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## **{Agri – GM Crops – 19/06/11} Genetically Modified Organism (Transgenic Organism)**

Environment | Agriculture > [Sustainable Agriculture](#) | Science and Tech > New tech and its applications

- In GMO, **genetic material (DNA) is altered or artificially introduced** using genetic engineering techniques.
- Genetic modification involves the **mutation, insertion, or deletion of genes**.
- Inserted genes usually come from a different organism (e.g. In Bt cotton, Bt genes from bacterium **Bacillus thuringiensis** are induced).
- Genetic modification is done to induce a desirable **new trait** which does not occur naturally in the species.

### **GM techniques are used in:**

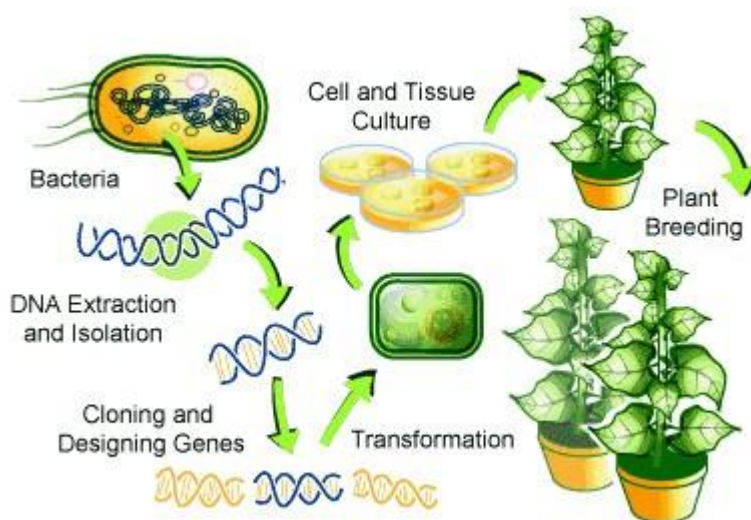
- Biological and medical research,
- Production of pharmaceutical drugs,
- Experimental medicine (e.g. gene therapy),
- Agriculture (e.g. **golden rice**, Bt cotton etc.),
- Genetically modified bacteria to produce the **protein insulin**,

- To produce biofuels from some GM bacteria, etc.

## Genetically modified crops (GM Crops or Biotech Crops)

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- They are the plants used in agriculture, whose DNA has been modified to induce a desired **new trait**.
- A New trait might help in
  - ✓ Controlling certain pests, diseases, or environmental conditions,
  - ✓ reduction of spoilage,
  - ✓ inducing resistance to chemical treatments (e.g. resistance to an herbicide),
  - ✓ **improving the nutrient profile** of the crop,
  - ✓ atmospheric nitrogen fixation by cereal crops,
  - ✓ inducing tolerance to high salt soils and to flooding in crops,
  - ✓ inducing drought resistance in crops,
  - ✓ prolonging shelf life and commercial value of fruits and vegetables.



## Major GM Crops

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### Bt Cotton

- Bt cotton is insect-resistant cotton variety.
- Strains of the **bacterium Bacillus thuringiensis** produce different **Bt toxins**.
- Bt toxins are insecticidal to the larvae of moths, bollworms, etc. but are harmless to other forms of life.
- In 2002, a joint venture between Monsanto and Mahyco introduced Bt cotton to India.

### Advantages

- Increases yield of cotton due to effective control of three types of bollworms.

- Reduction in insecticide use in the cultivation of Bt cotton in which bollworms are major pests.
- Potential reduction in the cost of cultivation (depending on seed cost versus insecticide costs).

#### Problems with Bt Cotton

- High cost of Bt cotton seeds as compared to non Bt cotton seeds.
- Ineffective against sucking pests like whitefly.
- Whitefly attack has become rampant in Punjab, Haryana and elsewhere.
- The costs of Bt seed and insecticide increase the [risk of farmer bankruptcy in low-yield rain-fed settings](#).

#### Bt Brinjal

- Brinjal is India's second most consumed vegetable after potatoes.
- Bt brinjal is created by inserting a crystal protein gene from the soil bacterium *Bacillus thuringiensis*.
- The Bt brinjal has been developed to give resistance to the Brinjal Fruit and Shoot Borer (FSB).
- Mahyco has developed the Bt brinjal variety.
- Insecticide requirement for Bt brinjal is far less than its non-Bt counterpart for the control of FSB.
- The Genetic Engineering Appraisal Committee (GEAC) cleared Bt brinjal for commercialization in 2009.
- Following concerns raised by some scientists and anti-GMO activists, the GOI has imposed a moratorium on its commercial use (not a permanent ban).
- Mahyco's Bt brinjal is commercially grown in Bangladesh.

#### Golden rice

- Golden rice is a variety of rice (***Oryza sativa***) produced to biosynthesize **beta-carotene**, a precursor of **Vitamin A**, in the edible parts of rice.
- It is mostly consumed in areas with a shortage of dietary vitamin A.

#### Benefits of GMO

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##### Crops

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- Enhanced taste and quality.
- Reduced maturation time.
- Increased nutrients, yields, and stress tolerance.
- Improved resistance to disease, pests, and herbicides.
- New products and growing techniques.

## Animals

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- Increased resistance, productivity, hardness, and feed efficiency.
- Better yields of meat, eggs, and milk.
- Improved animal health and diagnostic methods.

## Environment

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- "Friendly" bioherbicides and bioinsecticides.
- Conservation of soil, water and energy.
- Bioprocessing for forestry products.
- Better natural waste management.

## Society

- Increased food security for growing population.

