

# Visual Guide to GM Crops in India

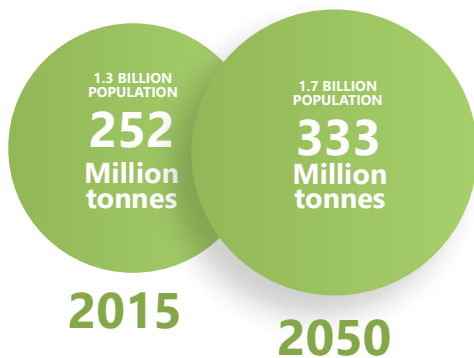
## Introduction

In this booklet we explore how policies on Genetically Modified (GM) crops impact farmers in India.

While navigating the sharp divide regarding GM crops, Centre for Civil Society seeks to solve pressing obstacles facing India's agricultural system.

## Quick Numbers

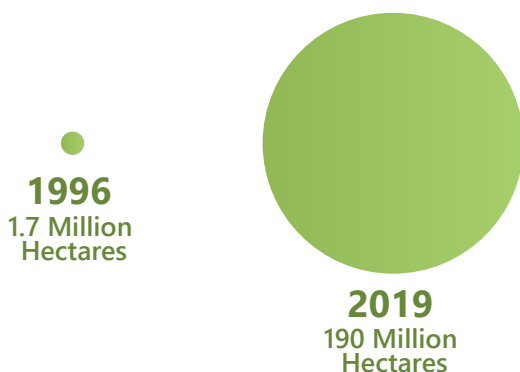
India's need for domestic food production



## Global Hunger Index 2020 Rankings



## The Global Rise of GM Crops



## GMO

Organisms in which the genetic material (DNA) has been **altered** in a way that **does not occur naturally by mating** or natural recombination (Plan and Eede 2010).

*GMO ≠ Cross Breeding*

## From the Beginning...

**1994**

### FIRST GM CROP INTRODUCED

Named 'Flavr Savr Tomato' to slow down ripening by Calgene, later acquired by Monsanto

**1995**

### BT COTTON INTRODUCED IN INDIA

Maharashtra based Mahyco gained permission to import Bt material from Monsanto

**2000**

### TECHNICAL GO AHEAD TO BT COTTON

The Review Committee on Genetic Manipulation (RCGM) gave the technical go-ahead to Bt Cotton

**2001**

### COMMERCIAL APPROVAL DENIED

The Genetic Engineering Approval Committee (GEAC) denies commercial approval, requests Indian Council of Agricultural Research (ICAR) to step in & provide independent advice

**2002**

### APPROVED FOR COMMERCIAL RELEASE

GEAC approved commercial release for an initial 3 year trial period in 6 cotton growing states

**2009**

### BT BRINJAL COMMERCIALY APPROVED

First ever GM food crop to be commercially approved in India. Developed by Mahyco & Monsanto

**2010**

### INDEFINITE PROHIBITION ON BT BRINJAL

MoEFCC in 2010 indefinitely put a moratorium on Bt Brinjal after public consultations

**2011**

### MANDATE TO OBTAIN NOC FROM STATE GOVTS

GEAC makes it mandatory for applicants to obtain 'no objection certificates' from state governments prior to the field trials

**2014**

### 11 STATES REFUSE TO ISSUE NOC

Gujarat, along with 10 other states, refused to issue NOCs for field trials of GM food crops

**2017**

### RECOMMENDATION FOR APPROVAL OF GM MUSTARD

Developed by Dr. Deepak Pental & team, University of Delhi. Officially known as Dhara Mustard Hybrid-11 given technical clearance by GEAC

**2018**

### APPROVAL FOR GM MUSTARD HALTED

After facing opposition from the bee keeping industry, MoEF&CCC says they are "studying the issue with meticulous precision"

**2019**

### APPROVAL FOR FIELD TRIALS OF BT BRINJAL

GEAC approves field trials in 8 states during 2020-23, provided the state govts grant NOCs for the trials

# The Case of illegal Cultivation of GM Crops

Many biotech proponents indicated the illegal cultivation of GM crops as a signal of farmers' willingness to embrace GM technologies (Jayaraman 2001).

