Analysing the concerns and likely impact of adopting GM crops in India

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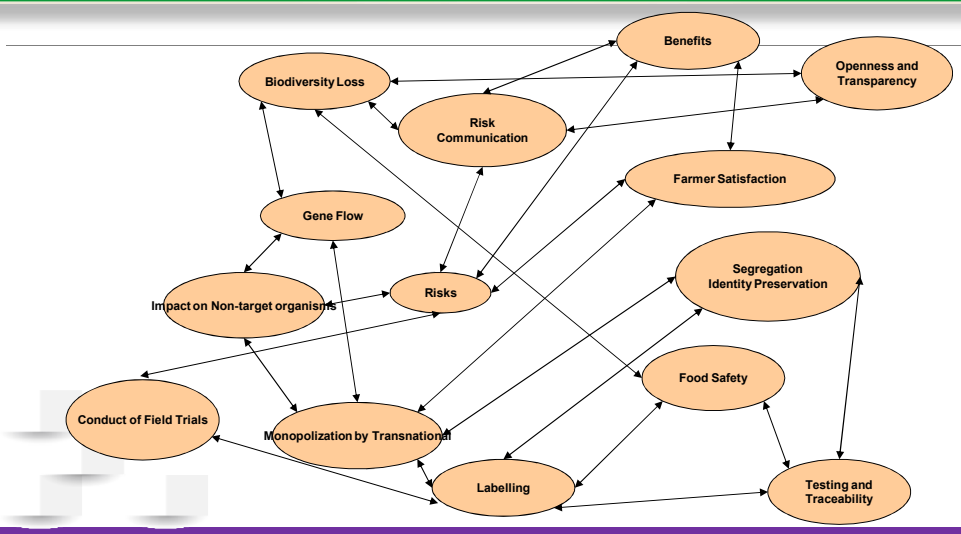
GM crops in India: Concerns by stakeholders

- Subject of debate at various levels
- Parliamentary Committee Reports
- Decision documents by regulatory agencies
- Legal cases in Supreme Court
- Media Reports

Issues and concerns raised

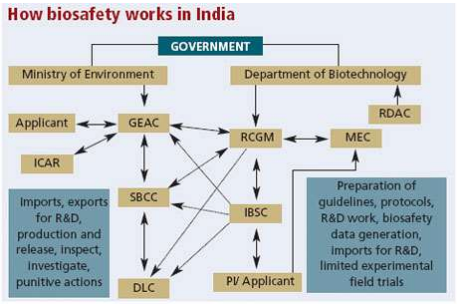


Biosafety and ethical concerns

- **Scientific**
  - Potential harm to human health; Risk of introducing toxins, allergens and other anti-nutrition factors in foods.
  - Potential damage to the environment;
    - Potential likelihood of transgenes escaping from cultivated crops into wild relatives
    - Changes in weediness potential
    - Interaction with non-target organisms
    - Resistance/tolerance of target organisms

Addressing scientific concerns

- Internationally accepted safety assessment methodologies for GM crops
- Rigorous data requirements for pre-market safety assessment
- Review of data by experts and regulators



OECD

Convention on Biological Diversity

CODEX ALIMENTARIUS International Food Standards

World Health Organization

Food and Agriculture Organization of the United Nations

Addressing non-scientific concerns

- Based on apprehensions
- Not unique to GM crops but applicable to agriculture in general

Impact of polarized debates: Delay in approval of GM crops

- Bt cotton – Approved in 2002
- High adoption rates, >95% under Bt-cotton cultivation.
- Benefits include:
  - ✓ Tripled Cotton production (13 million bales in 2003 to 37.1 million bales in 2021, Yield gain-31%)
  - ✓ Reduced Insecticide sprays (Usage decreased by 39%)
  - ✓ Increased production of Cotton seed, and its byproducts -oil and meal (0.46 million tons in 2002-03 to 1.5 million tons in 2014-15)
- Despite highly successful experience, no further approvals

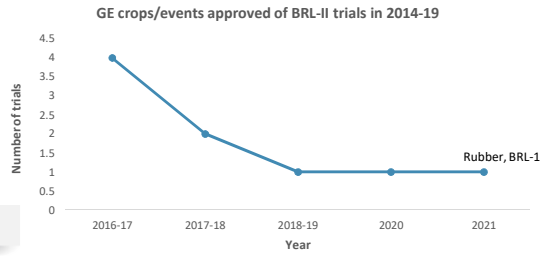
Impact of polarized debates: Delay in approval of GM crops

- Bt brinjal moratorium, but being grown and consumed in Bangladesh
- GM mustard on hold despite urgent need to increase productivity
- Illegal cultivation of HT cotton in large acreage being reported

