UNIT 5 AGRICULTURAL SECTOR

Structure

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5.0 OBJECTIVES

After completing this unit, learners will be able to:

- Analyze the role and relevance of the agriculture sector in the Indian economy;

- Interpret trends in agricultural production and productivity, focusing on major food grains and non-food grains since independence, especially after the adoption of the New Agricultural Strategy in the mid-1960s;
- Identify the causes behind stagnation and deceleration in agricultural investment, particularly public investment in India;
- Examine the factors contributing to inadequate credit access for farmers from formal agricultural credit sources;
- Assess the significance of farm size in Indian agriculture and its declining trend;
- Investigate the causes of low agricultural productivity in India and its impact on farmers' incomes;
- Evaluate various issues related to agricultural inputs in India;
- Analyze the circumstances that hindered Indian farmers from adopting new farming technologies; and
- Appraise the policy and strategic initiatives implemented by the Government to double farmers' income.

5.1 ROLE AND RELEVANCE OF AGRICULTURE IN THE INDIAN ECONOMY

Agriculture is one of the most important sectors of the Indian economy. Although its share in the country's GDP has declined over the years even then it employs about half of the labour force. The agriculture sector helps the industrial sector through backward and forward linkages. It has contributed significantly to the process of India's development in a number of ways, some of which are listed below:

- *Contribution to National Income:* In 1950-51 contribution of the agricultural sector to national income was 59 per cent and in 2004-05 it came down to 24.4 per cent and further to about 15 per cent in 2017-18. Economic Survey 2023-24 says that the Indian agriculture sector provides livelihood support to about 42.3 per cent of the population and has a share of 18.2 per cent in the country's GDP at current prices. The economic contribution of agriculture to India's GDP is steadily declining with an average annual growth rate of 4.18 per cent at constant prices over the last five years in the agriculture sector, while the service sector with about 54 per cent share of the country's GVA is witnessing an average growth rate of 7 per cent or more. Nearly 43 per cent of the population continues to be dependent on agriculture for livelihood.
- *Largest Employment Provider Sector:* In 1972-73, 73.9 per cent of the working population was engaged in agriculture/allied activities, which fell to 64.8 per cent in 1993-94, to 48.9 per cent in 2011-12. With a

rapid increase in population, the absolute number of people engaged in agriculture has become exceedingly large. The surplus labour of the agriculture sector could not be absorbed in secondary and tertiary sectors of the economy despite the higher growth rate in these sectors, a large section of the labour force still depends on agriculture for its survival. As the development of other sectors, in terms of employment generation, has not been sufficient, the dependence of the increasing population on agriculture has increased with marginal productivity of labour being less than or equal to zero — a scenario which gives rise to the familiar problem of disguised unemployment in agriculture.

- *Provision of Food Surplus to the Expanding Population:* Agriculture is the basic source of food supply and if agriculture fails to meet the rising demand for food products (due to an increase in population), it is bound to affect adversely the growth rate of the economy. In India, food consumption still constitutes on average 60 per cent of household income thereby generating adequate demand for food products.

- *Providing Raw Materials to Industries (Backward Linkage):* The agriculture sector provides essential raw materials to many industries such as cotton textiles, jute, sugar, vegetables, oil, tinned food, Cigarettes rubber, etc. The entire range of food processing industries is also dependent on agriculture. Therefore, unless agriculture develops, these industries will not be able to meet their demand for raw materials.

- *The market for Industrial Products (forward linkage):* As the majority of the population lives in rural areas, increased rural purchasing power is a valuable stimulus to industrial development, as propounded by Ragnar Nurkse and Arthur Lewis in their theories on financing industrial development through agriculture. So far as Indian agriculture is concerned, the agriculture sector is the sole consumer of many products of the industrial sector, such as tractors, combines, agricultural machines and implants, fertilizers, pesticides etc. Besides this, with the rise in the farmers' income, almost all FMCG companies are moving to rural areas to explore and exploit new markets for their products.

- *Commercial Importance:* For several years after independence, the three agriculture-based exports of India – cotton textiles, jute and tea – accounted for more than 50 per cent of the export earnings of the country. On adding the exports of other agricultural products such as cashew kernels, tobacco, coffee, Vanaspati, oil, sugar, etc. the share of agriculture in total exports rose to around 70 to 75 per cent. Such a heavy dependence on agriculture reflected the underdeveloped nature of the economy. With economic progress and consequent diversification of the production base, the share of agricultural goods in total exports fell to 44.2 per cent in 1960-61 which considerably fell to 30.7 per cent in 1980-81 and 12.3 per cent in 2016-17. In the fiscal

period 2022-23, India's agricultural exports reached USD 53.1 billion (11.77 per cent of total merchandise export), with APEDA contributing a significant 51% of India's Agri-exports. Now the agri-export basket consists of 40 agri. and allied products.

India is still home to the largest number of poor and malnourished people in the world with it being at the 105th position among 127 countries in Global Hunger Index, 2024. As per the Global Hunger Report 2024, 13.7 per cent population in India is undernourished. Higher priority to agriculture will achieve the goals of 'no poverty' (SDG 1) and 'zero hunger' (SDG2) and inclusive growth. 'Growth with inclusiveness' can be achieved only when agriculture growth accelerates and is widely shared among the people and regions of the country.

Given the role and relevance of agriculture in India's economy, this Unit intends to discuss in detail (a) the performance of the agriculture sector in terms of trends in production and productivity; (b) Issues and concerns being faced by the sector; and (c) Strategic, policy and schematic initiatives taken by the government for the transformation of agriculture and how far these measures have benefited in *de-facto* sense the farmers/cultivators.

5.2 GROWTH OF INDIA'S AGRICULTURE (TRENDS IN PRODUCTION AND PRODUCTIVITY)

The two major crop groups are Food crops and Non-food crops. Food crops include rice, wheat, jowar, bajra, maize, small millets, cereals, gram, pulses, vegetables and fruits. Non-food crops include Oilseeds (groundnut, linseed, rapeseed and mustard, Soybean, niger seed etc.), Fibre crops (cotton, jute and mesta), sugarcane, tobacco, Plantation crops (tea, coffee and rubber), Condiments and Spices.

Food crops constitute around 2/3 of total agricultural production. Rice is the most important component in the food grains category followed by wheat. In the non-food grains category, oilseeds constitute the most important group followed by Sugarcane and cotton.

The horticulture sector emerged as one of the most promising sectors of the country's agriculture and Allied services sector. The horticulture production in the country in 2023-24 (Third Advance Estimates) is estimated to be about 353.19 million tonnes (Fruits, vegetables, aromatic and medicinal plants, flowers, plantation crops, honey, and spices), which is more than the total foodgrains production estimated to be about 332.30 million tonnes in the same year.

Trends in Production

Table 5.1 reveals the following trends:

- Consistent increase in food grains production with considerable annual fluctuations.

- The production of two major crops: Wheat and Rice consistently increased since 1950-51. The increase was significant, especially in the case of wheat after the adoption of the New Agricultural Strategy in the mid-1960s. Rice followed in the early 1980s. These two crops benefitted the most from the development of 'miracle seeds' adopted during the era of the 'Green Revolution'.

- Jowar and Bajra exhibited erratic trends over the planning period. The introduction of HYV maize has pushed up its production and productivity. As a result, the area under maize has risen significantly at the cost of other serials like jowar, Bajra, etc.

