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PROBLEMS AND CHALLENGES FACED BY INDIAN AGRICULTURE

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CERTIFICATE

This is to certify that the Project entitled **"PROBLEMS AND CHALLENGES FACED BY INDIAN AGRICULTURE SECTOR"** is genuine and bonafide work done by **K.VEERA KUMARI**, under my guidance and supervision for the submission to **St.Theresas College for Women**, Eluru under RUSA 2.0.

Project Guide

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I convey my sincere thanks to all the people concerned who have helped me directly or indirectly in successful completion of this project.

DECLARATION BY THE CANDIDATE

I hereby declare that the project report entitled "**PROBLEMS AND CHALLENGES FACED BY INDIAN AGRICULTURE SECTOR"** submitted by me to **St. Theresa's College** for Women, Eluru under RUSA 2.0 Scheme is a bonifide project work carried out by me under the guidance of **Mr. SHAIK ALISHA**, Lecturer in Commerce, Department of Commerce. I further declare that the work reported in this project has not been submitted either in part or in full, for the award of any any degree in any other institute or university.

Narsapur

Date : Signature of Candidate

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AGRICULTURE

Agriculture is the science and art of cultivating plants and livestock. Agriculture was the key development in the rise of sedentary human civilization, whereby farming of domesticated species created food surpluses that enabled people to live in cities. The history of agriculture began thousands of years ago. After gathering wild grains beginning at least 105,000 years ago, nascent farmers began to plant them around 11,500 years ago. Pigs, sheep and cattle were domesticated over 10,000 years ago. Plants were independently cultivated in at least 11 regions of the world. Industrial agriculture based on large-scale monoculture in the twentieth century came to dominate agricultural output, though about 2 billion people still depended on subsistence agriculture into the twenty-first.

Selective breeding and modern practices in animal husbandry have similarly increased the output of meat, but have raised concerns about animal welfare and environmental damage. Environmental issues include contributions to global warming, depletion of aquifers, deforestation, antibiotic resistance, and growth hormones in industrial meat production. Genetically modified organisms are widely used, although some are banned in certain countries.

The major agricultural products can be broadly grouped into foods, fibers, fuels and raw materials (such as rubber). Food classes include cereals (grains), vegetables, fruits, oils, meat, milk, fungi and eggs. Over one-third of the world's workers are employed in agriculture, second only to the service sector, although the number of agricultural workers in developed countries has decreased significantly over the centuries.

The word agriculture is derived from a Latin word- ager or agri meaning soil, and 'culture' meaning cultivation of the soil. In modern terms, agriculture comprises "the art and science of cultivating the soil, growing crops and rearing livestock."

You can consider farming to be rather a complete system which includes inputs, processing, and outputs. The inputs here are seeds, fertilizers, machinery, which then, undergoes operations like ploughing, sowing, irrigation, weeding, and harvesting. And thus, we get the final outputs like crops, dairy and poultry products.

Objectives of the Study:

- To procure knowledge about Indian Agriculture.
- To study the Problems and challenges faced by Indian Agriculture Sector.
- To know recent developments in Indian Agriculture.
- To explain the Agriculture system in India.

Methodology of the Study

This study is based on the analysis of problems & challenges faced by Indian Agriculture sector with the help of secondary source of data.

The secondary source of data are...

- Agriculture books
- Research papers
- Journals and reports on trends
- News papers,Magazines
- Relevant websites

Frame work of the Study

- Chapter one comprises theoretical view of Agriculture, objectives of the study, Methodology, frame work and limitations.
- Chapter two includes Information regarding Indian Agriculture.
- Chapter three consists of Farming Systems in India.
- Chapter four consists Importance of Indian Agriculture.
- Chapter five includes Problems and challenges faced by Indian Agriculture, Conclusion and Bibliography.

Limitations of the Study

Though the project is completed successfully but with a few limitations.

It is easy to collect secondary data, however we need to be aware of the limitations.

- The study is based on secondary data and secondary data can be general and vague.
- Limited knowledge about the Indian Agriculture in the initial stage.
- Inability to get full information from the books.
- It might be originally collected for other purpose.

INDIAN AGRICULTURE

Types of agriculture in India

Based primarily on nature of the land, climatic characteristics and available irrigational facilities, the farmers in India practice different types of farming:

1. Subsistence farming: This is one of the most popular farming techniques that can be seen in various parts of India. The farmer along with his family cultivates grains for themselves or for sale at the local market. The entire family works on the farm and most of the agricultural work is done manually here. Tradition methods of farming are followed by the farmers in their small farms. Since facilities like electricity and irrigation are generally not available to the poor farmers, they do not use fertilizers and high yielding variety of seeds in their fields to the extent they should do.

2. Shifting Agriculture: This way of farming is widely used by the tribal groups to grow crops. First the land is obtained by clearing a forested area and then crops are planted. While the land loses its fertility, another area of land is cleared and the crops are shifted there. The commonly grown crops in this type of farming are dry paddy, maize, millets and vegetables. This practice is known by different name in different regions of India. For example, it is called Jhum in Assam, Ponam in Kerala, Podu in AP and Odisha, Bewar, masha, penda, and bera in MP. But since it causes extensive soil erosion, governments have tried to discourage this practice of cultivation by tribals.

3. Plantation Agriculture: Plantations are only capable of producing a single crop which takes long time to grow. Plantation agriculture is practiced in Kerala, Assam, Karnataka, and Maharashtra. For example, rubber, tea, coffee, cocoa, spices, coconut and fruit crops like apples, grapes, oranges, etc. are grown by plantation agriculture. Since it is a capital intensive process, it requires good managerial ability, technical know-how and advanced machinery, fertilizers, irrigation, and transport facilities. It is an export-oriented agriculture and grown in plantation agriculture have a life cycle of more than two years.

4. Intensive Agriculture: In areas where irrigation has been possible, the farmers use fertilizers and pesticides on large scale to bring their land under high yielding variety of seeds. It is also known as industrial agriculture. It involves higher use of inputs such as capital and labor per unit land area. This is where it differs from traditional agriculture where the inputs per unit land are lower.

5. The first major experiment of Indian government in the field of agriculture called the Intensive Agriculture Development program (IADP) was launched in 1961 to provide loan for seeds and fertilizers to farmers. Intensive Agriculture Development program was started with the assistance of Ford Foundation.

6. Dry Agriculture: Dry land farming is practiced in the more arid and desert-like areas of the country, including northwest and central India. Crops such as gramjowar, bajra, and peas are grown in these conditions. Arid and semi-arid areas with rainfall between 750-

1150mm and lower moisture availability for crops are chosen for such cultivation.

7. Wet Agriculture: Many areas of India are affected by heavy monsoon rains and subsequent flooding. This is suitable in all the well-irrigated areas like those in the northeast India and the Western Ghats. Rice, jute, and sugarcane are cultivated in such mode of agriculture.

8. Terrace Agriculture: The hill and mountain slopes are cut to form terraces and the land is used in the same way as in permanent agriculture. Due to scarcity of the availability of flat land, terraces are made to provide small patch of level land. Soil erosion is also checked due to terrace formation on hill slopes.

Types of Crops

Did you know India is the largest producer of bananas and mangoes in the world? It is also the second largest producer of wheat and rice. Agriculture has always been the backbone of our country's economy. And ever since the Green Revolution, we have started cultivating varied types of crops. Let us educate ourselves about the most important crops grown in India.

A crop is a plant that is cultivated or grown on a large scale. Crops are generally grown so they can be commercially traded. i.e any plant that is grown and harvested extensively for profit purposes. There are two major types of crops that are grown in India. Let us take a look at these.

