5. Emerging Perspectives in Agriculture and Government Initiatives with Special Reference to India

CHARACTERISTICS OF INDIAN AGRICULTURE

- **Source of livelihood:**

  Agriculture is the main occupation. It provides employment to nearly 61% persons of total population. It contributes 25% to national income.

- **Dependence on monsoon:**

  Agriculture in India mainly depends on monsoon. If monsoon is good, the production will be more and if monsoon is less than average then the crops fail. Sometimes floods play havoc with our crops. As irrigation facilities are quite inadequate, the agriculture depends on monsoon.

- **Labor intensive cultivation:**

  Due is increase in population the pressure on land holding increased. Land holdings get fragmentated and subdivided and become uneconomical. Machinery and equipment can not be used on such farms.

- **Under employment:**

  Due to inadequate irrigation facilities and uncertain rainfall, the production of agriculture is less, farmers find work a few months in the year. Their capacity of work cannot be properly utilized. In agriculture there is under employment as well as disguised unemployment.

- **Small size of holdings:**

  Due to large scale sub-division and fragmentation of holdings, land holding size is quite small. Average size of land holding was 2.3 hectares in India while in Australia it was 1993 hectares and in USA it was 158 hectares.

- **Traditional methods of production:**

  In India methods of production of agriculture along with equipment are traditional. It is due is poverty and illiteracy of people. Traditional technology is the main cause of low production.

- **Low Agricultural production:**

  Agricultural production is low in India. Agriculture productivity is low in comparison to the International farm productivity. Rice, wheat, cotton productivity is much lower than in the USA, Japan, Russia. Very high pressure on land due to the high population density.

- **Dominance of food crops:**

  75% of the cultivated area is under food crops like Wheat, Rice and Bajra, while 25% of cultivated area is under commercial crops. This pattern is cause of backward agriculture.

- **Other characteristics includes,**

- Subsistent in Character
- Heavy Pressure of Population
- Predominance of Food Grains
- Mixed Cropping
- High Percentage of the Reporting Area under Cultivation
- Small Size of Holdings and Fragmentation of Fields
- Limited Intensive Agriculture
- Primitive Technology
- Indian Agriculture is Labor Intensive
- Rain-fed Agriculture
- Less Area under Leguminous and Fodder Crops
- Tradition Bound
- Low Productivity
- Government Policy
- Lack of Definite Agricultural Land Use Policy
- Lack of Marketing and Storage Facilities
- Low Status of Agriculture in the Society
- Land Tenancy
- Poverty and Indebtedness of the Farmers
- Inadequacy of Extension Service
- Inadequate Agricultural Research and Education, Training, and Extension
- Soil Erosion and Soil Degradation
- Other Characteristics and Problems

GREEN REVOLUTION

HISTORY

- The Green Revolution was an endeavor initiated by *Norman Borlaug* in the 1960s. He is known as the ***'Father of Green Revolution'*** in world.
- It led to him winning the Nobel Peace Prize in 1970 for his work in developing High Yielding Varieties (HYVs) of wheat.
- In India, the Green Revolution was mainly led by M.S. Swaminathan.
- The Green Revolution resulted in a great increase in production of food grains (especially wheat and rice) due to the introduction into developing countries of new, high-yielding variety seeds, beginning in the mid-20^{th} century.
- Its early dramatic successes were in Mexico and the Indian subcontinent.
- The Green Revolution, spreading over the period from 1967-68 to 1977-78, changed India’s status from a food-deficient country to one of the world's leading agricultural nations.
- In 1943, India suffered from the world’s worst recorded food crisis; the Bengal Famine, which led to the death of approximately 4 million people in eastern India due to hunger.

- Even after independence in 1947, until 1967 the government largely concentrated on expanding the farming areas.