Table 5.1: Trends in Agricultural Production 1950-51 to 2023-24 (Units in Million Tones)

Decadal Trends from 1950-51 to 2011-20 and Annual Trends thereafter up to 2023-24											
Crop	1950-51	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2011-20	2021-22	2022-23	2023-24
1	2	3	4	5	6	7	8	9	10	11	12
Rice	20.6	34.6	42.2	53.6	74.3	85	96	110.93	129.5	135.8	137.8
Wheat	6.4	11	23.8	36.3	55.1	69.7	86.9	98.11	107.7	110.6	113.3
Jowar	5.5	9.8	8.1	10.4	11.7	7.5	7	4.9	4.2	3.8	4.7
Bajra	2.6	3.3	8	5.3	6.9	6.8	10.4	9.45	9.8	11.4	10.7
Maize	1.7	4.1	7.5	7	9	12	21.7	25.8	33.7	38.1	37.7
Pulses	8.4	12.7	11.2	10.6	14.3	11	18.2	20.75	27.3	26.1	24.2
Total FGs	50.8	82	108.4	129.6	175.4	196.8	244.5	273.85	315.6	329.7	332.3
Oilseeds#	6.2	7	9.6	9.4	18.6	18.4	32.5	30.96	38	41.4	39.7
Sugarcane	57.1	110	126.4	154.2	241	296	342.4	363.23	439.4	490.5	453.2
Cotton@	3	5.6	4.8	7	9.8	9.5	33	33.48	31.1	33.7	32.5
Jute$	3.3	4.1	4.9	6.5	7.9	9.3	10	10.11	9.8	9	9.3

@Million Bales (bale=170kg), $ Million Bales (bale=180kg),

#Includes groundnut, rapeseed & mustard, sesamum, linseed, castor seed, nigerseed, safflower, sunflower and soybean;

Source: UNIT 13 columns from 2-6 from Economic Survey, 2023-24 (Statistical Tables, Table 1.12), Col 7 to 11; For Column 12, UPAG portal.

- During the last ten years i.e. 2014-15 to 2023-24 (as per 3rd Advance Estimates), total pulses and oilseeds production has increased by 43 per cent and 44 per cent, respectively.

- India produces 25% of the world's pulses, although its contribution to total food grain fell from 16% in 1950 to 8% in 2022-23. Pulses requirement in India is estimated at 30 million tons, but actual production has been considerably less than this level during most of the period. However, production of pulses shot up from 16.4 million tons in 2015-16 to 26 million tonnes in 2022-23. The total import of pulses was 2.49 million tonnes in 2022-23 to bridge the gap between the demand and production of pulses in the country. The supply of pulses lagged for most of the planning era; India has had to import a large quantity of pulses over the period which constituted 8-10 per cent of our total demand in the country.

- Although production of oilseeds increased by 6.67 times between 1950-51 and 2022-23 and reached all all-time high at 41.4 million tonnes in 2022-23, it is still short of total demand. There has been a large gap between demand and supply for a considerable period forcing the country to import large quantities of edible oils. Even at present 60 per cent of the demand for edible oils is met out of imports, which is likely to be untenable in the long run.

- Production of cotton which averaged 8 to 9 million bales per annum till 2000-01 rose significantly thereafter due to widespread use of BT Cotton (a genetically modified pest resistant plant cotton variety) in 2002. From annual production of about 9 million bales in 2000-01, the production rose to 33 million bales in 2010-11 but there after it almost stagnated at the same level. Now almost 90 per cent of cotton area is covered under BT cotton.

- Jute saw slow and halting progress during the entire period of planning and remained stagnant thereafter.

- Sugarcane exhibited a consistent increase in production during the four decades 1952-53 to 2002-03 but thereafter it rose considerably with annual fluctuations, however, production of sugarcane reached a record level of 490.5 million tonnes in 2022-23.

Trends in Productivity

Agricultural production depends not only on the area but also on the productivity of the land. It shows the relationship between inputs and output. Agricultural productivity can be classified into two categories viz. agricultural productivity per hectare and agricultural productivity per worker. Trends in productivity per hectare of major food grains and Non-food grains crops after independence are analysed in Table 5.2

Table 5.2 reveals the following trends:

- The yield per hectare of all food grains has increased by about five times from 552 kg per hectare in 1950-51 to 2873 kg per hectare in 2023-24.

- The most significant increase has been recorded by wheat with its yield increasing from 655 kg per hectare to 3615 kg per hectare in 223-24. Productivity of rice also increased significantly from 1123 kg per hectare in 1970-71 to 2873 kg per hectare in 2018-19.

- Jowar and Bajra recorded much lower rates of productivity growth.

- Most disappointing has been the performance of pulses with stagnant productivity at around 532 kg per hectare during the period from 1960-61 to 1999-00, thereafter it increased at a snail's pace to 907 in 2023-24.

- The productivity of maize and cotton has increased in recent years due to the adoption of hybrid maize varieties and BT cotton since 2002 in most areas of the country.

Table-5.2: Yield Per Hectare of Major Crops

(Kg per Hectare)

Crop	1950-51	1960-61	1970-71	1980-81	1990-91	1999-00	2010-11	2020-21	2021-22	2022-23	2023-24
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Rice	668	1013	1123	1336	1740	1901	2239	2717	2798	2838	2873
Wheat	655	851	1307	1630	2281	2708	2989	3521	3537	3521	3615
Jowar	353	533	466	660	814	764	949	1099	1092	1079	1175
Bajra	288	286	622	458	658	688	1079	1420	1430	1510	1449
Maize	547	926	1269	1159	1518	1822	2540	3199	3387	3545	3321
Pulses	441	539	524	473	578	544	691	885	888	902	907
Total FGs	**552**	**710**	**872**	**1023**	**1380**	**1626**	**1930**	2394	2424	2494	2525
Oilseeds*	481	507	579	532	771	810	1193	1247	1312	1368	1316
Cotton	88	125	106	152	225	190	499	451	428	443	436

Even if we focus on trends in agricultural growth in the post-1991 economic reforms regime, it is observed that new economic policy seems to have bypassed the agriculture sector completely. The comparison in aggregate GDP growth vis-à-vis Agri GDP growth is reflected this in Table 5.3

Table 5.3: Rates of Growth (in per cent) since 1991

Years	**Overall GDP**	**Agri-GDP**
1991-92 to 1995-96	5.2	2.4
1999-00 to 2003-04	6.0	2.9
2004-05 to 2013-14	8.0	3.7
2014-15 to 2018-19	7.2	1.9
2019-20 to 2023-24	4.44	4.2

Check Your Progress 1

1) Trace out the trends in production and productivity of major crops in India after independence.

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2) Do you agree that 'Agriculture has significantly contributed to the development of India'?

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3) Do you agree that agriculture growth continued to stagnate even after economic reforms were launched in 1991? Does it imply that economic reforms have bypassed agriculture?

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5.3 ISSUES IN INDIAN AGRICULTURE

5.3.1 Deceleration in Agriculture Investment

Gross capital formation (GCF) refers to the total investment in physical assets over a specific period. It includes new and existing fixed assets, such as machinery, buildings, land improvements, equipment purchases, and inventory changes. This metric is a crucial indicator of investment in modernising agriculture, enhancing productivity, and ensuring sustainability. The development of infrastructure, particularly post-harvest facilities, can significantly reduce waste, preserve produce quality, and increase farmers' income.

