## 1. Discuss the potential and challenges of food processing industry in India.

### Approach

Define what is food processing industry in context of India.In next part write major potential in this sector and then address the challenges.Write a forward looking conclusion which contextualises the rise of industry with change in work environment.

### Introduction

India has made vast progress overtime in providing food security for its people and has become largely self-reliant in agriculture. Accordingly, the policy focus has shifted from attaining self-sufficiency to generating higher and stable income for the farming population. Food processing industry (FPI) is one area which has the potential to add value to farm output, create alternate employment opportunities, improve exports and strengthen the domestic supply chain. India, with about 11.2 per cent of total arable land in the world, is ranked first in the production of milk, pulses and jute, second in fruits and vegetables and third in cereals (Government of India, 2019). It is also the sixth largest food and grocery market in the world.

### Body

Potential of Food processing industry in India :

- Employment Generation: It provides direct and indirect employment opportunities, because it acts as a bridge between Agriculture and Manufacturing.
- Doubling of farmers' income: With the rise in demand for agri-products there will be commensurate rise in the price paid to the farmer, thereby increasing the income.
- Reduce malnutrition: Processed foods when fortified with vitamins and minerals can reduce the nutritional gap in the population.
- Reduce food wastage: UN estimates that 40% of production is wasted. Similarly, NITI Aayog estimated annual post-harvest losses of close to Rs 90,000 crore. With greater thrust on proper sorting and grading close to the farm gate, and diverting extra produce to FPI, this wastage could also be reduced, leading to better price realisation for farmers.
- Boosts Trade and Earns Foreign exchange: It is an important source of foreign exchange. For e.g. Indian Basmati rice is in great demand in Middle Eastern countries.
- Curbing Migration: Food Processing being a labour intensive industry will provide localized employment opportunities and thus will reduce the push factor in source regions of migration.
- Curbing Food Inflation: Processing increases the shelf life of the food thus keeping supplies in tune with the demand thereby controlling food-inflation. For e.g. Frozen Safal peas are available throughout the year.

- Crop-diversification: Food processing will require different types of inputs thus creating an incentive for the farmer to grow and diversify crops.
- Preserve the nutritive quality of food and prolongs the shelf life by preventing them from spoilage due to microbes and other spoilage agents,
- Enhances the quality and taste of food thereby bringing more choices in food basket
- Enhances consumer choices: Today, food processing allows food from other parts of the world to be transported to our local market and vice versa.

Challenges Faced by Food Processing Industry In India:

Supply and Demand Side Bottlenecks

- Small and dispersed marketable surplus due to fragmented holdings, low farm productivity due to lack of mechanization, high seasonality, perishability and lack of proper intermediation (supply chain) result in lack of availability of raw material. This in turn, impedes food processing and its exports.
- Demand of processed food is mainly restricted to urban areas of India.

Infrastructure Bottlenecks

- More than 30% of the produce from farm gate is lost due to inadequate cold chain infrastructure.
- The NITI Aayog cited a study that estimated annual post-harvest losses close to Rs 90,000 crore.
- Lack of all weather roads and connectivity make supply erratic.

Informalization in Food Processing Industry

- The food processing industry has a high concentration of unorganised segments, representing almost 75% across all product categories. Thus, causes the inefficiencies in the existing production system.

Deficiencies in the Regulatory Environment:

- There are numerous laws, under the jurisdiction of different ministries and departments, which govern food safety and packaging.
- The multiplicity of legislation and administrative delays leads to contradictions in food safety specifications and guidelines.

Low-Value Exports:

- Further, most processing in India can be classified as primary processing, which has lower value-addition compared to secondary processing.
- Due to this, despite India being one of the largest producers of agricultural commodities in the world, agricultural exports as a share of GDP are fairly low in India relative to the rest of the world.
- The same proportion is around 4% for Brazil, 7% for Argentina, 9% for Thailand, while for India it is just 2%.

Besides these, issues like mounting cost of finance, lack of skilled and trained manpower, inadequate quality control and packaging units and high taxes and duties, thwart development of FPI.

**Conclusion**

With the bourgeoning urban and young population, demand for processed food items is set to increase in the coming years. The food processing industry in India needs to gear up to meet the demand by investing in necessary infrastructure. The industry requires a steady flow of raw materials from the producers/farmers meeting specific quality standards and at stable prices. Farmer producer organisations, by bringing together small farmers and agricultural entrepreneurs, can enhance the opportunity to build more stable supply chain. Besides ensuring steady flow of income to the farmers, greater linkages with industry could also reduce wastages, particularly in perishables.

**2. What are mega food parks? Discuss their objectives. Do they have backward and forward linkages? Examine.**

**Approach**

Define what are megafood parks in Introduction.Then address the objectives as mentioned by the ministry of food processing and then write about backward and forward linkages in food industry and megafood parks .Write a forward looking positive conclusion for the industry in contention.

