
UNIT 1 LAND RELATIONS IN PRE-BRITISH INDIA

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1.0 OBJECTIVES

On going through this unit, you will be able to explain:

- the nature of land relations during the pre-British rule, particularly the Mughal period;
- the presence of intermediaries between the state and the peasant; and
- regional variations in revenue collection arrangements and property rights.

1.1 INTRODUCTION

It is true that technological factors such as fertilizers, HYV seeds, controlled irrigation and scientific implements play an important role in agricultural development. But 'institutional factors' such as owner or tenant cultivation, absentee landlordism, indebtedness of the cultivators, etc. also play a significant role in stimulating or obstructing agricultural growth. In fact, application of technology in agriculture itself substantially depends upon the kind of institutions, which exist in a particular region. The more successful forms of peasant agriculture appear to have emerged where owner-cultivation was dominant. It is observed that the green revolution technology has been more successful in *ryotwari* and *mahalwari* areas dominated by peasant proprietors. And since the existing tenurial structure is the result of gradual process of evolution, influenced by social, political and economic factors, it becomes essential to look into the process of evolution of tenurial structure.

In this unit we will discuss some of the basic issues related to ownership and cultivation of land during the pre-British India. During that period land was relatively abundant compared to demand. Moreover, wasteland was easily available for reclamation in some areas. In this environment some basic issues arise: whether the owner cultivated his land or leased it out; whether the owner was allowed to sell his land; whether land was inheritable or not; how land tax was collected from the cultivator; what percentage of the agricultural produce was collected as tax; and what the punishment was for non-payment of tax.

1.2 LAND TENURE SYSTEM IN PRE-MUGHAL PERIOD

We cannot hold a detailed discussion of land tenure system in the pre-Mughal India in the present course. However, before giving an account of the tenurial system of the mughal period, it is worthwhile to have a brief idea about the nature of ownership of land during ancient period.

The question of ownership in land has been discussed by economic historians and their conclusions are largely confined to two options, the state or peasant ownership. Various combinations of the state's and the peasant's rights have also been suggested. It is argued that the proprietorship in land originated with the act of *reclamation*, and the peasant who reclaimed and converted the forest into arable land became the proprietor of that land. The king did not have any property right in land except the right to a share of the produce in return for 'affording protection to his subjects'. However, D. N. Jha argues that an individual proprietor exercised only a qualified ownership over his land, the king being its ultimate lord. On the other hand, Irfan Habib accepts the existence of private property in land but at the same time notes that peasant did not have the right to free *alienation* of land. But most scholars agree that the peasants held permanent and heritable occupancy rights in land and the king was not expected to evict them. In those early days, cultivation of land was strongly insisted upon. The individual peasant enjoyed the right of use as long as he cultivated the land. Sir Henry Maine points out that each family had the duty of submitting to the common rules of cultivation and pasturage. Grazing ground and forest tracts adjoining the village were the common ownership of the entire village community.

The revenue paid by the peasants was generally a share of the produce. The method adopted was either through actual division of the peasant's produce or state's share was estimated by inspection of the growing crop. Even sometimes an average or standard figure was determined for the state's share from the unit area of each crop. The collection of revenue was generally through various officers. They were authorized by the king to collect state's share of revenue and to retain a portion of it as payment for their services. Gradually, these offices became hereditary. Consequently, layers of intermediaries developed between the state and the cultivators.

1.3 LAND TENURE SYSTEM DURING MUGHAL PERIOD

The discussion in this section is in general relevant for the whole of Mughal India. But, particularly, it conforms more to the northern and central parts where Mughal rule was more entrenched. Distinguishing features of land tenure systems in other regions will be investigated later in the sections on Eastern, Western and Southern India. We will discuss two aspects, viz., land tenure and taxation on land. Both these aspects are not independent of each other, which makes the identification of different types of land rights in India difficult. So to understand the land tenure structure we will start our discussion with land revenue system.

1.3.1 Land Revenue System

The simplest form of land revenue was crop sharing. From this simple sharing, we can trace the evolution of other systems of assessment, which were designed to reduce the burden of work and expenses for the Mughal administration. One such method of assessment was *Kankut* (Kan = grain, Kut = estimate). Initially under this method production of each crop was estimated first by estimating yield per unit of land at the current harvest and then multiplying it with area under that crop. Tax was calculated on the basis of the proportion it was supposed to bear to the produce. Later on, to remove the discretion of officials, the *Kankut* was modified into *Zabt* (measurement) where instead of leaving the yield to be fixed at each harvest, a standard schedule for different crops was promulgated for a longer period. During Akbar's time, on the basis of detailed information collected for the period of ten years on yields, prices, and areas cultivated for each locality, the revenue rates were fixed directly in cash for each crop. However, in addition to this standard system of cash revenue, other methods of assessment such as crop-sharing (*batai*) and *Kankut*, continued in certain villages or for certain crops. Moreover, during crop failure, due concession was made in collection of tax in 'crop-less' areas.

Whatever may be the methods of assessment and collection, one major aim of the Mughal administration, according to Irfan Habib, was to take away the bulk of the peasant's surplus. The shares of the crop taken under the '*batai*' or *Kankut* varied with crops and localities. The norm seems to be one-half in the less fertile regions, and substantially more in the more fertile regions.

In Northern India, the unit of assessment was the village. The revenue due from a village was fixed with reference to its productive capacity usually for the year. But this sum was not distributed by assessors over the individual peasants. Inside the village the individual peasants contributed to this revenue on the basis of one or other of the familiar systems - either on an estimate of the produce gathered, or by rates on the area sown, or by lump sum payable for the land holding.

The collection of revenue was enforced by several methods. Non-payment of revenue was deemed equivalent to rebellion. While eviction was not unknown as a punishment, the more usual method seems to have been imprisonment and torture of the village headmen, followed by the massacre of the adult male population and enslavement of women and children.

1.3.2 Intermediaries and Land Rights

Theoretically the king was the sole claimant to the land revenue. But, as a matter of fact, the assessment and collection of the revenue was largely through the members of a small ruling class. Large areas of cultivated land were given to them revenue-free; and where revenue was levied on their land it was often at substantially lower rates. We discuss below about the intermediaries.

1.3.3 The Jagirdars

The *jagirdars* were the king's officers enjoying land-gifts. These were the persons who held ranks (*mansabs*) granted by the emperor. Each rank entitled its holder (*mansabdar*) to a particular amount of pay which was usually met by assigning an area (*Jagir*) that was officially estimated to yield an equivalent amount of the revenue. These ranks (*mansabs*) were not inheritable, though it was normal practice to allow the relations of higher *mansab*-holders to continue with their *mansabs*. The temporary character of *Jagir* strengthened the control of the emperor over the *Jagirdars*. According to Abul Fazal, a *mansab*-holder was entitled to a *Jagir*, but not to a particular tract of land in *Jagir*, and not the same land year after year. The *mansabs* (and hence *Jagirs*) were revised from time to time to award promotions or demotions.

Thus it seems that a *Jagirdar* had no permanent rights on his assigned area. Theoretically his claims were also confined to the authorised land-revenue and taxes. But, in practice, the *Jagirdar* was a much more powerful person specially if he happened to be a big assignee enjoying police jurisdiction as well. In fact, a large proportion of land was under such *Jagirs*. It is estimated that, in 1646, a mere sixty-eight princes and nobles at the top claimed 36.6 per cent of the total revenue demand of the empire and the next 587 officials claimed nearly 25 per cent. The remaining 7,555 *mansab*-holders claimed between a quarter and a third of the revenues. Thus the larger portion of the land lay within *Jagirs*.

In Irfan Habib's opinion, it was within the powers of a *Jagirdar* to remove a zamindar. As for peasants, the *Jagirdars* claimed powers to detain them to land, like serfs, and bring them back, if they ran away. It is widely believed that in the later period of Mughal empire the *Jagirdars* resorted to oppression and extortion of the peasants because, unsure of holding particular areas for a longer time they had no regard for the long-term prospects of revenue collection.

As mentioned earlier, during Mughal period, revenue demand was very high and more than half of the gross produce was taken away from the peasants. Though peasants held permanent and heritable occupancy rights in land, bulk of the agricultural produce of the empire was placed in the hands of numerically very small class of *jagirdars*.

1.3.4 The Zamindars

The *Zamindar* is a Persian term which means holder of land (*zamin*). The frequent use of this term began from Akbar's time onwards for any person with any hereditary claim to a direct share in the peasant's produce. The basic right of *Zamindar* was his claim to impose certain levies on the peasants over and above the land-revenue assessment. Irfan Habib also refers to other cesses and perquisites of *Zamindars* such as house tax and levies on forest and water produce, since these are specified among the rights transferred in *zamindari* sale deeds.

Though claims of *zamindars* were originally distinct from land revenue, the role assigned to them in the Mughal revenue system tended to blur these distinctions. In a large part of the Mughal empire, the *Zamindar* was expected to collect the tax from the primary cultivators, in return for an allowance of one-tenth of the collections, given either in cash or in allotment of revenue-free land.

The zamindars often claimed to derive their rights from settling a village and distributing its lands among the peasantry. Theoretically, they also had the right to evict peasants, but land being more abundant than labour in practice the right to evict the peasant had much less significance.

In Irfan Habib's opinion the *zamindari* right was in itself an article of property. It was inherited according to the same laws and customs as governed the inheritance of other property. *Zamindari* right was also freely sold. Some *zamindaris* were actually mortgaged to professional money-lenders. Provision for transfer of *Zamindari* rights also enabled persons who had accumulated wealth out of the extraction of land revenue, such as petty officials, revenue grantees, etc., to transform themselves into *zamindars*. But it was rare to find merchants buying up *zamindaris*.

Zamindar and peasant-held villages were found side by side in the same district in Mughal empire. Even sometime in a peasant village, Mughal administration created new *zamindaris*. During the decline of Mughal empire, *zamindari* rights was created even by force. Sometimes peasants of a village also sold away their rights to a person, who became the zamindar of that village. At the same time, there are numerous instances of fresh villages being settled without the intermediation of zamindars.

Thus during the Mughal period two groups of revenue extractors, viz., jagirdars and zamindars, whose involvement in agricultural production was almost nil, were of enormous importance. What the producer was supposed to pay was fixed in law by imperial regulations. What was actually taken depended on the power and inclinations of *Jagirdars* and *Zamindars*. During the declining days of the Mughal empire this system became quite oppressive.

1.3.5 The Village Community

A notable feature of village life in pre-British period was the combination of agricultural work with manufacturing processes with an unalterable division of labour. Production was mainly for direct use and the surplus after payment of revenue was marketed. Relationship of the village with town was one way and it hardly received anything in return and provided for almost all of its needs from within the village. Normally the peasants of the village claimed the same ancestry and so belonged to the same brotherhood (*bhaichara*). This fraternity by invoking ties of blood bound the peasants in unity far stronger than could have been expected among mere neighbors. Authority in the village was exercised by a group of elders, traditionally a council of five persons, the *Panchayat*.

But the earlier contention that peasants had common ownership in land is disputed by many scholars. It is suggested that the individual families had their separate holdings and only the forest and grazing grounds were held commonly. Of course there were certain other spheres, outside production, where peasants acted collectively. In the village every peasant paid his share into the common financial pool from which the land-revenue, the demands of officials, the repayment of any common loan (specially raised during natural calamities to pay the part or whole of the land revenue of the village), and expenses for the economic, social, and even spiritual benefit of the village were met. Even in the case of abandoning of a village and migration to some other areas, villagers normally decided collectively.

Views also differ over the homogeneous nature of peasantry. Economic differentiation within the peasantry had emerged during the Mughal period. Irfan Habib point out that in Northern India as well as in other parts of the Mughal empire there were some large cultivators raising crops for the market; and there were small peasants, who could barely produce foodgrains for their own subsistence. Beyond this differentiation among the peasantry, there was still sharper division on the basis of caste. Depending upon their resources in seed, cattle and money, peasants might cultivate larger or smaller plots. But larger land holdings were linked to, and often resulted from, superior position or status secured either as headmen (*muqaddams*) or as members belonging to dominant elements of the village (*kalantran*), in contrast to the small peasantry (*rezariaya*). The village headmen often had revenue-free allotments, amounting to 2½ per cent of the total, and the superior elements were often assessed at lower rates of revenue than ordinary peasants.

Another source of strength of the rich peasantry was associated with the land-revenue system. The basic units of revenue assessment and collection being a village, it was natural for the revenue authorities to rely upon the headmen or a small group of upper peasants. This dominant group fixed tax rates for each peasant, collected it, and put it in a pool. From this pool the land revenue would be paid, so also certain other common expenses including the fees and perquisites of certain officials. Those who controlled the pool usually evaded paying their own due share of revenue. Lower rates were also levied upon some favoured elements. The smaller peasants, forming the bulk of the peasantry, were thus called upon to pay more than their due share of the revenue in order to make up the total. Thus the internal contradictions started emerging within the peasant communities.

1.3.6 The Peasant and the Ownership of Land

Now let us consider the crucial question of who was the landowner. This was the question which, after the conquest of India, British administrators addressed to themselves. In fact in the years preceding the Permanent Settlement in Bengal, the English circulated some questionnaires with a view to eliciting ‘official’ opinion concerning various land rights. The question most often asked was “who is the owner of the land—the ruler (*hakim*) or the *zamindar*?” It will be noticed that the question as formulated excluded the peasants from consideration altogether.

However, most of the scholars today agree with the view that king was not the owner. Numerous Mughal government documents refer to private persons as owners (*maliks*), holding *malkiyat* or ownership of land. In Aurangzeb’s *farman* to Muhammad Hashim the terms *maliks* and *arbab-i-zamin* (landowners) are clearly used for ordinary cultivators or peasants. But the crux of the matter really is whether the substance, not merely the name, of the peasant’s right was such as to deserve the application of the term ‘proprietary’ in its strict juridical sense.

On the one hand, there was general recognition of the peasant’s title to permanent and hereditary occupancy of the land he tilled. In case he was found incapable of cultivating land or had abandoned it altogether, land was given to another peasant for cultivation. But if at any time, the malik recovered his ability to cultivate it or came back to it, the land was to be resorted to him. On the other hand, there was no question of really free alienation, which is an essential feature of modern proprietary right. The readiness with which authorities recognized the peasant’s right of occupancy and the anxiety they showed to prevent him from leaving the land were both natural in an age when land was abundant and peasants scarce. Sale of land might also not be possible because there was no scarcity of land and the revenue burden was quite heavy. The peasant, in such a situation, might not often succeed in finding buyers. The peasants thus enjoyed the permanent and hereditary right of occupancy but did not possess the right of free alienation.

In fact, the rights which in aggregate constitute ownership, in the true sense of the word, were not as a rule vested in one-person, but were distributed irregularly among the various parties connected with the land. Moreover, the collapse of the Mughal administration had produced an environment in which might (force) counted more than right. The interests were traditionally multiple and the notion of an absolute and exclusive form of proprietorship was alien to India.

Check Your Progress 1

- 1) Why is it that the peasant ownership of land during Mughal Period is so debatable? Answer in 50 words.

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2) Point out the features of the Indian village community during the pre-British period in 3 sentences.

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3) State whether True or False:

- i) During Mughal period more than half of the gross produce was taken away as revenue.
- ii) It was within the power of a *zamindar* to remove a *jagirdar*.
- iii) In the Mughal regime both *zamindar* and peasant ownership were prevalent.
- iv) During the Mughal period revenue actually taken away was more than that fixed by imperial law, depending upon the power of the intermediaries.

1.4 LAND RELATIONS IN EASTERN INDIA

The investigation of land relations during Mughal period in Bengal is of particular interest, because it was here that the early British administrators acquired the terminology which they carried with them to the North. Bengal stood apart from other provinces because the revenue system in force here was the one known as *mugtai*, a fixed demand. The revenue was levied in cash, at rates per unit of land, or in lump sums covering entire villages, the same amount being levied year after year, until, as a special measure, there might be a revision or enhancement. According to James Grant, initially the revenue demand fixed in 1582 by Todar Mal represented around one-fourth of the average produce. In 1658 there was an enhancement of 13 per cent. After that successive levies were made on the *zamindars* in the form of *cess*, although the basic demand remained unchanged. But Moreland does not agree with James Grant's account, specially, his statement that the basis of assessment was one-fourth of the produce. Moreland considers that in Todar Mal's time the state's claim was uniformly one-third.

Unlike northern India, in Bengal the imposition of revenue-demand was not upon the peasants but upon the *zamindars*. Bengal *zamindars* were different from the *zamindars* in other parts of Mughal empire. Here the zamindar was called upon to answer for the payment of land revenue within the area of his *zamindari*. He collected the land tax (or rent) from the peasant at rates fixed by custom or by himself and paid the amount imposed upon him by the administration. The balance left with him constituted his income. In other parts of the Mughal empire the zamindar was expected to collect cash and allot revenue-free land.

Land revenue system in Assam, which had evolved during the long *Ahom rule* (1228-1818) was entirely different. According to B. Chaudhuri, under Ahom rule the payment of revenue in the form of cash or produce was of a limited extent. The fiscal system in Ahom rule was based on labour services of the entire community, mostly in connection with the defence of the kingdom as the Ahoms had no regular standing army. Occasionally, people were engaged for the maintenance of public works also. The male population was divided into groups called *khels*, each *khel* being further divided into smaller units (*gots*), composed of three to four males (*paiks*). In times

of peace only one *paik* of each *got* served the state, usually for three or four months in a year, the other members looking after the cultivation of his land. During wars all the male members were called up, with the women and children looking after the entire cultivation. Each *paik* family, in return for such services, got free of rent two *puras* (about 2.66 acres) of wet land, in addition to a piece of land, also rent free, suitable for homestead or garden, and could add to its holding by reclamation of wasteland where this was plentiful. The *Ahom* king entrusted the administration and the defence of the realm to the Assamese aristocracy. The economic power of this group was largely derived from the income from their rent-free estate, which were worked mostly by servants and also partly by free *paiks*.

1.5 WESTERN INDIA: LAND REVENUE AND RIGHTS

Western India comprises roughly the narrow coastal area from the Rann of Kutch to north Kanarah, the wide flat Gujarat plains and the Deccan Plateau. Most of this region had been under Mughal empire.

1.5.1 Land Revenue

As described by H. Fukazawa, in this region, the village agricultural land was normally divided into (1) ordinary owned land (*miras jamin*) (2) gifted or exempted land (*inam jamin*) (3) state land (*khalsa jamin*) and (4) land of extinct families (*gat kul jamin*) or wasteland.

In the official documents a distinction is made between the imposition upon *miras* land to be paid to the state and that upon *inam* land to be paid by tenants to inam holders. The former imposition was called land tax (*sera*) while the latter was called rent (*dhara*). Similarly imposition upon the *khalsa* land as well as *newly* cultivated wasteland was also termed *dhara*. But in actual practice this distinction may not be much significant because land revenue, whether tax or rent, was as a rule assessed and levied in cash on different soils and different crops through very complicated procedure. Revenue was sometimes also assessed on crop-sharing basis. Shivaji fixed the revenue burden between one-third to two fifths of the produce. In general, the revenue rate was gradually increased during the eighteenth century due to the financial difficulties of the Peshwa government. Of course, Brahmans and government officials were usually treated with special favour in revenue matters under the Peshwas. On the other hand, the Maratha government also encouraged the extension of cultivation to wastelands by offering various favorable terms to the peasants especially to the *aparts* (temporary peasants) of other regions.

A large portion of the revenue was more or less assigned temporarily to the state officials and aristocrats as their salary. The officials responsible for the collection of revenue from the village headmen in their assigned areas were hereditary chiefs called *desmukhs* (desai in Gujarat) and hereditary accountants, *despande*. They were often called *zamindars* in the official documents. In the Deccan Muslims kingdom the assignees widely exercised administrative authorities over their assigned territories. However, when the Mughals conquered the Deccan during the seventeenth century they successfully curbed such authority and specified the amount to be collected.

1.5.2 Land Rights

Fairly complete private ownership was recognized in *miras* land as well as *inam* land. Maratha government never forfeited *miras* land for failure to pay the land revenue, but had to resort instead to temporary possession of the land, imprisonment of the *mirasdar*, or collection from other *mirasdars*. Some scholars are of the view that

government could not increase the land revenue on miras lands; but since it could always levy additional cesses, and frequently did, this theoretical prohibition had not much force. *Inam* land, on which the land revenue was very low, was held by temples, village officials, artisans and servants. When land-holding families died, their land lapsed to the village and were treated like the wasteland of the village. The village headman (*patil*) might convert this land into *miras* land for himself or the village assembly could gift it to some willing peasants or sell it as *miras* land. In addition to it, state land was also in abundance all over Maharashtra.

In each village there were hereditary village officers such as headman (*patil*), accountant (*kulkarni*) and assistant headman (*chaugula*). These officers used to own more or less large *miras* land. They were allowed by the government to have some *inam* land as well. Moreover, they were entitled to receive some amount of produce from peasants and village artisans. Their office and accompanying *inam* land as well as privileges were called *watan*. This was not only heritable but saleable and transferable with the acknowledgement of state authorities and village assembly. A second group of people in the village was proprietary peasants called *mirasdars*. Mirasdar peasants, mostly *kunbis* by caste, were permanent resident of the village and paid both the regular revenue and miscellaneous cesses for the state on their miras land.

A third group in the village was of *upari* (literally 'stranger') peasants or tenants. They were temporary residents of the village, who had left their home village due to famine, devastation caused by wars, etc. and became migratory. The *upari's* assessment could be raised from year to year, and his tenancy terminated at the end of the annual lease. They had no hereditary claims to the land, no matter how long they or their families might have been in cultivation, nor could they take part in governing village affairs. However, according to some scholars, they were only a small minority of peasants in the seventeenth century.

Lastly, village servants and artisans called *balutedars* were also a part of the village population. Their composition was fairly uniform though number varied according to the size of the village. They were expected to serve villagers whenever required in their respective capacities fixed by their castes, and were paid the remunerations at the time of two harvests of the year, usually in kind. Besides many of them were given by the village a small plot of *inam* land which was as a rule cultivated by themselves.

1.6 SOUTH INDIA: LAND REVENUE AND TENANCY

South India comprises roughly the present states of Andhra Pradesh, Karnataka (but excluding north Kanara, Belgaum and Bijapur, formerly part of Bombay presidency), Kerala, Tamil Nadu and the Marathwada district of Maharashtra. Political boundaries shifted rapidly in this region in the eighteenth century. By 1772 nearly all of south India was under three Muslim rulers: the Nizam in the north (Hyderabad state), the Nawab of Carnatic in the south-east and Haider Ali in Mysore and parts of Kerala. Only Travancore and Thanjavur were under Hindu rulers.

1.6.1 Land Revenue

Not much information is available about pre-British modes of taxing the peasantry in southern parts of India. But at the village level the revenue was collected through the village headmen and village accountant. In many *mirasdari* areas, there were no hereditary village headmen and the mirasdars as a group performed the function of revenue collection. There is, however, a controversy whether these taxes were paid to the king, local chieftain or local assembly. The political turmoil of the eighteenth century also added to this confusion. Zamindars behaved as independent rulers.

Towards the end of the eighteenth century they were occasionally joined by Europeans. In 1800, the year before the company took over Tirunelveli, the Nawab mortgaged several villages to a European who collected the land revenue and threw the defaulters into prison.

1.6.2 Land Tenure Structure

Agarian structure in pre-British south India was quite complex with many variations. One important reason for these variations was availability or non-availability of water. Agrarian structure was more stratified in coastal areas where yields were high and risks were relatively low. These were the regions which could afford to support large temples, settlements of Brahmins and a variety of artisans to whom *inam* lands were given which were either free of revenue or lightly assessed. *Inam* lands were also given to village officials who were generally more powerful in the dry areas.

According to Dharma Kumar, one special feature of the south Indian scene was the existence, particularly in the irrigated Tamil plains and some Telugu areas, of communal system of holdings, especially in the Brahmin settlements. In these villages, the holdings were expressed as shares of the total. The shareholders had the right to cultivate their shares and also to participate in the management of village lands leased out, and in the profits from the orchards, forests, tanks and other property held in common, in proportion to their shares. The shares did not necessarily specify a particular plot of land, specially in those villages where the lands allotted to each shareholder for cultivation were periodically redistributed. Though these shareholders acted collectively in certain matters, yet their cultivation was almost always individually organised. These shareholders were called *mirasdars* (having hereditary rights in land) in the revenue records. During the eighteenth century their holdings were very unequal in size, whatever might have been their original distribution. In almost every village there were a few large landholders; as dominant landlords.

1.6.3 Tenancy

Because Brahmins were forbidden to touch the plough, the lands of Brahmin landholders were cultivated by others. Even in the case of some large non-Brahmin landholders, lands were leased out. Many landholders with small holdings and the landless with a pair of bullocks and a plough acted as tenants on these lands. The terms of tenancy differed in different cases. The main distinction was between the resident of the village (*ulkudi*) and the outsider (*parakudi*). The *ulkudi* had greater security of tenure, sometimes even hereditary rights of occupancy. The *parakudi* generally had yearly leases. The rent was normally a share of the gross produce though occasionally fixed amounts of cash or kind per acre were also paid. On wet lands the rents usually ranged from 50 to 82 per cent of the gross produce, after deduction of the land revenue. Most commonly, in Thanjavur, it was between two-thirds to three-fourths of the gross crop. Rental shares varied with the security of tenancy, the element of risk and cost sharing arrangements between the landlord and tenant. In fact, sometimes it was difficult to distinguish between a labourer and a sharecropper receiving a fifth or less of the crop.

Check Your Progress 2

- 1) How was land revenue assessed in Western India?

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2) Who were the intermediaries in land tenure system in Eastern India?

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3) State whether True or False:

- i) In Bengal, *zamindars* collected the tax on land.
- ii) Paiks were part of the *zamindari* system.
- iii) Brahmins in south India cultivated the land themselves.

1.7 LET US SUM UP

In this unit we have discussed the prevailing institutional land relation structure growth during the pre-British period. The land tenure system has not been uniform over time and space throughout India. The property rights and rights to alienation have been controversial issues. But most scholars agree that the peasants held permanent and heritable occupancy in land and the king was not expected to evict them. The peasant had to submit a part of the produce as tax. This extraction from the peasant, although invariably on the higher side, became exorbitant with the creation of various layers of intermediaries.

1.8 KEY WORDS

- Alienation** : It refers, in this context, to the transfer (may be through sale or inheritance) of title to property from one person or organisation to another.
- Reclamation** : The restoration of natural resources, such as land, to productive use. Examples may be reclaiming deserts through irrigation and forests, and reclaiming eroded fields and hillsides through proper cultivation and replanting, etc.
- Rental** : Rent, in a broader sense, is the payment for the use of a resource, whether it be land, labour, equipment, ideas or even money. Typically the rent of labour is called 'wages', the payment for the use of land and equipment is called 'rent'; the payment for the use of an idea is called a 'royalty' and the payment for use of money is called 'interest'. Rental is the amount of rent paid or received. The rental of estates, for example, refers to the rent to be paid for the use of it.

1.9 SOME USEFUL BOOKS

Dharma Kumar and Meghnad Desai (Eds.), 1982, *The Cambridge Economic History of India* Vol. II, Cambridge University Press. (Chs. I and II.)

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1.10 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Sub-section 1.3.6 and answer.
- 2) See Sub-section 1.3.5. Bring out the main characteristics.
- 3) i) True ii) False iii) True iv) True

Check Your Progress 2

- 1) See Sub-section 1.5.1 and answer.
- 2) See section 1.4 and answer.
- 3) i) True ii) False iii) False

UNIT 2 AGRARIAN RELATIONS DURING BRITISH RULE IN INDIA

Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Impact of British Rule in Eastern India
 - 2.2.1 Permanent Settlement
 - 2.2.2 Transfer of Zamindari Rights
 - 2.2.3 Indebtedness and Alienation of Land
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 - 2.3.1 Impact of Land Revenue System
 - 2.3.2 Land Transfers
 - 2.3.3 Landholding Structure and Tenancy
- 2.4 Impact of British Rule in Western India
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 - 2.4.2 Stratification
 - 2.4.3 Tenancy
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- 2.6 Agricultural Labourers
- 2.7 Land Tenure System and Agricultural Growth
- 2.8 Let Us Sum Up
- 2.9 Key Words
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- 2.11 Answers/Hints to Check Your Progress Exercises

2.0 OBJECTIVES

On going through this unit, you will be able to explain:

- regional variations in landed property relations during British Rule;
- the impact of British rule on village economic system; and
- the poor agricultural growth during colonial regime.

2.1 INTRODUCTION

During the British rule there was widespread destruction of village communities, formation of land market, rising rents, indebtedness, formation of layers of intermediaries, frequent famines and impoverishment of the population as a result of some direct and indirect influences of the British rule.

There is a subtle difference between ‘agrarian relations’ and ‘land relations’. Agrarian relation is a much broader term and includes credit and marketing facilities apart from land relations. On the other hand, land relation depicts the land tenure system and ownership. In this Unit we will discuss the agrarian relations during the British rule in India. As there were considerable variations in the land tenure system across regions we bring out the important features of this regime at a regional level.

2.2 IMPACT OF BRITISH RULE IN EASTERN INDIA

The East India Company took over the Dewani (financial rights) of Bengal, Bihar and parts of Orissa in the year 1765. Immediate interest of the company was to collect the maximum amount of income in the quickest possible time. The company required large amount of money to (a) finance trade and commerce, and (b) maintain the army for strengthening and expansion of the rule. To realize the higher land revenue, the zamindari were auctioned to the highest bidders.

The policy of maximizing land revenue altered the composition of landed society. Many old zamindars could not compete in the race. The highest bidders at the public auction in many cases were people who made fortunes through their association with the new administration and through participation in the new trade and commerce. The peasants were literally robbed by these zamindars, in order to pay up the company's dues, and were often forced to abscond. This reckless process, which continued till the permanent settlement, resulted frequently in famines, loss of human life and large areas of land were rendered as waste. Between 1765 to 1793 the revenue demand of the company nearly doubled.

2.2.1 Permanent Settlement

The Permanent Settlement of 1793, in Bengal and Bihar, besides declaring the zamindars 'proprietors of the soil', fixed forever their dues to the state. It was argued that this would ensure not only the security of revenue, but also the prosperity of the company's commerce. A thriving commerce was the vital need of the British and agriculture provided variety of goods for export. It was more important also because that was the time of the commencement of the Industrial Revolution in Britain. It was thought that the creation of private property in land would create the right conditions for investment in agriculture. Landed property would acquire a value and the large capital possessed by many natives in Calcutta, which they were employing in usury, or monopolizing salt, or other necessities of life would be appropriated to the more useful purpose of purchasing and improving lands. Moreover, the creation of a class of loyal supporters (zamindars) for the stability of British rule was another important objective.

However, their expectations were only partially fulfilled. As far as the creation of a class of loyal supporters is concerned, the British substantially succeeded in it. But zamindars, new as well as old, failed to become agrarian capitalists, and preferred to remain feudal landlords. Capital was invested not for agricultural development but for purchasing of land. Moreover, in due course of time, a long chain of intermediaries cropped up between the state and the tiller. The Zamindars were expected to pay a fixed sum as revenue to the government. This revenue amounted to 90 per cent of the rent collected by the zamindars, in 1793. However, with increase in prices, the value of money eroded. The state lost because its revenues in terms of money were permanently fixed while the value of money had drastically fallen. The peasant lost because rents were not regulated and the increased value of agricultural produce was transferred to the hand of the zamindars and intermediaries.

The Bengal model was, however, not replicated in parts of Orissa and Assam. It was realized that the freezing of the land revenue demand, which constituted by far the most important source of the government income at that time, would be sheer folly. Both in Orissa and Assam settlements were temporary and the revenue demand was increased from time to time.

In Orissa, between 1805 and 1897, land revenue of the government increased by 93 percent. But in Assam the peasants surrendered to the State a larger proportion of their total agricultural output than peasants in other parts of eastern India. Since the

British had their distinct professional army and an elaborate administrative bureaucracy, the labour services of the *paiks* became redundant (see unit 1). The *paiks* were given a cash tribute, which was quite high as compared to the nominal tax on *paik's* land during Ahom rule. Moreover, the old Assamese aristocracy, to which the Ahom king trusted the defence of the state and a large part of the administration, also became superfluous under the new system. Their revenue-free estates were gradually confiscated.

2.2.2 Transfer of Zamindari Rights

As we know, the high land revenue demand, specially during the early British period, and the unprecedented rigour in its collection, created serious difficulties for many zamindars, which led to ruin of their estates. Moneyed persons were interested in buying these, and a market in land gradually developed. In addition to selling land, zamindars also leased out portions of their zamindaris thus creating further layers of intermediaries between the state and actual cultivators.

2.2.3 Indebtedness and Alienation of Land

Whatever was the condition before British rule, the pervasiveness of rural indebtedness during British rule remains an incontrovertible fact. Rural credit provided two sources of control: the dependence of a considerable number of peasants on a regular supply of credit, eventually involving surrender by them of a large part of their produce to the creditors, and the acquisition by creditors of the lands of defaulting peasants.

An important source of peasants' miseries was their undefined rent relations with zamindars, who abused their legal powers towards increasing their rental income. There was an increase in cultivation of cash crops such as indigo, opium and jute, during British rule. However, it contributed to the growth of rural indebtedness. An unremunerative indigo cultivation was largely forced on the cultivators by European planters through various devices. Opium cultivation, though not always forced, was vulnerable to the fluctuations of weather which resulted in frequent losses and indebtedness of the peasants. The cultivators of jute normally borrowed money from money lenders and jute traders, and, in return surrendered part or whole of their crops to the creditors, at lower prices. This affected them adversely thus perpetuating their indebtedness. Sudden slump in jute prices also affected them adversely thus increasing their dependence on moneylenders. Indebtedness of the peasants resulted in *distress sale* of land holdings and such sales increased in number over the years. Indebtedness and certain other factors converted the peasants into agricultural labourers.

2.2.4 Tenancy

The peasants who thus lost land were not necessarily driven out of land, except where the new owners cultivated them directly with hired labourers. The old peasants many a time cultivated their sold plots on a crop sharing basis. The share-cropping (*barga*) system did not result from rural credit relations alone, though its growth was considerably due to these. The *barga* system also prevailed where the owners, for various reasons, were unable to organise the cultivation of their lands. Some owners preferred the *barga* system where this ensured an increased rental income. Because of an increased demand for land by the peasants, share-cropping became more profitable for the land owner.

2.2.5 Tenancy Acts

With the Permanent Settlement the zamindars acquired exclusive property rights in land. Moreover, the entry of new zamindars destroyed all the customary rights of the peasants. The zamindars who bought the zamindari estates were trying to obtain

maximum return for their investments. To get the maximum out of the peasantry, they committed such excesses that the government was forced at times to intervene to stop a possible revolt. Two major tenancy acts were enacted in Bengal after the Permanent Settlement: the Rent Act of 1859 and the Bengal Tenancy Act of 1885, which was amended a number of times in the 1920s and 1930s. The tenancy act put some restrictions on the rights of the landlords to check the excesses committed by them.

Under the tenancy act occupancy rights were conferred on those ryots and under-ryots who had been in possession of any land for twelve consecutive years. The 'occupancy rights' of a ryot or an under-ryot also included rights of inheritance, transfer and mortgage. The occupancy ryot could not be ejected right away by the landlord even for non-payment of rent. However, court could sell his land for failure to pay rents. Rents of these tenants could be enhanced only under certain specified conditions.

Such occupancy ryots did not necessarily cultivate their holdings on their own and many of them, specially some big ryots, further leased out their lands to the tenants and share croppers rarely having any tenancy rights (non-occupancy tenants). One of the motives of the big ryots behind subletting their holdings was the considerable margin between the rent that the non-occupancy-tenants paid and the one they themselves paid. There was no legal protection against an increase of rent of these non-occupancy tenants and share-croppers by the occupancy tenants. By the year 1940, as many as one-third of peasants households were constituted of such inferior tenants, cultivating as much as one-fifth to one-fourth of all land.

Check Your Progress 1

1) What was the immediate impact of the East India Company taking over Dewani rights of Bengal, Bihar and Orissa?

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2) What were the objectives behind Permanent Settlement?

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3) In what respect was the Government at loss due to Permanent Settlement?

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4) What was the condition of tenants in Eastern India after the tenancy acts?

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2.3 IMPACT IN NORTHERN AND CENTRAL INDIA

In Northern India there was an intermixing of various kinds of revenue systems. Both Zamindari and Mahalwari systems were introduced in this region. Initially it was Bengal type permanent settlement that was favored, but later, after 1811, considerations of enhancement of revenue led to abandonment of fixed revenue system. So even in the case of zamindari areas only a small proportion was under permanent settlement, the rest were settled temporarily. In Punjab and parts of United Provinces, Mahalwari system was introduced where the unit of assessment was the village and payment of revenue became the joint responsibility of the village proprietary body. Each individual cultivator contributed his share in the revenue. Initially the burden of revenue was very heavy. The British laid claim to about 85 per cent of the rental. In principle it was reduced to two-thirds after 1833 and to one-half after 1855. But in actual practice this principle was not adhered to.

In the central parts of India, in the early decades of British rule, heavy assessments were the rule. They assessed the lands too high, demanded an impossible revenue, and impoverished the people. The mistake was realized at a later date and was condemned in the strongest terms. It was only in 1834 that a long settlement for twenty years was concluded in these territories, which was allowed to continue till the early 1860s. Under the new settlement of 1864, that was introduced in the Central Provinces, malaguzars or revenue-payers were recognized as the proprietors of the soil with a right to sell or mortgage their property. Tenancy rights were conferred on the cultivators. In principle it was decided that the land revenue would be limited to one-half of the rental of estates. But the principle was not adhered to when the assessments were made. Settlement officers did not accept the actual rental of estates. They estimated what the rental should be from their own calculations, and based the land revenue demand on those estimated rentals. Thus, the rental considered as the basis of assessment was higher than the actual rents received by the land owners. As a result, land revenue demanded was higher than 50 per cent of actual rental.

2.3.1 Impact of Land Revenue System

We noticed that land revenue was to be paid in cash, not in kind. Secondly, the amount of revenue was kept fixed for a period of twenty or thirty years, under permanent settlement. Consequently, the revenue of the state did not increase. On the other hand, the payment of revenue in cash generated a pressure on the cultivators. They were forced to produce cash crops like indigo, sugarcane and wheat. Moreover, they had to borrow money for payment of tax. Sometimes they took advance from the village money lender. Everywhere the local grain dealer-cum-moneylender, who was in some cases also the village accountant (patwari), found his position strengthened. The cultivator was moved more by his immediate cash requirements to meet revenue

and rent installment and to pay marriage expenses rather than by the mere prospect of higher profits from valuable crops. In fact, the profits tended to make their way into the middleman's pocket. In the Shahjahanpur district the fatal effects of accepting the inducement of urban *Khandsaris* or sugar factories became so notorious that the Chandel Rajputs inhabiting the Ramganga tract in the Khundur pargana refused to grow sugarcane rather than risk the loss of their independence and proprietary title to alien creditors.

2.3.2 Land Transfers

With the introduction of transferable proprietary rights in land, the land sales increased. The Board of Revenue on revenue administration of North West Province commented in 1854. "In no country in the world probably do landed tenures so certainly, constantly and extensively change hands. These mutations are effecting a rapid and complete revolution in the position of the ancient proprietors of the soil." Behind this alienation and mortgage of land lay the much larger problem of indebtedness. It was estimated that 10 per cent of agricultural land had already passed into the hands of what district officers termed 'the wily *mahajan* and sleek, impassive *bania*'. Yet official opinion remained opposed to any tampering with free trade in land. It was because of the realization that legislative inference might seriously upset the provision of rural credit and jeopardize the security of the land revenue. Similarly in the districts of Central Provinces, by the time of the 1864 Settlement almost the whole of the profits was taken away by the moneylenders. While mortgage was growing rapidly, decrees were being carried out through the civil courts in the 1870s. Continuous transfer of land from cultivators to moneylenders prompted legislation in the shape of Bundelkhand Alienation Act of 1903. But despite the Alienation Act the professional moneylenders in Bundelkhand remained a permanent part of the rural scene and sustained their hold over peasants. These moneylenders-cum-traders were more interested in rent-receiving or in controlling the disposal of peasant grown cash crops than in directly engaging in agriculture. So the introduction of legal private property rights in land tended to lengthen the claim of intermediaries above the actual cultivator and left the peasant based small scale traditional cultivation intact. British hopes of the emergence of capitalist agriculture, which would take benefits of economies of scale, did not materialise.

2.3.3 Landholding Structure and Tenancy

The picture presented by the Zamindari Abolition Committee's report of 1948 was a startling one. In North Western Provinces, the landholding structure was such that the greater part of land was held by relatively small group of large landholders. Altogether a mere handful of zamindars, just 1.3 per cent of the total population held more than half of the land. Yet it must be remembered that large proportion of such 'estates' had no physical existence as larger local landholdings but were simply bundles of rent-collecting rights over scattered parcels of land. Thus a large part of land in this region was cultivated by one or the other type of tenants. Similarly, in Punjab just 3.5 per cent of the total landowners owning above 50 acres of land owned more than one-fourth of the total area in 1924. By 1939 their proportion in total landowners came down to 2.4 per cent but area owned increased to 38 per cent. Invariably these bigger owners in Punjab were leasing out their lands to the tenants. This is also borne out by the fact that in 1924 around 120,900 owners owned more than 50 acres of land whereas only 20,000 cultivated more than 50 acres. In Punjab, which was generally considered as the land of peasant proprietors, between 1891-92 and 1939-40, area cultivated by the tenants increased from 10.6 million acres to 17.8 million acres whereas its proportion in the total cultivated area increased from around 46 per cent to 57 per cent (total cultivated area also increased from 23.1 million acres to 31.2 million acres during this period). Around 85 per cent of all the 'tenants at will' were without any security of tenure and they were normally paying very high rents.

2.4 IMPACT OF BRITISH RULE IN WESTERN INDIA

The system of revenue collection adopted in this part was basically the ryotwari system. Settlement was normally for a fixed period of 30 years, which meant that the revenue demand could be enhanced after that period. Under the *ryotwari* settlement, the *ryoti* cultivator is directly under the state. He is recognized as proprietor and can sublet, mortgage or transfer by gift or sale his plot of land. He cannot be ejected so long as he pays the revenue, which is fixed.

With the introduction of new land revenue system in Western India, the *miras* and *upart* tenures were merged and the occupant of the land had the same rights irrespective of their earlier status. The hereditary village and higher officials (*patils*, *desais* and *desmukhs*) were prohibited from collection of customary perquisites from people. In addition to this, exclusion of these hereditary officials from revenue administration also tended to lower their independence.

2.4.1 Changes in Agrarian Society

In the 1860s the American Civil War stimulated the international demand for Indian cotton (which was earlier fulfilled by North America) and large investments in railways and irrigation also facilitated exports. During this period, there was a sharp rise in prices of agricultural commodities, specially of cotton. The first to benefit from the boom were the traders and moneylenders but cultivators also got some benefit. But new settlements were due in many districts in the late 1860s. On the basis of prevailing high prices the new settlements of land revenue raised the assessment. Between 1856-57 and 1870-71 the total revenue of Bombay Presidency went up by 37 per cent (and by a further 18 per cent by 1890). Prices began to decline after 1870 and by 1876 many agricultural prices had fallen to 1860 level. Thus it became difficult for the ryots to pay the increased revenue and they went to the moneylenders for loans. Increasing indebtedness of the cultivators culminated in the Deccan riots in 1875 against moneylenders.

In addition to heavy land revenue demand, the new legal system had also given the village moneylender more freedom. As we know from the previous Unit, during the Maratha rule, the moneylenders knew that the government would not support them if they tried to confiscate peasant's land for recovery of debt. But the British courts were much more rigid in enforcing the land transfer and the cultivators were often ignorant of the new laws.

But what the *baniyas* were interested in, was control of the crops, and the trade. By the middle of the nineteenth century the moneylenders controlled nearly all the internal trade in both grains and cotton in the Deccan. Their main interest was to preserve this control through advancing loans to the peasants who were required to sell their crops to them at a much lower price than prevailing market prices. However, not only the *baniyas* but the prosperous members of the traditional cultivating castes, the *kunbis*, also took to moneylending. In fact these agriculturist moneylenders had a much greater appetite for land than the mercantile castes and possibly the land transfers in favour of the *kunbis* may have been of greater importance than transfers to traditional moneylenders. In 1930, it was reported that only 29 per cent of the peasants in Konkan were free from debt, and in the north Konkan much of the land held by peasants had passed into the hands of creditors, whether professional moneylenders or large peasants.

2.4.2 Stratification

There was rise of the rich peasantry and increasing stratification of the peasantry during the late 19th and early 20th centuries. The cultivation of cash crops such as

sugarcane, tobacco, groundnut and cotton expanded. The small section of the cultivators who had a surplus to market made large profits, and invested them back into agriculture mainly into irrigation. They also bought carts and instead of handing over their grain to the local shahukar at his price they could seek better markets. These rich farmers, who had been able to seize the new market opportunities, often replaced the traditional moneylenders as sources of credit in the village. These commercialized agriculturists also often purchased the land of small cultivators, who were often in heavy debt. Data collected for the Royal Commission on Agriculture showed that in 1924-25, 86 per cent of the total cultivated area was held by large owners each having more than 25 acres and they formed just 12 per cent of the total landowners.

