
UNIT 1 AGRICULTURE

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1.1 INTRODUCTION

Agriculture contributes a large share of national output and employs majority of labour force in most developing countries. It plays an important role in development. Productivity gains in agriculture have a positive impact on the overall development of an economy. This unit discusses the importance of agriculture in the development of an economy and the major issues in the development of agriculture. Green Revolution has played an important role in moving India from the status of dependency to self sufficiency and even surplus. This unit discusses the various aspects as well as the critics of Green Revolution. We will also be familiarized with the concept of sustainable agriculture.

After reading this unit, you will be able to

- explain the importance of agriculture in the development of an economy.
- discuss the major issues in the development of agriculture.
- narrate the process and problems of agricultural development in india
- explain the concepts of sustainable agriculture
- discuss the causes and remedies of the current food crisis at national and global level

1.2 IMPORTANCE OF AGRICULTURE IN DEVELOPMENT

Agriculture is vital to the development because of the fact that a large percentage of world's population live in rural areas and depend directly or indirectly on agriculture. Agriculture is an engine of growth, and productivity gains in agriculture would have a positive impact on overall development of the economy. The classical economists believe that agricultural progress contributes to greater productivity. Greater productivity and output further lead to economic development. Meier (1995) has noted four different ways of how agriculture can contribute to development. Those are as follows:

- By supplying foodstuffs and raw materials to other expanding sectors in the economy;
- By providing an “investable surplus” of savings and taxes to support investment in other expanding sectors;
- By selling a “marketable surplus’ for cash, which will raise the demand of the rural population for products of other expanding sector; and
- By relaxing the foreign exchange constraints, by earning foreign exchange through exports or by saving foreign exchange through import substitution.

The old paradigm of development believes that an economy, to take-off, must have productivity gain in agriculture. First, the surplus in agriculture sector will not only raise farmer’s income and their demand for industrial product, but also free some labour from the agriculture sector to be employed in industrial sector and other activities. Second, increase in productivity in agriculture will also improve food security of a nation. Third, the rise in agricultural productivity will lead to the rise of industrial sector.

The problem arises in recent years, when many countries are experiencing an increasing productivity but a declining share of agriculture in GDP. In other words, the share of agriculture in GDP goes down in fast growing economies. China and India are the two illustrious examples. Therefore, the new paradigm sees agriculture not so much as a key sector of development. It considers that agriculture development is a necessary but not sufficient condition for development. Their view is much connected to globalization. For them old paradigm is more applicable to close economy rather than to open economy. For example, in Singapore, which is an open economy, agriculture has little to do with the successful development of Singapore. Thus globalization and free trade has affected the relationship between agriculture particularly in developing countries and growing economies. Yet, agriculture has a critical role to play from the point of view of food security, and still the food insecurity remains a key issue in many developing nations. The World Development Report 2008 on “Agriculture for Development” highlights that in much of the Sub-Saharan Africa, agriculture is a strong option for spurring growth, overcoming poverty and enhancing food security. In Asia, the focus of agriculture will be to generate rural jobs by diversifying into labour-intensive, high-value agriculture linked to a dynamic rural non-farm sector. The report considers that in the 21st century, agriculture continues to be a fundamental instrument for sustainable development and poverty reduction.

World Development Report-2008 addresses three main questions, which is critical from the standpoint of agriculture and development. Those are:

i) What can agriculture do for development?

Agriculture has served as a basis for growth and reduced poverty in many countries, but more countries could be benefited, if governments and donors were to reverse years of policy neglect and remedy their underinvestment and mis-investment in agriculture.

ii) What are effective instruments in using agriculture for development?

Top priorities are to increase the assets of poor households, make smallholders and agriculture in general- more productive and create opportunities in the rural non-farm economy that the rural poor can seize.

iii) How can agriculture-for-development agendas best be implemented?

By designing policies and decision processes most suited to each country's economic and social conditions, by mobilizing political support, and by improving the governance of agriculture.

The agriculture promotes development in the following ways:

- i) **Important economic activity:** Agriculture is an important economic activity. The promotion of public private partnership in agriculture has promoted private investment in agriculture. Most of the private sector investors are investing in agriculture, and contract farming promoted through the private company is one of the illustrious examples of private investment in agriculture. According to the World Development Report-2008, agriculture based countries generate on an average 29 percent of gross domestic product (GDP), and employ 65 percent of the labour force. Still in many developing countries agriculture is the main source of livelihood.
- ii) **Food Security:** Agriculture production is important for food security. It is a major source of income of the rural people. Agriculture is one of the important sector which has been fighting with the poverty and hunger in the developing countries.
- iii) **Environmental Services:** Agriculture is a good source of environmental promotion. The judicious use of water sources, water harvesting, and preserving bio-diversity would lead to environmental promotion. Therefore, managing the connections between agriculture, natural resource conservation, and environment must be an integral part of using agriculture for development.
- iv) **Agriculture can reduce poverty and unemployment:** Agriculture is playing an important role in reducing poverty in both developed and developing countries. In China, aggregate growth generating from agriculture is 3.5 times effective in reducing poverty than growth outside agriculture. In India agriculturally advanced states have lesser percentage of population living below the poverty line as compared to their counter parts. According to the World Development Report 2008, in Ghana, rural households accounted for a large share of a steep decline in poverty, partially induced by growth of agriculture.
- v) **Agricultural Development Promotes Industrial Development:** The agricultural sector plays an important role in providing market for the products of industrial sector. Thus the speed of industrial sector depends on how rapidly agricultural income are rising. The rising income in the agricultural sector will enable the rural people to buy not only agriculture related technology but also the lighter industrial products like radios, television, motorcycles, refrigerators, etc. Thus the development of agriculture and industry are interrelated.

Dear learner, in this section we discussed about the importance of agriculture in development. Now try and answer the following question in *Check your progress-1*.

Check Your Progress 1

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

1) Explain briefly how agriculture promotes development of any economy.