Kharif Crops

The word "Kharif" is Arabic for autumn since the season coincides with the beginning of autumn or winter. Kharif crops also are known as *monsoon crops*. These are the crops that are cultivated in the monsoon season. The Kharif season differs in every state of the country but is generally from June to September. These crops are usually sown at the beginning of the monsoon season around June and harvested by September or October. Rice, maize, bajra, ragi, soybean, groundnut, cotton are all Kharif types crops. Let us take a detailed look at few of these,

Browse more Topics under Crop Production And Management

- Soil Preparation and Sowing of Seeds
- Irrigation
- Manure and Fertilizers
- Protecting and Harvesting of Crops
- Storage of Crops and Food for Animals

Rice

As mentioned before, India is the second largest producer of rice in the world after China. India accounts for approximately 20% of the worlds rice production. It is arguably the most important agricultural crop that grows in the country. Rice is a staple food pan India, and its cultivation is also widespread across the country. Rice prominently grows in high rainfall areas. It requires average temperatures of 25°c and a minimum of 100 cms of rainfall. It's traditionally grown in waterlogged rice paddy fields.

Northeast plains and coastal areas are the major rice producing areas of the country.

Maize

After rice and wheat, maize is the most important cereal crop in India. It accounts for approximately one-tenth of the total agricultural produce in India. Cultivation of maize is focused in the regions of Andhra Pradesh and Karnataka. It requires temperatures in the range of 21°c to 27°c and rainfall of between 50 cms to 75 cms.

Rabi Crops

The Arabic translation of the word"Rabi" is spring. These crops' harvesting happens in the springtime hence the name. The Rabi season usually starts in November and lasts up to March or April. Rabi crops are mainly cultivated using irrigation since monsoons are already over by November. In fact, unseasonal showers in November or December can ruin the crops. The seeds are sown at the beginning of autumn, which results in a spring harvest. Wheat, barley, mustard and green peas are some of the major rabi types of crops that grow in India.

Wheat

India, being the second largest producer of wheat in the world, has a high dependency on this rabi crop for its agricultural income. Wheat is a staple food among Indians, especially in the northern regions. Wheat requires cool temperatures during its growing season in the range of about 14°c to 18°c. Rainfall of about 50 cms to 90 cms is most ideal. However, during harvesting season in the spring, wheat requires bright sunshine and

slightly warmer temperatures. Uttar Pradesh is the largest wheat growing state in India closely followed by Punjab and Haryana.

Mustard

Mustard belongs to the 'Cruciferae' family and is widely used in India for cooking purposes. Also, mustard is used to extract oil, which is edible and is predominantly used in Indian cooking. It requires a subtropical climate to grow which is a dry and cool climate. The temperature range to grow mustard is between 10°c to 25°c. Rajasthan has the largest production of mustard in India.

Zaid Crops

There is a short season between Kharif and Rabi season in the months of March to July. The crops that grow in this season are Zaid crops. These crops are grown on irrigated lands and do not have to wait for monsoons. Some examples of Zaid types of crops are pumpkin, cucumber, bitter guard.

FARMING SYSTEMS IN INDIA

Farming Systems in India are strategically utilized, according to the locations where they are most suitable. The farming systems that significantly contribute to the agriculture of India are subsistence farming, organic farming, industrial farming. Regions throughout India differ in types of farming they use; some are based on horticulture, ley farming, agroforestry, and many more. Due to India's geographical location, certain parts experience different climates, thus affecting each region's agricultural productivity differently. India is very dependent on its monsoon cycle for large crop yields. India's agriculture has an extensive background which goes back to at least 9 thousand years. In India, Agriculture was established throughout most of the subcontinent by 6000–5000 BP. During the 5th millennium BP, in the alluvial plains of the Indus River in Pakistan, the old cities of Mohenjo-Daro and Harappa experienced an apparent establishment of an organized farming urban culture.

That society, known as the Harappan or Indus civilization, flourished until shortly after 4000 BP; it was much more comprehensive than those of Egypt or Babylonia and appeared earlier than analogous societies in northern China. Currently, the country holds the second position in agricultural production in the world. In 2007, agriculture and other industries made up more than 16% of India's GDP. Despite the steady decline in agriculture's contribution to the country's GDP, agriculture is the biggest industry in the country and plays a key role in the socio-economic growth of the country. India is the second-largest producer of wheat, rice, cotton, sugarcane, silk, groundnuts, and dozens more. It is also the second biggest harvester of vegetables and fruit, representing 8.6% and 10.9% of overall production, respectively. The

major fruits produced by India are mangoes, papayas, sapota, and bananas. India also has the biggest number of livestock in the world, holding 281 million. In 2008, the country housed the second largest number of cattle in the world with 175 million.

Climate effect on farming systems

Each region in India has a specific soil and climate that is only suitable for certain types of farming. Many regions on the western side of India experience less than 50 cm of rain annually, so the farming systems are restricted to cultivate crops that can withstand drought conditions and farmers are usually restricted to single cropping. Gujarat, Rajasthan, South Punjab, and northern Maharashtra all experience this climate and each region grows such suitable crops like jowar, bajra, and peas. In contrast, the eastern side of India has an average of 100–200 cm of rainfall annually without irrigation, so these regions have the ability to double crop. West Coast, West Bengal, parts of Bihar, U.P. and Assam are all associated with this climate and they grow crops such as rice, sugarcane, jute, and many more.

There are three different types of crops that are cultivated throughout India. Each type is grown in a different season depending on their compatibility with certain weather. Kharif crops are grown at the start of the monsoon until the beginning of the winter, relatively from June to November. Examples of such crops are rice, corn, millet, groundnut, moong, and urad. Rabi crops are winter crops that are sown in October - November months and harvested in February - March. Its typical examples are wheat, boro paddy, jowar, nuts, etc. The third type is Zaid crops which are summer crops. It is sown in February - March and harvested in May - June. Its examples are aush paddy, vegetables, jute, etc.

Irrigation farming

Irrigation farming is when crops are grown with the help of irrigation systems by supplying water to land through rivers, reservoirs, tanks, and wells. Over the last century, the population of India has tripled. With a growing population and increasing demand for food, the necessity of water for agricultural productivity is crucial. India faces the daunting task of increasing its food production by over 50 percent in the next two decades, and reaching towards the goal of sustainable agriculture requires a crucial role of water. Empirical evidence suggests that the increase in agricultural production in India is mostly due to irrigation; close to three-fifths of India's grain harvest comes from irrigated land. The land area under irrigation expanded from 22.6 million hectares in FY 1950 to 59 million hectares in FY 1990. The main strategy for these irrigation systems focuses on public investments in surface systems, such as large dams, long canals, and other large-scale works that require large amounts of capital. Between 1951 and 1990, nearly 1,350 large- and medium-sized irrigation works were started, and about 850 were completed.

Problems from Irrigation

Because funds and technical expertise were in short supply, many projects moved forward at a slow pace, including The Indira Gandhi Canal project. The central government's transfer of huge amounts of water from Punjab to Haryana and Rajasthan contributed to the civil unrest in Punjab during the 1980s and early 1990s. Problems also have arisen as groundwater supplies used for irrigation face depletion. Drawing water off from one area to irrigate another often leads to increased salinity receiving water through irrigation are poorly managed or

inadequately designed; the result often is too much water and water-logged fields incapable of production.

Geography of irrigation in India

Irrigation farming is very important for crop cultivation in regions of seasonal or low rainfall. Western U.P., Punjab, Haryana, parts of Bihar, Orissa, A.P., Tamil Nadu, Karnataka, and other regions thrive on irrigation and generally practice multiple or double cropping. With irrigation, a large variety of crops can be produced such as rice, sugarcane, wheat and tobacco.[4]

Shifting cultivation

Shifting cultivation is a type of subsistence farming where a plot of land is cultivated for a few years until the crop yield declines due to soil exhaustion and the effects of pests and weeds. Once crop yield has stagnated, the plot of land is deserted and the ground is cleared by slash and burn methods, allowing the land to replenish. Crops like yarn cassava, maize, potatoes are mostly grown This type of cultivation is predominant in the eastern and north-eastern regions on hill slopes and in forest areas such as Assam, Meghalaya, Nagaland, Manipur, Tripura, Mizoram, Arunachal Pradesh, Madhya Pradesh, Orissa, and Andhra Pradesh. Crops such as rain-fed rice, corn, buck wheat, small millets, root crops, and vegetables are grown in this system. Eighty-five percent of the total cultivation in northeast India is by shifting cultivation. Due to the increasing requirement for cultivation of land, the cycle of cultivation followed by leaving land fallow has reduced from 25–30 years to 2–3 years. This significant drop in uncultivated land does not give the land enough time to return to its natural condition. Because of this, the resilience of the ecosystem has broken down and the land is increasingly deteriorating.