Higher growth rates of agriculture witnessed in the 1980s were due to the lagged impact of increases in the share of agriculture and allied sectors in gross capital formation during the late 1960s and 1970s. However, since the 1980s, the share has shown a declining trend. There was a mild recovery during the late 1990s till 2001 – 02, and the share declined again. Total investment in agriculture as a proportion of GDP declined from 9.9 per cent in 1990-91 to just 3.5 per cent in 1999-2000. The share of public investment in gross capital formation in agriculture has also declined over the years, as shown in Table 5.4. The share of the public sector in the gross capital formation in agriculture and allied services is declining and reached an

abysmally low at 12.85 per cent at current prices in the FY 2021-22, however, it increased to 14.16 per cent in the FY 2022-23

Table 5.4: Share of public & private sector in capital formation in Agriculture and allied activities

Sector	1970s	1980s	1990s	2000s	2011-12	2015-16	2021-22	2022-23
Private	66.5	58.3	76.1	81.1	84.9	81.19	87.15	85.84
Public	33.5	41.7	23.9	18.9	15.1	18.81	12.85	14.16

Source: National Accounts Statistics and National Accounts Statistics, 2017 and 2023-24

There is a difference like public and private capital formation and contribution to the production processes. The former is mainly like public goods such as irrigation projects and road networks. These will not be provided by private capital. The decline in public capital formation is not adequately compensated by an increase in private investment in agriculture. The most important cause of the decline in public investment in agriculture is the diversion of resources from investment to current expenditure in the form of subsidies. However, farmers have no option but to develop their infrastructure—such as minor irrigation facilities, warehouses, agricultural machinery etc. to grow more and make agriculture more profitable.

However, the Economic Survey 2023-24 states that the Gross Capital Formation (GCF) of the agriculture sector and the share of GCF in the agriculture and allied sectors as a percentage of Gross Value Added (GVA) has been growing steadily, mainly due to increased public investment. The GCF of the agriculture sector grew at the rate of 19.04 per cent in 2022-23, and the GCF as a percentage of GVA rose from 17.7 per cent in 2021-22 to 19.9 per cent in 2022-23, suggesting an increase in investment in agriculture. The average annual growth in GCF from 2016-17 to 2022-23 was 9.70 per cent. The Survey states that despite the increasing trend in GCF, there is a need to further boost agriculture investment, especially in the context of doubling farmers' income. The DFI 2016 report indicated that to double farmers' income from 2016-17 to 2022-23, income would need to grow at an annual rate of 10.4 per cent in the farm sector, which in turn would require an annual growth rate in agriculture investment of 12.5 per cent.

5.3.2 Non-availability or Inadequate Credit from Formal Sources

Agricultural credit plays a crucial role in creating an environment for the adoption of modern production technology and encouraging private investments in farms. Farmers, particularly marginal and small farmers, have been dependent on non-institutional credit sources for the supply of credit. The indebtedness of farmers has remained a major issue in rural prosperity. The farmers need credit for fulfilling short-term working capital requirements and long-term investment in capital goods for the farm sector. Further,

farming households require credit for several reasons, which include both productive purposes for income generation and unproductive purposes for non-income generation. Indebtedness and farmers' suicide are closely linked. The vicious cycle of debt has aggravated the agrarian crisis leading to an increase in the number of farmers' suicides. Borrowing from non-institutional sources is the major reason for debt-related farmers' distress.

The Government has taken several steps to reduce the dependence of farmers on private money lenders to meet their credit needs and provide relief to the indebted farmers. A large number of institutional agencies are involved in the disbursement of credit to agriculture. The Government of India, Reserve Bank of India and National Bank for Agriculture and Rural Development (NABARD) have initiated several policy measures to improve the accessibility of farmers to institutional sources of credit.

- The Kisan Credit Card (KCC) scheme was introduced in 1998 to issue Kisan Credit Cards to farmers on the basis of their holdings for uniform adoption by the banks so that farmers may use them to readily purchase agriculture inputs such as seeds, fertilizers, pesticides etc. and draw cash for their production needs. The KCC scheme, along with the benefit of IS & PRI has been extended to farmers practising animal husbandry and fisheries in FY 2018-19. The cumulative number of KCC issued by Commercial Banks, Co-operative Banks and Regional Rural Banks was 7.34 crore with an outstanding amount of Rs. 8.85 Lakh Crores as of 31 March 2023.
- Modified Interest Subvention Scheme (MISS), a Central Sector Scheme, was also introduced to provide short-term Agri-loans availed by farmers through KCC for their working capital requirements at a concessional rate of interest. Under this scheme, farmers are given KCC loans at a subverted interest rate of 7%. For this, at present, interest subvention @1.5% is being given to financial institutions. Therefore, short-term loans for Agriculture and other allied activities up to Rs. 3.00 lakh are available to farmers at an interest rate of 7% per annum. An additional 3% Prompt Repayment Incentive (PRI) is also given to the farmers for prompt and timely repayment of loans; thus, reducing the effective rate of interest to 4% per annum. In case of a short-term loan availed for allied activities only (other than crop husbandry), loan amounts up to Rs. 2.00 lakh are available at the rate of 7%. An additional 3% PRI is also available on it. To discourage distress sales by farmers and encourage them to store their produce in warehouses, the benefit of interest subvention of 3% is available to small and marginal farmers having Kisan Credit Card for a period of up to six months, post-harvest of the crop. For the FY 2023-24, the budget allocation is 23,000 crores.
- Due to the proactive policies, agricultural credit disbursement in the country increased from Rs.46268 crore in 1999-2000 to Rs. 21.55 lakh crore in 2022-23 at a compound annual growth rate (CAGR) of 18.18 per cent

- According to NABARD All India Rural Financial Inclusion Survey (NAFIS) 2021-22, the proportion of agricultural households that took loans from institutional sources only increased from 60.5% in 2016-17 to 75.5% in 2021-22 (the corresponding increase for non-agri households was from 56.7% in 2016-17 to 72.7% in 2021-22). The proportion of Agri-households that took any loan from non-institutional sources only decreased from 30.3% in 2016-17 to 23.4% in 2021-22.

5.3.3 Inadequate Irrigation Coverage and Falling Productivity of Irrigation in Foodgrains

Inadequate irrigation cover for most of the crops is an important constraining factor in the speedy adoption of improved technology. Various Economic Surveys released by the Ministry of Finance have highlighted the following issues: (a) Only 40.46 per cent of Net Area sown (NAS) was under irrigation in 2001-02, which increased only to around 49.8 per cent in 2016-17, and 55.26 per cent in 2021-22 (b) share of public expenditure on irrigation and flood control to total public expenditure has declined over the years, (c) Irrigation coverage across the states is quite skewed (e.g. in Punjab 97.5 per cent of the total area under all crops irrigated, while in Maharashtra it was only 22.8 per cent in 2021-22). Haryana is the only state in the country where 99.1 per cent area under all crops is irrigated and (d) distribution of irrigation facilities across crops is equally skewed (e.g. 95.6 per cent of the area under wheat, 66.7 per cent of the area under rice has been under irrigation in 2020-21 while for pulses and oilseeds, it was only 20.7 per cent and 33.7 per cent, respectively).

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), a major initiative about increasing the irrigation potential and maintaining the existing potential was launched during the year 2015-16, to enhance physical access to water on farm and expand cultivable areas under assured irrigation, improve on-farm water use efficiency, introduce sustainable water conservation practices, etc. It is an umbrella scheme, consisting of two major components being implemented by the Ministry of Jal Shakti, namely, Accelerated Irrigation Benefit Programme (AIBP), and Har Khet Ko Pani (HKKP). HKKP, in turn, consists of four sub-components: (i) Command Area Development & Water Management (CAD&WM); (ii) Surface Minor Irrigation (SMI); (iii) Repair, Renovation and Restoration (RRR) of Water Bodies; and (iv) Ground Water (GW) Development. In addition, PMKSY has a Watershed Development (WD) component which is being implemented by the Department of Land Resources. Further, during the period 2015-22, the Per Drop More Crop (PDMC) component was also implemented by the Department of Agriculture and Farmers Welfare (DoA & FW) under PMKSY.

Further, in December 2021, the implementation of PMKSY for the period 2021-22 to 2025-26 has been approved by the Government of India. The low irrigation cover for various crops has led to severe rainfall dependency. One finds a high correlation between production and rainfall for pulses and oilseeds.