  But the population was growing at a much faster rate than food production.
- This called for an immediate and drastic action to increase yield. The action came in the form of the Green Revolution.
- The green revolution in India refers to a period when Indian Agriculture was converted into an industrial system due to the adoption of modern methods and technology such as the use of HYV seeds, tractors, irrigation facilities, pesticides and fertilizers.
- It was funded by the US and the Indian Government and the Ford and Rockefeller Foundation.
- The Green Revolution in India is largely the Wheat Revolution as the wheat production increased by more than three times between 1967-68 and 2003-04, while the overall increase in the production of cereals was only two times

MERITS

- The number of greenhouse emissions can be reduced.
- It allows us to create more food than conventional methods of growing.
- It offers good yields in challenging conditions.
- It allows a decline in food costs across the globe making food economically sustainable.
- It increases the per capita income of farmers by increasing the agricultural outputs.

PROBLEMS

- Loss of soil fertility due to increased use of chemical fertilisers.
- Continuous use of groundwater for tube well irrigation has reduced the water table below the ground.
- The chemical fertilisers, easily soluble in water, can dissolve in the groundwater and pollute it.
- They can kill bacteria and other micro-organisms helpful for the soil.
- Excessive use of fertilisers can also make the soil alkaline and unfit for cultivation.
- The usage of a high quantity of pesticides and insecticides incorporated toxicity in the plants.
- In order to protect crops from different types of disease caused by pest as well as the damages caused by insects, the farmers used pesticides and insecticides at a high amount.
- The production of different varieties of one single crop was affected. It is because the green revolution program concentrated mainly on crop with varieties which were very naturally high yielding and did not consider low yielding crop varieties.
- As the water and soil from framing land are ruined either due to rain or flood, all the toxic content of pesticides and other chemicals present in the soil gets mixed with the nearby water source and it leads to the death of aquatic organisms mostly fish.

WHITE REVOLUTION

- It was launched by the Government of India after the immense success of the Green Revolution.
- It was also known as “Operation Flood Programme”.
- It was initiated by Dr. Verghese Kurien.
- It resulted in a large increase in the production of milk all over the country.
- A white revolution was initiated in India with the ambition of increasing milk production and making the country one of the largest producers of milk in the world.

➢ The objective of the White Revolution:

- Creating a flood of Milk by Increase production.
- Increase the earnings of the rural population.
- Providing milk to consumers at good prices.

➢ Features Of White Revolution:

- Adopting new techniques for animal husbandry.
- Changing the nutritional requirement and ingredients in different proportions to improve yield.

BLUE REVOLUTION

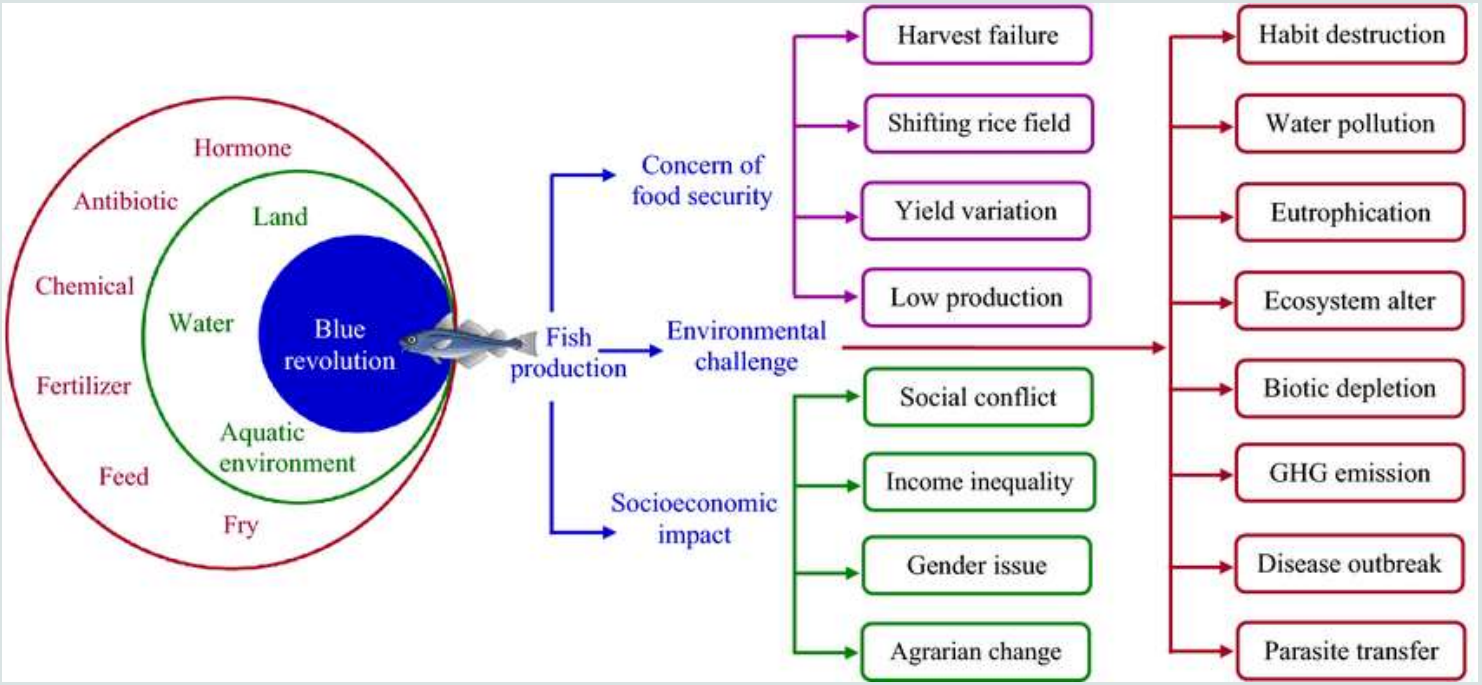
- It was launched in India during the seventh five-year plan that went from 1985 to 1990.
- It has brought improvement in aquaculture by adopting new techniques of fish breeding, fish rearing, fish marketing and fish export.
- Fishing is the primary source of livelihood for several communities in the India.
- India is the world's second largest fish producer with exports worth more than 47,000 crore rupees.
- Fisheries are in fact India's single largest agriculture export with a growth rate of 6 to 10 percent in the last five years in comparison the growth rate of the farm sector in the same period is around 2.5 percent.

