Date – 19 September 2022

India's broken rice export ban.

Prelims: Indian economy and Indian social development

Mains: GS paper III: Indian Economy and issues relating to planning, mobilization of resources, growth, development, and employment, major crop pattern In India.

Why in news?

- The ruling government of India, not more than 4 months ago put banned the export of wheat from India, because of unexpected crop failure resulting in low procurement and a decrease in public stocks. . Concerns over a similar situation arising have now led it to impose curbs, albeit not an outright ban, on rice shipments as well

what are the restriction

- India exports four categories of Rice, and out of those, two of them –basmati rice and parboiled non-basmati rice – are openly allowed.
- The restriction is only for the other two: raw(white), and broken non-basmati rice.
- Recently, the Revenue Department to the Ministry of Finance informed the slapping of 20% duty export on rice " other than the parboiled and basmati rice " which was supposed to come into effect from Sept 9.
- It will include all the raw non-basmati rice shipments, whether full or broken grains.
- Another notification of the Directorate General of Foreign Trade in the Ministry of Commerce and Industry puts a blanket ban on broken rice export.
- It concludes that only nonbroken basmati of full-grained will be allowed for export on payment of 20% duty
- The restrictions noticed will come into effect just under half of India's rice exports in terms of quantity and over a third by value.

Why these bans?

There are prime reasons :

- **The 1st is** the significant decline of India's rice production due to the deficient monsoon rainfall in the northern states of India, like Uttar Pradesh, Bihar, Jharkhand, and Gegatic West Bengal.
- The 2nd reason is It the production of rice in Punjab and Haryana also affected the virus that has caused the **"dwarfing" of paddy plants** in many fields there.
- The 3rd reason is during current the Kharif season some of the farmers have planted the lower–yielding shorter duration varieties, which is bound to reflect the output.
- The 4th reason is, that rice export is being restricted, as to sustain the public duration system with the low public wheat.
- Broken rice can be used to boost India's ethanol production.

What are Parboiled rice and broken rice?

- The type of rice that is obtained, from the milling of paddy grains produced by farmers. In general, paddy has 20-20% husk and 10-11% bran. Remnant of the husk and bran white raw rice that contains 68-69% of paddy. The milled rice at the end has both whole grains and broken grains.
- The paddy with its outer husk is soaked in water, steamed, and dried, hence the rice becomes harder and breakage during milling is called parboiled rice.
- India exports parboiled rice which contains 5-15% broken grains. In raw rice, it is about 25%.
- Rice which is 100% broken exports have been prohibited.

Rice export in India

- According to the data, last year more than 70% of basmati has been exported to Iran and Arabian countries,
- Some more percent were being added to it by the countries like UK, USA, Canada, Australia.
- Almost 55% of non-basmati rice has been exported to African countries. Including countries of south America like Cameroon, Djibouti, Guinea, Madagascar, Somalia Benin, Ivory Coast, Senegal, Togo, and Liberia.
- Most exports to Africa and Bangladesh consist of parboiled rice, while China imports broken rice that has now been banned.

What is promising about the selective ban on rice exports?

- The central government of India has determined to make sure the availability of broken rice for various industrial uses and for its own poultry.
- The Eastern countries depend upon Indian cheap rice, mainly for feed purposes depend. so the Rice shipment to the nations in the East has been restricted.
- The central government of India's indirect message for these countries is to import corn from us.

- Saving the domestic stocks of food grains in a country like India holding a large population is very essential at a time of fears of a global food crisis precipitated by fertilizer shortages and droughts.
- This will help the producer to stand a benefit with corn prices ruling at ₹22,000-23,000 a ton.

What are the criticisms against this government move?

There is fear that the restrictions,

- can affect the supplies in a negative way when the demand will increase in hr global market for Indian rice.
- Bring shortage to the global food.
- Surplus the inflation in the poor countries.

What is the way ahead?