2.4.3 Tenancy

There were landlords and tenants in south Konkan, north Kanara and in *inam* lands in the Deccan even before the British period. But there appears to have been a significant growth in the number of tenants, especially from the 1880s onwards. Many former revenue officials and moneylenders were leasing out their land to the tenants. It seems that well-to-do owner cultivators started withdrawing from cultivation and leased out their land during the first half of the twentieth century. In Gujarat land owned by non-cultivating holders increased from 24 per cent to 30 per cent of the agricultural area between 1916-17 and 1942-43 while their number rose from 65,000 to 1,01,000.

Most of these tenants were tenants-at-will. The majority of tenants in Maharashtra paid in kind; the general rate was half the crop, with the landlord paying the land revenue. This system was particularly advantageous to the landlords when prices were rising.

2.5 IMPACT OF BRITISH RULE IN SOUTH INDIA

The first half of the nineteenth century was a period of experimentation with methods of collecting the land revenue. As the British extended their rule over South India, they were faced with the question of whom to settle with for the land revenue. Whether revenue be taken directly from individual cultivators or contracts be made with intermediaries. In general, the policy adopted was that, for the sake of political stability, there should be minimum disturbance of the traditional rights. However, the British did not always uphold this principle.

Initially in certain districts ryotwari settlements were introduced. But soon after the introduction of Permanent Settlement in Bengal, similar arrangements were made in certain districts of Madras Presidency.

The land revenue was fixed in perpetuity, the zamindaris were made both inheritable and transferable, and uncultivated land were given to the zamindars tax free. The zamindars were a diversified group. Some claimed descent from kings or military chieftains, others from tax officials. Yet others were new men who had bought estates. The zamindaris were varied in size. Some were enormous, sometimes covering almost the whole of a district while others consisted of just a few villages. Though the land revenue and tenure in this part of India was basically ryotwari, by 1830 over a third of the Presidency was under zamindari system. Thereafter, the area under zamindari declined. Whenever zamindars were unable to pay the revenue as demanded, the government confiscated their estates and converted them to ryotwari. But even then around one-fourth of the area remained under zamindari system until the 1940s.

In this part of India, the division of rights between the peasants and the zamindars remained undefined. It appears that the peasants of the southern zamindaris were

in general more secure than those in northern zamindaris. When the Permanent Settlement was introduced, it was assumed that the zamindars would collect half the gross produce and pay two-thirds of that to the government in cash, retaining one-third for the expenses of his revenue establishment and his personal income. But the actual collection from the peasants were much higher than this.

For sometime the land revenue collection from the villages in most areas was contracted out to middlemen, who might be former rent collectors, or the leading cultivators of the village, or in some cases, speculators with little experience of the revenue system. These leases were initially to last for three or five years followed by decennial leases. But by 1822, it was decided that the ryotwari system should be introduced in all the non-zawmindari areas, as and when the village leases expired. Under the ryotwari system, in principle, the land revenue was generally fixed at half the gross produce on unirrigated lands and three-fifths on irrigated lands. Besides the land revenue and the amounts officially set aside for community purposes and village officials, there was unrecorded plunder by revenue officials. The cultivator was thus often left with very little.

2.5.1 Changes in Agrarian Structure

During the later half of the nineteenth century, the area under cultivation increased faster than the population. Large irrigation works were completed on the Godavari and the Krishna. The cultivation of cotton, groundnut and oilseeds increased. The building of roads and railways facilitated trade. Between 1881-82 and 1915-16, price of gains rose by 100 per cent or even more. The terms of trade moved in favour of agriculture. The burden of land revenue fell. The cultivator was able to invest in land. Progress was rapid in some regions, notably the Krishna-Godavari delta. This led to tremendous increase in prices of land. In one village, Peddapadu in east Godavari, N.G. Ranga calculated in 1926 that the price of fertile land had risen from Rs. 40 to Rs. 1500 per acre in sixty years. The real income of the village had increased by 250 per cent during the same period. The rich peasants widened the sphere of their activities and invested in rice mills, mica and other industries. They extended their money-lending business and went into banking.

But the depression of the 1930s hit both the rich as well as the poor. Agricultural prices and employment fell sharply. Payment of fixed revenue became difficult. It was difficult for the farmers to pay back their loans. Grain looting and attacks on rich moneylenders and landlords were symptoms of the widespread agrarian distress. The rural economy as a whole grew much poorer in the 1930s. Moreover, during the 20th century, population was growing faster than agricultural output. Until 1916 or so, the increase in agricultural output probably managed to match the increase in population; from then on the two diverged. Foodgrains output per head was 30 per cent lower in 1946 than in 1916.

Indebtedness of rural population increased during the 19th century. The same trend continued during the early 20th century and during the Great Depression; the burden of debt became so pressing that the government was forced to take action. The debt conciliation boards set up by the government during the depression scaled down debts in some cases but over the 1930s the volume of debt rose further. It was only during Second World War, when agricultural prices rose sharply, that, probably, there was a fall in the real burden of debt.

2.5.2 Tenancy

According to Dharma Kumar, there is little evidence regarding the growth of tenancy during British rule. The most common arrangement was share cropping and the tenant commonly got half the crop on dry lands but his share could be less on fertile, irrigated

lands ranging from one-third to one-fourth of the crop. The tenants' share also depended on input sharing arrangements. Generally, the landlord paid the land revenue and made substantial repairs to well and water channels. The tenant provided the manure. The quantities of manure per acre and the number of manuring was occasionally prescribed. Usually the leases were oral but were continued for long periods. Tenants in ryotwari areas had no legal standing, and they being a weak party, tenancy disputes were rare. Whether because of the relative infrequency of tenancy disputes or because of an implicit assumption that tenancy could not be a problem under a system of 'peasant proprietorship' like ryotwari, hardly any measures were taken in Madras presidency to protect tenants.

2.6 AGRICULTURAL LABOURERS

In the traditional village economy of pre-British India, the small cultivator was the focal point and there was no scope for a distinct class of persons working solely as agricultural labourers on the lands of others. The absence of such a separate class of agricultural labourers is also strikingly borne out by the fact that none of the accounts, which contain a detailed list of the traditional occupations in Indian village communities refer to agricultural labour as the sole occupation of a sizeable part of the population. In sharp contrast to this the 1931 census figure shows that nearly 38 per cent of the entire agricultural population was composed of landless agricultural labourers. This reveals that the structure of the traditional Indian agrarian society had undergone a great transformation under the British rule.

The number and proportion of agricultural labourers had not been evenly spread throughout the country. In Bombay, Madras and Central provinces their proportion was more than half of the total agricultural population in 1931. It was 58 per cent in Bombay, 53 per cent in Madras and 52 per cent in Central Provinces. S.J. Patel calls this Southern Triangle of India as the 'land of the landless labourers'. The second region, where the proportion of agricultural labourers to the total agricultural working population was between 22 to 35 per cent, comprises Bihar, Orissa, Bengal and Assam, i.e., eastern India. Separately, their proportion was 35 per cent in Bihar and Orissa, 33 per cent in Bengal and 22 per cent in Assam (including plantation workers). The third region comprises those areas where the proportion of agricultural labourers to the total agricultural population was still lower, i.e., less than 20 per cent in 1931. The United Provinces (22 per cent), Punjab (14 per cent), North-West Frontier Province (18 per cent) were in this region.

The tremendous increase in the proportion of agricultural workers was the result of a great social and economic transformation that went on in India during the nineteenth and the twentieth centuries. An important change which took place during the nineteenth century was in the organisation of village communities. The agrarian society of India, before British Rule, was founded on the integrated units of cultivation and handicrafts. Groups of cultivators and artisans, supplementing each other's needs, lived together in substantially self-sufficient village communities. The cultivators and the artisans lived together for centuries on the basis of traditional arrangements regulating the exchange of the cultivators' products and the artisans' services. Each cultivator carried on the cultivation of his farm with the assistance of his family. In such a society, there was no room for the existence of an independent and distinct class of agricultural labourers whose main source of livelihood was work on the land of others for which they received wages in kind or cash. During the 19th century, the village communities were confronted with economic, social and political changes of a far reaching character, which served ultimately to bring about their disintegration. One of the reasons of their disintegration was the decline of domestic industries. With the Industrial Revolution in England, exports of British manufactured goods to India rose sharply. The construction of a network of railways during the later half of the 19th

century further stimulated it. The net result was a decline of handicrafts in India without being compensated by modern industrialisation. Many artisans left their earlier profession and became agricultural labourers.

As we have already noted earlier, with the introduction of new land revenue system, private property in land was strengthened and free alienation of land also granted. Further, under the new land revenue system, government revenue was a fixed amount, irrespective of crop output, and was to be paid in cash. Thus during periods of bad crops or low prices the peasants were forced to borrow from moneylenders to pay the land revenue. Once in the clutches of moneylenders they were rarely able to free themselves from debt and the end result invariably was mortgage or sale of land. This, in addition to commercialization, led to the proletarianisation of some poor peasants and concentration of land with few resourceful rich peasants who later on employed the landless on their farms. Thus decline of domestic industries and the distintegration of the peasantry led to the transformation of the social basis of the agrarian society in India. New classes appeared on the scene: the moneylenders and rich peasants on the one hand, pauperized peasants and agricultural labourers on the other.

2.7 LAND TENURE STRUCTURE AND AGRICULTURAL GROWTH

The net result of all these changes in agrarian structure in India during the British period was stagnation of agricultural sector. During the period of 1891 to 1947 for British India as a whole, output rose at a rate of just 0.37 per cent per annum (see Table 2.1). Moreover, growth rate of foodgrains output was 0.11 per cent which was significantly lower than the population growth rate of 0.67 per cent per annum. Agricultural crop output seems to have gradually increased over the period, but the pace was slower than population growth, especially after 1921. Foodgrains output declined (after 1921) so that per capita output fell markedly. Commercial crop output increased rapidly, nearly doubling over the period.

Table 2.1

Agricultural Output and Population Growth Rates in British India: 1891 to 1947

Region	Percentage growth rates (per annum) in			
	Foodgrains	Population	Non-foodgrains	All crops
British India	0.11	0.67	1.31	0.37
Greater Bengal	- 0.73	0.65	0.23	- 0.45
United Province	0.35	0.40	0.92	0.42
Madras	0.42	0.80	2.37	0.98
Punjab	1.10	0.93	2.40	1.57
Bombay and Sind	0.27	0.71	1.44	0.66
Central Provinces	0.29	0.58	0.07	0.48
Five Regions excluding Bengal	0.47	0.64		0.80

Source: George Blyn, Trends in Agricultural Output in India, 1891-1947

If we look at the regional trends, Greater Bengal's steep rate of decline stands out among the regions (Table 2.1). Though there is a marginal increase in the output of

non-foodgrains in this region, it is nullified by a significant decline in foodgrains output. The remaining regions all had growth rates higher than the British India average. But, only Punjab had average growth rate of foodgrains production higher than its population growth rate. In fact, its overall growth rate is also significantly higher than other states. In case of United Provinces the average growth rate of foodgrains is almost touching the population growth rate. The remaining three regions, however, had foodgrains growth rates considerably less than their population growth.

Production could have increased only through expansion of area under production or raising productivity. The potential for increasing yield per acre was great (considering its initial low level), but it appears that institutional as well as material requirements for growth were not conducive. Land tenurial structure was such that there were layers of intermediaries between the ultimate owner and actual cultivators. The owners of land in most cases were absentee landlords without having any contact with land. The small cultivators, burdened by government taxes, heavy indebtedness, relatively high rent, and exploited by middlemen, did not have any margin to invest in land. It was not possible to invest by taking loans because of the high rate of interest and fluctuating prices and yields. A considerable share of economic surplus accruing to the landlords in the form of rents was being spent on lavish living. To maintain their style of life, many among them got heavily indebted. More thrifty among the big owners mainly invested their money in the purchase of land rather than improvement of agriculture. For moneylenders (agriculturists as well as professionals) moneylending was more profitable than any productive investment in land. As a result, net investment in agriculture was almost negligible and yield rates of most crops in different regions were either stagnant or declined.

Increasing output of cash crops was mainly due to the shift of area from foodgrains to cash crops. Though in Punjab also, area under tenancy was quite high, but here generally tenants (who themselves were mostly small owners) leased in from landowners who were normally living in the village and supervising their cultivation. Tenancy in Punjab was basically a method of labour mobilisation by those owners whose holdings were bigger (not as big as in zamindari areas) than what could be cultivated with family labour. Moreover, an important source of agricultural growth in Punjab was area expansion which increased during this period from 23 million acres to 31 million acres. Though in India as a whole the British were neglecting irrigation works, yet in Punjab during this period there was a tremendous investment in irrigation. Area irrigated by government canals during 1901-02 to 1939-40 in Punjab increased from about 4.5 million acres to 12.5 million acres. In fact, irrigation was provided in those areas of Punjab which otherwise were lying vacant due to scanty rainfall; and with the provision of irrigation, area under cultivation also increased.

In general, the output growth was higher in ryotwari and mahalwari areas. Greater Bengal was the area where land tenure structure was most retrogressive. There were layers of parasitic landowners living on rental incomes. The traditional irrigation system kept decaying. Possibly these were the reasons for deterioration of agriculture there. In addition to it, Bengal was the region where colonial exploitation was most rapacious and lasted for the longest period. Punjab came under British rule much later when the burden of land revenue was relatively modest. The disintegration of handicrafts was also on a lesser scale in the Punjab than in Bengal.

Check Your Progress 2

- 1) What are the reasons behind the tremendous increase in agricultural labourer during British rule?

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2) What are the reasons for the lower growth in agricultural production in spite of great potential during the first half of the 20th century?

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3) Why did Punjab witness relatively higher agricultural growth than other parts?

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2.8 LET US SUM UP

During British rule the traditional village economy underwent social and economic transformation, mainly through the decline of handicrafts and domestic industries without being compensated by modern industries. This process resulted in creation of a whole lot of agricultural labourers. With the introduction of new land revenue system, of course, right to alienation of land was granted and land revenue was fixed at a particular amount irrespective of level of output, but bad crops forced the peasants to borrow from the money-lenders.

Once trapped in the clutches of money-lenders with hardly any opportunity to free themselves from debt, the peasants had no other option but to mortgage or part with land. This, in addition to commercialisation of agriculture, led to the pauperisation of poor peasants and concentration of land in a few rich landlords.

There were some variations across regions in the nature of agrarian relation during the British period. Punjab, for instance, witnessed some growth in output during this period. On the other hand, Bengal witnessed a decline in agricultural output. The overall growth rate was very low.

2.9 KEY WORDS

Land tenure system : It indicates the period for and the manner in which land is retained by a cultivator. In case of tenants it reflects the occupancy of land, security of tenure, inheritance and transferability of tenancy rights, etc.

- Industrial Revolution** : The 'Industrial Revolution' took place in Europe in general and England in particular during the eighteenth century. It may be defined as the application of power-driven machinery to manufacturing, which accelerated output growth significantly. Large deposits of coal, abundant supply of labour and technological developments contributed to this rapid industrialisation. Apart from the manufacturing sector it transformed the English countryside as well through new farming techniques in agriculture.
- Great Depression** : Depression is the downward phase in a business cycle. During this phase there is decline in output and employment in the economy. The depression that took place globally during 1929-33, more intensely in America, is termed as the 'Great Depression' because of its severity.
- Commercialisation of agriculture** : Traditionally Indian farmers cultivated food crops for self-consumption and sale in the market. Cash crops were grown but not at a bigger scale. During their rule, the British encouraged farmers, rather forced them through several means, to grow cash crops such as cotton and indigo. Cultivation of cash crops required huge investments and involved higher risk of crop failure. This left the farmers in indebtedness and resulted in ultimate sale of land.
- Peasant** : Farmer in rural areas owning or renting a small piece of land which he cultivates himself. Generally he is poor with low-income level. Peasants as a social class or group are termed peasantry.
- Proprietary Title** : Rights or claims to ownership of property.

2.10 SOME USEFUL BOOKS

Dharma Kumar and Meghnad Desai (Eds.), 1982, *The Cambridge Economic History of India* Vol. II, Cambridge University Press. (Chs. I and II.)

Dutt, R.C., 1976, *The Economic History of India*, Vols. I & II, Publications Division, Government of India, New Delhi.

Dutt, R.P., 1979, *India Today*, Manisha, Chs. IV and VIII

Ghosh, *Emergence of Capitalism in Indian Agriculture*, P.P.H., New Delhi.

Habib, Irfan, 1963, *The Agrarian System of Mughal India 1556-1707*, Asia Publishing House, Bombay, (Chs. IV to IX.)

Moreland, W.H., 1968, *The Agrarian System of Moslem India*, Oriental Books Reprint Corporation, Delhi.

Patel, Surendra J. 1952, *Agricultural Labourers in Modern India and Pakistan*, Current Book House, Bombay.

Rayachaudhri, Tapan and Irfan Habib (Eds.), 1982, *The Cambridge Economic History of India*, Vol. 1, Cambridge University Press (Ch. IX).

2.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) The immediate impact was a rise in land revenue. For reasons see Section 2.2, second paragraph.
- 2) See Sub-section 2.2.1 first paragraph.
- 3) See Sub-section 2.2.1 and answer.
- 4) See Sub- section 2.2.4 and 2.2.5 for answer.

Check Your Progress 2

- 1) See Section 2.6. See the reasons for the disintegration of village communities.
- 2) See Section 2.7 and answer.
- 3) See Section 2.7. The reasons are higher investment in irrigation, less retrogressive land tenure system and being absorbed into the British Empire at a later date.

UNIT 3 LAND REFORMS DURING 1947-70

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Need for Land Reforms
- 3.3 Land Reforms Measures
 - 3.3.1 Abolition of Intermediaries
 - 3.3.2 Tenancy Reforms
 - 3.3.3 Ceilings on Land Holdings
 - 3.3.4 Bhoodan and Gramdan
 - 3.3.5 Protection of Tribal Land
 - 3.3.6 Consolidation of Holdings
- 3.4 Choice of Appropriate Form of Farm Organisation
- 3.5 Changes in Agrarian Structure
- 3.6 Pattern of Landholdings
 - 3.6.1 Pattern of Ownership Holdings
 - 3.6.2 Pattern of Operational Holdings
- 3.7 Let Us Sum UP
- 3.8 Key Words
- 3.9 Some Useful Books
- 3.10 Answers/Hints to Check Your progress Exercises

3.0 OBJECTIVES

After going through this unit, you will be in a position to:

- explain the need for agrarian reforms;
- explain the land reform measures undertaken during 1950s and 1960s; and
- assess the impact of reforms in changing the unequal and exploitative agrarian structure.

3.1 INTRODUCTION

In the previous two Units we discussed the agrarian structure prevalent before Independence, particularly during the Mughal and British periods. The main characteristics of the agrarian structure which independent India inherited were

- a) absentee land ownership;
- b) exploitation of tenants through high rents and insecurity of tenure;
- c) unequal distribution of land;
- d) tiny and fragmented holdings; and
- e) lack of adequate institutional finance to agriculture.

On this agrarian structure was imposed a situation in which bulk of the cultivators were short of *fixed* as well as *working capital*. This resulted in low investments and thereby low yields in agriculture.

Agrarian structure, as you know, is a broad concept comprising land tenure system as well as credit, marketing, etc. Thus agrarian reforms would imply corrective measures in land tenure system, credit and marketing. On the other hand, the concept 'land reforms' is somewhat narrower than the above and relates to the corrective

measures in prevalent land tenure system. Credit and marketing are quite important for agricultural development. However, we will take up these two issues later in Block 5. In this Unit, and the next one, we will consider the land reforms measures undertaken after Independence. In the present Unit we will discuss the measures taken during 1947-70 while the reforms measures after 1970 will be taken up in Unit 4.

3.2 NEED FOR LAND REFORMS

As we noticed above, land ownership was highly unequal at the time of Independence. There was a parasitic class of intermediaries who played no role in production. On the other hand, the vast majority of actual cultivators were either tenants or sub-tenants, without any security of tenure. According to the National Commission on Agriculture (1976), this was the root cause of the state of chronic crisis in which Indian agricultural economy was enmeshed before the attainment of Independence.

Before Independence, there were three major systems of land tenure, namely Zamindari System, Mahalwari System and Ryotwari System. The Zamindari system was introduced by Lord Cornwallis in 1793 through permanent settlement that fixed the land rights of zamindars in perpetuity without any provision for fixed rents or occupancy rights for actual cultivators. Under the permanent settlement, zamindars were found to be more interested in higher rent than in agricultural improvement. During the early nineteenth century, efforts were made to undo the adverse effects of permanent settlement and to provide for temporary settlement as a matter of policy. Regulation VII of 1822 Act provided for temporary settlement with provision for periodic settlement in parts of the United Provinces. In the provinces of Madras and Bombay, ryotwari system was prevalent. Each ryot was recognised by law as the proprietor with the right to transfer or mortgage or sub-let his land. Moreover, in parts of United Provinces and Punjab, Regulation VII of 1822 Act and Regulation IX of 1833 Act provided for Mahalwari Settlement with the entire village community. This required each peasant of the village to contribute to total revenue demand of the village on the basis of the size of holding. In 1885, the Bengal Tenancy Act was passed with a view to conferring occupancy rights upon ryots who were in continuous possession of land for 12 years. The tenant could not be evicted by the landlord, except by a decree of court. Similarly, the Bihar Tenancy Act of 1885 and Orissa Tenancy Act of 1914 granted occupancy rights to tenants. Besides, the Madras Tenancy Act of 1908 provided for protection of ryots from eviction as long as they paid the rents. Nevertheless, since majority of actual cultivators were unrecorded *tenants-at-will*, these legal measures could not bring much relief to the tiller of the soil.

Although the adverse effect of landlordism on agricultural production was most profound in the states of Uttar Pradesh, Bihar, West Bengal and Orissa, other states that were under Ryotwari and Mahalwari Systems also witnessed the growth of a large number of intermediaries with all its adverse impact. The leased-in area constituted nearly 35 per cent of the total operated area in 1950-51. Most of the leases were unwritten and tenants did not have legal security of tenure. The rents varied from 50 per cent to 70 per cent of gross produce. In addition, tenants were often asked to provide free labour to landlords. After Independence therefore, it became necessary to undertake some land reforms measures for removing the feudal character of the agrarian economy and paving the way for rapid agricultural growth with social justice.

Broadly speaking, the objectives of agrarian reforms are as follows:

- i) To change the unequal and unproductive agrarian structure;
- ii) To remove exploitative agrarian relations, often known as patron-client relationship in agriculture,
- iii) To promote agriculture growth with social justice.

Check Your Progress 1

1) How do you define agrarian reforms?

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2) What were the main objectives of land reforms in India?

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3) Why was it necessary to change the pre-independence agrarian structure?

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3.3 LAND REFORMS MEASURES

After Independence, the Indian National Congress appointed the Agrarian Reforms Committee under the Chairmanship of J.C. Kumarappa, for making an in-depth study of the agrarian relations prevailing in the country. The committee submitted its report in 1949 which had a considerable impact on the evolution of agrarian reforms policy in the post-independence period. The committee recommended that all intermediaries between the state and the tiller should be eliminated and the land must belong to the tiller subject to certain conditions.

Let us now examine the various agrarian reform measures undertaken after independence. As already mentioned, the term ‘land reforms’ refers to reforms undertaken in the land tenure system. The steps include (i) abolition of intermediaries, (ii) fixation of ceilings on land holdings and (iii) redistribution of surplus land among landless or semi-landless peasants. Besides, any special measures adopted to prevent alienation of tribal land and consolidate fragmented holdings come within the broad definition of agrarian reforms.

3.3.1 Abolition of Intermediaries

Following the recommendation of Kumarappa Committee, all the states in India enacted legislation for the abolition of intermediary tenures in the 1950s, although the nature and effects of such legislation varied from state to state. In West Bengal and Jammu & Kashmir, legislation for abolishing intermediary tenures was accompanied by simultaneous imposition of ceilings on land holdings. In other states, intermediaries were allowed to retain possession of lands under their personal cultivation without limit being set, as the ceiling laws were passed only in the 1960s. As a result, there was enough time left for the intermediaries to make legal or illegal transfers of land. Besides, in some states, the law applied only to tenant interests like *sairati mahals* etc. and not to agricultural holdings. Therefore, many large intermediaries continued to exist even after formal abolition of zamindari. Nevertheless, it has been estimated that consequent upon the legal abolition of intermediaries between 1950 and 1960, nearly 20 million cultivators in the country were brought into direct contact with the Government.

3.3.2 Tenancy Reforms

The Agrarian Reforms Committee recommended against any system of cultivation by tenants and maintained that leasing of land should be prohibited except in the case of widows, minors and disabled persons. This viewpoint received further strength subsequently in various Five Year Plans. According to the Second Five Year Plan, abolition of intermediary tenures and bringing the tenants into direct relations with the state would give the tiller of the soil his rightful place in the agrarian system and provide him with full incentives for increasing agricultural production.

Immediately after Independence, although the major emphasis was on the abolition of intermediaries, certain amendments to the existing tenancy laws were made with a view to providing security to the tenants of ex-intermediaries. But these legal measures provoked the landlords to secure mass eviction of tenants, sub-tenants and share-croppers through various legal and extra-legal devices. The highly defective land records, the prevalence of oral leases, absence of rent receipts, non-recognition in law of share-croppers as tenants and various punitive provisions of the tenancy laws were utilized by the landlords to secure eviction of all types of tenants. To counteract such a tendency, therefore, it became necessary on the part of the State Governments to enact or amend the laws in the subsequent years and provide for adequate safeguards against illegal eviction and ensure security of tenure for the tenants-at-will.

Broadly speaking, tenancy reforms undertaken by various states followed four distinct patterns. First, the tenancy laws of several states including Andhra Pradesh (Telengana region), Bihar, Himachal Pradesh, Karnataka, Madhya Pradesh and Uttar Pradesh banned leasing out of agricultural land except by certain disabled categories of landowners, so as to vest the ownership of land with the actual tillers. But concealed tenancy continued to exist in all these states.

Second, the state of Kerala banned agricultural tenancy altogether without having any exception. Third, States like Punjab, Haryana, Gujarat and Haryana did not ban tenancy as such. But tenants after continuous possession of land for certain specified years, acquired the right of purchase of the land they cultivated. However, in all these states, leasing out by both large and small farmers continued. In fact, a tendency towards reverse tenancy in which large farmers leased-in land from marginal farmers was set in since the advent of green revolution in the mid-sixties.

Fourth, states like West Bengal, Orissa, Tamil Nadu and Andhra area of Andhra Pradesh did not ban leasing-out of agricultural land. But share-croppers were not recognised as tenants. The State of West Bengal recognised share-croppers as tenants only with effect from 1979, with the launching of 'Operation Barga'.

Almost all State Governments provided for the regulation of rent, excepting Kerala where leasing out was completely prohibited. The regulated or fair rent ranged between 1/4th to 1/6th of the produce. But actual rent remained always higher than the regulated or fair rent. In many places where small and marginal farmers leased-in land from large or absentee landowners, the situation continued to be exploitative, thereby discouraging the actual tillers to cultivate the land efficiently.

3.3.3 Ceilings on Land Holding

The term ‘ceiling on land holdings’ refers to the legally stipulated maximum size beyond which no individual farmer or farm household can hold any land. Like all other land reforms measures, the objective of such ceiling is to promote economic growth with social justice. It has been duly recognised by India’s planners and policy makers that beyond a point any large scale farming in Indian situation becomes not only uneconomic, but also unjust. Small farms tend to increase economic efficiency of resource use and improve social equity through employment creation and more equitable income distribution. According to C.H. Hunumantha Rao, small farms offer more opportunities for employment compared to large farms. Hence, even if large farms produce relatively more output per unit of area, they cannot be considered more efficient in a situation of widespread unemployment and under-employment prevalent in this country.

Table 3.1
Ceilings on landholdings as imposed during 1960-1970

State	Level of ceiling (hectare)
Andhra Pradesh	10.93 to 131.13
Assam	20.23
Bihar	9.71 to 29.14
Gujarat	4.05 to 53.14
Haryana	12.14 to 24.38
Jammu and Kashmir	9.21
Kerala	6.07 to 15.18
Madhya Pradesh	10.12
Orissa	8.09 to 32.37
Punjab	12.14 to 24.28
Rajasthan	8.90 to 135.97
Tamil Nadu	12.14 to 48.56
Uttar Pradesh	16.19 to 32.37
West Bengal	10.12

In 1959, Indian National Congress (Nagpur Resolution) resolved that agrarian legislation to cover restrictions on the size of land holdings must be implemented in all states by the end of 1959. Accordingly, all the State Governments excepting north-eastern region imposed ceilings on land holdings in the 1960s. The states of West Bengal and Jammu and Kashmir had already imposed ceilings on land holdings along with the laws for abolition of intermediaries in the early 1950s. However, the Nagpur Resolution of 1959 had significant impact as various State Governments immediately took to the ratification of ceiling legislation. The Gujarat Agricultural Land Ceiling Act, 1960; The Madhya Pradesh Ceiling on Agricultural Holdings Act, 1960; The Orissa Land Reforms Act, 1969, The Uttar Pradesh Imposition of Ceilings on Land Holdings Act, 1960; The Bihar Land Reforms (Fixation of Ceiling Area and Acquisition of Surplus

Land Act, 1961; The Karnataka Land Reforms Act 1961; The Maharashtra Agricultural Lands (Ceiling on Holdings) Act, 1960; The Tamil Nadu Land Reforms (Fixation of Ceiling Land) Act, 1961 and The Kerala Land Reforms Act, 1963 were some of the results of the Nagpur Resolution on Land Reform. However, as the ceiling laws were not ratified simultaneously with abolition of zamindari, except in West Bengal and Jammu and Kashmir as stated before, several nami and benami transfer of land took place. This reduced the potential ceiling surplus land that could be available for redistribution. Besides, several states including Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Orissa, Punjab, Uttar Pradesh and West Bengal followed individuals as the unit of application for ceiling, while family as the unit of application was adopted in Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. We present the ceiling limits fixed by various states in Table 3.1.

It may be seen from Table 3.1 that ceilings were quite high in several states. In addition, the following categories of land were exempted from the ceiling laws:

- 1) Land under Tea, Coffee, Rubber, Coco and Cardamum Plantations
- 2) Land used for cultivation of Palm, Kesra, Bela, Chameli or rose when such land holders have no land for any other cultivation (U.P.)
- 3) Sugarcane Farms
- 4) Co-operative Gardens, Colonies
- 5) Tank Fisheries
- 6) Area under orchard up to 4 hectares (Punjab and Haryana)
- 7) Land held by co-operative farming and other co-operative societies, including land mortgage bank
- 8) Land held by religious, charitable and educational institutions
- 9) Land awarded for gallantry
- 10) Land held by sugarcane factories
- 11) Land held by state or Central Government
- 12) Land held by a public sector or industrial or commercial undertaking
- 13) Land vested in Gram Sabha, Bhoodan or Gramdan Committee
- 14) Land situated in any area which is specified as being reserved for non-agricultural or industrial development under the relevant tenancy law (Gujarat)
- 15) Specified farms engaged in cattle breeding, dairying or wool raising
- 16) Several categories of other land including those held by public sector or commercial undertakings, research farms, etc. or even private forests.

These exemptions as provided in the ceiling laws gave rise to problems of law evasion by manipulating the classification of land. Also the size of the ceiling surplus land available for redistribution was consequently reduced.

3.3.4 Bhoodan and Gramdan

The Bhoodan movement was launched in 1951, immediately after the peasant uprising in Telengana region of Andhra Pradesh, and after some years, another movement known as Gramdan came into being in 1957. The objective was to persuade landowners and leaseholders in each concerned village to renounce their land rights, after which all the lands would become the property of a village association for the egalitarian redistribution and for purpose of joint cultivation. Vinoba Bhave hoped to eliminate private ownership of land through Bhoodan and Gramdan and maintained that the

movement would go a long way to ensure the just redistribution of land, the consolidation of holding and their joint cultivation.

However, the movement failed to achieve its targeted objectives and the degree of success in respect of both land acquisition and land distribution was very limited.

Of the total land of about 42.6 lakh acres, received through Bhoodan, more than 17.3 lakh acres were rejected as they were found unfit for cultivation. About 11.9 lakh acres were distributed and 13.4 lakh acres remained to be distributed. In most cases, the village landlords donated only those pieces of land which were either unfit for cultivation or were in dispute with tenants or government. In fact, the landlords preferred to part away with their disputed lands as a compromise formula for there was little hope under the existing law, of being able to keep this land with them. Besides, in return for such land donation, the landlords also received input subsidies and other facilities, which was no less an inducement to part away with the land unfit for cultivation. Furthermore, while it was provided under the Gramdan movement that private ownership in land is to cease, only the landholders right to sell land was restricted (though not banned), leaving intact the right of inheritance on such lands by the children.

3.3.5 Protection of Tribal Land

All the concerned states ratified laws for prevention of alienation of the tribals from land. In all the scheduled areas, land transfer from tribal to non-tribal population was prohibited by law. But due to various legal loopholes and administrative lapses, alienation of the tribals from their land continued on a large scale. In fact, mortgaging of land to moneylenders due to indebtedness, poverty and acquisition of tribal land for irrigation, dams and other public purposes were largely responsible for alienation of tribal land. Since land is the main source of livelihood for the tribal people and they do not have much upward mobility, indiscriminate acquisition of tribal land for public purposes should be avoided.

3.3.6 Consolidation of Holdings

The term 'Consolidation of holdings' refers to amalgamation and redistribution of the fragmented land with a view to bringing together all plots of land of a cultivator in one compact block. Due to growing pressure of population on land and the limited opportunities for work in the non-agricultural sector, there is an increasing trend towards sub-division and fragmentation of land holdings. This makes the task of irrigation management, land improvement and personal supervision of different plots very difficult.

After independence, almost all states excepting Tamil Nadu, Kerala, Manipur, Nagaland, Tripura and parts of Andhra Pradesh enacted laws for consolidation of holdings. But the nature of legislation and the degree of success achieved varied widely. While in Punjab (including Haryana) it was made compulsory, in other states law provided for consolidation on voluntary basis, if majority of the land owners agreed.

Generally speaking, the consolidation acts provided for (i) prohibition of fragmentation below standard area, (ii) fixation of minimum standard area for regulating transfers, (iii) schemes of Consolidation by exchange of holdings, (iv) reservation of land for common areas, (v) procedure for payment of compensation to persons allotted holdings of less market value in exchange, (vi) administrative machinery for carrying consolidation schemes, and (viii) filing of objections, appeals and penalties.

However, due to lack of adequate political and administrative support, the progress made in terms of consolidation of holding was not very satisfactory, excepting in Punjab, Haryana and western Uttar Pradesh where the task of consolidation was

accomplished. But in these states, there is a need for reconsolidation again due to subsequent fragmentation of holdings under the population pressure.

Check Your Progress 2

- 1) What was the impact of abolition of zamindari in the 1950s?
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- 2) What do you mean by ceiling on land holdings? What was its objective? To what extent, the objective of ceiling on holdings was achieved? What led to its failure?
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- 3) Why did the scheme of consolidation of holdings fail?
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3.4 CHOICE OF APPROPRIATE FORM OF FARM ORGANISATION

After Independence there was also a debate on the choice of farm organisation. The Kumarappa Committee (1949) expressed the view that *peasant farming* would be the most suitable form of cultivation although small farmers should be pooled under a scheme of cooperative or joint farming. Besides, collective farming and state farming was for the development of reclaimed wasteland where landless agricultural workers could be settled. According to the First Five Year Plan, the formation of co-operative farming associations by small holders would ensure efficient cultivation. The Second Five Year Plan asserted that a step should be taken for the development of co-operative farming, so that a substantial proportion of land is cultivated on co-operative lines. The Third Five Year Plan agreed to this proposal, but maintained that with the implementation of the programme of land reforms, the majority of cultivators in India would consist of peasant proprietorship. They should be encouraged and assisted in organizing themselves on voluntary basis for credit, marketing, processing, distribution and also for production.

3.5 CHANGES IN AGRARIAN STRUCTURE

After Independence, a number of land reform measures were undertaken in the 1950s and 1960s which were quite revolutionary in nature and impact. As a result of abolition of zamindari, the feudal mode of production came to an end. Also the proportion of area under tenancy declined.

However, tenancy reforms failed to yield much positive impact, as a large number of tenants-at-will were evicted from land. Also the benefits of consolidation of holdings remained confined to Punjab, Haryana and western Uttar Pradesh.

Thus, the first phase of post-independence land reforms in the 1950s and 1960s yielded a mixed result. It could be termed successful in the sense that all intermediaries were abolished which provided the basis for improvement in agricultural productivity. Nevertheless, the unequal agrarian structure remained in place. In 1953-54 nearly 8 per cent of the ownership holdings accounted for about 51 per cent of the total area, while in 1971, about 10 per cent of the holdings accounted for 54 per cent of the total land. While at the all India level, the Gini coefficient of concentration ratio marginally declined during the 1960s, in several states including Bihar, Punjab and Haryana, Tamil Nadu, Uttar Pradesh and West Bengal, it increased. In other words, there was an increasing tendency towards unequal power structure in terms of land ownership (Table 3.2). Although the average size of holdings declined from 2.39 hectares in 1953-54 to 2.21 hectares in 1971, in several states, the average size of large farms increased.

Table 3.2
Concentration Ratio of Ownership Holdings by State

State	1961	1971
Andhra Pradesh	0.764	0.732
Bihar	0.701	0.712
Gujarat	0.683	0.683
Kerala	0.756	0.702
Madhya Pradesh	0.632	0.621
Maharashtra	0.707	0.682
Karnataka	0.663	0.663
Orissa	0.684	0.645
Punjab and Haryana	0.749	0.776
Rajasthan	0.654	0.607
Tamil Nadu	0.749	0.751
Uttar Pradesh	0.621	0.631
West Bengal	0.666	0.672
All India	0.720	0.710

Source: T. Haque and A.S. Sirohi (1986).

3.6 PATTERN OF LANDHOLDINGS

The earliest comprehensive picture of the distribution of total owned area by size classes of ownership holdings has been presented by the National Sample Survey (8th Round) pertaining to the year 1953-54.

In a discussion of the pattern of landholdings we include here the size distributions of ownership holdings as well as of cultivation or operational holdings (farms). By ownership holding is meant the area owned by a single household. And by cultivation or operational holding is meant the area cultivated or operated by a single household. (Operational Holding = Ownership Holding — Land Leased out + Land Leased in) Ownership holdings as well as cultivation holdings may be held either as a single plot of land or as several plots scattered at different places. When a holding is held in several scattered plots, it is called a 'fragmented holding' and the process creating such holdings is termed 'fragmentation'. An attempt also has been made here to give a picture of the extent of fragmentation in the agricultural holdings in India.

Our purpose is to focus attention on the distribution of holdings in the Indian agricultural sector at one or more points of time between 1947-48 and 1961-62, for such a distribution is not only an important aspect of the structure of Indian agricultural economy but may also explain the structure of other inputs, in so far as the use of other inputs is itself influenced by the pattern of landholdings.

3.6.1 Pattern of Ownership Holdings

Concentrating now on the pattern of ownership holdings, it may be noticed that nearly 310 million acres of land were estimated to be owned by rural households in 1953-54. This was nearly 38.4 per cent of the total geographical area and 61 per cent of the topographically usable land. A certain proportion of land in the rural areas, no doubt, was owned by urban households. The owned area of 310 million acres was held by 66 million households.

The average size of ownership holdings in the rural areas was thus only 4.72 acres. But when we look at the size-distribution of holdings, the situation is found to be far worse.

Nearly 22 per cent of the households in the rural areas did not hold any land. These households would be largely of agricultural labourers who did not own any land, and particularly of cultivating small tenants. The next 24.9 per cent of the households together held only 1.4 per cent of the land and each of these held an area less than 1 acre in size. Thus, nearly 47 per cent of the households either held no land or held land of area less than one acre. At the other extreme, less than 1 per cent of the households owned among themselves nearly 16 per cent of the owned area, and the size of each of these holdings was 50 acres and above. If we add the immediate lower groups also, then nearly 3.4 per cent of the households held among themselves 34 per cent of the total area. In the lowest size group (0.01 to 0.99 acres) the average size per holding was only about 0.26 acre, while in the size-group over 50 acres the average was about 87.4 acres. It indicates that the disparity in ownership of landholdings was very high.

The disparity in the distribution of ownership holdings seems to have been the highest in South India, where the concentration ratio was 0.74 and the lowest in North India and West India, where the concentration ratios were 0.64. The average size of holding was the lowest in South India (about 3.42 acres), while it was the highest in Central India (about 8.29 acres).

How far does such extreme inequality in the distribution of ownership holdings affect the agricultural economy is a question that naturally follows. It may be pointed out

that, the efficiency of cultivation which depends on appropriate combination of other factors of production with land could, at least in theory, be free from the pattern of ownership.

3.6.2 Pattern of Operational Holdings

The concept more appropriate to efficiency of agricultural operation is the concept of “operational” or “cultivation” holding. This will be considered in this section. Theoretically, even with a very adverse distribution of ownership, through a process of leasing in and leasing out, it is possible to have a pattern of operational holdings, less inconsistent with the dictates of efficient technology, or with the requirements of the laws of returns, or of returns to scale. As a matter of fact, if there was a very little of leasing out of land by large owners and very little leasing in by small owners, the pattern of operational holdings would look much the same as that of ownership; and if that were the pattern of operational holdings, there would be too many tiny farms (operational holdings) and some farms too large for efficient cultivation.

Table 3.3 shows that, although a small decline in concentration of land took place after land reform legislation, land distribution remained highly skewed. In 1953-54, the bottom 60 per cent of holdings operated 15.5 per cent of area while in 1960-61 the bottom 62 per cent of holdings operated 19 per cent of area. At the other end, in 1953-54 the top 5.8 per cent of holdings operated 36.6 per cent of area while in 1960-61 the top 4.5 per cent operated 29 per cent of area.

Table 3.3

Size Distribution of Operational Agricultural Holdings, 1953-54 and 1960-61

Size (acres)	1953-54		1960-61	
	Percentage of total holding	Percentage of area operated	Percentage of total holding	Percentage of area operated
Very small (up to 0.99)	19.7	1.1	17.1	1.3
Small (1.00-4.99)	40.3	14.4	44.6	17.9
Medium (15.00-24.99)	6.7	16.8	6.0	17.0
Large (25.00-49.99)	4.3	19.6	3.5	17.4
Very Large (50.00 & above)	1.5	17.0	1.0	11.6
Total	100.0	100.0	100.0	100.0

Check Your Progress 3

- 1) Which form of farm organisation was considered suitable for India after Independence?

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2) What do you mean by co-operative farming?

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3) What was the impact of agrarian reforms on agrarian structure?

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4) Distinguish between ownership holdings and operational holdings.

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5) State the reasons for the decline in leased-in area in 1961-62 over 1953-54.

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3.7 LET US SUM UP

Despite large efforts made in the direction of agrarian reforms in the 1950s and 1960s, the situation relating to the agrarian structure remained highly unsatisfactory. According to the Planning Commission's Task Force on Agrarian Relations, although the laws for the abolition of intermediary tenures were implemented fairly efficiently, the tenancy reforms and tenancy legislation fell short of proclaimed policy. Highly exploitative tenancy in the form of crop sharing still prevailed in large parts of the country. Such tenancy arrangements not only perpetuated the social and economic injustice, but also acted as a constraint to agricultural modernisation. Besides, in the wake of the green revolution, while the rich farmers' condition improved, those of the

agricultural labourers and the poor tenants remained more or less unchanged. In fact these failures led to land related conflicts including naxalite movement in several places.

3.8 KEY WORDS

- Bhoodan and Gramdan** : These refer to the land management launched by late shri Vinoba Bhave in 1951. This was to persuade land owners in each village to renounce their land rights after which all the lands would become the property of a village organisation for either equal redistribution or joint cultivation.
- Ceilings on Land Holdings** : It relates to the fixation of maximum limit beyond which nobody can hold any land.
- Consolidation of Holdings** : It refers to bringing together all plots of land of a cultivator in one compact block.
- Land to the Tiller** : It refers to the system of land tenure in which actual tillers or cultivators also have the ownership or occupancy right.
- Mahalwari System** : Relates to the system of land tenure in which land rights were settled with the entire village under Regulation IX of 1833 Act. This required each peasant of the village to contribute to total revenue demand of the village on the basis of the size of the land he cultivated. This was prevalent in Punjab and parts of United Provinces.
- Patron-Client Relationship** : It refers to exploitative agrarian relations in which landlords exploit the tenants or workers and yet there is so much dependence on landlords that the tenants or actual workers cannot sever the relationship.
- Ryotwari System** : It refers to the system of land tenure in which each ryot was recognised by law as the proprietor with the right to transfer or mortgage or sublet the land. This was provided under Regulation VII of 1822 Act mainly in the provinces of Bombay and Madras.
- Zamindari System** : Refers to the system of land tenure in which land rights of intermediaries were confirmed through permanent settlement in 1793 by Lord Cornwallis and continued subsequently even under temporary settlement scheme.

3.9 SOME USEFUL BOOKS

Haque, T and A.S. Sirohi, 1986, *Agrarian Reforms and Institutional Changes in India*, Concept Publishing Company, New Delhi.

