Agriculture



"the science, art or practice of cultivating soil, producing crops and raising livestock and in varying degrees the preparation and marketing of the resulting products".

- Geographical Area
- Reporting Area for Land Utilization Statistics
- Forest Area
- Area under Non-agricultural Uses
- Barren and Un-culturable Land
- Permanent Pasture and other Grazing Land
- Land under Miscellaneous Tree Crops, etc.
- Culturable Waste Land

• Fallow Lands other than Current Fallows:

This includes all land which was taken up for cultivation but is temporarily out of cultivation for a period of not less than one year and not more than five years.

Current Fallows:

This represents cropped area which is kept fallow during the current year.

Net Area Sown:

This represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once.

• Gross Cropped Area:

This represents the total area sown once and/or more than once in a particular year, i.e. the area is counted as many times as there are sowings in a year. This total area is also known as total cropped area or total area sown.

• Area Sown more than once:

This represents the areas on which crops are cultivated more than once during the agricultural year. This is obtained by deducting Net Area Sown from Gross Cropped Area.

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Irrigated Area:

The area is assumed to be irrigated for cultivation through such sources as canals (Govt. & Private), tanks, tube-wells, other wells and other sources. It is divided into two categories:

(i) Net Irrigated Area:

It is the area irrigated through any source once in a year for a particular crop.

(ii) Total Net Un-irrigated Area:

It is the area arrived at by deducting the net irrigated area from net sown area.

(iii) Total/Gross Irrigated Area:

It is the total area under crops, irrigated once and/or more than once in a year. It is counted as many times as the number of times the areas are cropped and irrigated in a year.

(iv) Total/Gross Un-Irrigated Area:

It is the area arrived at by deducting the gross irrigated area from the gross sown area.

(v) Cropping Intensity:

It is the ratio of Net Area Sown to the Total Cropped Area.

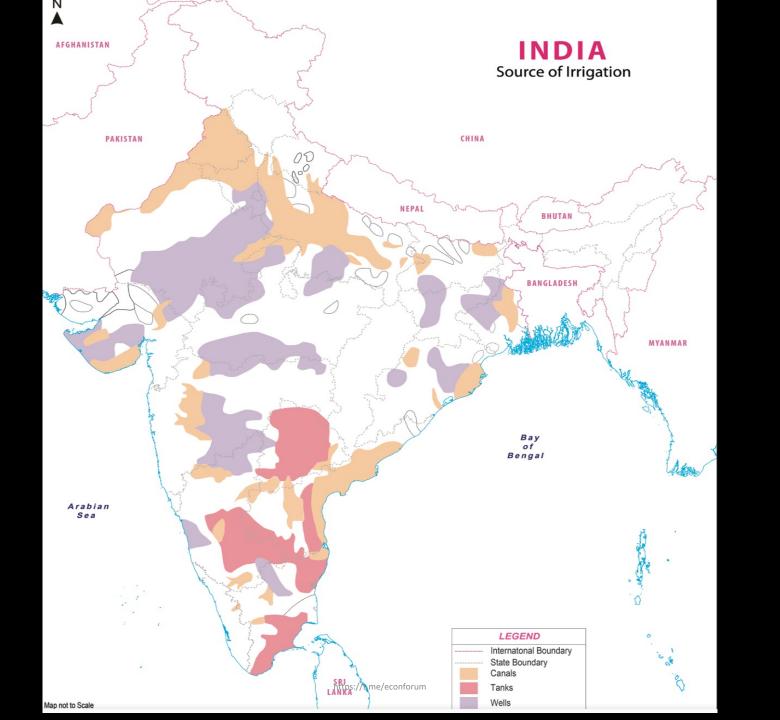
Factors influencing Agriculture



Infrastructure

Institutional

Technology



Issues related to Major irrigation Projects in India:

- Delays in completion of projects
- Inter-state Water disputes
- Regional disparities in irrigation development
- Water-logging and salinity
- Increasing cost of irrigation
- Losses in operating irrigation projects
- Decline in water table

- 1. How and to what extent would micro-irrigation help in solving India's water crisis? (Answer in 150 words)
- 2. What is water-use efficiency? Describe the role of micro-irrigation in increasing water-use efficiency.
- 3. Suggest measures to improve water storage and irrigation system to make its judicious use under depleting scenario.
- 4. Elaborate on the impact of the National Watershed Project in increasing agricultural production from water-stressed areas.