**Introduction**

Ministry of Food Processing Industries is implementing Mega Food Park Scheme in the country since 2008.It aims at providing a mechanism to link agricultural production to the market by bringing together farmers, processors and retailers.These food parks give a major boost to the food processing sector by adding value and reducing food wastage at each stage of the supply chain with particular focus on perishables.

**Body**

Objectives:

- The primary objective of establishing Mega Food Parks is to provide modern infrastructure facilities for the food processing along the value chain from farm to market with a cluster based approach based on a hub and spokes model.
- It includes creation of infrastructure for primary processing and storage near the farm in the form of Primary Processing Centres (PPCs) and Collection Centres (CCs) and common facilities and enabling infrastructure like roads, electricity, water, ETP facilities etc. at Central Processing Centre (CPC).
- These PPCs and CCs act as aggregation and storage points to feed raw material to the processing units located in the CPC.
- These are demand-driven projects and would facilitate food processing units to meet environmental, safety and social standards.
- Each Mega Food Park is likely to attract investment of about Rs. 100 Crore in common facilities and leverage an additional investment of about Rs. 250 Crore. Expected annual turnover of each MFP is about Rs. 500 Crore. It is likely to benefit about 6000 farmers/ producers directly and 25000-30000 farmers indirectly.

Backward and forward integration in the food processing industry:

- In food processing industry, the inputs such as fruits, vegetables, dairy products, meat, poultry and fish are so much perishable that lack of transportation and backward links would result in their waste.

- Further, for industry players, effective links add value to the brand by ensuring high quality end to end and better control over the factors of production resulting in cost saving and enhanced efficiency.
- Backward Integration refers to that integration where Company expands its activities to upstream areas. Company aims to get raw material at cheap rates, uniform quality, steady supply and eliminate any middlemen. e.g. Starbucks (chain of coffee bars) buys coffee plantations in Central America.
- Forward Integration refers to that integration where Company expands its activities to downstream areas. Company aims to get more control over sales, consumer-contact and eliminate any middlemen, wholesaler, retailer. e.g. Amul has its own pizza outlets and ice cream parlours.
- For a broader understanding one more large scale example can be cited of Mega food parks promote the backward linkages while Rythu bazar scheme of Andhra Pradesh which helps farmers to directly sell their produce to customers promotes forward linkages.

Effective and seamless backward and forward integration in food processing industry plug gaps in supply chain in terms of availability of raw material and linkages with the market. Hence, It benefits the economy in following ways:

- Food processing industry drives rural economy by increasing consumption due to increased income, essential for sustaining economic growth. Decrease in post-harvest wastage losses due to better technologies and improved logistics.
- Better compliance to food quality standards and thus expand market base.
- Stabilize food prices in the economy (food inflation).Consumers will be benefited with access to larger variety of products at reasonable prices.
- However various challenges still remain owing to Lack of infrastructure, large no. Of intermediaries, lack of testing and grading facility and land reform issues.
- Food processing firms, particularly Small and Medium Enterprises (SMEs), have difficulties in accessing finance.

Government Policy around Forward and Backward Integration in Food Processing Industry:

- Currently, the government is running a scheme called Scheme for Creation of Backward and Forward Linkages to provide effective and seamless backward and forward integration for processed food industry.
- At the same time, NITI Aayog has consistently pushed for contract farming, opening of multi brand retail for 100% FDI through automatic route etc.
- Recently promulgated “The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020.” is likely to strengthen the Food processing Industry by strengthening its forward and backward linkages.

**Conclusion**

Rising per-capita income, changing life style and food habits provide significant opportunities for the growth of Food processing industry. Recently promulgated ordinances and the schemes such as SAMPADA, Mega food park etc. are likely to strengthen backward and forward linkages in turn help the Food processing industries to grow from present 2% of GDP to optimise high output of farming sector.

**3. Discuss the importance of Integrated Farming System (IFS) models in augmenting farmers' income.**

**Approach**

Define what is Integrated farming system in introduction.In next part write in what ways it can augment farmers income.Make a forward looking conclusion which is positive in nature.

**Introduction:**

Integrated Farming System (IFS) also defined as biologically integrated farming system which integrates natural resources and regulation mechanisms into farming activities to achieve maximum replacement of off-farm inputs, secures sustainable production of high quality food and other products through ecologically preferred technologies, sustain farm income, eliminates or reduces sources of present environment pollutions generated by agriculture and sustains the multiple function of agriculture.