National Commission on Agriculture, 1976, *Report on Agrarian Reforms. No. XV*, Government of India, New Delhi.

Planning Commission, 1973, *Task Force on Agrarian Relations*, Government of India.

3.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Sections 3.1 and 3.2 and Answer.
- 2) The objectives of land reforms are given at the end of Section 3.2.
- 3) Go through Section 3.2 and answer.

Check Your Progress 2

- 1) See Sub-section 3.3.1 and answer.
- 2) See Sub-section 3.3.3 and answer.
- 3) Go through Sub-section 3.3.6 for the reasons.

Check Your Progress 3

- 1) Peasant farming was considered to be most suitable for cultivation in India.
- 2) In this case small holdings of farmers are pooled together and cultivated jointly.
- 3) See Section 3.5 and answer.
- 4) The difference is given in the second paragraph of Section 3.6.
- 5) Go through Sub-section 3.6.2 and answer.

UNIT 4 LAND REFORMS: PROGRAMME AND PERFORMANCE AFTER 1970

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Effective Redistribution of Ceiling Surplus Land
- 4.3 Amendments in Tenancy Laws
- 4.4 Changes in the Agrarian Structure
- 4.5 Updating of Land Records
- 4.6 Consolidation of Holdings
- 4.7 Land Rights of Women
- 4.8 New Economic Policy and Land Reforms
- 4.9 Government Policy
- 4.10 Let Us Sum Up
- 4.11 Key Words
- 4.12 Some Useful Books
- 4.13 Answers/Hints to Check Your Progress Exercises

4.0 OBJECTIVES

After going through this unit, you will be in a position to explain:

- the land reforms measures undertaken after 1970;
- the effectiveness of land reforms in changing the agrarian structure; and
- the perspective of land reforms in the wake of economic liberalization.

4.1 INTRODUCTION

In Unit 3, we have already discussed the first round of land reforms during the 1950s and 1960s. In this Unit, we will discuss the land reform measures undertaken since the 1970s. The failure of the first round of land reforms to remove the unequal power structure in the villages caused a lot of discontent among the poor. Besides, the green revolution in the late 1960s further widened the income gap between the haves and the have nots. In fact, the growing discontent led to land conflicts, including naxalite movement in West Bengal, Bihar, Andhra Pradesh and other parts of the country. These developments forced the government to revise the ceiling laws in the early 1970s. In addition, some state governments amended their tenancy laws. Further, a need for proper maintenance and updating of land records was felt.

Various measures of land reforms undertaken since 1970 can be discussed under the following heads:

- i) Lowering the ceiling limits and thrusts on effective redistribution of ceiling surplus land
- ii) Amendments in tenancy laws
- iii) Computerisation and updating of land records
- iv) Changes in the agrarian structure
- v) Changes in the status of consolidation of holdings, and
- vi) Perspective of land reforms in the wake of economic liberalisation

4.2 EFFECTIVE REDISTRIBUTION OF CEILING SURPLUS LAND

The Union Government in consultation with state governments prepared national guidelines for more or less uniform ceiling laws. Following the guidelines all the state governments lowered the ceiling limits and inter-state variations in the levels of ceilings as well as exemptions granted to various categories of land were reduced. Besides, there emerged a uniform pattern of ceiling legislation in the country; the family being now the unit of application in all the states. The ceilings on land holdings as imposed after 1972 by various states are given in Table 4.1.

Table 4.1
Ceilings on Landholdings as imposed after 1972

State	Level of ceiling (hectare)
Andhra Pradesh	4.05 to 21.85
Assam	6.74 ^a
Bihar	6.07 to 18.21
Gujarat	4.05 to 21.85
Haryana	7.25 to 21.85
Himachal Pradesh	4.05 to 12.14 ^b
Jammu & Kashmir	3.68 to 7.77 ^c
Karnataka	4.05 to 21.85
Kerala	4.86 to 6.07
Madhya Pradesh	4.05 to 21.85
Orissa	4.05 to 18.21
Punjab	7.00 to 21.80
Rajasthan	7.25 to 21.85 ^d
Tamil Nadu	4.86 to 24.28
Tripura	4.00 to 12.00
Uttar Pradesh	7.30 to 18.25
West Bengal	5.00 to 7.00

a= Additional area under orchard subject to maximum of 2.02 hectares above the ceiling is permissible.

b= In certain specified areas upto 28.33 hectares.

c= Orchards in excess of the ceiling is permissible, subject to an annual tax.

d= In certain specified areas upto 70.82 hectares.

The ceiling limits in various states was about 4 hectares of irrigated land capable of producing at least two crops in a year and its equivalent of other categories of land. The ceiling laws enacted in the 1970s were an improvement over the ones adopted in the 1950s and 1960s.

However, certain categories of land continued to be exempted from ceiling which left scope for law evasion through the device of shifting lands to the exempted categories. These included mainly the following categories of land:

- i) Land held by religious, charitable and educational institutions,
- ii) Land for special cultivation of tea,

- iii) Land held by a co-operative farming society for feeding a sugar factory (Assam)
- iv) Land under plantations and private forest (Kerala)
- v) Land belonging to primary co-operative societies (Himachal Pradesh)
- vi) Land possessed by commercial undertakings (Tamil Nadu)

Moreover, although family is now the unit of application for the purpose of determining the ceiling, the term 'family' has been defined very broadly in many states and the majors have been granted separate units in almost all the states. In other words, even the new ceiling laws did not attack the various sources of law evasion and the question of proper ceiling legislation and its implementation has not yet been solved.

Table 4.2
Implementation of Land Ceiling Laws by State

(up to September 1998)

States/UTs	Area in hectares			
	Declared surplus	Taken Possession	Distributed Beneficiaries	Total No. of beneficiaries
Andhra Pradesh	791461	639030	577551	529116
Assam	612380	575837	505202	445648
Bihar	415447	387463	305858	377730
Gujarat	230911	158646	134963	31906
Haryana	93239	88244	87309	27435
Himachal Pradesh	316556	304895	4374	6365
Jammu & Kashmir	455575	450000	450000	450000
Karnataka	267758	155118	118441	32047
Kerala	138439	95987	64922	148423
Madhya Pradesh	294838	262406	186158	72558
Maharashtra	607194	553521	535685	141472
Manipur	1830	1685	1682	1258
Orissa	178016	166814	155401	136686
Punjab	222594	105181	103557	28303
Rajasthan	610374	566228	458974	80160
Tamil Nadu	196966	182762	171066	183369
Tripura	1995	1944	1599	1424
Uttar Pradesh	570395	538300	402018	360389
West Bengal	1354689	1265937	1032201	2476910
D & N Haveli	9406	9305	6851	3353
Delhi	1132	394	394	654
Pondichery	2326	1177	1023	1359
Total	7373524	6510874	5305229	5536565

Source: Ministry of Rural Areas and Employment, Govt. of India, Annual Report, 1998-1999

According to an estimate by the Planning Commission, the new ceiling laws should have resulted in surplus land for redistribution. According to Rajkrishna, this should have provided at least 90 per cent of the area required to give any/every landless family a minimum basic holdings. Unfortunately, till September 1998, only about 7.4 million acres of land were declared surplus under the ceiling laws of various states and only about 5.3 million acres have been redistributed among 5.5 million beneficiaries.

Nearly 50 per cent of the beneficiaries were members of schedule castes and schedule tribes. Table 4.2 shows the state-wise distribution of ceiling surplus land. It may be seen from the table that of the total ceiling surplus land distributed, about one-fifth was in the state of West Bengal. Other larger states like Bihar, Uttar Pradesh and Madhya Pradesh have redistributed relatively smaller area. In short, if a small state of West Bengal could redistribute 10.3 lakh hectares of ceiling surplus land, there is no reason for a bigger state like Uttar Pradesh to have distributed only 4 lakh hectares of ceiling surplus land.

The ceiling laws enacted by various states are often not properly defined and therefore, there is either law evasion or delay in the implementation of the law. For example, the existing laws (i) do not specifically provide for suo-motto action on benami transfer of land, (ii) do not ensure correct record of land owners about ceiling, (iii) do not ensure punishment for the law evaders, and (iv) do not take possession of the wasteland for redistribution. In many cases implementation of ceiling laws has been poor because the ceiling laws came into conflict with the law of inheritance. For example, before the ceiling law was implemented the land was distributed among minor sons, daughters and grandsons and granddaughters which is permitted by the law of inheritance. The available data suggest that large number of cases related to ceiling surplus land are pending in courts because of delay in judicial decisions. There are a lot of court cases pending. Moreover, due to (i) influence of landlords, (ii) lack of organisation of potential beneficiaries, (iii) lack of up-to-date land records, and (iv) manipulative changes in the classification of land, the implementation of ceiling laws has been very slow. Furthermore, a large part of the ceiling surplus land acquired by the government is of inferior quality. The allottees of such land need to invest substantially on land reclamation for bringing such land under cultivation. Although there is a centrally sponsored scheme for reclamation of such lands, in most states, the scheme has not been operationalised because the state governments has to provide equal matching grant.

4.3 AMENDMENTS IN TENANCY LAWS

During the 1970s several state governments amended their tenancy laws. In Andhra region of Andhra Pradesh, the amendment of 1974 to tenancy laws conferred continuous right of resumption on land owners. The right of resumption has ceased in the case of all leases subsisting at the commencement of the amending act of 1974, but it continues in respect of future leases. In Gujarat, the tenancy act was amended according to which tenants who were evicted between 1957 and 1992 were entitled to restoration. In Jammu & Kashmir, the J&K Agrarian Act of 1976 declared that all rights, titles and interests in land of any person not cultivated personally after 1971 shall be vested in the state free from all encumbrances with effect from 1973. The Act provided for conferment of right of tenant after allowing the resident land owner to resume land for personal cultivation provided his annual income does not exceed Rs. 500 per month and the tenant is left with no less than 2 standard acres of land.

The Government of Karnataka amended the Land Reform Act 1961 in 1973, which provided for fixity of tenure subject to landlords right to resume half the leased area. In 1979 the tenancy law was further amended which banned leasing-out except by soldiers and seaman and conferred ownership right on a large number of tenants. In Uttar Pradesh an amendment to the tenancy law was made in 1977. According to this, Sirdars excepting those settled on vacant land were declared as Bhumidars with transferable rights. In West Bengal, the law on acquisition and settlement of homestead land (amendment act 1972) provided that tenants of homestead lands would be given full right provided an application was made up to August 1974. Besides, the government of West Bengal launched 'Operation Barga' for recording the share cropping tenancy in 1978. It has been estimated that about 14 lakh share-croppers were conferred with permanent heritable right.

In fact, the impact of such special campaign for recognizing and recording the land rights of share croppers is said to have yielded positive impact on agricultural productivity and poverty reduction in the state.

4.4 CHANGES IN THE AGRARIAN STRUCTURE

After implementation of land reforms, it was expected that there will be a remarkable change in the agrarian structure in terms of reduction in the concentration of land holdings and improvement in the economic conditions of poor tenants. However, the available data indicate that inequality in the ownership of land holdings has not declined much over time. During 1971 to 1992 the Gini ratio of inequality remained constant at 0.71. In a number of states including Gujarat, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Orissa and Rajasthan there was an increase in the concentration ratio of land holdings which indicates that the land reform measures have been mostly ineffective in reducing the level of rural inequality.

The proportion of landless households increased from 9.6 % in 1971 to 11.3% in 1992 (NSSO 48th Round, Report No. 399). During the same period the proportion of leased-in area declined from 11.6% in 1971 to 8.3% in 1992. However, in many states since tenancy is legally banned concealed tenancy exists. In the state of Bihar, for example, the incidence of tenancy is reported to be above 30%. Thus, the agrarian structure seems to be as unequal and unproductive as before.

Check Your Progress 1

- 1) What were the changes brought about in the ceiling laws adopted in early 1970s?
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- 2) What were the major constraints in the effective implementation of land ceiling laws?
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- 3) To what extent have the land reform measures undertaken since 1970 changed the agrarian structure?
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4.5 UPDATING OF LAND RECORDS

The maintenance of up-to-date land records is important not only for effective implementation of land records, but also for harmonizing the process of overall rural transformation. During the Seventh Five Year Plan a *centrally sponsored scheme* was launched for computerization of land records. During the Eighth Five Year Plan nearly 48 crores of rupees were allocated for this purpose. By 1997-98 about 470 tahsils were covered under this programme. However, the progress made so far is poor due to lack of adequate infrastructural and training support at the local level. Besides, there is a need to take steps to bring about transparency in the administration of land records.

4.6 CONSOLIDATION OF HOLDINGS

Since 1971 there has not been much progress in the consolidation of holdings. The area under consolidation increased from 500 lakh hectares to 641 lakh hectares only. In several states, the consolidation programme has not made any progress what so ever due to lack of compulsory provisions in the law. In Bihar, the consolidation programme has been discontinued since July 1992. The Government of Karnataka repealed the consolidation act in 1991. The state of Maharashtra also suspended the implementation of consolidation programme with effect from 1993 (Table 4.3).

Table 4.3
Consolidation of Land Holding (State- wise)

States/UTs	Area Consolidated (Lakh hectares)	Period of Reporting
Andhra Pradesh	8.18	1992
Bihar	96.05*	1999
Gujarat	69.88	1999
Haryana	104.38	1999
Himachal Pradesh	29.91	1999
Jammu & Kashmir	1.37	1973
Karnataka	26.76#	
Madhya Pradesh	95.53	
Maharashtra	526.5\$	1993
Orissa	26.74	1999
Punjab	103.74	1999
Rajasthan	42.30	
Uttar Pradesh	481.63	1999
Delhi	2.33	1992
Total	1615.30	As on October 1999

* Scheme has been discontinued since 1992 in Bihar.

Consolidation of holding Act, 1966 has been repealed in 1991.

\$ Implementation of the scheme stopped since 1993.

In view of the overall beneficial effects of the consolidation programme, state governments should give priority to it. Besides, the state governments should ensure that interest of small and marginal farmers and tenants are protected during the

process of consolidation through appropriate and up-to-date land records and proper valuation of their lands. It is interesting to note that the central government has constituted a high level committee to suggest measures for implementation of consolidation of holdings in future.

4.7 LAND RIGHTS OF WOMEN

Land reform policy in the past did not address the question of land rights of women. In Uttar Pradesh, the Zamindari abolition act banned a female child from inheritance of agricultural land. In some states, women cannot even buy agricultural land. In the absence of recorded land rights, they cannot prove that they are agriculturists. In 1992 the revenue ministers' conference recommended that in matters of distribution of ceiling surplus land and other public lands, women should be given equal opportunities. The land should be allotted jointly in the name of husband and wife. In practice, however, women are generally ignored as land ownership is given in the name of a male member of the benefited family. It is thus desirable that law should specifically provide women with equal access to benefits of land reforms.

4.8 NEW ECONOMIC POLICY AND LAND REFORMS

In the wake of economic reforms, land reforms appear to have taken a back seat in India. Sometimes even the philosophy of redistribution of land through land reforms is questioned. It is often argued that the existing land reforms laws restrict the growth of capitalistic/contract farming which is necessary for market-led growth. In recent years some state governments even proposed for relaxation of ceiling and tenancy laws for revitalizing the land market. The Government of Maharashtra has already proposed for upward revision of land ceiling for horticultural purposes. The state of Karnataka also has prepared an agricultural policy which mentions about the need for liberalisation of tenancy and upward revision of ceiling. However, the Government of India has not so far agreed to such proposals.

In fact, the argument that land reform stands in the way of market-led growth appears to be misplaced. The experience of countries like Japan and Korea shows that land reforms can help in the faster and more sustainable development of capitalistic agriculture, without creating much pain for the rural population. But market-led economic reforms, not accompanied by land reforms, could be painful for the rural poor and may not be sustainable in the long run. As a matter of fact land reforms should precede market reforms as a means of rapid and balanced economic development.

4.9 GOVERNMENT POLICY

The government policy on land reforms has been more or less consistent since the 1970s. All the Five Year Plans from Fifth Plan onwards have emphasised the need for effective implementation of land reforms for agricultural growth and equity. The Ninth Five Year Plan also clearly mentioned that land reforms would continue to be an important policy instrument for alleviating rural poverty. Proper implementation of land laws and policies would lead to restructuring of the agrarian economy in a way conducive to higher growth rates of agricultural sector but with greater equity in the distribution of gains from it. The main focus of the Ninth Five Year Plan on land reforms is on the following few critical areas:

- i) Efforts should be made to detect and redistribute the ceiling surplus land and to enforce the ceiling law strictly.
- ii) Tenancy reforms should be taken up specifically in the states characterized by semi-feudal modes of production.

- iii) The rights of tenants and share croppers need to be recorded and security of tenure provided to them.
- iv) The poor should be given access to common property resources and government wastelands.
- v) The land rights of women must be ensured through amendment of the existing land laws.
- vi) Updating of land records should be expedited as this is a necessary pre-requisite of any land reforms policy.
- vii) A massive programme of organizing the rural poors for participation in and implementation of land reforms and poverty alleviation programmes should be undertaken with the help of voluntary groups.

However, the political will on the part of various state governments to enforce land reforms effectively appears to be doubtful.

Check Your Progress 2

- 1) Why is the maintenance of up-to-date land records so important?
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- 2) How do you protect the interests of small farmers and tenants in the process of consolidation of holdings?
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- 3) Do you think that new economic policies and land reforms are contradictory to each other?
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4.10 LET US SUM UP

The land reforms measures undertaken since 1971 have yielded mixed results. In a state like West Bengal, the approach was participatory in nature in which the

government functionaries, panchayat bodies and the local politicians largely helped in effective implementation of land reforms. Of the total 2 million hectares of ceiling surplus land distributed in the country, nearly one-fifth came from the state of West Bengal only. Other states have adopted a lukewarm attitude towards the enforcement of ceiling laws.

As far as tenancy reforms are concerned, the state of Kerala has banned tenancy altogether. Besides, in the Telangana area of Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh and Uttar Pradesh leasing-out of land has been banned except by certain disabled categories. However, concealed tenancy exists in all these states. In fact, tenants in all these states are more insecure because all leases are oral and informal in nature. Recording of the incidence of such tenancy on the pattern of 'Operation Barga' in West Bengal may be helpful.

Furthermore, in the wake of economic reforms since 1991, the concern for implementation of land reforms by the government appears to have declined, although various pronouncements by the Ministry of Rural Areas and Employment and the Planning Commission show that land reforms continue to be one of the policy instruments for the alleviation of rural poverty. As a matter of fact, the government lacks the necessary will power to implement land reforms and also there is no organized pressure from the potential beneficiaries for it.

4.11 KEY WORDS

- Gini Coefficient** : It is used to measure inequality in distribution of income or assets. In the present case it is used to measure the inequality in the distribution of land ownership. Gini coefficient ranges between zero and one. Higher the value of the coefficient, higher is the degree of inequality.
- Operation Barga** : It relates to the special campaign launched by the government of West Bengal in 1978 for recording the incidence of share cropping and according permanent and heritable rights to the share-croppers.
- Matching Grant** : In order to encourage certain activities/ investments the central government provides grants to the state governments. Often it is of the matching grant type. Here the central and state governments fund the project in certain ratio. For example, if matching grant is 50:50, then the central government reimburses 50 per cent of the expenditure incurred by the state government.
- New Economic Policy** : It refers to the policy of economic reforms/ liberalisation adopted since 1991. The new policy talks of a more liberal land ceiling and land leasing.

4.12 SOME USEFUL BOOKS

Haque, T. and A.S. Sirohi, 1986, *Agrarian Reforms and Institutional Changes in India*, Concept Publishing Company, New Delhi.

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Ministry of Rural Areas and Employment, *Annual Report, 1998-1999*, Government of India.

4.13 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) You can discuss the changes brought about in the land distribution and security of tenure.
- 2) See Section 4.2 and answer.
- 3) See Section 4.4 and answer.

Check Your Progress 2

- 1) Up-to-date land records would help in identification of surplus land, its distribution and detection of irregularities. See Section 4.5.
- 2) See Section 4.6 and answer.
- 3) Go through Sections 4.8 and 4.9 and answer.

EEC-14 AGRICULTURAL DEVELOPMENT IN INDIA

Block 1 Indian Agriculture : Institutional Perspectives

- Unit 1 Land Relations in Pre-British India
- Unit 2 Agrarian Relations During British Rule in India
- Unit 3 Land Reforms During 1947-70
- Unit 4 Land Reforms : Programme and Performance after 1970

Block 2 Agricultural Economy of India

- Unit 5 Role and Importance of Agriculture in Indian Economy
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UNIT 5 ROLE AND IMPORTANCE OF AGRICULTURE IN INDIAN ECONOMY

Structure

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5.0 OBJECTIVES

After going through this unit you will be in a position to:

- assess the role of agriculture in Indian economic development;
- identify the criteria for assessing the role of agriculture;
- examine the linkages between agriculture and non-agricultural sectors; and
- explain some of the important features of Indian agriculture.

5.1 INTRODUCTION

Agriculture occupies a key position in all economies irrespective of their level of development. It satisfies certain basic needs of human beings by fulfilling their food and non-food demands. It supplies: i) *foodgrains* such as rice, wheat, coarse cereals and pulses, ii) *commercial crops* such as oilseeds, cotton and sugarcane, iii) *plantation crops* such as tea and coffee, and iv) *horticultural crops* such as fruits, vegetables, flowers, spices, cashewnut and coconut. In addition to these, certain *allied activities*

such as milk and dairy products, poultry products and fishery are included in the agricultural sector.

Most of the developed and industrialised countries received their initial spurt for industrial advancement from agriculture.

5.2 IMPORTANCE OF AGRICULTURE

To make an assessment of the role and importance of agriculture it is necessary to examine its contribution to development of the economy. Such contribution may be measured in terms of its share in Gross Domestic Product (GDP), employment generation, exports, etc. Another dimension of the role of agriculture is the support it renders to the industrial sector by supplying raw materials on the one hand and food for the workforce engaged in this sector on the other. Moreover, it generates demand for the industrial products. All these aspects have to be studied in order to analyse the role and importance of agriculture in an economy.

5.2.1 Contribution to GDP

Agriculture has been observed to contribute a very large share to GDP of most of the economies before industrial development takes place in them. As the process of industrial development accelerates, the share of non-agricultural sectors in GDP tends to increase steadily. Simultaneously, the relative share of agriculture shrinks and yields place to that of manufacturing and services sectors. This does not imply that the agricultural production does not increase. It only implies that the growth in the production of industrial and services sectors is faster than the growth in agricultural sector. This process of change is the consequence of a change in the structure of the economy which steadily becomes more industrialised. Quite often such a change in the composition of GDP is cited as an indicator of economic development.

5.2.2 Contribution to Employment

An equally relevant criterion for examining the role of agriculture is its share in the total workforce. Number of workers engaged in agriculture is usually very high before industrial development takes place in an economy. This share tends to decline with industrialisation of the economy as employment opportunities grow rapidly in sectors other than agriculture. Steady changes in the occupational distribution of workforce have been observed in most economies as they experience industrial growth and diversification. Generally, the trend is towards a steady decline in the share of workforce engaged in agriculture and an increase in the proportion of workforce engaged in manufacturing and services sectors.

5.2.3 Contribution to Exports

Another indicator of the role of agriculture in an economy is the contribution it makes to exports. As industrial growth takes place and there is a steady change in the composition of exports, in favour of manufactures and services. The share of agriculture in the exports of the economy undergoes a decline.

5.2.4 Contribution to Other Sectors

An equally significant criterion to gauge the role and importance of agriculture is the contribution it makes to the growth of the non-agricultural sectors. As it is the source of raw materials for a number of industries and also supplier of food for the workers who are engaged in non-agricultural sectors, agricultural sector becomes crucial for industrial growth and expansion. As a major sector of an economy, it plays an important role in generating demand for the products of the other sectors. The extent

of dependence of the other sectors of the economy on agriculture is a vital criterion for assessing the role of agriculture in an economy.

5.2.5 Comparison with Other Countries

A comparison between the relative share of agriculture in the GDP of India and those of some other countries can be quite instructive. Table 5.1 gives data for such a comparison.

Table 5.1
Relative Share of
Agriculture in GDP of Select Countries

Country	Share in GDP (Percentage)		Workforce engaged in Agriculture (%)
	1980	1998	1990
World Average	7	5	49
India	36	24	69
Australia	5	3	6
Brazil	11	8	23
China	30	18	72
Japan	4	2	7
Mexico	8	5	28
Nepal	62	40	95
Pakistan	30	25	52
South Africa	7	4	14
United Kingdom	2	2	2
USA	3	2	3

Source: World Development Report 1999-2000

We make three observations from Table 5.1. First, we see that the share of agriculture is much higher in the case of developing economies than in developed economies. Second, there is a decline in the share of agriculture in GDP in most countries. Third, the workforce engaged in agricultural sector is much higher in the case of developing economies than in developed economies.

We observe from Table 5.1 that in developed economies such as the UK and the USA the relative share of agriculture in GDP is quite low. It is only 2 per cent, in both these countries in the year 1998. In the year 1980 this share was only slightly higher. Similarly in Australia and Japan also the contribution of agriculture to GDP in 1998 is 3 per cent and 2 per cent respectively. In these countries also there is a decline in the share in 1998 compared to 1980.

Some of the other countries which show a comparatively low contribution of agriculture to their GDP are South Africa, Mexico and Brazil. In the case of India the share of agriculture in GDP has declined from 36 per cent in 1980 to 24 per cent in 1998. The

situation in some of the other developing countries is also similar. In China this share declined from 30 per cent in 1980 to 18 percent in 1998. In Pakistan this share was 30 per cent in 1980 and has declined to around 25 per cent in 1998. In an industrially less developed economy such as Nepal the share of agriculture remained around 40 per cent in 1998 and has declined from 62 per cent in 1980. For the world as a whole the share of agriculture to GDP in 1998 is reported to be only 5 per cent. It is clear from this table that the share of agriculture is smaller for the more developed economies and larger for the less developed economies.

Check Your Progress 1

- 1) Indicate whether the following statements are true or false:
 - a) Share of agriculture in GDP tends to increase as economic development takes place.
 - b) There is a change in the composition of GDP in favour of manufactured products as industrialisation takes place.

2) Identify five types of agricultural products used as raw material in industry.

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3) How will you assess the importance of agriculture in an economy?

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5.3 SHARE OF AGRICULTURE IN INDIAN ECONOMY

In the previous section we identified some criteria to assess the role and importance of agriculture in an economy. On the basis of these criteria now let us examine the trends that have emerged in the role of agriculture in India particularly since Independence.

5.3.1 Share in GDP

Some broad estimates of the share of agriculture in GDP of India suggest that in the first quarter of the twentieth century (1901-1925) the share of agriculture in GDP was about two-third. At the time of Independence (1947) this share declined to nearly one-half. As expected, this share has steadily declined to about 24 per cent in 2000-01.

From Table 5.2 we see that there has been a steady decline in the share of agriculture in GDP. The figures for the manufacturing sector are also shown for a comparison. You may note that the share of the manufacturing sector has risen steadily since Independence. It must also be noted that even though value of agricultural production (at 1993-94 prices) has increased from Rs.69090 crore in 1950-51 to Rs.251713 crore in 2000-01 (about 3.5 times), the relative share of agriculture in GDP has decreased from 52.0 per cent to 23.8 per cent over the same period. At the same time value of output in the manufacturing sector increased 13.5 times and its share in GDP has gone up from 8.8 per cent in 1950-51 to 14.9 per cent in 2000-01.

Table 5.2
Agricultural and Manufacturing Sectors : Value of Output and Share in GDP

Year	Agricultural Sector		Manufacturing Sector	
	Value of output in Rs. Crore at 1993-94 prices	Percentage share	Value of output in Rs. Crore at 1993-94 prices	Percentage share
1950-51	69090	52.0	11665	8.8
1960-61	94857	49.1	19853	10.3
1970-71	117235	43.0	31688	11.6
1980-81	136262	37.6	46159	12.7
1990-91	194847	31.3	98081	15.7
2000-01	251713	23.8	157806	14.9

Source: National Accounts Statistics of India, EPW Research Foundation, 2002.

5.3.2 Share in Workforce

Agriculture in India absorbs a very large proportion of the labour-force. The proportion of workforce engaged in agriculture in India even in the 1990s is more than 60 per cent. According to the 1991 population census 67 per cent of the workforce was engaged in agriculture. This proportion was marginally lower than the earlier census figure which was 72 per cent.

We have given in Table 5.1 the figures relating to the percentage share of workforce engaged in agriculture in different countries. The table shows that in the year 1990 this proportion was only 2 to 3 per cent in industrially developed economies like UK and USA. It was 7 per cent in Japan and about 6 per cent in Australia. Among the low income economies Nepal had nearly 95 per cent of its workforce engaged agricultural activities in while China had nearly 72 per cent and Pakistan about 52 per cent. The average share of agriculture in the workforce in the year 1990 for the world as a whole was around 49 per cent. Once again it is evident that with industrial development of an economy, the proportion of workforce engaged in agriculture declines. In the case of Indian economy however, there is only a weak indication of such a tendency.

5.3.3 Share in Exports

Agricultural sector has been a major contributor to India's export earnings. For a long time the agro-based products namely tea, cotton textiles and jute textiles accounted for more than 50 per cent of the export earnings of the country. By adding to the list other products like spices, coffee, tobacco, cashew, sugar, etc., the share of agriculture in total exports was almost 70 per cent. This share has, however, declined over time with economic growth and diversification of the economy. For example, the share of agriculture and allied products in the total exports in 1960-61 was nearly 44 per cent. It has continued to decline and for the year 2000-01 this share was only 13.5 per cent.

5.3.4 Assessment of the Trends

A review of the direct contribution of agriculture to GDP, to employment and to exports reveals that agriculture is a very important sector of the Indian economy. Even though the share of agriculture in GDP, employment as well as export earnings has declined over time, agriculture continues to remain a crucial sector in terms of its contribution to the economy. We may note that while a steady and significant decline in the contribution of agriculture to GDP and export earnings of India has taken place, the fall in the share of workforce engaged in agriculture has not been as significant.

Check Your Progress 2

- 1) Indicate whether the following statements are true or false:
 - i) While the value of output in agriculture in India increased by nearly 3.5 times between 1950-51 and 2000-01 that of manufacturing sector increased by nearly 13.5 times.
 - ii) The share of agriculture in GDP of India has remained unchanged
 - iii) The share of agriculture in GDP is smaller for the less developed countries and more for the industrially advanced countries.
 - iv) Proportion of workforce engaged in agriculture in India in the year 1991 was much more than that in 1951.
- 2) Comment on the trend in the share of agriculture in India's GDP.

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5.4 LINKAGES BETWEEN AGRICULTURE AND NON-AGRICULTURE SECTORS

In the previous section we learnt about the extent of contribution of agricultural sector to the economy of India directly. It contributes a fairly large share to to employment and to the foreign exchange earnings. In addition to direct contribution, the agricultural sector in India has a considerable indirect influence on the economy through its impact on the non-agricultural sectors.

5.4.1 Nature of Linkages

We may formulate an outline of this relationship between the agricultural and the non-agricultural sectors by studying the flow diagram given in Fig.5.1.

The flow diagram shows that the agricultural sector has two main categories of supplies to the non-agricultural sector. These are: i) supply of raw materials such as sugarcane, oilseeds, cotton and jute fibres, tea and rubber, and ii) supply of foodgrains, vegetables, dairy and poultry products, etc. Thus agricultural sector provides inputs for agro-based industries and fulfills the demand of the workforce engaged in non-agricultural sector for foodgrains and other food products.

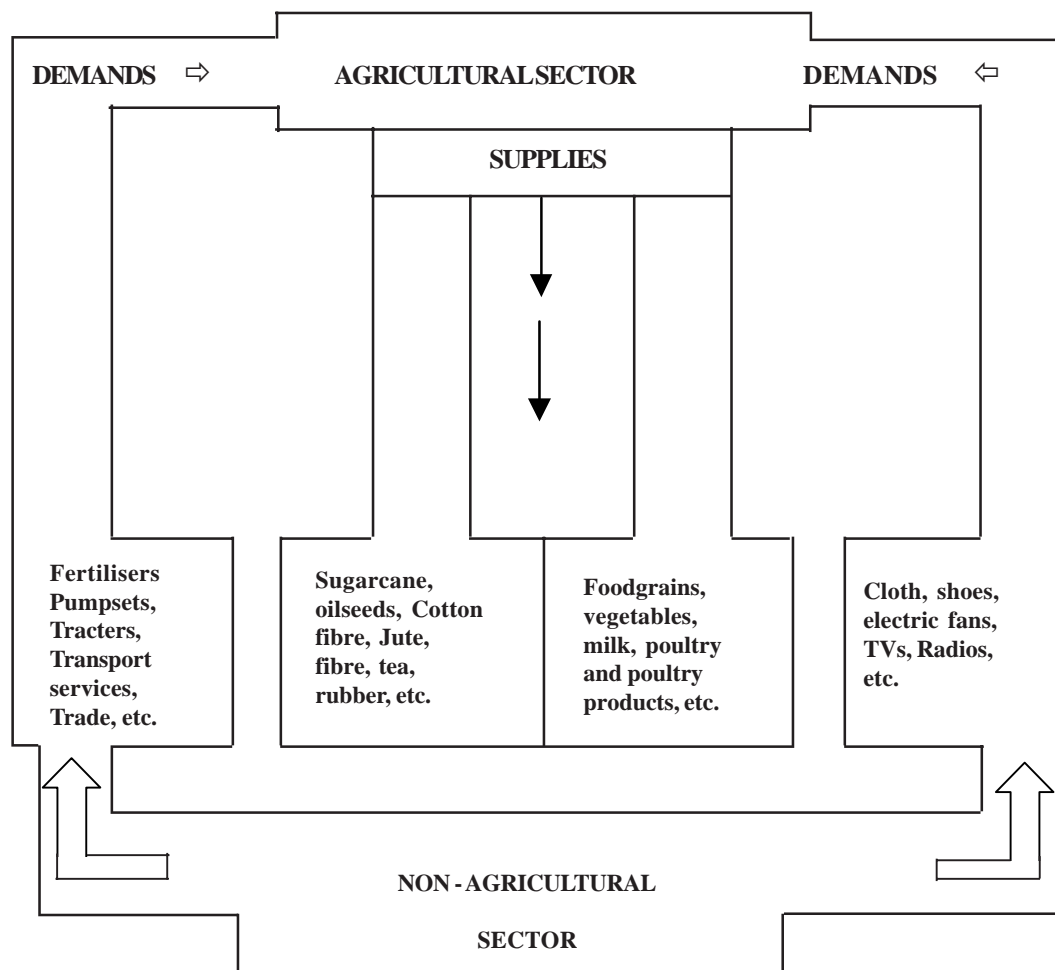


Fig. 5.1 : Flow Diagram of Linkages between Agricultural and Non-agricultural Sectors

The agricultural sector generates demand for the products of non-agricultural sector. Such demand can take two forms. First, agricultural sector requires inputs such as fertilizer, pump sets, tractor and transport services, which are supplied by the non-agricultural sector. Second, the workforce engaged in agricultural sector demands for the output of the industrial and services sectors. Persons working in agricultural sector require consumer goods like cloth, shoes, medicines and several types of consumer durable goods. Higher agricultural production creates higher demand for goods and services produced by non-agricultural sector.

Thus we see that agricultural and non-agricultural sectors have two types of linkages, namely (a) supply linkages and (b) demand linkages. Let us examine the important features of these linkages.

5.4.2 Supply Linkages

These linkages imply the interdependence between agricultural and non-agricultural sectors of the economy with agriculture acting as the supplier of raw materials as well as food to other sectors. Some of the major industries in India are cotton textiles, vegetable oils, sugar. These industries constitute a large part of the Indian economy. Sugar, cotton textiles, vegetable oil industries depend directly on the agricultural sector for the supply of raw material. The performance and growth of these industries depend upon the availability of raw material from agriculture.

An equally important aspect of the supply side linkage between the agricultural and non-agricultural sectors is the food needed for the sustenance of the labour-force engaged in the non-agricultural sector. Agriculture has to produce enough food not only for the workforce engaged in agriculture but also for the workers working in the

non-agricultural sectors. The food supplied to the non-agricultural sectors is called *food surplus* because it is over and above the food requirement of the workers engaged in the agricultural sector itself. Unless this food surplus increases, the employment in the non-agricultural sector cannot increase. As the non-agricultural sectors tend to grow there is not only an increased demand for raw materials in these sectors but also an increased demand for food for the workers working in these sectors.

Agricultural sector in India has contributed considerably to the growth of non-agricultural sectors. The growth of cotton textile industry, sugar industry, vegetable oil industry, jute textiles, plantation products have been sustained by the increasing supply of raw materials.

The agricultural sector has contributed to the growth of the economy as a whole by increasing the supply of food surplus. In the initial stages of growth of the Indian economy there was a massive dependence on the imports of food grains. Without such imports the expansion of the industrial sector would have been much slower. However, since the beginning of the decade of 1970s, this dependence on the imports of foodgrains has steadily decreased. Indian economy is now in a position not only to meet its food requirements but also to export foodgrains.

5.4.3 Demand Linkages

Agricultural sector is not merely a source of supply of raw materials and food to other sectors of the economy. It also generates demand for the products and services of the other sectors. Transport sector in India, be it railways or roadways carries a large bulk of agricultural products. Growth in agricultural production leads to the growth of demand for transport services. Similarly, trading and marketing of agricultural products constitutes a major economic activity in the Indian economy. Agricultural growth automatically generates growing demand for trading activity in agricultural products.

Agricultural sector also generates a demand for some of the industrial products like chemicals, fertilizers, tractors, pumpsets for irrigation, pesticides and insecticides. Increase in agricultural production, over time, has been accompanied by an increase in the demand for such inputs from the industrial sector.

Incomes generated in the agricultural sector also result in the generation of demand for industrial products like cloth, vegetable oils, toilet soap, washing soap and electric bulbs, besides the demand for other consumer durables. Thus, growth of income and output in the agricultural sector generates growth impulses for the industrial sector through demand linkages.

In the recent years the interest of industrial sector in the agri-linked ventures particularly those related to food processing and export has increased. This is because of growing demand for such products both within the economy as well as in the rest of the world.

It should be evident that there is a strong linkage between agricultural and industrial growth. Industrial growth is dependent on agricultural growth not only for the increased supply of raw materials but also food surplus to meet the food requirements of the labour-force engaged in industry. At the same time increased production and income in the agriculture sector has been made possible by the increased use of inputs such as fertiliser, pesticides, tractors and pumpsets. This increase in production and income has also generated increased demand for trade and transport services as well as for consumer products from the industrial sector.

Check Your Progress 3

- 1) State whether the following statements are true or false:

- a) Agricultural sector is linked to the industrial sector only because it supplies raw material to industry.
 - b) Agricultural sector in India has not contributed to the growth of industrial sector.
 - c) Growth in agricultural production automatically leads to the growth in demand for trade and transport services.
 - d) There is no interest of the industrial sector in the agricultural sector at present.
- 2) Briefly comment on the nature of linkages between agricultural and the non-agricultural sectors in India.

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- 3) Explain the demand linkages between agricultural and non-agricultural sectors of the Indian economy.

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5.4.4 Changing Nature of Agriculture-Industry Linkages

One important aspect of the linkages between agricultural and non-agricultural sectors needs to be noted. As the industrial sector expands, there is a considerable diversification in this sector. There is a steady change in the nature of industries. The dependence of some of the industries on the agricultural sector is not of the same genre as some of the agro-based industries like sugar, cotton textile, jute and textiles. Industries such as steel, aluminum, automobiles and the like do not draw raw materials from agriculture—in any case not as much as in the case of agro-based industries.

As the industrial sector expands, there is a tendency for diversification. Such diversification is accompanied by growth of metal-based industry, capital goods industry and consumer durables industry. The raw material or the supply with agricultural sector linkage becomes less significant as the share of such industries increases in proportion to the agro based industries. In the case of the Indian economy, the growth of chemical based industries, electrical goods industries as well as industries manufacturing electronic goods has reduced the raw material linkage between the industrial sector as a whole and the agricultural sector.

It would be useful to look upon the industry-agricultural linkage in terms of their *growth effect* as distinct from the *diversification effect*. While growth effect is positive, the diversification effect is negative. As the industrial sector expands there is some diversification but it is also accompanied by the growth of existing industries. For example, emergence of electronic goods industries in recent years may not result in the increased demand for raw materials from agriculture but higher growth in the cotton textile industry (even though cotton is being displaced by polyester fibre) leads to some growth in the demand for raw materials from agriculture.

The food supply linkage, however, behaves differently. Food requirements of the industrial sector continue to grow with the growth as well as diversification of the industrial sector. As the income in the non-agricultural sector increases, the food requirement of the labour-force engaged in this sector also increases. It may, however, be noted that the demand for food does not increase proportionately with the increase in income in the non-agricultural sector. It increases less than proportionately. Due to expansion there is increase in employment in the non-agricultural sector which also adds to the demand for food.

Similar is the case for the demand linkage. The demand for industrial inputs into the agricultural sector as well as the demand for consumer goods produced in the industrial sector does not expand proportionately. While the demand for some of the inputs from industry into agriculture increases as the land use improves and more fertiliser, pump sets, harvester combines, diesel for tractors, etc. are demanded by the agricultural sector. Yet it does not increase proportionately to the increase in production. It must be clear that there is a limit to the use of such inputs on a given cultivated area. Hence the demand for such inputs tends to increase only slowly and less than proportionately.

As the agricultural income increases, the demand for consumer goods increases. However, the pattern of this demand undergoes a change. There is a diversification in the demand for the consumer products. Consumers in the agricultural sector demand new consumer products such as electrical goods, travel services, educational services, in addition to the consumer goods like cloth, shoes and vanaspati.

We can, thus, conclude that the agriculture-industry linkage in a growing economy does not remain static. It undergoes a change. Some linkages become weak, particularly those of the raw material supply from agriculture to industry. Other linkages, however, do not become weak because of the expansion of the industrial sector. Food linkage tends to become stronger. Even though the demand for food in the industrial sector increases less than proportionately to the increase in income, it continues to increase. Similarly the demand for industrial inputs into agriculture also tends to slacken but the demand for consumer goods tends to become diversified. On the whole, the agriculture industry growth linkages are fairly strong and they each other.

As pointed out earlier, investment by the industrial sector in the agricultural sector to meet the requirement of growing demand for food processing and exports of agricultural products has further strengthened the industry-agriculture linkage in the Indian economy. As the industrial sector tends to invest in the agricultural sector, there is a likelihood of greater integration of the industrial and agricultural sectors.

Check Your Progress 4

- 1) Fill in the blanks to complete the following statement with words given at the end.

Even though the demand for declines as the industrial sector diversifies, the for food for the workforce engaged in industry continues to There is a

of the raw material linkage but the food supply remains On the whole, however, agriculture-industry linkages are fairly in the Indian economy.

(strong, rise, decline, raw material, weakening, supply, linkage, strong, demand, weak)

- 2) Explain the nature of changes in the agriculture-industry linkages as the economy tends to grow.

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- 3) Industrial diversification inevitably leads to weakening of agriculture-industry linkage. Do you agree? Explain briefly.

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5.5 IMPORTANT FEATURES OF INDIAN AGRICULTURE

We discuss some of the features peculiar to Indian agriculture. This will enable us to form an idea of its prospects and performance capabilities.

At the time of Independence, Indian agriculture was described as ‘backward’. This was reflected in the low productivity per worker as well as per hectare of land. The backwardness of the agricultural sector was attributed to the outdated and traditional techniques and the land-relations system. By the land relations system we mean the relationship between the owners of land and the actual cultivators. This system was excessively exploitative at the time of Independence. Owing to the pressure of growing population and absence of adequate opportunities for employment outside agriculture, the demand for land was persistently on the rise. The landowners were, thus, able to charge high rents from the cultivators leaving very little for their subsistence. Improvements on land were not made by the landowners as their rents were on the rise and the cultivators were left with very little to make such improvements. Large cultivated area depended for water supply only on the rainfall. Thus, most of the land could be used for producing only one crop during the year. The overall impact of these conditions on the Indian agriculture was that it did not experience any significant growth of output. The average rate of growth of agricultural production during the first half of the twentieth century was only about 0.25 per cent per annum.

There has been significant improvement in the rate of growth of agricultural production since Independence. On an average, this rate has been estimated to be around 2.7 per cent per annum. However, the overall rate of growth is not uniformly spread across regions or crops. It has also not been stable over time. The Indian agricultural sector has some prominent features which are examined below:

5.5.1 Uncertainties and Fluctuations in Agricultural Production

Agriculture in India continues to remain predominantly rainfed. The total area irrigated as a percentage of the gross cropped area (GCA) was only about 17 per cent at the beginning of the 1950s. It has gradually increased to around one third of the GCA in the decade of nineties. Thus, nearly two third of the cultivated area continue to depend upon rainfall for irrigation purposes.

Fluctuation in the quantity, frequency and timing of rainfall from year to year is a common feature in India. Thus there is some uncertainty in the availability of an essential input, i.e., water. The fluctuation in rainfall causes fluctuations in agricultural production and thereby in the GDP of India. Uneven spread of rainfall across regions further adds to these fluctuations. The economy often witnesses drought conditions in some regions while some other regions are devastated by floods in the same year.