- 1st is to reduce export prices can be announced to intercept any under-invoicing.
- 2nd, There should be periodic checks to make sure premium non-Basmati and other types of rice are not get shipped as Basmati rice to avoid the 20% tax by hawala traders.
- The 3rd , will be to ensure that other types of rice are not mixed with Basmati and shipped out to evade the tax. In both these cases, there is a lurking danger of *hawala* traders operating through this channel.

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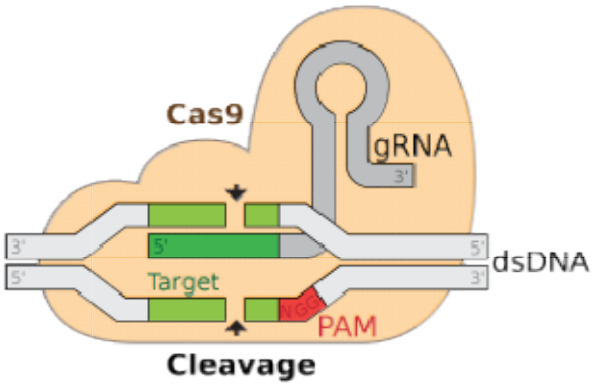
CRISPR: beginning to deliver

Prelims: the importance of national and international relation

Mains: GS paper III, IT and space field awareness.

Why is it in the news?



- For the last 3 years, the gene–editing technology also known as CRISPR (Clustered regularly interspaced short palindromic repeats), with about unlimited abilities has produced flawless results in Clinical Trials.
- India permitted a 5-year Project to develop CRISPR to eradicate, sickle cell anemia.

What is genome editing?

- These are a kind of DNA editing technology.
- By using genome editing technologies, scientists can change DNA, change the physical features of eye colour, and reduce the disease risk.
- These technologies work like scissors, they cut the DNA in a particular spot, and after that scientists can add or remove, or can replace the DNA, where it was cut.
- During the late 1900s CRISPR technologies were developed around the world.s.

CRISPR technology?

- CRISPR (Clustered regularly interspaced short palindromic repeats) is a new genome editing tool developed in 2009.
- After the development of the CRISPR tool, it becomes easier to work with DNA than before.
- **Advantages of CRISPR:** It is simpler, faster, low cost, and has more accuracy than the earlier invented editing tools.

- It is a kind of unique technology, by which geneticists and medicine researchers edit the parts of the genome adding or altering portions of the DNA in living organisms of DNA sequence
- It is made of two molecules that introduced the change in DNA

What is CRISPR-Cas9?

- They are kind of an enzyme named Cas9.
- It works as a pair of "molecular scissors ", which can cut the two strands of DNA at a particular location in the genome so that bits of DNA can alter.
- A small piece of RNA is known as RNA (gRNA).
- It is made of a small piece of pre-designed RNA sequence (about 20 bases long) located in a longer RNA scaffold.
- The scaffold part binds to DNA and the pre-designed sequence 'guides' Cas9 to the right part of the genome
- This ensures that the Cas9 enzyme cuts the DNA at the correct point in the genome.
- Scientists can use DNA repair machinery to introduce changes to one or more genes. in the genome of a cell of interest.
- The guide RNA is structured in a way to locate and find the binds to a specific sequence in the DNA.
- The guide RNA has the RNA bases that complement that targeted DNA sequence in the genome.
- The Cas9 follows the guide RNA to the exact location, in the DNA sequence and makes a cut across both strands of the DNA.

- In this stage, the cell recognizes the damaged DNA and then tries to repair it.

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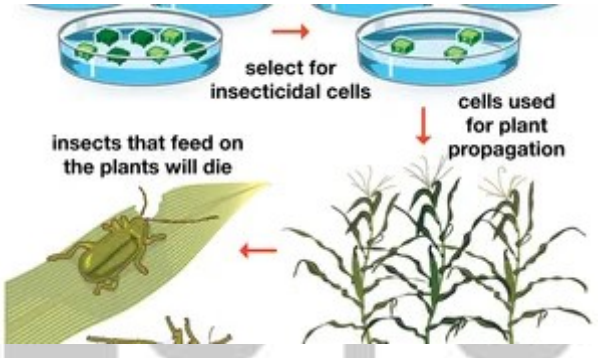
Genentically modified plants

What are genetically modified plants and how are they modified?