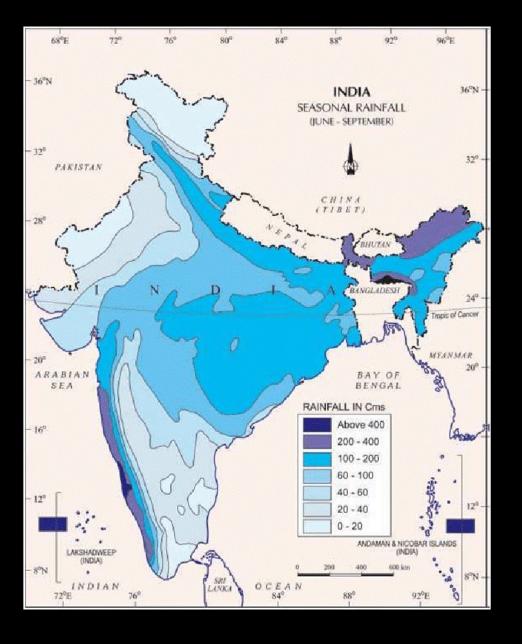
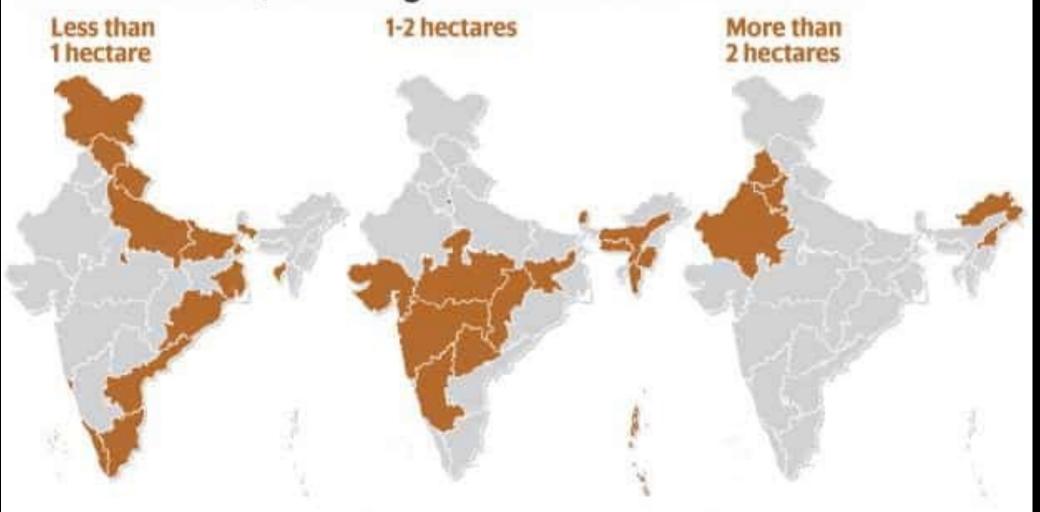




Chart 3

In 12 Indian states, the average farm size is less than a hectare

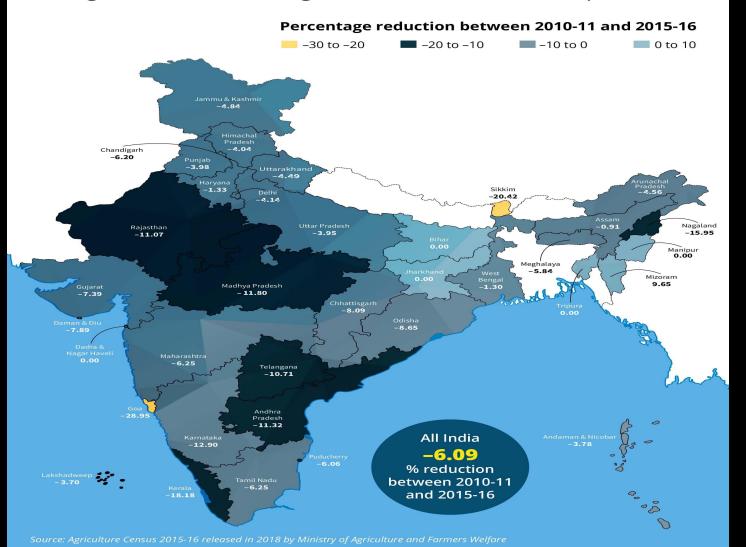


Source: Agriculture Census, Census of India, Indira Gandhi Institute of Development Research

FARMLAND FRAGMENTATION

Over the years, the number of farm holdings in the country has increased, but the area under farming has dipped. As a result, not only has the average size of land holding decreased, the share of marginal farmers has risen substantially.

30 states and Union Territories have registered reduction in the average size of land holdings. Mizoram is the lone exception.