➢ **Objectives:**

- To double the income of fishers with improved post-harvest marketing infrastructure, including e-commerce, technologies, and world-class entrepreneurs.
- To guarantee that fish farmers and fishermen take an active role in income generation.
- By 2020, export revenue will have tripled, with a strong emphasis on advantages that encompass institutional systems.
- To enhance the country's food and nutritional security.

CHALLENGES IN BLUE REVOLUTION:

- Concern over stagnation of production of marine fisheries.
- Resource quality issues
- Alternate demands on the same waterbody
- Water quality problems resulting from these alternate demands.
- Socio-economic issues around the resources
- Limited rights over the waterbodies
- Security and length of tenancy when these are leased
- Poaching of fish
- Techno-managerial issues
- Availability of spawn, seedlings and fingerlings on time
- Availability of necessary feed and medicines
- Access to markets and working capital.



PINK REVOLUTION

- Pink Revolution is a term used to denote the technological revolutions in the meat and poultry processing sector.
- Pink revolution is also denoted as a revolution for Onion production, pharmaceuticals and prawn production.

  Modernization is the mechanization and specialization of the standard of processes in the meat industry.
- The importers of Indian meat are Malaysia, Thailand, Vietnam, Australia, Saudi Arabia UAE, and Egypt. The major exporters of buffalo meat are Punjab, Maharashtra, and Uttar Pradesh.
- The Indian poultry industry is now worth more than 700 billion dollars. It has been growing at rates between 8-15% annually.

- The authority of the Pink revolution falls under the National Meat and Poultry Processing Board that works under the directives of the Ministry of Food Processing.
- The challenges faced by the pink revolution are as mentioned below.
  - Despite the huge livestock population in India, it accounts for only around 2% of the global market.
  - Standardizing the quality and safety aspects of meat and poultry
  - Creating standard policies for meat production and export
  - Providing meat testing facilities
  - Providing cold storages for the growth of the meat and poultry processing sector
  - Infrastructure facilities for modern slaughterhouses
  - Increased investment in the sector and more hygienic method for meat and poultry processing