Nearly **50% of cotton** cultivated in Maharashtra in 2021 was expected to be **HtBt Cotton**

**GUJARAT, 2001**  
11,000 hectares of illegal GM cotton worth \$ 30 million discovered

Sales of **illegal HtBt cotton** have **doubled** during 2020-2021 from **3.5 million to 7.5 million**

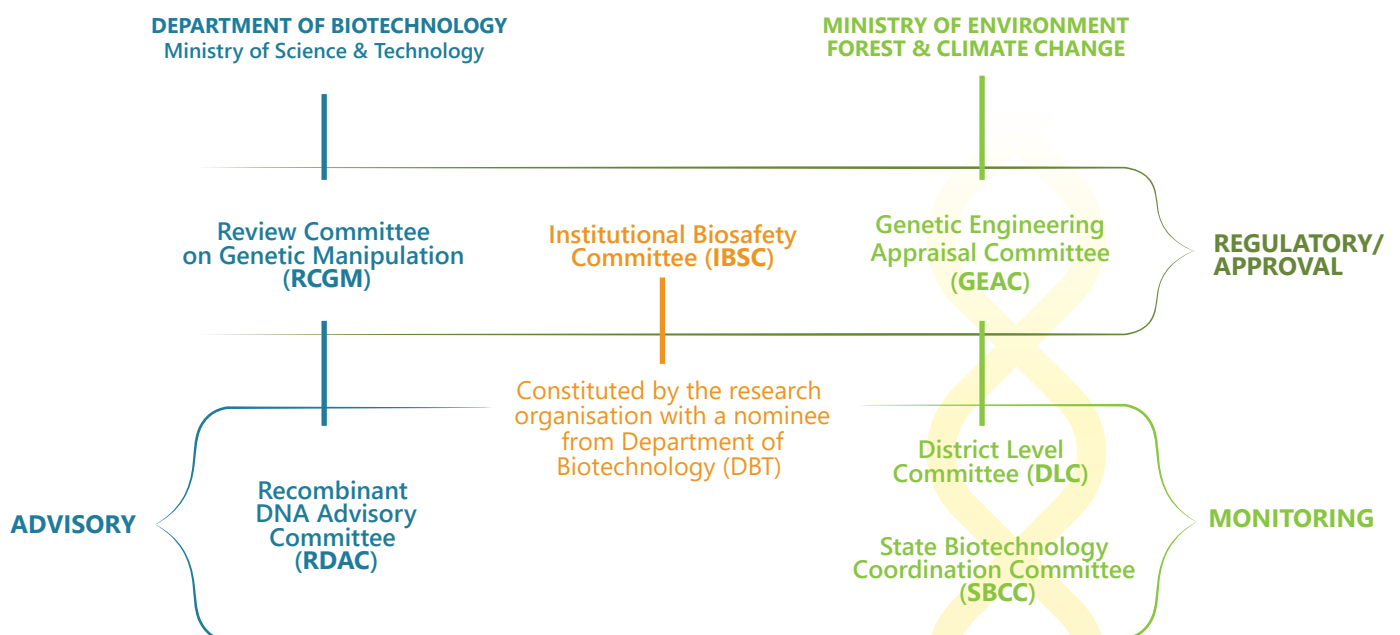
**15% of cotton farmers** in major cotton growing states had **switched to the HtBt variant in 2017** (Department of Biotechnology)

**AKOLA, 2019**  
**1,500 farmers** led by Shetkari Sanghatana, a **pro-GM farmers union** gathered to plant illegal GM crops such as HtBt cotton & Bt Brinjal in protest of the regulatory logjam