Shifting cultivation in Odisha

Odisha accounts for the largest area under shifting cultivation in India. Shifting cultivation is locally known as the podu cultivation. More than 30,000 square km of land (about 1/5 land surface of Odisha) is under such cultivation. Shifting cultivation is prevalent in Kalahandi, Koraput, Phulbani and other southern and western districts. Tribal communities such as Kondha, Kutia Kondha, Dongaria Kondha, Lanjia Sauras, and Paraja are all involved in this practice. Many festivals and other such rituals revolve around the podu fields because the tribals view podu cultivation as more than just a means of their livelihood, they view it as a way of life. In the first year of podu cultivation, tribals sow kandlan (variety of arhar dal). Sowing means spraying the seeds and is used at pre-monsoon time and the area is adequately protected. Yield differs from area to area depending on local climatic factors. After harvest, the land is left fallow. During the pre-monsoon, varieties of rice, corn, and ginger are also sown. Generally, after the third year, the tribals abandon this land and shift to new land. On the abandoned land, natural regeneration starts from the available rootstocks and seed banks. Bamboo comes up naturally; along with many other climbers that regenerate. Generally, this land is not cultivated for the next 10 years.

Impacts of shifting cultivation

Frequent shifting from one land to the other has affected the ecology of these regions. The area under natural forest has declined; the fragmentation of habitat, local disappearance of native species and invasion by exotic weeds and other plants are some of the other environmental consequences of shifting agriculture. Areas that have a fallow cycle of 5 to 10 years are more vulnerable to weed invasion

compared to 15-year cycles, which have more soil nutrients, a larger variety of species, and higher agronomic yield.

Commercial Agriculture

In a commercial based agriculture, crops are raised in large scale plantations or estates and shipped off to other countries for money. These systems are common in sparsely populated areas such as Gujarat, Tamil Nadu, Punjab, Haryana, and Maharashtra. Wheat, cotton, sugarcane, and corn are all examples of crops grown commercially.

Types of commercial agriculture

Intensive commercial farming: This is a system of agriculture in which relatively large amounts of capital or labor are applied to relatively smaller areas of land. It is usually practiced where the population pressure is reducing the size of landholdings. West Bengal practices intensive commercial farming.

Extensive commercial farming: This is a system of agriculture in which relatively small amounts of capital or labor investment are applied to relatively large areas of land. At times, the land is left fallow to regain its fertility. It is mostly mechanized because of the cost and availability of labor. It usually occurs at the margin of the agricultural system, at a great distance from the market or on poor land of limited potential and is usually practiced in the tarai regions of southern Nepal. Crops grown are sugarcane, rice and wheat.

Plantation agriculture: Plantation is a large farm or estate usually in a tropical or sub-tropical country where crops are grown for sale in distant markets rather than local consumption.

Commercial grain farming: This type of farming is a response to farm mechanization and it is the major type of activity in the areas of low

rainfall and low density of population where extensive farming is practiced. Crops are prone to the vagaries of weather and droughts and monoculture of wheat is the general practice.

Ley Farming

With increases in both human and animal populations in the Indian arid zone, the demand for grain, fodder, and fuelwood is increasing. Agricultural production in this region is low due to the low and uneven distribution of rainfall (100–400 mm yr"1) and the low availability of essential mineral nutrients. These demands can be met only by increasing production levels of these Aridisols through the adoption of farming technologies that improve physical properties as well as the biological processes of these soils. Alternate farming systems are being sought for higher sustainable crop production at low input levels and to protect the soils from further degradation.

In India's drylands, ley farming is used as a way to restore soil fertility. It involves rotations of grasses and food grains in a specific area. It is now being promoted even more to encourage organic farming, especially in the drylands. Ley farming acts as insurance against crop failures by frequent droughts. Structurally related physical properties and biological processes of soil often change when different cropping systems, tillage, or management practices are used. Soil fertility can be increased and maintained by enhancing natural soil biological processes. Farming provides balanced nutrition for sustainable production through continuous turnover of organic matter in the soil.

Plantation farming

This extensive commercial system is characterized by the cultivation of a single cash crop in plantations of estates on a large scale.

Because it is a capital centered system, it is important to be technically advanced and have efficient methods of cultivation and tools including fertilizers and irrigation and transport facilities. Examples of this type of farming are the tea plantations in Assam and West Bengal, the coffee plantations in Karnataka, Kerala, and Tamil Nadu, and the rubber plantations in Kerala and Maharashtra.

Forestry

In contrast to a naturally regenerated forest, tree plantations are typically grown as even-aged monocultures, primarily for timber production. These plantations are also likely to contain tree species that would not naturally grow in the area. They may include unconventional types of trees such as hybrids, and genetically modified trees are likely to be used in the future. Plantation owners will grow trees that are best suited to industrial applications such as pine, spruce, and eucalyptus due to their fast growth rate, tolerance of rich or degraded agricultural land, and potential to produce large quantities of raw material for industrial use. Plantations are always young forests in ecological terms; this means that these forests don't contain the type of growth, soil or wildlife that is typical of old-growth natural ecosystems in a forest.

The replacement of natural forests with tree plantations has also caused social problems. In some countries, there is little concern or regard for the rights of the local people when replacing natural forests with plantations. Because these plantations are made solely for the production of one material, there is a much smaller range of services for the local people. India has taken measures to avoid this by limiting the amount of land that can be owned by someone. As a result, smaller plantations are owned by local farmers who then sell the wood to larger companies.

Teak and bamboo

Teak and bamboo plantations in India are a good alternative crop solution to farmers of central India, where conventional farming is popular. Due to rising input costs of farming, many farmers have grown teak and bamboo plantations because they only require water during the first two years. Bamboo, once planted, provides the farmer with output for 50 years until it flowers. Production of these two trees positively impacts and contributes to the climate change problem in India.

Crop rotation

Crop rotation can be classified as a type of subsistence farming if there is an individual or communal farmer doing the labor and if the yield is solely for their own consumption. It is characterized by different crops being alternately grown on the same land in a specific order to have more effective control of weeds, pests, diseases, and more economical utilization of soil fertility. In India, leguminous crops are grown alternately with wheat, barley, and mustard. An ideal cropping system should use natural resources efficiently, provide stable and high returns, and avoid environmental damage.

Pearl millet

Pearl millet crop is mostly grown as a rainfed monsoon crop during kharif (June–July to September–November) and also as an irrigated hot weather (February–June) crop in central and south India. Pearl millet is often grown in rotation with sorghum, groundnut, cotton, foxtail millet, finger millet (ragi), castor, and sometimes, in the south India, with rice.

On the red and iron-rich soils of Karnataka, pearl millet and ragi rotation are practiced although pearl millet isn't always grown annually.

Cluster bean – Pearl millet crop sequence with crop residue incorporation has significantly increased the productivity in the arid zone of Western Rajasthan where Fallow – Pearl millet/Pearl millet after Pearl millet crop sequence is practiced. In Punjab, the dryland rotation may be a small grain-millet-fallow. In irrigated lands, pearl millet is rotated with chickpea, fodder sorghum, and wheat. In the dry and light soils of Rajasthan, southern Punjab and Haryana, and northern Gujarat, pearl millet is most often rotated with a pulse-like moth or mungbean, or is followed by fallow, sesame, potato, mustard, moth bean, and guar. Sesame crop may be low-yielding and may be replaced by castor or groundnut.