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1.3 PERFORMANCE OF AGRICULTURE

The performance of agriculture as noted down in the World Development Report-2008 are:

- From 1980-2004, the GDP of agriculture expanded globally by an average of 2.4 percent a year, more than the population growth of 1.6 percent a year.
- Developing countries achieved much faster agricultural growth (2.6 percent a year) than industrial countries (0.9 percent a year) in 1980-2004.
- Developing countries accounted for an impressive 79 percent of overall agriculture growth during the period (1980-2004).
- The major contributor to growth of agriculture in Asian and developing world in general was productivity gains rather than expansion of land devoted to agriculture.
- Since the 1960s, rising cereal yields have been driven by widespread use of irrigation, improved crop varieties and fertilizers.
- Livestock expansion has also contributed to the high agricultural growth rates. Livestock is one the fastest growing sub-sectors in developing countries, where it already accounted for a third of agricultural GDP.

1.3.1 Contribution of Agriculture to GDP, Workforce and Income

While agriculture accounts for around 2% of GDP, and less than 4% of employment in developed countries, its share in the GDP of low-income countries is as high as 24%. Agriculture provides over 60% of total employment in South Asia and sub-Saharan Africa (Pal, 2006). Agriculture thus plays an extremely important role in developing countries, in providing livelihood and rural development. In most developing countries, agriculture is dominated by small and marginal farmers who are engaged in subsistence farming. Agriculture plays a major role in providing food security for the bottom level of the population. Developing countries consider domestic self-sufficiency in foodgrain as an important element of food security. For all these reasons, sustained growth in agriculture is considered essential for ensuring food security and alleviating poverty.

Table 1.1: Region-wise Percentage of Adults Employed in Agriculture

	Sub Saharan Africa	South Asia	East Asia & Pacific	Middle East & North Africa	Europe & Central Asia	Central Africa & Caribbean
MEN						
Self Employed	56.6	33.1	46.8	24.6	8.5	38.4
Wage Earner	4.0	21.8	9.4	9.4	10.1	20.9
WOMEN						
Self Employed	53.5	12.7	38.4	38.6	6.9	22.8
Wage Earner	1.4	11.4	5.7	1.0	5.4	2.3

Source: World Development Report 2008

Table 1.1 gives a clear picture of the adults employed in agriculture in different parts of the world. The table shows that a large number of men and women in different parts of the world and more specifically in the developing and less developed countries are employed in agriculture. In all the regions except Middle East and North Africa, more number of men are employed in agriculture as compared to women.

In this section you have read about the performance of agriculture and its contribution to the economy. Now try and answer the questions in *Check your progress-2*.

Check Your Progress 2

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit

1) Discuss the contribution of agriculture to the GDP of any economy.

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1.4 MAJOR ISSUES IN AGRICULTURAL DEVELOPMENT

Some of the major issues in agricultural development are discussed as under.

i) Land Issues

Indian agriculture is dominated by small and marginal holders. Such small holdings are not only uneconomical but also the root cause of many difficulties in the way of agricultural development. Unregistered cultivators, tenants and tribal cultivators who do not have land titles face difficulties in

accessing institutional credit and other facilities. This calls for registration of actual cultivators, tenants and women cultivators on priority basis. There is also a need to free the lease market to ensure availability of land for cultivation to the marginal and small farmers. The land rights of tribals should also be protected. There is ample scope for further redistribution of land when waste and cultivable lands are taken into account. Considering the fact that about 42 percent of the agricultural workers are female, the future assignment of land should take women into consideration while making land redistribution. Two major considerations for any land reform are i) security of tenure for tenants for the period of contract and the right of the land owner to resume land after the period of contract is over.

ii) Subsidies and Investment

Though subsidies are effective in pushing agricultural growth to a certain extent, it is important to make sure that they do not become a permanent feature of any economy. The availability of subsidized inputs during the Green Revolution period has led to indiscriminate use of inputs. This in turn has led to degradation of land, and water, adverse NPK ratio in soil, wasteful use of water, soil salinity, pollution, excessive use of electricity, etc. Moreover, the benefits of such subsidies have been reaped mainly by the farmers of irrigated area leading to large regional disparities. The present system of fertilizer subsidy is irrational, and has become counter-productive. Fertilizer is sold at almost the same controlled price throughout the country. However, because nitrogenous fertilizers are subsidized more than potassic and phosphatic fertilizers, the subsidy tends to benefit more the crops and regions which require higher use of nitrogenous fertilizer as compared to the crops and regions which require higher application of potassic and phosphatic fertilizers. The imbalance in the use of nitrogen–phosphorus–potassium (NPK) brought about by distortions in price ratio in favour of nitrogenous fertilizer is creating serious problem of soil degradation and adversely affecting productivity.

The public investment in agriculture has declined in the past two decades which in turn has slowed down the pace of technological change, adversely affecting productivity. Since the early 1980s public investment in agriculture has experienced a secular decline, while input subsidies (on fertilizers, power, and canal irrigation) have been rising. In the early years of economic reforms, an attempt was made to arrest and reverse these trends, but this effort could not be sustained. As a result the gap between investments and subsidies kept widening. Today input subsidies, together with food subsidies, amount to roughly five to six times the public investment in agriculture.

iii) Irrigation and Water Management

Water is the main input in agriculture. India is endowed with abundant water resources and the second largest irrigated area in the world, however, the contribution of water towards productivity in agriculture is very low. To cite a single example, cotton farmers in Tamil Nadu consume approximately seven times as much water and generate about 1/5th the yield as their counterparts using extensive cultivation and furrow irrigation methods in

California. That means that the productivity of each litre of water used for cotton cultivation in California is 35 times higher than in Tamil Nadu.

In India around 40 percent of the country's cultivated area is irrigated. The irrigation potential of the country has not been exploited fully. Rain-fed areas constitute about 60 percent of the net sown area of the country. The decline in the public investment in irrigation is an important reason for not being able to use the irrigation potential to its full capacity. Capacity utilization of ground water resources also depends on the availability of electric power for pumping water. Rain-fed agriculture is characterized by low productivity due to low input use. Majority of the rural poor live in the rain-fed areas.