## Issues Surrounding GMO

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## Safety

- The adverse impacts of genetically modified food are not evident immediately.
- Potential human health impact: allergens, transfer of antibiotic resistance markers, unknown effects.
- Potential environmental impact: unintended transfer of transgenes through crosspollination, unknown effects on other organisms (e.g., soil microbes) and loss of flora and fauna biodiversity.
- **Criticism against Anti-GM lobby:** Instead of evaluating the risks, costs and benefits of hybrids on a case-by-case basis, they propose a blanket ban on genetic modification.

## Access and intellectual property

- Domination of world food production by a few companies.
- Increasing dependence on industrialized nations by developing countries.
- **Biopiracy** — foreign exploitation of natural resources.

### **Ethics**

- Violation of natural organisms' intrinsic values.
- Tampering with nature by mixing genes among species.
- Objections to transferring animal genes in plants and vice versa.

### **Labelling**

- Not mandatory in some countries (e.g. United States).
- Mixing GM crops with non-GM confounds labelling attempts.

### **Research**

- The **objectivity and authenticity** of scientific research and publication.

### **Effectiveness**

- The ineffectiveness of BT cotton against whitefly attack in Punjab and Haryana has raised more questions.

### **Issues with banning GM crops**

- The ban on GM crops is also promoting an illegal market to flourish in India.
- Bangladesh is reaping the benefits of Bt Brinjal while its cultivation is banned in India.

### **GMO have already entered the food chain**

- Cotton seed oil extracted from Bt cotton plants is being consumed in Gujarat and Maharashtra.
- Soybean oil is extracted from imported seeds, which are produced from GM crops abroad.

### **Illegal cultivation (Farmer's rights vs. Government Regulation)**

- A farmers' group in Maharashtra, marked its protest against the government ban on genetically modified (GM) crops by [planting Bt brinjal and HT cotton](#).
- There is a grave danger of illegal genetically modified brinjal cultivation proliferating.

## **{Agri – IPR – 19/05/01} Protection of Plant Varieties and Farmers' Rights Act, 2001**

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[Livemint](#) | 01-05-2019 | GS3: Awareness in the fields of IT, ..... and issues relating to IPR.

- PepsiCo India sued some farmers from Gujarat for unauthorised cultivation of its proprietary potato variety.
- PepsiCo's proprietary potato variety FC5 was registered under the **Protection of Plant Varieties and Farmers' Rights Act, 2001**.

### **Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPVFR)**

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- India has [ratified the Agreement on Trade Related Aspects of the Intellectual Property Rights](#) (TRIPS).
- PPVFR Act, 2001 has been enacted in India for giving effect to the TRIPS Agreement.
- After joining WTO in 1995, the choice before India was to either enact a law or to accept the plant breeders' rights given by the **International Union for Protection of New Plant Varieties (UPOV Convention)**.
- UPOV option was rejected because the current version of UPOV, which was adopted in 1991, **denies the farmers the freedom to re-use farm saved seeds and to exchange them with their neighbours**.

### **Objectives of the PPVFR Act**

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- Facilitate an effective system for protection of plant varieties and the rights of farmers.
- Encourage the development of new varieties of plants.
- Protect the rights of the farmers in respect of their contribution in conserving plant genetic resources.
- Facilitate the growth of the seed industry which will ensure the availability of high quality seeds.

### **Important provisions of PPVFR**

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- The act **allows farmers to plant, grow, exchange and sell patent-protected crops, including seeds, and only bars them from selling it as "branded seed"**.
- PepsiCo's FC-5 has been registered as an **Extant Variety** (the FC-5 was already available in the country before it was registered and that there was "common knowledge" about this variety in the country).
- Registration of extant varieties was allowed in the PPVFR so that **[farmers' varieties can be registered under this provision](#)**.

### **Criticism of PPVFR Act, 2001**

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- **Discourages research and innovation:** PPVFR Act allows farmers to use patented varieties and hence private companies are not keen to bring new technology.
- India neither invests in public nor respects private and foreign players' IPR = bad for business in the long run.

## Monsanto's case

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- In 2015 an Indian firm, one of the licensees of the U.S. company Monsanto's seeds in India, had petitioned in the court to **cancel Monsanto's patent over Bt cotton seeds**.
- Monsanto had lodged counter cases for **patent infringements** by Indian companies.
- Indian seed company had to pay a 'trait fee' **fixed by the government** to Monsanto to sell its GM seeds.
- The domestic company argued that the foreign player was not entitled to a 'trait fee' **[as the Indian Patent Law doesn't allow GM seeds any patent cover](#)**.
- In 2018, the Delhi high court had ruled Monsanto's patent over Bt cotton seeds as invalid.
- Deli HC reaffirmed that **items such as seeds, animals and plants cannot be patented under Indian laws**.
- 2019: **[SC overturned the HC judgement and allowed Monsanto to claim patent on its GM cotton seeds](#)**.
- Monsanto was earlier affected by the GOI cutting royalty on GM Bollgard 2 cotton seeds.

## Agriculture regulatory system in India is weak

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- Farming activities in developed countries are strictly regulated.
- Indian farmers are free spirited, and the patent laws and regulatory mechanism is weak.

## Examples

- Farmers in Maharashtra growing **illegal herbicide-tolerant cotton ([not yet approved in India](#))**.
- Farmers in Haryana growing **genetically modified brinjal (not yet approved in India for commercial use)**.
- Farmers in Gujarat have been cultivating GM cotton since before it was approved by the MoEF.
- Nuziveedu Seeds Ltd, one of the licensees of the U.S. company's seeds in India, wants to sell Monsanto's seeds but doesn't want to pay the royalties.

## Way forward

- The way to **reduce corporate dominance** over agriculture is by **increasing investments in public research, not by arm-twisting** or surrendering to farmer-friendly optics.

