Role of Agriculture in India and Green Revolution

Agriculture of India and World

Agriculture began independently in different parts of the globe and included a diverse range of taxation. Eleven separate regions of the Old and New World were involved as independent centres of origin. Indians practice Agriculture since the times of Indus Valley Civilization. Green Revolution is the biggest revolution in Agriculture.

Agriculture

Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India, more so in the vast rural areas. It also contributes a significant figure to the Gross Domestic Product (GDP). Sustainable agriculture, in terms of food security, rural employment, and environmentally sustainable technologies such as soil conservation, sustainable natural resource management and biodiversity protection, are essential for holistic rural development. Indian agriculture and allied activities have witnessed a green revolution, a white revolution, a yellow revolution and a blue revolution.

This section provides the information on agriculture produces; machineries, research etc. Detailed information on the government policies, schemes, agriculture loans, market prices, animal husbandry, fisheries, horticulture, loans & credit, sericulture etc. is also available.

Agriculture and employment

Insufficient public investment for agrarian development and inadequate access to institutional credit apart, frequent droughts and floods are reasons for the declining trend.

Over the last three-and-a-half decades, there has been a structural shift in the occupational choice among rural workers, particularly rural agricultural workers, with changes in their occupational choices ranging from agriculture to non-agricultural sectors. According to the 38th Round (1983) of the National Sample Survey (NSS) report, around 77 per cent of rural households depend on the agricultural sector to sustain their livelihoods.

On the other hand, workforce participation in rural non-agricultural sectors for male workers increased from 22 per cent in 1983 to 47 per cent in 2018, thus registering an increase of 25 percentage points. Along similar lines, female employment in the rural non-agricultural sector gradually increased from 12 per cent to 29 per cent over the same period.

Agriculture and international trade

Agriculture and related sectors such as forestry and fisheries account for 19.9 percent of the country's GDP. Consequently, the agricultural sector plays an important role in Indian economics, politics, and society.

India is among the world's leaders in terms of production volume for various commodities such as rice, wheat, cotton, sugar, horticulture, and dairy.

India: Market Size of Indian Agricultural Products

Units: $ billion	**2017**	**2018**	**2019**	**2020**
Total Exports	32.2	32.7	31.0	33.4
Total Imports	27.8	22.3	22.7	22.1

Imports from the United States	1.9	1.9	2.1	1.6

- The total agriculture commodities export was US$ 17.19 billion between March 2020 and February 2021.
- During April 2020 and February 2021, grapes export amounted to US$ 182.21 million.
- India exported pulses worth US$ 261.47 million and dairy products worth US$ 182.90 million from April 2020 and February 2021.
- During April 2020 and February 2021, natural honey export amounted to US$ 79.33 million.
- India is the largest milk producer in the world. Milk production in the country is expected to reach 330 million tonnes (MT) by 2024.
- India has the world's largest population of buffalos (109.8 million in 2020).

Recent Development

Ministry of Commerce and Industry introduced Agriculture Export Policy, 2018 with an aim to double farmers' income by 2022 by doubling agricultural exports from India and integrating Indian farmers and agricultural products in India to the global value chain. The export of agriculture is targeted at US$ 60 billion by 2022.

- **Agriculture Export Policy**
  To increase farmers' income, harness export potential and make India a leading player in agriculture sector, Indian government launched comprehensive agriculture export policy.
- **The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act, 2020**
  This Act will allow intra-state and inter-state trade of farmers' produce beyond the physical premises of APMC markets and the state governments will be prohibited from levying market fee, cess, or levy outside APMC areas
- **The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020**
  This ordinance will provide a framework on farming agreements, and will protect and empower the farmers to engage with agri business firms, processers, wholesalers, exporters, or large retailers
- **The Essential Commodities (Amendment) Ordinance 2020**
  Under this ordinance the central government will be able to regulate the supply of certain food items only under extraordinary circumstances (such as war and famine).

Green Revolution

Green Revolution was from 1930 – 1960. It revolutionised the agriculture field including new agricultural technologies and Irrigational System. Norman Borlaug is one of the leaders of this revolution, Hence he was " Father Of Green Revolution". He saved billions of people from starvation and hence given the Noble Price. Quality of diet improved over the world after the green revolution.

Green revolution solved problems like Hunger and malnutrition. The increase in chemical fertilizers and pesticides deteriorated the health of people introducing Cancer and leukaemia. This terminal illness was the result of chemicals and pesticides used in growing crop.

Green Revolution in India was lead by CS Kalkat who is hence titled as ” Father of Green Revolution in India”. Modern technologies and HYV seeds bosted the agricultural yieldings of India. Since India is a developing country, the revolution initiated in 1960 in states like Punjab, Haryana and Uttar Pradesh. Before green revolution, India wasn’t a self – sufficient country. Eventually, after the green revolution, India is a self-sufficient country. The highest yielding crop in India is wheat. This revolution majorly was beneficial for the northern Indian states. Therefore, the green revolution is responsible for the advancement in India. Hence, the green revolution led to an increase in higher productivity factor.