5.5.2 Wide Diversities

Indian agriculture is characterised by large diversities across regions. The climatic and soil conditions vary from the arid desert in Rajasthan to the high rainfall and extremely wet conditions in Assam and Meghalaya. There is, therefore, a multiplicity of crops and some degree of inter-regional specialisation in agricultural production. Furthermore, there are diversities in the productivity of land not only between regions but also within a region. Hill districts of Uttar Pradesh have agro-climatic conditions which are very different from that in the plains of the same state. Even within the plains there are wide differences in fertility and soil conditions between the eastern and the western parts of the state.

5.5.3 Predominance of Small Farmers

A large number of cultivators are operating on very small or tiny farms. In the year 1990-91, about 60 per cent of the farms were of less than one hectare in size and almost 78 per cent of the farms were of 2 hectares or less in area. This is primarily attributed to the pressure of growing population on agriculture which causes subdivision and fragmentation of the farms. Many of these farms are inadequate to provide even subsistence to a small family.

5.5.4 Predominance of Subsistence Farming

A large number of *small* and *marginal farmers* do not produce enough for the needs of the families working on them. They are known as subsistence farmers. Production for sale in the market is confined only to larger farms. There is, thus, a mixture of subsistence farming and commercial farming. Benefits of state policies like price support and subsidies are available to the large farmers who are engaged in commercial farming and not to the small farmers who are engaged in subsistence farming.

5.5.5 Inequalities in Agricultural Sector

There are wide disparities in the size of farms. In India, almost 78 per cent of the farms are less than two hectares in area. Such farms constitute about 32 per cent of the total cultivated area. At the other end of the spectrum, large farms of size ten hectares and above constitute only 1.2 per cent of the total number of farms but

operate as much as 17 per cent of the cultivated area. Large farmers are able to get access to the financial and irrigation resources. They are, therefore, able to obtain much higher income than the small and marginal farmers.

5.5.6 Low Level of Productivity

Low level of productivity has been one of the symbols of backwardness of Indian agriculture. Despite several technological improvements and spread of new agricultural technology the overall level of productivity has remained low. Compared to developed countries productivity per worker as well as per hectare in India is very low. For instance productivity per hectare in the case of rice, which is a major crop of India, was only 29 quintals in India as compared to 63 quintals in USA, 62 quintals in Japan, 61 quintals in China in the year 1998. For other major crops like wheat, groundnut and cotton, the situation is very much similar. Low productivity not only aggravates the pressure on land but also keeps the cost of production very high.

Check Your Progress 5

- 1) Indicate whether the following statements are true or false:
 - a) Indian agriculture was highly developed before Independence.
 - b) The average rate of growth of agricultural output since Independence has been nearly 27 per cent per annum and has been uniform over the years.
 - c) Fluctuations in rainfall and its uncertainties cause fluctuations in agricultural output.
 - d) Small and subsistence farms predominate the Indian agricultural scene.
- 2) Briefly discuss some of the main features of Indian agriculture.

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5.6 LET US SUM UP

Role and importance of agriculture in an economy can be measured by examining its share in the GDP, employment and international trade. It also has an indirect impact on the economy through its linkage with other sectors. Agriculture continues to remain a major sector of the Indian economy even though its share in GDP has declined from nearly 50 per cent in 1950-51 to about 24 per cent in 2001-02. However, the share in employment has declined only marginally and about two-third of the labour force are still engaged in the agricultural sector. The share of agriculture in exports has declined significantly but still continues to be fairly large. The agricultural sector contributes to the industrial growth in India through agriculture- industry linkage. Its raw material support to agro-based industries and food surplus supplies have remained sufficiently strong over time. It has also generated demand for the industrial products and services of transport and trading sectors. The large agricultural sector of the Indian economy is characterized by fluctuations in output, diversities as well as inequalities besides the predominance of small farms and low level of productivity.

There have been substantial developments in the agricultural sector since Independence. Measures to improve land relations in the form of land reforms and improvements in the sources of credit have borne some fruit. Marketing conditions, irrigation facilities and technology in general have undergone significant changes. The sector is however, still marked by uneven development and wide diversities, predominance of small farms, traditional and even primitive techniques co-existing with some of the modern techniques. Storage conditions for crops in rural areas are largely very primitive leading to loss of produce. On the whole, despite the developments in the agricultural sector, there is substantial scope for its modernisation and improvement.

5.7 KEY WORDS

- Agro-based industries :** Industries which directly draw their raw materials from the agricultural sector.
- Gross Cropped Area :** It is the total cultivated area plus that part of the area which is cultivated more than once.
- Gross Domestic Product:** Refers to the value of goods and services produced within the economy without double counting and without deducting the depreciation of capital stock.
- Linkages :** Refer to the interdependence between various segments through flows of output to each other.

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5.9 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) (a) F (b) T
- 2) Refer to Section 5.2
- 3) Refer to Section 5.2

Check Your Progress 2

- 1) i) See Table 5.2
ii) F
iii) F
iv) F
- 2) Read Sub-section 5.3.1 and answer

Check Your Progress 3

- 1) a) F
b) F
c) T
d) F
- 2) Refer to Sub-section 5.5.1 and answer.
- 3) The nature of these tenures are discussed in Sub-section 5.5.3.

Check Your Progress 4

- 1) Raw material, demand, rise, weakening linkage, strong, strong.
- 2) Draw your answer from Section 5.6
- 3) Draw your answer from Section 5.6

Check Your Progress 5

- 1) a) F
b) F
c) T
d) T

UNIT 6 DIVERSIFICATION TRENDS OF INDIAN AGRICULTURE

Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Importance of Allied Activities
 - 6.2.1 Allied Activities and Resource Use
 - 6.2.2 Allied Activities and Supply of Products
 - 6.2.3 Allied Activities as Sources of Energy and Implements
 - 6.2.4 Allied Activities as Sources of Employment and Income
- 6.3 Animal Husbandry
 - 6.3.1 Role of Livestock
 - 6.3.2 Features of the Livestock Economy
 - 6.3.3 Size and Composition of Livestock
 - 6.3.4 Inter-state Comparisons
- 6.4 Dairy Farming
 - 6.4.1 Breeds of Dairy Animals
 - 6.4.2 Operation Flood
- 6.5 Government Measures of Assistance
- 6.6 Poultry Farming
 - 6.6.1 Features
 - 6.6.2 Government's Measures of Assistance
 - 6.6.3 Issues in Poultry Development
- 6.7 Fisheries
 - 6.7.1 Importance of Fisheries
 - 6.7.2 Potential of Fisheries
 - 6.7.3 Types of Fish Farming
 - 6.7.4 Marine Fisheries
 - 6.7.5 Inland Fisheries
 - 6.7.6 Government's Measures of Assistance
- 6.8 Let Us Sum Up
- 6.9 Key Words
- 6.10 Some Useful Books
- 6.11 Answer/Hints to Check Your Progress Exercises

6.0 OBJECTIVES

After going through this Unit you should be in a position to:

- appreciate the importance of allied activities in India's rural economy;
- identify the features of India's livestock economy;
- examine the progress made in the dairy sector of the economy;
- point out the issues of development in different areas of allied activities; and
- suggest course of action for future development of the sector.

6.1 INTRODUCTION

In the previous Unit, we have examined the role and importance of crop production in the Indian economy. We have examined that the crop production has expanded nearly four-fold during the last fifty years. We also reached a universally acceptable conclusion that till a major technological breakthrough occurs once again as it did in

the 1960s that resulted in Green Revolution crop production in India has reached a plateau. And with that the scope and possibilities of further increase in employment and income levels are remote.

It is imperative to raise employment and income levels in the rural economy. To achieve this there is limited choice but to diversify farm activities. Diversification in Indian agriculture can be achieved by promoting allied activities like fisheries and dairy farming.

6.2 IMPORTANCE OF ALLIED ACTIVITIES

Allied activities assume critical importance in India's rural economy in more than one respects. They play a very important role:

- in bringing about a balance in the production system and utilisation of resources;
- in smoothening the income flows between seasons;
- in ensuring participation of people with nil or inadequate resources in productive activities; and
- in bringing about a balance in nutritive value of farm products.

Let us elaborate these further.

6.2.1 Allied Activities and Resource Use

We may draw attention to the following facts:

- i) You have seen in the previous block that cultivable land in India is scarce. It is either not available for large number of people or is available in inadequate quantity. Therefore, cultivation cannot be a means of self-employment and income generation for a substantial proportion of the population in the rural areas which include landless labourers and marginal farmers. For these sections of people, allied activities can provide a source of gainful employment.

Activities such as poultry and piggery do not need land as a direct and major factor of production. Similarly, sheep and goat husbandry, although mainly depend upon the products of land (fodder), do not need stationary and highly fertile land. Sheep and goat themselves are mobile and hence, can be maintained on fodder which can grow on uncultivated/uncultivable pasture land and also on by-products of trees and other vegetative elements.

- ii) In India, arid and semi-arid areas, i.e., areas with an annual rainfall of 750 mm or less, are quite substantial. They cover about a third of the net sown area. About 16 per cent of the total soils belong to the types such as desert soils, hill soils, forest laterite soils, foot hill soils, mountain meadow soils and other types of mountain soils which are not directly usable for cultivation. In such areas, animal husbandry provides an alternative gainful avenue.
- iii) Traditionally, some tribes are used to a migrating pattern of living. In such environment sheep and goat husbandry provide an excellent avenue of gainful employment.
- iv) Biologically, sheep is an excellent converter of grass into useful products like meat and wool. On average, sheep and cattle, respectively, get 80 to 90 per cent and 60 to 65 per cent of their protein from forages and, therefore, do not directly compete with human beings for food and maintenance. Similarly, other animals such as buffalo, camel, donkey and horse though basically need products of land,

they do not compete with human beings for all their requirements of feed. Fishery, likewise, uses only that part of land which is not available for direct cultivation, i.e., land under water, saline or sweet, stagnant or flowing. The allied activities thus do not directly compete with human beings for a large part of their maintenance requirements.

6.2.2 Allied Activities and Supply of Products

Allied activities produce products that are very useful to human beings. These products help in reducing man's dependence on land for survival. Milk, meat, eggs, fish, wool, hair and skin supplement the total stock of products produced on land, i.e., food and fibre.

The protein contents of beef, mutton, fish and egg are 20, 18, 17 and 13 per cent, respectively, as against 8, 11 and 12 per cent in the case of rice, maize and wheat, respectively. In a country like India where malnutrition and unbalanced diet are common features of millions of people, the availability of indigenous nutritive products is very critical.

The allied activities thus work as a balancing force for availability of nutrition. In certain cases, the conversion efficiency of animals, birds, and fish as producer of food is more than the direct use of land for production of such food.

The role of allied activities is thus more supplementary and complementary and less competitive with cultivation of crops.

6.2.3 Allied Activities as Sources of Energy and Implements

Allied activities make cultivation more efficient by providing sources of energy and implements. These activities are the sources of organic manure, draught and traction power. These are also the source of some traditional implements like leather buckets and ropes. Camels, mules and donkey are better suited as means of transport in certain areas where the use of mechanical means of transport (such as tractor) is either not feasible or is very costly. In view of the increasing energy crisis, some countries have started the use of their cattle and buffaloes as a source of energy for the farm sector.

The allied activities enhance the economic viability and even technical feasibility of cultivation by providing important inputs at the production stage and making use of the by-products at the disposal stage. Allied activities thus open new dimensions of judicious land utilisation through mixed or diversified farming.

6.2.4 Allied Activities as Sources of Employment and Income

The allied activities are playing a complementary role to farm sector by providing a stable and dependable source of employment and income. One should look into the changing level of monetisation and regular cash flows in areas where allied activities have been adopted on a more systematic and scientific basis. These cash flows are changing the nature of other activities also in the rural areas which were previously tailored only to the seasonal income flows of cultivation.

In view of the above factors, the allied activities could be relied upon as a major instrument of social change, for supplementing the income and providing a large scope for employment in the rural areas. In short, allied activities have a very important role to play in stabilising the economy of the rural people.

6.3 ANIMAL HUSBANDRY

The livestock economy of India has gained momentum during the last three decades or so. Its performance is based mainly on the changing composition of animals in favour of milk-yielding bovines. The milk trend underlying the livestock economy for past decades was accelerated by modernised marketing along the AMUL model and by determined measures for the protection of health and improvement of breed, resulting in what has come to be known as the “White Revolution”.

6.3.1 Role of Livestock

The role of livestock can be better appreciated by their changing share in the total agricultural production. The share of livestock products in the agricultural sector was 6 per cent in 1970-71; it has increased to about 15 per cent presently. Thus, the rate of growth of output in the livestock sector has been more than that in the agricultural output sector.

The contribution of livestock is about 12 times that of fisheries and over seven times that of forestry. Employment in animal husbandry can be assumed to be of the same order.

Animals are a major source of energy input; they also provide dung, which is an important source of biological manure. The major and more widely known contribution of livestock is in terms of livestock products such as milk, milk products and to an extent meat, hides and skin, etc.

6.3.2 Features of the Livestock Economy

The livestock economy of India has several outstanding features. Among these, the more important can be mentioned as follows:

- i) India is known for its cattle wealth and ranks high among countries that have a large bovine population relative to their human population. About one-sixth of the world’s cattle and one-half of the world’s buffalo population are concentrated in India.
- ii) In rural India for every two persons there is one bovine animal.
- iii) India would rank high among countries of the world using bullocks for work as a source of motion power.
- iv) India has the largest buffalo population in the world. The use of the female buffalo as a milch animal is perhaps a distinctive feature of India. Despite a large number of breeding cows, the share of buffaloes in total milk supply is larger. While cows constitute over 66 per cent of total milch animals, they supply less than 45 per cent of total milk produced in the country.

India’s livestock economy has thus many distinct but at the same time perplexing features. These need to be studied with care.

6.3.3 Size and Composition of Livestock

Data on livestock are collected through the quinquennium census in India. As per available data, the bovine population (i.e., cattle and buffaloes) are the two most important species of livestock for the source of draught power and dairy products. While cattle is reared for the purpose of getting draught and traction power, buffaloes are mainly reared for the purpose of dairying) in undivided India increased by just 2.3

per cent over a period of 25 years between 1920 – 1945. On the other hand, since Independence bovine population has been increasing at an annual average rate of about 3.0 per cent.

Some of the important facts brought out by the censuses have been as follows:

- 1) There has been a continuous increase in the number of total cattle and buffaloes, number of breeding cattle and buffaloes (milch animals) and working animals during the post-independence period. The proportion of cattle in total animals has slightly declined over the period but still constitute about three-fourth of the total cattle and buffaloes.
- 2) On an average, about 70 per cent of the total cattle and buffaloes are of the mature age, i.e., more than 3 years and the remaining are young animals. The adult animals are almost equally divided into working and milch animals. Working animals mainly include male cattle and buffaloes, which are used for agriculture and transportation purposes and for breeding. The milch animals include adult cows and female buffaloes which are used for production of young stock and milk.
- 3) A predominant proportion of working animals is constituted by bullocks.
- 4) On an average, 4 to 5 out of every 10 milch animals are in milk, i.e., lactating stage at any time. The remaining ones are dry animals.

6.3.4 Inter-State Variations

The following observations can be made about the distribution of livestock as between the different states of the country:

- 1) Uttar Pradesh stands first in respect of total livestock and also in respect of buffaloes, pigs, horses and ponies.
- 2) Madhya Pradesh and Rajasthan are two other states which individually account for more than 10 per cent of total livestock in the country.
- 3) Camels are available in the north-western part of the country, i.e., Rajasthan and Haryana. Similarly, Uttar Pradesh, Madhya Pradesh and Bihar together have half the total number of pigs in the country. Only four states, viz., Rajasthan, Andhra Pradesh, Tamil Nadu and Karnataka, account for more than two-third of total sheep in the country. About 45 per cent of total buffaloes are found in three states, viz., Uttar Pradesh, Andhra Pradesh and Madhya Pradesh.

Check Your Progress 1

- 1) Highlight the important functions of allied activities in India's rural economy.

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- 2) Allied activities are not competitive, but complementary to cultivation. Explain in brief.

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- 3) What are the types of products available from allied activities?

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6.4 DAIRY FARMING

Over the years, dairy farming has emerged as the most important allied activity in the farm sector of the Indian economy. Along with Green Revolution, the White Revolution has brought about a critical change in the income and employment pattern in the rural economy. The revolutionary “Operation Flood” has taken India to the top place in production of milk and milk products. India has truly and squarely emerged as a nation where ‘rivers full of milk’ flow.

6.4.1 Breeds of Dairy Animals

Dairy animals in India can broadly be classified into three groups as follows:

- 1) **Indigenous Cows:** Cows presently available in India are largely indigenous in origin and a few are exotic also. There are about twenty-six well-defined indigenous breeds in addition to some nondescript breeds of cattle. Based on the utility of the cattle as a source of draught power or milk production, the indigenous breeds are classified into three major groups as follows:
 - i) **Draught breeds:** The bullocks of these breeds are good as draught animals. The cows of these breeds are, of course, poor milkers. Fourteen out of twenty-six well-defined breeds are exclusively draught breeds. These breeds are locally known as Amritmahal, Bachaur, Bargur, Dangi, Hallikar, Kangayam, Kenkatha (Kemvaria), Kherigarh, Khillari, Malvi, Nagori, Ponwar and Siri.
 - ii) **Dual purpose breeds:** There are eight breeds of cattle in India which produce calves which develop into good bullocks and heifers which develop into good milking cows. These breeds are known as Gaolao, Haryana, Kankrer, Krishna Valley, Mewati (Kosi), Ongole (Nellore), Rath and Tharpanker.
 - iii) **Dairy breeds:** There are four breeds which belong to this group. The cows of these breeds are high milk-yielders but the bullocks are poor as draught animals. These breeds are Deoni, Gir, Sindhi (Red Sindhi), and Sahiwal.
- 2) **Exotic Breeds of Cows:** The main exotic breeds imported in India are Jersey, Holstein Friesian, Ayrshire, Brown Swiss, Guarnsey and Red Dame. Some of these breeds were imported as back as 100 years. These breeds are basically

dairy breeds. However, it is ascertained that even crossbred bullocks are found quite useful for work as compared to the vast majority of non-descript type of bullocks. At present, they are used for improving the breed of indigenous cattle by cross-breeding programmes.

- 3) **Buffalo Breeds:** There are seven well-defined buffalo breeds in India in addition to few localised breeds. The main breeds are known as Jaffarabadi, Mehsana, Murrah, Nagpuri, Nali, Ravi and Surati. Except for Nagpuri, all breeds are good milkers.

6.4.2 Operation Flood

Operation Flood marks a turning point in the history of dairy farming in India. It marked a switchover from the traditional system of marketing and production of milk to a modern new system of organised dairies.

The traditional channel of milk handling does not require an expensive infrastructure such as a dairy plant or other costly equipment, chilling station, refrigerated or insulated vans and employment of technically qualified staff with high salaries. Because of this, all possible permutations of these systems incorporate two features, viz.,

- 1) Absence of elaborate and expensive facilities and therefore little capital investment per litre of capacity; and
- 2) Absence of direct link between the producers and the consumers.

Even when the demand-supply situation compels very high selling price, the producers get very little, the middlemen pocketing the lion's share.

The organised dairies collect milk through one of the following systems:

- 1) Directly from the producers and middlemen alike by establishing village procurement centres; and
- 2) From the producers and middlemen alike by establishing milk collection and chilling centres; and
- 3) From primary co-operative societies.

Primary co-operative societies connect the primary producers with the marketing organisation and hence offer an improvement over the traditional unorganised dairy sector.

In pursuance of realisation of this philosophy, the Operation Flood was launched in the year 1969-70. With that milk production and marketing entered a new phase.

The Operation Flood was launched to realise primarily two objectives:

- 1) To ensure remunerative price to milk producers throughout the year through producers' co-operatives; and
- 2) To provide regular supplies of milk to consumers at a reasonable price.

The initial corpus of funds for the implementation of Operation Flood was generated by the sale of 1,27,517 tonnes of skimmed milk powder and 39,696 tonnes of butter oil provided by the World Food Programme. The Indian Dairy Corporation was specifically set up by the Government of India for receiving these gifts and generating funds by their sale for the implementation of the project.

The initial corpus provided the basis for integrated dairy development to be taken up all over the country.

Operation Flood has been designed to lay the foundation for a viable, modern and self-sustaining dairy industry in the country. The major activities taken up include:

- organisation of village level co-operatives and district level co-operative unions of milk producers,
- provision of technical inputs through the co-operative structure, and
- setting up of processing capacities and marketing facilities in rural milk sheds as well as in the metropolitan dairies.

Another feature of the Operation Flood project is the setting up of a National Milk Grid to offset the regional and seasonal imbalances in milk collection and procurement and to even out the flow of milk to various demand centres. The National Milk Grid is strengthened by commissioning (i) long distance rail milk tankers and (ii) road milk tankers, as well as creating storage facilities at strategic locations for preservation of milk powder, butter and other milk products.

The major achievements of the Operation Flood can be briefly summarised as follows:

- The programme has made a commendable impact on milk production. An assured outlet for a perishable product like milk at fixed prices is a sufficient incentive for rural enterprises to respond.
- In the past, the large share of buffalo milk in the market supply of milk created a problem of sharp seasonal fluctuations. These fluctuations have largely been contained now. A bulk of the milk procured now is converted into milk products.
- Organised marketing has helped to increase the income of owners of milch animals.

The impact on income distribution, however, is uneven. Organised marketing eventually concentrates on urban and relatively large consumption centres. The milk scheme does not directly serve the rural areas.

Check Your Progress 2

1) Mention the important breeds of dairy animals in India.

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2) What is Operation Flood? What have been its principal objectives?

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- 3) What are the main features of Operation Flood?

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6.5 GOVERNMENT MEASURES OF ASSISTANCE

The Government had, rightly, realised the importance of allied activities for the development of India's rural economy at the beginning of the First Five Year Plan in April 1951 itself.

The Government has drawn up a comprehensive programme of development for the animal husbandry and dairy farming sector of the Indian economy. The main components of the programme are as follows:

- 1) **Key Village Scheme:** The key village scheme was introduced during the First Five Year Plan and was the main plank for cattle development. Its basic objective was the multiplication of superior germplasm from the established farms in selected areas in breeding tracts. The scheme envisaged a multi-faceted approach to cattle development by giving simultaneous attention to better breeding, improved feeding, effective disease control measures, scientific management practices and organised marketing facilities.

The scheme has been considerably expanded in the subsequent plans.

- 2) **Intensive Cattle Development Project (ICDP):** Experience with the Key Village Scheme had shown that a large number of dairy plants set up were not able to collect sufficient quantities of milk. These considerations led to the formulation of the ICDP as a part of the Special Development Programmes started during the later half of the Third Five Year Plan.
- 3) **Animal Health Programme:** Animal diseases not only take a heavy toll on lives of animals, but also reduce their milk production capacity. The most commonly known and most damaging diseases have been rinderpest and foot and mouth diseases. Other diseases are tuberculosis, brucellosis, mastitis, etc. Improvement of animal health as a whole requires, on the one hand, awareness among owners, and on the other, establishment of medial centres. Concerted action has been taken by the government along these lines.
- 4) **Improvement of Breed:** While better animal stock protects the potential production capacity, improvement of breed helps to increase the milk production potential. As mentioned earlier, buffalo as a dairy animal is developed more in India than elsewhere. Breeds of cattle developed outside India are high milkers. Breed improvement programme consists mainly of developing pure Indian breeds, crossing and back-crossing of cattle breeds and reproducing the improved breeds. There are 26 breeds of cattle and 7 breeds of buffaloes. Out of them, for 12 breeds of cattle and 4 breeds of buffaloes breed characteristics have been identified by the Indian Council of Agricultural Research (ICAR).

The Government has taken measures to improve the breeds by setting up cattle breeding farms and artificial insemination centres all over the country.

- 5) **Artificial Insemination:** Artificial insemination and preservation of semen is an important aspect of breed improvement. Established breeds can have wider coverage through artificial insemination.
- 6) **Feed and Fodder Development:** Better and special quality breeds unless accompanied by increased supply of fodder and feed would not yield desired results. Ninety per cent of the country's bovine population subsists on grass in common grazing land or pastures. Only five per cent of the cultivated area is under cultivated fodder. Attempts to solve the feed and fodder problem, to achieve a continuous high rate of growth of animal products along with the problem of increasing crop production, would strain available land and such other inputs as fertilisers and irrigation. Besides, the production system will have to change from the traditional to a modernised one. Technological research and organised marketing are efforts towards modernisation of the livestock economy. Piecemeal efforts do not prevent sliding back.

6.6 POULTRY FARMING

Poultry farming is possible in widely differing agro-climatic environment and provides an excellent opportunity for gainful employment to idle or underemployed members of rural families. As a result of organised and concerted efforts made under poultry development plans on a countrywide scale, a strong base has been laid and poultry farming has established itself in India as a profitable commercial enterprise.

6.6.1 Features

Poultry as an economic activity exhibits a scene of wide contrast in India. The size of production unit and sophistication of its management varies from one or two domestic birds to tens of thousands of exotic breeds, on the one hand, and from absolutely no care to a highly sophisticated, specialised scientific and mechanised management of poultry farms on the other.

India has achieved a commendable progress in poultry. This progress is sometimes considered comparable with the advances made in the wheat production.

Some of the important features of poultry farming in India are as follows:

- 1) More than 90 per cent of the total poultry birds in India are fowls. About 45 per cent of the total fowls are laying birds while the remaining ones are used for broiler.
- 2) There are about 20 identified breeds in India. The indigenous breeds are well known for their adaptability to local climatic and geographical conditions. These are good brooders, foragers and efficient mothers. These are, however, poor layers. The improved breeds include some pure exotic strains, cross-bred strains and graded desi strains. The imported strains include White Leghorn, Australorps, Succex, Minorca, White Cornich, Rhode Island Reds and New Hampshire. The first four are heavy layers and White Cornich is a good broiler bird. The remaining are dual purpose birds.
- 3) India at present enjoys the seventh rank among the countries in respect of the production of eggs. The increase in the output of eggs has resulted from the increase in laying stock as well as increase in the average number of eggs by a layer during the year. The improvement in yield has resulted largely on account of increasing proportion of improved layers in the total laying stock. The productivity of improved strains has been about three times more as compared with the indigenous ones. There has been a considerable technological improvement in this regard.

- 4) Andhra Pradesh and Maharashtra are the two states, which individually account for more than 10 per cent of the total eggs produced in the country. Kerala also produces about 10 per cent of the total egg production in the country. West Bengal, Tamil Nadu, Karnataka and Bihar also have a sizeable contribution to the total production of eggs in the country. Most of these states have an advantage of local markets available in the metropolitan cities situated within the states. This is also supported by the number of hatcheries working in these states; these supply one-day-old good quality chicks to the poultry farms. The role of private sector is more prominent in the setting up of the hatcheries.

6.6.2 Government Measures of Assistance

The government has undertaken a number of steps towards development of poultry farming.

- 1) During the First Five Year Plan, an All India Poultry Development Programme was launched. The aim was establishment of Poultry Extension-cum-Demonstration Centres. The scope of the programme was enlarged during the subsequent plans by establishing Regional Central Government Poultry Farms. These centres were set up to demonstrate the modern methods of poultry, impart training in poultry raising and supply infrastructural facilities. The concepts of backyard poultry-keeping yielded place to poultry-farming as a commercial enterprise.
- 2) Intensive Egg and Poultry Production-cum-Marketing Project is another important programme. The project was launched with an area development and package approach. Under this programme, centres were established in selected urban areas in different states. Scientific poultry breeding programmes were launched and central poultry farms were set up as a first step towards attaining self-sufficiency in the production and supply of high quality chicks.
- 3) In the early seventies, the selective breeding programme initiated earlier at the Central poultry farms was modified and a Co-ordinated Poultry Breeding Project was launched in which three central and a number of state poultry breeding farms participated. Poultry disease control measures and disease diagnostic services were strengthened and mobile veterinary clinics were established.
- 4) Commercial poultry production based on scientific breeding was started in India in the 1960s. At that time franchise hatcheries of foreign based poultry breeding organisations were set up for commercial mass production of genetically superior hybrid chicks. As a result, superior quality hybrid chicks with excellent egg laying potentiality became available in the country in large numbers.
- 5) The initial attempts based on size/family selection programme made by the Central and State farms in the 1960s to develop high egg laying strains of chicken yielded some encouraging results. However, it was found that the co-ordination between the Central and State farms was not satisfactory, and that the breeding programme needed enlargement in size and uninterrupted pursuit in a sustained manner. Further, a modification of the technical programme was considered necessary to achieve the desired goal of production of high yielding stocks expeditiously. A revised technical programme was, therefore, drawn up in the early seventies for launching a co-ordinated Poultry Breeding Project by the Government of India.

6.6.3 Issues in Poultry Development

As stated, earlier poultry were largely seen as a backyard enterprise. It is only since the 1960s that the poultry farming has been taken up as a commercial enterprise. Introduction of deep litter and cage system of poultry-keeping, production of balanced feed, multiplication of exotic and high-yielding layers in public and private sectors,

mass preventive vaccination against common poultry diseases are the major contributory factors.

As a result of this enterprise, superior quality hybrid chicks with excellent egg laying potential have become available in the country in large numbers. A large number of feed manufacturing units in private, public and co-operative sectors have been established in the country

The policies and strategies proposed for poultry development in the country have provided for the following:

- large-scale development of quality poultry stock within the country to increase egg and meat production and make the country self-reliant for quality stock;
- establishment of adequate marketing arrangements; and
- improvement of health coverage, extension and training programme.

The poultry sector has reached a stage in development where the following issues merit attention.

- 1) One major shortcoming of our poultry development programme has been that it is largely production oriented with little attention paid to marketing. The result is the periodic boom and busts with farmers feeling the pinch. Today, the bulk of eggs and poultry reach the consumer from the farmer's door through a long chain of middlemen who appropriate a large part of the consumer's rupee. Thus, the increase in production does not result in an equitable and proportionate benefit to the farmer. To ensure a remunerative price to the producer and a reasonable price for the consumer, a suitable marketing channel should be organised on priority basis.
- 2) Lack of quality control on balanced poultry feed and lack of availability at reasonable price adversely affect the growth of poultry farming in the country. Field reports indicate that the mortality in chicks and drop in egg production are sometimes due to poor quality of feed available in the market. Feed analysis laboratories should be set up in all pockets where poultry development has been taken up to provide quick and inexpensive testing to poultry farmers.
- 3) The need to organise an efficient poultry health programme in keeping with the dynamic growth of the industry is both urgent and vital. Towards this end, the disease diagnostic facilities need to be strengthened for the benefit of poultry farmers. Mobile vans to extend these facilities to the remote poultry farmer's doorsteps are also needed.
- 4) A Poultry Corporation at the national level needs to be established to induce healthy competition between public and private sector hatcheries to the eventual benefit of farmers.
- 5) The hatcheries are known to be a potent source for transmission of egg-borne and other poultry diseases through supply of baby-chicks. In order to check the spread of diseases, it is essential to regulate the hatcheries through a proper licensing system.
- 6) The substantial development of the poultry industry at present is centred mainly around large cities and towns where a large number of commercial poultry farms have been established. The rural community received very little benefit from the development of poultry farming. Poultry farming should be encouraged in the rural and backward areas of the country to build a farmer base for the industry. It could help them to overcome the twin problems of poverty and poor health.
- 7) Extension support needs to be enlarged and strengthened to help the transfer of appropriate technology of modern poultry farming to farmers in the rural areas.

Training should be provided on a regular basis to the extension personnel to update their knowledge. Systematic arrangement should be made to obtain reliable information on all aspects of poultry farm economies.

Check Your Progress 3

- 1) Examine the importance of poultry farming for the rural economy.
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- 2) Review in brief the main features of poultry farming in India.
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- 3) Examine the main issues being faced by the poultry farming sector in India presently.
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6.7 FISHERIES

Fisheries constitute another important allied activity in India’s rural economy.

6.7.1 Importance of Fisheries

The importance of fisheries in India’s rural economy can be judged from the following:

- 1) Fisheries largely depend upon the resources which are not directly available for crops or animal husbandry and hence it supplements income without competing for the inputs.
- 2) A high quantity of land and water resources covered by seas and oceans are not available or are not useful for raising crops or livestock. In India this is all the more important because of the small per capita arable land and irrigation water resources. On the other hand, there is a huge potential of fish crop.

- 3) Fisheries are also important from the angle of improving nutritional standards of a majority of the people.
- 4) It is also an important source of foreign exchange.
- 5) Fishery is a labour-intensive activity and hence would play a significant role in providing gainful employment to the weaker sections of the society.

6.7.2 Potential of Fisheries

India has a long coastal line of about 6,535 kilometres. Considering 320 kilometres into the sea as the exclusive economic zone, it amounts to a total area of about two million square kilometres (6535 km x 320 km) available for marine fishing. The area thus available for marine fishing adds about 64 per cent of the area to the country's total land surface. Unlike crop and animal husbandry, fish farming in the sea involves more of harvesting operations, cultivation and nursing being done by natural elements.

In addition to the coastline area, a total of 9.5 million hectares is available for inland fish farming, including brackish water fish farming.

6.7.3 Types of Fish Farming

Fish farming, as indicated above, is of two types: Marine fishery, and Inland fishery.

Marine fishery implies fish farming in sea water.

Inland fishery can be divided into two groups, namely fresh water and brackish water fisheries.

Fresh water fisheries exist in the rivers, canals and irrigational channels, large fresh water lakes, numerous small lakes, jheels, reservoirs, ponds and tanks.

Brackish water fisheries comprise the fisheries in sprawling estuaries of river mouths, brackish water lakes, lagoons and swamps containing tidal waters along the coastline. Adopting an ecological classification, both fresh and brackish waters can be categorised under lotic or lentic types. The **lotic fishery** includes inland waters in which the water body as a whole is continuously in a state of motion. On the other hand, **lentic fishery** includes standing water series and those having little water motions at the inlets and outlets. Lentic type of water bodies also encompass both fresh and brackish waters.

There is another important way of sub-dividing the inland fisheries into two classes, namely, capture and culture fisheries. In **capture** fisheries, the role of the human agency is limited only to capturing fish or at most to regulating the mode of capture. In **culture** fisheries which are provided by impounded waters of tanks, pond and embanked brackish waters, human beings undertake various positive measures for culture effecting definite increase in production. In other words, in capture fisheries human beings only reap the aquatic harvest without having to sow and in culture fishery they have to tend and nurse before reaping the harvest.

6.7.4 Marine Fisheries

The progress of fisheries in India has been more pronounced in the field of marine fishery. A positive approach towards a modernised marine fishing industry was adopted after Independence, taking into account the vastness of its resources and the need to apply tools of research and mechanisation for its development. The principal measures introduced include replacement of natural fibres with synthetic fibres for making nets, mechanisation of boats primarily as a means of propulsion, development of trawl

fisheries mostly in the near shore waters and the introduction of mechanised device for fish location.

Marine fisheries of India can be broadly classified into (1) coastal fisheries or inshore fisheries, and (2) offshore fisheries. Of the vast coastline about three-seventh is in the west coast and four-seventh in the east coast.

About two-thirds of the marine fish catch are from the west coast and one-third from the east coast. The varieties caught are mackerel, prawns, pomfrets, Bombay duck, etc.

India is the largest fish producing country among all the countries bordering the Indian Ocean. Various estimates based on exploratory surveys and production of prime organic matter in the Indian Ocean have indicated a possible annual yield of nearly 11 million tonnes of fish. At this level of exploitation, the Indian Ocean would be at par with the more intensely exploited oceans such as the Atlantic and the Pacific. The projected potential of total fish production from the world oceans is of the order of 200 million tonnes. Correspondingly, the share of the Indian Ocean would be nearly 40 million tonnes. As against these potentials, the present production from the Indian Ocean is only three million tonnes of which India's share is nearly half.

6.7.5 Inland Fisheries

Inland fisheries can be divided into two groups, namely fresh water and brackish water fisheries. Fresh water fisheries exist in the rivers, canals and irrigational channels, large fresh water lakes, numerous small lakes, jheels, reservoirs, ponds and tanks. The brackish water fisheries comprise the fisheries in sprawling estuaries of river mouths, brackish water lakes, lagoons and swamps containing tidal waters along with the coastline.

It has been estimated that the length of principal rivers in India along with their tributaries is about 29 thousand kilometres; canals and irrigational channels cover about 112.6 thousand kilometres. The reservoirs and lakes situated all over India present a water area of about 29 lakh hectares for fishery development. The capture fishery water in the form of open estuaries or river mouths, brackish water lakes and back waters are estimated to have an area of 7.6 lakh hectares.

The main fresh waters species of fish found in India are major carps, catfish, sheat fish, live fish, mullets, feather backs, prawns, etc. The vast majority of fish in brackish water are marine species with sufficient tolerance for salinity variations. The important estuarine species are clerpeoids, anchovies, mullets, cat fish, perches, prawns and crabs. Fishing is undertaken by operating different types of gears, namely, shore-seines, boat-seines, gill-nets, hook and line fishing and various types of traps.

India ranks third in the world in inland fish production. The first being China followed by Russia. It may be noted that while the world's catch of inland fish forms only about 15 per cent of the total fish catch, the inland fish production in India constitutes about 51 per cent of the country's total fish production. This shows the importance of inland fish in India's economy.

6.7.6 Government Measures of Assistance

The government has taken a number of steps through various development programmes. These include:

- Organising intensive surveys on marine fishery resource assessment and ensuring optimum exploitation of marine resources through a judicious mix of traditional country boats, mechanised boats and deep sea fishing vessels;

- Intensify efforts on processing, storage and transportation of fish, improving marketing, tapping vast potential for export of fish and fish products; and
- Improving the socio-economic condition of fishermen.

The development programme for inland fishery includes promotion of inland fish production on scientific basis through extension, education, training and provision of inputs with a view to increasing the productivity of water area. Brackish fish farming is given special attention in order to provide economic benefits to coastal fishing communities through a blend of culture and capture fisheries.

Check Your Progress 4

- 1) Identify and explain different types of fish farming.

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- 2) What are the important measures taken by the government towards the development of fisheries.

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6.8 LET US SUM UP

Allied activities assume crucial importance in India's rural economy. These activities play a very important role in bringing about a balance in the production system and utilisation of resources. They smoothen the income flows between seasons, ensure participation of people with little or inadequate land resources in productive activities and bring about a balance in nutritive value of farm products.

Each of the allied activities, be it animal husbandry, dairy farming, poultry farming or fisheries, is to be seen as complementary to crop farming. These activities do not cause any shift of resources from crop cultivation; they present an alternative avenue of income and employment generation.

There has been substantial developments in certain allied activities. For example, milk production in India has increased from 17 million tonnes in 1950-51 to 81 million tonnes in 2000-01. The per capita availability of milk has also increased from 124 grams per day in 1950-51 to 217 grams per day in 2000-01. Similarly fish production in the country has increased from 0.7 million tonnes in 1950-51 to 5.6 million tonnes in 2000-01. Over this period export of marine products has increased 20 thousand tonnes to 430 thousand tonnes.

The development programmes for the farm sector formulated in the recent plans hinge very closely on development of allied activities.

6.9 KEY WORDS

Aquaculture	: The cultivation or rearing of aquatic plants or animals.
Arid Lands	: Dry, parched lands
Broiler	: Young chicken raised for broiling or roasting.
Brooder	: The young of a bird produced at one hatching or birth.
Diversification	: To expand the range of the available products.
Exotic breed	: A breed of animal that has been imported from or that has originated in a foreign country.
Hatchery	: A place for hatching eggs especially of poultry or fish.
Husbandry	: Farming and a careful management of resources.

6.10 SOME USEFUL BOOKS

Dantwala, M. L. (ed.) 1991, *Indian Agricultural Development Since Independence*, Oxford and IBH Publishing and Co., New Delhi.

Dhingra, I. C., 2003, *Special and Preferred Sector Finance*, Sultan Chand and Sons, New Delhi.

Government of India, Indian Economic Survey, Various Issues

Government of India, Report of the National Commission on Agriculture

6.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Read Section 6.2 and point out its importance in efficient resource utilisation, supply of agricultural products, employment, and income generation.
- 2) Answer in line of the fact that allied activities do not compete for resources and help in supplementing the income of farmers.
- 3) Read Section 6.2 and answer.

Check Your Progress 2

- 1) Read Sub-section 6.4.1 and answer.
- 2) Read Sub-section 6.4.2 and answer.
- 3) Read Sub-section 6.4.2 and answer.

Check Your Progress 3

- 1) Explain how poultry helps in employment and income generation.
- 2) Bring out the important aspects of poultry farming given in Sub-section 6.6.1
- 3) Read Sub-section 6.6.3 and answer.

Check Your Progress 4

- 1) Explain the types of fisheries given in Sub-section 6.7.3
- 2) Read Sub-section 6.7.6 and answer.

UNIT 7 FORESTRY IN INDIA : LINKAGE WITH AGRICULTURAL SECTOR

Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Development of Forestry in India
 - 7.2.1 Forestry under British Rule
 - 7.2.2 Forestry in Post-independence Period
- 7.3 Forest Policy in India
 - 7.3.1 Forest Policy under British Rule
 - 7.3.2 Forest Policy in Post-independence Period
- 7.4 Changing Nature of Forestry in India
 - 7.4.1 Integrated Afforestation and Eco-Development Projects (IAEPS) Scheme
 - 7.4.2 Fuelwood and Fodder Project Scheme
 - 7.4.3 Non-Timber Forest Produce Scheme
 - 7.4.4 Grants-in-Aid Scheme
 - 7.4.5 Seed Development Scheme
 - 7.4.6 Afforestation under 20-Point Programme
 - 7.4.7 National Afforestation Programme
- 7.5 Joint Forest Management
- 7.6 Forest Agriculture Inter-linkages
 - 7.6.1 Land Use Pattern
 - 7.6.2 Forests and Human Ecosystem
 - 7.6.3 Forests and Ecological Ecosystem
- 7.7 Let Us Sum Up
- 7.8 Key Words
- 7.9 Some Useful Books
- 7.10 Answers/Hints to Check Your Progress Exercises

7.0 OBJECTIVES

After going through this unit you will be in a position to:

- appreciate the importance of forests in India;
- identify the initiatives on forestry undertaken by the government through various schemes;
- identify the objectives of national forest policy;
- explain the philosophy of joint forest management; and
- identify the linkages between forests and agriculture.

7.1 INTRODUCTION

Forests play a crucial role in the socio-economic life of the millions who live in forest and rural based subsistence economy in India. Forests not only provide fuel wood, timber, fodder, etc. but also are the life supporting system and abode for the tribes and rural mass living within and on fringes of forests. This sector encompasses about one quarter of the geographic area of the country. India is having just two per cent of world forest area but supporting 16 per cent of world human population and 14 per cent of world cattle population. As compared to other countries of the world, India is thus lagging behind in forest resources both in terms of area coverage as well as per capita area under forests (Table 7.1).

Table 7.1

Forest cover and per capita availability in different regions/countries

Region/ Country	Percentage of forest cover to land area (1995)	Per capita forest area (ha)	Region/ Country	Percentage of forest cover to (1995)	Per capita forest area (ha)
World	26.6	0.64	Nepal	33.7	0.2
Asia	16.4	0.1	China	14.3	0.1
Africa	17.7	0.7	Philippines	22.7	0.1
Europe	41.3	1.3	Sri Lanka	27.8	0.1
USA	23.2	0.8	India	15.7	0.06
Malaysia	47.1	0.8	Bangladesh	7.8	0.02
Indonesia	60.6	0.6	Pakistan	2.3	0.01
Japan	66.8	0.2			

The relevance of forestry sector is all the more pronounced in a developing country like India which has a predominantly agriculture based rural economy. Forests have been offering a wide range of both tangible and intangible benefits essential for the socio-economic development of this country. The history of development of forests in India is however linked with the political history of the country.

7.2 DEVELOPMENT OF FORESTRY IN INDIA

You may be aware that Indian epics give attractive descriptions of forests like *Dandakaranya*, *Nandanvan*, *Khandabvan*, etc. and the ancient Hindu culture is said to have its origin from *aranyas* (forests). However, successive political upheavals in the country inevitably had their effect on forests. The first indication of forestry administration was found in 300 B.C. during the reign of Chandragupta Maurya when a *superintendent of forest* was appointed to protect forests and wild life. Later, during the days of Ashoka also much importance was given to planting trees along the roads and camping sites. In Mughal period, there did not seem to be any interest in the conservation of forests. However, Akbar showed keen interest in planting of trees along canals and roadsides. As population increased, more and more forest areas were cleared for settlement and cultivation. There was thus a gradual depletion of forests. Except a few “royal trees”, forests were open to all and people met their requirements of forest produce without any restriction.

7.2.1 Forestry under British Rule

Heavy destruction of forests in India occurred in the later part of the 18th century and early part of the 19th century. In the early years of British Raj, large indents were made on Indian timber. Teak forests along the coast of Malabar were over-exploited to meet the requirements of British Navy following the appointment of a commission in the year 1800 to enquire into the availability of teak wood. Sandalwood from Southern India was sold in European markets. A Conservator of Forests was appointed in 1806 to organize timber supplies from India to European markets. People also met their needs from forests without any difficulty. The general policy was to expand agriculture. The first step for forest conservation began in India with raising of teak plantations at Nilambur, in present day Kerala, in 1842.

