

**1. What are the major bottlenecks in creating an efficient nation-wide agricultural market? Discuss. What recent measures have been taken to address these bottlenecks.**

**Demand of the question:**

It expects students to discuss major bottlenecks in creating an efficient nation-wide agricultural market. It also expects students to write about the recent measures taken by the government to address these bottlenecks.

**Introduction:**

Agriculture sector is one of the dominant sectors of Indian economy. It contributes about 14% of the total GDP of India and provides employment to over 60% of the population. But, it is plagued with many problems. The problem of nation-wide agri marketing tops the list of issues related to agriculture.

**Body:**

Bottlenecks in creating an efficient nation-wide agriculture market:

- Minimum Support Price (MSP) for different crops announced by the Union Government. But there is a wide gap between the cost of production and the MSPs announced for the year. MSP is not available to Dairy products, vegetables, fruits etc.
- Not many private markets could come up during the last 15 years as the local APMCs felt threatened by them.
- There are hindrances when it comes to establishing market for livestock sector which is a very important sector of the agribusiness economy.
- India has surplus production in most agri-commodities but farmers have been unable to get better prices due to lack of investment in necessary infrastructure such as Ware house, Cold Storage etc. Almost 40 per cent produce of all fruits and vegetables production lost annually in India due to less number of cold storages, ware houses etc.
- The imposition of the curbs on stocking of farm produce and regulation of the prices of commodities, etc. under Essential Commodities Act (ECA) are some of the factors responsible for less interest of entrepreneurs. Hence, less investment in the farm sector.
- There are restrictions for farmers in selling agri-produce outside the notified Agricultural Produce Market Committee (APMC) which in turn put less money in the hands of farmer.
- The farmers are also restricted to sell the produce only to registered licensees of the State Governments, which restricted farmers option to explore new markets in other states.
- Further, barriers exist in free flow of agriculture produce between various States owing to the prevalence of various APMC legislations enacted by the State Governments.
- Climate change is expected to make the situation worse by posing some unprecedented challenges such as floods, sea level rise, disturbed monsoon cycle etc.

These structural, operational & natural bottlenecks resisted the creation of efficient nation-wide agriculture market. Hence, Union government recently introduced new measures to address these bottlenecks:

The central government introduced major agriculture market reforms through three ordinances & other initiatives:

- The Essential Commodities (Amendment) Ordinance 2020. (ECA)
- The Farming Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020.(FPTC)
- The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020.
- Besides earlier to it the Department of Agriculture & Cooperation formulated a Central Sector scheme for Promotion of National Agriculture Market through Agri-Tech Infrastructure Fund (ATIF) through provision of the common e-platform.
- Also, Pradhan Manthri Fasal Bima Yojana provides insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities, pests & diseases.

It will help to create efficient nation-wide market in following ways:

- The amendment to ECA would deregulate the commodities such as cereals, edible oils, oilseeds, pulses, onions and potatoes. It will help to lessen the fears of private investors of excessive regulatory interference in their business operations.
- The freedom to produce, hold, move, distribute and supply will lead to harnessing economies of scale and attract private sector/foreign direct investment into the agriculture sector.
- It will help drive up investment in cold storages and modernization of the food supply chain.
- An amendment to FPTC will create an ecosystem where the farmers and traders would enjoy freedom of choice of sale and purchase of agri-produce.
- It will also promote barrier-free inter-state and intra-state trade and commerce outside the physical premises of markets notified under State agricultural produce marketing legislations.
- It empowers farmers for engaging with processors, wholesalers, aggregators, large retailers, exporters etc. and thus eliminating intermediaries resulting in full realization of price.
- It also provides an effective dispute resolution mechanism with clear timelines for redress.
- These reforms are expected to build necessary agrarian infrastructure in the country which will lead to build "One India, One Agriculture Market" i.e. an efficient nation-wide agricultural market.

These reforms will promote efficient nation-wide market under the slogan of one nation one market. But, there are some challenges which still persists:

- Agricultural marketing is mainly a state entitlement, as Union government introduced these reforms, it might keep away the state from its limited revenue resources.
- The peasantry may be at large will be at the mercy of the Agri Business Corporations since there will not be any arrangements for price support and price stabilisation for crop.