Considering the importance of water in farming, conservation of surface and groundwater for appropriate recharging of groundwater has become imperative.

iv) Agricultural Credit

Agricultural credit plays an important role in augmenting use of agricultural law for cultivation, adoption of technology in agriculture and also use of HYV seeds. Ironically, informal credit which is too costly to repay still occupies an important place than the institutional credit. One of the reasons for rural indebtedness and farmers suicide is credit from money lenders.

The public policies for agricultural credit should aim to reduce the role of informal sector credit. Some of the problems in expanding credit in rural areas include

- i) Narrowing of branch network in rural areas.
- ii) Fall in credit deposit ratios in rural areas.
- iii) Disproportionate decline in agricultural credit to vulnerable groups specially small and marginal farmers.
- iv) Political interference like loan wavers leading to sickness of some of the formal credit institutions.

In India, a multiagency approach comprising of co-operative banks, scheduled commercial banks and RRBs have been followed for supplying credit to agricultural sector. The progress of agricultural credit system in terms of scale and outreach of institutional framework for agricultural credit has been commendable. After the nationalization of banks, the public sector banks have made commendable progress in terms of putting in place a wide banking network as the offices of public sector banks increased from 8262 in 1969 to 68355 in 2005. Another important achievement has been the decline in the role of non-institutional sources in the disbursement of agricultural credit. The share of non-institutional credit declined from around 93 percent in 1951 to 31 percent in 1991. However, figures in the beginning of this decade show that the share of non-institutional credit has taken a reverse swing (Table 1.2).

Table 1.2: Source wise share of borrowings of cultivator households

Sources of credit	1951	1961	1971	1981	1991	2002
Non-Institutional credit	92.7	81.3	68.3	36.8	30.6	38.9
i) Money Lenders	69.7	49.2	36.1	16.1	17.5	26.8
Institutional credit	7.3	18.7	31.7	63.2	66.3	61.1
i) Co-operative societies/Banks	3.3	2.6	22.0	29.8	23.6	30.2
ii) Commercial Banks	0.9	0.6	2.4	28.8	35.2	26.3
Unspecified	-	-	-	-	3.1	-
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: All India Debt and Investment Survey and NSSO

In spite of the vast network of rural financial institutions, one of the major impediments in the adoption of new technological practices, land improvements and building up of irrigation and marketing infrastructure has been the inadequacy of farm investment capital. Farmers in India seem to borrow short term credit to maintain the continuity in agricultural operations.

The flow of investment credit to agriculture is constrained by host of factors such as high transaction costs, structural deficiencies in the rural credit delivery system, issues relating to credit worthiness, lack of collaterals in view of low asset base of farmers, low volume of loans with associated higher risks, high manpower requirements etc.,

Another cause of concern is the growing disparity in the credit disbursement among marginal, small and large farmers. This may be mainly because the bankers have a risk aversion tendency towards small and marginal farmers as compared to large farmers, who are better placed in offering collaterals.

v) Risk and Insurance in Agriculture

Farmers are generally exposed to two types of risk – yield risk and price risk. The yield risk is mainly attributed to the vagaries of nature and price risk is owing to price volatility. In order to shield the farmers from either or both the risks, agricultural insurance assumes significant importance. The importance of Agricultural insurance is widely accepted all over the globe. In most economies governments assume significant role towards protection of the farmers against all type of risks. The private companies also have an important role in public private partnership mode. As a business proposition, agricultural risk insurance is associated with high loss ratios and hence subsidization plays a crucial role. It is difficult, if not impossible, to ensure 100 percent coverage, either in terms of farmers or area. In the case of Spain, for instance, subsidization is to the extent of 45% of the programme and private insurance companies are made to work as a group under a state-sponsored lead agency, so that the state can control pricing of the product. Generally speaking, this is true even in the case of USA, where formulation of risk insurance policy is essentially a responsibility of the individual states.

The issue of introduction of crop insurance in India was taken up in 1947 and homogenous area approach was favoured as a basis for implementation. In 1965,

crop insurance bill was introduced and a model scheme was circulated which was not favoured by any of the states due to huge financial obligations. Later in August 1971, the Expert Committee headed by Dharam Narain concluded that it would not be advisable to introduce crop insurance in near future even on pilot basis.

An all risk Comprehensive Crop Insurance Scheme (CCIS) for major crops was introduced in April 1985 and was linked to short term credit and implemented on homogenous area approach. The AIC introduced Rainfall Insurance Scheme in 27 districts of four states from Rabi 2004 season. The scheme was introduced as a pilot programme in 20 rain gauge stations spread over Andhra Pradesh, Karnataka, Rajasthan and Uttar Pradesh. The three options provided under this scheme include Seasonal Rainfall Insurance, Rainfall Distribution Index and Sowing Failure. This scheme anticipated shortfall in yield on account of deficit rainfall.

Beginning 2003-04, we also see further development with the entry of some private insurance companies. Though they are yet to make any visible impact on the overall agricultural insurance scene in the country. ICICI–Lombard General Insurance Company had introduced rainfall insurance, a move which was followed by IFFCO- Tokio General Insurance Company with its “Baarish Bima”. For the private sector insurance companies, with their primary business being in various general insurance foray into agriculture risk insurance is experimental first time business, and it is too early to comment on the effectiveness of their operations.