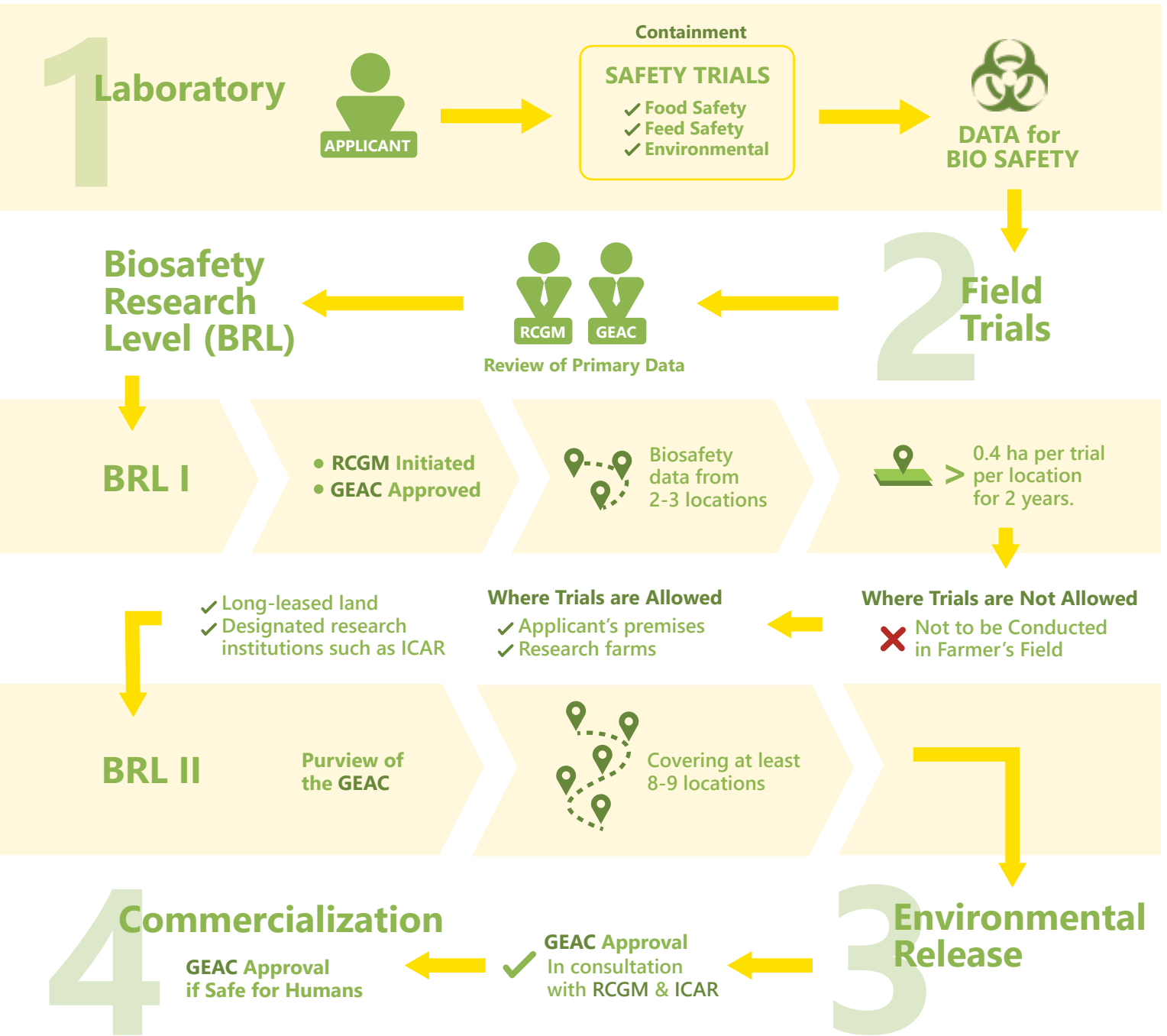
## Regulatory Set-Up of GM Crop in India

In India, genetically modified organisms (GMOs) are broadly regulated under *Rules for the manufacture, use, import, export & storage of hazardous microorganisms, genetically engineered organisms or cells, 1989* notified under the Environment Protection Act, 1986 (EPA, 1986).

### 6 AUTHORITIES IMPLEMENT THE 1989 RULE



# Approval Process of a GM Crop

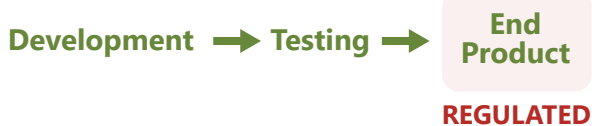


## Product versus Process

Regimes across the world either treat GMOs as a 'Product' or a 'Process' before creating a regulatory set up