Cropping Pattern: the proportion of land under cultivation of different crops at different points of time.

This indicates the time and arrangement of crops in a particular land area.

- 1. Explain the changes in cropping pattern in India in the context of changes in consumption pattern and marketing conditions(2023).
- 2. How do subsidies affect the cropping pattern, crop diversity and economy of farmers? What is the significance of crop insurance, minimum support price and food processing for small and marginal farmers?
- 3. How has the emphasis on certain crops brought about changes in cropping patterns in the recent past? Elaborate the emphasis on millet production and consumption.

- 1. What are the different types of agriculture subsidies given to farmers at the national and at state levels? Critically analyse the agricultural subsidy regime with reference to the distortions created by it.
- 2. Given the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY).

Crop Rotation: different crops are grown on the same land in pre-planned succession. The crops are classified as one-year rotation, two-year rotation, and three-year rotation, depending upon their duration.

Crop Diversification: Crop diversification means growing more than one crop in an area. Diversification can be accomplished by adding a new crop species or different variety, or by changing the cropping system currently in use.

Commonly it can mean adding more crops into an existing rotation. Diversification can also be implemented to replace low-value commodities with high-value commodities, such as vegetables and fruits.

It can also include an integration of crops and livestock, defined as mixed farming.

Crop diversity encompasses several aspects, such as crop species diversity, varietal diversity within crop species, and genetic diversity within crop species.

It is recognized as one of the most feasible, cost-effective, and rational ways of developing a resilient agricultural cropping system.

Advantages of Crop Diversification:

- Increases income on small farm holdings.
- Increases profits by reducing the cost of production.
- Helps withstand fluctuation in commodity prices.
- Provides resilience to highly variable weather conditions resulting from climate change.
- Provides more varied and healthful Food, both for humans and livestock.
- Decreases pest pressure, including diseases, insects and weeds.
- Improves soil quality.
- Increases employment opportunities.
- Diverse rotations may increase crop yields and produce quality.

Potential challenges to increased adoption of crop diversification on the farm are:

- Market demand may be limited by a range of factors, such as government policies, subsidies, etc.
- Lack of infrastructure for storage and transportation.
- Absence of suitable equipment.
- Price and supply of inputs.
- Lack of technical knowledge and references regarding their production practices.
- Lack of crop varieties adapted to the specific region.

Type of diversification	Nature of diversification	Potential benefit
Improved structural diversity	Makes crops within the field more structurally diverse	Pest suppression
Genetic diversification in monoculture	Cultivation of mixture of varieties of same species in a monoculture	Disease suppression, Increased production stability
Diversify field with fodder grasses	Growing fodder grasses alongside of food/pulse/oilseed/ vegetable etc.	Pest suppression, opportunity to livestock farming
Crop rotations	Temporal diversity through crop rotations (Sequential cropping)	Disease suppression, Increased production stability
Polyculture	Spatial and temporal diversity of crops (Growing two or more crop species within the field)	Insect, pest disease suppression, climate change buffering and increased production
Agroforestry	Growing crops and trees together (Spatial and temporal diversity)	Pest suppression and climate change buffering
Mixed landscapes	Development of larger-scale diversified landscapes through mixture of crops and cropping system with multiple ecosystems	Pest suppression and climate change buffering
Micro- watershed based diversification	Integration of crop with other farming components for year round income and employment generation, besides sustaining soil and environmental health	Insect, pest and disease suppression, climate change buffering and increased production, employment and income

1. What are the present challenges before crop diversification? How do emerging technologies provide an
opportunity for crop diversification?

Mixed Cropping:

Mixed Farming:

Organic farming:

Natural farming: Bhartiya Prakritik Krishi Paddati (BPKP).

Integrated farming:

an approach to agriculture that involves the integration of multiple agricultural enterprises, such as crops, livestock, and fishery, in a single farming system.

- Diversification
- Efficient use of resources
- Livelihood
- Sustainability

requires significant investment in infrastructure and human resources, technical expertise, and market linkages.

- 1. How far is the Integrated Farming System (IFS) helpful in sustaining agricultural production.
- 2. Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable examples.

Corporate Farming: Corporate farming refers to direct ownership or leasing in of farmland by business organisations in order to produce for their captive processing requirements or for the open market.

- They can make increase in agricultural productivity through the use of better inputs and through effective nurture.
- Reduction in cultivation costs due to use of better technology.
- They have access to large capital to withstand loss in case of crop failure.
- Eliminates the role of middlemen by performing every activities from growing to harvesting themselves.
- Highly beneficial for utilisation of waste and uncultivated lands.

Contract Farming: an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices.