- These are kinds of living organisms, whose genetic material has been artificially changed in a laboratory through genetic engineering, in a way to favour the expression of desired physiological traits or the creation of wished biological products.
- This is created by the combinations of plants, animals, bacteria, and virus genes that generally do not occur in nature or by traditional cross-breeding methods.
- Most GMOs are designed to withstand the direct application of herbicide or to produce an insecticide.
- Nevertheless, some new technologies are now used to create artificial traits in plants, for example, to resist the browning in apples, and to make new organisms using biology.

- These are a kind of plant, in which the DNAs are modified by genetic engineering for embedding a new trait in the plants which do not happen naturally in the species.
- The purpose of genetic engineering is to transcend the genus barriers by inserting an alien gene in the seed to achieve the desired effect and the alien gene could be from a plant, animal, or even a soil bacterium.
- A few genetically modified variants of maize, canola, soybean, etc are available.

GM crops in India:

- The only GM crop that is allowed in India since 2002, is BT cotton, which has two foreign genes from the soil, *Bacterium Bacillus thuringiensis* (**Bt**), that allows the crop to build a protein toxic to the common pest *pink bollworm* and another one is Ht Bt which is obtained by the insertion of an additional gene, from another soil bacterium, it permits the plants to resist the common herbicide glyphosate.
- In Bt Brinjal, a gene allows the plant to withstand the attacks of fruit and shoot borers.

- Earlier to this, the government of India restricted the commercial release of genetically modified mustard due to very strong opposition from anti-GMO activists and NGOs.

The legal status of GM crops in India

- The Genetic Engineering Appraisal Committee (GEAC), is the supreme body in India, that checks the commercial release of GM crops under the aegis of the Ministry of Environment, Forest and Climate Change (MoEF&CC).
- This committee is responsible for the growing activities which involve the use of large-scale involvement of hazardous microorganisms and recombinants in research and from the environmental perspective.
- It is also responsible for increasing proposals for releasing genetically engineered (GE) organisms and products into the environment, including experimental field trials.
- It also takes care of the increase in uses of the unapproved GM variant, which can lead to an imprisonment of 5 years and a fine of 1 lakh fine under the Environment Protection Act, 1989

Issue related to the Genetically Modified Crops

Agriculture Genetic Modification conflict: there are possibilities of getting some undesired consequential effect like the resulting food can have an allergic reaction.

- A study by Karolinska Institute Sweden and another study of Biopharmaceutical Company Novartis, have pointed out that the CRISPR-Cas9-modified cells can trigger cancer.

The Germline Modification: in this modification process, the gene which is too passed on to the children and future generations is intentionally changed- in a way to create genetically modified people.

- It is the most correct righteous debate related to genome editing centers about human germline modification. This is so because it made the germline can transfer to the future generation also.
- For both safety and social reasons, Human germline modifications have not been considered appropriate for many years.

Genetic Inequality:

- The wealthy families of the society will be able to buy the latest upgraded offspring for their children. consequently, it will bring genetic inequality, and even it will be a greater inequality than the present world already has.
- Many key scientists in this field, have arisen concerns about the misuse of possible misuse of the technology, which can be used for eugenics, to build genetic discrimination.

Regulation of Imported Crops:

- Initially, the Genetic Engineering Appraisal Committee (GEAC) was responsible for regulating the GMO levels in imported consumables, under the Union environment ministry.
- Later, the role of the committee was mitigated with the enactment of the Food Safety and Standard Act, 2006, and the Food Safety and Standards Authority of India (FSSAI) was allotted to check imported goods.

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