5.3.4 Shrinking Farm Size

The shrinking size of the average land holding of an Indian farmer has held back agricultural productivity and there is not much that can be done about this. Due to smaller holding size, the majority of Indian farms find it difficult to access institutional credit, access new technology, adopt more efficient forms of farm practices and undertake more capital-intensive investment for land improvement. As per the latest information available from Agriculture Census 2015-16, the average size of operational holdings has decreased from 2.28 hectares in 1970-71 to 1.84 hectares in 1980-81, to 1.41 hectares in 1995-96 and 1.08 hectares in 2015-16. The total number of operational holdings in the country has increased from 138.35 million in 2010-11 to 146.45 million in 2015-16 showing an increase of 5.86%. The highest percentage share in 2015-16 was observed in the marginal category (68.5%) followed by small (17.6%), semi-medium (9.6%), medium (3.8%) and large category (0.6%). The total operated area in the country has decreased from 159.59 million ha. in 2010-11 to 157.82 million ha. in 2015-16 showing a decrease of 1.11%. The highest percentage share in 2015-16 was observed in marginal category (24%) followed by semi-medium (23.8%), small (22.9%), medium (20.2%) and large category (9.1%).

As per data from Agricultural Census 2015-16, the small and marginal holdings (below 2.00 ha.) constituted 86.08 percent in 2015-16 against 85.01 per cent in 2010-11 and had 46.94 per cent of the operated area in the current Census as against the corresponding figure of 44.58 per cent in 2010-11 in the country. The semi-medium and medium operational holdings (2.00 ha. – 9.99 ha.) were 13.35 per cent with an operated area of 44.00 percent. The corresponding figures for the 2010-11 census were 14.29 per cent and 44.82 per cent. The large holdings (10.00 ha. & above) were only 0.57 per cent of the total number of holdings in 2015-16 with a share of 9.06 per cent in the operated area against 0.70 per cent and 10.59 per cent in 2010-11 respectively.

The survey shows that nearly one-third of farmers have land parcels smaller than 1 ha, while 37 per cent of farm households owned land parcels smaller than 0.4 ha, and another 30 per cent had holdings which fall between 0.41 and 1.0 ha. Only 16 per cent of agricultural households owned landholdings in between 1 to 2 ha and only 13 per cent of farmers have holdings bigger than 2 ha.

Table 5.6: Trends in farm Size Holdings in India (Units in Million)

Holding	1970-71	1980-81	1990-91	2000-01	2010-11	2015-16
Marginal	36	50	83	75	93	100
Small	13	16	20	23	25	26
Medium	19	21	22	21	20	23
Large	3	2	2	1	1	1

Note: Marginal: up to 1 hectare, Small: 1-2 hectares, Medium: 2-10 hectares, Large: over 10 hectares.

Sources: Agriculture Census 2011and 2015-15

Considering the declining trends observed in the size of agriculture holdings in the past and the prospective increase in population over time, the fragmentation of holdings is likely to continue and the average size of operational holdings is expected to further decrease in the country.

To make small holdings more viable and to assist augmentation of farm incomes, the Government has taken several measures including the adoption of modern technologies and practices like multiple cropping, intercropping and integrated farming systems. The Indian Council of Agricultural Research (ICAR) is conducting research programmes to develop location-specific varieties and technologies for enhancing the production and productivity of farm holdings. Support is also provided to farmers (including small and marginal farmers) through initiatives and programmes of the Government like Interest Subvention Scheme, Mission for Integrated Development of Horticulture (MIDH), National Food Security Mission (NFSM), Neem Coated Urea, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Pradhan Mantri Fasal Bima Yojana (PMFBY), National Mission for Sustainable Agriculture (NMSA) etc.

5.3.5 Issues Related to Agriculture Inputs

Imbalance in fertilizer use

In general, the nitrogenous (N), phosphate (P) and potash (K) Fertilizers' ratio of 4:2:1 is considered to be optimum for India. Any deviation in fertiliser use from this norm would constrain growth in crop productivity. The total fertilizer use in India increased at 6 per cent per annum from 2.65 million tons of NPK in 1971–72 to 64.84 million tons in 2023-24. The all-India NPK use ratio widened from 7.7:3.1:1 during 2021-22 to 11.8:4.6:1 during 2022-23. Per hectare use of total fertilizer nutrients (N+P2O5+K2O) marginally up from 141 kg in 2021-22 to 141.2 kg in 2022-23. Uttar Pradesh had the largest share (17.6%), followed by Maharashtra (9.5%), Madhya Pradesh (9.4%), Karnataka (6.9%), Punjab (6.3%), Rajasthan and Gujarat (6.1% each), Andhra Pradesh (5.9%), Telangana (5.7%), Bihar (5.5%), West Bengal (5.4%), Haryana (4.5%) and Tamil Nadu (3.5%). Thus, 92 per cent of NPK fertilizers are consumed only in 13 states.

Investigations carried out under the All India Coordinated Research Project on 'Long Term Fertilizer Experiments' over five decades at fixed sites have indicated that continuous use of nitrogenous fertilizer alone had a deleterious effect on soil health and crop productivity showing deficiencies of other major and micronutrients. Even with recommended doses of NPK and more, deficiency of micro and secondary nutrients has become yield-limiting over the years. Deficient nutrients may also affect plant growth and cause plant physiological disorders. There is also a possibility of nitrate contamination in groundwater above the permissible limit of 10 mg NO_3-N /L due to excessive/over-use of nitrogenous fertilizers, particularly in light-textured soils that have consequences on human/animal health if used for drinking purposes.

The Government has launched a National Mission on Soil Health Card to promote soil test-based balanced and judicious fertilizer application in the country. Similarly, organic farming is being promoted under Parampragat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain Development for North East Region (MOVCD-NER) in the country. Trainings and demonstrations are organized through ICAR institutions including Krishi Vigyan Kendras (KVKs), and agricultural universities to educate farmers on all these aspects.

Effectiveness of minimum support prices (MSPs)

MSPs are declared before each sowing season (in June and October) so that farmers are aware of the minimum price the government will offer for their produce. As per a report by the NITI Aayog, a low proportion of farmers (10 per cent) were aware of MSPs before the sowing season. 62 per cent of the farmers were informed of MSPs after sowing their crops. The pricing policy of MSPs would be effective only if farmers are aware of it at the time of deciding what crops to grow. The NITI Aayog recommended that the awareness level of farmers regarding MSPs must be increased and the mediums of dissemination of this information must be strengthened.

Other issues with the implementation of the MSP regime include long distances to the procurement centres, increasing cost of transportation for farmers, irregular hours of the procurement centers, lack of covered storage godowns and inadequate storage capacity, and delays in the payment of MSPs to farmers.

Inadequate availability and access to quality seeds

Quality seeds are another input necessary for agricultural productivity, and good quality seeds account for 20 per cent - 25 per cent of increased crop productivity. Agricultural seeds are produced by various agencies such as the Indian Council of Agricultural Research and its research institutions, state agricultural universities, and national and state seed corporations. The private sector has also started playing a role in supplying some seeds such as hybrid maize, bajra, cotton and sunflower. About 30 per cent-35 per cent of the total seeds available are produced by private and public sector companies, and farm-bred seeds account for the remaining seeds. The cost of HYV varieties is too high for marginal and small farmers to afford, thus disincentivising them from purchasing these varieties. The Economic Survey 2015-16 recommended bringing in more players into the production of seeds, to improve their availability in the market and also reduce their prices.

Farm Mechanisation: Major challenges

Mechanisation is another aspect with a significant impact on agricultural productivity. It makes activities such as tilling, spreading of seeds and fertilizers and harvesting more efficient, so that the cost of inputs is offset. It can also make the use of labour in agriculture more cost-effective. The status

of mechanisation in agriculture varies for different activities, although the overall level of mechanization is still less than 50 per cent as compared to 90 per cent in developed countries.