Second Green Revolution and Food Management

12 Important Components of Green Revolution in India

1. High Yielding Varieties (HYV) of seeds
2. Irrigation (a) surface and (b) ground.
3. Use of fertilizers (chemical).
4. Use of Insecticides and Pesticides.
5. Command Area Development (CAD).
6. Consolidation of holdings.
7. Land reforms.
8. Supply of agricultural credit.
9. Rural electrification.
10. Rural Roads and Marketing.
11. Farm Mechanisation.
12. Agricultural Universities.

The Second Green Revolution: The Role of Genetically Modified Food

- There are calls for a second Green Revolution to drive new agricultural research and development programmes. Arguably, with the spread of precision agriculture and biotechnology, the second Green Revolution is already underway. Just as the first Green revolution was composed of multiple innovations, the second is also likely to be built on multiple technologies. Genetic engineering is one technology that will fuel the second Green Revolution and improve global food security.
- GM is a broad field and there are many types of GM products available or in various stages of development. Some products use GM techniques to promote more rapid growth, resistance to disease and pests, or to deliver vitamins, minerals or nutrients through a process known as bio-fortification.
- There are also two ways to genetically modify an organism. The first, known as transgenic modification, involves the movement of genetic material from one variety or species of organism to another. The second involves changing, or editing, the existing genetic material of an organism.

What is Food Security?

The Food and Agricultural Organization (FAO) states that food security emerges when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has three important and closely related components, which are listed below

1. Availability of food
2. Access to food
3. Absorption of food.

Laws on Food Security – India

In order to provide the Right to food to every citizen of the country, the Parliament of India, enacted legislation in 2013 known as the National Food Security Act, 2013. Also called the Right to Food Act, this Act seeks to provide subsidized food grains to approximately two-thirds of India's 1.33 billion population. Food Subsidy is the foundation on which the National Food Security Act 2013 is implemented in India.

National Food Security Bill, 2013

1. This Bill was introduced in Lok Sabha on 7th August 2013
2. It was passed in Lok Sabha on 26th August 2013.
3. The National Food Security Bill was passed in Rajya Sabha on September 02, 2013.

Food Security Programmes of India

1. Public Distribution System. – A major chunk of Government Expenditure on Food Security is spent on Food Subsidies which are implemented through the Targeted Public Distribution System.
2. Mid Day Meal Scheme
3. Integrated child development services scheme.

The food management system and food price policy, to ensure food security in India thus consists of three major instruments,

1. Procurement at minimum support prices,
2. The maintenance of buffer stocks, and the
3. Public Distribution System.

Food Subsidy in India – Implementation

Food Security of beneficiaries is ensured by distributing food grains at subsidized prices through the Targeted Public Distribution System (TPDS). It protects them from price volatility due to inflation. Over the years, while the spending on food subsidy has increased, the ratio of people below the poverty line has decreased.

The Ministry of Consumer Affairs, Food, and Public Distribution is the nodal ministry for the implementation of food subsidy. This Ministry has 2 Departments which are given below

1. Department of Food and Public Distribution
2. Department of Consumer Affairs

98% of this Ministry's budget is allocated to the Department of Food and Public Distribution.

Minimum Support Price and Buffer Stock

Minimum Support Price:

The Food Corporation of India (FCI) purchases wheat and rice from the farmers in states where there is surplus production. The farmers are paid a pre-announced price for their crops. This price is called Minimum Support Price (MSP). The MSP is declared by the government every year before the sowing season to provide incentives to the farmers for raising the production of these crops.

Procurement prices in India

Centralized Procurement System

Under Centralized Procurement System, the procurement of foodgrains in Central Pool are undertaken either by FCI directly or State Government agencies procures the foodgrains and handover the stocks to FCI for storage and subsequent issue against GOI allocations in the same State or movement of surplus stocks to other States. The cost of the foodgrains procured by State agencies is reimbursed by FCI as soon as the stocks are delivered to FCI as per cost-sheets issued by GOI.

Decentralized Procurement System (DCP)

The scheme of Decentralized Procurement of foodgrains was introduced by the Government in 1997-98 with a view to enhancing the efficiency of procurement and PDS and encouraging local procurement to the maximum extent thereby extending the benefits of MSP to local farmers as well as to save on transit costs. This also enables procurement of foodgrains more suited to the local taste.

Under this scheme, the State Government itself undertakes direct purchase of paddy/rice and wheat and also stores and distributes these foodgrains under NFSA and other welfare schemes. The Central Government undertakes to meet the entire expenditure incurred by the State Governments on the procurement operations as per the approved costing. The Central Government also monitors the quality of foodgrains procured under the scheme and reviews the arrangements made to ensure that the procurement operations are carried smoothly.