Advantages:

Producer/farmer

- Makes small scale farming competitive small farmers can access technology, credit, marketing channels and information while lowering transaction costs
- Assured market for their produce at their doorsteps, reducing marketing and transaction costs
- It reduces the risk of production, price and marketing costs.
- Contract farming can open up new markets which would otherwise be unavailable to small farmers.
- It also ensures higher production of better quality, financial support in cash and /or kind and technical guidance to the farmers.

Agri-based firms

- Optimally utilize their installed capacity, infrastructure and manpower, and respond to food safety and quality concerns of the consumers.
- Make direct private investment in agricultural activities.
- The price fixation is done by the negotiation between the producers and firms.

Challenges

- Contract farming arrangements are often criticized for being biased in favour of firms or large farmers, while exploiting the poor bargaining power of small farmers.
- Problems faced by growers like undue quality cut on produce by firms, delayed deliveries at the factory, delayed payments, low price and pest attack on the contract crop which raised the cost of production.
- Contracting agreements are often verbal or informal in nature, and even written contracts often do not provide the legal protection in India that may be observed in other countries. Lack of enforceability of contractual provisions can result in breach of contracts by either party.
- Single Buyer Multiple Sellers (Monopsony).

Cooperative Farming

- Cooperative farming mainly refers to farming practices where farming operations are conducted cooperatively.
- These agricultural practices are conducted by individuals on their holdings jointly with certain common agencies.
- These agencies form on their behalf for the collection and purchase of agricultural inputs such as seeds, fertilizers, equipment, etc. and the sale of their agricultural produce.
- An agricultural cooperative is also called as a farmers' co-op. It is a cooperative where farmers pool their resources in certain areas of activity.
- It allows little farms to do what big farms can do, like buy inputs at bulk rates, increase volume to open new markets and lower the per-use cost of equipment.
- Together, producers can lower costs, access required services or facilities and generate more income.

Factors such as increasing pressure of population on land, uneconomic size of holding, primitive and unscientific methods of cultivation, inequitable distribution of land, poverty, and ignorance of the peasantry, etc., are the main impediments that stand in the way of implementation of the planned agricultural production in India.

Features of cooperative farming

- Joining of the farmers in this system is voluntary.
- Farmers retain their right to land.
- Farmers pool their land, livestock and other implements.
- The entire farm is managed as a single unit and management is elected by all the members
- Every member earns a share of the total production with their land contribution and labour performed.

Advantages of cooperative farming

- Cooperative farming solves the problem of sub-division and fragmentation of holdings.
- The cooperative farm has more men-material-money resources to increase irrigation system potential and land productivity. Members would not have been able to do it individually on their small farm.
- Case studies normally point out that with cooperative farming, per acre production increases.

Cooperative Farming - Causes for Failure in India

- Attachment with Land: Due to their strong attachment to their land, farmers are unwilling to give up their rights to it for the good of society.
- Lack of Cooperative Spirit: Farmers generally lack a cooperative and friendly spirit. On the basis of caste, they are separated into numerous sections. They are not prepared to join society since there is no sense of unity among them.
- Illiteracy: Farmers in developing nations tend to be uneducated, and they are resistant to changes in the way they cultivate their land. Some of them continue to cultivate using traditional techniques.

- Lack of Capital: Due to a lack of capital, co-operative farming groups are unable to keep up with the expanding demands of agriculture. Additionally, there aren't enough credit options for these societies.
- **Dishonesty:** Cooperative management frequently reveals itself to be dishonest. The cooperative farming society is rendered useless by the members' self-centeredness.
- Loss of Independence: Farmers that practise cooperative farming experience a loss of independence in their farming business, which they find challenging to accept.
- **Re-Payment of Debt:** When debt is not paid off on time, it can cause financial institutions a lot of issues. Some team members fail to understand their responsibilities, which leads to failure.

Which one of the following best describes the concept of 'Small Farmer Large Field?

- (a) Resettlement of a large number of people, uprooted from their countries due to war, by giving them a large cultivable land which they cultivate collectively and share the produce
- (b) Many marginal farmers in an area organize themselves into groups and synchronize and harmonize selected agricultural operations
- (c) Many marginal farmers in an area together make a contract with a corporate body and surrender their land to the corporate body for a fixed term for which the corporate body makes a payment of agreed amount to the farmers
- (d) A company extends loans, technical knowledge and material inputs to a number of small farmers in an area so that they produce the agricultural commodity required by the company for its manufacturing process and commercial production



- 1. State the objectives and measures of land reforms in India. Discuss how land ceiling policy on landholding can be considered as an effective reform under economic criteria. (2023, Answer in 150 words)
- 2. How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers?

