued by several challenges, including pest attacks and low yields. In 2002, Bt cotton, a genetically modified crop that is resistant to bollworms, was introduced in India with the promise of increasing yields and reducing the use of pesticides, which would lead to higher profits for farmers. Since then, Bt cotton has become the dominant variety of cotton in India, with over 90% of cotton farmers cultivating it. However, the performance of Bt cotton has been a subject of controversy, with some studies claiming that it has not lived up to its promises. This article evaluates the Bt cotton scenario in India by analyzing its performance in terms of yield, profitability, and sustainability, and examining the socio-economic impacts on farmers and the environment.

## Performance of Bt Cotton in India

Bt cotton has had some positive impacts on cotton farming in India. Studies have shown that Bt cotton has led to a significant increase in yields, ranging from 10% to 45% (Singh et al., 2017). This increase in yields has resulted in higher profits for farmers, as they are able to sell more cotton

at a higher price. Moreover, Bt cotton has reduced the use of pesticides, which has led to lower input costs for farmers and reduced exposure to harmful chemicals (Qaim & Kouser, 2013).

However, the performance of Bt cotton is not uniform across all regions and farmers. In some regions, Bt cotton has not performed as well as expected, with yields remaining stagnant or even decreasing over time (Dev & Rao, 2019). Moreover, the high cost of Bt cotton seeds has resulted in indebtedness among farmers, who are forced to borrow money to purchase seeds (Gruère et al., 2008). This has led to a vicious cycle of debt and poverty, with farmers unable to break free from their reliance on expensive inputs.

**Socio-economic Impacts**

The introduction of Bt cotton has had significant socio-economic impacts on farmers in India. On the one hand, Bt cotton has led to higher profits for some farmers, particularly those who have been able to achieve high yields. On the other hand, the high cost of Bt cotton seeds has resulted in a widening gap between rich and poor farmers, with small and marginal farmers unable to afford the expensive seeds (Dev & Rao, 2019). Moreover, the high cost of Bt cotton seeds has led to the emergence of a seed market dominated by a few multinational corporations, which has reduced the diversity of seeds available to farmers (Gruère et al., 2008).

**Environmental Impacts**

Bt cotton has also had environmental impacts, both positive and negative. On the positive side, the reduced use of pesticides has led to a decrease in the contamination of soil and water with harmful chemicals (Qaim & Kouser, 2013). On the negative side, the monoculture of B Conclusion: In conclusion, the Bt cotton scenario in India has had both positive and negative impacts on cotton farming. While Bt cotton has led to an increase in yields and a reduction in pesticide use, it has also resulted in a widening gap between rich and poor farmers and a decrease in the diversity of seeds available. Additionally, the performance of Bt cotton is not uniform across all regions and farmers, with some experiencing stagnant or decreasing yields. It is therefore important to address these challenges to ensure the long-term sustainability of cotton farming in India.

One way to address these challenges is to promote the use of sustainable farming practices, such as crop rotation and integrated pest management, which can reduce the reliance on expensive inputs like Bt cotton seeds. Additionally, there is a need for policies that promote the development and dissemination of affordable and diverse seed varieties, which can help small and marginal farmers to improve their yields and profitability.

Overall, the evaluation of the Bt cotton scenario in India highlights the need for a holistic approach to agriculture that takes into account the social, economic, and environmental dimensions of farming. By promoting sustainable practices and policies, it is possible to ensure that cotton farming in India is not only profitable but also equitable and environmentally sustainable.

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