In 1855, Lord Dalhousie, then Governor General of India issued a memorandum outlining the rules for the conservation of the forests of the whole country. A qualified forester, Dr. Dietrich Brandis, was appointed as the Inspector General of Forests in 1864. The first Indian Forest Act was drafted in 1865 and the Department of Forest was created in 1866 in India with a view to protect forest resources nationwide. A revised Indian Forest Act came into existence in 1878 and it was made operational in most of the provinces of British India. The Forest Act classified the forests as 'preserved' and 'protected' forests for the first time. In 1894, the Department of Forests issued a circular outlining the future policy for forestry in India. Later on this circular was popularly termed as the *old forest policy*. The first forest school was established in 1878 at Dehradun and provincial forest service commenced in 1891. Thereafter, technical education and training in the area of forestry was organized and expanded. The Imperial Forest Research Institute (now the Forest Research Institute and College) was established in 1906 in Dehradun.

The national character in forest administration was considerably diluted with political changes in 1921 when forests became a *provincial subject* and their administration came into the hands of provincial governments. The gains in the policy and administration of forest conservation received a severe set back during the two World Wars, more particularly in the Second World War. During this period charcoal production was increased to run army trucks. After World War-II, forest based industries cropped up in good number and forest exploitation continued unabated. Forests were also cleared for construction of roads and wooden sleepers for laying down railway lines.

7.2.2 Forestry in Post-independence Period

After Independence with inclusion of princely states with the rest of the country, the task of consolidation of forests, unification of forest laws and extension of scientific management on a reasonably uniform basis became the most important preoccupation of the forest administration at the national and provincial levels. In the early 1950s, most of the states enacted national legislation affecting the land tenure systems and large areas of privately owned forests came under the forest departments of the state. A national Forest Policy was enacted in 1952 with a view to manage forest resources nationwide. Indian Forestry, which was previously in "State List" was included in 'Concurrent List' after the 42nd amendment of the Indian Constitution in 1976. Moreover, according to the 42nd amendment, ten fundamental duties were included for the citizen of India. The 7th fundamental duty of all citizens of India is "*to protect and improve natural environment including forests, lakes, rivers, wildlife and to have compassion for living creatures*". On the basis of the above constitutional amendment, three new directive principles were added to the original fourteen directive principles of Indian Constitution. One of the three new directive principles is related to *promotion of natural environment including forests, lakes, rivers and wild life by the State*. Thus the constitutional amendment of 1976 prepared base for more intensive participation of the Union Government in the conservation of Indian forestry. Subsequently, in order to protect forest areas of the country, the Government of India passed the Forest Conservation Act of 1980 and enacted the Indian National Forest Policy in 1988. The constitutional amendments of 1976 are thus considered a landmark in the developmental history of Indian Forestry.

Development of forestry has been assigned a special significance by planners, economists and politicians. Under the Five Year Plans, man-made forests were grown on an unprecedented scale. Forest development found an important place in the national plans. But unfortunately, very meager amount of finance were allotted for its development. Though forestry covers not less than one-fifth of India's geographical area, it has received a meager proportion of budgetary allocations (Table 7.2).

Table 7.2

Forestry in India Under Five Year Plans

Plan Period	Focus	Plan outlay (Rs.Crore)	Afforestation (in lakh ha.)
First Plan (1951-56)	Afforestation and rehabilitation of the degraded forests, plantation of economically and commercially important species suitable for match-wood and other industries, conservation of wildlife.	7.64 (0.39)	0.52
Second Plan (1956-61)		21.21 (0.46)	3.11
Third Plan (1961-66)	High value forest product, better techniques of timber extraction, attaining self-sufficiency in industrial timber, fuel wood and other forest products, plantation of industrially valuable species, plantation of quick growing species.	45.85 (0.53)	5.83
Annual Plans (1966-69)	Plantation of quick growing species, modernizing harvesting and planting techniques.	41.93 (0.63)	4.53
Fourth Plan (1969-74)	Increasing productivity of forests, link up forest development with forest based industries; develop forest as a support to rural economy, self-sufficiency in forest products, especially in major forest products as early as possible.	84.42 (0.54)	7.14
Fifth Plan (1974-79)	Production forestry, large scale man-made forests with the help of institutional financing, farm forestry, complying with recommendations of National Commission on Agriculture (1976) on forestry.	208.84 (0.51)	12.21
Sixth Plan (1980-85)	Conservation of existing forests, countrywide afforestation, social forestry, people's movement in forestry sector, programmes like tree for every child, eco-development force, eco-development camps and agro-forestry.	962.49 (0.71)	46.50
Seventh Plan (1985-90)	Forests for survival, continuation of social forestry programmes further, large scale afforestation of wastelands, creation of more sanctuaries and national parks, expansion of forestry research and training.	1859.10 (1.03)	88.00
Eighth Plan (1992-97)	Integrated Afforestation and Eco-Development Project, Fuelwood and Fodder Project, Non-Timber Forest Produce Scheme, Grants-in-Aid Scheme, Seed Development Scheme, Association of scheduled tribes and rural poor in regeneration of degraded forests on pilot basis in 9 states, Modern forest fire control methods in India.	4081.87 (0.94)	102.14
Ninth Plan (1997-2002)		7390.00 (0.86)	76.40*

* Estimated figure

Note : Figures in parentheses represent percentage of total financial outlay.

Check Your Progress 1

- 1) What are the benefits rendered by forests?

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2) Why is the 42nd amendment of the Indian Constitution considered a landmark in the development history of Indian forestry?

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3) Fill in the Blanks.

- i) Forest is in list of public administration in India.
(State, Central, Concurrent)
- ii) Under Five Year Plans forests were grown on an unprecedented scale.
(natural, man-made)
- iii) Forests encompass about of the geographic area of India.
(one quarter, half, two-third)
- iv) The first step for forest conservation began in India with raising of teak plantation at in 1842.
(Nilambur, Darjeeling, Sind Province)

7.3 FOREST POLICY IN INDIA

Forest policy connotes the actions of a government for preservation, maintenance and enhancement and optimum utilization of forest resources during a particular period to attain national welfare. Forest policy has to undergo changes according to changed circumstances.

7.3.1 Forest Policy under British Rule

History of forestry in pre-independence India is one of the continuous over exploitation. For the first time in 1855, Lord Dalhousie, the Governor General of India proclaimed a forest policy saying that timber was state property and individuals had no rights or claims on it. In order to implement this policy an Indian Forestry Service was organized whose primary objective was conservation and protection of existing forests.

National Forest Policy, 1894

In the year 1894, the Department of Forest issued a circular (later on popularly known as the *old forest policy*) which formed the basis of future policy for forestry of India. The circular stated that forests of India were the property of the state and they were to be administered to fulfill the objectives of providing benefits to the taxpayers of India as a whole and regulated benefits to the people living within and in the vicinity of forests. The old forest policy categorized forests into four groups, viz., forests to be preserved, forests for commercial use, minor forests and pasture lands.

The British forest policy made provision for the relinquishment of forest area for agricultural use on some conditions. However, the policy notwithstanding, unconditional practices of converting forest areas into agriculture land continued. The tribes of India were never induced to stop the harmful practice of shifting cultivation. Moreover, the practice of illegal cutting of trees and removing timber from forests by the agencies and contractors were sustained. The development of forest communication was neglected during this period. As a result, proper supervision of forests remained a difficult task.

7.3.2 Forest Policy in Post-Independence Period

The national forest policy could not be formulated after attainment of Independence for a period of about five years due to emergence of complicated political, economic and social problems in the country during that period.

A. National Forest Policy, 1952

The Government of India enunciated the first national forest policy in 1952. It was clearly accepted in the policy that the *old forest policy* (1894) still consisted many good ideas but reorientation was required in the policy in view of the changes that took place between 1894 and 1952. The main objective of the Forest Policy Resolution of 1952 was to make development of forests as one of the important national commitments in the larger interest of the economy and human welfare. The policy discouraged indiscriminate extension of arable land by cutting of forests. It proposed classification of forests on a functional basis into (i) protection forests, (ii) national forests, (iii) village forests, and (iv) tree lands. It emphasized on evolving a system of balanced and complementary land use. The policy laid stress on the following:

- a) persuading away the tribal people from the harmful practice of shifting cultivation,
- b) increasing the efficiency of forest administration by having adequate forest laws,
- c) giving requisite training to the forest staff of all ranks,
- d) providing adequate facilities for the management of forests and for the conduct of research in forestry and forest products utilization,
- e) controlling grazing in forests, and
- f) promoting the welfare of the people through forestry.

The important features of the forest policy resolution of 1952 are as follows:

- a) In order to achieve self-sufficiency, forest earnings should be increased at a higher rate.
- b) It lays stress on evolving a system of balanced and complementary land use.
- c) It emphasizes the need for establishing tree lands for the amelioration of physical and climatic conditions.
- d) It provides for progressively increasing the areas of grazing, timber for agricultural implements and firewood to release cattle dung for use as manure.
- e) It proposes the classification of forests on a functional basis.
- f) It recognizes the importance of forests in the development of a balanced economy and reiterates that an adequate share of land be earmarked for the growth of forests.
- g) It lays stress on evolving appropriate policies and measures to encourage the development of forests with a view to developing agriculture, forest based industries and increasing the land under them to step up the export of forest commodities.

The National Forest Policy, 1952, rightly emphasized optimum use of forest land. Optimum use consisted of balanced and complementary use of forest resources. It required detailed survey, continuous planning and careful execution. Special attention was paid on promotion of protective forests as they play a vital role in checking soil erosion, conserving moisture, controlling floods and sand dunes, and promoting physical and climatic balance of the country. The policy also emphasized on the expansion of tree cover in land owned by government, public as well as by private agencies.

B. National Forest Policy, 1988

Indian Forestry, which was previously in the “State List” was included in the ‘Concurrent List’ after the 42nd amendment of the Indian Constitution in 1976. As a matter of fact, the amendments necessitated the formulation of the second National Forest Policy, so that the Union Government might adopt more assertive role for the promotion of forestry sector. Also there had been profound changes in the Indian economy between 1952 and 1988, which adversely affected environmental stability as well as ecological balance including atmospheric equilibrium of India. The second national forest policy was enunciated in December 1988.

The basic objectives the National Forest Policy, 1988 are:

- i) Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country.
- ii) Conservation of the natural heritage of the country by preserving natural forests with vast variety of flora and fauna, which represent the remarkable biological diversity and genetic resources of the country.
- iii) Control of soil erosion and denudation in the catchments of rivers, lakes and reservoirs in the interest of soil and water conservation, for mitigating floods and droughts and for the retardation of siltation of reservoirs.
- iv) Increase in the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands.
- v) Meeting the requirements of fuelwood, fodder, minor forest produce and small timber of the rural and tribal populations.
- vi) Increase in the productivity of forests to meet essential national needs.
- vii) Efficient utilization of forest produce and maximizing substitution of wood.
- viii) Creation of people’s movement with the involvement of women, for achieving these objectives and to minimize pressure on existing forests.

The policy laid emphasis on i) protection of existing forests and forest land; ii) increasing forest and vegetation cover on hill slopes, in catchments of rivers, lakes and reservoirs and ocean shores and on semi-arid, arid and desert tracts; iii) discouraging diversion of good and productive agricultural lands to forestry in view of the need for increased food production; iv) encourage planting of trees alongside roads, railway lines, rivers and streams, canals, and on other unutilized lands under State/corporate, institutional or private ownership; and v) raising green belts in urban/industrial areas as well as in arid tracts. The national goal was to have minimum of one-third of the total land area under forest or tree cover. In the hills and in mountainous regions, the aim was to maintain two-third of the area under such cover in order to prevent soil erosion and land degradation and to ensure the stability of the fragile eco-system. A massive need-based and time-bound programme of afforestation and tree planting, with particular emphasis on fuelwood and fodder development, on all degraded and denuded lands in the country, whether forest or non-forest land, was the national

imperative. Diversion of forest land for any non-forest purpose was subject to the most careful examinations by specialists from the standpoint of social and environmental costs and benefits. Projects like construction of dams and reservoirs, mining, industrial development and expansion of agriculture, etc. which involve diversion of forest land were required to at least provide funds in their investment budget for regeneration/compensatory afforestation.

7.4 CHANGING NATURE OF FORESTY IN INDIA

Forests have acquired increasing importance in the recent past not only for their social and economic benefits but also for the ecological and environmental functions. Accurate and updated information on forest resources thus have gained relevance. In a country like India where forests are rich and diverse, collection and compilation of information on forest covers, growing stock, annual increment, species composition, biodiversity, non timber forest produce, etc. is a daunting task. Initially, those areas were considered as forest lands which are statutorily notified as forest though may not necessarily bear forest cover. The broad categories of such legal status of forest area are *reserved*, *protected* and *unclassed* forests. These are owned and managed by the Forest Departments. With the advancement of technology, forest cover of the country was assessed using remote sensing technology of visual interpretation technique through satellites. The Forest Survey of India (FSI) did the first exercise with 1981 to 1983 as data period and the report was published in 1987. Since then, forest cover is being assessed biennially by the FSI.

The forest cover of the country is broadly classified into three classes, namely *dense forest*, *open forest* and *mangroves*. All lands with tree cover of canopy density of 40% and above are called dense forests. On the other hand, all lands with tree cover of canopy density between 10 and 40 per cent are called open forests. The salt tolerant forest ecosystems, found mainly in tropical and sub tropical inter-tidal regions, are known as mangroves. As per the latest survey, India has 63.73 million hectare of forest cover constituting 19.3 per cent of the geographic area, out of which 37.74 million ha (11.48%) is dense forest, 25.50 million ha (7.76%) open forest and 0.49 million ha (0.15%) mangroves. Madhya Pradesh accounts for the largest forest cover of the country, i.e., 20.68% followed by Arunachal Pradesh (10.80%), Orissa (7.38%), Maharashtra (7.32%) and Andhra Pradesh (6.94%). The seven Northeastern states taken together have 25.70% of the total forest cover in the country.

In Table 7.3 we present the changes in area under forest cover since the beginning of the First Five Year Plan. You can see from the table that the average annual loss of forest cover has been very little during the past couple of decades and there has been an increase in forest cover off late. The credit for this goes mainly to regeneration of forestry through social forestry measures, conservation of forest resources, and more importantly, people's awareness of the need for conservation and participation in regeneration of forest cover.

During the beginning of planning era in India, commercial aspect was predominant under forestry plantations. The aim was to supply raw materials to forest based industries, which ultimately would strengthen the industrial base of Indian economy. Later on stress was also laid on growing fuelwood, small timber for farm implements and house construction, cottage industries, etc. under *social forestry* programmes in order to release the pressure from natural woods. The oil crisis in the early 1970s concentrated more attention on regeneration of renewable energy resources like forests/firewood. The National Commission on Agriculture also gave emphasis on tree cropping and urged for concerted efforts by the government, the people and the banking industry in this respect. The National Forest Policy, 1988, envisages massive afforestation and social forestry programmes on all denuded, degraded and unproductive

lands to achieve the target of bringing one third of national geographic area, i.e., about 110 million hectare land under forest cover. This implies that approximately, 30 million hectares of non-forest wastelands are to be brought under tree cover. This could be possible only by promoting farm-forestry, community forestry and agro-forestry by government agencies, NGOs and individuals. The National Wasteland Development Board designed special programmes and schemes for this purpose. The National Afforestation and Eco-development Board (NAEB), created in July 1992, also promoted various schemes to enhance the forest cover. We will discuss these programmes below.

Table 7.3
Forest Cover in India

Data period	Forest cover (million ha.)	Percentage to geographic area	Average Annual change in forest area
1951-52#	73.4	22.33	
1961-62#	69.0	20.99	- 0.44
1975-76#	74.7	22.73	- 0.29
1981-82#	74.7	22.73	0.00
1981-83*	64.08	19.49	
1985-87*	63.88	19.43	-0.05
1987-89*	63.93	19.45	0.03
1989-91*	63.93	19.45	-0.001
1991-93*	63.89	19.45	-0.025
1993-95*	63.34	19.27	-0.27
1996-98*	63.73	19.39	0.13

Recorded forest area : All lands statutorily notified as forest though they may not necessarily bear tree cover.

* **Forest cover** : All lands with a tree canopy density of more than 10 per cent though they may not be statutorily notified as forest area.

7.4.1 Integrated Afforestation and Eco-Development Projects (IAEPS) Scheme

This scheme is intended to promote afforestation and development of degraded forests by adopting an integrated watershed-based approach. This 100% Centrally Sponsored Scheme envisages micro-plan preparation by a multi-disciplinary team in consultation with the local people. During the Eighth Plan period under this scheme an area of about 2,89,917 ha. was covered with a total expenditure of Rs. 203.12 crore.

7.4.2 Fuelwood and Fodder Project Scheme

This scheme is meant for augmenting the production of fuelwood and fodder in 229 identified fuelwood deficient districts of the country to meet the needs of the communities. The cost of raising the plantations of fuelwood and fodder is shared equally between the Central and the State Governments. Under this scheme an area of about 3,87,216 ha. was covered with a total expenditure (central assistance component) of Rs.154.19 crore during the Eighth Plan period.

7.4.3 Non-Timber Forest Produce Scheme

The scheme provides for financial assistance to state governments for increasing the production of non-timber forest produce (NTFP), including medicinal plants by raising plantations. This 100% Centrally Sponsored Scheme has a focus on creation of NTFP plantation assets in tribal areas. During the Eighth Plan period an area of about 1,06,170 ha. was covered with a total expenditure of Rs. 56.47 crore under this scheme.

7.4.4 Grants-in-Aid Scheme

Promotion of people's participation in afforestation activities is a mandate of the NAEB. Under this scheme, non-governmental organizations (NGOs) are assisted financially for taking up afforestation and tree planting in public and private wastelands adjoining forest areas and building upon people's movement for afforestation. A total of 338 projects were sanctioned and Rs. 7.51 crore was released to voluntary agencies during Eighth Plan period.

7.4.5 Seed Development Scheme

Developing facilities for collection, testing, certification, storage and use of quality seeds for afforestation purposes is the aim of this scheme. The scheme also aims at establishing seed certification protocol in the long run, which would ultimately increase the productivity of forests. Under this scheme a total amount of Rs. 7.80 crore was released to States/UTs during Eighth Plan period.

7.4.6 Afforestation under 20-Point Programme

NAEB, in the Ministry of Environment and Forests, is the nodal agency for fixing targets and monitoring the achievements for afforestation and tree planting activities under point 16 of the 20-Point Programme. During the Eighth Plan period under 16 (a) (Seedling distribution) 501.07 million seedlings were distributed and under 16 (b) (area coverage) 4.56 million ha. of area was afforested bringing the total national area covered under afforestation to 7.03 million ha.

7.4.7 National Afforestation Programme

To improve upon the afforestation in India, the Ministry of Environment and Forests has decided to merge all the existing schemes, viz., Integrated Afforestation and Eco-Development Projects Scheme (IAEPS), Area Oriented Fuelwood and Fodder Projects Scheme (AOFFPS), Conservation and Development of Non-Timber Forest Produce, including Medicinal Plants (NTFPS), and Association of Scheduled Tribes and Rural Poor in Regeneration of Degraded Forests (ASTRP) into one - National Afforestation Programme. The dovetailing of the programmes is expected to reduce multiplicity and ensure better percolation of the benefits. The restructured programme is proposed to be implemented through a two-tier set-up comprising Forest Development Agencies (FDAs) and Joint Forest Management Committees (JFMCs) during the Tenth Five Year Plan.

Check Your Progress 2

- 1) What are the basic elements considered in a forest policy?

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2) What are the basic objectives of the National Forest Policy,1988?

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3) Distinguish between *forest land* and *forest cover*.

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7.5 JOINT FOREST MANAGEMENT

Social forestry programmes were very effective during the early 1980s. However, they lost the vigour during the later part of the decade. People’s participation in enacting the forest promotion schemes was felt more necessary. Although the National Forest Policy, 1988, redefined the objectives of forest management, it did not envisage any direct role for the people in day-to-day management of forests. It implicitly believed that government, alone should control forests, with changed objectives. The arguments in favor of management of forests by government are:

- 1) Forest management is associated with a wider range of externalities, as these provide external benefits to the rest of the ecosystem.
- 2) Forest department operatives have often argued that the management of forests requires a level of professional training and scientific competence that is outside the capacities of peasants and forest users.
- 3) The time horizons of forest management would favor public ownership and public investment.
- 4) It will allow major economies of scale and a long-term planning framework.

The strong case for exclusive government management of forests is weakened because government mechanism alone is not in a position today to enforce its property rights on forests. Forests are subject to intense pressure from human, livestock and urban markets. Over-exploitation of forests by people, which has increased in the last few decades, is caused by several factors. These are:

- 1) Increasing marginalisation of small landowners has forced them to seek new avenues of income like head loading.
- 2) As village commons deteriorated, villagers turned to government forests as substitutes.
- 3) Government policies raising commercial plantations further restricted the people from the forest resource. The orientation of forest lands from the people who

need it for satisfaction of their needs, and consequently forestry turning into open access lands has been one of the main causes of degradation.

Realizing these realities, the Government of India introduced the participation of people in managing forests by issuing a Joint Forest Management (JFM) resolution in June 1990. It encouraged the forest departments to involve people in the management of forests. The resolution specifies the rights of the protecting communities over forest land. Those protecting forests are to be given usufructs like grasses, lops and tops of branches, non-timber forest produce and a portion of the proceeds from the sale of trees when they mature. (This varies from 20-60% of timber sold.) The order exhorts the state forest departments to take full advantage of the expertise of committed voluntary agencies for building up meaningful people's participation in protection and development of degraded forest land. According to JFM philosophy, the forest people interaction was conceptualized to harmonize the interest of people and long-term sustainability in a mutually supporting manner.

The JFM programme has now become the central point of future forest development projects funded by the Government of India and donor agencies like World Bank, SIDA and DFID. As many as 25 states in India have started practicing Joint Forest Management and about 36,130 forest protection committees are managing a total of 10.25 million hectare of forest land. The involvement of local communities in JFM is the maximum in the states of Madhya Pradesh, Bihar, West Bengal and Orissa.

7.6 FOREST AGRICULTURE INTERLINKAGES

The term agriculture has a wider meaning which includes cultivation of crops, livestock breeding, fishing, forestry, dairy and poultry farming, etc. In this context, the agricultural land use refers to the land used for production purposes, which has a spatial dimension. When loss of forests was felt through i) loss of biodiversity; ii) ecological imbalance; and iii) environmental hazards the necessity for restoring forest wealth and green cover on the earth was utterly felt. Forestry started to be practiced as a form of agriculture in i) non-forest lands; ii) village commons; and iii) private lands even interfacing with agriculture. The philosophy of forests has changed its colour from natural regeneration to manmade commercial cultivation of tree crops. Forestry is complementary to agriculture: (i) ecologically by way of regulation of soil, soil nutrient, water and microclimate, and (ii) economically through efficient utilization of the underemployed rural and tribal human power. Both forestry and agriculture are interlinked in many a way. Forestry agriculture interlinkages can be studied on the basis of their interface in land use, human ecosystem and ecological ecosystem (see Fig. 7.1).

7.6.1 Land Use Pattern

Land is the primary requirement for both forestry as well as agriculture. Under classical forestry, land under forest cover was cleared for agricultural practices. To say otherwise, forestry has given way for agricultural expansion. Under community forestry, tree crops are grown in non-forest areas and farmlands. In other words, agriculture has given room for forestry along with other farm practices. A range of agro-forestry possibilities exists in which trees, crops and livestock are grown symbiotically, each benefiting the other. Where agriculture and forestry are combined, the practice is called *agrosilviculture*. On the other hand, *silvipastoral* systems involve the combination of forestry and livestock and *agrosilvipastoral* systems are the combination of agriculture, forestry and livestock. All the agro-forestry land management systems aim at i) conservation of ecology, ii) optimization of land use with intentions to produce desired commodities, iii) protection from damages from external agencies like wind and running ground water, and iv) improvement of the site.

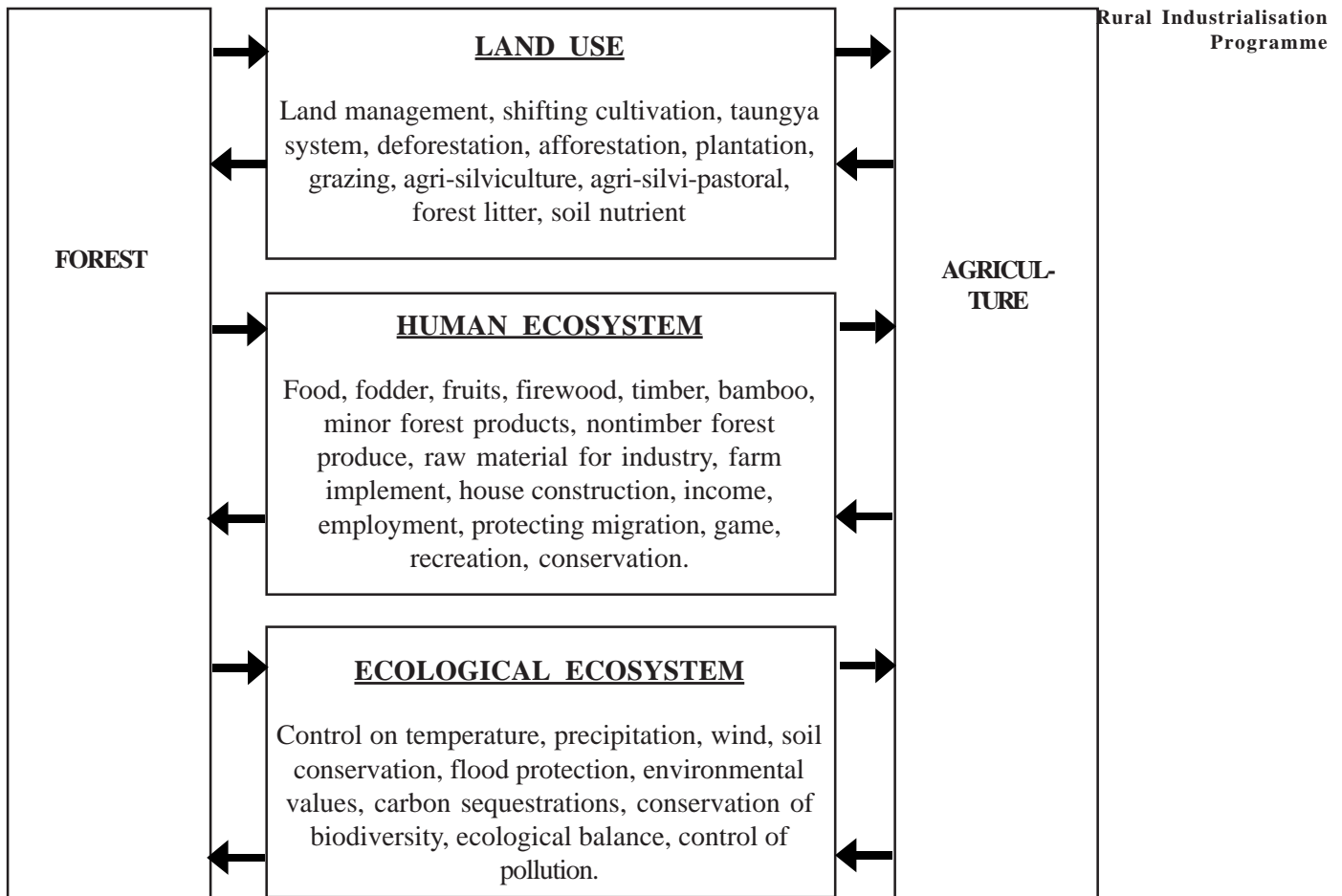


Fig. 7.1: Forest & Agriculture Inter-linkages

a) *Shifting Cultivation*

Shifting cultivation is the oldest form of agro-silviculture. It is a *slash and burn* farming technique in which an area of forest is felled and burned, and crops grown in a primitive way on the cleared land for two or three years. Thereafter, forest is allowed to return on the discarded land over a fallow period of 10-15 years, during which soil fertility is restored, before it is cut again for practicing shifting cultivation. It is one of the most primitive form of farming agricultural crops. It is believed to have originated in the Neolithic period around 7000 BC and still extensively practiced by the tribes in forest areas. It is commonly known as ‘Milpa’ in Central America, ‘Zande’ in Africa, ‘Chena’ in Ceylone, ‘Kaigin’ in the Philippines, ‘Tsembaga’ in the Papua New Guinea. In India it is known as ‘Jhum’ in Assam, ‘Adiabik’ in Arunachal Pradesh, ‘Hooknismog’ in Tripura and ‘Podu’ in Orissa. The yield under shifting cultivation is generally very low. This does not help the tribes in getting adequate returns from the land. Instead it causes irreparable damage to the valuable forest wealth.

b) *Taungya System*

Taungya is another form of agro-silvicultural land management system, which is mainly practiced in forest land. This practice was developed in Burma with a view to raise forest plantations virtually free of cost. In India also the practice has retained the name and is being practiced in states like Uttar Pradesh, Madhya Pradesh and Kerala. Under this practice, the forest land, after clear felling, is leased to a prospective farmer who is given all the facilities to stay on the farm and cultivate the clear felled area for a year before he is asked to raise forest plantations in a specific design as approved by the forest department. Because of the stored fertility the farmer harvests bumper crop for the first year, which is an attraction for the *taungyadar*. In the

second year he carries out forest plantations along the lines as directed by the forest department and continues to cultivate in between the plantation lines. In most of the cases the cultivation is continued for a period of one or two years after planting trees because thereafter the plants suppress the agricultural crop. Thereafter, the taungyadar shifts to another adjacent patch of clear felled forest land for carrying out similar operations. The system of management is so designed as to permit continuity of work.

In some of the states, this practice has now been given up. The main reason is that the taungyadars neglect tree planting and concentrate mainly on agriculture and later on refuse to leave the area. This practice has done a lot of harm to the forest preservation in some of the states in the country.

c) Social Forestry

Social forestry is a potential approach to minimize unsustainable withdrawals from forests by way of producing fuel wood, fodder and timber in conjunction with agricultural crops on non-forest land. The concept of social forestry was introduced in India by the National Commission on Agriculture in 1976 although it was in vogue in different forms and different contents for a long time. The Forest Department defines social forestry as growing of trees on lands not held by the Forest Department. The basic objective behind this approach is to develop fuel-food-fodder production system on uncultivable land such that this would meet the needs of rural population for small timber, fuel and fodder; and also could minimize the pressure on forests. Social forestry can be practiced along canals, railway lines, roadsides, village common lands, village approach roads, camping grounds, school yards, community buildings, etc. Social forestry covers farm forestry, extension forestry, agro forestry, afforestation, recreation forestry, etc. The forms of social forestry along with their subdivisions have been explained in Fig. 7.2.

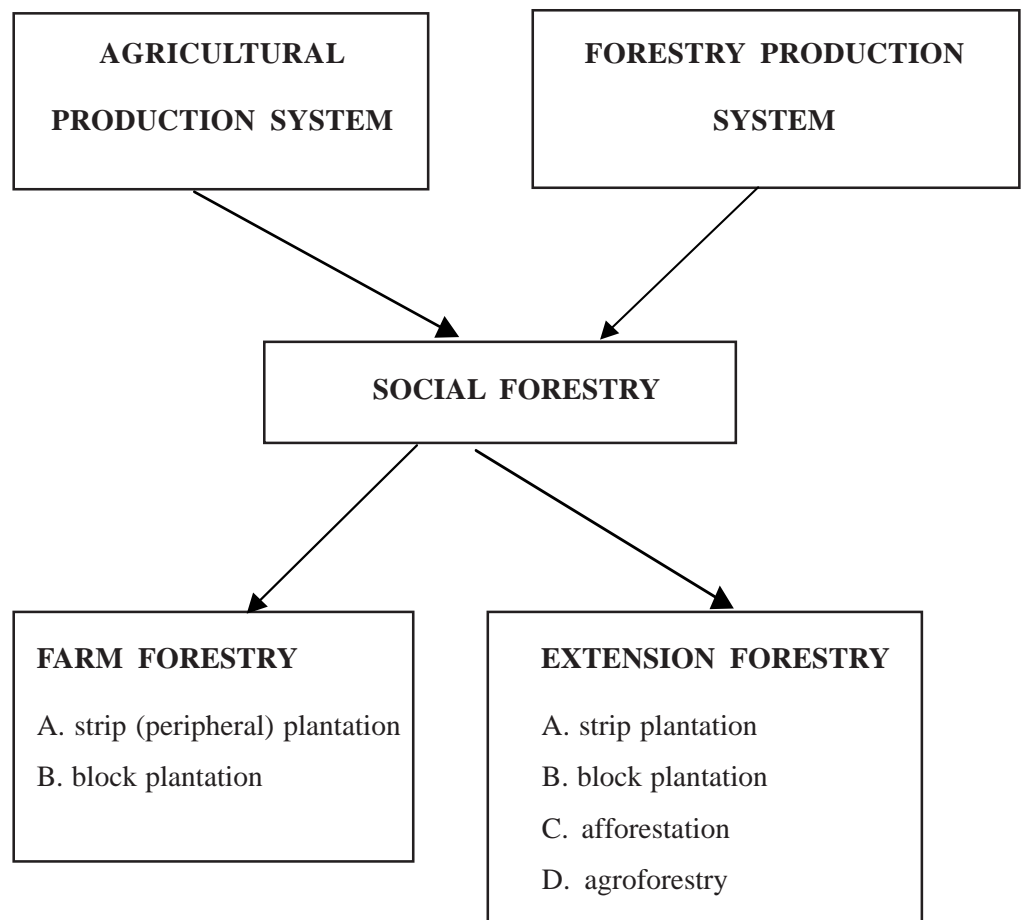


Fig. 7.2 : Social Forestry

The broad objectives of social forestry are as follows:

- i) Fuel wood supply to rural areas and replacement of cow dung, which may be better used as manure;
- ii) Small timber supply for rural housing and agricultural implements;
- iii) Provide timber for construction, etc.
- iv) Provide green fodder to the livestock and green manures to enrich soil fertility;
- v) Protect agricultural fields against wind and wild animals; and
- vi) Meet the recreational needs of the rural population.

d) ***Farm Forestry***

Practice of forestry in farms or village lands with integration of other farm operations is known as farm forestry. Farm forestry is one of the major forestry initiatives in recent times. In common usage, it refers to growing trees by individual farmers on their farmland, usually as cash crops. This is accomplished by relatively resource rich farmers, through commercial production using high level inputs, better technical package and short duration species. On the contrary, the low input approach to farm forestry is for relatively resource-poor farmers with the objective of obtaining small yet attractive returns with minimal additional investment. The beginning of farm forestry in India was made in the states of Tamil Nadu and Gujarat in the early 1970s. Later on it was extended to other parts of the country.

Peripheral Plantation : It consists of plantations of one or two lines of trees along the field boundaries in all or some sides. Peripheral plantation has many advantages: i) it does not occupy much space, ii) does not demand management skills, iii) provides supplementary income, and iv) it is a resource to meet petty but urgent needs of the farmer. Plant species like *eucalyptus*, *acacia catechu* (khair), *poplar*, *moringa olifera*, etc. are generally preferred for peripheral plantation.

Block Plantation : It is the most widely practiced design of tree planting on farms. Under this system, the farmers plant tree species as a crop on their land. Though all groups of farmers practice this system it is generally preferred by the large farmers as they have relatively high land holdings. The high cost of cultivation and long gestation period also act as hindrances for the small and medium farmers to adopt block plantation on large scale.

e) ***Extension Forestry***

Extension forestry refers to growing mixed forestry comprising raising of grass and leaf fodder, fruit trees on suitable wastelands, panchayat lands and village commons. Afforestation of degraded forest land and raising of plantations of quick growing species on sides of roads, railway lines, canal and river banks, etc. also form part of extension forestry. These activities are mainly conducted by the government departments, NGOs, village communities, etc. with financial support from government sources as well as external funding agencies.

f) ***Strip plantation***

Plantation of trees on strips or lines is the simple explanation of strip plantation. There are five types of strip plantation currently followed in India. These are roadside plantations, rail side plantations, canal-bank plantations, river-bank plantations and foreshore plantations. The basic objectives behind adopting strip plantation are to:

- provide shade to travelers
- enhance aesthetic values of roads, rail lines, canal banks, etc.
- augment supply of fuelwood and fodder

- make use of unutilized land on both sides of the road, rail lines, canals, etc. for productive purposes
- generate employment and contribution to the state revenue
- maintain ecological balance and green house effect.

g) *Agro Forestry*

Growing trees in agriculture is the simple explanation for agro-forestry but the basic concept is entirely different. Agro forestry system is a blend of the forest ecosystem and the agricultural system. It is a land use system, which enables the farmer to produce food and wood and at the same time conserve the ecosystem. Agro forestry is an approach to combine both agriculture and forestry that allows tree-crop interface in the same plot of land. This is a concept of multiple or mixed cropping pattern. In tropical countries like India, agro-forestry has special relevance for its capacity to control soil erosion, enriching soil nutrient and fertility through litter fall, etc. In agroforestry one of the major considerations is to identify species that are compatible with the soil, agro-climatic and crop conditions. Due importance is always given to those species which improve the productivity of the site under agroforestry system.

7.6.2 Forest in Human Ecosystem

Since time immemorial forests have been an integral part of human ecosystem. It is nature's greatest bounty to the humankind. Human civilization was largely dependant on forests for food and shelter. Forests have been serving as the life supporting system for human being since the beginning of life on earth. With the advancement of agriculture, industrial development and urbanization, people though moved away from the forest related economic activities, their dependence on forest resources is still discernible. Even today in the developing countries like India large section of rural population, particularly tribes and those living on the fringes of forests, live in a forest based subsistence economy and depend on forests for meeting their various day to day needs.

Forests confer a host of direct and indirect benefits to human beings. It is the abode for tribes and people living in the fringes of forests. Nevertheless, forests provide food, fodder, fruits, nuts for sustaining life for many. Timber, bamboo and other wood are extensively used for construction of house and household goods as well as agricultural implements in agro-based rural economy. Firewood still constitutes the largest source of fuel for cooking and heating in rural areas. The minor forest products (MFPs) and other non-timber forest products (NTFPs) extend food and income support for farm labourers. Agriculture is a seasonal activity in most parts of the country. Distribution of land resources is also quite unfavourable to a large section of population as most of them are landless labourers or marginal landholders. The landless labourers and marginal as well as small farmers largely depend on forest resources. Forests support them with off-season employment opportunities by way of collecting MFPs, NTFPs; and through plantation and other forest developmental activities undertaken by Forest Departments. This in turn stops migration of farm labour to urban centers.

7.6.3 Ecological Ecosystem

Forests serve as a part of the climatic system and sustainable biodiversity. Forests have a vital role to play in i) reducing global warming, ii) balancing oxygen and carbon dioxide ratio, iii) increasing precipitation, iv) reducing local temperature, and v) moderating climatic extremes. The role of forests in retarding the water run-off, distributing rainfall, preventing soil erosion, reducing wind damage and safeguarding water supplies is often valued more than their output of wood. Forests sustain the ecological balance. The microclimate of an area mostly depends on topography and

vegetation within broad limits, established by forests. They exercise a positive influence on the ecological parameters. This influence increases with the increase in the density of the forests and the foliage. Forests i) discipline the rivers, ii) control the floods, iii) maintain the springs, iv) prevent erosion by water and wind, and v) keep the air cool and clean. In recent times the ecological relevance of natural wilderness has surpassed the economic significance of forests.

Check Your Progress 3

- 1) Fill in the blanks.
 - a) The Government of India introduced the Joint Forest Management Resolution in
(June 1990, July 1982, September 1988)
 - b) The Forest Protecting Committees under JFM enjoy the right over
(cutting and selling of trees, usufructs selling of forest land)
 - c) Shifting cultivation is a farming system.
(slash and burn, hit and run)
- 2) Write short notes on:
 - a) Farm Forestry
 - b) Strip Plantation
 - c) Agrosilvipastoral System
 - d) Ecological relevance of forests.

7.7 LET US SUM UP

Forests play a crucial role in the socio economic life of the millions who live in a forest and rural based subsistence economy in India. Forests not only provide fuel wood, timber, fodder, etc. but also are the life supporting system and abode for the tribes and rural mass living within and fringes of forests. This sector encompasses about one quarter of the geographic area of the country. However, management of forests have been very poor during the past few decades. Forests in India were cleared for augmenting agricultural land and developmental needs like construction of roads and dams.

The pressure on forests has been beyond its carrying capacity. It has been thus the concern of the development planners to make productive use of the wastelands and other forest as well as non-forest land such that it would not only regenerate forest cover but also earn income and employment to the local people in addition to revenue to the government. It would also support restoring the ecological balance and minimize the pressure on natural forests. Efforts were initiated with laying down forest policies for sustainable management of natural forests and generation of manmade forests. During the early years of planning in India, commercial aspect was predominant under forestry plantations. The aim was to supply raw materials to forest based industries, which ultimately would strengthen the industrial base of the Indian economy. Later on stress was also laid on growing fuel wood, small timber for farm implements and house construction, etc. under *social forestry* programmes. The National Commission on Agriculture also gave emphasis on tree cropping and urged for concerted efforts by the government, the people and the banking industry. People's participation on large scale in Joint Forest Management and other social forestry practices has minimized the felling of natural forests and has helped regeneration of forest cover towards sustainable forest development.

7.8 KEY WORDS

- Agrisilviculture** : It is a land management system where plantation of tree crops and agriculture are practiced simultaneously on the same plot of land. Thus, this system represents a combined production system of wood and agricultural crops.
- Agrosilvipastoral** : It is a three dimensional production system designed for the concurrent production of agricultural crops, forest crops and fodder for rearing of domesticated animals on the same plot of land.
- Bio-diversity** : It entails all forms of biological entities inhabiting the earth including all varieties of plants, animals, birds, micro and macro organisms, and even genetic materials like seed and germplasms.
- Ecological balance** : It is the optimum combination of animate (biotic: plant and animal kingdom, human) and inanimate (abiotic: climatic, edaphic, hydrographic, physiographic) environmental factors which determine the process of living organism and their distribution on the earth.
- Externalities** : These are the gains and losses sustained by others as a result of action initiated by producers or consumers or both for which no compensation is paid. These are some times called third party effects, neighbourhood effects or spillovers. Examples: soil erosion, climatic changes, etc. are externalities resulting from clearing of forests.
- NTFPs** : (Non-Timber Forest Products) refer to all forest products excluding timber products like poles, log, veneer, etc. NTFPs include bamboo, leaves, fruits, roots, and other minor forest products.
- Silvipastoral** : It refers to the land management system in which tree crops are managed for the production of wood as well as for the rearing of domesticated animals. In this system, the animals are kept and permitted to graze within the forests. Thus, this system represents a combined production system in which wood and animals are raised.
- Soil erosion** : It refers to loss of topsoil of a land surface. Wind and running ground water are the chief agents of soil erosion. Loss of vegetation cover (deforestation) causes rapid erosion of topsoil.
- Village commons** : It refers to land areas where a community or all the villagers have exclusive rights on use and access without ownership rights. Examples: Panchayat lands, pasturelands, etc.

7.9 SOME USEFUL BOOKS

- Agrawal, V. P., 1998, *Forests in India*, Oxford & IBH Publishing Co., New Delhi.
- Desai, V., 1991, *Forest Management in India – Issues and Problems*, Himalaya Publishing House, Delhi
- Jha, L. K., 1994 , *India's Forest Policies*, Ashish Publishing House, New Delhi
- Jha, L.K. and P. P. Sen, 1991, *Social Forestry*, Himalaya Publishing House, New Delhi

7.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Please see Section 7.1
- 2) Please see Sub-section 7.2.2
- 3) (i) Concurrent list, (ii) man-made, (iii) one quarter, (iv) Nilambur

Check Your Progress 2

- 1) Please see Section 7.3
- 2) Please see Sub-section 7.3.3
- 3) Please see Section 7.4

Check Your Progress 3

- 1) (a) June 1990, (b) usufructs, (c) slash and burn
- 2) (a) Please see Sub-section 7.6.5, (b) Please see Sub-section 7.6.7, (c) Please see Section 7.6.1, (d) Please see Section 7.8

UNIT 8 RURAL INDUSTRIALISATION PROGRAMME

Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Nature of Rural Industries
- 8.3 Role of Rural Industries
- 8.4 Rural Artisans
 - 8.4.1 Main Features of Rural Artisans
 - 8.4.2 Problems of Artisans
- 8.5 Khadi and Village Industries
- 8.6 Agro-based and Agro-processing Industries
 - 8.6.1 Definition of Agro-based Industries
 - 8.6.2 Distinctive Features of Agro-based Industries
 - 8.6.3 Prospects of Agro-processing Industry
- 8.7 Problems Faced by Rural Industries in India
- 8.8 Government Measures of Assistance
- 8.9 Impact of Government Policy
- 8.10 Suggestions for Rural Industrial Policy
- 8.11 Let Us Sum Up
- 8.12 Key Words
- 8.13 Some Useful Books
- 8.14 Answers/Hints to Check Your Progress Exercises

8.0 OBJECTIVES

After studying this Unit you should be able to:

- identify the nature and characteristics of rural industry;
- appreciate the role of rural industry in India's economic development;
- explain the problems faced by rural artisans;
- identify the role of the Khadi and Village Industries Commission;
- identify the distinctive features of agro-based industries; and
- explain the role of the government in rural industrialisation programme.