Buffer Stock

Buffer stock is the stock of foodgrains, namely wheat and rice procured by the government through Food Corporation of India (FCI). This buffer stock is created in order to distribute foodgrains in the deficit areas and among the poorer strata of society at a price lower than the market price.

Issue Price:

The food grains stored in granaries are distributed in the deficit areas and among the poorer strata of society at a price lower than the market price known as issue price.

Fair Price Shops:

Fair price shops are ration shops that keep stock of foodgrains, sugar, kerosene oil for cooking. These items are sold to people at a price lower than market price These are government sponsored shops.

Market Intervention Scheme

- MIS is a price support mechanism implemented on the request of State Governments for the procurement of perishable and horticultural commodities in the event of a fall in market prices.
- It is implemented when there is at least a 10% increase in production or a 10% decrease in the ruling rates over the previous normal year.
- MIS works in a similar fashion to Minimum Support Price based procurement mechanism for food grains but is an ad-hoc mechanism.
- Its objective is to protect the growers of these horticultural/agricultural commodities from making distress sale in the event of the bumper crop.
- Under MIS, support can be provided in some years, for a limited but defined period, in specified critical markets and by purchasing specified quantities. The initiative has to emerge from the concerned state.

Price stabilization fund

Price Stabilisation Fund is any fund created to absorb extreme volatility in selected commodity prices. The sum in the fund is usually used for activities aimed at bringing down/up the high/low prices say, for example, acquisition of certain goods and distribution of the same as and when appropriate so that costs remain within a range.
The PSF scheme provides for the advancement of interest-free loans to State Governments/Union Territories (UTs) and Central Agencies to finance their working capital and other expenses, which they may incur in the procurement and distribution of such commodities.
Consequently, the actual use of the fund depends on the willingness of the governments of the state/union territories to use such loans for these purposes.
Furthermore, the actual identification of the time in which assistance is needed and the implementation of the price support measures are left to the states.

National Food Security and Agriculture Market

Commission for Agricultural Costs and Prices –

Introduction

The Commission for Agricultural Costs and Prices (CACP) was initially known as the Agricultural Prices Commission. It was renamed the Commission for Agricultural Costs and Prices in 1985.

- It is a statutory panel under the Ministry of Agriculture & Farmers' Welfare, Government of India.
- The CACP is an expert body that recommends the MSPs of the notified Kharif and Rabi crops to the **Cabinet Committee on Economic Affairs (CCEA)**.
- **The objective of the Commission:** The Commission was established to recommend Minimum Support Prices (MSPs), to motivate cultivators and farmers to adopt the latest technology in order to optimize the use of resources and increase productivity.
- However, its suggestions are not binding on the Government.

Commission for Agricultural Costs and Prices Composition

The CACP is currently composed of five people. It consists of:

1. A Chairman
2. Member Secretary
3. One Official Member
4. Two Non-Official Members

The two non-official members are usually representatives of the farming community and have an active association with the farming community.

National food security, 2013

National Food Security Act 2013 extends to whole of India and it was to be rolled out by the states within one year of its enactment. But, majority of the states were not able to do this mainly because it required computerization of the beneficiaries lists as a prerequisite. Currently, some 14-15 states have rolled out the act; and the last date to roll out the act is fixed 30th September 2015 by Union Government. This deadline has been extended from time to time.

Short Term Loans

A short-term loan is usually for 1 to 2 years. A short-term loan is often required to meet the day-to-day business needs or the working capital requirements of a business. There are several sources of short-term loans, including a loan from a Commercial bank, Trade Credit, Discounting Bills of Exchange, Factoring, and more.

Short-term loans carry a higher interest rate when compared to the long-term loan. Also, it may involve even weekly repayment if the term of the loan is very short. It is a general rule – shorter the term, and the easier a loan is to get, the higher is the interest rate. One must be very careful when going for this type of term loan as it not only involves a higher interest rate, charges may also be on the higher side if you default on repayments.

Medium-Term Loans

A medium-term loan is usually for a period of 2 to 5 years and can be said to be a hybrid of short and long-term loans. Such a loan is often taken for carrying repair or renovation of the fixed asset. For example, modernizing a showroom.

A medium-term loan is usually skipped when talking about the types of terms loans as people may go straight to the long-term loan after discussing the short-term loan. However, it is better to keep the duration of 2 to 5 years under medium-term as terms and condition for such a period is somewhat different from the long-term loan. Like, the interest rate is comparatively higher, while the documentation part is easier when compared to the long-term loans.