1. In view of the declining average size of land holdings in India which has made agriculture non-viable for a majority of farmers, should contract farming and land leasing be promoted in agriculture? Critically evaluate the pros and cons.

- 2. Establish relationships between land reforms, agricultural productivity and elimination of poverty in the Indian economy. Discuss the difficulties in designing and implementation of agriculture friendly land reforms in India.
- 3. Discuss the role of land reforms in agricultural development. Identify the factors that were responsible for the success of land reforms in India.



- 1. Explain various types of revolutions, took place in Agriculture after Independence in India. How these revolutions have helped in poverty alleviation and food security in India?
- 2. India needs to strengthen measures to promote the pink revolution in the food industry for ensuring better nutrition and health. Critically elucidate the statement

National Food Security Mission

In view of the stagnating food grain production and an increasing consumption need of the growing population, Government of India has launched this Centrally Sponsored Scheme, 'National Food Security Mission' in October 2007.

The Mission met with an overwhelming success and achieved the targeted additional production of rice, wheat and pulses.

The Mission continued during 12th Five Year Plan with new targets of additional production of food grains of 25 million tonnes of food grains comprising of 10 million tonnes rice, 8 million tonnes of wheat, 4 million tonnes of pulses and 3 million tonnes of coarse cereals by the end of 12th Five Year Plan.

National Horticulture Mission

The NHM's key objective is to develop horticulture to the maximum potential available in the state and to augment production of all horticultural products (fruits, vegetables, flowers, coco, cashew nut, plantation crops, spices, medicinal aromatic plants) in the state.

Other objectives include:

- 1. To provide holistic growth of the horticulture sector through an area based regionally differentiated strategies
- 2. To enhance horticulture production, improve nutritional security and income support to farm households
- 3. To establish convergence and synergy among multiple ongoing and planned programmes for horticulture development
- 4. To promote, develop and disseminate technologies, through a seamless blend of traditional wisdom and modern scientific knowledge
- 5. To create opportunities for employment generation for skilled and unskilled persons, especially unemployed youth

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Price Support Schemes in India



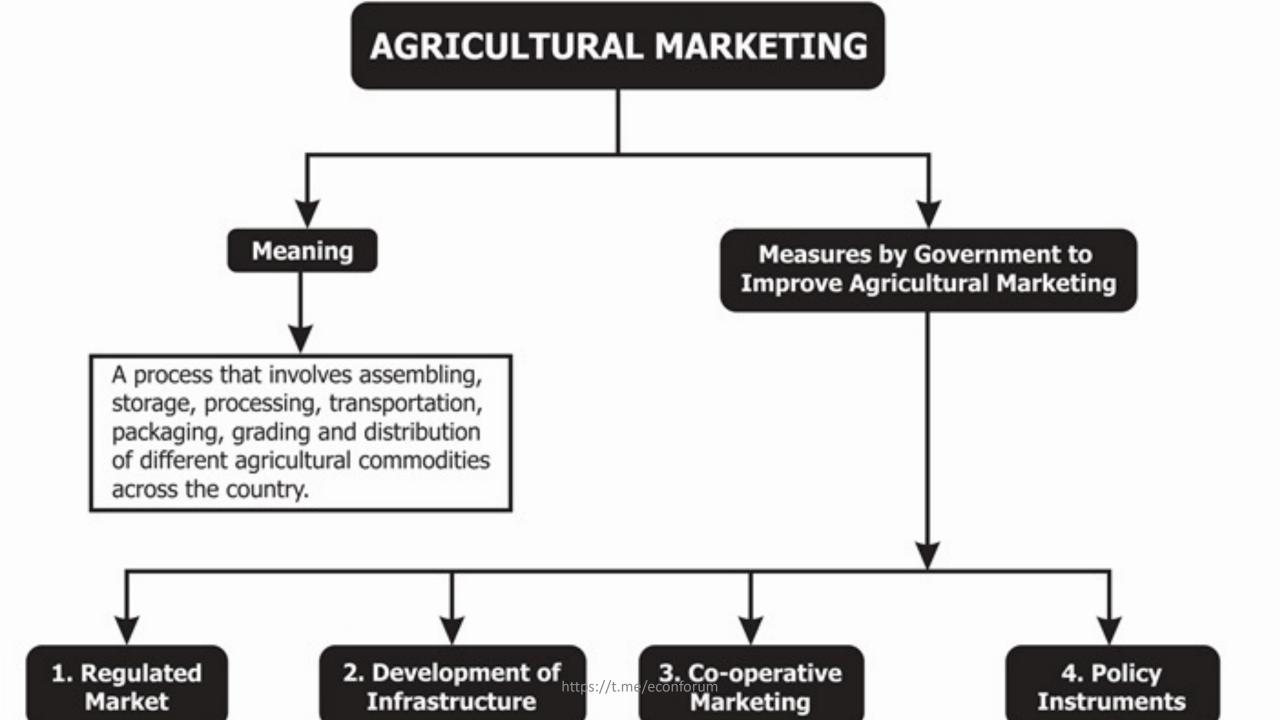
- Cereals (7) paddy, wheat, barley, jowar, bajra, maize and ragi
- Pulses (5) gram, arhar/tur, moong, urad and lentil
- Oilseeds (8) groundnut, rapeseed/mustard, toria, soyabean, sunflower seed, sesamum, safflower seed and nigerseed
- Raw cotton
- Raw jute
- Copra
- De-husked coconut
- Sugarcane (Fair and remunerative price)
- Virginia flu cured (VFC) tobacco