Some challenges faced by farm mechanisation include different soil and climatic zones which require customised farm machinery, and small land holdings with a lack of access to resources. To increase productivity, farm equipment which is durable, lightweight and low cost and also specific to different crops and regions should be made available for small and marginal farmers.

Post-harvest activities-Inadequate Storage facilities

After agricultural produce is harvested, it requires a robust storage infrastructure in order to minimise any losses due to adverse weather conditions or in the process of transportation. Owing to the inadequate capacity and poor conditions of storage, the quantity of food which is wasted during the harvest and post-harvest processes in the country has increased over the years. The highest losses are observed in the case of fruits and vegetables (up to 40 per cent of production), pulses (6.4 per cent - 8.4 per cent) and oilseeds (5.3 per cent - 9.9 per cent).

In sum, Indian agriculture continues to face challenges, some new and some old, such as: (i) declining availability/quality of soil, water and other natural resources; (ii) decreasing size of farm holdings; (iii) inefficient use of inputs and their increasing costs; (iv) scarce and more costly agriculture labour; (v) drudgery in farming operations; (vi) growing risks in farming at all its stages from pre-production to production to marketing; (vii) increasing information gap, knowledge gap and skill gap; (viii) poor access to credit and investments; (ix) slow diffusion of relevant technologies; (x) competitiveness of quality and prices in domestic and export markets; (xi) inadequate focus on processing and value addition; (xii) inadequate rural infrastructure; (xiii) regional imbalances; (xiv) problems in retaining rural youth in agriculture; (xv) poor access to resources and services for women in agriculture; (xvi) weak institutional/sub-system linkages and convergence; and (xvii) extreme events of climate change.

Check Your Progress 2

1) Discuss the factors responsible for slow growth in agriculture in recent years.

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2) How does public investment in agriculture affects the productivity growth of the sector in India? Give reasons.

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3) Give a critical appraisal of the flow of institutional credit for agriculture in India.

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4) Do you agree with the view that shrinking farm size in India is a major factor in sluggish growth and rural poverty in India?

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5.3.6 Failure to Evolve and Adopt New Technologies

With climate change, increasing population, and looming concerns about food security, the world has never been more focused on food and agriculture. Embracing modern, sustainable agricultural practices has emerged at the core of agricultural development. Besides, slow growth of the income of farmers and the resultant increase in the gap between the income of farmers and the business community further created the wide range of income inequalities in India. Following technologies have emerged in agriculture that can help the farmers to increase their productivity and income,

1) **Digital Agriculture:** Utilizing drones, robotic harvesters, and IoT devices, digital agriculture transcends traditional practices. These tools offer precise monitoring and management of crops, streamlining operations, and optimizing resource use. IoT technology, in particular, equips farmers with real-time data on soil conditions, crop health, and environmental factors, enabling targeted interventions and enhanced productivity. Critical to modern farming, sensors embedded in IoT devices monitor vital parameters, including soil moisture, temperature, and crop health. This not only facilitates remote farm management but also propels the automation of irrigation systems, ensuring water is delivered efficiently to crops when and where it's needed most.

2) **Use of Digital Twins & Generative Artificial Intelligence (AI):** Digital twins and generative AI stand out as transformative technologies, leveraging both synthetic and real-world data to make significant impacts on agronomical research and field-level decision-making. Digital twins are virtual replicas of physical systems, and generative AI acts as the brain that brings digital twins to life with its predictive analytics and pattern recognition capabilities. Together, they are revolutionizing how

we approach agriculture, offering a dynamic and predictive understanding of farming operations. Generative AI, enables farmers to make informed decisions about planting and crop management, optimize resource use, and achieve higher yields with lower environmental impact. These technologies help farmers to mitigate risks associated with weather, pests, and disease. And thus, safeguard farmers' livelihoods and contribute to more resilient food systems.

3) **Regenerative Agriculture:** Regenerative Agriculture is redefining sustainable farming, by maintaining soil health, biodiversity, and ecosystem resilience. **Adaptive Grazing, No-Till Farming** and limiting the use of synthetic pesticides and fertilizers are being used to maintain land productivity.

4) **Sustainable Farming Practices:** The demand for sustainably produced and organic food products is rising with the growing awareness of health and sustainability.

5) **Alternative Proteins:** The growing interest in alternative protein sources—that is available in the pulses and other plants — is leading to a transformative shift in crop cultivation patterns, with farmers increasingly turning to high-demand crops like soybeans, peas, and other legumes, vital for crafting these alternative protein sources.

6) **Agricultural Biotechnology:** It has evolved from traditional farming techniques to encompass a wide spectrum of scientific and technological innovations such as genetic engineering, genome editing, transgenics, microbiome, biologicals, metabolomics and RNA interference.

Large number of small and marginal farmers, limited financial resources with them, lack of effective communication, poor educational standards, inadequate extension and expansion of modern technologies, and high dependency on subsidies are some of the major causes of poor adoption of modern technologies in India.

5.3.7 Agriculture Marketing

Agriculture marketing is a combination of wide activities ranging from rural transport (transporting farm produce from farms to markets), warehousing (normal warehouse for non-perishable commodities and cold storage for perishable commodities), grading and shorting, pricing, to selling. Inadequate transportation and warehousing infrastructure-which leads to post-harvest losses and reduces the shelf life of perishable agricultural commodities, large number of market intermediaries—which are more organized as compared to farmers, lack of timely information regarding prices, susceptibilities to price fluctuations—often influenced by weather conditions, global market trends, large scale hoardings and policy changes, lack of standardization and grading, closed transactions and deals that often ignore the interests of the farmers are some of the shortcomings of Indian agriculture marketing.

Enactment of Agricultural Produce Markets Regulation (APMR) Acts during the sixties and seventies by the states paved the way for wide-ranging reforms in agriculture marketing. Ministry of Agriculture has identified the following 7 vital areas of market reforms to pursue with the States/Union Territories.

1) Direct wholesale purchase from farmers outside the market yards at farmgate by Processors/ Exporters/ Bulk Retailers/ End users, etc.;
2) Establishment of private market yards/private markets managed by a person other than a Market Committee;
3) Establishment of farmer/consumer market by a person other than the Market Committee (Direct Sale by the producer to the consumers);
4) Provision for Contract Farming;
5) Provision for unified single registration/license for trade transactions in the mandis across the State;
6) Provision for e- trading; and
7) Provision for single point levy of market fee at first transaction.

E-National Agriculture Market (e-NAM)

The government introduced a Central Sector Scheme for the promotion of e-NAM to bring about a transformation in the agriculture marketing environment. A unified market can be best realised through a pan-India electronic platform which can facilitate the participation of buyers and sellers from all over the country. The e-NAM network was inaugurated on 14 April 2016. As of January 2025, 1410 Mandis in 23 states and 4 Union territories have been integrated with e-NAM. 1,78,77,555 farmers and 2,64,111 traders, 4,389 Farmers Producers Organisations, 1,14,942 Commission Agents (CAs), 79 service providers have been registered on e-NAM portal with a turnover of Rs. 16, 163.1 crore from the trading of 63.17 lakh tons produce. 38 foodgrains/cereals, 16 spices, 14 oilseeds, 46 fruits, 59 vegetables and 52 other commodities are being traded in e-NAM. The vision of a full-fledged e-NAM is where all types of markets have interoperability in communication, standards, and systems operating under a common regulatory framework.