8.1 INTRODUCTION

Animal husbandry, dairy farming, poultry farming, fisheries, and forestry constitute the allied activity sector of crop farming. In the preceding two Units we have examined different aspects of the allied activity sector. Along with allied activities, the development of rural industries including agro-processing activities is essential for development of agriculture itself, particularly when 75 per cent of the operational holdings are of an average size of 1 hectare. Consequently, majority of the cultivators require supplemental income to rise above the poverty level. Rural industries serve as a good alternative to agricultural income. We will examine the nature, character and present state of rural industrialisation in this Unit.

8.2 NATURE OF RURAL INDUSTRIES

Rural industries embrace all industries which are run by rural people in or near their homes as a spare-time or whole-time occupation. These are based primarily on the

utilisation of locally available raw materials, skill and small amounts of capital. Many of the rural industries are operated as a traditional profession.

Rural industries can be broadly classified into three groups, viz., (1) cottage industries, (2) agro-based industries, and (3) small industries.

- 1) **Cottage industries:** These are generally associated with agriculture as a part-time or whole-time occupation in rural and semi-urban areas.
- 2) **Agro-based, agro-processing industries:** These industries are based on the processing of agricultural produce, or are linked to the input needs of agriculturists. Rural agro-based industries are generally organised either on cottage or on a small-scale basis.
- 3) **Small-scale industries:** These industries are owned by persons with enough means for their own subsistence, though not always sufficient to run the industrial units on a profitable level. Small industries are distinguished from large industries by including under the former those industrial units which employ capital valued at less than Rs.1 crore. Most of the small industries situated in the rural areas are what can be identified as 'tiny' industries. In official jargon, these are those units that employ a capital of less than Rs.25 lakh.

8.3 ROLE OF RURAL INDUSTRIES

Rural industries have a crucial role to play in the rural economy of India, as would be clear from the brief description given below:

- 1) **Employment potential:** These industries provide the maximum employment per unit of capital invested; the labour-capital ratio in these industries is higher than in large-scale industries. In a country where labour is surplus and capital scarce, it is only to be expected that the production process should be decentralised and should be divided into smaller units.
- 2) **Local availability of raw materials:** Most of the raw materials required by these industries are available in the rural areas. If the production process can be carried to the villages, transportation expenses will be minimum. Also, in the rural areas many of the resources still remain unexploited, by establishing these industries, such resources will be utilised.
- 3) **Economic equality:** These industries, by increasing employment among the rural masses, lead to an increase in their purchasing power which at present to a large extent is confined only to urban areas. The decentralised structure can pave the way for an equitable society.
- 4) **Problem of agricultural labourers:** These industries can solve the problem of landless agricultural labourers by providing employment to them at their own places during the on-season in the form of off-farm employment and during off-season in the form of whole-time job. This would create, on the one hand, employment opportunities for the unemployed and the underemployed agricultural workers and on the other it would supplement the meagre income of the rural population.
- 5) **Mobilisation of savings:** Savings of people remain idle because of lack of proper financial institutions in villages. On the contrary, these are frittered away in unproductive consumption and unnecessary litigation. These can be invested in productive channels if rural industries are established.

- 6) **Improvement in the standard of living:** Indian villages have so far remained very backward. These industries will raise the standard of rural masses by the following processes: (i) by providing employment to rural workers in their own homes; (ii) by offering consumer goods at comparatively cheaper rates; and (iii) by encouraging the construction of social and economic overhead capital such as roads, and electricity supply, and establishment of educational and financing institutions, etc. In this way, these industries are helpful in the all-round development of our villages and thereby of the masses of the entire country.
- 7) **Other advantages:** These industries will save us from many evil effects of industrialisation such as pollution, over-urbanisation and associated evils of urban life.

These advantages of decentralised rural industries had been recognised as early as in the Industrial Policy Resolution of 1948, and have been reiterated in every subsequent policy statement.

Check Your Progress 1

- 1) What is a village industry?

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- 2) Examine the importance of village industries in the rural economy of India.

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8.4 RURAL ARTISANS

The population of rural artisans in India has been estimated at about 85 million. Rural artisans are found in traditional activities such as carpentry, goldsmith, weaving and masonry as well as in activities adjunct to modern mechanical electrical industry such as radio repair work, welding, automobile repair work and so on. Most of the artisans produce goods for household use. In a number of cases, these goods are of high aesthetic quality. As new skills are acquired, they may also perform certain functions approximating the servicing and maintenance of durable consumer goods. Encouragement to this class of producers results in important benefits to the economy in the form of additional output and employment.

8.4.1 Main Features of Rural Artisans

The main features of rural artisans are :

- i) One of the main features of rural artisans is that their operations involve hardly any large-scale mechanised application.
- ii) They attend to work personally.
- iii) They do not generally hire any labourer outside their families for helping them in their business.
- iv) They usually cater to customers of given tastes and preference and with some exceptions to markets of limited size.
- v) They generally do not work in any fixed premises (workshops, etc.).
- vi) Their scale of operations mainly hinges upon the availability of raw materials. It is a normal practice with small artisans to purchase raw materials with the help of the sale proceeds of their products of the earlier round of production. Otherwise, at times, they purchase raw material with the help of the money given to them as 'advance' either by customers when placing order for goods or intermediaries who sell the goods of artisans to traders or final consumers and make profits.
- vii) In view of the comparatively low staying power of artisans, availability of funds on reasonable terms is crucial for them to run the normal course of business.

In short, average assets and value-added per unit by rural artisans is very small. A large proportion of those engaged in these pursuits are living below the poverty line.

8.4.2 Problems of Artisans

The major problems of artisans are :

- i) For most artisans, procuring raw materials is fast becoming an uphill task. With the forest resources becoming scarce, the problem is compounded.
- ii) The marketing of the artisans' products leaves much to be desired. It is exploited by a long chain of middlemen who perform little productive functions.
- iii) Artisans, specially the small artisans, have been denied for long an access to institutional sources of credit.

These problems of artisans could have been easily taken care of by a well-organised network of co-operatives. But many co-operatives set up in different states with the avowed purpose of helping artisans have become defunct or are in process of becoming so. Many of the co-operatives have demonstrated poor management skills and lack of dynamism. Similarly, many of them are marred by a marked propensity to function as independent units for individual gain rather than for common benefit. The overwhelming influence wielded by proprietary establishments has also proved detrimental to the co-operative movement.

8.5 KHADI AND VILLAGE INDUSTRIES

Mahatma Gandhi called for the use of khadi in 1920 primarily with a political intent to boycott foreign goods in general and cloth in particular. It was expected to provide an opportunity to every person for self-discipline and self-sacrifice as a part of non-co-operation movement. Since then the conceptual approach and the consequent institutional framework has undergone a series of changes based on the actual experience and experiments. In the process khadi has pervaded the entire socio-economic and political structure of India.

The various facets of Gandhiji's concept of khadi – 'the sum of the whole industrial system' – can be summed up as follows:

- key to Swaraj,
- means of mass education,
- link between people of different classes,
- symbol of dignity and manual labour,
- means for securing more even distribution of means of living,
- check of drain of wealth to foreign countries,
- an occupational therapy for physical illness afflicting the West,
- emblem of non-violence,
- for international peace, and
- an instrument for village reconstruction.

On the institutional plane, the programme was implemented through the trusteeship concept and co-operative endeavour which brought into sharp focus the non-profit making and non-exploitative characteristics. Emphasis on providing living wage was also introduced subsequently.

The above basic concepts of khadi and village industries in the national economy continue to be valid even now. With the launching of five-year plans, probably for the first time, an effort was made to view the difficulties and problems of development of village and small-scale industries from an all India angle and in an integrated manner. The general approach was one of rehabilitating these industries as to provide the rural population with additional employment and opportunities of supplementing their incomes.

Khadi and Village Industries Commission (KVIC)

On the organisational side, the establishment of six All-India Boards was an important step for planned development of village and small-scale industries. They were set up with a view to formulating, guiding and to an extent implementing co-ordinated programme for development of small-scale industries, handloom industries, khadi and village industries, handicrafts, coir and sericulture.

The All India Khadi and Village Industries Board was transformed into the Khadi and Village Industries Commission by an Act of Parliament on April 1, 1957.

The primary functions of the KVIC were generally to plan, organise and implement programme for development of khadi and village industries. The KVIC has a schedule of industries to be promoted by the Commission.

The functions of the KVIC are wide and varied. It keeps a reserve of raw materials and improved implements and supply them at economical rates to the artisans. The objective is to improve the technique of manufacture and quality of the products. Secondly, it provides a suitable organisational base for wider marketing of the artisans' products. The patterns of assistance and institutional framework for implementing the programme, which are mainly done through registered institutions and co-operatives, suit the requirements of and provide work opportunities to the poor families at or near places where they reside.

There has been emphasis on technical improvements in the traditional implements used by the rural artisans to: i) increase their productivity, ii) improve the quality of products, and iii) enhance their earnings without displacing them from their occupation. As a result of intensive laboratory research and field trials, a series of new machines, equipment and implements, power-operated or otherwise have been evolved and are

being introduced on a wider scale to reduce the cost of production, improve the quality of products and hence the productivity and earnings of artisans.

The KVIC has been a pioneering agency in inducting intermediate as well as appropriate technology in the countryside. Six and twelve spindle, new model charkhas, semi-automatic locks, paddy de-huskers, gear shellers and rice polishers, small solvent extraction plants, irrigation pipes, leather goods, manufacture of muslin (finer counts) khadi reviving the memories of “Dacca Muslin”, modern scientific methods of bee keeping, installation of bio-gas plants for providing energy and enriched manure are some of the landmarks in developing and popularising improved technology in different industries under the purview of the KVIC.

Thus, in our country where even after five decades of planned development more than one-fourth of the population are living below the poverty line, the level of employment and earnings provided in the khadi and village industries sector is contributing in a very significant way for bringing this category of persons above the poverty line.

Check Your Progress 2

1) Examine the main features of rural artisans in India.

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2) What are the problems being faced by rural artisans in India?

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3) Examine the importance of khadi and village industries in the rural economy of India.

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8.6 AGRO-BASED AND AGRO-PROCESSING INDUSTRIES

Agro-based and agro-processing industries in rural areas constitute the small-scale industry sector in the rural economy.

These industries provide a crucial link between agricultural and industrial sectors. In recent years, these industries have attracted the attention of economic thinkers, NGOs, policy-makers and the government alike. This is a major development in that it will lead to major initiatives in improving efficiency in various agro-based industries and explore prospects of further growth.

There are numerous activities which belong to the broad group of agro-based industries. These relate to food processing, vegetable oil production, horticultural products, dairy and livestock products, fish and fish products and consumer goods. Each group of the activities comprises a long list of items. For example, food processing alone comprises 29 items or so.

8.6.1 Definition of Agro-based Industries

The agricultural sector provides raw materials to various industries. For example, it provides raw material to sugar industry, textile industry, jute industry, rubber industry, tea, coffee, etc.

Conventionally, an agro-industry is considered as an enterprise that processes agricultural raw materials. The Agricultural Credit Review Committee of the Reserve Bank of India, popularly known as the Khusro Committee defines agro-processing industries as follows:

“Agro-processing industries would be those which use not less than 50 per cent of the raw materials from agriculture and where the value-added as a result of the processing undertaken is not more than 50 per cent of the final value of output.”

The Committee has classified agro-processing industries in to three broad heads:

- Crop production,
- Wood production, and
- Livestock production.

Each of these categories has a number of sub-categories and they are re-grouped into:

- Food processing, and
- Non-food processing.

8.6.2 Distinctive Features of Agro-based Industries

- i) The agro-based industries account for about 39 per cent of all the industries in the factory sector; the proportion of food and non-food industries being 18 per cent and 21 per cent, respectively.
- ii) The agro-based industries have only 11.63 per cent share in total fixed capital. An average agro-based industry has a fixed capital of only Rs.17.7 lakh per factory as compared with Rs.86.2 lakh per non-agro-based industry.
- iii) An agro-based industry on an average has utilised Rs.16.2 lakh by way of working capital per factory as compared with Rs.35.2 lakh by the non-agro based industry.

- iv) The agro-based industries account for 36.46 per cent of the direct employment created by the factory sector; it brings out the labour intensive and capital saving character of these industries.
- v) The number of persons employed per factory in the agro-based industries is only slightly less than the number of labourers employed by a non-agro based industry.
- vi) The agro-based industrial sector accounts for 26 per cent of the total output and 21 per cent of the net value added of the total factory sector. The percentage share of the food and non-food industries is almost equal, i.e., about 13 per cent of the total output produced by the factory sector.
- vii) As compared to agro-based industry, non-agro-based industry needs a little more than three times of capital to generate direct employment for one person, i.e., total capital per employee in the non-agro- based industry is Rs.1.55 lakh as compared with only Rs.48 thousand in the agro-based industry. In a labour surplus and capital scarce economy the policy implications of these capital labour ratios are quite obvious.
- viii) Agro-based industries are relatively more working-capital oriented as indicated by a higher proportion of working-capital in the total capital as compared with non-agro-based industries.
- ix) Capital productivity as measured in terms of net value added per unit of fixed capital in agro-based industries is twice as much when compared with non-agro-based industry. One rupee of capital invested in agro-based industry on an average generates net value added worth 70 paise as compared to only 35 paise in the non-agro-based industries.
- x) Value added per person in the agro-based industry is about 46.8 per cent of the corresponding value for the non-agro-based industries. In terms of average value of output per employee, the agro-based industry is not very far behind the non-agro industry.
- xi) Labour as a factor of production has a larger share in the total value added of agro-based industry even though an average employee in these industries gets lower emoluments compared with those employed in the non-agro-based industries. To the extent a rural labour gets an employment nearer in rural areas, the real worth of the lower emoluments would be certainly larger as compared with the same amount earned outside the rural areas.

8.6.3 Prospects of Agro-Processing Industry

The agro-processing industries assume importance in India from economic development point of view. The developmental value can be understood from their suitability for the generation of income and employment in rural areas particularly for those sections of the rural society whose resource-base is poor.

It is because of this potential that the KVIC has identified 96 activities which can be taken up as village industries. These include the following:

- Processing, packing and marketing of cereals, pulses, spices, condiments, etc.
- Palm gur making and other palm products industry,
- Manufacture of cane gur and khandsari,
- Bee keeping,
- Fruits and vegetable processing, preservation and canning including pickles,
- Ghani oil industry,

- Fibre other than coir,
- Collection of forest plants and fruits for medicinal purposes,
- Processing of maize and ragi,
- Manufacture of pith mats and garlands, etc.,
- Cashew processing, and
- Leaf cup making.

Agro-processing relates essentially to six areas/groups of activities. These are:

- Primary food processing,
- Vegetable oil processing,
- Horticultural products,
- Dairy and livestock products,
- Fish and fish products,
- Consumer goods/processed foods.

Each of these groups comprises a wide range of products, produced through processing.

1) **Primary Food Processing**

Primary food processing by far is the most significant activity among those related to agro-processing. Activities such as rice milling, flour millets and pulse processing form the major components of primary food processing. Among these activities rice milling has expanded significantly. A large number of rice mills have come and rice has now become a major item of export. The demand for Indian basmati rice abroad is stable and, therefore, there is a considerable scope for expanding this activity. Rice milling as an agro-based industry has matured over the years. The systems and procedures for financing installation of rice mills, seasonal working capital requirement and channelising the commodity for exports have been streamlined.

The rice milling community is fairly aware of the guidelines for obtaining credit and meeting export requirements.

The other activities in the group of agro-based industries are relatively less developed.

2) **Vegetable Oil Processing**

Vegetable oil as a medium of cooking has a large domestic demand. Traditionally, groundnut, rapeseed, mustard and coconut have been the major source of vegetable oil.

However, lately two new oilseed crops namely soybean and sunflower have been introduced. Sunflower has been introduced with limited success. Soybean has emerged as a major crop and has given boost to vegetable oil industry.

A notable feature of the growth of vegetable oil industry is the strong tendency among the vegetable oil producers to approach capital market. A large part of credit needs of oil industry, therefore, is being met through capital market. However, expansion of industry in this manner will have its own cascading effects on the demands for agricultural credit. The farmers will require new crop loan limits and also enhancement in the existing credit limits due to rise in prices of fertilisers. As the land holdings of the farmers going in for soybean are relatively large the credit needs would be relatively large. A separate scale of finance for the new regions adopting soybean should be evolved so as to adequately finance farmers going in for soybean and sunflower cultivation.

3) Horticulture Products

The government has been paying increasingly more attention to the development of the horticultural products. Nine commodities have been identified for this purpose. These are: mango, grapes, banana, vegetables, onions, okra, kukurbits, asparagus and flowers. The basic emphasis in the development programmes is on increasing the production for tapping the international market. In this context, the agro-processing industries would find their role in the following manner:

- Enhanced export in the fresh form would create need for certain essential processing operations for improving the shelf life, preservation and transportability.
- To the extent all commodities cannot be exported in the fresh form, it would create the need and scope for domestic agro-processing industries for the surplus production.
- Some commodities would find a better market and higher returns if they are exported in the processed form and hence the entrepreneur will be naturally tempted to manufacture certain ready-to-consume processed products.

For horticultural products, it would be in the fitness of things to launch pilot projects. The pilot projects should be in the nature of selecting a crop, identifying the areas and selecting farmers for financing them.

4) Dairy and Livestock Products

Dairy is one activity in which India has a distinction of evolving new technologies on one hand and successfully adopting the existing technologies on the other. In fact, milk is one unique commodity which has a tremendous potential for processing activities of various degrees. Now the consumption of processed milk in liquid form has become an accepted practice in India. The processing of milk for manufacturing a variety of milk products both of indigenous type and also of exotic form is a prominent agro-based industry. India has developed successful models of development by using dairy farming as an agent of socio-economic change. The examples of such a development process being initiated through dairy farming are provided by Kaira District Milk Producers Union (AMUL) in Gujarat and Varana Dudh Sahakari Sangh in Maharashtra.

5) Fish and Fish Products

Though India has a large Exclusive Economic Zone of more than two million square kilometres capable of producing 415 million tonnes of fish annually, at present a little over 30 per cent of the known resources are being exploited. This indicates that there is good scope for its development.

Aquaculture has become extremely important for India in view of the burgeoning demand for shrimps in Japan, USA and other developed countries. The scope of increasing shrimp production through capture fisheries is limited. Estimates for exports of shrimps vary. India has already achieved a level of Rs.4,500 crore in exports of shrimps and shrimp products along with other fish products.

There is scope for developing aquaculture in maritime states of Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Orissa and West Bengal.

6) Consumer Goods and Processed Food

Under this category, demand for processed food is expanding. India has a very large population of middle income group. Moreover, acceptability and taste for

ready-to-consume processed food items are going up at a fast rate. This indicates that over a period of time the consumer food processing industry is likely to increase its share in the total industry sector.

With the rising demand for quality food and government emphasis on increasing export through the agricultural sector, the agro-processing industries will become a major group of activities. Foreign investment is coming in a big way in this sector.

Check Your Progress 3

1) What is an agro-industry?

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2) State the distinctive features of agro-based industry in India.

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3) Highlight the prospects of primary food processing industry in India.

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8.7 PROBLEMS FACED BY RURAL INDUSTRIES IN INDIA

Major problems being faced by rural industries in India are as follows:

1) **Low Technology:** Low technology base has been one of the major constraints in the growth of rural industries. This constraint has been pointed out in our plans also. Measures have been initiated by organisations such as KVIC to improve the technology so that:

- the cost of finished products could be brought down by improving productivity,

- quality and marketability of products could be improved,
- drudgery of workers could be reduced, and
- the earnings could be improved.

These efforts have yielded results. Noteworthy among these are: i) the development of six and twelve spindle, new model charkhas (which came in a big way in offering fuller employment to the spinners), ii) the technology to process non-edible oils for manufacturing soaps that are economically competitive and qualitywise appealing, iii) development of power driven ghani, iv) power operated Shiela wheel for potters, v) the LYMPO technology which enables the manufacture of cement at village level that could substitute the portland cement in several uses, and vi) mixing of polyester fibre with natural fibres for manufacture of blended khadi fabrics. The recent improvements of cottage charkhas for silk reeling and the Trivedi reeling machine for tussar silk, scientific processing of flaying and tanning and meat meal preparation at the manufacture level, and manufacture of corrugated roof sheets out of coir waste are some other examples.

What is, however, causing concern is that though these improvements have tremendous potential in speeding up the growth process of these industries, their development has been rather slow. This apart, many technologies still remain in the laboratories and R&D bodies for want of adequate organisation, infrastructure, manpower and resource support. There is an urgent need to disseminate these technologies to targeted beneficiaries.

There are also certain areas where adequate R&D attention has not been provided to technology upgradation. For example, the rural housing technology (which is greatly in need and has incredible potential in creating rural industrial base) and the processing of a number of fruits and vegetables. The present R&D network relating to these technologies is very weak and feeble.

It is necessary to build an all India organisation on the pattern and magnitude of the Indian Council of Agricultural Research. Under its guidance national institutes of R & D for every rural industry with potential should be organised.

Extension has been one of the often forgotten and least attended functions. The present extension work is very poor. At the block level there are less than eight hundred extension workers to take care of rural industries. Even at the rate of three per block, there is a need for over 15,000 of them. We have achieved a good score in improving and disseminating the agricultural technology during the last five decades. We need to do the same for rural industries now.

- 2) **Credit:** Credit is one of the major requirements of rural artisans and entrepreneurs. Their resource base being very poor their dependence on credit is crucial. Yet they do not have an easy access to credit.

Till recently, the volume of credit a rural artisan/entrepreneur could get was determined by his credit-worthiness. In 1971, institutional agencies provided only 5 per cent of the borrowings of rural artisan households. They depended on moneylenders, landlords and traders for over 70 per cent of their borrowings.

During the last three decades with the policy change in lending to priority sectors, the banking system has no doubt shown some improvement in this respect.

The Differential Rate of Interest Scheme for rural artisans, the composite loan scheme for entrepreneurs in rural areas and the NABARD scheme for handloom weavers reflect this trend. At the apex level, these schemes are designed to comprehensively serve the credit needs of the rural industries.

However, results down the line are not that encouraging. For instance, the institutional coverage of artisans is still very insignificant. Against the total estimated credit requirements of Rs.9,750 crore, hardly Rs.100 crore have reached rural artisans, i.e., around 1 per cent. The NABARD's scheme of handloom finance too covers only about 32 per cent or so of the weavers. The rest of the weavers depend on master weavers and other private sources.

Against the backdrop of the changing economic context the credit needs of the rural industries are becoming more compelling because of the necessity to adopt improved technology, increased difficulties in procuring inputs and in marketing the end products. Therefore, the system of institutional finance has to take up increasing responsibility in serving rural industries.

- 3) **Raw Materials:** The source of raw materials for several rural industries, by and large, is the rural sector itself. However, these industries have been facing severe constraints procuring their inputs. Increased commercialisation of the economy, growth of high technology urban industries based on rural raw materials (for example, leather, splints and veneers, bamboo, non-edible oils and wool) have caused the local artisans and entrepreneurs to lose their input market to the urban industries.

The intermediary processing of many agricultural products has shifted to urban markets. In this way, these inputs become expensive and literally prohibitive to rural entrepreneur. He does not get them at a price that he can afford to pay. For example, leather worker in a village is deprived of his self-employment opportunity, as he cannot procure the urban processed leather at an affordable cost.

Modern technology and market forces thus have considerably eroded self-employment status of rural entrepreneur, so much so that he has now become a highly under-employed servicing artisan. The case of the village oil-processing man (teli) is a familiar example here.

Yet another factor that has greatly affected the rural artisan is the wide fluctuations in the prices of raw materials such as raw silk, cotton, and vegetable oils. Supply of these inputs is controlled by centralised urban markets. The availability of yarn to handloom weaver has been highly subject to the above phenomenon. Its supply has become irregular and expensive. Very often, due to non-availability of yarn, the weaver is forced into idleness. Even though some organisational measures have been initiated to help the artisan, the results are not encouraging. The weaver, for example, continues to depend on middlemen who offer him yarn on credit basis. In due course, yarn supply system has forced him to lose his employment status and become a wage earner. In most of the cases, this servicing functionary, i.e., raw material supplier has gained the status of master trader.

Hitherto, rural industries market was confined to local demand. However, due to marketisation and growing compulsion to bring down costs and retain economic viability, there has been an increasing need to expand their market horizons.

- 4) **Marketing:** For certain products, like handlooms and khadi, it has become necessary to identify and pursue particular segments of the market which have been patronising their products. This has resulted in increasing pressure on resources as well as marketing capability of rural industries.

Unfortunately, the plan to develop a national grid of marketing network for rural industries' products has not produced substantial results. The Rural Marketing and Servicing Centres, which were supposed to serve as base points at block level for the national grid, have not come into being in any big way. There are less than 400 such centres against the need for over 5,000.

With the exception of khadi and village industries and to some extent the handloom weavers who are assisted by co-operatives, several rural industries depend on the private marketing system which has been patently exploitative.

Thus, lack of proper market outlets has acted as a strong disincentive to rural industries and undermined the enthusiasm of talented artisans and entrepreneurs.

- 5) **Organisation:** Industrial activities in rural areas continues to be poorly organised. This is in spite of specialised organisational network established exclusively for each industry.

What is disturbing, even for those who are formally said to have been brought under the umbrella of these organisations, is the quality and volume of services from these continue to be limited. Further, formation of co-operatives has not brought any significant improvement in the lives of a large proportion of actual weavers. It is no wonder that sizeable proportion of weaver population refuse to see any distinction between the co-operatives and the master-weavers.

The multi-purpose District Industries Centre Programme was to serve the V&SI sector apart from helping medium and large-scale industries. If the involvement of these centres in programmes related to the rural industries is any indication, their launching has not substantially changed the position of industries. It is time that the performance of these centres in relation to the promotion of rural industries is evaluated. Such an examination would serve as a basis for drafting suitable policy changes and action programmes in future.

8.8 GOVERNMENT MEASURES OF ASSISTANCE

The fact that rural and small industries form an integral part of India's rural economy has been accepted by the Government. The Industrial Policy Resolution, 1948, and the subsequent policy statements had underlined in very clear terms the significance and role of industries in the rural economy.

In pursuance of the policy and the strategy adopted during the plans, the Government has taken the following measures to assist village industries:

- 1) **Credit Facilities:** The village and small industries sector is considered as a priority sector for the supply of institutional credit. It receives financial assistance from state governments, state financial corporations and banking institutions.
- 2) **Allocation of Raw Materials:** The small sector gets priority in the allocation of raw materials. Efforts are made to disburse scarce raw materials to rural-based industries through the agency of co-operatives.
- 3) **Technical Advice:** Technical advice and assistance to small scale manufacturers is provided by the Small Industries Development Organisation (SIDO) through its network of service institutes and extension, production and training centres. The SIDO also provides common service and tool room facilities attached to small industries service institutes and extension centres. It conducts courses in management and technical discipline.

The National Small Industries Corporation (NSIC), which was set up in 1955, operates the scheme of procuring machinery for small-scale manufacturers on a hire-purchase basis on concessional terms. It also assists the small-scale sector in processing orders from government departments and agencies. The Prototype Development and Training Centres set up with American, German and Japanese assistance at Rajkot, Okhla and Howrah impart training to persons engaged in small industries.

- 4) **Industrial Estates and District Industries Centres:** Several industrial estates have been set up all over the country to accommodate small industrial units in a more congenial atmosphere where various common facilities are provided for their smooth working.

The scheme of DICs was introduced in May 1978. The avowed objective of the scheme is to provide a 'focal point' for the development of small industries.

- 5) **Rural Industries Projects:** A centrally sponsored scheme for rural industries projects was taken up in 1962-63. Its main objective has been to evolve techniques for establishing viable industrial units in inhospitable rural environment. Another aim is to reduce disparities in the levels of development among different regions, and provide gainful employment opportunities.
- 6) **Food Parks:** As part of the strategy to develop food-processing infrastructure, the Government has been encouraging setting up of food parks in different parts of the country. The idea behind setting up of food parks is that small and medium entrepreneurs find it difficult to invest in capital intensive activities, such as cold storage, warehouse, quality control labs, effluent treatment plant, etc. Assistance for development of such facilities can make the food processing units in the food parks more cost effective and provide better market orientation.

PSUs/Joint/Assisted/Private sector/NGOs/Co-operatives are eligible for grants of up to Rs.4 crore for common facilities such as uninterrupted power supply, water supply, cold storage/ice plant, warehousing facilities, effluent treatment plant, quality control and analytical laboratory. So far 20 food parks have been sanctioned in different states of the country.

- 7) **Marketing Assistance:** Marketing assistance is provided by the government to the cottage and small industries. The various commodity boards set up by the government are entrusted with the task of facilitating the marketing of products of cottage and small industries. Besides, each state government has set up emporia and sales depots in large cities, where the products mobilised from the rural areas and small city centres are marketed.
- 8) **The Khadi and Village Industries Commission:** The KVIC is charged with the planning, organisation and implementation of programmes for the development of village industries.

8.9 IMPACT OF GOVERNMENT POLICY

After more than 50 years of experimentation, the concrete reality of rural industrialisation in India is still in the experimental stage. The responsibility for rural industrialisation is widely dispersed among various ministers and a host of developmental agencies. Although each of these agencies is urged by the government to give special attention to rural areas in the promotion of their respective industries and also have a better co-ordination with various agencies, no serious efforts have been made so far either at the central or the state level in this direction. As a result, the dictum "everybody's business is nobody's business" seems to be applicable to the area of rural industrialisation.

8.10 SUGGESTIONS FOR RURAL INDUSTRIAL POLICY

A programme for rural industrialisation should consider the feasibility of setting up the following types of industries:

- 1) **Processing of Agricultural Produce:** A number of industrial units can be created to provide full time employment to a large number of people. They can

also serve to provide supplementary part-time employment to farmers and their families. Some of the examples of such industries are processing of cotton, ginning, preparation of milk and milk products, oil extraction, jute manufacturing and extraction of sugar.

- 2) **Industries to Utilise Agricultural By-Products:** There is considerable scope for exploring the technological possibilities of utilising several agricultural by-products as raw materials for manufacturing industries.
- 3) **Development of Village Handicrafts and Cottage Industries:** The village industries can be used to manufacture not only consumer goods but also help in producing some capital goods needed by our farmers, such as ploughs, picks, shovels, and wheel barrows. Certain agricultural machinery parts or other equipment parts may be produced as per specifications in rural areas.
- 4) **Professional Services Sector:** There is a great need for rationalising the professions of gardeners, cobblers, blacksmiths and carpenters in rural areas.

A strategy to promote industrial production should be based on the following points:

- Increase the living standards of people which will call for the acceleration in per capita income on a sustained basis;
- Reduce disparities in income distribution;
- Reduce unemployment and underemployment; and
- Reduce regional inequality in industrial growth and promote balanced regional development.

In order to accelerate rural industrialisation, it would be necessary to produce a wide variety of consumer goods for local consumption such as vegetable oils, soaps, agricultural implements, cloth, certain hardware materials, etc. The rural community should be helped to reap the multiple effects of income and employment of the financial outlays on rural industries projects.

Check Your Progress 4

1) What is the need for establishment of food parks?

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2) Why is the procurement of raw material a major problem for a rural industry?

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3) What are government measures to assist rural industries?

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8.11 LET US SUM UP

The fact that rural industries form an integral part of India’s rural economy was appreciated by the government none-too-late. The Industrial Policy Resolution, 1948, and the subsequent policy statements had underlined in very clear terms the significance and role of industries in the rural economy. In pursuance of this policy and the strategy adopted during the plans, the government has taken a number of measures to promote rural industrialisation programme. However, the progress of rural industry has been less than encouraging. There is a need to promote rural industry in a big way if a sizeable dent is to be made in rural poverty and unemployment.

8.12 KEY WORDS

- Agro-processing industries** : Those industries which use not less than 50 per cent of the raw material from agriculture and where the value added as a result of the processing undertaken is not more than 50 per cent.
- Non-traditional items of agricultural exports** : As against conventional items of exports of plantation agricultural commodities such as tea, coffee, rubber, and species, the export of fruits, vegetables, flowers, processed food, etc. is categorised as non-traditional items of agricultural export.

8.13 SOME USEFUL BOOKS

Dhingra, I. C., 2003, *Special and Preferred Sector Finance*, Sultan Chand and Sons, New Delhi

Reserve Bank of India, *Report on Currency and Finance*, various issues

Government of India, *Indian Economic Survey*, various issues

Planning Commission, 2003, *Tenth Five-Year Plan 2002-07*, Government of India

8.14 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Section 8.2 and answer.
- 2) See Section 8.3 and answer.

Check Your Progress 2

- 1) The main features include use of locally available resources, low mechanisation, use of family labour and low scale of operations. See Section 8.4.1 for details.
- 2) The main problems of artisans relate to procurement of raw material and marketing of products. Availability of credit from financial institutions is another problem.
- 3) See Section 8.5 and bring out the contribution of khadi in income and employment generation, and national development.

Check Your Progress 3

- 1) While answering this question you may define agro-based and agro-processing industries.
- 2) See Section 8.6.2 and answer this question.
- 3) See Sub-Section 8.6.3, particularly the paragraph under the heading primary food processing.

Check Your Progress 4

- 1) Food parks are set up to promote food-processing industries. Certain infra-structural facilities are essential for an industry but not viable for a rural entrepreneur to set up. These facilities are provided at the food park.
- 2) The reasons for non-availability of raw materials could be depletion of forests, lack of credit facilities for purchase, and fluctuations in prices of raw materials. See Section 8.7.
- 3) See Section 8.8 and answer.

UNIT 9 LAND UTILISATION AND CROPPING PATTERN

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Land Utilisation Pattern
 - 9.2.1 Typology of Land Use
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- 9.3 Agricultural Land Use in India
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9.0 OBJECTIVES

After going through this unit you will be in a position to:

- explain the concept of land utilization;
- identify the categories in which land is used;
- explain the shift in land utilization pattern;
- explain the pattern of agricultural production;
- appreciate the changes in cropping pattern over time; and
- identify the impact of the changes in cropping pattern.

9.1 INTRODUCTION

The scope of bringing in more land into cultivation is limited in any country. The physical conditions, geographical location, population size and growth, level of

development, institutional framework, etc. determine the nature of land use in an economy. Moreover, the area available for cultivation is put to use for different crops keeping in view the quality of land, food habits of people and relative profitability of different crops. Thus, as food habits, relative prices and productivity undergo change, the cropping pattern may change over time. However, such changes should be commensurate with the land use planning in a country.

In the present unit we will learn about the land use and cropping patterns in India, particularly during the post-independence period. We will also bring out the probable reasons for the changes in these patterns.

9.2 LAND UTILIZATION PATTERN

In a broad sense the term land use pattern means the use of land resources under different ecological settings. The pattern of land use of a country at any particular time is determined by the physical, economic and institutional framework taken together. In other words, the existing land use pattern in different regions in India has been evolved as a result of the action and interaction of various factors, such as physical characteristic of land, the institutional framework, the structure of other resources (capital, labour, etc.) available. In addition, the geographical location of the region in relation to other aspects of economic development, viz., those relating to transport, industry, trade, etc. influence the land use pattern. A close scrutiny of the present land use pattern and the trends during the recent years will help us in understanding the Indian economic scenario.

9.2.1 Typology of Land Use

The total land in India can be divided into five categories from the land utilization perspective. These are: (i) Forests, (ii) Area not available for cultivation, (iii) Uncultivated land excluding current fallow, (iv) Fallow lands, (v) Cultivated Area.

The area not available for cultivation generally includes land put to industrial and other non-agricultural uses as well as barren and uncultivable land. Under the heading uncultivated land we include pasture, grazing land, tree cover and wasteland. On the other hand, fallow relates to land that is cultivable but is left unplanted. The cultivated land indicates the *net sown area*.

Let us look into the land utilization pattern for the year 1995. The total area of India is 328.73 million hectares (mha). The data available for land use classification for the year 1995 is for 304.83 mha. Of which forest area represent 22.43% (i.e., 68.39 mha.) (See Table 9.1). You can see from the table that the largest share of the total geographical area is occupied by the net sown area (46.8%) with 142.82 mha. On the other hand, the un-cultivated area comprising area under non-agricultural uses and barren and uncultivable land, represent 13.6 per cent of the total area. Other uncultivated land excluding fallow land which consists of i) permanent pasture and other grazing land, ii) land under miscellaneous tree crops and groves not included in net sown area, and iii) waste land is stretched over 29.08 mha. (9.6 per cent of the total geographical area). Of these, 11.24 mha. are under permanent pasture and other grazing land, 3.63 mha. under miscellaneous tree crops and groves and 14.21 mha. under wasteland. Fallow land occupies an area of 23.3 mha, i.e., 7.6 per cent.

9.2.2 Changes in Land Utilization Pattern

The picture that we observe for 1995 is quite different from that in 1950.

You can compare the land utilization patterns for the year 1995 over that in 1950 from Table 9.1. Some prominent features of the table are:

- 1) The area under forest cover has increased from 14.24 % in 1950 to 22.43% in 1995.
- 2) The net sown area, which represents area available for cultivation, has increased from 41.77% in 1950 to 46.85% in 1995. This has been made possible by bringing additional area into cultivation.
- 3) The area not available for cultivation has declined from 16.71% in 1950 to 13.54% in 1995. Here, the area under non-agricultural uses has increased while the area under barren land has declined. This implies that a large proportion of the barren land has been brought to economic use.
- 4) The area under uncultivated land excluding fallow land has declined. An important feature in this context is that land under miscellaneous tree crops, plantation, etc. has declined significantly from 6.97% to 1.19%.

There is also a marked increase in the gross cropped area by 56.26 mha. (131.89 mha. in 1950 to 188.15 mha. in 1995). The increase in the cropping intensity from 110.7 to 131.7 is an indication of *rabi* and kharif area put to cultivation. Development and construction of major, medium and minor irrigation projects has resulted in higher cropping intensity and more area under crops.

National forest policy lays down that the area under forest be steadily increased to 33% of the total geographical area of the country. There is now little scope for extension of cultivable area without creating imbalance in ecological settings. Intensive cultivation with extension of irrigation facilities and scientific methods of dry farming could meet the food requirements of the growing population.

Table 9.1 : Land Utilization Pattern (in mha)

Type of Land	1950		1995	
	Area	Percentage	Area	Percentage
A. Total Geographical Area	328.73		328.73	
B. Reporting Area for Land utilization	284.32		304.85	
1. Forest	40.48	14.24	68.39	22.43
2. Area not available for cultivation	47.52	16.71	41.28	13.54
a. area under non-agricultural uses	9.36	3.29	22.51	7.38
b. Barren and uncultivable land	38.16	13.42	18.77	6.16
3. Other uncultivated land excluding fallow land	49.45	17.39	29.08	9.54
a. Permanent pasture and other grazing land	6.68	2.35	11.24	3.70
b. Land under miscellaneous tree crops and groups not included in net sown area	19.83	6.97	3.63	1.19
c. Cultivable waste	22.96	8.08	14.21	4.66
4. Fallow land	28.12	9.89	23.3	7.64
a. Fallow land other than current fallow	17.44	6.13	9.77	3.20
b. Current fallow	10.68	3.76	13.53	4.44
5. Net sown area	118.75	41.77	142.82	46.85
C. Gross cropped area	131.89		188.15	
D. Cropping intensity (%)	111.07		131.70	

Source: Agricultural Statistics at a Glance:1999, Government of India

9.3 AGRICULTURAL LAND USE IN INDIA

In 1993-94, an area of 42.68 mha was under rice, 25.2 mha was under wheat, 33.5 mha was under coarse cereals and 101.49 mha under total cereals. An area of 23.4 mha was under total pulses; 124.8 mha was under total foodgrains, 2.94 mha under fruits, 4.2 mha under vegetables, 28.5 mha under total oilseeds, 8.36 mha under total fibers, 0.42 mha under tobacco, 3.74 mha under sugarcane, 2.36 mha under spices, 10.64 mha under other crops.

9.3.1 Scientific Cropping Pattern and Agricultural Land Use

In order to increase agricultural production from given land resources, it is necessary to use scientific cropping pattern. Cropping system approach holds many promises in this regard. The adoption of cropping system technology and its successful implementation depend on physical and socio-economic resources, which are available or are made available at the time when they are needed. Location specific and farm based cropping patterns have to be evolved with consideration of such determinants as land, topography, water availability, intensity and duration of sunlight, labour availability, cash or credit, power source and market demand.

Adequate resource utilization of a farm in integrated farming system with crops as major enterprise is the crux of the problem. Carandang (1980) has projected that the cropping system approach has two main components, viz., farm resources and production technology. Farm resources are of two types: physical and socio-economic. Physical resources include land, sunshine, and water. On the other hand, socio-economic factors include markets, labour, power, cash, etc. Production technology depends on nature of crops and varieties, tillers, fertility, weed management, insects management, disease control, inter-plant durations, water management, etc. Both farm resources and production technology need to be integrated on scientific basis.

9.3.2 Governmental Intervention for Scientific Land Use

A nation lives for thousands of years whereas individuals live for some decades. Therefore, individual activities should not be allowed to restrict the potentials for future generations. Any national government has to safeguard the interests of future generations without compromising the welfare of the present generation. Hence the need for better land use planning arise where both the public and private interests are taken care of.

In order to facilitate scientific and sustainable land use governments have promulgated various legislations. These legislations have been enacted mostly after Independence. Land Utilization Acts were passed in 1947 and 1949 respectively by Uttar Pradesh and Punjab governments. The Uttar Pradesh Soil Conservation Act, 1954 embodies soil conservation programmes. The states of Bihar and Punjab have passed Land Reclamation Acts. The Madhya Bharat Land Utilization Act of 1950 restricts keeping land fallow for longer periods. The Bombay Khar Land Act, 1948 and Punjab Land Preservation, Amendment Act 1953 were enacted to restrict misuse of land resources.

However these acts have not been able to check the mismanagement of land resources. Due to improper implementation and loose interpretation of laws there have been many instances of misuse of land.

9.4 SOIL CONDITIONS IN INDIA

Soil is an essential input for agricultural production. It supports plant growth. You may be aware that soil is transferable natural material, which is found on earth crust and provides natural medium to plant growth. The soil is a natural body, differentiated into

layers of loose (unconsolidated) mineral and organic matter. The depth of soil varies across regions.

Soils of India have been classified into large number of groups and sub- groups. The main groups are:

- i) **Red Soil**- The colour of the soil is red due to presence of various oxides of iron. These soils are poor in fertility and deficient in organic matter. This type of soil comprises vast area of Tamil Nadu, Karnataka, Goa, Daman and Diu, South Eastern Maharashtra, Andhra Pradesh, Chhattishgarh, Orissa and Jharkhand. It is also extended to Santhal Praganas of Bihar and Birbhum district of West Bengal to Jhansi and Hamirpur of Uttar Pradesh. The red soil in Tamil Nadu occupies the largest area and constitute nearly 2/3 of the cultivated area.
- ii) **Laterite Soil**- This type of soil is yellowish red or red in colour. These soils are high in organic matter. These soils are peculiar to India with an intermittently moist climate. This type of soil is generally found in the summit of the hills of Karanataka, Kerala, Madhya Pradesh, the Eastern Ghats of Orissa, Maharashtra, West Bengal and Tamil Nadu. On the laterite (soil), at lower elevations paddy is grown whereas in higher elevations, tea, cinchona, rubber and coffee is grown.
- iii) **Black Soil**- This soil type has characteristic dark colour, varying from dark brown to deep black. These soils contain high amount of organic matter. These soils are varying in depth from shallow to deep. Typically soil derived from the Deccan trap is the black cotton soil. It is prevalent in Maharashtra, western part of Madhya Pradesh, parts of Andhra Pradesh, parts of Gujarat, and some parts of Tamil Nadu. Many black soil areas have a high degree of fertility but some especially in the uplands are moderately productive. In Maharashtra these soils are derived from the Deccan trap and occupy quite large area.
- iv) **Alluvial Soil**- These soils are dark in colour and contain lime. Considerable salinity and alkalinity are also found. The fresh alluviums are coarser in texture and show little or no horizonation. This is by far the largest and most important soil group in India contributing the largest share to agriculture. This type of soil is formed by the deposition laid by the Ganges and the Bramhputra system. Alluvial soil stretches over West Bengal, Uttar Pradesh and Assam on the Bramhaputra and Ganga river basins. The alluvial soil of Tamil Nadu, Kerala, and Gujarat found in the deltaic areas along the coast are the deposition of sediment of southern rivers.
- v) **Desert Soil**- This type of soil is low in organic matter content. The colour varies from yellowish brown to pale brown. It contains many water-soluble minerals. These soils are predominating in western Rajasthan, Haryana, Punjab, lying between Indus river and Aravali range. The Rajasthan desert is a vast sandy plain including isolated hills at places. In many parts, these soils are alkaline to saline with unfavorable physical conditions.
- vi) **Terai Soil**- This type of soil is found in the hills of Himalayan region, Jammu and Kashmir, Uttar Pradesh, Bihar and West Bengal. They are formed by the down-ward movement of materials from the lower Himalayan ranges.
- vii) **Brown Soil**- In this case the surface soil is brown and moderately rich in organic matter. The organic content varies between 0.5 to 1 per cent. The soil is neutral to slight acidic in nature.
- viii) **Saline and alkaline Soil**- They contain high contents of soluble salts. It is estimated that about 7 million hectares of land in the country are driven out of cultivation due to salinity. Three cases of salinity soil are recognized.

a) Saline Soil

This soil contains toxic core of soluble salts in the net zone. This is also called white alkali.

b) Non saline Alkali or Sodic Soil

These soils do not contain any large amount of neutral salt.

c) Saline Alkali Soil

This group of soil is both saline and alkali. This causes low yield of crops.