Dairy Farming

In 2001 India became the world leader in milk production with a production volume of 84 million tons. India has about three times as many dairy animals as the USA, which produces around 75 million tons. Dairy Farming is generally a type of subsistence farming system in India, especially in Haryana, the major producer of milk in the country. More than 40% of Indian farming households are engaged in milk production because it is a livestock enterprise in which they can engage with relative ease to improve their livelihoods. Regular milk sales allow them to move from subsistence to earning a market-based income. The structure of the livestock industry is globally changing and putting poorer livestock producers in danger because they will be crowded out and left behind. More than 40 million households in India are at least partially dependent on milk production, and developments in the dairy sector will have important repercussions on their livelihoods and on rural poverty levels. Haryana was chosen to assess possible developments in the Indian dairy sector and to broadly identify areas of interventions that favor small-scale

dairy producers. A methodology developed by the International Farm Comparison Network (IFCN) examined impacts of change on milk prices, farm management and other market factors that affect the small-scale milk production systems, the whole farm and related household income.

Co-operative farming

Co-operative farming refers to the pooling of farming resources such as fertilizers, pesticides, farming equipment such as tractors. It however generally excludes pooling of land unlike in collective farming where pooling of land is also done. Co-operative farming is a relatively new system in India. Its goal is to bring together all of the land resources of farmers in such an organized and united way so that they will be collected in a position to grow crops on every bit of land to the best of the fertility of the land. This system has become an essential feature of India's Five Year Plans. There is immense scope for co-operative farming in India although the movement is as yet in it infancy. The progress of co-operative financing in India has been very slow. The reasons are fear of unemployment, attachment to the land, lack of proper propaganda renunciation of membership by farmers and the existence of fake societies.

IMPORTANCE & ROLE OF INDIAN AGRICULTURE

Role of Agriculture in India

seven important roles of Indian agriculture are

1. Contribution to National Income:

From the very beginning, agriculture is contributing a major portion to our national income. In 1950-51, agriculture and allied activities contributed about 59 per cent of the total national income. Although the share of agriculture has been declining gradually with the growth of other sectors but the share still remained very high as compared to that of the developed countries of the world. For example, the share of agriculture has declined to 54 per cent in 1960-61, 48 per cent in 1970-71, 40 per cent in 1980-81 and then to 18.0 per cent in 2008-09, whereas in U.K. and U.S.A. agriculture contributes only 3 per cent to the national income of these countries.

2. Source of Livelihood:

In India over two-thirds of our working population are engaged directly on agriculture and also similarly depend for their livelihood. According to an estimate, about 66 per cent of our working population is engaged in agriculture at present in comparison to that of 2 to 3 per cent in U.K. and U.S.A., 6 per cent in France and 7 per cent in Australia. Thus the employment pattern of our country is very much common to other under-developed countries of the world.

3. Source of Food Supply:

Agriculture is the only major source of food supply as it is providing regular supply of food to such a huge size of population of our

country. It has been estimated that about 60 per cent of household consumption is met by agricultural products.

4. Role of Agriculture for Industrial Development:

Agriculture in India has been the major source of supply of raw materials to various important industries of our country. Cotton and jute textiles, sugar, vanaspati, edible oil plantation industries (viz. tea, coffee, rubber) and agro-based cottage industries are also regularly collecting their raw materials directly from agriculture.

About 50 per cent of income generated in the manufacturing sector comes from all these agro-based industries in India. Moreover, agriculture can provide a market for industrial products as increase in the level of agricultural income may lead to expansion of market for industrial products.

5. Commercial Importance:

Indian Agriculture is playing a very important role both in the internal and external trade of the country. Agricultural products like tea, coffee, sugar, tobacco, spices, cashew-nuts etc. are the main items of our exports and constitute about 50 per cent of our total exports. Besides manufactured jute, cotton textiles and sugar also contribute another 20 per cent of the total exports of the country. Thus nearly 70 per cent of India's exports are originated from agricultural sector. Further, agriculture is helping the country in earning precious foreign exchange to meet the required import bill of the country.

6. Source of Government Revenue:

Agriculture is one of the major sources of revenue to both the Central and State Governments of the country. The Government is getting

a substantial income from rising land revenue. Some other sectors like railway, roadways are also deriving a good part of their income from the movement of agricultural goods.

7. Role of Agriculture in Economic Planning:

The prospect of planning in India also depends much on agricultural sector. A good crop always provides impetus towards a planned economic development of the country by creating a better business climate for the transport system, manufacturing industries, internal trade etc.

A good crop also brings a good amount of finance to the Government for meeting its planned expenditure. Similarly, a bad crop lead to a total depression in business of the country, which ultimately lead to a failure of economic planning. Thus the agricultural sector is playing a very important role in a country like India and the prosperity of the Indian economy still largely depends on agricultural sector. Thus from the foregoing analysis it is observed that agricultural development is the basic precondition of sectoral diversification and development of the economy.

An increasing marketable surplus of agricultural output is very much essential in India for:

(i) Increasing supply of food and raw materials at non-inflationary prices;

(ii) Widening the domestic market for industrial products through higher purchasing capacities in the rural sector;

(iii) Facilitating inter-sectoral transfers of capital needed for industrial development along-with infra-structural development;

(iv) Increasing foreign exchange earnings through increasing volume of agricultural exports.

Importance of Agriculture

Agriculture is not only important but it also provides a base for development. In India, the agricultural sector occupies a vital position in the overall economy of the country as follows:

i. Share of Agriculture in National Income:

Agriculture has got a prime role in Indian economy. Though the share of agriculture in national income has come down, still it has a substantial share in GDP. The contributory share of agriculture in Gross Domestic Product was 55.4 percent in 1950-51, 52 percent in 1960-61 and is reduced to 18.5 percent only at present. The share of the agricultural sector's capital formation in GDP has declined from 2.2 percent in the late-1999s to 1.9 per cent in 2005-06.

ii. Important Contribution to Employment:

Agriculture sector, at present, provides livelihood to 65 to 70 per cent of the total population. The sector provides employment to 58.4 per cent of country's workforce and is the single largest private sector occupation.

iii. Important Source of Industrial Development:

Various important industries in India find their raw material from agriculture sector -cotton and jute textile industries, sugar, vanaspati, etc. are directly dependent on agriculture. Handlooms, spinning oil milling, rice thrashing, etc. are various small scale and cottage industries, which are dependent on agriculture sector for their raw material. This highlights the importance of agriculture in industrial development of the nation.

iv. Importance in International Trade:

India's foreign trade is deeply associated with agriculture sector. Agriculture accounts for about 14.7 per cent of the total export earnings. Besides, goods made with the raw material of agriculture sector also contribute about 20 per cent in Indian exports. In other words, agriculture and its related goods contribute about 38 per cent in total exports of country.

In short, agriculture occupies a central place in the Indian economy. Its performance sets the pace of growth in the economy as a whole. It should, however, be noted that Indian agriculture is still in the state of backwardness, the per capita productivity in agriculture is less than in industry.

PROBLEMS FACED BY INDIAN AGRICULTURE

Here we detail about the major problems faced by Indian agriculture.

- **Inequality in Land Distribution:**

The distribution of agricultural land in India has not been fairly distributed. Rather there is a considerable degree of concentration of land holding among the rich landlords, farmers and money lenders throughout the country. But the vast majority of small farmers own a very small and uneconomic size of holdings, resulting to higher cost per units. Moreover, a huge number of landless cultivators has been cultivating on the land owned by the absentee landlords, leading to lack of incentives on the part of these cultivators.

- **Land Tenure System:**

The land tenure system practiced in India is suffering from lot of defects. Insecurity of tenancy was a big problem for the tenants, particularly during the pre- independence period. Although the land tenure system has been improving during the post-independence period after the introduction of various land reforms measures but the problem of insecurity of tenancy and eviction still prevails to some extent due to the presence of absentee landlords and benami transfer of land in various states of the country.