5.3.8 Crop Diversification

Crop diversification refers to a practice of farming under which farmers produce multiple crops on the fields in place of any single crop. At the micro level, it increases the net income of the farmer through better utilization of economic resources. It also helps in maintaining the soil fertility. At the macro level-i.e. crop diversification helps to meet the ever-increasing demand for cereals, pulses, vegetables, fruits, oilseeds, fibres, fodder, and raw materials for agriculture-based industries.

The need for crop diversification arises in those states/areas where the rice-wheat cropping pattern dominates. Yield levels of these two dominant crops

experienced stagnancy and net profit accruals showed diminishing trends. The problem got further aggravated in northern India: Punjab, Haryana, Uttar Pradesh, parts of Rajasthan and Madhya Pradesh – due to depletion of water tables. Crop rotation, multiple cropping, Catch crops, Relay cropping, Alley cropping, Bee culture, Companion crops, Intercropping, Mixed cropping, and Trap cropping are some of the important techniques used for crop diversification.

Check Your Progress 3

1) What is meant by agricultural marketing? Discuss its defects in the Indian context.

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2) In what way Indian farmers failed to adopt new agricultural technologies?

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3) 'Crop diversification is the key for raising the farmers Income'. Do you agree with the statement? Critically examine the strategy envisaged by the Government for promoting crop diversification in India.

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5.4 SOME RECENT POLICY INITIATIVES FOR THE TRANSFORMATION OF INDIAN AGRICULTURE

5.4.1 Prime Minister's Multi-dimensional Seven Points Strategy

Prime Minister's multi-dimensional seven-point strategy includes:

1) Emphasis on irrigation along with end-to-end solutions on the creation of resources for 'More crop per drop'.

2) Provision of quality seeds and nutrients according to the soil quality of each farm.

3) Large investments in warehouses and cold chains to prevent post-harvest losses.

4) Promotion of value addition through food processing.

5) Implementation of National Agricultural Markets and e-platforms (e-NAM) to eliminate shortcomings of all the 585 centers.

6) To mitigate the risk, the introduction of a crop insurance scheme at a lower cost to the farmers.

7) Promotion of allied activities such as dairy, animal husbandry, poultry, bee-keeping, horticulture, and fisheries.

5.4.2 Policy Initiatives for Enhancing the Farmer's Output/Hectare: Improving Cropping Intensity

In consonance with crucial sources for raising the cropping intensity, two major flagship schemes launched immediately after the announcement of DFI include (a) Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and (b) Pradhan Mantri FasalBima Yojana (PMFBY)

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

With almost 54 per cent of the net sown area in the country rain-fed, the availability of irrigation facilities will ensure access to some means of protective irrigation for all agricultural farms in the country. To this effect Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been approved (in July 2015) and formulated with the vision of extending the coverage of irrigation 'Har Khet ko pani' and improving water use efficiency 'More crop per drop'.

Pradhan Mantri Fasal Bima Yojana (PMFBY)

Small and marginal farmers holding (86.3 per cent) with 47.3 per cent cropped area dominate India's agriculture. India's primary failure has been its inability to capitalise on technology and efficient agricultural practices, which can ensure surpluses despite small landholdings. Another reason for India's farmers needing insurance is that the commercialisation of agriculture requires an increase in credit needs, but most of the small and marginal farmers cannot avail credit from formal institutions due to the massive defaults caused by repeated crop failure. Besides, due to climate change higher incidence of extreme weather events aggravates agrarian distress and if this risk is mitigated, farmers will be motivated to make investment in agriculture.

- In April 2016, the government of India had launched PMFBY after rolling back the earlier insurance schemes viz. National Agriculture Insurance Scheme (NAIS), Weather-based Crop Insurance scheme and Modified National Agricultural Insurance Scheme (MNAIS). The PMFBY was created to target 50 per cent of all farmers, with the promise

of compensation in case of crop loss. As per provisions of PMFBY guidelines, the premium share of the farmer is capped at 2% for Kharif crops, 1.5% for Rabi Crops and 5% for commercial/Horticultural crops. Some States have further waived off farmer's share of premiums due to which there is very less burden on the farmers. The Union Cabinet has approved the continuation of Pradhan Mantri Fasal Bima Yojana and Restructured Weather Based Crop Insurance Scheme till 2025-26 with a total budget of ₹69,515.71 crore. The Cabinet approved the setting up of the **Fund for Innovation and Technology (FIAT),** with an allocation of ₹824.77 crore for technology improvements in insurance schemes.

5.4.3 Policy Initiatives for Crop Diversification and Enhancing Value Realization

To enhance the farmers' income one of the alternatives is that farmers may be motivated to diversify the cropping pattern from cultivation of cereals such as wheat and rice to high-value crops such as fruits and vegetables, commercial crops, spices etc. The idea behind Operation Green is to double the income of farmers by the end of 2022 by changing the cropping pattern.

Basic Principles of Operation Green Strategy

- *Principle I:* To establish the link between farmers and major organized retailers, to begin with, and there after allow them to access the retail markets. The real challenge is to find the right markets that can give them remunerative prices on a sustainable basis. Farmers can be organised in Farmers Producers Organisations (FPOs). NABARD and Small Farmers' Agri-Business Consortium (SFAC) together have about 3,000 FPOs, which could be the starting points for the aggregation of commodities, assaying, sorting, grading, and even packing with bar codes, reflecting their traceability. It is targeted to form at least 10,000 FPOs by 2022.

- *Principle 2:* The existing Agricultural Produce Market Committee (APMC) system of marketing does not allow FPOs to sell their produce directly to private traders. APMC Act needs to be replaced by the New Agriculture Produce and Livestock Marketing, (Promotion and Facilitation) (APLM) Act, 2017.

- *Principle 3:* Reducing post-harvest losses (PHL) in fruits and vegetables, which are approximately 40 per cent in India. Agri-logistics can help generate post-harvest specialised infrastructure needed for the complete integration of cold-chain facilities. To increase the income gains to farmers, they should be involved in post-harvest logistics as partners through the Farmer Producer Organization (FPO)/Village Producer Organization (VPO)/cooperative society. This would directly benefit the farmers by providing them access to bigger markets (beyond the local market) and more remunerative prices.

- *Principle 4:* Linking the processing industry with farmers and FPOs. The processing of perishable agricultural products is low (around 2 per cent). In fact, farmers do not have access to the food processing markets and most of their produce they sell directly to APMC markets and private traders and thus get less than $1/14^{th}$ of the price the consumer pays to the chain of middlemen operating between farmers and retail and food processors. Operation Green (TOP) focuses on direct access to the food processing market by FPOs. To facilitate this linkage, the Agricultural Produce and Livestock Contract Farming and Services (Promotion & Facilitation) Act 2018 has been drafted and circulated to all states to replace it with existing APMC Acts.

Agricultural markets despite some changes continue to face many challenges like licensing barriers, lack of integration of various markets, lack of marketing infrastructure, high incidence of marketing charges, high wastages in the supply chain etc. Market dynamics continued with the protectionist perspectives. The best protection for farmers is in promoting long-term market linkages, such that markets are connected across place, time and form with farms. The necessary condition for transferring remunerative prices to the farmers is a competitive environment that facilitates fair and transparent price discovery.

5.4.4 Policy Initiatives to Ensure Remunerative Prices to Farmers for their Produce

The success of the green revolution journey is predicated upon, *inter-alia*, market support in terms of Minimum Support Prices (MSP) and Procurement Policies. MSP was intended to serve as a floor price and an assurance against risks that could arise from sharp falls in the market price. The Government notifies MSPs based on the recommendations of an independent body, called Commission for Agricultural Costs and Prices (CACP). CACP recommendation is based on the A-2 concept of cultivation which comprises input costs in cash +Imputed value of family labour.