- 1. What are the major factors responsible for making rice-wheat system a success? In spite of this success how has this system become bane in India?
- 2. What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilize the yield of the crop in the system?
- 3. How has India benefited from the contributions of Sir M. Visvesvaraya and Dr. M. S. Swaminathan in the fields of water engineering and agricultural science respectively?
- 4. Assess the role of the National Horticulture Mission (NHM) in boosting the production, productivity, and income of horticulture farms. How far has it succeeded in increasing the income of farmers?

Food Security in India

- 1. What are the salient features of National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India? (Answer 250 words)
- 2. Food Security Bill is expected to eliminate hunger and malnutrition in India. Critically discuss various apprehensions in its effective implementation along with the concerns it has generated in WTO.
- 3. What are the direct and indirect subsidies provided to farm sector in India? Discuss the issues raised by the World Trade Organization (WTO) in relation to agricultural subsidies.(2023)

- 1. What do you mean by the Minimum Support Price (MSP)? How will MSP rescue the farmers from the low-income trap?
- 2. What are the reformative steps taken by the Government to make the food grain distribution system more effective?



What is APMC?

Agricultural Produce Market Committee (APMC) is a system operating under the State Government since agricultural marketing is a State subject.

The APMC has Yards/Mandis in the market area that regulates the notified agricultural produce and livestock.

The introduction of APMC was to limit the occurrence of Distress Sale by the farmers under the pressure and exploitation of creditors and other intermediaries.

APMC ensures worthy prices and timely payments to the farmers for their produce.

APMC is also responsible for the regulation of agricultural trading practices. This results in multiple benefits like:

- Needless intermediaries are eliminated
- Improved market efficiency through a decrease in market charges
- The producer-seller interest is well protected

e-NAM & APMC

- The National Agriculture Market (NAM) is a pan-India electronic trading portal, which links the existing Agricultural Produce Market Committee (APMC) mandis across the country to form a unified national market for agricultural commodities.
- The e-NAM portal is a single-window service for any information and services related to APMC that includes:
- Commodity arrivals and prices
- Buy and sell trade offers
- Provision to respond to trade offers, among other services
- The NAM reduces the transaction costs and information irregularity even when the agriculture produce continues to flow through the mandis.
- The states can administer agriculture marketing as per their agri-marketing regulations, under which, the State is divided into various market areas and each market area is administered by a separate APMC, which will impose its own marketing regulation that includes fees.

Model APMC Act of 2003

- The Government of India designed a model Agricultural Produce Market Committee (APMC) Act in 2003 as a first attempt to bring reformations in the agricultural markets.
- Provisions under this act were:
- New market channels other than APMC markets
- Private wholesale markets
- Direct purchase
- A contract for buyers and farmers
- The Market Committees under the APMC Act, 2003 was responsible for:
- Ensuring transparency in the transactions and pricing system of the market area
- Providing market-led extension services to farmers
- Ensuring that farmers are paid for the produce sold on the same day
- Promoting agricultural processing that will increase the value of the produce
- Making the availability and dates public on which the agricultural produce is brought to the market
- Promoting and establishing public-private partnerships (PPP) in these markets.

Shortcomings in the APMC System

- The monopoly of APMC Monopoly of any trade (barring few exceptions) is bad, whether it is by some MNC corporation by government or by any APMC. It deprives farmers of better customers and consumers from original suppliers.
- **Entry Barriers** License fees in these markets are highly prohibitive. In many markets, farmers are not allowed to operate. Further, over and above license fee, rent/value for shops is quite high which keeps away competition. At most places, only a group of the village/urban elite operates in APMC.
- **Cartelization** It is quite often seen that agents in an APMC get together to form a cartel and deliberately restraint from higher bidding. Produce is procured at a manipulatively discovered price and sold at a higher price. Spoils are then shared by participants, leaving farmers in the lurch.