**Body**

Integrated farming is an alternative farming practice which was originally devised in China and now is being supported worldwide as an all-round development of agriculture along with animal husbandry and other such occupation which is related to core agricultural practices. Integrated farming has the capability to make the agriculture sector profitable which otherwise has been proved largely as a subsistence sector and a major reason behind leaving this age old occupation and migration to cities.

Advantages of Integrated Farming system in the context of farmers' economic profile

- Productivity : Integration of crop and allied enterprises helps to increase economic yield per unit area per unit time. Intensification of cropping and allied enterprises in space and time dimension found to increase the productivity.
- Profitability : Produce/waste material of new enterprise can be used for other enterprise at least for crop, thus reducing the cost of production and increasing profitability per rupee investment.
- Sustainability:- Huge quantity of inorganic fertilisers, pesticides, herbicides are required to meet the food requirement of increasing population @ 2.2 % every year. Abundant use of such material causes soil degradation and pollution. The productivity of soil gets drastically reduced in due course of time. IFS provides an opportunity to sustain production through organic supplementation and effective utilisation of byproduct of linked components.
- Balanced food : IFS link varied nature of enterprises to provide nutritious food viz., vitamins, proteins, carbohydrates, fat, minerals etc. from the same area. This solves the malnutrition problem of poor peoples.

- Environmental Safety : Abundant use of inorganic fertilisers, pesticides, herbicides make the soil, water and environment polluted. Similarly, residues of some crops, waste material also pollute the environment after decomposition. However in IFS waste material, byproducts of one composite are effectively recycled using for other component and by-product of that component as organic manure to enrich the soil. Use of bio agent or crop protection also minimises the pesticides.
- Recycling of waste : By-product of the crop husbandry can be effectively recycled for preparation of compost. Some of the by-product can be used as feed. This reduces the cost of production of one enterprise at the cost of other. Thus net income of farm is increased.
- Saving energy : Energy crises can be served to same extent by utilising organic waste to generate biogas which can be used for cooking, lighting etc.
- Adoption of new technology : Big farmers are fully aware with the new technologies because of using improved varieties, package of practices. But small and marginal farmers are not able to adopt for want of money. In IFS linking of cropping with dairy, mushroom, sericulture, floriculture there is a flow of money throughout the year.
- Money round the year:- In conventional farming income is expected once at the end of cropping season. However, IFS provides flow of money round the year by way of disposing eggs, milk, edible mushroom, honey, cocoons of silkworm etc.
- Availability of fodder, fuel and timber : IFS utilises every part of land. Growing of fodder trees on border will not only provide fodder but also enrich the soil by fixing atmospheric nitrogen. In multi-storeyed cropping includes of fodder component like cowpea as second or third tier also meet the fodder crises. The current production of fuel wood is about 20 million ton which needs to be increased to eighteen folds.
- Employment round the year : Crop-livestock integration increase labour requirement through the year, other activities like mushroom cultivation, sericulture, apiculture also needs labor. Hence IFS provides employment to family members as well as outside labour throughout the year.
- Agro-industries :Linking of various components in IFS, the production definitely increased to commercial level. Surplus production leads to development of agro based side industry.
- Increase input efficiency : IFS provides better scope to use available inputs more efficiently. This leads to increase benefit: cost ratio.
- Standard of living : IFS leads to produce milk, eggs, fruits, honey, edible mushroom and generate bioenergy for farmers family and commercial purpose. There is regular flow of money at frequent interval through out the year.
- Avoid degradation of forest : There is a vast gap between demand and production of fuel wood and timber. Users encroaches/destroy the forest area to bridge the gap. Forest lands get degraded and eroded due to denudation of forest. IFS linked with Afforestation and provide safety against degradation of lands, besides supplementation of fuel, timber and fodder.

- Integrated Farming Systems suitable particularly for hilly regions of the North Eastern Region can be adopted. Some are as – Integrated Fish cum Pig farming, Integrated Fish cum Duck Farming, Integrated Fish Farming-Chicken, Integrated Fish farming-cum-Cattle farming, Integrated Fish farming-cum-Rabbit farming, Integrated Fish farming-cum-Agriculture. Sikkim being an organic state is a good example.

Example from Indian scene:

- An Indian example of Integrated farming can best be understood by the fact that once a degraded land in Jodhpur, Rajasthan having very less crop production (and income) with the use of integrated farming practices such as plantation of improved qualities of Ber along with intercropping, honeybee keeping and a goat unit turned into a major revenue generator along with improving the quality of soil and decreased expenditure on fertiliser and pesticides, produced good quality fruits using organic farming which has high demand overseas.

## Conclusion

Integrated farming systems seem to be the possible solution to the continuous increase of demand for food and nutrition, income stability and livelihood upliftment particularly for small and marginal farmers with little resources. Therefore it supplements well the goals India needs to achieve on doubling of farming income, Climate change, nutritious food, and augmenting rural livelihood.