- **Sub-division and Fragmentation of holdings:**

In India, the average size of holding is expected to decline from 1.5 hectares in 1990-91 to 1.3 hectares in 2000-01. Thus the size of agricultural holding is quite uneconomic, small and fragmented. There is continuous sub-division and fragmentation of agricultural land due to

increasing pressure of population and breakdown of the joint family system and also due to forced selling of land for meeting debt repayment obligations. Thus the size of operational holdings has been declining year by year leading to increase in the number of marginal and small holdings and fall in the number of medium and large holdings.

- **Cropping Pattern:**

The cropping pattern which shows the proportion of the area under different crops at a definite point of time is an important indicator of development and diversification of the sector. Food crops and non-food or cash crops arc the two types of crops produced by the agricultural sector of the country.

As the prices of the cash crops are becoming more and more attractive therefore, more and more land have been diverted from the production of food crops into cash or commercial crops. This has been creating the problem of food crisis in the country. Thus after 50 years planning the country has failed to evolve a balanced cropping pattern leading to faulty agricultural planning and its poor implementation.

- **Instability and Fluctuations:**

Indian agriculture is continuously subjected to instability arising out of fluctuations in weather and gamble of monsoon. As a result, the production of food-grains and other crops fluctuates widely leading to continuous fluctuation of prices of agricultural crops. This has created the element of instability in the agricultural operation of the country.

- **Conditions of Agricultural Labourers:**

Agricultural labourers are the most exploited unorganized class in the rural population of the country. From the very beginning landlords

and Zamindars exploited these labourers for their benefit and converted some of them as slaves or bonded labourers and forced to continue the system generation after generation. All these led to wretched condition and total deprivation of the rural masses.

After 50 years of independence, the situation has improved marginally. But as they remain unorganized, thus economic exploitation of these workers continues. The level of income, the standard of living and the rate of wages remained abnormally low.

Total number of agricultural workers has increased from 55.4 million in 1981 to 74.6 million in 1991 which constituted nearly 23.5 per cent of the total working population of the country. This increasing number has been creating the problem of surplus labour or disguised unemployment, which in turn is pushing (heir wage rates below the subsistence level.

- **Poor Farming Techniques and Agricultural Practices:**

The farmers in India have been adopting orthodox and inefficient method and technique of cultivation. It is only in recent years that the Indian farmers have started to adopt improved implements like steel ploughs, seed drills, barrows, hoes etc. to a limited extent only. Most of the farmers were relying on centuries old. Wooden plough and other implements. Such adoption of traditional methods is responsible for low agricultural productivity in the country.

- **Inadequate Use of Inputs:**

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- **Inadequate Use of Inputs:**

Indian agriculture is suffering from inadequate use of inputs like fertilizers and HYV seeds. Indian farmers are not applying sufficient quantity of fertilizers on their lands and even the application of farm yard dung manure is also inadequate. Indian farmers are still applying seeds of indifferent quality. They have no sufficient financial ability to purchase

good quality high yielding seeds. Moreover, the supply of HYV seeds is also minimum in the country.

- **Inadequate Irrigation Facilities:**

Indian agriculture is still suffering from lack of assumed and controlled water supply through artificial irrigation facilities. Thus the Indian farmers have to depend much upon rainfall which is neither regular nor even. Whatever irrigation potential that has been developed in our country, a very limited number of our farmers can avail the facilities.

In spite of vigorous programme of major and minor irrigation projects undertaken since 1951, the proportion of irrigated land to total cropped area now comes to about 53 per cent in 1998-99. Therefore, in the absence of assured and controlled water supply, the agricultural productivity in India is bound to be low.

- **Absence of Crop Rotation:**

Proper rotation of crops is very much essential for successful agricultural operations as it helps to regain the fertility of the soil. Continuous production of cereals on the same plot of land reduces the fertility of the soil which may be restored if other crops like pulses, vegetables etc. are grown there. As the farmers are mostly illiterate, they are not very much conscious about the benefit of crop rotation. Therefore, land loses its fertility to a considerable extent.

- **Lack of Organized Agricultural Marketing:**

Indian farmers are facing the problem of low income from their marketable surplus crops in the absence of proper organized markets and adequate transportation facilities. Scattered and sub-divided holdings are also creating serious problem for marketing their products.

Agricultural marketing in India is also facing the problem of marketing farmers' produce in the absence of adequate transportation and communication facilities, Therefore, they fell into the clutches of middlemen for the speedy disposal of their crops at an uneconomic and cheaper price.

- **Instability in Agricultural Prices:**

Fluctuation in the prices of agricultural products poses a big threat to Indian agriculture. For the interest of the farmers, the Government should announce the policy of agricultural price support so as to contain a reasonable income from agricultural practices along with providing incentives for its expansion. Stabilization of prices is not only important for the growers but also for the consumers, exporters, agro-based industries etc.

In India, the movements of prices of agricultural products are neither smooth nor uniform, leading a fluctuating trend. In the absence of proper price support and marketing support, prices of agricultural products has to go down beyond the reasonable limit so as to create a havoc on the financial conditions of the farmers.

Again the exorbitant prices charged by the middlemen on agricultural crops also pose a serious threat to the consumers. Thus price, fluctuation may lead to disaster as both falling and rising prices of agricultural crops are having its harmful impact on the society as well as on the economy of the country.

- **Agricultural Indebtedness:**

One of the greatest problems of Indian agriculture is its growing indebtedness. The rural people are borrowing a heavy amount of loan

regularly for meeting their requirements needed for production, consumption and also for meeting their social commitments. Thus the debt passes from generation to generation. Indian farmers fall into the debt trap as a result of crop failure, poor income arising out of low prices of crops, exorbitantly high rate of interest charged by the moneylenders, manipulation and use of loan accounts by the moneylenders and use of loan for various unproductive social purposes.

- **Small and fragmented land-holdings:**

The seemingly abundance of net sown area of 141.2 million hectares and total cropped area of 189.7 million hectares (1999-2000) pales into insignificance when we see that it is divided into economically unviable small and scattered holdings.

The average size of holdings was 2.28 hectares in 1970-71 which was reduced to 1.82 hectares in 1980-81 and 1.50 hectares in 1995-96. The size of the holdings will further decrease with the infinite Sub-division of the land holdings.

The problem of small and fragmented holdings is more serious in densely populated and intensively cultivated states like Kerala, West Bengal, Bihar and eastern part of Uttar Pradesh where the average size of land holdings is less than one hectare and in certain parts it is less than even 0.5 hectare.

Rajasthan with vast sandy stretches and Nagaland with the prevailing 'Jhoom' (shifting agriculture) have larger average sized holdings of 4 and 7.15 hectares respectively. States having high percentage of net sown area like Punjab, Haryana, Maharashtra, Gujarat,

Karnataka and Madhya Pradesh have holding size above the national average.

Further it is shocking to note that a large proportion of 59 per cent holdings in 1990- 91 were marginal (below 1 hectare) accounting for 14.9 per cent of the total operated area. Another 19 per cent were small holdings (1-2 hectare) taking up 17.3 per cent of the total operated area.

Large holdings (above 10 hectare) accounted for only 1.6 per cent of total holdings but covered 17.4 per cent of the operated area (Table 22.1). Hence, there is a wide gap between small farmers, medium farmers (peasant group) and big farmers (landlords).

The main reason for this sad state of affairs is our inheritance laws. The land belonging to the father is equally distributed among his sons. This distribution of land does not entail a collection or consolidated one, but its nature is fragmented.

Different tracts have different levels of fertility and are to be distributed accordingly. If there are four tracts which are to be distributed between two sons, both the sons will get smaller plots of each land tract. In this way the holdings become smaller and more fragmented with each passing generation.

Sub-division and fragmentation of the holdings is one of the main causes of our low agricultural productivity and backward state of our agriculture. A lot of time and labour is wasted in moving seeds, manure, implements and cattle from one piece of land to another.

Irrigation becomes difficult on such small and fragmented fields. Further, a lot of fertile agricultural land is wasted in providing

boundaries. Under such circumstances, the farmer cannot concentrate on improvement.