- **High commission, taxes, and levies –** Farmers have to pay commission, marketing fee, APMC cess which pushes up costs. Apart from this many states impose Value Added Tax.
- **Conflict of Interest** APMC plays the dual role of regulator and Market. Consequently, its role as regulator is undermined by vested interest in the lucrative trade. They despite inefficiency won't let go of any control. Generally, members and chairman are nominated/elected out of the agents operating in that market.
- Other Manipulations Agents have a tendency to block a part of the payment for unexplained or fictitious reasons. Farmer is sometimes refused a payment slip (which acknowledges sale and payment) which is essential for him to get a loan.

Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM AASHA) is a scheme that aims at ensuring fair price for farmers and their produce.

By strengthening the procurement process, the PM-AASHA scheme will improve the income of the farmers to a greater extent.

The PM AASHA Scheme as the following components

1. Price Support Scheme (PSS): Through the Price Support Scheme procurement of pulses, oilseeds will be carried out by the Central Nodal Agencies with support from state governments. The PSS will be set up by the Food Corporation of India along with NAFED and any expenses incurred will be borne by the Central Government.

- 2. Price Deficiency payment Scheme (PDPS): In this scheme, all oilseed notified for SP will be covered. Direct payment of the difference between_Minimum Support Price(MSP) and the selling price will be made to the registered farmers. All payments will be made to the registered bank account of the farmer. In other words, no procurement will take place but rather the difference between MSP and selling price will be paid to the farmers.
- **3. Pilot of Private Procurement & Stockist Scheme (PPPS)**: As per the Pilot of Private Procurement & Stockist Scheme (PPPS) the private sector will take part in the procurement operations. The states will have an option to carry out the scheme on pilot basis in selected APMCs with involvement from the private sector.

- It does not strengthen the procurement mechanism infrastructure in the country which is robust for wheat and rice.
- With the exception of wheat and rice, the quantity of produce procured by designated state agencies was limited, leading to low awareness.
- As per the evaluation by the NITI Aayog, the procurement facilities in several states were found to be 'insufficient' in the long run.

NCCF, as an organization to promote consumer cooperative movement in the country, aspires to facilitate the voluntary formation and democratic functioning of cooperatives, based on self-reliance and mutual aid for overall economic betterment and financial autonomy.

National Agricultural Cooperative Marketing Federation of India Ltd.(NAFED) was setup with the object to promote Co-operative marketing of agricultural produce to benefit the farmers. Agricultural farmers are the main members of Nafed.

The objectives of the NAFED shall be to organize, promote and develop marketing, processing and storage of agricultural, horticultural and forest produce, distribution of agricultural machinery, implements and other inputs, undertake inter-state, import and export trade, wholesale or retail as the case may be and to act and assist for technical advice in agricultural, production for the promotion and the working of its members, partners, associates and cooperative marketing, processing and supply societies in India

1. There is also a point of view that agriculture produce market committees (APMCs) set up under the state acts have not only impeded the development of agriculture but also have been the cause of food inflation in India. Critically examine.



- It boosts the shelf life of food products.
- Prevent food-contamination.
- Food storage and Transportation.
- Turns raw food materials into attractive, marketable products.
- Provide employment to a large population.

Benefits of Food processing

The important benefits of food processing include:

- 1. Food processing reduces the number of harmful bacteria in food that can cause diseases. For eg., drying, pickling dehydrates the food product and alters the pH that prevents the growth of harmful microorganisms.
- 2. It also improves the shelf-life of food products.
- 3. It reduces health inequalities and major health concerns.

Drawbacks of Food Processing

The important drawbacks of food processing include:

- Processed food contains artificial ingredients.
- A large number of resources are spent in making the food pleasant to the brain that leads to overconsumption.
- Processed foods are the biggest source of added sugar that is very unhealthy.