There are more schemes on the float that go beyond crop insurance .The Farm Income Insurance Scheme (FIIS) was started during 2003-04 to provide income protection to the farmers by integrating the mechanism of insuring yield and market risk. Under this, the farmer’s income is intended to be insured by providing minimum guaranteed income. Similarly, livestock insurance is provided by public sector insurance companies for almost all livestock animals.

vi) Research and Extension

There is a large gap between the yields in the research station and the farmers field. The yields of most of the crops have almost stagnated showing no or very little increase over the years. This shows that the Indian agriculture has reached a technology fatigue. There has not been any major breakthrough in yield improvement specially because of the low allocation of funds to the Indian agricultural research system. There is a need to reorganize the priorities in the Indian agricultural research system by emphasizing on the needs of rainfed areas which cover nearly 60 percent of cultivated area. Adequate priority should also be given to emerging challenges particularly post harvest, marketing and environmental conservation. Since private sector participation in agricultural research is limited to profitable crops and enterprises taken up by resource rich farmers, the public sector research has to increasingly address the problems facing the resource poor farmers in the less-endowed regions. There is also a need to have biotechnological research suited to different locations of the country.

vii) Diversification and Food Security

There has been diversification of Indian diets wherein, the hi-value products have caught the fancy of the rapidly increasing middle-class population of the country. Increase in per capita income, increasing urbanization, increasing number

of working women in urban India are largely responsible for diet diversification in India. There has been an increase in the per capita consumption of fruits and vegetables and edible oils. Diversification does not mean just diversification in agriculture related activities. Adequate importance should also be given to allied activities like animal husbandry and fisheries. Not only does the livestock sector contribute to more than 5 percent of the GDP but also engages many of the rural women in major livestock related activities. Specifically in Indian context where the ownership of livestock is more evenly distributed with landless labourers and marginal farmers, the development of this sector is important for the balanced development of the rural economy.

Recent trends that have raised concern regarding food security, farmers' income, and poverty are:

- Slowdown in growth.
- Widening economic disparities between irrigated and rain-fed areas.
- Increased vulnerability to world commodity price volatility following trade liberalization. This had an adverse effect on agricultural economies of regions growing crops such as cotton and oilseeds.
- Uneven and slow development of technology.
- Inefficient use of available technology and inputs.
- Lack of adequate incentives and appropriate institutions.

viii) Marketing

Since most of the farmers in most of the developing countries are small and marginal farmers, the produce of individual farmers is in such small quantities that it becomes difficult for them to market such small amounts. They also face problems in getting inputs, credit and marketing. In such economies where small scale agriculture is widespread, contract farming arrangements are particularly useful. In India, contract farming is going on in several agricultural crops however, it is not backed by an efficient legal system. There is a need to strengthen contract farming arrangements to strengthen small farmers. To avoid any kind of exploitation of the farmers, an effective legal mechanism needs to be in place. The real challenge is to organize the small and marginal farmers for marketing and linking them to more profitable high-value agriculture.

ix) Effect of Globalization on Agriculture

With the opening up of the economy, the domestic agriculture is subjected to competition from products of other countries specially those of developed countries where agriculture is highly subsidized. There have been many instances in the recent past when the domestic prices of many commodities have gone higher than the international prices. To compete in the international market, there is a need to adopt both yield increasing and cost cutting technologies.

The ongoing negotiations on Agreement on Agriculture in the WTO provide the developing countries with the opportunity to rectify some of the inadequacies in the agreement. The developing countries are likely to benefit if the developed countries reduce agricultural subsidies. The overall trade distorting subsidies given by the developed countries need to be reduced to provide a level playing ground to all the countries.

x) Agribusiness

Agriculture in the basic sense of produce of the field is hardly remunerative to the farmer. In other words, agricultural operations must now mark a shift in approach from being merely a field harvesting of crops to local mandi disposal operations to demand driven activity with an increased focus on processing and value addition. Value addition is to be created through diversification of use of produce and emphasis on quality production. Bold measures now need to be taken to encourage agri business and industries based on agricultural produce so that producer gains significantly in returns. Any activity related to or associated with agriculture operations, before, during and after crop production is agri business and includes-

The input sector: Input suppliers play a major role in the production of food and fiber, and the sector is currently recognized as a major phase of agribusiness. Agricultural input provides production agriculturalists with the feed, seed, fertilizer, credit, machinery, fuel, chemicals, and various other things that they need to operate.

The output sector: The output sector includes all agribusinesses and individuals that handle agricultural products from the farm to the final consumer. This includes agribusinesses involved in buying, transporting, storing, warehousing, grading, sorting, processing, assembling, packing, selling, merchandising, insuring, regulating, inspecting, communicating, advertising, and financing.

The agri-service sector: The agri-service sector of the agriculture industry is concerned with researching new and better ways to produce and market food and to protect food producers and consumers, and with providing special, customized services to all the other phases of agriculture. Public agencies have played a dominant role in the agri-services area, but private agencies are rapidly increasing their offerings of farm services.

Agribusiness is responding to the strong consumer demand for high-value commodities, processed products and pre-prepared foods. There is in fact expansion of demand for farm products. It provides new opportunities to farmers for value addition, while agro-processing firms provide them with crucial inputs and services and also cover a part of their risk. If properly used and understood, it should turn out to be bonanza for the farmers. Investment is flowing thick in agribusiness, and agribusiness and super market retail boom is a new mantra. Many companies have already invested billions either directly or through local partnerships. There is likelihood of agribusiness firms with all their managerial abilities, finding new ways to use the demand opportunities. However, fears are being expressed that, by virtue of their capital and scale operations, these firms may space out small traders, processors and retailers. In this context, two most important issues today relate to (a) expansion of organized retail segment, and (b) entry of global players in the retail sector.

xi) Agriculture and Climate Change

The unimpeded growth of greenhouse gas emissions is raising the earth's temperature. The consequences include melting glaciers, more precipitation, more and more extreme weather events, and shifting seasons. The accelerating pace of climate change, combined with global population and income growth, threatens

food security everywhere. Agriculture is extremely vulnerable to climate change. Higher temperatures eventually reduce yields of desirable crops while encouraging weed and pest proliferation. Changes in precipitation patterns increase the likelihood of short-run crop failures and long-run production declines. Although there will be gains in some crops in some regions of the world, the overall impacts of climate change on agriculture are expected to be negative, threatening global food security. Populations in the developing world, which are already vulnerable and food insecure, are likely to be the most seriously affected. The results of an analysis by IFPRI, 2009 suggest that agriculture and human well-being will be negatively affected by climate change:

- In developing countries, climate change will cause yield declines for the most important crops. South Asia will be particularly hard hit.
- Climate change will have varying effects on irrigated yields across regions, but irrigated yields for all crops in South Asia will experience large declines.
- Climate change will result in additional price increases for the most important agricultural crops—rice, wheat, maize, and soybeans. Higher feed prices will result in higher meat prices. As a result, climate change will reduce the growth in meat consumption slightly and cause a more substantial fall in cereals consumption.
- Calorie availability in 2050 will not only be lower than in the no-climate-change scenario—it will actually decline relative to 2000 levels throughout the developing world.
- By 2050, the decline in calorie availability will increase child malnutrition by 20 percent relative to a world with no climate change. Climate change will eliminate much of the improvement in child malnourishment levels that would occur with no climate change.
- Thus, aggressive agricultural productivity investments of US\$7.1–7.3 billion are needed to raise calorie consumption enough to offset the negative impacts of climate change on the health and well-being of children.

In this section we discussed about the major issues in agricultural development. Now, try and answer the following questions in *Check Your Progress 3*.

Check Your Progress 3

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

- 1) What is the role of subsidies and investment in the agricultural growth of any country?

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2) What are the types of risks faced by farmers? How can the farmers avert these risks?

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1.5 SUSTAINABLE AGRICULTURE

1.5.1 Meaning Sustainable Agriculture

Several definitions have been formulated to describe sustainable agriculture. However, these are often tailored to fit specified circumstances. Some of the definitions are as follows:

Sustainable agriculture is a way of farming that can be carried out for generations to come. This long term approach to agriculture combines efficient production with the wise stewardship of the earth’s resources.

A sustainable agriculture is one that, over the long term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fiber needs; is economically viable; and enhances the quality of life for farmers and society as a whole.

After reading these two definitions, it is important to know various characteristics of sustainable agriculture.

1.5.2 Characteristics of Sustainable Agriculture

By the definitions of sustainable agriculture, a farm that emphasizes short run profit but sacrifices environmental quality would not be sustainable in the long run. From the other perspective, pursuing environmental quality without ensuring viability of short-run returns also would be unsustainable.

- Meet human needs with a safe, high-quality, and affordable supply of food and fiber;
- Provide access for everyone to nutritious, healthful and affordable food, while ensuring a safe and secure supply of food;
- Produce quality food while preserving open space, abundant wildlife, and other forms of biodiversity;
- Protect the natural resource base and prevent the degradation of air, soil and water quality, while using natural biological cycles and controls;

1.5.3 Components of Sustainable Agriculture

- Use of resistant cultivars.
- Management of soil to maximize biological activity.
- Establishment of conditions to attract natural pest control agents, such as the use of certain flowering plants to attract parasitic and predatory wasps.

- Use of insect traps for monitoring and even controlling pests.
- Management of the ground cover and field borders to promote the predators and parasites of pests.
- Release of specific biological control agents.
- Use of low-toxic biodegradable/ botanical pesticides.

1.5.4 Sustainable Agriculture vs. Organic Agriculture

Sustainable agriculture should not be confused with organic farming as both are very different from each other. Sustainable agriculture means not only the withdrawal of synthetic chemicals, hybrid-genetically modified seeds and heavy agricultural implements; it also tries to simulate the conditions found in nature. Sustainable agriculture involves intercropping, use of farmyard manure and remnants, mulching and application of integrated pest management. If this is followed then there is no reason why agriculture cannot be an economically viable activity in addition to being environmentally sustainable.

1.5.5 Inclusive Agriculture

Inclusive agriculture means promotion of agriculture in those areas among those farmers who have been grossly excluded from the agricultural incentives, subsidies and similar other benefits. The focus of inclusive agriculture would largely be on:

- Promotion of agriculture in dry land and hilly and sub-mountainous and desert zones.
- Small, marginal and landless agricultural labourers who really take care of agriculture but hardly enjoy the benefit.
- Role of women in agriculture as a cultivator, entrepreneur, extension agent and farm labourers.
- Incentives to all kind of agriculture both food crops and cash crops; livestock sector, fruits and vegetables and horticulture activities.
- Access to credit from the organized institutions and marketing facilities for the farmers in disadvantaged conditions and areas.

Government of India (2007) has also emphasized that the growth to be all inclusive, the agricultural strategy must focus on the 85 percent of farmers who are marginal, increasingly female and who find it difficult to access inputs, credits and extension or to market their output.

Check Your Progress 4

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

1) What do you understand by organic agriculture?

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1.6 GLOBAL FOOD CRISIS

Long time neglect of agricultural sector has led to the current food crisis which has affected both the rich and the poor alike. Food shortages have affected billions of people all over the world especially the poor in the developing countries. Some call it to be the result of the market oriented and liberalising policies adopted by choice or compulsion by most of the countries. These policies have either neglected agriculture for over a decade or led to shift in global prices which in turn have led to a major shift in the cropping pattern in most of the countries. Agriculture in developed countries is highly subsidised. Due to opening up of markets, the cultivators of the developing countries have to compete with the cheap imports from the developed countries.

IMF data shows more than 40 percent rise in global food prices since 2007. The increase has been mainly in essential foodgrains. In 2007, the global prices of wheat increased by 77 percent and rice prices increased by 20 percent. In 2008, wheat prices have been highly volatile, whereas rice prices soared up by nearly 150 percent in the first quarter of 2008. The price of corn which is a staple food in Latin America more than doubled in the past 2 years. The prices of other food items like vegetable, meat and edible oils have also gone very high.

The impact of rising food prices has been more pronounced in the developing and less developed countries where a major share of family budget is spent on food items. There have even been food riots in many countries. World Bank estimates that such high food prices could lead to more than 100 million people in low income countries to slip to deeper poverty.