**Conclusion:**

As NITI Aayog's three year agenda focuses on reforming the agricultural market so that farmers are empowered to sell their produce to whomsoever they wish. The recent measures are taken by the government in this light will be helpful to create an efficient nation-wide market and will also ensure rise in income of farmers in turn contributing to achieve the target to double farmers income by 2022.



## 2. . How is technology adoption transforming agricultural efficiency in rural India? Illustrate.

### Demand of the question:

It expects students to write in short about problems faced by agriculture sector while improving its efficiency, besides also expects more emphasis on how technology adoption has transformed agricultural efficiency in rural India.

### Introduction:

India is one of the leading contributors to the domestic and global agriculture output demand. India is the world's largest producer of milk, 2nd largest producer of fruit & vegetable in the world, and technology adoption has helped to improve these figures in various ways.

### Body:

Issues involved to improve agricultural efficiency:

- Conversion of agricultural land for alternative uses, declining average size of farm holdings have drastically reduced the average land holding in turn posing a challenge to implement efficiently the traditional methods of farming.
- Dependence on rainfall and climate: Indian agriculture is heavily dependent on monsoon rain and ever-increasing global temperature has made agriculture more prone to extreme weather events.
- Absence of marketing infrastructure, Large gaps in storage, Cold chains limited connectivity have posed transport & marketing challenges.
- Lack of Mechanisation: Introduction of latest technology has been limited due to various reasons like accessibility for credit and low awareness.
- Profiteering by middlemen is reducing farmers income in turn reducing farmers purchasing power for new technology adoption.
- Food processing efficiency is low in India, It's at 3% when compared to 30-70% in developed countries and wastage of agriculture produce is as high as 40%.

These issues were addressed by technology adoption in agriculture sector:

- Remote sensing (via satellites), GIS, crop and soil health monitoring, and technologies for livestock and farm management are the examples of technology which are helping to improve the agricultural efficiency.
- Seed quality enhancing: The quality enhancement can be done with advanced techniques, adopting seed management strategies resulted into creating high yield seed varieties.
- Solar-powered water pumps: These pumps use the abundant solar power available to pump water from the ground. These provide an energy-efficient way. Hence, reduce cost of production and increase profits for farmer.
- Per capita availability of fruits and vegetables is quite low because of post-harvest losses which account for about 25% to 30% of production. But, adoption of cold storage chain technology for perishable and other



perishable allied agri – commodities has helped to reduce wastages and improve the gains to farmers and consumers substantially.

- ICT sectors such as e-choupal is an example of efficient supply chain system empowering the farmers with timely and relevant information enabling them to get better returns on their investment.
- E-governance in the areas like- maintenance of land records is a great step in removing the malpractices and creating assurance of rightful ownership.
- Aadhar linked bank accounts and government records provide access to monetary benefits by establishing the correct identity, in turn solving problem of access to credit.
- Direct farm to door connectivity through e-commerce and m-commerce platforms has facilitated large number of artisans to cut the middleman share and get fair price for their produce.
- Agro-based small enterprises such as providing tractor & other farm equipments on rents at reasonable rates in rural areas helped to reduce cost of production. e.g. : UBER enabled farm equipments on rent system through UBER apps.
- Better access to information through Kisan Suvidha app and DD Kisan Channel helped to improve efficiency in the agriculture.
- GPS mapping, which helps farmer in accessing the need i.e. where they need to put more fertilizer or less, as per requirement of the soil. GPS enabled services are also helping in field of documentation about yield, moisture, etc.

Though technology adoption has improved agricultural efficiency in Indian agricultural sector, some areas still need attention:

- As per FICCI's "Knowledge Paper on Indian farm equipment sector" Farm equipments use in India stands at about 40-45 percent. This is still low when compared to countries such as the US (95percent), Brazil (75 percent) and China (57percent).
- 'Tractor-isation' and not mechanisation of Industry is happening.
- As per National Digital literacy mission, digital literacy is almost no-existent among more than 90% of India's population.