MEGA FOOD PARKS

COLD CHAIN

FP & PRESERVATION CAPACITIES

BACKWARD & FWD LINKAGES

HR & INSTITUTION

AGRO PROCESSING CLUSTER

FOOD SAFTETY & QUALITY ASSURANCE

OPERATION GREENS

PMKSY Scheme

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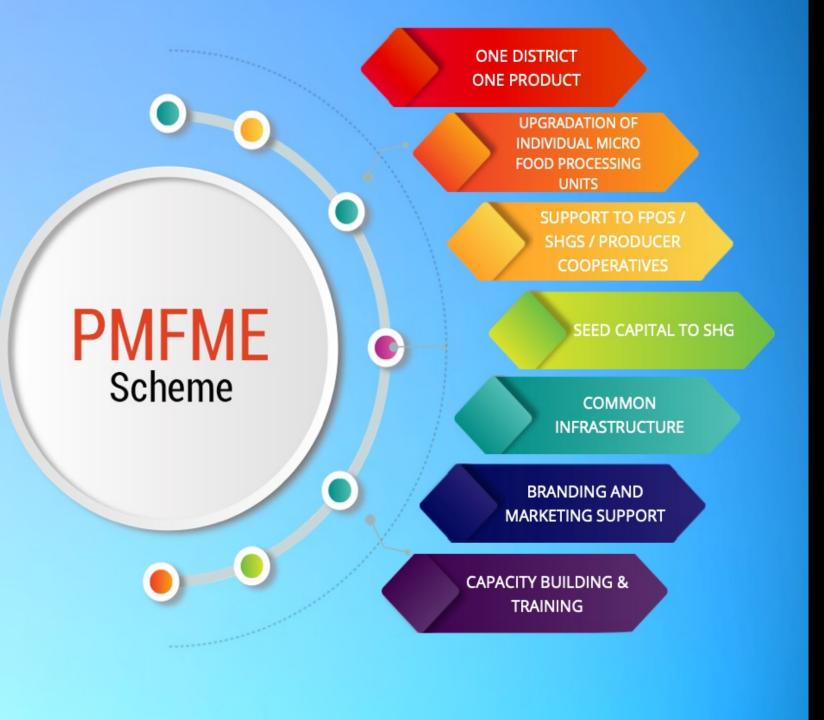
PLISFPI Scheme

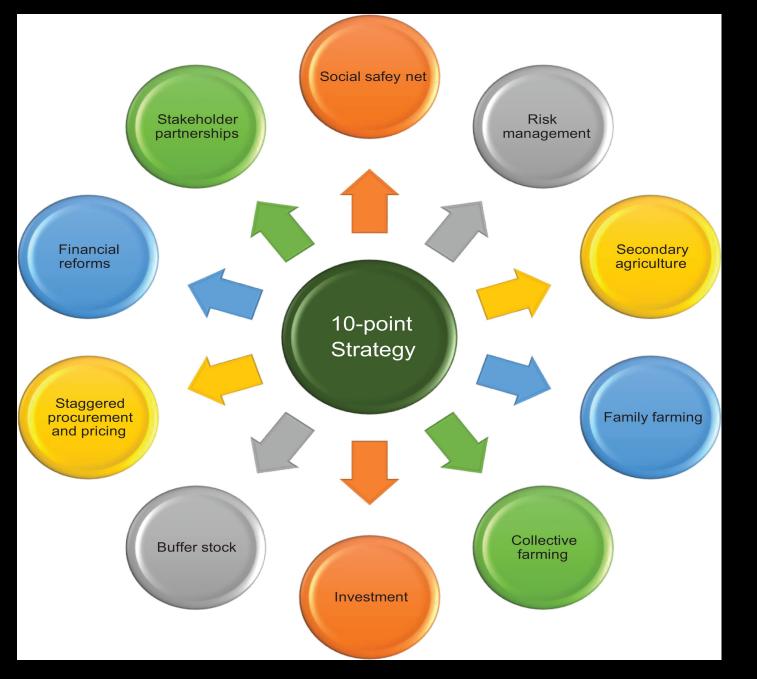
ABOUT SCHEME

INCENTIVES ON SALES & INVESTMENT

INCENTIVES ON INNOVATIVE

INCENTIVES FOR BRANDING & MARKETING





- Bharatiya Prakritik Krishi Paddhati Programme (BPKP)
- Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)
- TOP Scheme
- Operation Greens
- Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)
- Pradhan Mantri Krishi Sinchai Yojana
- Paramaparaghat Krishi Vikas Yojana

- 1. What are the main constraints in transport and marketing of agricultural produce in India?
- 2. Examine the role of supermarkets in supply chain management of fruits, vegetables, and food items. How do they eliminate the number of intermediaries?
- 3. What are the challenges and opportunities of food processing sector in the country? How can income of the farmers be substantially increased by encouraging food processing?

- 1. Elaborate on the policy taken by the Government of India to meet the challenges of the food processing sector
- 2. What are the reasons for poor acceptance of cost-effective small processing units? How can the food processing unit be helpful to uplift the socio-economic status of poor farmers?

Thank you