## About Trade Related Aspects of the Intellectual Property Rights (TRIPS)

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- TRIPS is an international agreement on intellectual property rights.
- The Agreement covers most forms of intellectual property including patents, copyright, trademarks, geographical indications, industrial designs, trade secrets, and **exclusionary rights over new plant varieties**.
- It came into force in 1995 and is **binding on all members of the World Trade Organization (WTO)**.

## **{Agri – Policy – 19/05/06} National Academy of Agricultural Research Management**

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[The Hindu](#) | 06-05-2019 | GS2 > Government policies and interventions for development in various sectors.

- According to Food and Agriculture organisation (FAO) of the UN, approximately **one third** of the food produced for human consumption gets wasted.
- The rotting food emits methane (Methane's Global Warming Potential is **21-22 times of CO<sub>2</sub>**).
- Methane produced from rotting food can be converted to combustible **bio gas** (CBG).
- Some enthusiasts are working on converting food waste into CBG under the aegis of NAARM.

### **National Academy of Agricultural Research Management (NAARM)**

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- The ICAR-NAARM was established by the ICAR in 1976 at **Hyderabad**.
- The major mandate of the NAARM is to build capacity in agricultural research, education and provide policy advocacy for the **National Agricultural Research and Education System** (NARES).
- Association for Innovation Development of Entrepreneurship in Agriculture (**a-IDEA**) is an agri-incubation for start-ups at NAARM.

### **National Agricultural Research System (NARES)**

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- NARES [comprises the ICAR](#), other central research institutes, and national research centres set up by ICAR.
- NARS has 100+ research institutes and 70+ agricultural universities spread across the country.

## **{Agri – Schemes – 19/05/31} Recent Schemes**

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[PIB](#) | [THBL](#) | [Economic Times](#) | 31-05-2019

- GOI aims to double farmer incomes by 2022, when India marks 75 years of freedom.
- Measures taken by government: Minimum Support Prices (MSP) for **22 crops**, PM Krishi Sinchai Yojana, PM Kisan Sampada Yojana, e-NAM for better markets and more.

### **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)**

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- PM-KISAN Yojana was announced in the interim Budget for the year 2019-2020.
- The key element of PM-KISAN is income support of Rs. 6000/- to the small and marginal landholder farmer families with cultivable land holding upto 2 hectare across the country.
- The amount is being released in three 4-monthly instalments of Rs.2000/- each over the year through DBT.
- May 2019: PM-KISAN Yojana is now **extended to include all eligible farmer families irrespective of the size of land holdings**.



- Estimated Beneficiaries: 14.5 crore farmers.
- Estimated expenditure: Rs. 87,217.50 crores for year 2019-20.

### **Pradhan Mantri Kisan Pension Yojana (PMKPY)**

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- The Union Cabinet has approved PMKPY, a new Central Sector Pension scheme.
- The scheme is expected to secure lives of 5 crore Small and Marginal Farmers (SMF) in three years.
- The GOI would spend Rs. 10774.50 crore for a period of 3 years towards its contribution.

#### **The salient features of this scheme are:**

- The scheme is a voluntary and contributory pension scheme for all Small and Marginal Farmers (SMF).
- Entry age of the scheme is 18 to 40 years.
- The SMF are entitled to a minimum fixed pension of Rs.3,000/- on attaining the age of 60 years.
- The **Central Government contributes an equal amount** as contributed by the farmer to the Pension Fund.
- After the subscriber's death, the spouse of the SMF beneficiary will be entitled to receive 50% of the pension received by the beneficiary, provided he/she is not already an SMF beneficiary of the Scheme.
- If, the death of the subscriber happens during the period of contribution, the spouse shall have the option of continuing the Scheme by paying regular contribution.
- Farmers can opt to allow his/her monthly contribution to the Scheme to be made from the benefits drawn from the **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)** Scheme directly.
- A farmer can pay his monthly contribution by registering through Common Service Centres (CSCs) under MeitY.

### **Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA)**

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- PM-AASHA has been introduced by the Centre to **plug the holes in the procurement system and address the gaps in the Minimum Support Price (MSP) scheme.**
- The new scheme is a mix of sub-schemes which involve direct procurement, paying for losses incurred when market prices are lower than the announced MSP, and pilot of private procurement and stockist scheme.

#### **Price Support Scheme (PSS)**

- PSS promises assured price for farmers and prevent distress sale during bumper harvest.
- The scheme proposes to strengthen physical procurement of pulses, oilseeds and copra.
- **State governments** will decide the type and quantity of the crop to be procured when wholesale prices fall below MSP.

- State governments will also procure 25 per cent of the marketable surplus of farmers for eligible crops.

### **Price Deficiency Payment Scheme (PDPS)**

- PDPS hedges price risks wherein farmers will be compensated for distress sale at prices below MSP.
- This scheme proposes to cover all oilseeds for which MSP is notified.
- Under PDPS, the payment of the difference between MSP and the market price will be made to farmers.
- This scheme **does not involve any physical procurement** of crops by the State agencies.
- While assuring MSP for farmers, it will reduce the accumulation of unwanted food grains and oilseeds stocks.
- The fiscal costs of procurement and storage will also reduce significantly.

### **Private Procurement Stockist Scheme (PPSS)**

- Under PPSS, GOI is mulling to allow the entry of private players in the procurement of oilseeds (pilot basis).
- The private players can procure oilseeds at the state-mandated MSP for which they would be paid a service charge not exceeding 15 per cent of the notified support price.

### **Foot and Mouth Disease (FMD) and Brucellosis Disease Control**

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- The Cabinet approved a Rs 13,343-crore scheme to control foot and mouth disease and brucellosis, which are common in cows, buffaloes, sheep, goats and pigs.
- These animals will be vaccinated under the scheme.
- So far, the cost has been shared between the Centre and the states.
- From now on, the central government has decided to bear the entire cost of the programme.