PURPLE REVOLUTION

- The Ministry of Science and Technology initiated the Purple Revolution or Lavender Revolution in 2016 through the Aroma Mission of the Council of Scientific and Industrial Research (CSIR).
- It aims to promote the indigenous aromatic crop-based agro-economy by shifting from foreign aromatics to homegrown kinds.
- First-time producers were offered free lavender seedlings as part of the goal, and those who had previously produced lavender were paid Rs. 5-6 per plant.
- Lavender farming is done in nearly all of Jammu and Kashmir's 20 districts.
- The main product is Lavender oil which sells for at least Rs. 10,000 per litre
- Lavender water, which separates from lavender oil, is used to make incense sticks.
- Hydrosol, which is formed after distillation from the flowers, is used to make soaps and room fresheners

GREY REVOLUTION

- The beginning of the "grey revolution" occurred after the 1960s. The start of the grey revolution was triggered by the setbacks of the green revolution.
- The grey revolution concentrated on the use of fertilizer to accelerate development after India was successful in expanding the higher-yielding seed varieties. The grey revolution assisted in resolving several issues that the green revolution's aftermath brought forth.
- It sought to be a better version of the green revolution and address its failings.
- Sustainable food system solutions are being developed by the Agri tech startup Grey Revolution.
- In order to feed the world, it is creating a platform that enables smallholder farmers to boost yield and profitability.

OBJECTIVES OF GREY REVOLUTION

- A significant disadvantage was the fact that Punjab's rice production growth rate declined to 1.13% in 1995-96 from 9% between 1965 and 1974.
- The region under pulses experienced a considerable reduction.
- Rice farming during the summer months required an excessive amount of energy and water.
- Diseases, pests, and weeds were now more common. Biodiversity suffered significantly as a result of this.
- Urban areas now contain higher concentrations of aero-solution.
- Groundwater has been overused, which has increased the cost of pumping water and reduced profitability.
- A significant contributor to the green revolution was a decline in sanitation and related conditions.

RED REVOLUTION

- An agricultural revolution known as the "red revolution" in India focused on meat and tomatoes. The production of tomatoes and meat has seen a significant increase as a result of the red revolution.
- Vishal Tewari, the father of India's red revolution, served as its leader.
- The production of tomatoes and other main livestock products, such as meat, increased by an average of 3.1% every year as a result of this revolution.
- The change was made possible by the expansion of resources and advancements in technology, which accounted for about 66% of the growth.
- The state with the highest tomato production is Andhra Pradesh. Tomatoes grow best in India during the Kharif and Rabi seasons, which are respectively from June to September and October to February.

Agricultural Revolutions in India		
Products/Aim	**Revolution**	**Father of the Revolution**
Integration of ecological principles in technology development	Evergreen Revolution	M S Swaminathan
Higher Production (Technology-driven 2nd Green revolution)	Protein Revolution	Coined by Narendra Modi and Arun Jaitely
Oilseed Production (Especially Mustard and Sunflower)	Yellow Revolution	Sam Pitroda
Petroleum products	Black Revolution	–
Fish Production	Blue Revolution	Dr Arun Krishnan
Leather / Cocoa / Non-Conventional Products	Brown Revolution	–
Jute Production	Golden Fiber Revolution	–
Fruits / Honey Production / Horticulture Development	Golden Revolution	Nirpakh Tutej
Fertilizers	Grey Revolution	–
Onion Production / Pharmaceuticals / Prawn Production	Pink Revolution	Durgesh Patel
Egg Production / Poultry Production	Silver Revolution	Indira Gandhi (Mother of the Revolution)
Cotton	Silver Fiber Revolution	–
Meat Production / Tomato Production	Red Revolution	Vishal Tewari
Potato	Round Revolution	–
Food Grains	Green Revolution	M.S. Swaminathan
Milk Production	White Revolution	Verghese Kurien

Agriculture Revolution in India

	Black Revolution		Petroleum
	Blue Revolution		Fish
	Brown Revolution		Leather
	Golden Revolution		Fruit / Honey
	Green Revolution		Food Grains
	Grey Revolution		Fertilizer
	Pink Revolution		Onion
	Red Revolution		Meat / Tomato
	Silver Revolution		Egg / Poultry
	White Revolution		Milk / Dairy
	Yellow Revolution		Oil Seeds
	Evergreen Revolution		Overall Development

Thank You