Long Term Loans

These types of term loans are for more than five years. Most of the long-term loans are secured, for instance, home loans, car loans, loans against property. Since the loan is secured, the rate of interest is also lower. However, it can be unsecured as well. In an unsecured loan, no collateral or asset is needed, but the rate of interest is comparatively higher as the lender bears more risk.

EMI for such a loan is also quite low as the payment is spread over a long period. A long-term loan is credit-based, so the better your credit score is, the better are the chances that you get a lower interest rate. The amount of loan will also depend on your credit history and income.

Agricultural credit in India

Agricultural credit is considered as one of the most basic inputs for conducting all agricultural development programmes. In India, there is an immense need for proper agricultural credit as Indian farmers are very poor. From the very beginning, the prime source of agricultural credit in India was moneylenders.

After independence, the Government adopted the institutional credit approach through various agencies like co-operatives, commercial banks, regional rural banks etc. to provide adequate credit to farmers, at a cheaper rate of interest. Moreover, with growing modernisation of agriculture during the post-green revolution period, the requirement of agricultural credit has increased further in recent years.

Agricultural Marketing:

Concept and Definition: The term agricultural marketing is composed of two words-agriculture and marketing. Agriculture, in the broadest sense, means activities aimed at the use of natural resources for human welfare, i.e., it includes all the primary activities of production. But, generally, it is used to mean growing and/or raising crops and livestock. Marketing connotes a series of activities involved in moving the goods from the point of production to the point of consumption. It includes all the activities involved in the creation of time, place, form and possession utility.

According to Thomsen, the study of agricultural marketing, comprises all the operations, and the agencies conducting them, involved in the movement of farm-produced foods, raw materials and their derivatives.

Essential Commodities Act, 1955:

The Act was enacted to ensure the availability of essential commodities to consumers and protect them from the exploitation of unscrupulous traders, therefore, the Act provides rules related to the regulation and control of production, pricing, and distribution of the essential commodities.
There are two main aims of this Act:
(1)To maintain or increase the supply of these essential commodities, and
(2)To secure equitable distribution and availability of these essential commodities.

According to the Essential Commodities Act, essential commodities mean any commodity specified in the schedule. Thus, there are 7 following commodities that are specified in the schedule:

- Drugs (this is used in the same sense as defined under clause **b** of **Section 3** of the Drugs and Cosmetics Act, 1940);
- Fertilizers, whether organic, inorganic or mixed;
- Foodstuffs, including edible oils and its seeds;
- Hank yarn, made wholly with cotton;
- Petroleum and its products;
- Jute, whether in the form of raw or textiles;
- Seed, whether of fruits and vegetables, of cattle fodder, or of jute.

Fertilizers and Manures

Fertilizers are any organic/inorganic, natural/synthetic material used in soil to supplement it with plant nutrients which are essential for plant's growth.

Fertilizers were another most important part of green revolution. Some points to be noted are –
1) In India per hectare Consumption around (around 146 Kg) is far lower than developed countries.
2) Indian Soils are deficient in Nitrogen and Phosphorus
3) Fertilizer can most effectively be used with ample water. So rainfed areas (deprived of irrigation) constitute 70 % of agricultural land and still they use only 20% of national Fertilizers consumption. On other hand Rabi crops are dominantly produced in Irrigated areas, so they consume about 66% of fertilizers while their share of total agri output is 33%
4) Due to rising prices of fertilizers government is promoting organic farming and organic manure.
5) India meets its 80 % requirement of Urea (N), while it is heavily dependent on Imports for its potassium (K) and phosphorus (P) fertilizer requirements.

Seeds productions

To qualify as a registered seed producer, a farmer must first register and also sign a contract agreement with the seed enterprise. List of registered growers is then forwarded to the Seed Certification Agency for field inspection and certification procedures to be followed. Apart from the registration with the seed enterprise for internal quality control purposes, the contract form is a business agreement signed between the grower and the enterprise. In the case of the SQCU, it is an administrative agreement/procedure for Seed Quality Control measures to be followed at the time of foundation seed purchases to the time of field inspections, harvesting, conditioning, testing and certification. These administrative procedures are first discussed with the grower and the contents explained by the SQCU or the enterprise during training.

Source of seed:

The seed enterprise through research recommends the variety and the class of seed to be multiplied. Seed must be obtained from an authentic source. The contracting seed enterprise will supply the registered seed grower with higher class seed than the class the farmer has been contracted to grow.

Selection of land:

The land/field must meet seed production requirements. For certification purposes, field/land requirements of the enterprise must meet the selection requirements of the SQCU. The land must be ecologically suitable.

The choice of the right nursery site is a prerequisite for proper seedling establishment, reduction in seedling damage and stuck during transplanting.

The land selected for seed production must be fertile, preferably light textured, with adequate irrigation and proper drainage system. The field should be free from weeds and volunteer plants from the previous paddy crop. The field should not be infested with serious pests and diseases.