#### **The threat of [Foot and Mouth Disease \(FMD\) and Brucellosis](#):**

- Foot and mouth disease is a highly infectious (**viral**) disease that affects cloven hoofed animals.
- Brucellosis (Mediterranean fever) is a zoonotic infection caused by the **bacterial** genus Brucella.
- The bacteria are transmitted from animals to humans by ingestion through infected food products.
- These diseases are very common amongst the livestock – cow-bulls, buffaloes, sheep, goats, pigs etc.
- If a cow/buffalo gets infected with FMD, the **milk loss is upto 100%** which could last for four to six months.
- Further, in case of Brucellosis the **milk output reduces by 30%**, during the entire life cycle of animal.
- Brucellosis also causes infertility amongst the animals.
- Both the diseases have a direct **negative impact on the trade of milk and other livestock products**.
- Foot and Mouth Disease Control Programme (FMD-CP) and Brucellosis Control Programme (Brucellosis-CP) are run by Department of Animal Husbandry and Dairying (Ministry of Agriculture And Farmers Welfare).

## Pradhan Mantri Fasal Bima programme

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### Tech holds key to fast-tracking crop insurance claims

- The govt has mandated to settle insurance claims within two months of filing.
- The government plans to rope in specialised agencies that can use satellites, remote-sensing data, unmanned aerial vehicles and artificial intelligence to assess crop yield estimates at the panchayat level, reducing delays in crop insurance claim settlements.
- Last year, the government had imposed a 12% penalty for delayed settlement on insurance companies if payment was not made within two months of prescribed cut-off date.
- The government will start with the assessment of eight crops, including paddy, maize, sorghum, soyabean, bajra, cotton, groundnut and guar in the ensuing kharif season.
- Crop yield information is mandatory for insurance estimation under Pradhan Mantri Fasal Bima programme.

### Soil Health Management (SHM)

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- Soil Health Management (SHM) is one of the components under **National Mission for Sustainable Agriculture** (NMSA). (NMSA is one of the eight components of [National Action Plan on Climate Change](#))
- SHM aims at
  - ✓ promoting Integrated Nutrient Management (INM) through judicious use of chemical fertilizers including secondary and micronutrients in conjunction with organic manures and bio fertilizers and
  - ✓ fertilizer testing facilities to improve soil test based recommendations to farmers.
- Soil Health Card Scheme is under implementation since 2015 to provide Soil Health Card to all farmers.
- Soil Health Card will provide information to farmers on soil nutrients status of their soil and recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.

### {Agri – Schemes – 19/06/24} Agriculture Credit to Farmers

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[PIB](#) | 24-06-2019

#### GOI/RBI/NABARD have taken the following major initiatives for providing hassle free crop loans:

- The Government of India fixes **Agriculture Credit Disbursement Targets** for the Banking Sector every year and banks have consistently surpassed these targets.
- With a view to ensure availability of agriculture credit at a reduced interest rate of 7% p.a. to the farmers, the Department of Agriculture, Cooperation and Farmers' Welfare implements an **interest subvention scheme** for short term crop loans up to Rs. 3.00 lakh.

- The scheme provides interest subvention of 2% per annum to Banks on use of their own resources.
- Besides, additional 3% incentive is given to the farmers for prompt repayment of the loan, thereby reducing the **effective rate of interest to 4%**.
- As per RBI directions, Domestic Scheduled Commercial Banks are required to lend **18%** of the **Adjusted Net Bank Credit (ANBC – a component of Priority Sector Lending)** towards agriculture.
- A **sub-target of 8%** is also prescribed for lending to small and marginal farmers.
- Similarly, in the case of Regional Rural Banks 18% of their total outstanding advances is required to be towards agriculture and a sub-target of 8% has been set for lending to small and marginal farmers.
- **Kisan Credit Card (KCC) Scheme** enables farmers to purchase agricultural inputs such as seeds, fertilisers, pesticides, etc. and draw cash to satisfy their agricultural and consumption needs.
- The KCC Scheme has been simplified and converted into ATM enabled RuPay Debit Card with facilities of any number of withdrawals within the limit, etc.
- RBI has decided to raise the limit for **collateral-free agriculture loans from Rs. 1 lakh to Rs. 1.6 lakh**.
- The requirement of 'no due' certificate has also been dispensed with for small loans up to Rs.50,000.
- To bring small, marginal, tenant farmers, oral lessees, etc. into the fold of institutional credit, Joint Liability Groups (JLGs) have been promoted by banks.

### **National Bank for Agriculture and Rural Development (NABARD)**

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- NABARD extends refinance to banks and provides loan assistance to the State Governments for promotion and development of agriculture and other rural activities.
- NABARD provides loan assistance to the State Governments under various Funds namely:
  - ✓ **Rural Infrastructure Development Fund (RIDF),**
  - ✓ **Long Term Irrigation Fund (LTIF),**
  - ✓ **Warehouse Infrastructure Fund (WIF)**
  - ✓ **NABARD Infrastructure Development Assistance (NIDA),**
  - ✓ **Food Processing Fund (FPF), etc**

### **{Agri – Schemes – 19/06/25} e-NAM scheme**

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PIB | 25-06-2019

- National Agriculture Market (eNAM) is a pan-India electronic trading portal which networks the existing APMC mandis to create a **unified national market for agricultural commodities**.
- Uniformity in agriculture marketing through eNAM is achieved by

- ✓ reducing transaction costs
- ✓ expanding the market access for farmers
- ✓ streamlining of procedures across the integrated markets,
- ✓ removing information asymmetry between buyers and sellers and
- ✓ promoting real time price discovery based on actual demand and supply.
- eNAM facilitates
  - ✓ better price discovery through transparent auction process
  - ✓ better marketing opportunities for the farmers
  - ✓ timely online payment
  - ✓ single window services for all APMC related information and services
- In 2019, e-NAM, for the first time conducted inter-State trade between mandis of two different States.
- Earlier trade used to happen either within the APMC or between two APMCs situated within same state.
- Three reforms are mandatory in respective State APMC Acts for integrating their mandis with e-NAM i.e. (i) Provision for e-trading, (ii) Single point levy of market fee, (iii) Unified Single trading license for the State.
- **States without APMC Act like Bihar** need to provide legally enforceable guidelines and institutional mechanism for implementing e-NAM.