Let us now look at the reasons which have led to such sudden rise in prices of essential food items. Though the rise in prices may look sudden, but it has been a result of long term and continuous neglect of agriculture sector world over. The explanation endorsed by the then Bush Administration is that the spurt in food prices is essentially demand driven due to several years of rapid economic growth, rising income and therefore growing demand for food in India and China. However five major factors which have played a crucial role in rise in world food prices are as follows:

- i) Energy is an important input in agriculture especially in cultivation and transportation of food. The rising prices of oils have hence affected the agricultural costs both directly and indirectly.
- ii) Due to high dependence on OECD countries for oil and other petroleum products and because of the rising oil prices, the governments in many countries have promoted bio-fuels as an alternative to petroleum. This has led to shift in cropping pattern of many countries in favour of bio-fuels. In 2006, US diverted its 20 percent area under maize production, Brazil used half of its sugarcane production and EU used a large part of its vegetable oilseed production to make bio-fuel. According to IMF, ethanol production using corn in US has been the major reason for at least half of the increase in corn output since 2006.
- iii) Policy neglect of agriculture over the past two decades, the world over has also been one of the major reasons for food shortages and rising prices.

There has been a lack of public investment in agriculture and agricultural research. There has also been a shift from traditionally grown food crops to cash crops. Besides, increasing urbanization also leaves less land for agriculture.

- iv) Climate change in almost all parts of the world has also caused poor harvest due to increased draughts, floods, cyclones, tsunamis etc.
- v) Changes in market structures wherein a small number of agribusiness companies increasingly control all aspects of cultivation and distribution result in producers not getting the benefits of price increase. Public holdings of stocks have also generally reduced. This has reduced the capacity of public intervention to prevent speculative activities.

1.7 AGRICULTURAL DEVELOPMENT IN INDIA

The post independence marked a turning point for agriculture in India. The agricultural growth rate, which was less than 0.5 percent per annum during the period 1904-05 to 1944-45, recorded an annual growth rate of 2.7 percent during 1949-50 to 1983-84. The land reform and the green revolution are the two main strategies that helped to augment agricultural development in India. The agricultural scholars have divided agricultural development phases into periods i.e. 1950-51 and 1966-67 and that between 1967-68 and 1983-84 and have characterised these as the land reform strategies adopted during the mid fifties and the green revolution strategy adopted since the mid-sixties. These two strategies of agricultural development are discussed below:

1.7.1 Land Reforms

During British colonization, land ownership and land use patterns were changed to make it easier for the British to buy land at low prices for mines, plantations etc. The British did not introduce this system to India, but they popularised it. With the introduction of the land tax under the Permanent Settlement Act 1793, the British popularized the 'zamindari' system (where landowners collect tax from the peasants) at the cost of the 'jajmani' system (where everybody shares the land).

At independence, ownership and control of land was highly concentrated in a few landlords whose main intention was to get maximum rent from their tenants. Under this arrangement, the tenant farmer had little economic motivation to develop farmland for increased production (because they would not make any money out of it). At the same time, the landlord wasn't particularly concerned about improving the economic condition of the farmers (because the landowner would lose money). As a result, agricultural productivity suffered and the tenants' situation deteriorated.

In the years immediately following India's independence, land ownership was recognised as crucially important. India was extremely poor, and in order to try and abolish poverty, progress was needed on two fronts: high productivity and sharing equally. The most important event in the agricultural history of India is the land reforms enacted and implemented during the mid-fifties. The objectives of land reform are:

- i) Reordering agrarian relations to achieve social equity.
- ii) Curtailing exploitation and enlargement of land base of the rural poor; and
- iii) Increase agricultural productivity.

Major issues covered in land reforms are

- i) Abolition of intermediaries
- ii) Settlement and regulation of tenancy
- iii) Regulation of size of holdings.

A historical background of land reforms in India is given as under:

At the time of independence, there existed three types of proprietary land tenures in the country. The term land tenure is used to refer to the terms and conditions on which land is held and used.

i) **Abolition of Intermediaries**

- a) **The Zamindari or Landlord Tenure:** Under this system, the land was held by a person who was responsible for the payment of land revenue. Landlords never cultivated the land they owned and rented them out to the cultivators. In this system between the actual state and the tiller there grew an intermediary who was interested in the land only to the extent of extraction of exorbitant rent.
- b) **Ryotwari System:** Under this system, the responsibility of paying land revenue to the Government was of the cultivator himself and there was no intermediary between him and the state. The ryot had full right regarding sale, transfer and leasing of land and could not be evicted from the land as long as he pays the land revenue. But the settlement of land revenue under ryotwari system was done on a temporary basis and were periodic, after 20, 30 or 40 years.
- c) **The Mahalwari or The Joint Village Tenure:** Under this system, the village communities held the village lands commonly and it was joint responsibility of these communities to make payments of the land revenue.

Thus the overall system of collection of revenue was based on exploitation. The British government snatched away whatever surplus above the minimum subsistence the cultivator produced. The latter were forced to lead a wretched life of slavery and deprivation. Under the above-mentioned systems the practice of cultivation by tenants became widely prevalent. These tenants were also exploited in a number of ways. It was basically to stop the exploitation of the actual tillers of the soil and pass on the ownership of the land to them that land reforms introduced in the post-independence period in India.

ii) **Settlement and Regulation of Tenancy**

- a) **Measures of Tenancy Reforms:** The legislation for abolition of intermediaries was aimed at providing land to the tiller but it did not put an end to the problem of tenancy. Measures taken to minimize the evils of tenancy cultivation and to safeguard the interest of the tenants are as follows

- b) Regulation of rents:** during the pre-independence period, rents were fixed either by the custom or were the result of the market forces of demand and supply. Supply of land being fixed, the demand of land rowing with an increasing population, there has been a continuous tendency for rents to rise. It was, therefore, imperative that rents should be fixed by enacting legislation. The rates of rent prevalent were one half of the produce or more. Considering the return on investment in other sectors of economy, these rents were excessive by any standard of social justice.