The only answer to this ticklish problem is the consolidation of holdings which means the reallocation of holdings which are fragmented, the creation of farms which comprise only one or a few parcels in place of multitude of patches formerly in the possession of each peasant.

But unfortunately, this plan has not succeeded much. Although legislation for consolidation of holdings has been enacted by almost all the states, it has been implemented only in Punjab, Haryana and in some parts of Uttar Pradesh.

Consolidation of about 45 million holdings has been done till 1990-91 in Punjab, Haryana and western Uttar Pradesh. The other solution to this problem is cooperative farming in which the farmers pool their resources and share the profit.

- **Seeds:**

Seed is a critical and basic input for attaining higher crop yields and sustained growth in agricultural production. Distribution of assured quality seed is as critical as the production of such seeds. Unfortunately, good quality seeds are out of reach of the majority of farmers, especially small and marginal farmers mainly because of exorbitant prices of better seeds.

In order to solve this problem, the Government of India established the National Seeds Corporation (NSC) in 1963 and the State Farmers Corporation of India (SFCI) in 1969. Thirteen State Seed Corporations (SSCs) were also established to augment the supply of improved seeds to the farmers.

High Yielding Variety Programme (HYVP) was launched in 1966-67 as a major thrust plan to increase the production of food grains in the country.

The Indian seed industry had exhibited impressive growth in the past and is expected to provide further potential for growth in agricultural production: The role of seed industry is not only to produce adequate quantity of quality seeds but also to achieve varietal diversity to suit various agro-climatic zones of the country.

The policy statements are designed towards making available to the Indian farmer, adequate quantities of seed of superior quality at the appropriate time and place and at an affordable price so as to meet the country's food and nutritional security goals.

Indian seeds programme largely adheres to limited generation system for seed multiplication. The system recognises three kinds of generation, namely breeder, foundation and certified seeds. Breeder seed is the basic seed and first stage in seed production. Foundation seed is the second stage in seed production chain and is the progeny of breeder seed.

Certified seed is the ultimate stage in seed production chain and is the progeny of foundation seed. Production of breeder and foundation seeds and certified seeds distribution have gone up at an annual average rate of 3.4 per cent, 7.5 per cent and 9.5 per cent respectively, between 2001-02 and 2005-06).

- **Manures, Fertilizers and Biocides:**

Indian soils have been used for growing crops over thousands of years without caring much for replenishing. This has led to depletion and exhaustion of soils resulting in their low productivity. The average yields

of almost all the crops are among t e lowest in the world. This is a serious problem which can be solved by using more manures and fertilizers.

Manures and fertilizers play the same role in relation to soils as good food in relation to body. Just as a well-nourished body is capable of doing any good job, a well nourished soil is capable of giving good yields. It has been estimated that about 70 per cent of growth in agricultural production can be attributed to increased fertilizer application.

Thus increase in the consumption of fertilizers is a barometer of agricultural prosperity. However, there are practical difficulties in providing sufficient manures and fertilizers in all parts of a country of India's dimensions inhabited by poor peasants. Cow dung provides the best manure to the soils.

But its use as such is limited because much of cow dung is used as kitchen fuel in the shape of dung cakes. Reduction in the supply of fire wood and increasing demand for fuel in the rural areas due to increase in population has further complicated the problem. Chemical fertilizers are costly and are often beyond the reach of the poor farmers. The fertilizer problem is, therefore, both acute and complex.

It has been felt that organic manures are essential for keeping the soil in good health. The country has a potential of 650 million tonnes of rural and 160 lakh tonnes of urban compost which is not fully utilized at present. The utilization of this potential will solve the twin problem of disposal of waste and providing manure to the soil.

The government has given high incentive especially in the form of heavy subsidy for using chemical fertilizers. There was practically no use of chemical fertilizers at the time of Independence As a result of initiative

by the government and due to change in the attitude of some progressive farmers, the consumption of fertilizers increased tremendously.

In order to maintain the quality of the fertilizers, 52 fertilizer quality control laboratories have been set up in different parts of the country. In addition, there is one Central Fertilizer Quality Control and Training Institute at Faridabad with its three regional centres at Mumbai, Kolkata and Chennai.

Pests, germs and weeds cause heavy loss to crops which amounted to about one third of the total field produce at the time of Independence. Biocides (pesticides, herbicides and weedicides) are used to save the crops and to avoid losses. The increased use of these inputs has saved a lot of crops, especially the food crops from unnecessary wastage. But indiscriminate use of biocides has resulted in wide spread environmental pollution which takes its own toll.

- **Irrigation:**

Although India is the second largest irrigated country of the world after China, only one-third of the cropped area is under irrigation. Irrigation is the most important agricultural input in a tropical monsoon country like India where rainfall is uncertain, unreliable and erratic India cannot achieve sustained progress in agriculture unless and until more than half of the cropped area is brought under assured irrigation.

This is testified by the success story of agricultural progress in Punjab Haryana and western part of Uttar Pradesh where over half of the cropped area is under irrigation! Large tracts still await irrigation to boost the agricultural output.

However, care must be taken to safeguard against ill effects of over irrigation especially in areas irrigated by canals. Large tracts in Punjab and Haryana have been rendered useless (areas affected by salinity, alkalinity and water-logging), due to faulty irrigation. In the Indira Gandhi Canal command area also intensive irrigation has led to sharp rise in sub-soil water level, leading to water-logging, soil salinity and alkalinity.

- **Lack of mechanisation:**

In spite of the large scale mechanisation of agriculture in some parts of the country, most of the agricultural operations in larger parts are carried on by human hand using simple and conventional tools and implements like wooden plough, sickle, etc.

Little or no use of machines is made in ploughing, sowing, irrigating, thinning and pruning, weeding, harvesting threshing and transporting the crops. This is specially the case with small and marginal farmers. It results in huge wastage of human labour and in low yields per capita labour force.

There is urgent need to mechanise the agricultural operations so that wastage of labour force is avoided and farming is made convenient and efficient. Agricultural implements and machinery are a crucial input for efficient and timely agricultural operations, facilitating multiple cropping and thereby increasing production.

Some progress has been made for mechanising agriculture in India after Independence. Need for mechanisation was specially felt with the advent of Green Revolution in 1960s. Strategies and programmes have been directed towards replacement of traditional and inefficient

implements by improved ones, enabling the farmer to own tractors, power tillers, harvesters and other machines.

A large industrial base for manufacturing of the agricultural machines has also been developed. Power availability for carrying out various agricultural operations has been increased to reach a level of 14 kW per hectare in 2003-04 from only 0.3 kW per hectare in 1971-72.

This increase was the result of increasing use of tractor, power tiller and combine harvesters, irrigation pumps and other power operated machines. The share of mechanical and electrical power has increased from 40 per cent in 1971 to 84 per cent in 2003-04.

Uttar Pradesh recorded the highest average sales of tractors during the five year period ending 2003-04 and/West Bengal recorded the highest average sales of power tillers during the same period.

Strenuous efforts are being made to encourage the farmers to adopt technically advanced agricultural equipments in order to carry farm operations timely and precisely and to economise the agricultural production process.

- **Soil erosion:**

Large tracts of fertile land suffer from soil erosion by wind and water. This area must be properly treated and restored to its original fertility.

- **Agricultural Marketing:**

Agricultural marketing still continues to be in a bad shape in rural India. In the absence of sound marketing facilities, the farmers have to

depend upon local traders and middlemen for the disposal of their farm produce which is sold at throw-away price.

In most cases, these farmers are forced, under socio-economic conditions, to carry on distress sale of their produce. In most of small villages, the farmers sell their produce to the money lender from whom they usually borrow money.

According to an estimate 85 per cent of wheat and 75 per cent of oil seeds in Uttar Pradesh, 90 per cent of Jute in West Bengal, 70 per cent of oilseeds and 35 per cent of cotton in Punjab is sold by farmers in the village itself. Such a situation arises due to the inability of the poor farmers to wait for long after harvesting their crops.