Minimum support prices acquire value only when they are supplemented by a robust mechanism of procurement, whenever they are breached in the market on the negative side. It is opined that the farmers would gain better from a more robust system of procurement rather than an increase in MSPs. The existing procurement mechanisms by the government are implemented under:

- Food Corporation of India (FCI) operations for Central Pool. Procurement is made to meet buffer norms and meet the targets of the public distribution system.

- Price Support Scheme (PSS) applicable in case of MSP-notified crops. Intervention by GoI whenever market prices fall below MSP.

- Market Intervention Scheme (MIS): To support commodities, for which MSPs are not notified — fruits/vegetables/other horticulture products.

- Price Stabilisation Fund (PSF): A scheme to protect consumers from rising prices.

Enhanced MSP (= 1.5 times of Cost of Cultivation-A-2) in Union Budget, 2018 followed by the announcement of PM-AASHA for Enforcement.

Giving a major boost to the pro-farmer initiatives of the Government and in keeping with its commitment and dedication to the Annadata, the government launched a Scheme "Pradhan Mantri Annadata Aay Sanrakshan Abhiyan" (PM-AASHA) which aimed at ensuring remunerative prices to the farmers for their produce as announced in the Union Budget for 2018. The new Umbrella Scheme PM-AASHA comprises of Price Support Scheme (PSS) (for Pulses, Oilseeds and Copra), a Price Deficiency Payment Scheme (PDPS) (oilseeds and pulses) and a Pilot of Private Procurement & Stockiest Scheme (PPPS) (only for oilseeds in 15 districts).

Warehousing

An efficient marketing system alone is not sufficient and cannot guarantee desired benefits to farmers unless it is supported by an efficient storage system for post-harvest crops. Warehousing allows farmers to balance their supply to markets and in the interim, enables them to avail finance to meet their immediate financial requirements. Warehousing availability, of suitable type and quality, thus makes it an important component of the agricultural marketing system. Three main agencies in the public sector engaged in building large-scale storage/warehousing capacity viz., Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and State Warehousing Corporation (SWCs). The government also supports the private sector and Cooperatives in creating warehousing capacity under the 'Agricultural Marketing Infrastructure sub-scheme' (erstwhile rural godown scheme).

5.4.5 Policy Initiatives to Improve Resource Efficiency/ Reduction in Cost

The inputs (seed, fertilizers and pesticides, farm machinery, credit and labour) account for a major component of cost in the case of all selected crops. The effective management of these inputs and their efficient use would help in reducing the cost and in turn enhancing the productivity and income of the farmers.

Soil Health Management – Soil Health Card (SHC) Scheme

Diagnostic surveys in the Indo-Gangetic Plains (IGP) indicate that in several high-productivity areas of irrigated ecosystems, farmers use excessive fertilizer N to maintain the yield levels attained previously with relatively less fertilizer. Indiscriminate use of N fertilizers aggravates soil fertility depletion and proves detrimental in terms of low nutrient use efficiency, poor quality of produce, enhanced susceptibility of crops to biotic and abiotic stresses, and a

potential threat of groundwater pollution due to excessive leaching of nitrates beyond the effective root zone.

Enhancing nutrient use efficiency will be the key to sustained agricultural production, lowering of unit cost of cultivation and raising farm income in the years to come. SHC Scheme, launched on 19 February 2015 aims at issuing SHC to each one of the 140 million farm holdings at 2-3-year intervals on a continuing basis. The SHC would include analysis of 12 soil parameters viz., the potential for hydrogen (pH), Emulsifiable Concentrate (EC), Soil Organic (SOC), available primary nutrients (N, P, K), available secondary nutrient (S), and available micro-nutrients (Zn, Fe, Cu, Mn, Boron). Based on analyses of these values, fertilizer and soil amendment recommendations are to be formulated for three prominent crops in each of the kharif (monsoon) and rabi (dry) seasons.

The issue of subsidised fertilizers to farmers was linked to the recommendations made in the soil health card.SHC involves assessment of soil fertility variation and suggesting nutrient prescriptions following the principle of 4R (right rate, right source, right time and right method). As of 31st March 2019, around 130 million SHCs were issued.

Halve Urea Consumption by 2022

To rationalise the use of fertilizers, the government announced a Direct Benefit Transfer (DBT) scheme under which subsidies will be released for those fertilizers issued against the SHCs. The SHC-based fertilizer recommendation is expected to enhance productivity and income. But timely availability of all fertilizers recommended in the SHC is a pre-requisite for adoption of SHCs

Seed – A Critical Input

Seed is a critical input for enhancing the productivity of all agricultural and horticultural crops and plays a vital role in improving the income status of farmers. The use of quality seeds alone can increase productivity by 15-20 per cent, showcasing its importance in agriculture. A sustained increase in agricultural production and productivity necessarily requires continuous development of new and improved varieties as well as hybrids, suitable for 128 agro-climatic zones of the country. This also necessitates an efficient seed multiplication system, integrating plant breeding, trade and distribution, and finally the farmer using the seeds. One of the serious factors responsible for the low use of quality seed is the sale of spurious seed in the market.

In order to improve the quality of farm saved seeds (60-65 per cent), Seed Village Programme being implemented from year 2005-06 onwards needs to be upgraded for better monitoring. The targeted 500 number of Seed Processing and Godown at the Gram Panchayat level by 2022 will strengthen seed production system.

Pest Management

In India, the farmer's crop yield losses range from 15 to 25 per cent owing to the presence of weeds, pests, diseases and rodents. The Government enacted Insecticides Act (I.A.), 1968 which regulates the import, manufacture, sale, transport, distribution and use of pesticides so as to prevent risks to human beings, animals and matters connected therewith. Challenges such as the Quality of pesticides, Optimum application of pesticides, Popularising Integrated Pest Management (IPM) techniques, Price of generic pesticides and monopolistic practices still need to be addressed. The problems of excessive pesticide usage can be addressed through multi-stakeholder participation. In addition to farmers, pesticide producers and sellers, middlemen of vegetable trade and consumers should also be involved in the diagnosis of the problems and designing of approaches.

Agriculture Mechanisation

Agricultural Mechanisation speeds up tasks, and helps bring judicious use of inputs like seeds, fertilizer and water, contributing to farm productivity, and, therefore aids in enhancing farmers' income. Estimates indicate that agricultural mechanisation can contribute to a cut in cultivation cost by 25 per cent and a rise in productivity by 20 per cent, thereby affecting an increase in farm income, to the extent of 25-30 per cent.

The Government of India is promoting agricultural mechanisation on farms through a Sub Mission on Agricultural Mechanization (SMAM) of Rs. 2000 crore, which started in April 2014 under the umbrella of the National Mission on Agricultural Extension and Technology (NMAET). The objectives of this Mission are: increasing the reach of farm mechanisation to small and marginal farmers and regions with low farm power; promoting 'Custom Hiring Centers'; creating hubs for hi-tech and high-value farm equipment; Awareness through demonstration and capacity building and ensuring performance testing and certification of machines.

Check Your Progress 4

1) Discuss in brief the Prime Minister's multi-dimensional seven-point strategy.

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2) Discuss Policy initiatives for enhancing the farmer's output/hectare: Improving cropping intensity

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3) What policy Initiatives have been adopted for crop diversification and enhancing value realization?

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4) What is MSP? Explain its importance to Indian agriculture and consumers.

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5.5 RELEVANCE OF NON-AGRICULTURAL ACTIVITIES IN DOUBLING OF FARMERS' INCOME

The agrarian structure of India has been experiencing a reduction in farm size and an increase in the marginalisation of holdings for the past several decades. The small land base of the Indian farmer is one of the major factors contributing to rural poverty. If agriculture were to be the sole source of income for small landholders, the majority of them would live much below the poverty line. A number of studies from developing countries have suggested that diversification of the rural economy towards non-farm activities has considerable potential to augment farmers' income and reduce rural poverty. Diversification towards nonfarm activities overcomes the land constraint to income growth, enables the farmers to cope with the shocks of crop failure and enhances their capacity to invest in productivity-enhancing agricultural inputs and technologies.