Consequently, the First and the Second five-year plan recommended that rents should not exceed one fourth or one fifth of the gross produce. Various states have passed necessary legislation regulating rents, but there were large variations in the rents fixed in different states. In Gujarat, Maharashtra, and Rajasthan, one-sixth of gross produce was fixed as maximum rent. In Assam, Karnataka, Manipur and Tripura, maximum rents varied between one-fourth to one-fifth of the gross produce. In Punjab, one-third of produce was considered as fair rent, while in Tamil Nadu it was between 33.3 and 40 percent of the gross produce. In Andhra Pradesh one-fourth of the gross produce for irrigated land and one-fifth in other cases had been fixed as rent.

- c) Security of Tenure:** the security of tenure was aimed to provide some incentives to tenants to make certain improvements of permanent nature on the land they cultivate. Many states, therefore, enacted legislation providing for the security of tenure so long as they continue paying the rent.
- d) Right of Ownership of Tenants:** A very important feature of the land reform is the provision of the right of ownership of tenants. The Second plan considered it very desirable to bring tenants in non-resumable area in direct contact with the state. Earlier the right to purchase was optional to the tenants but this did not prove to be effective. Thus, the third plan suggested the optional clause to be removed and peasants be required to purchase land. Legislation for this purpose was enacted in various states. For instance, in West Bengal the tenants and sub-tenants were brought into direct relationship with the state by the conferment of full ownership rights. In Punjab, the right to purchase was optional. Legislation had been enacted in Gujarat, Kerala, Madhya Pradesh, Maharashtra, Karnataka, Orissa, Rajasthan, Uttar Pradesh, West Bengal and the Union Territories. Whereas in Assam, Jammu and Kashmir and Tamil Nadu, no provisions existed even for an optional right of purchase. While the state can facilitate the transfer of ownership rights from the landlords to the tenants, no financial burden is imposed on the state.

iii) Regulation of Size of Holdings

- a) Consolidation of Holdings :** Consolidation of fragmented agricultural land holdings forms an integral part of the Land Reform Policy. Successive Five Year Plans have accordingly been laying stress on consolidation of fragmented land holdings for planned development of villages and increased agricultural output. Consequently, many States enacted legislations and had taken up the work relating to consolidation of land holdings. The States of Uttar Pradesh, Haryana and Punjab have achieved commendable success. In Uttar Pradesh, even now, consolidation of land holdings is in operation

in about 9000-10,000 villages. In other States, work was continued for some years but lost momentum thereafter.

Consolidation of holdings was also advocated to group together the numerous tiny and scattered holdings of poor cultivators in order to form bigger tracts, susceptible to more efficient management. Cooperative farming on these would increase productivity and employment through economies of scale. The large, economical units of consolidated land, it was opined, would mitigate the problem of poor yield and enhance productivity through economies of scale and also increase employment.

Other important reforms include:

- i) Distribution of ceiling surplus land
- ii) Distribution of Government wasteland and Bhoodan land
- iii) Prevention of alienation and restoration of alienated tribal land
- iv) Central Sector Scheme for Computerization of Land Records
- v) Centrally Sponsored Scheme for Strengthening of Revenue Administration and Updating of Land Records.

1.7.2 Green Revolution

The Green Revolution is a good example of a planned development initiative that brings out all the essential features of the development process. The Green Revolution is usually described as the introduction of hybrid varieties of wheat and rice, but the adoption of hybrids alone is not sufficient to explain the phenomenal achievements of the Green Revolution. Success was made possible by a comprehensive and well-coordinated program involving multiple changes in the way society managed the production of food.

The Green Revolution led to sizable increases in returns to land, and hence raised farmers' incomes. Moreover, with greater income to spend, new needs for farm inputs, and milling and marketing services, farm families led a general increase in demand for goods and services. This stimulated the rural non-farm economy, which in turn grew and generated significant new income and employment of its own. In India, the percentage of the rural population living below the poverty line fluctuated between 50 and 65 percent before the mid-1960s but then declined steadily to about one-third of the rural population by 1993. Research studies show that much of this steady decline in poverty is attributable to agricultural growth and associated declines in food prices. Big increases occurred in per capita consumption of vegetable oils, fruits, vegetables, and livestock products in Asia.

Major Factors behind the Success of Green Revolution

- a) **Mechanization of Farming:** Intensive agriculture demands the use of diverse machinery that saves the farmer time and labour. Farm mechanization means use of various types of machines and other agricultural implements during the production, transportation and processing of agricultural products. Farmers in the countries adopted farm mechanization for fast growth of agriculture, leading to increased production. This has helped to increase cropping intensity, diversification of agriculture, better usage of available irrigation facilities, timely sowing and harvesting and transportation of inputs

to the fields. This has helped the farmers to get better prices for their products as they can easily access the nearest market outlets.

- b) **Adoption of High Yielding varieties:** The adoption of HYVs occurred quickly. By 1970, about 20 percent of the wheat area and 30 percent of the rice area in developing countries were planted to HYVs, and by 1990, the share had increased to about 70 percent for both crops. Yields of rice and wheat virtually doubled. Higher yields and profitability also led farmers to increase the area of rice and wheat they grew at the expense of other crops. And with faster-growing varieties and irrigation, they grew more crops on their land each year. These changes more than doubled cereal production in Asia between 1970 and 1995, while population increased by 60 percent. Instead of widespread famine, cereal and calorie availability per person increased by nearly 30 percent, and wheat and rice became cheaper.

Achievements of Green Revolution in the Indian Economy

- Crop areas under high-yield varieties needed more water, more fertilizer, more pesticides, fungicides and certain other chemicals. This spurred the growth of the local manufacturing sector. Such industrial growth created new jobs and contributed to the country's GDP.
- The increase in irrigation created need for new dams to harness monsoon water. The water stored was used to create hydro-electric power. This in turn boosted industrial growth, created jobs and improved the quality of life of the people in villages.
- India paid back all loans it had taken from the World Bank and its affiliates for the purpose of the Green Revolution. This improved India's creditworthiness in the eyes of the lending agencies.
- Some developed countries, especially Canada, which were facing a shortage in agricultural labour, were so impressed by the results of India's Green Revolution that they asked the Indian government to supply them with farmers experienced in the methods of the Green Revolution. Many farmers from Punjab and Haryana states in northern India were thus sent to Canada where they settled (That's why Canada today has many Punjabi-speaking citizens of Indian origin). These people remitted part of their incomes to their relatives in India.
- Prior to the launch of the Green Revolution, Indian agriculture was largely based on subsistence-level farming which did not generate sufficient production to meet the country's food requirements. In the past this had led to periodic food shortages and famines which were managed by huge imports from abroad. Green Revolution was an attempt to break out of this condition and increase food production to make the country self-sufficient.