### GMO AS PRODUCT

Examples: US, Argentina, Canada



### GMO AS PROCESS

Examples: India, Brazil, China



# BT Cotton in India

## BT - *Bacillus Thuringiensis*

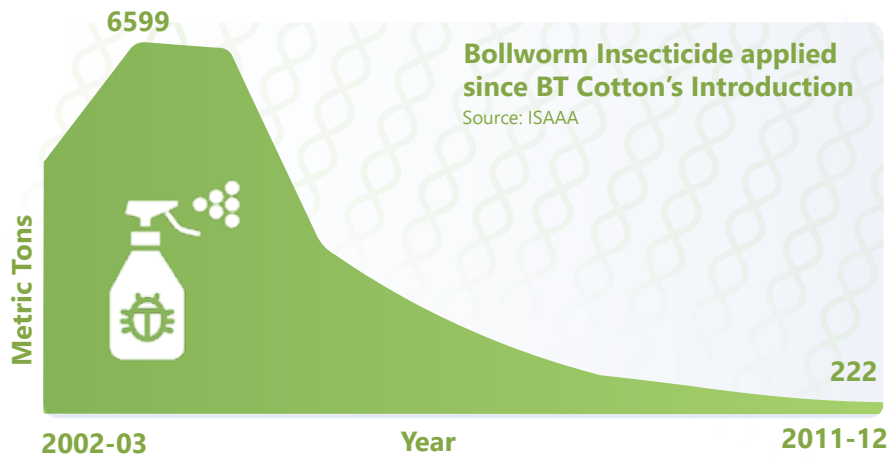
Since its introduction in 2002, Bt Cotton saw a rapid upward trajectory in terms of adoption.

### 7/8 Million Cotton Farmers have adopted BT Cotton in India



(Raman 2017; Directorate of Economics and Statistics 2019)

India makes up 6% of global acreage under GM crops,  
Ranks 5th in GM cropland, behind the USA, Brazil, Argentina, and Canada.



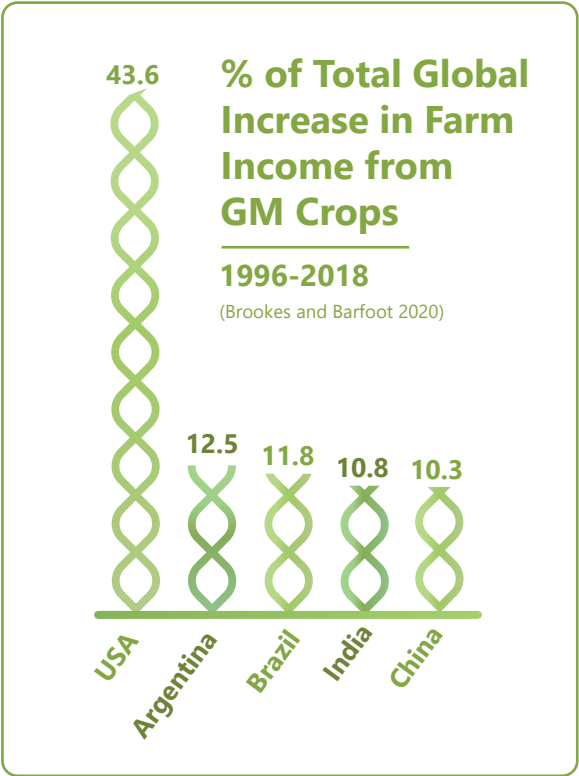
...nevertheless,  
the impacts have been a matter of **intense debate**, and the conclusions from either side are often used as an indication to either **adopt or reject** GM technologies

## Words Matter

It is interesting to note how...

**GEAC** changed its name from Genetic Engineering **Approval** Committee to Genetic Engineering **Appraisal** Committee in 2010.

The **1989 Rule** on GMOs by default regards GMO as **Hazardous** (...*hazardous microorganisms of genetically engineered organisms...*).



# Concerns to be Addressed

### Gridlock of Bureaucracy

The ever growing, micromanaging bureaucracy of GM crops in India hinders economic growth.

### Decoupling of Politics & Science

Vested interests influencing government policies for the sake of vote bank.

### Monopolization of Seeds through Stringent IP

Notable GMO critics argue about the lack of autonomy for the farmer when only a few corporations have IP rights over seeds.



A-69, Hauz Khas, New Delhi - 110016

Tel: +91 11 2653 7456 | Website: [www.ccs.in](http://www.ccs.in) | Email: [ccs@ccs.in](mailto:ccs@ccs.in)