In order to meet his commitments and pay his debt, the poor farmer is forced to sell the produce at whatever price is offered to him. The Rural Credit Survey Report rightly remarked that the producers in general sell their produce at an unfavourable place and at an unfavourable time and usually they get unfavourable terms.

In the absence of an organised marketing structure, private traders and middlemen dominate the marketing and trading of agricultural produce. The remuneration of the services provided by the middlemen increases the load on the consumer, although the producer does not derive similar benefit.

Many market surveys have revealed that middlemen take away about 48 per cent of the price of rice, 52 per cent of the price of grounduts and 60 per cent of the price of potatoes offered by consumers.

In order to save the farmer from the clutches of the money lenders and the middle men, the government has come out with regulated markets. These markets generally introduce a system of competitive buying, help in eradicating malpractices, ensure the use of standardised weights and measures and evolve suitable machinery for settlement of disputes thereby ensuring that the producers are not subjected to exploitation and receive remunerative prices.

- **Inadequate storage facilities:**

Storage facilities in the rural areas are either totally absent or grossly inadequate. Under such conditions the farmers are compelled to sell their produce immediately after the harvest at the prevailing market prices which are bound to be low. Such distress sale deprives the farmers of their legitimate income.

The Parse Committee estimated the post-harvest losses at 9.3 per cent of which nearly 6.6 per cent occurred due to poor storage conditions alone. Scientific storage is, therefore, very essential to avoid losses and to benefit the farmers and the consumers alike.

At present there are number of agencies engaged in warehousing and storage activities. The Food Corporation of India (F.C.I.), the Central Warehousing Corporation (C.W.C.) and State Warehousing Corporation are among the principal agencies engaged in this task. These agencies help in building up buffer stock, which can be used in the hour of need. The Central Government is also implementing the scheme for establishment of national Grid of Rural Godowns since 1979-80.

This scheme provides storage facilities to the farmers near their fields and in particular to the small and marginal farmers. The Working

Group on additional storage facilities in rural areas has recommended a scheme of establishing a network of Rural Storage Centres to serve the economic interests of the farming community.

- **Inadequate transport:**

One of the main handicaps with Indian agriculture is the lack of cheap and efficient means of transportation. Even at present there are lakhs of villages which are not well connected with main roads or with market centres.

- **Scarcity of capital:**

Agriculture is an important industry and like all other industries it also requires capital. The role of capital input is becoming more and more important with the advancement of farm technology. Since the agriculturists' capital is locked up in his lands and stocks, he is obliged to borrow money for stimulating the tempo of agricultural production.

The main suppliers of money to the farmer are the money-lenders, traders and commission agents who charge high rate of interest and purchase the agricultural produce at very low price. All India Rural Credit Survey Committee showed that in 1950-51 the share of money lenders stood at as high as 68.6 per cent of the total rural credit and in 1975-76 their share declined to 43 per cent of the credit needs of the farmers.

Problem Relating to Rain-fed Crops:

In respect of rain-fed crops such as coarse grains-poor men food-specially pulses, constraints on raising production are well-known.

These are:

i. An effective set of fully-developed technologies and extension methodology requires to be devised.

ii. High degree of uncertainty together with the relative poverty of the farmers makes the application of even known improved practices difficult and risky.

iii. The rural poor, particularly in the drought-prone areas and in remote areas of the country, continue to suffer from fluctuations in employment and income and inadequate availability of food grains in years of drought.

Problems relating to the Use of Farm Inputs:

i. In regard to irrigation, through the area has shown a good improvement, the flow of benefit has not been commensurate. This is reflected both in the low intensity of cropping and in the under utilisation of the potential created. The efficiency in the use of irrigation facilities also leaves much to be desired. In view of this, the productivity of irrigated land in the country is less than 50 per cent of the potential.

ii. India has not been able to reach the targeted levels in the consumption of fertilisers. Even more important than the quantity consumed is the efficiency in the use of fertilisers. This has not been the case in the recent past, although there is a growing awareness of the problem. Besides this, the pattern of fertiliser consumption in the country is very highly skewed. In certain regions, a few crops and the rabi season account for the bulk of the fertiliser use.

iii. Recent plans have stressed the need for equitable and efficient distribution system, reduction in regional disparities and correction

of the crop-wise imbalance that now exists in regard to various inputs.

Problems of Small Farmers:

Over 80 million of 90 million operational farm holdings in the country are below 2 hectares in size. About 60-70 per cent of GDP from agriculture comes from subsistence agriculture. Unless small farmers are helped to improve their productivity and profitability through optimum use of their land, water, credit and other resources, it will not be possible to achieve our goal in food production of billion-plus. Decline in Productivity of Input: A major concern has been the decline in the productivity inputs. Various explanations have been given for declining productivity of inputs.

These are:

i. The new technology was initially adopted in areas with assured irrigation. The extension of new technology into more difficult terrains is bound to be more costly and capital intensive.

ii. Of late, there is evidence to suggest that new agricultural technologies are spreading in the rain-fed areas. The investment cost is substantially higher in the case of rain-fed areas than in the areas with assured irrigation.

iii. The fall in productivity could also have taken place because of the inefficiency in the use of inputs.

Rising Cost of Production in Agriculture:

Over the last two decades, the prices received by the farmers have lagged behind the input prices, especially with regards to the prices of industrial inputs. The prices of important agricultural crops are reviewed every year by the government to keep them in line with costs of production and input prices. But often, what the farmers receive in effect is a weighted sum of the prices offered by the government and those prevailing in the free market.

Weakening of Linkages between Agriculture and Industry:

Although the inter-dependence of the agricultural and the industrial sectors has increased over the years, the strength of linkage between the agricultural and the manufacturing sectors has weakened. It must be realised that the majority of the population still depending on agriculture, and with a high rural bias in the culture of the population, weakening of this linkage is a serious matter of concern.

Highly Regulated Sector:

Equally critical is the fact that agriculture is highly regulated that imposes restrictions on movement of agricultural products. Among these, the more important can be identified as:

(i) compulsory levies (e.g. sugarcane, cotton);

(ii) licensing requirement (e.g. exports of agricultural products), and

(iii) internal trade restrictions (i.e. inter-state restrictions).

To sum up, although during the last six decades impressive gains have been made in agricultural production in some parts of the country, much still remains to be done to establish a balanced progress.

Government Schemes & Programmes for the Development of Agriculture

Nowadays Government of India is giving more priority for the welfare of farmers. In this regard it is implementing several farmers welfare schemes to re-vitalize agriculture sector and to improve their economic conditions. Therefore, the government has rolled out new initiatives, schemes, programmes and plans to benefit all the farmers. These agriculture schemes or programmes are very helpful for the farmers and he or she must know about it so as to take its benefit.

Here are some important government schemes in agriculture

1. Soil Health Card Scheme

Launched in 2015, the scheme has been introduced to assist State Governments to issue Soil Health Cards to all farmers in the country. The Soil Health Cards provide information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.

2. Pradhan Mantri Fasal Bima Yojana (PMFBY)

PMFBY is an actuarial premium based scheme under which farmer has to pay maximum premium of 2% for Kharif, 1.5% for Rabi food & oilseed crops and 5% for annual commercial/horticultural crops and remaining part of the actuarial/bidded premium is shared equally by the Centre and State Government. One of the objectives of the scheme is to facilitate prompt claims settlement. The claims must be settled within two

months of harvest subject to timely provision of both yield data and share of premium subsidy by the State Government.

3. Neem Coated Urea (NCU)

This scheme is initiated to regulate use of urea, enhance availability of nitrogen to the crop and reduce cost of fertilizer application. NCU slows down the release of fertilizer and makes it available to the crop in an effective manner. The entire quantity of domestically manufactured and imported urea is now neem coated. It reduces the cost of cultivation and improves soil health management.

4. Pradhan Mantri Krishi Sinchai Yojana (PMKSY)

It was launched on 1st July, 2015 with the motto of 'Har Khet Ko Paani' for providing end-to end solutions in irrigation supply chain, viz. water sources, distribution network and farm level applications.