#### **Facilities available to farmers at e-mandis for using e-NAM platform:**

- Farmers can access the prevailing commodity prices information on e-NAM mobile app.
- Facility of pre-registration of lot by farmers for their produce available through mobile app.
- Facility of quality testing of the produce of the farmers before bidding.
- Farmers may view progress of online bid value of their produce through mobile.
- The details of final bid rate of commodity of farmer are received through SMS by farmers.
- Online payment gateway is available for transfer of bid value directly to bank accounts of farmers.

#### **Online warehouse-based trading soon**

- GOI plans to launch [warehouse-based trading over eNAM](#) to provide competitive prices to farmers.
- This will help farmers sell their produce directly from godowns without hurdles.
- The trading will initially start from state owned warehouses of Warehousing Development and Regulatory Authority (WDRA), which regulates and promotes orderly growth of the warehousing business.
- The model APMC Act 2017, which aims at providing real prices to farmers, has a provision to declare godowns or warehouses as market which would enable farmers to trade directly from there.

## **{Agri – Schemes – 19/06/27} Transport and Marketing Assistance (TMA)**

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- [PIB](#) | [ET](#) | 27-06-2019
- The US and Australia have raised doubts about **Transport and Marketing Assistance (TMA)** announced in March this year, at WTO saying it was **trade distorting**.
- The Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) scheme that has been questioned by New Zealand.
- **Nairobi WTO Ministerial commitment** of 2015 talked of **reducing trade distorting subsidies**.

## **Transport and Marketing Assistance (TMA) for Specified Agriculture Products**

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- India's aim to **double exports of agricultural commodities to \$60 billion by 2022** by boosting shipment of agriculture commodities such as tea, coffee and rice.
- In accordance, Department of Commerce of the Ministry of Commerce & Industry has notified TMA for Specified Agriculture Products.
- Under the TMA scheme, the government will **reimburse a certain portion of freight charges and provide assistance for marketing of agricultural produce to boost exports of certain commodities**.

### **Pattern of Assistance**

- All exporters, duly registered with relevant Export Promotion Council as per **Foreign Trade Policy (2015-20)**, of eligible agriculture products shall be covered under this scheme.
- Assistance would be provided in cash through direct bank transfer as part reimbursement of freight paid.
- The assistance shall be admissible only if payments for the exports are received in Free Foreign Exchange through normal banking channels.

## **{Agri – Schemes – 19/06/28} Bringing Green Revolution to Eastern India (BGREI)**

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[PIB](#) | 28-06-2019 | Environment | Agriculture > [Green Revolution](#)

- GOI is laying emphasis on development of resource rich eastern region of the country for enhancing agricultural production.
- This would help in reducing the over exploitation of natural resources in north western region, the traditional food bowl of the country.
- **[Bringing Green Revolution to Eastern India \(BGREI\)](#)** – a sub scheme of **Rashtriya Krishi Vikas Yojana (RKVY)** is being implemented since 2010-11 in seven (7) eastern states of the country namely **Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Eastern Uttar Pradesh and West Bengal**.

More about BGREI: <https://www.pmfias.com/bgrei-bringing-green-revolution-eastern-india/>

## **{Agri – Schemes – 19/06/28} Framework for Doubling Farmers' Income**

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[PIB](#) | 28-06-2019

- GOI had constituted an Inter-ministerial Committee in 2016 to examine issues relating to “Doubling of Farmers Income (DFI)” and recommend strategies to achieve the same.
- The Committee has submitted its Report to the Government in September 2018.
- The Committee has identified seven major sources of growth, viz.,
  1. improvement in crop productivity;
  2. improvement in livestock productivity;
  3. resource use efficiency or savings in the cost of production;
  4. increase in the cropping intensity;
  5. diversification towards high value crops;
  6. improvement in real prices received by farmers; and
  7. shift from farm to non-farm occupations.
- Agriculture being a **State subject**, the State Governments undertakes development of perspective plans and ensure implementation of the schemes.

### **GOI supplements the efforts of the State Governments through various Schemes such as:**

- Kisan Credit Cards provides agriculture credit to farmers at subsidized rates, with a 2% interest subvention (IS) and Prompt Repayment Incentive (PRI) of 3% so as to make the **effective rate of interest as 4%**.
- Indian Banker’s Association has waived off processing fee and all other service charges on KCC.
- RBI has raised the collateral free existing agriculture loan limit from **Rs.1 lakh to Rs.1.60 lakh**.
- For risk mitigation, GOI has launched a crop insurance scheme namely Pradhan Mantri Fasal Bima Yojana (PMFBY) from Kharif 2016 season.
- GOI has approved the increase in the Minimum Support Price (MSPs) for all Kharif & Rabi crops for 2018-19 season at a level of at least 150 percent of the cost of production.
- With a view to provide income support to all farmers’ families, Central Government started a new Central Sector Scheme, namely, the **Pradhan Mantri Kisan SAMman Nidhi (PM-KISAN)**.
- Government has decided to implement another new Central Sector Scheme for providing old age pension to farmers.

