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Q. Discuss the advantages and challenges/ concerns related to GM crops in India.
(150 words)

21 Jan, 2019 GS Paper 3 Science & Technology

Approach:

- Discuss the current status of GM crop production in India.
- List the advantages.
- State the concerns and challenges associated with GM crop production.
- Suggest ways in which advantages and challenges can be balanced in the society.

Introduction

- “Genetic modification” or “genetically modified” short for GM involves altering the genes of an organism, be it a plant, animal or microorganism. This can be done by altering an existing section of DNA, or inserting a gene from another organism.
- The transgene can help genetically modified plant to withstand pesticides, climate change, can help in faster and better growth.
- The approval of any new genetically modified crop is given on a case to case basis after thorough scientific evaluation of health and environment safety as per applicable guidelines made under Environment (Protection) Act, 1986 and Rules, 1989.
- Many GM varieties are believed to be under different stages of development, but yet to mark a formal release. GM Mustard is the new GM crop in the block that is doing the rounds of constant speculation and has been cleared by the Genetic Engineering Approval Committee (GEAC), the biotech regulator in India under the Ministry of environment and forests with no such biosafety or public health concerns.
- As per report of International Service for the Acquisition of Agri-biotech Applications, 2018, India ranks 5th in global cultivation of GM crops. Bt. cotton is the only GM crop approved for commercial cultivation in the Country which has incorporated genes from the *Bacillus thuringiensis* or Bt soil bacterium coding for resistance against heliothis bollworm insect pests.

Body

Advantages of GM crops

- GM crops provide stronger resistance to diseases, pest, insects and herbicides along with higher tolerance to cold/heat, drought and salinity.
- This can contribute to ensuring food security for the increasing population in the higher risks of climate change.
- GM crops can offer better income opportunities to the farmers by minimising the risks and costs of pesticides.

- The nutritional content of the crops can be altered as well, providing a denser nutritional profile. For ex: The UN Food and Agricultural Organization notes that rice, genetically modified to produce high levels of Vitamin A, have helped to reduce global vitamin deficiencies.

Challenges

- The impact of growing GMO crops like GM mustard on the health of the population, the environment (the soil on which it is grown), the food chain, the groundwater, etc., is still unknown.
- GMOs carry risks of 'unintended' effects and toxicity due to changes made at genetic level which would be irreversible
- Weeds are the wild plants that soak up nutrients from the soil and do not allow crops to absorb the nutrients.
- GMOs can pose significant allergy risks. Genetic enhancements often combine proteins not contained in the original organism, which can cause allergic reactions for humans.
- GMOs also carry risk of affecting the biodiversity by compromising the gene pool of wild varieties of crops.
- GMOs also carry the financial burden for producers as seeds have to be bought new from the GM crop companies for every crop.
- They also carry ethical concerns like violation of natural organisms' intrinsic values, tampering with nature by mixing genes among species.

Conclusion:

- Even though GM crops hold the hope for future in view of climate change, food security, poverty, hunger, malnutrition etc. they are still riddled with concerns regarding their impact on environment and human health which needs a pragmatic policy initiative, research and controlled trials to allay public fears.
- India also needs to put in place a proper mechanism for research, field trials and clearance of GM crops to reap their potential benefits for future without getting caught in political quagmire.