PMKSY not only focuses on creating sources for assured irrigation, but also creating protective irrigation by harnessing rain water at micro level through 'Jal Sanchay' and 'Jal Sinchan'.

Micro irrigation is to be popularised to ensure 'Per drop-More crop'. PMKSY adopts State level planning and projectised execution that allows States to draw up their own irrigation development based on District Irrigation Plans and State Irrigation Plans.

Components:

- Accelerated Irrigation Benefit Programme(AIBP): implemented by Ministry of Water Resources, RD & GR.

- PMKSY (Har Khet ko Pani): implemented by Ministry of Water Resources, RD & GR
- PMKSY (Watershed): implemented by Department of Land Resources.
- PMKSY(Per Drop More Crop - PDMC)

5. Paramparagat Krishi Vikas Yojana (PKVY)

Paramparagat Krishi Vikas Yojana is implemented with a view to promote organic farming in the country. To improve soil health and organic matter content and increase net income of the farmer so as to realise premium prices. Under this scheme, an area of 5 lakh acre is targeted to be covered though 10,000 clusters of 50 acre each, from the year 2015-16 to 2017-18.

6. National Agriculture Market (e-NAM)

It provides e-marketing platform at national level and support creation of infrastructure to enable e-marketing.

This innovative market process is revolutionizing agriculture markets by ensuring better price discovery. It brings in transparency and competition to enable farmers to get improved remuneration for their produce moving towards 'One Nation One Market'.

7. Micro Irrigation Fund (MIF)

A dedicated MIF created with NABARD has been approved with an initial corpus of Rs. 5000 crore (Rs. 2000 crore for 2018-19 & Rs. 3000 crore for 2019-20) for encouraging public and private investments in Micro irrigation. The main objective of the fund is to facilitate the

States in mobilizing the resources for expanding coverage of Micro Irrigation.

MIF would not only facilitate States in incentivizing and mobilizing resources for achieving the target envisaged under PMKSY-PDMC but also in bringing additional coverage through special and innovative initiatives by State Governments.

An Advisory Committee has been set up to provide policy direction and ensure effective planning, coordination and monitoring of the Micro Irrigation Fund.

8. Agriculture Contingency Plan

Central Research Institute for Dryland Agriculture (CRIDA), ICAR has prepared district level Agriculture Contingency Plans in collaboration with state agricultural universities using a standard template to tackle aberrant monsoon situations leading to drought and floods, extreme events (heat waves, cold waves, frost, hailstorms, cyclone) adversely affecting crops, livestock and fisheries (including horticulture).

Total 614 district agriculture contingency plans are placed in the 'farmer portal' of the Ministry of Agriculture and Farmers Welfare, Government of India.

9. Rainfed Area Development Programme (RADP)

Rainfed Area Development Programme (RADP) was implemented as a sub-scheme under Rashtriya Krishi Vikas Yojana (RKVY).

10. National Watershed Development Project for Rainfed Areas (NWDPRA)

The scheme of National Watershed Development Project for Rainfed Areas (NWDPRA) was launched in 1990-91 based on twin concepts of integrated watershed management and sustainable farming systems.

11. National Mission for Sustainable Agriculture (NMSA)

NMSA is one of the eight Missions under National Action Plan on Climate Change (**NAPCC**). It aims at promoting Sustainable Agriculture through climate change adaptation measures, enhancing agriculture productivity especially in rainfed areas focusing on integrated farming, soil health management, and synergizing resource conservation.

NMSA as a programmatic intervention caters to Mission Deliverables that focuses mainly on conservation agriculture to make farm sector more productive, sustainable, remunerative and climate resilient by promoting location specific integrated/composite farming systems.

Schemes under NMSA

- Rainfed Area Development (RAD): RAD is being implemented by RFS Division.
- Soil Health Management (SHM): SHM is being implemented by INM Division
- Sub Mission on Agro Forestry (SMAF): SMAF is being implemented by NRM Division

- Paramparagat Krishi Vikas Yojana (PKVY): PKVY is being implemented by INM Division
- Soil and Land Use Survey of India (SLUSI): Being implemented by RFS Division
- National Rainfed Area Authority (NRAA): Being implemented by RFS Division
- Mission Organic Value Chain Development in North Eastern Region (MOVCDNER): Being implemented by INM Division
- National Centre of Organic Farming (NCOF): Being implemented by INM Division
- Central Fertilizer Quality Control and Training Institute (CFQC&TI): implemented by INM Division

12. Livestock insurance Scheme

It aims to provide protection mechanism to the farmers and cattle rearers against any eventual loss of animals due to death. The scheme also demonstrates the benefit of the insurance of livestock to the people and popularizes it with the ultimate goal of attaining qualitative improvement in livestock and their products.

13. National Scheme on Welfare of Fishermen

This scheme was launched to provide financial assistance to fishers for construction of house, community hall for recreation and common working place. It also aims to install tube-wells for drinking water and assistance during lean period through saving cum relief component.

14. Scheme on Fisheries Training and Extension

It was launched to provide training for fishery sector so as to assist in undertaking fisheries extension programmes effectively.

15. Gramin Bhandaran Yojna

Objective of this Scheme:

- Create scientific storage capacity with allied facilities in rural areas.
- To meet the requirements of farmers for storing farm produce, processed farm produce and agricultural inputs.
- Promotion of grading, standardization and quality control of agricultural produce to improve their marketability.
- Prevent distress sale immediately after harvest by providing the facility of pledge financing and marketing credit by strengthening agricultural marketing infrastructure in the country.

CONCLUSION AND SUMMARY

India is an agricultural country. Agriculture and its allied activities act as main source of livelihood for more than 80% population of rural India. It provides employment to approximately 52% of labour. Its contribution to Gross Domestic product (GDP) is between 14 to 15%. This growth in itself represents a remarkable achievement in the history of world agriculture. India has achieved significant growth in agriculture, milk, fish, oilseeds and fruits and vegetables owing to green, white, blue and yellow revolutions. All these revolutions have brought prosperity for the farmers. Many factors are responsible for these achievement viz conducive government policies, receptivity of the farmers and also establishment of higher agricultural education institutions. The new breed of skilled human resources were instrumental in generating new technologies, and in its assessment, refinement and finally its dissemination to the farming community through extension methods. In order to sustain, diversify and realize the potential of agriculture sectors, it is necessary to develop skilled human resources.

Agricultural human resource development is a continuous process undertaken by agricultural universities. Agricultural universities impart education in the various disciplines of agriculture viz Agriculture, Agricultural Engineering, Forestry, Horticulture, Veterinary and Animal Husbandry, Dairy Science, Food Technology, Fisheries Science, Agriculture Information Technology, Agri Business Management etc. It imparts education at the level of diploma, degree, masters and doctoral level. At present there are 53 state agricultural universities (SAUs), five deemed to be universities, one central agricultural university and four central universities with agricultural faculty. All these educational institutions get financial and technical support from Indian Council of Agricultural Research (ICAR), New Delhi.

BIBLIOGRAPHY

Books & Journals:

1. Indian Agriculture Sector,Kalyani Publications.

2. Commercial Geography,Himalaya Publications.
3. Livestock Census Report, 2003. Dept. of Livestock & Animal Husbandry, Ministry of Agriculture, Govt. of India.
4. Data Book 2007. Indian Agricultural Statistics Research Institute, New Delhi.
5. Proceedings of 20th National Convention of Agricultural Engineers and national Seminar on Farm Mechanization for Diversification of Agriculture. Jan. 19-20, 2007. Dept. of Farm Power and Machinery, PAU, Ludhiana,
6. Singh S. 2008. Agricultural Mechanization Policy. Proceedings of Tractor & Farm Machinery Manufacturers' Meet, Nov. 16-17, 2007, CIAE, Bhopal.

Websites:

http://www.farmer.gov.in

http://www.crida.in