1.7.3 Rainbow Revolution

Technology led development in agriculture have made India self sufficient in foodgrains and a leading producer of several commodities in the world. The Green revolution in crops, Yellow revolution in oilseeds, white revolution in milk production, blue revolution in fish production and golden revolution in horticulture improved the status of Indian agriculture. Rainbow revolution

encompassing an all round growth in production of foodgrains, edible oil, fruits, vegetables and animal and fish products and evergreen revolution in agriculture through diversified agriculture, precision farming, resource conservation and value addition to provide in real sense the required food, nutrition and environmental security are the hopes of future.

In this section you read about the agricultural development in India. Now answer the following question in *Check your Progress 5*.

Check Your Progress 5

Note: a) Write your answer in about 50 words.

b) Check your answer with possible answers given at the end of the unit.

1) What are the major factors that led to the success of Green Revolution?

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2) Write short note on Rainbow Revolution.

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1.8 LET US SUM UP

Agriculture plays an important role in providing food and livelihood security to majority of the population in the developing countries. Agriculture was seen as a low productivity, traditional sector that only passively contributed to development by providing food and employment. The importance of agriculture is expected to decline as development advances. In India there has been a continuous decline in the contribution of agriculture to the GDP but there has not been a commensurate decline in the share of workforce which has been a cause of concern. Some of the problems typical to Indian agriculture include small holdings, low yield, high regional disparities and rise in food prices. Although Green Revolution led to a sizeable increase in the returns to land, the ill effects of the revolution have faced up in the form of excessive use of inputs leading to soil degradation, depletion of groundwater table and increasing regional disparities. Continuous policy neglect of agriculture has led to rising food prices, increasing indebtedness of farmers and other such effects. This calls for a policy shift in favour of the agricultural sector which is still a major contributor of livelihood security of majority of the population in India.

1.9 REFERENCES AND SELECTED READINGS

Acharya, S.S. (2007), *Agribusiness in India: Some Facts and Emerging Issues*, *Agricultural Economics Research Review*, Vol. 20 pp 409-424.

Chand, R., S.S. Raju and L.M. Pande(2007), *Growth Crisis in Agriculture: Severity and Opions at National and State Levels*, *Economic and Political Weekly*, Vol.42, No.26.

Dev, S.M. (2008), *Challenges for Revival of Indian Agriculture*, 1st Professor Dayanath Jha Memorial Lecture delivered at NCAP, New Delhi

IFPRI (2009), *Climate Change – Impact on Agriculture and Costs of Adaptation*, Food Policy Report, International Food Policy Research Institute, Washington D.C.

Meir, M.G (1995), *Leading Issues in Economic Development*, Oxford University Press, New York, Sixth Edition

Pal, P. (2006), *Why Developing Countries Need Special Products And Special Safeguard Mechanisms*, Working Paper, CENTAD, New Delhi.

World Bank, *World Development Report, 2008*, World Bank, New York, 2008

1.10 CHECK YOUR PROGRESS - POSSIBLE ANSWERS

Check Your Progress 1

- 1) Agriculture promotes development of an economy by
 - By supplying foodstuffs and raw materials to other expanding sectors in the economy;
 - By providing an “investable surplus” of savings and taxes to support investment in another expanding sectors;
 - By selling for cash a “marketable surplus’ that will raise the demand of the rural population for products of other expanding sector;
 - By relaxing the foreign exchange constraints, by earning foreign exchange through exports or by saving foreign exchange through import substitution.

Check Your Progress 2

- 1) While agriculture accounts for around 2% of GDP, and less than 4% of employment in developed countries, its share in the GDP of low-income countries is as high as 24%. Agriculture provides over 60% of total employment in South Asia and sub-Saharan Africa. Agriculture thus plays an extremely important role in developing countries, in providing livelihood and rural development. In most developing countries, agriculture is dominated by small and marginal farmers who are engaged in subsistence farming. Agriculture plays a major role in providing food security for the bottom level of the population. Developing countries consider domestic

self-sufficiency in foodgrain as an important element of food security. For all these reasons, sustained growth in agriculture is considered essential for ensuring food security and alleviating poverty.

Check Your Progress 3

- 1) Though subsidies are effective in pushing agricultural growth to a certain extent, it is important to make sure that they do not become a permanent feature of any economy. The availability of subsidized inputs during the Green Revolution period has led to indiscriminate use of inputs. The public investment in agriculture has declined in the past two decades which in turn has slowed down the pace of technological change, adversely affecting productivity. Since the early 1980s public investment in agriculture has experienced a secular decline, while input subsidies (on fertilizers, power, and canal irrigation) have been rising.
- 2) Farmers are generally exposed to two types of risk – yield risk and price risk. The yield risk is mainly attributed to the vagaries of nature and price risk is owing to price volatility. In order to shield the farmers from either or both the risks, agricultural insurance assumes significant importance. The importance of Agricultural insurance is widely accepted all over the globe. In most economies governments assume significant role towards protection of the farmers against all type of risks.

Check Your Progress 4

- 1) Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions rather than use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationship and a good quality of life for all involved.

Check Your Progress 5

- 1) Mechanization of farming and adoption of high yielding varieties are the major factors that have led to the success of Green Revolution in India. For details refer section 2.6
- 2) Rainbow revolution encompasses an all round growth in production of foodgrains, edible oil, fruits, vegetables and animal and fish products.