The Government of India consulted an Inter-ministerial Committee (Dalwai Committee) in April 2016 to examine issues relating to "Doubling farmers Income" and recommend strategies to achieve the same. The Committee submitted its report to the Government in September 2018 containing the strategy for doubling farmers' income by the year 2022. The Committee on Doubling Farmers' Income (DFI) recognizes agriculture as a value-led enterprise and has identified seven major sources of growth viz., (i) Increase in crop productivity; (ii) Increase in livestock productivity; (iii) Resource use efficiency or savings in the cost of production; (iv) Increase in the cropping intensity; (v) Diversification towards high-value crops; (vi) improvement in real prices received by farmers; and (vii) Shift from farm to non-farm occupations.

The government has adopted and implemented several policies, reforms, developmental programmes and schemes for achieving higher incomes for the farmers directly or indirectly. The unprecedented enhanced budgetary

provisions have been made to facilitate the following efforts of the Government:

1) Income support to farmers through PM KISAN
2) Pradhan Mantri Fasal BimaYojana (PMFBY)
3) Institutional credit for the agriculture sector
4) Fixing of Minimum Support Price (MSP) at one-and-a half times the cost of production
5) Promotion of organic farming in the country
6) Per Drop More Crop
7) Micro Irrigation Fund
8) Promotion of Farmer Producer Organisations (FPOs)
9) A National Beekeeping and Honey Mission (NBHM)
10) Agricultural Mechanization
11) Providing Soil Health Cards to farmers
12) Setting up of National Agriculture Market (e-NAM) extension Platform
13) Launch of the National Mission for Edible Oils – Oil Palm
14) Agri Infrastructure Fund (AIF)
15) Improvement in farm produce logistics, Introduction of Kisan Rail.
16) MIDH - Cluster Development Programme.
17) Creation of a Start-up Ecosystem in agriculture and allied sector.
18) Achievement in Export of Agri and Allied Agri- Commodities.

Check Your Progress 5

1) Briefly discuss the role and relevance of non-agricultural activities in raising the farmers' income in India.

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5.6 LET US SUM UP

In India, agriculture is a key sector in terms of its contribution to employment and GDP.

The green revolution in cereal production, the white revolution in milk production, the Yellow revolution in Oilseed Production as well as a National

Mission on Edible Oils – Oilseeds (NMEO-Oilseeds), and the more recent diversification of production towards pulses, fruit and vegetables as well as meat and meat products, have been largely in response to evolving demand patterns driven by rising incomes and urbanisation. As a result, India has transformed from a food-deficit country to a major exporter of agriculture and allied products. The strong growth in production has been sustained by improved access to inputs such as fertilizers and seeds, increased irrigation coverage (including micro-irrigation), the greater reach of institutional credit, the introduction of the Kisan Credit Card scheme – enabling more timely access to credit – and the designation of agriculture for priority lending. The beginning of structural change is underway due to the involvement of the private sector, going beyond the mainly traditional or unorganised private players (including mandi traders, private mills, village brokers, and traditional retailers) to organised private entities, such as agribusiness and large food processing companies or supermarkets.

Despite these successes, challenges remain. Among them, the notable being, the slow pace of structural transformation and low labour productivity, continuing fragmentation of operational holding, inefficient agro-food supply chains and retail sector, prevalence of informal channels of credit and climate change. Although Indian agriculture has increasingly become integrated with world markets, its trade share is still low compared to the share of India's total merchandise exports and imports as a per cent of India's GDP. Environmental pressures are also starting to loom large. To address these concerns, agricultural policies in India are designed and implemented by a complex system of institutions. States have Constitutional responsibility for many aspects of agriculture, but the Central government plays an important role by developing national approaches to policy and providing the necessary funds for implementation at the state level. Throughout the last decades, agricultural policies have sought to achieve food security, often interpreted in India as self-sufficiency, while ensuring remunerative prices to producers and safeguarding the interest of consumers by making supplies available at affordable prices.

5.7 KEYWORDS

Crop Diversification : Crop diversification refers to the addition of new crops or cropping systems to agricultural production on a particular farm taking into account the different returns from value- added crops with complementary marketing opportunities.

HYV Seeds : High Yielding Variety Seeds (HYV seeds) are seeds of better quality than normal quality seeds. They are resistant and have a high yielding potential against insects and diseases.

Institutional Credit : Agriculture credits provided by government institutions are called institutional credit.

Marginalising of Landholdings : A general feature of the size distribution of operational holdings is that the percentage of holdings decreases as the holding size increases.

Minimum Support Prices : The minimum support price (MSP) is an agricultural product price, set by the Government of India to purchase directly from the farmer.

5.8 SOME USEFUL BOOKS/REFERENCES

1. Acharya, S.S. (2016), "Agricultural Price Policy and Development: Some Facts and Emerging Issues", in Indian Society of Agricultural Economics (ed., 2016)

2. Aggarwal, N. , S. Jain and Sudha Narayanan (2017), The Long Road to Transformation of Agricultural Markets in India" Economic and Political Weekly, Vol.52, No.41

3. Chand, Ramesh (2016), "Doubling Farmers' Income: Rationale, Strategy, Prospects and Action Plan", NITI Policy Paper No.1/2017, NITI Ayog, New Delhi

4. Gulati, Ashok and Bathla, Seema (2002) Capital formation in Indian agriculture: Trends, composition and implications for growth. NABARD Occasional Paper No. 24. Also published in Economic and Political Weekly, 36: 1697-1708.

5. Indian Society of Agricultural Economics (ISAE) (edited 2016), "Indian Agricultural Economy under Liberalised Regime: 1991 to 2015", Academic Foundation, Delhi

6. Mishra SK and Puri VN, Indian Economy, 36th Edition, 2018, Himalayan Publishing House, New Delhi

7. Shantanu De Roy(2017), "Economic Reforms and Agricultural Growth in India", Economic and Political Weekly, Vol LII no 9, March 4, 2017

5.9 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) See Section 5.2 and answer

2) Sections 5.2 and answer

3) Sections 5.1 and 2.2 and answer

Check Your Progress 2

1) See Section 5.3 and answer

2) See Sub-section 5.3.1 and answer

3) See Sub-section 5.3.2 and answer

4) See Sub-section 5.3.3 and answer

Check Your Progress 3

1) See section 5.3.8 and answer

2) See Section5.3. and answer

3) See Section .5.3.10 and answer

Check Your Progress 4

1) See Sub-section 5.4.1 and answer

2) See Sub-section 5.4.2 and answer

3) See Sub-section 5.4.3 and answer

4) See Sub-section 5.4.5 and answer

Check Your Progress 5

1) See Section 5.5 and answer.

5.10 TERMINAL EXERCISE

1) The need for a Second Green Revolution is being experienced more than ever before. Do you agree? What are your views with respect to bringing revolution in the production of nutrition-rich crops like pulses, fruits and vegetables — which remained untouched in the first Green Revolution?

2) Discuss any two steps taken by the government in the direction of improving agricultural marketing system in India since independence.

3) "Agriculture sector appears to be adversely affected by the economic reform process." Elucidate.

4) Discuss the impact of the Climate change on the Indian Agriculture. What are the initiatives taken by the Government to mitigate this impact?

5) How farming system play an important role in doubling the farmers' income? Also, explain the role of Non-farm income in doubling farmers' income.

6) What are the Policy Initiatives taken by the government to ensure Remunerative Price to farmers for their Produce?