International Soy Conclave 2021 October 9-10, 2021

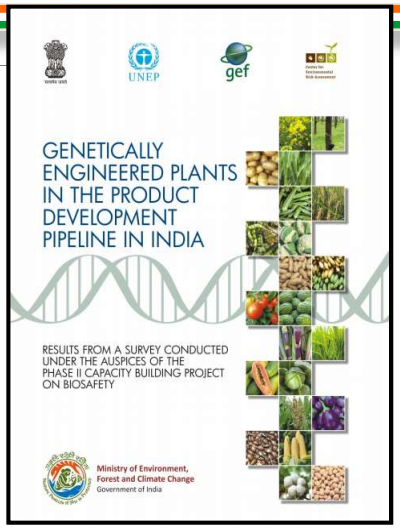
Impact of polarized debates: Number of field trials reduced

- Number of trials significantly reduced
- No trial conducted in last three years
- Requirement of NOC from states
- Data requirement increased significantly



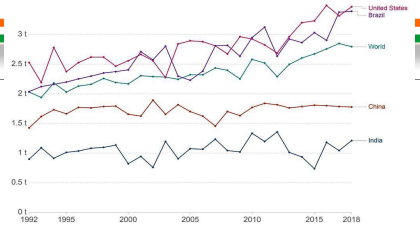
Impact of polarized debates: Limited research

- Research activities reduced significantly
- Several project terminated
- Students not interested in agricultural biotechnology

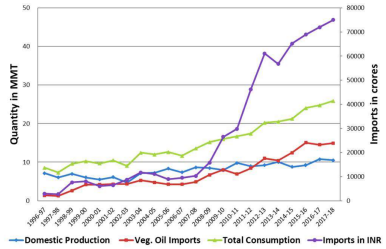


Impact of polarized debates: Stagnation in production and increase in prices

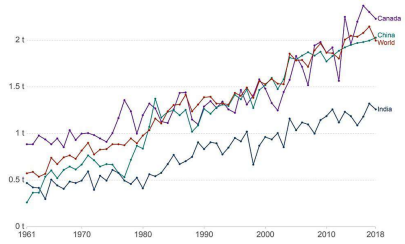
- Stagnation in production
- Increase in prices
- Increase in Imports



Soybean yields (tonnes/ hectare), 1961-2018



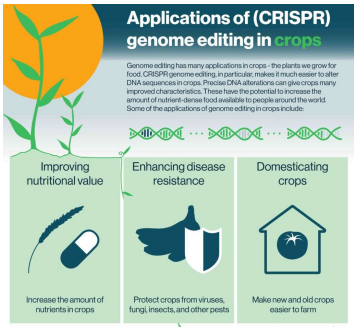
Domestic production and imports of vegetable oils



Rapeseed/Mustard yields (tonnes/ hectare), 1961-2018

Innovative technologies for addressing challenges in agriculture

- Increased Food Security to counter hunger in post-pandemic era
- Nutritional enhancements to address malnutrition
- Resilience to climate change
- Resistance to abiotic and biotic stresses

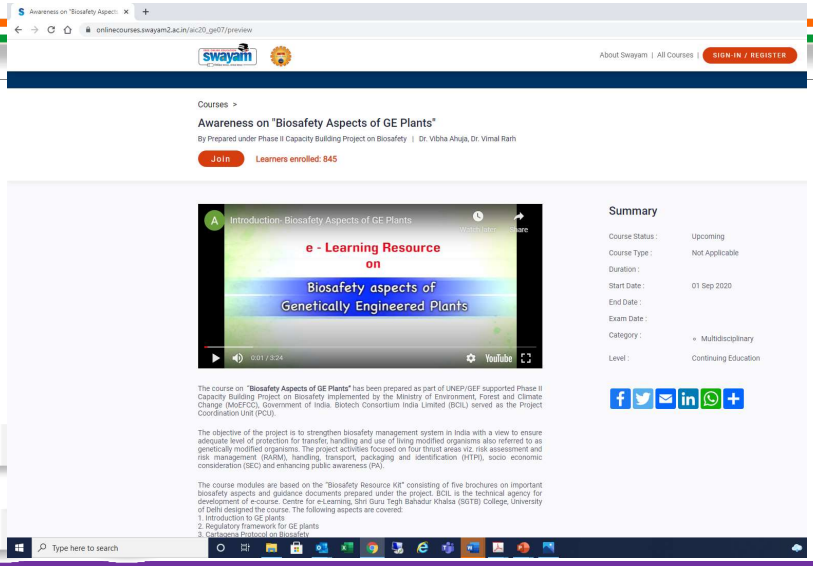


Way forward for GM Crops

- Urgent approval for field testing and cultivation
- Consideration of processed products as non-LMOs
- Enhancing investments in research
- Enabling environment required to make use of advances in technologies such as new plant breeding techniques

Know more about GM crops

E-course on "Biosafety Aspects of Genetically Engineered (GE) Plants" at SWAYAM Portal



Thank you for your attention!