## **{Agri – Schemes – 19/06/28} Green Revolution – Krishonnati Yojana**

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[PIB](#) | [PIB](#) | 28-06-2019 | Environment | Agriculture > [Green Revolution](#)

## **Green Revolution – Krishonnati Yojana**

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- The Cabinet Committee on Economic Affairs has given its approval for the Umbrella Scheme, "Green Revolution – Krishonnati Yojana" beyond 12th Five Year Plan for the period from 2017-18 to 2019-20.
- The Umbrella scheme comprises of 11 Schemes/Missions.
- The Schemes will be continued with an expenditure of Rs.33,000+ crore for the three financial years.

### **Mission for Integrated Development of Horticulture (MIDH)**

- MIDH aims to
  - ✓ promote holistic growth of horticulture sector;
  - ✓ enhance horticulture production, improve nutritional security and income support to farm Households.

### **National Food Security Mission (NFSM), including National Mission on Oil Seeds and Oil Palm (NMOOP)**

- It aims to increase production of rice, wheat, pulses, coarse cereals and commercial crops, through area expansion and productivity enhancement in the identified districts of the country.
- It further aims to augment the availability of vegetable oils and to reduce the import of edible oils.

### **National Mission for Sustainable Agriculture (NMSA)**

- NMSA is one of the schemes under [National Action Plan On Climate Change](#).
- NMSA aims at promoting sustainable agriculture practices by focusing on integrated farming, appropriate soil health management and synergizing resource conservation technology.

### **Submission on Agriculture Extension (SMAE)**

- SMAE aims to strengthen the ongoing extension mechanism of State Governments, local bodies etc., achieving food and nutritional security and socio-economic empowerment of farmers.

### **Sub-Mission on Seeds and Planting Material (SMSP)**

- SMSP aims to
  - ✓ increase production of certified/quality seed,
  - ✓ upgrade the quality of farm saved seeds,
  - ✓ promote new technologies in seed production, processing, testing etc.
  - ✓ modernizing infrastructure for seed production, storage, certification and quality etc.

### **Sub-Mission on Agricultural Mechanisation (SMAM)**

- SMAM aims to



- ✓ increase the reach of farm mechanization to small and marginal farmers and to the regions where availability of farm power is low,
- ✓ promote 'Custom Hiring Centres' to offset the adverse economies of scale arising due to small landholding and high cost of individual ownership,
- ✓ create hubs for hi-tech and high value farm equipment,
- ✓ create awareness among stakeholders through demonstration and capacity building activities, and
- ✓ ensure performance testing and certification at designated testing centres located all over the country.

### **Sub Mission on Plant Protection and Plant Quarantine (SMPPQ)**

- SMPPQ aims to
  - ✓ minimize loss to quality and yield of agricultural crops from the ravages of insect pests, diseases, weeds, nematodes, rodents, etc.
  - ✓ shield our agricultural bio-security from the incursions and spread of alien species,
  - ✓ facilitate exports of Indian agricultural commodities to global markets, and
  - ✓ promote good agricultural practices, particularly with respect to plant protection strategies.

### **Integrated Scheme on Agriculture Census, Economics and Statistics (ISACES)**

- It aims to undertake the agriculture census, study of the cost of cultivation of principal crops, to
  - ✓ undertake research studies on agro-economic problems of the country,
  - ✓ fund conferences/workshops and seminars involving eminent economists, agricultural scientists, etc.

### **Integrated Scheme on Agricultural Cooperation (ISAC)**

- It aims to provide financial assistance for improving the economic conditions of cooperatives, remove regional imbalances and to speed up cooperative development in agriculture sector.

### **Integrated Scheme on Agricultural Marketing (ISAM)**

- ISAM aims to
  - ✓ develop agricultural marketing infrastructure;
  - ✓ promote innovative technologies in agriculture marketing infrastructure;
  - ✓ provide infrastructure facilities for grading, standardization and quality certification of agricultural produce;
  - ✓ establish a nation-wide marketing information network;
  - ✓ integrate markets through a common online market platform (e-NAM) to facilitate pan-India trade in agricultural commodities, etc

## National e-Governance Plan (NeGP-A)

- NeGP-A aims to enhance & integrate the existing ICT initiatives of Centre and States to enhance efficiency & effectiveness of programs through making available timely and relevant information to the farmers.

## {Agri – Schemes – 19/06/28} Technology interventions

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[PIB](#) | 28-06-2019

- **Kisan Suvidha mobile application** to facilitate dissemination of information to farmers on the critical parameters viz., Weather; Market Prices; Plant Protection; Farm Machinery; etc.
- **Farm Machinery package for Different Agro-Climatic Zones in India mobile application**, which gives information on farm machinery package available for state-wise, agro-climatic zone wise, etc.
- **My Ciphert mobile application** to help farmers to get precise information regarding the Indian Council of Agriculture Research (ICAR) developed post-harvest technologies, products and machineries.
- **mKisan web portal** for sending advisories on crop related matter to the registered farmers through SMSs.
- **e-National Agriculture Market** initiative to provide farmers an electronic online trading platform.
- **Soil Health Card Scheme** to assist State Governments in providing Soil Health Cards to all farmers across the country once in a cycle of 2 years.
- The Government has set up 713 **Krishi Vigyan Kendras** and 684 **Agricultural Technology Management Agencies** at district level for dissemination of technologies among farm community.
- In addition, farmers are provided information through [Kisan Call Centres in 22 languages](#), **Agri-Clinics and Agri-Business Centres of entrepreneurs, Agri Fairs and exhibitions, Kisan SMS Portal, etc.**

### Weather related data for farmers

- Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) is providing agriculture related information including 'Weather conditions' to the farmers through Kisan Call Centres.
- India Meteorological Department (IMD) under the Ministry of Earth Sciences (MoES) implements **Gramin Krishi Mausam Sewa (GKMS)** for the benefit of farming community in the country.
- Under GKMS scheme, district level weather forecast for the next five days for all the districts is generated.
- Based on the weather forecast, advisories are communicated to the farming community through SMS and IVR using Kisan Portal launched by the Ministry of Agriculture & Farmers Welfare.