- ix) **Peat Soils**- This type of soil usually develops from brackish water sediments. There is high accumulation of organic matter due to poor drainage condition. This soil contains high percentage of free alumina.

9.5 SOIL EROSION

A major factor responsible for the degradation of natural resources is soil erosion. It has been estimated that accelerated soil erosion has irreversibly destroyed some 430 mha of land area covering 30% of the present cultivated area in different countries of the world. Soil erosion is more severe in mountainous than in undulating area. The loss of topsoil resulting in reduced productivity is a most serious degradation problem in the Indian sub- continent.

9.5.1 Soil Erosion by Water

Erosion by water is the most serious degradation problem in Indian Context. At present soil erosion is taking place at a rate of 16.35 tons per hectare per year totaling 5334 million tons per year. Nearly 29% of the total eroded soil is permanently lost to the sea and nearly 10% is deposited in reservoirs.

9.5.2 Wind Erosion

Wind erosion is a serious problem in the Arid and Semi-arid regions, including the states of Rajasthan, Haryana, Gujarat and Punjab. Removal of natural vegetative cover resulting from excessive grazing and extension of agriculture to marginal areas is the major human induced factor leading to accelerated wind erosion. Wind erosion is also prevalent in the coastal area where sandy soil predominates.

9.5.3 Salinization

A large fraction of irrigation has been achieved through expansion of canal irrigated area. In almost all cases the ground water table which was several meter deep prior to the introduction of irrigation has been rising following the introduction of irrigation. When ground water table reaches within 2 meter of the surface, it contributes significantly to evaporation from the soil surface and causes soil salinisation. Nearly 50 per cent of the canal irrigation areas are suffering from salinization or alkalization or both. The main reason for these problems as you will see in Unit 10 are inadequate drainage and inefficient use of available water resources. The socio-political factors have also contributed to the salinisation problem.

9.5.4 Waterlogging

Another cause of soil degradation in irrigated area is water logging due to excessive water application and canal seepage. It not only hampers crop growth but also degrades soil and productivity reduces considerably. The adverse effect of waterlogging

has affected the agricultural potential especially in eastern region. It is estimated that as high as 8 million hectares of land is exposed to waterlogging in the country.

Check Your Progress 1

1) What is cropping intensity? What are the measures of raising cropping intensity?

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2) Distinguish between red soil and black soil in terms of availability, fertility and crops grown.

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3) What are the important changes taking place in land utilisation pattern?

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9.6 CROPPING PATTERNS IN INDIA

Cropping pattern indicates the proportion of area under different crops at a point of time. Cropping activities go on all the year round in India provided water is available for the crops.

In India, the cropping pattern follows two distinct seasons; *Kharif* season from July to October and *Rabi* season from October to March. The crops grown between March to June called *zaid*. The crops are grown solo or mixed (mixed-cropping) or in a definite sequence (rotational cropping). The land may be occupied by one crop during one session (mono cropping) or by two crops during one season (double-cropping) which may be grown in a year in a sequence. We explain these cropping systems below.

9.6.1 Types of Cropping Systems

a) **Mono-cropping:** Mono-cropping or monoculture refers to growing of only one crop on a piece of land year after year. It may be due to climatological and socio-economic conditions or due to specialization of a farmer in growing a particular

crop, e.g., under rainfed conditions, groundnut or cotton or sorghum are grown year after year due to limitation of rainfall. In canal irrigated areas, under waterlogged condition, rice crop is grown as it is not possible to grow any other crop.

- b) **Multiple-cropping:** Growing two or more crops on the same piece of land in one calendar year is known as multiple-cropping. It is intensification of cropping in time and space dimensions, i.e., more number of crops within a year and more number of crops on the same piece of land at any given period. It includes inter-cropping, mixed-cropping and sequence cropping. Double-cropping is a case where the land is occupied by two crops, which are grown in a year in sequence.
- c) **Inter-cropping:** Inter-cropping is growing of two or more crops simultaneously on the same piece of land with a definite row pattern. For example, growing *setaria* and *redgram* in 5:1 ratio. Thus, cropping intensity in space dimension is achieved. Inter-cropping was originally practiced as an insurance against crop failure under rainfed conditions. At present, the main objective of inter-cropping is higher productivity per unit area in addition to stability in production. Inter-cropping system utilizes resources efficiently and their productivity is increased.

For successful inter-cropping, there are certain important requirements:

- 1) The time of peak nutrient demands of component crops should not overlap.
 - 2) Competition for light should be minimum among the component crops.
 - 3) Complementarity should exist between the component crops.
 - 4) The differences in maturity of component crops should be at least 30 days.
- d) **Mixed-cropping:** Mixed-cropping is growing of two or more crops simultaneously intermingled without any row pattern. It is a common practice in most of dryland tracts of India. Seeds of different crops are mixed in certain proportion and are sown. The objective is to meet the family requirement of cereals, pulses and vegetables.
 - e) **Sequence-Cropping:** Sequence cropping can be defined as growing of two or more crops in a sequence on the same piece of land in a farming year. Depending on the number of crops grown in a year it is called double, triple or quadruple cropping involving two, three and four crops respectively.

In addition to the above systems, relay cropping and ratoon cropping are also in existence. Relay cropping refers to planting of the succeeding crop before harvesting the preceding crops. Ratoon cropping or ratooning refers to raising a crop with re-growth coming out of roots or stalks after harvest of the crop.

- f) **Integrated Farming System:** Integrated farming system is a holistic method of combining several enterprises like cropping system, diarying, piggery, poultry, fishery, bee-keeping, etc. in a harmonious way so as to complement each other. The objective is efficient resource utilisation and maximization of profit in such a way so as to cause least damage to soil and environment.

9.6.2 Why Cropping Systems Differ?

Both climatic factors and resources of the farmers determine the cropping pattern on a farm. Though climate plays most vital part in crop selection, the area under crop is also influenced by economic considerations of the farmer, namely irrigation water, cost of inputs and prices of the products. In any locality, the prevalent cropping

system is the cumulative results of past and present decisions by individuals, communities or government or their agencies. A basic requisite for higher cropping intensity is the availability of water either through precipitation or through irrigation. It is being increasingly realized that the land and water resources are not unlimited and the wise use of the same is imperative. This is especially so for the countries like India where the population pressure is continuously increasing.

Tropical countries like India are fortunate in that the temperature condition remain favorable practically throughout the year for growing crops. However, it is crucially dependent upon water supply through natural precipitation or irrigation facility. Multiple-cropping has been in practice in many parts of India since long. Similarly, mixed-cropping has been an ancient art in India. Mixed-cropping systems were adopted as an insurance against failure of crops due to seasonal conditions or due to attack of pests and diseases. In recent years it has been shown beyond doubt that there are many other advantages too.

Integrated farming system seems to be the answer to the problem of scarcity of land resources. This will increase the income level and improve the nutrition standard of small-scale farmers with limited resources. Researchers on multiple-cropping system, however, suggest that the resources of the farmers be given major emphasis so that technologically a mixed-cropping can be adopted. Gradually new concepts on multiple-cropping have started coming in and now there has been some accumulation of useful scientific information. The information is based on analytical work on different crop combinations and sequential growth of the crops. In this respect cultivated areas in the country can be broadly classified into three categories based on rainfall pattern:

- i) Area where annual rainfall is above 1150 mm
- ii) Area where rainfall ranges from 750-1150 mm
- iii) Area where rainfall is below 750 mm

Most of the areas in Assam, Kerala, Orissa and West Bengal can be included in the first category. Basic problems in these areas pertain to limited irrigation and poor drainage. Most of the farmers are engaged in rice cultivation. Large parts of Tamil Nadu, Uttar Pradesh and Andhra Pradesh fall in the second category and occupy about one third of the total cultivated area in the country. In these areas there is large potential for creating minor irrigation facilities. The third category also occupies nearly one third of the cultivated area, comprising parts of Andhra Pradesh, Karnataka, Maharashtra and Rajasthan. In these areas, unless major and medium irrigation facilities are provided, there is little hope for raising cropping intensity to a substantial extent.

The cropping pattern is influenced by:

- Traditional social practices and dietary habits
- The crops with practicable pest and disease control method and suitability with ecological environment.
- The crops which are most profitable (or are high-yielding)
- The combination of crops that result in profit maximization and cost minimization.

9.7 CURRENT CROPPING PATTERNS

Three important features mark the cropping pattern of India: i) Predominance of foodgrains crops, ii) Slight shift towards commercial crops, and iii) Noticeable increase in some individual crops.

Table 9.2

Cropping Pattern in India in 1995

Crops	Area in '000 hectares	% share in Gross Cropped Area
Rice	42965	22.84
Wheat	25853	13.74
Jowar	11722	6.23
Bajra	10320	5.49
Maize	6141	3.26
Ragi	1902	1.01
Barley	894	0.48
Other cereals and millets	1820	0.97
Coarse cereals	32799	17.43
Total cereals	101617	54.01
Total pulses	24281	12.91
Sugarcane	4144	2.20
Spices and condiments	2645	1.41
Total fruits	3040	1.62
Potatoes	1070	0.57
Onions	392	0.21
Total vegetables	4506	2.39
Groundnut	7969	4.24
Rapeseed and mustard	5769	3.07
Sesamum	2212	1.08
Linseed	894	0.48
Other oilseed	10326	5.49
Total oil seed	27070	14.44
Cotton	7967	4.23
Jute	760	0.40
Mesta	190	0.10
Total fibers	9014	4.79
Tobacco	408	0.22
Other crops	11322	6.02
Gross cropped area	188147	100

Source: Agricultural Statistics at a Glance.

Taking the major crops into consideration we can present a broad picture in the cropping pattern in India. The major pattern follows two distinct groups: *Kharif* (monsoon crops) and *Rabi* (post-monsoon crops). The *kharif* crop includes rice, sorghum, bajra, maize, ragi, groundnut, cotton, etc. The crop occupying the highest percentage of the sown area of the region is taken as the base crop. All other possible alternative crops which are sown in the region either as substitute for the base crop in the same season or as the crops which fit in with the rotation in the subsequent season, are considered as the pattern.

9.7.1 The *Kharif* Season Cropping Patterns

The *kharif* season cropping pattern comprises mainly rice and non-rice-based crops.

- i) **Rice-based cropping pattern** - Rice is the best crop in this category and 9% of the area in India comes under rice-based cropping pattern. Nearly 45% of the total rice area in India receives 30 cm per month of rainfall during at least two months (July-August) of the south western monsoon and much less during other months. In contrast to these parts, the eastern and southern regions, comprising Assam, West Bengal, Coastal Orissa, Coastal Andhra Pradesh, Karnataka, Tamil Nadu and Kerala which receive 10-20 cm per month, also come under this cropping pattern. On the all India basis, about 30 rice-based cropping pattern have been identified in different states.
- ii) **Kharif cereals other than the rice-based cropping pattern-** Maize, *jowar*, *bajra* form the main *kharif* cereals, *Ragi* and small millets come next, these are grown in limited area. Maize is grown in high rainfall areas, *jowar* in medium rainfall areas and *Bajra* in low rainfall areas. The extent of the area under these crops during south western monsoon season is: maize(5.6 mha), *jowar* (11 mha) and bajra 12.4 mha.

Ragi is a *kharif* cereal (2.4mha) and is mainly concentrated in Karnataka, Tamil Nadu and Andha Pradesh. These states account for more than 60% of the total area under this crop.
- iii) **Maize-based cropping pattern-** The largest areas under *kharif* maize are : Uttar Pradesh (14mha), Madhya Pradesh (0.58 mha) and Punjab (0.52 mha). In the four states namely Gujarat, Jammu & Kashmir, Himachal Pradesh and A.P; the area under maize ranges from 0.24 to 0.28 mha in each, whereas other states have much less area under it. On the all India basis, about 12 Maize based cropping pattern have been identified.
- iv) **Kharif jowar-based cropping pattern-** The area under the *kharif jowar* in India is highest in Maharashtra (2.5 mha), closely followed by Madhya Pradesh (2.3 mha). In each of the states of Rajasthan, Andhra Pradesh, Karnataka and Gujarat, the area under this crop is between 1 and 1.4 mha. *Jowar* is mainly grown in areas having rainfall range from 10 to 20 cm per month, least for 3 to 4 months of the southeastern monsoon. On the all India basis, 17 major cropping patterns have been identified under this category.
- v) **Bajra-based cropping pattern:** The area under bajra crop is about 12.4 mha. Rajasthan has about two-third of the total area. Maharashtra, Gujarat and Uttar Pradesh together have over 4.6 mha, constituting the remaining one-third area under the bajra crop. On all India basis 20 major cropping patterns have been identified with bajra as base crop.
- vi) **Groundnut-based cropping pattern:** Groundnut is sown over an area of about 7.2 mha , mostly in five major groundnut producing states : Gujarat (24.4%) area,

Andhra Pradesh, (20.2%), Tamil Nadu (35.5%), Maharashtra (12.2%) and Karnataka (12%). Five other states, viz, Madhya Pradesh, Uttar Pradesh, Punjab, Rajasthan and Orissa together have about 17.3% of the total area under groundnut as base crop. On the all-India level, about nine major groundnut based cropping patterns have been identified.

- vii) **Cotton-based cropping pattern:** Cotton is grown over 7.6 mha in India. Maharashtra shares 36%(2.8mha), followed by Gujarat with 21% (1.6 mha), Karnataka with 13% (1mha) and Madhya Pradesh with 9%(.6mha) of the area. Together these four states account for about 80% of area under cotton. The other cotton growing states are Punjab, Andhra Pradesh, Tamil Nadu, Harayana and Rajasthan. On the all India basis about 16 broad cotton-based cropping patterns have been identified.

9.7.2 Rabi-season Cropping Patterns

The major cropping patterns prevalent in India during the *rabi* season are: i) wheat and gram based cropping pattern, and ii) *jowar*-based cropping pattern.

a) Wheat and gram based cropping patterns

These two crops are grown under identical climate and can often be substituted for each other. On the all-India level, about 19 cropping patterns have been identified with wheat and 7 cropping patterns with gram. The core of the wheat region responsible for 70 per cent of the area and 76 per cent of production comprises Punjab, Haryana, Uttar Pradesh, Madhya Pradesh flanked by Rajasthan and Gujarat in the Western region and Bihar and West Bengal in the Eastern region.

b) Rabi-Jowar based cropping patterns

On the all-India level, about 13 cropping patterns have been identified with the *rabi jowar*. Maharashtra has the largest number of these cropping patterns, wherein starting with the exclusive *rabi jowar*, bajra, pulses, oilseeds and tobacco are grown as alternative crops.

Check Your Progress 2

1) Distinguish between the following terms:

- a) double cropping and mixed cropping
- b) double cropping and sequence cropping
- c) mono-cropping and multiple cropping

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2) Describe the major cropping patterns followed in Northern India.

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3) What are the important cropping patterns during kharif season?

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4) Differentiate between rice-based and non-rice-based cropping patterns with suitable examples.

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9.8 CHANGES IN THE CROPPING PATTERNS

The trend in the land use pattern and cropping pattern over the last 50 years in India has shown increasing use of land for the purpose of cultivation with slight variations. The change in the land use pattern and cropping pattern is vastly affected by rapid urbanization. The higher cultivable area has been achieved by bringing large acreage of uncultivable land into cultivation.

9.8.1 Factors Affecting Cropping Pattern

The cropping pattern is highly influenced by personal, social, cultural and economic factors of the farmers. Apart from that, it is also affected by the climatic factors of a region.

The major factors are :

i) *Size of the Land Holding*

In India, marginal and small farmers represent the majority of farming community. So the mono crop paddy has become predominate as it fulfills the household needs and perpetuates the subsistence agriculture with little scope for commercial crop husbandry.

ii) *Literacy*

Majority of the farmers are ignorant of the scientific methods involved in mixed-cropping, mono cropping and other technological knowhow for practicing better cropping pattern.

iii) *Disease and Pest*

The cropping pattern also depends on the possibility of disease and pest infection

iv) *Ecological Suitability*

The cropping pattern of a particular region is highly dependent on the ecological condition (temperature, rainfall, humidity, etc.).

v) *Moisture Availability*

The source of irrigation greatly determines the type of the cropping pattern to be practiced. For example, in low rainfall area, dry land farming is the best possible way to profit maximization.

vi) *Financial Stability.*

The economic condition of the farmers also affects the cropping pattern. As the cash crops (for example, cotton) involve high capital investments, these are practised only in estate farming. The marginal section of the farming community adopts low cost crops.

9.8.2 Emerging Problems in Cropping Patterns

Over the years the emerging scenario in the cropping pattern points to the following observations.

- 1) The dominance of cereal crops in the foodgrains point to the poverty of the people. It meets the demand of the low-income people, in whose case a large proportion of income is spent on cereals. Even pulses which are the source of protein for this class of people is not grown on a significant scale. Most of the farmers being marginal and small are the net purchaser of foodgrains and hardly can afford the high input cost for raising a successful non-food cash crop.
- 2) The predominance of foodgrains group together with the fact that a significant proportion of agricultural production is concentrated in small farms, leads one to conclude that much of the cultivation is for self consumption.
- 3) The fact that large areas remains under foodgrains shows that land productivity has not increased at par with technological possibilities.
- 4) Despite significant changes in cropping pattern, the shift towards high valued commercial crops has been very small. The result is an insignificant impact on the growth of the crop output.

9.9 LONG-RUN EFFECTS OF CURRENT TREND

Cropping pattern presently in vogue in India is cereal biased and fails in assuring balanced food security. The cropping pattern does not depict a picture of diversified agriculture despite some commercialization and technological progress. Other associated aspects of the present cropping pattern are increased use of chemical fertilizers and pesticides, increase in water demand, and duplication of forest areas which are discussed below.

9.9.1 Increase in Use of Fertilizers and Pesticides

Higher production of foodgrains has resulted from more inorganic fertilizer and pesticide application. The NPK used has increased from 65.6 thousand tonnes in 1951-52 to

17318 thousand tonnes in 1997-98. The higher chemical fertilizer and pesticide application has led to toxicity in feeds.

Area where pesticides use has been increasing vigorously has seen insurgency among the insects and pests, led to disturbance in bio-system. In addition, there has been increasing use of hybrid and high yielding variety replacing the local varieties heading to almost extinction of the local variety.

9.9.2 Increase in Water Demand

In the last fifty years, the net sown area has been increased from 118 to 142 million ha. The increase in net sown area and increase in cropping intensity in turn increased the demand for water sources for irrigation. This increased demand is causing depletion of water resources. Competing sectors are being deprived of required water as agriculture consumes as high as 70% of total water use. The intensive cropping pattern is always in need of higher irrigation supply. This in turn pushes for development of sources of irrigation. The higher requirement of water deplete the ground water level. Increased demand for irrigation in turn requires major, medium and minor irrigation projects, which are highly expensive. The construction of irrigation projects many times faces bureaucratic hurdles and opposition from local residents because irrigation projects cause various social and environmental problems.

9.9.3 Depletion of Forest Areas

The present cropping pattern emphasized on bringing more and more land under agriculture thereby depleting the forestland. There has been an increase in the agricultural area through deforestation during the thirty years period 1950-81. The area under field crops rose from 118.7mha to 142.9 mha by bringing an additional 24 mha under crop through deforestation of private and rural forests or older fruit orchards. The land use pattern has moved towards higher food production leaving the forestry neglected.

Check Your Progress 3

1) Identify and explain the factors affecting cropping pattern.

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2) What are the problems due to changes in cropping pattern?

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9.10 LET US SUM UP

The scope of bringing in more land into cultivation is limited in India. Thus the existing land has to be utilized properly so that its productivity increases and consequently agricultural production is higher. In India, nearly half of total area is devoted to cultivation. During the past fifty years the land utilization pattern has undergone some changes. While the proportion of net sown area has increased, the proportion of uncultivated and wasteland has declined. Major crops such as rice and wheat not only occupy substantial share in total area under cultivation their share is increasing. This has implications for food habits, water demand and loss of bio-diversity.

9.11 KEY WORDS

- Net Sown Area** : The total operational holding of a particular farmer on which he can grow crop counted only once in an agricultural year is termed as Net Area Sown. This term denotes the total area under crops and orchards, counting areas sown more than once in the year only once.
- Gross Cropped Area** : Gross Cropped Area is the area sown under different crops in different seasons in a year on the available land.
- Cropping Intensity (CI)** : Cropping Intensity assesses farmers' actual land-use in area and time relationships for each crop or group of crops compared to the total available land area and time including the land temporarily. It is given (in percentage terms) by the ratio of Gross Cropped Area to Net Cropped Area. In simple terms, CI indicates the number of times a field is grown with crops in a year.

9.12 SOME USEFUL BOOKS

Government of India, 1999, *Agricultural Statistics at a Glance*.

Planning Commission, 2003, *Tenth Five Year Plan*, Government of India.

Mal, P., 2001, *Infrastructure Development for Agriculture and Rural Development*, Mohit Publications, New Delhi.

Singhal, V., 1996, *Indian Agriculture*, Indian Economic Data Research Centre.

9.13 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Cropping intensity is given by the ratio of gross cropped area to net cropped area. It can be increased by raising the number of times a piece of land is cultivated. Thus multiple cropping and mixed cropping would increase cropping intensity.
- 2) Read Section 9.4 and compare red soil and black soil.
- 3) Read section 9.2.2 and answer.

Check Your Progress 2

- 1) Read Section 9.6.1 and differentiate between the concerned terms.
- 2) Read Section 9.7 and answer.
- 3) Read Sub-section 9.7.1 to answer this question.
- 4) Read Sub-section 9.7.1 to answer this question.

Check Your Progress 3

- 1) Summarise the points given in Sub-section 9.8.1.
- 2) Read Sub-section 9.8.2 and answer.

UNIT 10 IRRIGATION IN INDIA

Structure

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Extent of Irrigation in India
- 10.3 Sources of Irrigation
 - 10.3.1 Sources of Minor Irrigation
 - 10.3.2 Sources of Major and Medium Irrigation
- 10.4 Major versus Minor Irrigation: Comparative Analysis
 - 10.4.1 Capacity Utilisation and Efficiency
 - 10.4.2 Gestation Period
 - 10.4.3 Cost Studies
- 10.5 Irrigation Management
 - 10.5.1 Shortage of Funds
 - 10.5.2 Utilisation Efficiency
 - 10.5.3 Pricing of Irrigation Water
- 10.6 Environmental Effects of Irrigation
 - 10.6.1 Displacement of Population
 - 10.6.2 Destruction of Habitat
 - 10.6.3 Impact of Minor Irrigation
- 10.7 Problem of Salinity and Water-logging
- 10.8 Suggestions for Better Water Management
- 10.9 Command Area Development Authority
- 10.10 Let Us Sum Up
- 10.11 Key Words
- 10.12 Some Useful Books
- 10.13 Answers/Hints to Check Your Progress Exercises

10.0 OBJECTIVES

After going through this unit, you would be in a position to:

- explain the role of irrigation in agricultural growth;
- identify the extent of irrigation coverage in various states of India in the post-independence period;
- distinguish among major, medium and minor irrigation projects;
- identify the sources of irrigation;
- compare the pros and cons of irrigation projects;
- explain the benefits of efficient utilisation of irrigation facility and scientific pricing of irrigation water; and
- explain the government schemes meant for irrigation development.

10.1 INTRODUCTION

Providing water to crops other than direct receipt of rainfall by plants is called irrigation. Irrigation is the process of watering the cultivated crops through artificial means. Irrigation plays both protective and productive role in the crop growth cycle. Irrigation is the application of the water to soil for the purpose of supplying moisture essential for plant growth especially during stress period. It provides an insurance against short duration drought during crop season. Irrigation boosts productivity and

overall production. It also increases gross cropped area (GCA) through an increase in cropping intensity.

The timing and quantity of rainfall is beyond the control of human being. Moreover, the northwestern part of the country receives very little rainfall. Thus we cannot rely on rainfall alone for agricultural development. Irrigation facility, on the other hand, is controlled and thus quite desirable. So long as a major technical breakthrough in the art of rain-fed farming does not occur, the emphasis on irrigation is bound to persist.

Irrigation development comes to the forefront of infrastructure development strategy for agriculture. Out of total geographical area of 329 million hectares (mha), the gross cropped area (GCA) in the country is 186 mha and the net sown area (NSA) is only 142 mha. However, the entire cultivated area in India cannot be irrigated because of limited availability of water. It is estimated that the ultimate irrigated area of the country from all the sources is around 113.5 mha. Of these, the potential of major and medium irrigation is 58.5 mha while that of minor irrigation is 55 mha.

There has been rapid development of irrigation facilities in India since 1951. It has undoubtedly played a crucial role in increasing the food production, from around 50 million tonnes in 1951 to 206 million tonnes fifty years later. The increase has been achieved principally through improvement in the productivity of land, since the area under crops has increased only marginally. The liberal use of chemical fertilizers, the steady increase in the use of certified/quality seeds, and the extensive use of electricity in agriculture are among the other factors that have helped the rapid growth of agricultural production. The role of irrigation is of a catalytic agent because no farmer would invest on costly inputs like chemical fertilizers without assurance of the basic input, water, which is scanty in most parts of the country.

10.2 EXTENT OF IRRIGATION IN INDIA

Expansion of irrigation facilities along with consolidation of the existing system has been the main strategy for increasing production of foodgrains. Irrigation support is provided through major, medium and minor irrigation projects and command area development. With sustained and systematic development of irrigation, its potential has increased from 22.5 mha in 1951 to around 91 mha ha by 1999-2000.(see Table 10.1 for irrigation potential created up to 1994, and Tables 10.2 to 10.5 for related information).

Table 10.1 : Irrigation Potential Created and its Utilisation

(up to 1994; in thousand hectares)

State	Potential created			Potential Utilized			Percentage utilisation		
	1			2			3		
	a	b	c	a	b	c	a	b	c
	Major & Medium	Minor	Total	Major & Medium	Minor	Total	Major & Medium	Minor	Total
Andhra Pradesh	3039	2937	5976	3214	2649	5863	106	90	98
Arunachal Pradesh	-	70	70	-	54	54	-	77	77
Assam	179	591	770	116	524	640	65	89	83
Bihar	2796	5087	7882	2745	4329	7074	98	85	90
Goa	13	19	32	15	21	36	115	111	113
Gujarat	1281	1934	3215	1343	1803	3146	105	93	98

Agricultural Resources

Haryana	2058	1535	3593	1836	1479	3315	89	96	92
Himachal Pradesh	8	145	153	4	119	123	50	82	80
Jammu & Kashmir	174	368	542	150	351	501	86	95	92
Karnataka	1434	1480	2914	1308	1406	2714	91	95	93
Kerala	504	536	1040	669	487	1156	133	91	111
Madhya Pradesh	2025	2634	4659	1624	2372	3996	80	90	86
Maharashtra	2080	2493	4573	1307	2211	3518	63	89	77
Manipur	62	51	113	78	41	119	126	80	105
Meghalaya	-	45	45	3	38	41		84	91
Mizoram	-	11	11	-	9	9		82	82
Nagaland	-	66	66	-	56	56		85	85
Orissa	1444	1265	2709	1333	1116	2449	92	88	90
Punjab	2386	3319	5705	2570	3217	5787	108	97	101
Rajasthan	2047	2438	4485	1926	2317	4243	94	95	95
Sikkim		23	23		17	17		74	74
Tamilnadu	1550	2130	3680	1458	2120	3578	94	100	97
Tripura	3	92	95	1	79	80	33	86	84
Uttar Pradesh	6876	19912	26788	5897	17294	23191	86	87	87
West Bengal	1370	2872	4242	1614	2298	3912	118	80	92
All India	31329	52051	83380	29216	46486	75702	93	89	91

Source: Centre for Monitoring Indian Economy 1999

Table 10.2 : Percentage Distribution of Irrigated Area under Principal Crops (1995-96)

State	Rice	Maize	Wheat	Total Cereal	Total pulses	Total Food grain	Groundnut	Rapeseed & Mustard	Total Oil-seed	Sugarcane	Cotton	Tobacco	Total (all crops)
Andhra Pradesh	94.8	15	72.7	69.9	1.2	53.8	16.8	...	17.6	95	14.9	33.1	40.7
Bihar	40.2	40.5	88.4	52.2	2.2	47.1	...	33.3	20.6	22.4	...	73.7	45.7
Gujarat	5.6	9.6	74.4	34	10.8	29.6	9.5	97.8	27.4	100	36.1	73	32.7
Haryana	99.4	15.4	98.3	83.3	25.6	76.8	50	66.8	68.1	97.2	99.5	...	78.2
Jammu & Kashmir	91.2	5.9	24.2	39.4	15.6	38.4	...	79.7	70.6	...	...	...	41
Karnataka	66.8	65.2	33.8	26.6	3.9	21.6	20.5	16.7	19.5	100	23.6	3.4	23.8
Madhya Pradesh	23.7	1.3	68.1	32.7	21.2	29.3	6.7	45.3	7.2	97.3	33.1	...	24.7
Manipur	32.5	...	...	31.6	...	31.5	...	...	...	...	...	...	27.7

Nagaland	44.3	...	100	34.6	...	32.6	...	75	35.3	...	...	...	31.6
Orissa	35.5	10.8	100	33.2	6.8	25.4	34.5	16.1	13.9	100	...	10	25.8
Punjab	99.8	56.7	97.1	96.6	72.5	96.1	50	87.4	88.8	94.9	99.6	...	95.2
Rajasthan	38.6	13.5	94.6	30.2	9.8	24.1	35.2	73.4	56.9	96.4	98	100	32.3
Tamil Nadu	92	53.2	...	68.4	6.6	58.2	27.7	...	35.5	100	36.8	100	50.8
Uttar Pradesh	62.3	31.3	92.5	70.3	27.5	64.3	1.5	75.2	51.4	88.2	91.7	100	65.8
West Bengal	27.2	...	89.3	29.9	3.2	28.6	...	85.2	70.9	50	...	...	29.8
All India	56.1	22.7	86.8	47.1	13	40.5	18.1	66.3	26.1	88.5	34.8	48.8	38.3

Source: Agricultural Statistics at a Glance 1999

Table 10.3 : Source-wise Distribution of Net Irrigated Area

(in thousand hectares, for 1995-96)

S.N.	State	Source of Irrigation					Total
		Canals	Tanks	Tube-wells	Other wells	Others	
1.	Andhra Pradesh	1539	747	709	947	181	4123
2.	Assam	362	...	...	...	210	572
3.	Bihar	1099	140	1728	96	617	3680
4.	Gujarat	593	35	724	1642	8	3002
5.	Haryana	1375	1	1353	...	32	2761
6.	Jammu & Kashmir	364	2	1	1	18	386
7.	Karnataka	950	230	372	428	322	2302
8.	Kerala	107	49	73	...	113	342
9.	Madhya Pradesh	1796	205	874	2294	759	5928
10.	Maharashtra	538	369	...	1571	89	2567
11.	Orissa	949	305	299	537	...	2090
12.	Punjab	1356	...	2356	1	134	3847
13.	Rajasthan	1497	189	703	2797	46	5232
14.	Tamil Nadu	771	512	200	1127	15	2625
15.	Uttar Pradesh	3075	58	7771	390	381	11675
16.	West Bengal	717	263	689	23	219	1911
	All India	17142	3111	17937	11860	3460	53510

Source: Fertilizer Statistics, 1998-99, FAI, New Delhi.

According to a recent estimate the ultimate irrigation potential of India is about 140 mha. Contribution from major and medium irrigation projects will be 58.5 mha while minor irrigation has a potential of 81.5 mha. In the case of minor irrigation, 17.5 mha will be contributed by minor surface projects while 64 mha contribution will be from minor ground water projects.

It is estimated that the total annual precipitation over India is about 4000 *billion cubic metres* (bcm), which contributes 1,869 bcm to surface flow. But out of this surface flow, only 690 bcm (37 per cent) is utilized. The replenishable ground water potential in the country is 432 bcm. So the total utilizable water is 1122 bcm as per present estimates. You would have observed that most of the activities in irrigation sector in India have been construction driven, that is construction of reservoir, canal, field channel, etc. gets priority. Little attention has been paid to management of distribution of water for irrigation.

Table 10.4 : Outlay and Potential Created under Major and Medium Irrigation Projects

Period	Outlay: Expenditure (Rs. in crore)	Potential created during the plan (mha)	Cumulative potential created (mha)
Pre-plan period	Not available	9.70	9.70
First plan (1951-56)	376	2.50	12.20
Second plan(1956-61)	380	2.13	14.33
Third plan (1961-66)	576	2.24	16.57
Annual plan(1966-64)	430	1.53	18.10
Fourth plan (1969-74)	1242	2.60	20.70
Fifth plan (1974-78)	2516	4.02	24.72
Annual plan (1978-80)	2079	1.89	26.61
Sixth plan (1980-85)	7369	1.09	27.70
Seventh plan(1985-90)	1107	2.22	29.92
Annual plan (1990-92)	5459	0.82	30.74
Eighth plan (1992-97)	22415	5.09	35.83

Source: India 1996, Government of India

Table 10.5 : Potential Created and Utilised under Minor Irrigation Projects

Plan	Potential	Utilization
First Plan	14.1	14.06
Second Plan	14.8	14.8
Third Plan	17.0	17.0
Annual Plan	19.0	19.0
Fourth Plan	23.5	23.5
Fifth Plan	27.3	27.3
Annual Plan	30.0	30.0
Sixth Plan	37.5	35.3
Seventh Plan	46.6	43.1
Eighth Plan	10.7	9.4

Source: India 1996, Government of India

10.3 SOURCES OF IRRIGATION

A variety of structures comprise the Indian irrigation sector. These can be classified in more than one way:

- 1) major or minor irrigation
- 2) surface water or ground water bases
- 3) gravity flow or lift irrigation.

The first classification is peculiar to India as large-scale irrigation is under the head major and medium irrigation and small-scale irrigation under minor head.

According to the size, irrigation project may be

a) **Major Irrigation Project**

Having cumulative command area (CCA) of more than 10000 hectare or which cost more than Rs. 5 crore.

b) **Medium Irrigation Project**

Having cumulative command area less than 10000 hectare but more than 2000 hectare or which cost between Rs.20 lakh to Rs.5 crore.

c) **Minor Irrigation Project**

Having cumulative command area less than 2000 hectare or which cost Rs. 5 lakh in plain areas and Rs.30 lakh in the hills.

10.3.1 Sources of Minor Irrigation

The minor irrigation works include dug-wells, tube-wells, tanks, etc. Minor irrigation structures are created through tank, surface percolation wells, tube-wells and fluxial wells. The water source for a minor irrigation project could be either surface flow or ground water storage. While tank and pond irrigation are examples of surface flow, construction of well is an example of ground water storage.

a) **Tank irrigation**

Most of the irrigation tanks are located in Andhra Pradesh, Karnataka, Orissa, Tamil Nadu and West Bengal. These provide irrigation to gross area of about 4.5 mha. Tank is a multipurpose use source (pisciculture, ducking, washing, irrigation, flood control, agro-forestry, etc.) and has great importance particularly to maintain water supply to command area and to recharge ground water level.

b) **Tube-well and Filter point well**

Shallow tube-wells meant for irrigation are privately owned and tap shallow aquifers (groundwater storage). These are used to irrigate only a few hectares and have a life period of 5 to 15 years, while deep tube-wells generally tap deep aquifers and give a recharge of more than 125000 liters per hour and irrigate a gross area of 80 to 100 ha.

c) **Open-well.**

Open-wells are traditional sources of irrigation. The new wells constructed during any period do not make an addition to the total number to the full extent during

that period as some wells go out of use. Open-wells are the cheap source of irrigation water use where topography is undulating and canal water does not feed the area. Open-wells are basically privately owned and the potential for irrigation is also not much.

10.3.2 Sources of Major and Medium Irrigation

Big dams and barrages built across rivers are sources of major and medium irrigation. Major irrigation done through canal draws their water from rivers or from artificial storage. River canals are of three types.

- 1) Inundation canal
- 2) Perennial canal
- 3) Storage canal.

Check Your Progress 1

- 1) Define minor, medium and major irrigation.

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- 2) What are the sources of minor irrigation?

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- 3) What are the sources of major irrigation?

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10.4 MAJOR VERSUS MINOR IRRIGATION: COMPARATIVE ANALYSIS

Both major and minor irrigation projects have their potential for water resource exploitation. However, both the types are different in nature and have their comparative merits and demerits. Tube-well technology is technically not feasible in non-alluvial tracts, which constitute nearly 70 per cent of Indian landmass. The option in these undulating plateaus and non-alluvial tracts is runoff collection in ponds and other water harvesting structures under minor irrigation projects or canal irrigation system under multipurpose river valley projects.

The factors which help us to make a choice between minor and major projects are: i) the availability of funds, ii) topographic positions, iii) social preferences, and iv) environmental considerations. You would have observed that a major project requires huge investments while a minor project require a small amount. Moreover, hilly areas will require different type irrigation than plain areas. We will take into consideration factors such as capacity utilisation, gestation lag and resource requirements while undertaking a comparative analysis of both the types of irrigation.

10.4.1 Capacity Utilization and Efficiency

The 'potential created' under any irrigation system is the area supplied with water delivery facility. On the other hand, 'potential utilized' is the area that is practically supplied with irrigation water for at least one season. Difference between the two can arise because some areas are planned to have irrigation facilities, but do not receive irrigation water. When the area that actually receives water is less than the area planned for irrigation, we say that there is under-utilisation of capacity. The phenomena of 100 per cent efficiency is rare and is not a ground reality.

Studies have shown that for the minor irrigation project, the capacity utilisation is only to the extent of 80 per cent in a normal rainfall year. The percentage varies across states : 50-60 per cent in Orissa and Tripura, 60-70 per cent in Assam, Goa, Karnataka, Minipur, Meghalaya, 70-80 per cent in west Bengal, Tamil Nadu, Kerala, and Arunachal Pradesh.

Minor irrigation is a low cost option. However, studies have shown that the production impact of minor irrigation is double that of major irrigation. Minor irrigation is mainly covered by tube-wells wherever ground water is sufficiently available. Different studies reflect that the rate of capacity utilization in the tube-wells averaged at 67 per cent for shallow tube-wells and 72 per cent for deep tube-wells. Capacity utilization in major irrigation projects is reported to be somewhat lower than that of minor irrigation. Sometimes it comes down below 60 per cent as conveyance loss, evaporation loss and field losses are more in major projects. However, situation may be completely different depending upon conveyance and distribution systems in each command.

Minor irrigation is mostly in private sector. Here benefits accrue directly to the owner. Thus proper maintenance of the project and management of water is taken care of. On the other hand, major and medium irrigation projects are generally owned by the government. Here it does not costs a farmer if there is mis-management or excess use of water. This appears to explain the higher efficiency of minor irrigation.

10.4.2 Gestation Period

The time lag between the investment and the return from development projects is called gestation period. The gestation period of irrigation projects is found to be very high as administrative and technical problems are compounded with legal problems. Many irrigation projects, especially large and medium ones, suffer from gestation lags.

In some cases the gestation lag exceeds two decades resulting in severe cost and time overruns. A medium scheme can generally be completed between 5 to 7 years. However, gestation period differs from project to project depending upon factors ranging from availability of finance to technical difficulties and now a days environmentally conscious groups or individuals.

In normal course of action also the gestation lag itself may vary over time. For a major project it may vary from 10 to 12 years if timely funding is available. In cases where funding and other constraints are present, the gestation lag could stretch up to 20 years. On the other hand, in the case of minor irrigation projects, the gestation period is usually one to two years. However, it depends upon availability of funds and organizational ability to get the project running.

Now a days, under different poverty alleviation programmes emphasis is given on minor irrigation projects as the gestation period, environmental impacts and investments are less. The gestation lags also may arise due to slow adaptability of irrigated agricultural practices by beneficiary farmers. The longer gestation period lead to cost and time overruns making the project often financially non-viable.

10.4.3 Cost Comparison

It is debatable whether minor irrigation is more cost efficient than major irrigation projects. The Planning Commission has estimated that investment needed for irrigating one hectare of land was Rs.1,530 in the Fifth Plan. It increased to Rs.36,210 per hectare in the Ninth Plan. For minor projects the cost of irrigation per hectare cultivated land was Rs.7331. However, the estimates are non-comparable as the values are expressed in the prevailing market prices of that period not adjusted for inflation over the years.

The cost of the major irrigation projects involves total capital investment for the construction of the reservoirs, dams, canal and conveyance systems up to the plot of land. The cost of the minor irrigation project involves the capital investment on the construction of the tanks, wells or tube-wells and the conveyance system. It is estimated that the project cost of minor irrigation project is around Rs.5 lakh for plain areas and Rs.30 lakh for hills. The cost of major irrigation project involves capital expenditure of around Rs.5 crore.

We present a summary of the distinction between major and minor irrigation projects in Table 10.6.

Table 10.6 : Major versus Minor Irrigation Projects

Major irrigation project	Minor irrigation project
1. Gestation period is high	1. Gestation period is low.
2. Investment cost and maintenance costs are very high.	2. Investment cost and maintenance costs are low.
3. Investment cost is more than Rs. 5 crore.	3. Investment cost is Rs. 5 lakh to Rs. 30 lakh.
4. It covers an area about 10,000 ha or more.	4. It covers an area about 1000-2000 ha or less.
5. Benefit-cost ratio of major irrigation project are generally less compared to minor irrigation project as the loss of water due to seepage, over use, unnecessary use of irrigation water and larger externalities.	5. Benefit-cost ratio of minor irrigation projects are generally higher than major irrigation projects due to less wastage of water by seepage and other means.
6. It has been observed that in the world as a whole, as much land goes out of production owing to water logging and salination every year as is brought under production through new projects	6. Depletion of natural aquifers is the major problem.
7. The costs over-run are much greater.	7. The costs over-run are less.

1) What are the reasons behind higher production impact of minor irrigation projects?

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2) Contrast minor irrigation with major irrigation with respect to capacity utilisation, gestation lag and investment cost.

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3) Bring out the distinguishing features of minor and major irrigation.

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10.5 IRRIGATION MANAGEMENT

A serious problem experienced often in irrigation works is the inability of the system to deliver the planned benefits owing to a variety of unforeseen developments. For instance, in storage reservoirs, sedimentation has been taking place at a much faster rate than was provided for in the project planning, resulting in diminution of storage space and its benefits. Canals have not been able to carry the authorized flows because the assumptions made or the design could not be achieved on the field. Canal cross regulators and flood disposal works provided were found inadequate for efficient functioning of the canal in many cases.

While irrigation has significantly influenced agricultural productivity, the yields are distinctly low with respect to international norms in most of the irrigated crops in the country. The average cereal yields (paddy, wheat, etc.) of 1.7 tonnes per ha achieved in India falls well below the international norm of 3 to 4 tonnes realized in well managed systems of the world. The gap is attributed to a number of factors such as: i) sub-optimal use of inputs, ii) obsolete cultivation practices, and iii) inefficient irrigation management. Given the sensitivity of crops to water stress and excess water and their effects on yield, irrigation management emerges as a major determinant of agricultural productivity.

The common problems of flow irrigation (canal) management are:

- a) excessive canal seepage
- b) inadequate water supply at tail end
- c) insufficient drainage and water logging
- d) main system deficiency
- e) improper cropping pattern and crop calendar
- f) lavish use of water
- g) inadequate maintenance
- h) poor revenue generation.

10.5.1 Shortage of Funds

Due to shortage of funds in most instances of major projects, the storage works or reservoirs were completed much ahead of the canal system. This resulted in abundant water availability for the limited areas opened for irrigation. As a result, the cropping pattern got distorted in favour of high water consuming crops irrespective of the suitability of the soil. In such situations the development of canals to its full length as originally planned will become difficult. The head-reach beneficiaries would appropriate excessive water due to cultivation of water-intensive crops. On the other hand, the tail-end beneficiaries may not get adequate amount of water as planned.

10.5.2 Utilisation Efficiency

While the role of irrigation in India's increased agricultural production is impressive, there is a need for retrospection to meet the future requirements of a continuously rising population. Since the 1950s, the aggregate growth rate of agricultural production has increased considerably. However, the present strategies may lead to stagnancy after a time calling for something new. In this context increasing the efficiency of irrigation is an important option. For sustained growth of agricultural production, irrigation will have to play a notable role commensurate with the high investment made in it.

It is estimated that the demand for food in future (2025 AD) will be around 345 million tonnes in India. That has to be met from rain-fed and irrigated farming. The national average yield from rain-fed agriculture is 1.25 tonnes per hectare and from irrigated agriculture it is 2.75 million tonnes. It has been estimated that 198 million tonnes of foodgrains will have to be produced from irrigated agriculture and 148 million tonnes from rain-fed agriculture.

Another point to be kept in view is that while there is significant decline of the share of agricultural sector in the GNP, the proportion of households dependent on agriculture has remained nearly constant. Irrigation activities will have to aim at the improvement of economic condition of farmers through better irrigation management practices and by extending benefits to new areas.