**Conclusion:**

Technology adoption has proved that it has potential to improve agricultural efficiency by improving farmers knowledge, access to credit, and agriculture output in many ways. Hence, technology adoption can help the farm product to reach from "local to global" market in an efficient way. If addressed the remaining issues in the technology adoption, it will also help to convert the image of Indian "Peasant farmer" in to an "Entrepreneur farmer".

### 3. What are various decentralised irrigation techniques? Why are they beneficial for India's agro-climatic conditions? Explain.

#### Demand of the question:

It expects students to explain various decentralised irrigation techniques. It also expects students to write about the benefits of these irrigation techniques as per agro-climatic conditions of India.

#### Introduction:

Irrigation is the prime most component in the agriculture sector in India. As more than three quarters of the annual rainfall occurs during the four months of the summer monsoon season, decentralised irrigation techniques play the pivotal role to ensure water supply for agriculture & household needs round the year.

#### Body:

Decentralised irrigation refers to the small-scale, storage and distribution of water for agricultural and other needs in rural as well as urban areas. Various decentralised irrigation techniques are as follows:

- Farm ponds: Farm ponds are small tank or reservoir like constructions, are constructed for the purpose of storing the surface runoff, generated from the catchment area. The farm ponds are the water harvesting structures, solve several purposes of farm needs such as supply of water for irrigation, cattle feed, fish production etc.
- Rain water harvesting: Rainwater harvesting has agricultural uses. It can be used to water crop plants in agricultural fields, improve ground water table. For instance, Work done by Paani foundation in selective rural areas has led to improvement in ground water table.
- Surface irrigation: Water is distributed over and across land by gravity, no mechanical pump involved.
- Localized irrigation: Water is distributed under low pressure, through a piped network and applied to each plant.
- Drip irrigation: A type of localized irrigation in which drops of water are delivered at or near the root of plants. In this type of irrigation, evaporation and runoff are minimized.
- Sprinkler irrigation: Water is distributed by overhead high-pressure sprinklers or guns from a central location in the field or from sprinklers on moving platforms.

Benefit of decentralised irrigation as per India's agro-climatic conditions:

- India accounts for only about 4 % of global water resources, where agriculture consumes more than 80 % of the total usable water available in the country.
- Decentralised irrigation offer the possibility to provide adequate water where centralised supply systems are not feasible due to technical,

economical or institutional reasons. Ex: In rural communities or informal settlements.

- Small water bodies (mainly tanks) are less capital-intensive, user-friendly with fewer environmental problems and augment groundwater resources through sub-surface recharge. Ex: Existence of decentralised water storage systems in (Hebbal) Bengaluru, etc.
- Decentralised supply offers the possibility to provide clean, reliable drinking water to rural or informal settlements where centralised systems are not economically or technically possible.
- Wide range of simple, relatively inexpensive and cost effective options are available so people can choose the technologies most appropriate for them. Ex: Drip irrigation, Sprinkler technique, etc.,
- Traditional irrigation techniques such as tankas, khadins, vav, ahar pynes are significant in areas such as arid and semi-arid regions. Ex: Bikaner, Jaisalmer, South Bihar.
- They are independent from an institutional set-up or centralised systems. Hence do not carry the major drawbacks of centralised irrigation system.

Government initiatives to promote decentralised irrigation:

- Mission Kakatiya is a flagship program under Telangana government aimed at restoring minor irrigation sources of water like ponds and tanks.
- Jalyukt Shivar yojan in Maharashtra has played a prominent role in providing farm ponds to every farmer in her/his agriculture field.
- In Gujarat 'Bhungroo' a water management system that injects and stores excess rainfall water underground. This water is then used for irrigation during summers .

**Conclusion:**

World Banks report on "India's Water Economy: Bracing for a Turbulent Future" (2006), stated that dams in India have the capacity to store only about 30 days of rainfall, compared with 900 days in major river basins in arid areas of developed countries. Hence, it becomes important to focus more on decentralised irrigation as it will help the agriculture sector to be self reliant (Aatmnirbhar) in irrigation.