### Adaptation of advanced technology

- Using machine learning and computer models for crop classification and area estimation.

- Using Artificial Intelligence (AI) to give accurate and timely information regarding crops, weather and insects etc. to the farmers.

## **{Cattle Rearing – Schemes – 19/05/22} Dairy Development Schemes**

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[PIB](#) | 22-06-2019 | GS3 > Agriculture and allied sectors > Animal Rearing

- National Programme for Dairy Development (NPDD)
- Dairy Entrepreneurship Development Scheme (DEDS)
- National Dairy Plan-I (NDP-I): Central Sector Scheme for a period of 2011-12 to 2018-19.
- Dairy Processing and Infrastructure Development Fund (DIDF)
- Supporting Dairy Cooperatives and Farmer Producer Organizations engaged in dairy activities (SDCFPO)

### **Dairy Entrepreneurship Development Scheme**

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- The Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), launched a pilot scheme titled “Venture Capital Scheme for Dairy and Poultry” in the year 2005-06.
- The main objective of the scheme was to extend **assistance for setting up small dairy farms** and other components to bring structural changes in the dairy sector.
- The name of the scheme was later changed to **Dairy Entrepreneurship Development Scheme (DEDS)**.

#### **Objectives of the scheme**

- To promote setting up of **modern dairy farms** for production of clean milk;
- To encourage heifer calf rearing, thereby conserving good breeding stock;
- To bring structural changes so that initial processing of milk can be taken up at the village level itself;
- To upgrade the quality and traditional technology to handle milk on a **commercial scale**;
- To generate **self-employment** and provide **infrastructure** mainly for unorganised sector.

### **Dairy Processing & Infrastructure Development Fund (DIDF)**

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- Large number of dairy cooperatives were commissioned during **Operation Flood** which ended in 1996.
- Dairy Cooperatives used pass on maximum share of sales realisation to milk producers.
- As a result, they are unable to invest in modernisation of dairy processing infrastructure.
- To ensure that Dairy Cooperatives remain competitive, the Government of India had announced creation of **Dairy Processing and Infrastructure Development Fund** under **NABARD**.
- The fund has a total corpus of Rs. 8000 crores over a period of 3 years (i.e. 2017-18 to 2019-20).

## Objectives

- To **modernize** the milk processing plants and machinery;
- To create additional milk processing capacity and producing more dairy products;
- To bring efficiency in dairy processing plants;
- To provide **greater opportunities of ownership and market access** to rural milk producers;

## Supporting Dairy Cooperatives and Farmer Producer Organizations engaged in dairy activities

- DAHD&F has approved this Central Sector Scheme from 2016-17 with a corpus fund of Rs. 300 Crore to be kept in perpetuity with **National Dairy Development Board (NDDB)**.
- The fund is to be used for providing loan for working capital to enable State Dairy Cooperative Federations.

### The scheme is being implemented by NDDB with the objectives:

- **To assist the State Dairy Cooperative Federations by providing soft working capital loan** to tide over adverse market conditions or natural calamities;
- To provide stable market access to the dairy farmers;
- To enable Dairy Federations to continue to make timely payment of dues to the farmers;
- To enable the cooperatives to procure milk at a remunerative price from the farmers;

## Cattle disease control schemes

### Foot and Mouth Diseases in Livestock

- The National Animal Disease Control Programme for **Foot and Mouth Disease (FMD) and Brucellosis** has been approved by the Cabinet on 31.05.2019 as a new Central Sector Scheme for a total outlay of Rs.13,343.00 crore for **five years (2019-24)**.

### It has the following components:

- Foot and Mouth Disease (FMD) control programme: The programme envisages 100% vaccination coverage of cattle, buffaloes, sheep, goats and pigs at **six months interval in the entire country**.
- Further, animals will be identified using unique **animal identification ear tags**.
- The programme also includes de-worming of targeted population of livestock twice a year.

### Brucellosis control programme

- The programme envisages 100% vaccination coverage of **female cattle and buffalo calves** (4-8 months of age) **once in a lifetime**.

## **{Cattle Rearing – Schemes – 19/05/22} National Programme for Bovine Breeding and Dairy Development (NPBBDD)**

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[PIB](#) | 22-06-2019 | GS3 > Agriculture and allied sectors > Animal Rearing

- The NPBBDD has been formulated by merging ongoing schemes of the Department of Animal Husbandry, Dairying and Fisheries in the dairy sector.
- This has been done to integrate milk production and dairying activities for attaining **higher levels of milk production and productivity**.

### **Components of the scheme**

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NPBBDD has the following three components.

- 1. National Programme for Bovine Breeding (NPBB)**
- 2. National Programme for Dairy Development (NPDD) and**
- 3. Rashtriya Gokul Mission.**

### **Implementation agencies**

- State Implementing Agencies (SIA): State Livestock Development Boards
- End Implementing Agencies (EIA): State Livestock Development Boards, State Animal Husbandry Departments, State Milk Federations.

### **Objectives of National Programme for Bovine Breeding**

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- To bring all breedable females under organized breeding through **Artificial Insemination** or natural service;
- To arrange quality Artificial Insemination services at farmers' doorstep;
- To conserve selected indigenous bovine breeds of high socio-economic importance;
- To provide quality breeding inputs so as to **prevent the important indigenous breeds from deterioration and extinction**.

### **Objectives National Programme for Dairy Development**

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- To create and strengthen infrastructure for production of quality milk including cold chain infrastructure linking the farmer to the consumer;
- To create and strengthen infrastructure for procurement, processing and marketing of milk;
- To strengthen dairy cooperative societies/Producers Companies at village level;
- To increase milk production by providing technical input services like cattle-feed, and mineral mixture etc;

## Rashtriya Gokul Mission

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- Rashtriya Gokul Mission Aims to **Conserve and Develop Indigenous Breeds**.
- Rashtriya Gokul Mission project has an outlay of Rs 500 crore during the 12th Five Year Plan.
- The mission will be implemented through the State Implementing Agency (Livestock Development Boards).

### Funds under the scheme will be allocated for:

- Establishment of Integrated Indigenous Cattle Centres viz **Gokul Gram**;
- Strengthening of **bull mother farms** to **conserve high genetic merit Indigenous Breeds**;
- Establishment of Breeder's Societies: Gopalan Sangh;
- Heifer (a cow that has not borne a calf, or has borne only one calf) Rearing programme award to Farmers (Gopal Ratna) and Breeders' Societies (Kamadhenu); etc.

### Objectives of the mission:

- **Development and conservation of indigenous breeds**;
- Undertake breed improvement programme for indigenous cattle breeds so as to **improve the genetic makeup** and increase the stock;
- Enhance milk production and productivity;
- Upgrade nondescript cattle using elite indigenous breeds;
- Distribute disease free high genetic merit bulls for natural service.

### Nondescript cattle

- There are 26 well defined breeds of cattle in India (18 per cent of the country's total cattle population).
- The remaining **82 per cent are referred to as nondescript** and are named after the region they come from.

### Gokul Gram

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- Under this component it is proposed to establish **Integrated Indigenous Cattle Centres or Gokul Grams** in the breeding tracts of indigenous breeds.
- Gokul Gram will act as **Centres for development of Indigenous Breeds and a dependable source for supply of high genetic breeding stock** to the farmers in the breeding tract.
- The Gokul Gram will be self-sustaining by generate economic resources from cattle by-products.
- Each Gokul Gram will be set up by the End Implementing Agency (EIA) and function under the auspices of the SIA/EIA or in a PPP mode.
- The Gokul Gram will maintain milch and unproductive animals in the ratio of 60:40.

## Why develop indigenous breeds?

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- India with 199 million cattle has 14.5% of the world cattle population.
- Of this, 83% i.e. 166 million are indigenous.
- Most of the indigenous cattle are **non-descript** and only 20% belong to breeds recognised by National Bureau of Genetic Resources.
- Indigenous cattle are **robust and resilient** and are particularly suited to the climate of their respective tracts.
- They are endowed with qualities of **heat tolerance, resistance to diseases and the ability to thrive under extreme climatic stress and less than optimal nutrition.**
- High milk yielding temperate climate breeds are **highly susceptible to tropical diseases** and rearing them in India comes with high capital costs and risks.

## {Food Processing – 19/06/17} World Food India 2019 to be held in New Delhi

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[PIB](#) | 17-06-2019 | GS3 > Food processing

- **Second edition of World Food India** is to be held from 1st to 4th November 2019 in New Delhi.
- The government initiated the **biennial event** to promote food processing sector at global level.
- WFI 2019 will be the biggest gathering of all global and domestic stakeholders in Food Processing Sector.
- Indian Food Processing Industry has recorded **11% growth rate**, which is twice the pace of Global Industry.
- However, India's share in global exports of processed food is **only 2%**.

### Importance of Food processing industry (FPI) in India

- Food processing is critical to achieving the goal of doubling the farmers' income in India by 2022.
- India has a high share of harvest and post-harvest losses due to poor storage, transportation and logistics to the extent of **\$13 Billion – 3 times the agricultural budget**. Improving FPI can reduce these losses.

## {Food Processing – Schemes – 19/06/21} Schemes and Measures

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[PIB](#) | 21-06-2019 | GS3 > Food processing

### Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)

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- Ministry of Food Processing Industries (MoFPI) is implementing Central Sector Umbrella Scheme-Pradhan Mantri Kisan SAMPADA Yojana (PMKSY).
- The period of implementation of the PMKSY is 2016-20 with a total outlay of Rs.6000 crore.
- The PMKSY has seven component schemes viz;

- ✓ Mega Food Parks,
  - ✓ Integrated Cold Chain and Value Addition Infrastructure,
  - ✓ Infrastructure for Agro-Processing Clusters,
  - ✓ Creation of Backward and Forward Linkages,
  - ✓ Creation/Expansion of Food Processing & Preservation Capacities,
  - ✓ Food Safety and Quality Assurance Infrastructure, and
  - ✓ Human Resources and Institutions.
- Under PMKSY, **capital subsidy** is offered in the form of grants-in-aid ranging from 35% to 75% of the eligible project cost.

## **Operation Greens**

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- The MoFPI has launched a new Central Sector Scheme “Operation Greens” for integrated development of **Tomato, Onion and Potato (TOP)** crops value chain, with an outlay of Rs.500 Crore.
- The scheme aims to promote Farmers Producers Organizations (FPO), agri-logistics, processing facilities and professional management of FPOs.

## **Other measures taken**

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- A special fund of Rs.2000 crore has been created with NABARD to provide affordable credit to food processing projects/units.
- Food & agro-based processing units and cold chain infrastructure has been classified as agriculture activity for **Priority Sector Lending (PSL)**.
- Fiscal measures like 100% exemption of Income Tax on profit for new food processing units, 100 percent income tax exemption from profit derived by FPOs having annual turnover of Rs.100 crore have been allowed.
- Lower Goods & Service Tax (GST) rates for majority of food products have been fixed.