10.5.3 Pricing of Irrigation Water

In India irrigation water is not economically priced, as the present prices do not reflect scarcity value of water. The Vaidyanathan Committee recommended pricing of water as per the principle that can cover at least operation and maintenance cost and a part of capital cost. The Irrigation Commission in 1972 had recommended irrigation rates for cereal crops at 5 per cent and for cash crops at 12 per cent of the output. Presently the total receipt from irrigation sector does not cover even 2% of the gross

output. However, farmers using water from private sources are paying much more than those depending on the publicly supplied irrigation water. The ability and willingness to pay has not been properly projected in the projects. The uneconomic pricing of irrigation water and electricity have induced the farmers for profligate use of precious water resulting in severe externalities like salinity and water-logging. Different committees have recommended that irrigation price should be increased to a level such that at least operation and maintenance cost and 1% of capital cost are recovered from beneficiary farmers.

10.6 ENVIRONMENTAL EFFECTS OF IRRIGATION

Irrigation results in an alteration of natural condition of the landscape by i) extracting water from the available sources, ii) adding water to fields where there was none or little, and iii) introducing man-made structure and features to extract, transferring and dispose of water. Irrigation projects and irrigated agriculture practices can impact the environment in a variety of ways, viz.,

- a) Construction of irrigation projects
- b) Water supply and operation of irrigation projects
- c) Irrigated agriculture management practices

The consequences of minor and major irrigation could be different. In case of major irrigation there could be:

- a) Relocation of the population of the area to be inundated
- b) Negative impact on wildlife, particularly endangered and archeological patrimony
- c) Relocation of the infrastructural system, i.e., roads, powerline, canal, etc.
- d) Use of hazardous materials during the construction of large dams
- e) Soil erosion and subsequent transport of sediments through runoff of excess irrigation water from croplands.

10.6.1 Displacement of Population

The gigantic dams costing hundred of crore of rupees have caused a great deal of harm to the people and environment. They displace crores of innocent people, mostly tribals and the poor. These projects have drown millions of hectares of rich forest. They have failed to prevent and control floods. Often panic discharges from these reservoirs have led to destruction through floods in the valley downstream. The average annual loss due to flood on standing crop, cattle, agricultural lands, houses, roads, railways, embankments, cottage industries, etc. are estimated to be anywhere between Rs.1000 crore to Rs.1500 crore.

In recent times, no major irrigation project has gone without protest. This has delayed the timely completion of projects and resulted in cost over-runs.

10.6.2 Destruction of Habitat

Large dams and multi purpose river valleys have become India's most controversial environmental issues. The construction of large dams in India has resulted in depletion of thousands of hectares of forest land causing destruction of natural habitat of wildlife.

Construction of large dams (major irrigation project) involves huge forest cutting for the water reservoir. It also involves huge digging of soil and displacement of soil for reservoir construction. Huge loss of forest and soil accounted for the major and medium irrigation project construction and developments.

10.6.3 Impact of Minor Irrigation

Because of the localized nature of minor irrigation the above problems may not arise. However, there could be depletion in water table because of excessive extraction of water from under-ground sources, particularly through deep tube-wells. Groundwater development for irrigation purpose and its excessive use has given rise to problems of groundwater depletion. In Punjab, for example, pumping exceeds recharge by 33 per cent causing water-table to drop by about 1 meter per year.

In coastal areas there could be damage to groundwater resource due to ingress of sea water into inlands. Stocks of weed water, such as intrusion from naturally brackish groundwater into adjacent normal groundwater reserves are also reported from arid land tracts of Haryana, Rajasthan and Northern Gujarat.

Another major externality pertains to ground water depletion due to cultivation of water intensive crops in low rainfall areas by using ground water reserves. The quality and quantity of ground water has changed over the years. In fact better part of the cropping potential developed after Independence comes from well-irrigation and not from canal irrigation. Stories of receding water table have emanated from many pockets in northwest and southern India. A receding water table not only means higher capital and operational cost of irrigation in future but also lesser reservoir of ground water resources to fall back upon during drought year.

10.7 PROBLEM OF SALINITY AND WATER-LOGGING

Salinity is one of the most serious problems facing irrigated agriculture. Salinity is linked with the rise in ground water tables resulting from excess irrigation and poor drainage in major irrigation systems. The resulting shallow water table brings salt to the upper layers of the soil profile. The increase in salinity in some areas like Haryana, Punjab, western Uttar Pradesh results from unscientific water application in high water intensive cereal crops. Followed over a period of time with the consequent result of rising ground water table in canal-irrigated areas or increase in surface return flows causes increase in salinity. The problem of soil salinity because of canal irrigation was widely reported in western-Yamuna canal command area. It is estimated that 15 to 20 per cent of net sown area in India suffer from soil salinity or alkalinity.

Technological options are available for checking salinity problems. Scientific water pricing, on-farm development including precious land leveling, appropriate crop-mix and improved water application (like drop or sprinkler) reduces salinity effect. Salt scrapping, gypsum application, rescheduling irrigation, use of farmyard manure, kharif fallow methods are followed for contriving salinity problems. The use of brackish underground-water is checked through policy measures. Irrigation induced soil salinity problem in arid and semi-arid area result in loss of 2,00,000 to 3,00,000 hectares of irrigated areas every year because of soil salinity and water-logging. In India around 13 million hectares of irrigated land suffer from soil salinity and water-logging. The result of salinity is reflected in decline in production potential of important agricultural crops in fertile irrigated areas.

Surveys in different canal commands of the country corroborate the fact that there has been severe crop loss due to faulty water management practices. Improving water use efficiency in water delivery system, main distributaries and minor systems can check excessive water use and related problems like salinity, and water-logging. Withdrawing ground water may cause the land to subside, aquifers to become saline or may accelerate other type of ground water pollution.

Canal related water-logging–salinity affected 6 out of 20 mha under canal commands as reported by B. D. Dhawan. The adverse externalities of irrigation emerges from

water-logging and salinity related problems in canal command areas and excessively used groundwater areas with increasing canal development activities. In the post-independence period the area under water-logging and salinity has been increasing.

10.8 SUGGESTIONS FOR BETTER WATER MANAGEMENT

Balanced development of irrigation sector, duly recognizing hydrological linkage between surface water and ground water resources, should be the aim of Indian irrigation planning. The demand for water for irrigation is ever increasing because of the rising population. Storing, diverting, and conserving or managing usable water resources efficiently can meet the demand. Continuous efforts need to be made to utilize the scarce water resources scientifically, judiciously and economically. It is suggested that there should be a close integration of water use and land use policies. Water allocation in an irrigation system should be done with due regard to equity and social justice. Disparities in the availability of water between head-reach and tail-end in all the systems of irrigation network like main canal, branch, distributary and scheduling of canal water supply should be minimized. Disparity between large and small farms should be obviated by adoption of a rotational water distribution system and supply of water on volumetric basis subject to certain ceiling.

The methods to be used for better water management are:

- Drip irrigation can be used for horticultural crops for water saving and better yields.
- Sprinkler irrigation can be used for closely spaced crops such as millets, pulses and oilseeds. Large-scale adoption of sprinkler in canal and tank irrigation project is necessary to use water efficiently and to increase the productivity.
- Diversification of crops and cropping pattern based on the availability of water/rainfall in the canal and tank irrigated areas should be followed.
- Farmer should avail proper information about the availability of water for rational planning of the crop husbandry.
- Drainage system should be well developed and care should be taken of the conveyance channel.
- Large scale adoption of micro irrigation in well-irrigated areas for wide spread high value crops such as coconut, banana and grapes may be taken up.
- Adoption of pipelines even in the canal command areas to minimize water losses can be a good proposition.

Further these are some of the factors that deserve special attention for the implementation and smooth functioning of irrigation projects:

- i) Checking the diversion of investible funds to subsidise payments (including hidden subsidies in canal irrigation) and to meet profligate ministerial and other government expenses.
- ii) Minimization of environmental effects of big dam projects
- iii) Eliminating the mounting inefficiencies in projects implementation (e.g., large time and cost over run) and in the management and maintenance of canal.
- iv) Resolving speedily interstate water disputes.

Apart from removing hindrance from the apex level, the base level should be strengthened for efficient water use. The following suggestions are given for the

optimum water use from the available sources:

- a) Making the maximum use of rainfall for raising crops, utilizing irrigation for making up deficiencies.
- b) Adoption of most suitable cropping pattern considering soil, climate and availability of irrigation supplies.
- c) Making most efficient use of irrigation supplies by minimizing losses in conveyances by lining and adopting scientific methods of irrigation on properly prepared fields.
- d) Deployment of irrigation supplies for maximum overall production and not necessarily maximum yields.
- e) Reuse of water to the extent feasible.
- f) Conjunctive use of surface water and ground water in accordance with precipitation in canal command areas.

10.9 COMMAND AREA DEVELOPMENT PROGRAMME

The central government sponsored Command Area Development Programme since 1974-75 with objectives of bridging the gap between creation and utilization of irrigation potential has been optimizing agricultural production from irrigated land in different states. Accordingly Command Area Development Authority (CADA) was created for effective conveyance of water to fields, drainage and on-farm development works. The programme broadly covers construction of field channels, land levelling, field drains and introduction of *warabandi* for rational supply of water to ensure equitable and assured supply of water to each and every farm holding. It also includes arrangement of supply of inputs and credits, agricultural extension, construction of markets and go-downs, and development of ground water for conjunctive use.

Prima facie, there is a vast scope for achieving improved yields from irrigated agriculture by introducing scientific water pricing method. Water Users' Associations are being formed in different states under the command of minor canals for better distribution of irrigation water. Water Users' Associations will have to be sponsored, encouraged, evaluated and replicated on an extensive scale. Research and development will have to be deployed widely for evolving various engineering and other strategies suitable for a variety of situations existing in the country. While government departments and agencies should provide overall guidance, direction, coordination and funding, the non-governmental organizations functioning in the field will all have to be involved in the task of organising the people and extension activities. It is now generally recognized that farmers' participation in management would go a long way in promoting sound water management practices. But the steps taken so far are in no way commensurate with the task ahead. The maxim of "some for all rather than more for some", which is particularly valid for irrigation systems can be achieved only through meaningful participatory management.

Check Your Progress 3

- 1) What are the environmental impacts of major irrigation projects?

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2) Why does the problem of salinity take place? How can we tackle this problem?

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3) What steps should be taken towards better management of irrigation water?

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4) What is the role of farmer and farmer associations in better water management?

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10.10 LET US SUM UP

Land under irrigation in India has increased from 22 million ha in 1951 to 90 million ha by the end of the Eighth Plan. This has helped in realizing a higher growth in foodgrains and yield. The irrigation potential of the country, however, are limited and the option of dry land farming needs to be considered.

Irrigation in India has resulted in number of environmental problems. Construction of large dams has resulted in loss of forest-land, displacement of people and resettlement problems. On the other hand, excessive extraction of ground water in low rainfall areas has resulted in depletion of water table.

The dream to touch the maximum feasible area of 113 million ha in 2005 AD can only be realized by water saving and using improved methods for surface irrigation. Drainage (removal of excess water from root zone) is as important as irrigation and proper action should be taken to provide drainage channel to remove excess water.

10.11 KEY WORDS

Salinity : Due to excess flow of water the water table comes up within three meters of the land surface. As a result, salinity of the land increases and productivity of land decreases.

Warabandi : According to this practice plots of land will receive irrigation water on stipulated days and not on other days. Thus excess water use in head-reach plots can be checked. This will lessen the excess water related problem such as salinity.

10.12 SOME USEFUL BOOKS

Dhawan, B. D., 1988, *Irrigation in India's Agricultural Development*, Sage Publications, New Delhi.

Mal, P., 2001, *Infrastructure Development for Agriculture and Rural Development*, Mohit Publications, New Delhi.

Ministry of Agriculture, 1999, *Agricultural Statistics at a Glance*, Government of India.

Mishra, K. M., 1990, *Irrigation and Economic Development*, Ashish Publishing House, New Delhi.

10.13 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Go through Section 10.3 and define these concepts on the basis of command area.
- 2) Read Sub-section 10.3.1 and answer.
- 3) See Sub-section 10.3.2 for the answer.

Check Your Progress 2

- 1) Go through Sub-section 10.4.1 and answer this question.
- 2) Read Section 10.4 and answer.
- 3) Bring out the distinct features of minor and major projects on the basis of Table 10.6.

Check Your Progress 3

- 1) Discuss the issues of displacement and destruction of habitat.
- 2) Read Section 10.7 and answer.
- 3) Read Section 10.8 and answer.
- 4) Read Section 10.8 and bring out the issues which can be tackled by the farmers.

UNIT 11 DRYLAND FARMING AND AGRO-CLIMATIC ZONING

Structure

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Concept of Dryland Farming
 - 11.2.1 Nature of Rainfall in India
 - 11.2.2 Need for Dryland Farming
- 11.3 Policies and Incentives for Dryland Farming
 - 11.3.1 Rain-water Management
 - 11.3.2 Crop Production Technology
- 11.4 Need for Agro-Climatic Zoning
- 11.5 Agro-Climatic Zones in India
 - 11.5.1 Agro-ecological Regions by ICAR
 - 11.5.2 Agro-Climatic Regions by Planning Commission
 - 11.5.3 Agro-ecological Regions by NBSS and LUP
- 11.6 Biotechnology for Agriculture
- 11.7 Let Us Sum Up
- 11.8 Key Words
- 11.9 Some Useful Books
- 11.10 Answers/Hints to Check Your Progress Exercises

11.0 OBJECTIVES

After going through this Unit, you will be in a position to:

- explain the importance and features of dryland farming;
- summarise the policies, incentives, programmes and projects of government and non-government agencies towards dryland farming;
- explain the significance of agro-climatic zoning;
- identify various agro-climatic zones in India as categorized by different agencies; and
- appreciate the applicability of biotechnology in the field of dryland agriculture.

11.1 INTRODUCTION

We learnt from the previous Unit that irrigation potential of India is limited and all cultivable land cannot be irrigated. Thus a large part of the cultivated area has to depend upon natural rainfall. Therefore, we have to look into the prospects of rain-fed farming. Given the fact many parts of the country receive scanty rainfall we have to develop appropriate technology for these regions.

The importance of dryland farming can be appreciated from the following:

- In India rain-fed area accounts for 74% of the total cultivated area and contributes substantially to agricultural production. Out of the total 144 mha cultivated area, only 37 mha (26%) are irrigated and rest are rain-fed.
- Dryland area contributes about 44% of total foodgrain production and about 75% of pulses and oil seeds.
- A large number of industrially important crops such as cotton, and groundnut are cultivated under dryland condition.

11.2 CONCEPT OF DRYLAND FARMING

Dryland farming is the practice of crop production entirely with rainwater received during the crop session. In low rainfall areas of arid and semi-arid climates the crop may face mild to very severe moisture stress during its life cycle. A dryland crop refers to a crop grown on well-drained soil where the ground water remains far below the soil layers occupied by the crop root throughout the year. The water requirements of the crop are thus satisfied solely by natural rainfall, i.e., surface soil moisture from precipitation is the primary source of moisture for the crop.

11.2.1 Nature of Rainfall in India

There is wide variation in the amount of rainfall received in different parts of India. It is as low as 10 cm in western Rajasthan and up to 1000 cm in Meghalaya. India receives an average annual precipitation of 400 million hectare metres (mhm), of which 70 mhm is lost through evaporation. Of the remaining 330 mhm, around 150 mhm is absorbed by the soil while 180 mhm constitutes the run-off. Of the 180 mhm run-off, we have been able to utilise only 20 mhm through construction of reservoirs and watersheds. Thus about 160 mhm of water is left as run-off to the sea through the rivers.

Nearly 80% of the total rainfall is received during the period July–September (about 90 days) in India. The amount of rainfall and its distribution during the rainy season determines the yield and production of crops. Factors such as: i) late onset of monsoon, ii) long dry spells during the season, and iii) early withdrawal of monsoon adversely affect production.

The amount of rainfall, its distribution, and water retention capacity of soil determines the ‘crop growing period’ in rain-fed areas. You will be surprised to know that growing period varies from 30 days to 300 days in India. Thus we have to select crops and cropping pattern keeping in view rainfall and soil quality in view.

Depending on the amount of rainfall received, farming in rain-fed areas can be of four types: i) Arid areas where rainfall is less than 50 cm per annum, ii) semi-arid areas with an annual precipitation of 50-75 cm, iii) sub-humid areas where precipitation is between 75-150 cm, and iv) humid areas with an annual rainfall of above 150 cm. In the arid and semi-arid areas there are prolonged dry spells during the crop growing period. Crop failures are more frequent in the arid and semi-arid areas. In the sub-humid areas there are dry spells during crop period, but the probability of crop failure is comparatively less. In the humid areas the probability of crop failure is rare but drainage of rain water is a major problem.

Apart from rainfall, two important factors responsible for increasing yield in rain-fed areas are: i) soil quality, and iii) availability of appropriate crop variety. In order to increase yield and production in rain-fed areas efforts have been made in two directions: i) the cultivable area of the country has been categorised into several homogeneous agro-climatic zones, and ii) research and development (R&D) efforts have been made to develop crop varieties and cropping pattern suitable for different agro-climatic regions. In this respect application of bio-technology in agriculture has played an important role. We will discuss about these two aspects later in this Unit.

11.2.2 Need for Dryland Farming

Dryland farming is the only way to utilize a vast geographical area with abundant sunshine and moderate fertility of soil. The productive capacity of these areas has not been exploited properly thereby keeping these areas as economically backward. As a result, economic and social inequalities among the farming community have gone up across regions.

The philosophy of dryland farming revolves around the principle that water is a limiting factor and one needs to maximize the efficiency of natural rainwater for crop production. The need for scientific approach towards farming in rain-fed areas is felt with the realization that the occurrence of drought is more or less inevitable. In rain-fed areas, emphasis has to be given on matching the crop to the soil and water availability and not vice-versa as it is with irrigated farming. Dryland farming has two dimensions:

- Growing and managing crops that can be profitable under the rainfall deficient years, during which drought tolerance and efficient water use are the main requirements.
- Growing and managing crops that are capable of making the best and efficient use of favourable environmental conditions provided during the good rainfall years.

Because of the uncertain nature of water availability in rain-fed areas, the risk of crop loss is higher. Such risks can be minimized by adoption of short-duration HYV and water-efficient crops. Moderate application of fertilizer containing nitrogen and phosphorus improves water efficiency. It is found that fertilizer helps the crops in withstanding the adverse effects of drought. It also recovers faster from drought when relieved from stress. You might be aware that weeds compete with crops for moisture and nutrients. Therefore, a weed free field for the first 30 to 40 days is crucial as they can cause a loss of 50 per cent to crop yield.

11.3 POLICIES AND INCENTIVES FOR DRYLAND FARMING

India experienced a rapid expansion in agricultural research system during the 1960s. During this period, however, the major concern was to increase agricultural production. Thus emphasis was given on development of crops suitable for the more fertile and irrigated areas. The development strategy of this decade is reflected in the Green Revolution that took place.

However, during the 1970s there was an emphasis on development of rain-fed areas. All-India Coordinated Research Project for Dryland Agriculture (AICRPDA) was initiated in 1970 at 23 centres representing different agro-climatic regions. Presently India has one of the strongest agricultural research system in the world. There is a network of 49 research institutes, 30 national research centres, 29 agricultural universities, 10 Project Directorates and a large number of All-India Coordinated Projects involving more than 24000 agricultural scientists and teachers.

Efforts on development of dryland farming have put emphasis on: i) rain-water and soil management, and ii) crop production technology. In order to increase production in rain-fed areas the government has taken several measures to harvest rainwater. Several schemes and projects on watershed development are going on in the country.

11.3.1 Rain-water Management

The planners have started realizing that it is quite difficult to obtain any incremental production from the conventional Green Revolution areas. For the second Green Revolution it is necessary to make the gray areas green. Hence emphasis has shifted to rain-fed areas, especially in the Eastern and arid peninsular India. Six programmes and projects have been launched for utilization of the potential of dryland areas. The objectives are:

- i) Realisation of the projected requirement of about 240 m tons of annual food grain production and smoothen out annual fluctuations of food grain yield.

- ii) Reduction in regional disparities between irrigated and vast rain-fed areas.
- iii) Restoration of ecological balances by greening rain-fed areas through appropriate mixture of trees, shrubs and grasses, and
- iv) Generation of employment for rural masses and reduction in large-scale migration from rural areas to already congested cities and towns.

These projects are as follows:

A) National Watershed Development Project for Rain-fed Areas (NWDPR)

The National Watershed Development Project for Rain-fed Areas (NWDPR) was launched in 1990-91. It covers 25 states and two union territories. The project started with the objectives of restoring ecological balance in rain-fed areas and sustainable biomass production. It focuses on:

- a) Conservation, up-gradation and utilization of natural endowments in an integrated manner with low cost replicable technology.
- b) Generating employment opportunities for the poverty stricken rural masses in the Rain-fed areas through directly involving the farmers and watershed beneficiaries in the planning and execution of all project works in the watershed by developing self-help groups.

Under this project the target was set for treating an area of 28 lakh hectares at a cost of Rs. 1100 crore.

B) World Bank Assisted Watershed Development Projects

The integrated watershed development projects (IWDP) has been in operation since 1991-92. The main objective of the project was to slowdown and reverse degradation of natural environment through the use of appropriate utilization of soil and moisture conservation technology and improved production methods.

C) Agricultural Development Project

The Agricultural Development Project (ADP) with the assistance from the World Bank is being implemented in various states to enhance sustainability in agricultural development and dryland agriculture.

D) DANIDA Aided Projects under Dryland Farming

The Government of Denmark launched integrated watershed development project in the state of Karnataka in 1990-91. Later on it was spread to various states. The second phase of this project has been negotiated and project became operational from 1995.

E) European Economic Community Assisted Project

European Economic Community assisted integrated watershed management project has been in operation since 1989.

F) Swiss Development Corporation Assisted Project

The project aims to develop 5 watersheds in five districts of Karnataka through the on-going participatory integrated watershed development project (PIDOW). It is in the process of extension to other states.

11.3.2 Crop Production Technology

Efforts in the direction of crop production technology have concentrated on development of high-yielding and appropriate varieties of crops and implements. Varieties of short-

duration crops in sorghum, millet, cotton, pulses, etc. have been developed to match the short growing season of rain-fed areas. In spite of the fact that these crops yield less fodder, these are readily accepted by the farmers, because of higher yield and response to fertiliser application and crop management.

The drills plough, which is simple and suits animal power is affordable by small and marginal farmer and it accelerates seeding. It requires one-third labour and covers two times more area compared to traditional seeding. It can be manufactured with locally available materials at a cost of around Rs.400.

In addition to development of crop varieties, research on appropriate cropping system is also going on. Research on resource use optimization has led to the development of a number of alternative land use options which bring about stability by distributing risk among crops. These include tree or pasture based cropping in harmony with agriculture on catchment basis. Agro-forestry, horticulture, etc. are typical examples of alternative land use system. Multi-value crops that generate food, ensure uninterrupted supply of fuel and fodder, and are environment friendly have been identified. Besides stabilizing productivity, alternative land use systems also moderate the impact of drought.

Check Your Progress 1

1) What is the need for dryland farming?

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2) What are the different types of rain-fed areas?

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3) What are the important projects undertaken for development of rain-fed areas.

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11.4 NEED FOR AGRO-CLIMATIC ZONING

An agro-climatic zone refers to areas having similar climatic conditions. The extent of rainfall, soil quality, moisture level, etc. make it suitable for a certain range of crops.

The purpose of climatic classification is to: i) study the climate systematically, and ii) understand its general patterns and ecological conditions. It also helps in making reliable estimates of agricultural potential, and deciding issues related to technology

transfer suitable to each of the climate zones. As it is not possible to replicate every experiment on every farm in each agro-climatic zone, a representative site is chosen and results are extrapolated to other sites of similar conditions.

The identification of agro-climatic zones helps us in devising land and water development strategies so that balanced agricultural development is achieved. It also helps in development of location specific research and development strategies. As a result, appropriate crop varieties and cropping patterns for each region are identified. It helps in planning for non-crop based agricultural activities like forestry, animal husbandry and fisheries and in identification of appropriate development projects and financial resources for each region.

You will see later in Unit 13 that Green Revolution resulted in wide regional imbalances in agricultural development during the 1960s and 1970s. Rain-fed areas remained untouched by Green Revolution which necessitated agricultural planning based on agro-climatic zones.

From macro-planning perspectives the main objectives of agro-climatic zoning are: (i) realization of a broad demand-supply balance in major commodities at the national level, based on potential and prospects of various zones, (ii) increase the net income of farmers, (iii) generation of additional employment, particularly for the landless labourers, and (iv) development of a framework for the scientific and sustainable use of natural resources particularly land, water and forests, in the long run.

Thus the important aspects of planning in agro-climatic Zones are:

- a) *Crop planning*: Diversification and introduction of high value crops, evaluating their suitability on particular land mass.
- b) *Irrigation plan*: Development of irrigation plans based on the agricultural and climatic condition.
- c) *Research and Development*: Development of location specific high yielding strains of crops and livestock keeping in view the suitability of climatic condition and land mass position.

The Ninth Plan strategy for agriculture is based on a 25 year Perspective Plan for the Development of Rain-fed Areas. Emphasis is being laid on a regionally differentiated strategy. Broadly at the macro level these regions are grouped into four Agro-Economic regions:

- a) High productivity zone, having either high level of irrigation or low rainfall with low irrigation situations. Usually these areas have a low incidence of poverty.
- b) Low productivity zone, having relatively high rainfall, low to medium irrigation and high productivity potentials, but high level of poverty at present;
- c) Low Productivity zone, having low rainfall, low irrigation, low level ground water, and high incidence of poverty
- d) Agro-ecologically fragile zone, having low productivity, high run-off, and soil erosion. The areas include North Western Himalayas, North-East, deserts of Rajasthan, and drought-prone Gujarat.

11.5 AGRO-CLIMATIC ZONES IN INDIA

Several attempts have been made to delineate major agro-ecological regions with respect to soil quality, climatic condition and natural vegetation. Various agencies have attempted classification of agro-ecological regions. Some of these agencies are:

- i) Agro-ecological regions by the Indian Council of Agricultural Research (ICAR)

- ii) Agro-climatic regions by the Planning Commission
- iii) Agro-ecological regions by the National Bureau of Soil Survey and Land-use Planning (NBSS & LUP)

We discuss these zones below.

11.5.1 Agro-ecological Regions by ICAR

The ICAR has classified India into eight agro-ecological regions. These are as follows:

- i) Humid Western Himalayan Region: It consists of Jammu and Kashmir, Himachal Pradesh and Uttaranchal. It is characterised by high mountains and low valleys. The climate varies from hot to sub-humid tropics in the south to temperate- cold-arid in the north with rainfall ranging from 80 cm to 100 cm.
- ii) Humid Bengal Assam-Basin: It consists of West Bengal and Assam representing Ganga-Brahmaputra alluvial plain. It is characterized by semi-stabilized sand dunes on alluvial terraces, latrite remnants in the west and numerous creeks and swamps in the deltaic tract. The rainfall ranges from 220cm to 400 cm.
- iii) Humid Eastern Himalayan Region and Bay Islands: It consists of Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya and Andaman Nicobar island. It includes the eastern Himalayan and Arakan ranges with a wide range of elevation. The rainfall ranges from 200 cm to 400 cm.
- iv) Sub-humid Sutlej–Ganga Alluvial Plains: It comprises Punjab, plains of Uttar Pradesh, Delhi and Bihar. The rainfall ranges from 30cm to 200 cm. The soils are highly disturbed in Bihar due to frequent floods.
- v) Subhumid to humid eastern and south-eastern uplands: It comprises Orissa, Andhra Pradesh and Chhatisgarh. It is characterized by undulating topography, denuded hills, plateau, river valley and highlands. The rainfall ranges from 100cm to 180 cm.

Table 11.1 : Rainfall and Soil Types by ICAR

Agro-climatic Region	Average annual rainfall (in cm)	Soil Type
Humid Western Himalayan Region	80-100 cm	Sandy loam, loamy and acetic sub mantle, loamy brown hillsoil
Humid Bengal Assam basin	220-400 cm	Alluvial, red and brown soil
Humid Eastern Himalayan Region and Bay Islands	200-400 cm	Red yellow alluvial and acidic latrite
Sub-humid Sutlej Ganga alluvial plain	30-200 cm	Alluvial, saline and alkali soil
Sub-humid to humid eastern and south eastern uplands	100-180 cm	Mixed black, red, yellow, red sandy, latrite, black alluvial soil
Arid Western plains	10-65 cm	Alluvial, black, latrite, mixed red and black soil
Semi -arid lava plateau and central highlands	330-750 cm	Alluvial, black latrite, mixed red and black soil
Humid to semi arid Western Ghats and Karnataka plateau	60-300 cm	Black, red, latrite and alluvial soil

- vi) Arid Western Plain: It includes Haryana, Rajasthan, Gujarat and Dadra Nagar Havelis. It is characterized by alluvial plain with sand dunes, saline depressions and granite hills. The rainfall in this region ranges from 10cm to 65cm.
- vii) Semi-arid lava plateau and central highlands: It comprises Maharashtra, Goa, Daman Diu and Madhya Pradesh. The rainfall ranges from 70 cm to 125 cm except in the Western Ghats where it varies from 330 to 750 cm. Major soil groups are alluvial, black, laterite, mixed red and black, and yellow brown.
- viii) Humid to semi-arid western ghat and Karnataka plateau: It consists of Karnataka, Tamil Nadu, Kerala, Pondicherry and Lakshadweep islands. The rainfall ranges from 60 to 300 cm. Major soil groups are black, red, lateritic and alluvial.

11.5.2 Agro-climatic Regions by Planning Commission

The Planning Commission under the Seventh Plan divides India into 15 agro-climatic zones based on soil quality, geological formation, climate, cropping pattern and development of irrigation and mineral resources. These are:

- 1) Western Himalayan Region
- 2) Eastern Himalayan Region
- 3) Lower Gangetic Plains Region
- 4) Middle Gangetic Plains Region
- 5) Upper Gangetic Plains Regions
- 6) Trans Gangetic Plains Region
- 7) Eastern Plateau and Hill Region
- 8) Central Plateau and Hill Region
- 9) Western Plateau and Hill Region
- 10) Southern Plateau and Hill Region
- 11) East Coast Plateau and Hill Region
- 12) East Coast Plains and Ghat Regions
- 13) Gujarat Plains and Hill Regions
- 14) Western Dry Region
- 15) The Island Region

11.5.3 Agro-ecological Regions by NBSS and LUP

The NBSS and LUP has brought out agro-ecological regional maps of India consisting of 21 zones based on physiography, soil and bio-climatic conditions. These zones are grouped under six ecosystems. These are as follows:

- a) **Arid Ecosystem**
 - 1) Western Himalayas, cold arid eco-regions with shallow skeletal soils.
 - 2) Western plains, hot arid eco-regions with deserts and saline soils.
 - 3) Deccan plateau, hot arid eco-regions with mixed red and black soils.
- b) **Semi-Arid Ecosystem**
 - 4) Northern plains and central highlands, hot semi-arid eco-region with alluvium derived soils.
 - 5) Central highlands and peninsula, hot semi-arid eco-region with medium and deep black soils.

- 6) Deccan plateau, hot semi-arid eco-region with shallow and medium black soils.
- 7) Deccan plateau and eastern ghats, hot semi-arid region with red and black soils.
- 8) Eastern ghats and Deccan plateau, hot semi-arid eco-region with red loamy soil.

c) **Sub-Humid Ecosystem**

- 9) Northern Plains, hot sub- humid eco-region with alluvium derived soils.
- 10) Central highlands, hot sub- humid regions with medium and deep black soils.
- 11) Deccan plateau and central highlands, hot sub-humid eco-regions with red and black soils.
- 12) Eastern plateau, hot sub- humid eco-regions with red and yellow soils
- 13) Eastern plateau and Eastern Ghats, hot sub- humid eco region with red loamy soils.
- 14) Eastern plains, hot sub-humid with alluvium derived soils.
- 15) Western Himalayas, warm sub-humid eco-region with brown forest and podzolic soils.

d) **Humid-Per Humid Ecosystem**

- 16) Assam and Bengal plains, hot humid eco-region with alluvium derived soils.
- 17) Eastern Himalayas, warm per- humid eco-region with brown hill soils.
- 18) Northeastern hills warm per- humid eco-region with red and lateritic soils.

e) **Coastal Ecosystem**

- 19) Eastern coastal plains, hot sub-humid eco-region with alluvium derived soils.
- 20) Western Ghats and coastal plains, hot humid – per-humid eco-regions with red, lateritic and alluvium derived soils.

f) **Island Ecosystem**

- 21) Islands of Andaman Nicobar and Lakshadweep, hot per humid with red loamy and sandy soils.

Table 11.2 : Rainfall and Soil Types by NBSS & LUP

Sl. No.	Agro-climatic Regions	Average annual rainfall (in cm)	Area in%	Annual growing periods (in days)
1)	Western Himalayas, Cold arid ecosystem with shallow skeletal soils	15	47	90
2)	Western Plain, Hot Arid, Ecosystem with Desert and saline soils	30	9	90
3)	Deccan Plateau, hot arid eco-region with mixed Red and Black soil	40-50	14	90
4)	Northern Plain and Central Highlands, Hot semi-arid Ecoregion with alluvium derived soil	40-80	10	90-150
5)	Central (Malwa) Highlands and Kathiawar peninsula, Hot semi-arid eco-region with medium and deep black soil.	60-90	5.6	90-150
6)	Deccan plateau, Hot semi-arid eco-region with shallow and medium (including deep) black soils	60-100	10	90-150
7)	Deccan plateau and Eastern Ghats, Hot semi-arid eco-region with red and black soil	60-100	6.3	90-150
8)	Eastern Ghats (TN) Uplands and Deccan plateau, Hot semi-arid eco-region with red loamy soils	60-100	6.9	120-150
9)	Northern Plain, Hot sub-humid eco-region with Alluvium derived soils	100-120	3.7	150-180

Agricultural Resources

10)	Central Highlands (Malwa and Bundelkhand), Hot sub-humid eco-region with medium and deep black soil	100-150	4.2	150-180
11)	Deccan Plateau and Central Highlands (BundelKhand), Hot sub humid eco-region with red and black soil	100-150	4.2	150-180
12)	Eastern Plateau (Chhatishgarh region), Hot sub-humid Eco-region with red and yellow soils	120-160	4	150-180
13)	Eastern (Chhotanagpur) plateau and Eastern Ghats, Hot sub-humid eco-region with red loamy soils	100-160	8.5	150-180
14)	Eastern plain, Hot sub-humid with alluvium derived soils	140-160	2.8	180-210
15)	Western Himalayas, warm sub-humid (including humid) eco-region with Brown forest and Podzolic soils	160-220	5.4	150-210
16)	Assam and Bengal plains, Hot humid (including sub-humid) eco-region with alluvium derived soils	140-200	3.6	270
17)	Eastern Himalayas, Warm per-humid eco-region with brown hill soils	200	2.4	270
18)	North eastern Hills (Purva natal) Warm per humid eco-region with red and latritic soils	160-260	3.3	270
19)	Eastern Coastal plain, hot sub-humid eco-region with alluvium derived soils	120-160	2.5	150-210
20)	Western Ghats and Coastal plains, Hot humid per-humid eco-region with red, latritic and alluvium derived soils	200	3	270
21)	Islands of Andaman Nicobar and Lakshadweep Hot per-humid eco-region with red loamy and sandy soils	160-300	0.3	270

Check Your Progress 2

1) What is the purpose of agro-climatic zoning?

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2) Which are the four major agro-economic regions in India ?

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3) What are the basic features of humid Bengal-Assam basin?

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11.6 BIOTECHNOLOGY FOR AGRICULTURE

Biotechnology refers to the use of living organisms for the manufacture of useful products. Micro-organisms such as useful traits of algae, bacteria, fungi, yeast, and cells of higher plants and animals can be combined to manufacture new varieties of crops. Thus the hybrid varieties of crops that we see today are the product of biotechnology.

The term “biotechnology” is derived by combining the words ‘biology’ and ‘technology’. It concerns with the exploitation of biological organisms for generating products/ services that are useful to man. There are two important features of biotechnology:

- utilization of biological entities, their components or constituents, and
- generation of some product or services for enhancement of human welfare.

Biotechnology has affected many major areas of human activity and welfare such as industries, medicine, agriculture and environment. It has been used as an important force for creation of quality product, enriching human consumption and propagation of quality animal and plant life. It has also created ample scope for employment, trade and influenced national economy.

Contribution of biotechnology to agricultural development is represented by achievements in rapid clonal multiplication of plants of economic importance, production of virus-free plants, rescue of otherwise nonviable interspecific hybrid, production of hybrids from sexually incompatible combinations through hybridization, etc. Efforts are being made to improve photosynthetic efficiency, nitrogen fixation efficiency, nutritional quality of seed storage proteins, etc. through genetic engineering. Plant tissue culture is being propagated in different species for higher production, disease resistance and quick maturing of fruit crops.

Governmental Measures

Realizing the importance of biotechnology the central government set up the Department of Biotechnology in 1986 in the Ministry of Science and Technology for planning, promotion and coordination of biotechnology programmes in the country. The major tasks of this department are to evolve integrated developmental plan and programmes, identify specific R&D areas, establish infrastructure for advanced research and create a cadre of trained manpower. The biotechnology industry can be divided into conventional and modern categories. Conventional biotechnology industry deals with products like vaccines, diagnostics, antibiotics, biofertilisers, bio-pesticides and fermentation products like yeast, cheese, alcohol, citric acid, lactic acid, and glucose. Modern biotechnology industry deals with genetically engineered products. In the past five years, more than 100 projects involving an investment of over Rs 250 crore were provided by the government. Apart from the national laboratories engaged in agricultural research and state level agricultural universities, many units in the private sector are also interested in research in biotechnology. The consumption of biotechnology products

in India amounted to Rs.1874 crore in 1992, of which products related to animal and human health accounted for 73%, agricultural products for 4% and industrial products for 23%.

Check Your Progress 3

- 1) What are the benefits of biotechnological research for agriculture?

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- 2) What measures have been taken by the government to promote the application of biotech in agriculture?

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11.7 LET US SUM UP

It is a fact that all cultivable area in India cannot be irrigated. Thus in a major proportion of cultivable area, we have to rely on natural rainfall. The problem is that the rainfed areas in India are quite diverse in terms of amount of rainfall and soil quality. Therefore, adoption of a uniform crop variety or cropping pattern does not solve the problem. In order to develop the rainfed areas we have to understand the climatic condition correctly, develop crop variety suitable to the climate, and transfer the production technology from lab to land.

Thus agriculture planning in India has adopted a regionally differentiated development strategy. The country has been categorised into a number of homogenous agro-climatic zones. For each region R & D efforts are going on to develop appropriate crops and cropping systems. Biotechnology has played an important role in developing high yielding, water efficient, disease resistant and short duration crops.

11.8 KEY WORDS

Agro-Climatic Zone : An agro-climatic zone refers to areas having similar climatic conditions.

Biotechnology : Biotechnology refers to the use of living organisms for the manufacture of useful products.

11.9 SOME USEFUL BOOKS

Planning Commission, 2003, *Tenth Five Year Plan*, Government of India.

Mal, P., 2001, *Infrastructure Development for Agriculture and Rural Development*, Mohit Publications, New Delhi.

Singhal, V., 1996, *Indian Agriculture*, Indian Economic Data Research Centre.

11.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Ultimate irrigation potential in India is limited. Thus cultivation in 74% areas has to depend upon natural rainfall.
- 2) Rain-fed areas can be of four types: arid, semi-arid, sub-humid and humid.
See Sub-section 11.2.1 for details,
- 3) See Sub-section 11.3.1 and answer.

Check Your Progress 2

- 1) The purpose of agro-climatic zoning is to study the climate and devise appropriate development strategy, development of appropriate crops through R & D, and adoption of appropriate crop planning.
- 2) See Section 11.4 and answer.
- 3) The humid Bengal-Assam basin is characterised by alluvial and latrite soils.
In this region the rainfall ranges between 220 cm and 400 cm.

Check Your Progress 3

- 1) See Section 11.6 and answer.
- 2) See Section 11.6 and answer.

UNIT 12 GREEN REVOLUTION: NATURE AND EXTENT

Structure

- 12.0 Objectives
- 12.1 Introduction
- 12.2 The Context of Green Revolution
 - 12.2.1 Pre-independence Period
 - 12.2.2 Post-independence Period
 - 12.2.3 Extent of Foodgrains Shortage
- 12.3 Innovation of HYV in Developed Economies
- 12.4 Technical Features of HYV
 - 12.4.1 Sensitivity to Water
 - 12.4.2 Sensitivity to Fertilisers and Pesticides
 - 12.4.3 Short-duration Maturity
- 12.5 Impact of Green Revolution on Output Growth
 - 12.5.1 Growth in Output
 - 12.5.2 Sources of Growth
- 12.6 Spread of HYV Technology in India
 - 12.6.1 Spread in Area
 - 12.6.2 Spread of Inputs
 - 12.6.3 Constraints on the Spread of HYV
- 12.7 Let Us Sum Up
- 12.8 Key Words
- 12.9 Some Useful Books
- 12.10 Answers/Hints to Check Your Progress Exercises

12.0 OBJECTIVES

After going through this unit, you would be in a position to:

- appreciate the context in which HYV technology was introduced in India;
- identify the technical features of HYV;
- explain the impact of green revolution on output growth; and
- explain the extent to which the new technology has been adopted in India.

12.1 INTRODUCTION

As we learnt in Block 1 agricultural development during the pre-independence period was negligible and agricultural output was stagnant. In the post-independence period, however, substantial growth in agricultural output has taken place. This period in general can be considered as consisting of a low growth phase, till the middle of 1960s and a high growth phase after mid-sixties. Often the mid-sixties is taken as a turning point in the Indian agricultural scenario. Incidentally the mid-sixties marked the introduction of new technology in India. This technology is often referred to as high yielding varieties (HYV) technology and some termed it as green revolution. The terminology as well as the parameters of this technology, the benefits and consequences of it are often controversial. The points of view of agricultural economists range from admiration to scepticism. Admirers concentrated on the growth aspects while sceptics questioned the nature of growth as well as redistributive aspects.

The questions raised were: Did the Indian policy makers make a mistake in encouraging the adoption of this technology at the time they did? What were the options available at that time? Would it have been possible to mitigate the adverse effects of this technology?

To answer these questions we should understand the context in which the new technology was introduced.

12.2 THE CONTEXT OF GREENT REVOLUTION

Stagnancy in agricultural growth was attributed to the colonial policy of (i) plundering and neglecting agriculture, (ii) non-maintenance of local irrigation systems, and (iii) killing of local initiatives. During the British period many changes took place on the agricultural scene, viz., (i) monetisation of the country side, (ii) introduction of agricultural taxes, (iii) commercialization of agriculture (through promotion of cotton, tobacco, sugarcane and plantation crops), (iv) exports of raw material especially cotton and tobacco, and (v) imports of mass produced goods. All these threw the rural artisans and craftsmen out of work and forced them to be dependent on agriculture as agricultural labourers.

12.2.1 Pre-Independence Period

All these changes rendered the countryside much worse than it was before the colonial era. The production and yields stagnated for more than half a century before 1947. The agricultural production technology remained more or less the same throughout several centuries, except for minor changes now and then. The shortsightedness and neglect of agricultural development by colonial regime resulted in several famines. The Bengal famine of 1943 was the worst, which wiped off several millions of population. The relief efforts confined only to organising few gruel camps, which were much less than desired by the circumstance. Several observers termed such disasters as 'man made' and unnatural calamities.

Between 1891 and 1947, aggregate grain output in British India increased at an average rate of 0.11 per cent per year (see Table 12.1). In the latter half of the period the growth rate was only 0.03 per cent. Rice output actually declined over the 56-year period at an average annual rate of 0.09 per cent. Wheat production increased at an average annual rate of 0.84 per cent. The performance of non-foodgrain crops was no better. Population increased at a mercifully low rate of 0.67 per cent per annum in British India. For undivided India, the estimated production in 1947-48 was 66 million tonnes. This was slightly less than that in 1900-01 (67 million tonnes). Let us consider the period 1936-37 to 1965-66 (thirty years). In the first 15 years (1936-51) foodgrains production declined at a rate of 0.68 per cent per annum, while in the next 15 years (1951-66) it increased at a rate of 2.75 per cent per annum. If we consider per capita foodgrains production, during the first 15 years it declined sharply and index number of agricultural output dropped to 84.2. Thus for nearly 50 years since the turn of the century, foodgrains production was almost stagnant.

Table 12.1 : Growth performance of Major Crop Groups in Pre-Independence Period
(Percent per annum)

Sl. No.	Major Crop Groups	Period (1891-1946)		
		Area	Yield	Output
1	Foodgrains	0.31	-0.18	0.11
2	Non-foodgrains	0.42	0.86	1.31
3	All Crops	1.40	0.01	0.37

Source: Blyn, G. (1983)

In the developed world also stagnation was observed during this period. In UK from 1884 to the Second World War, the average rate of increase in yields of foodgrains was only 0.2 per cent per year. In USA the annual compound rate of increase in yields of foodgrains was 0.3 per cent between 1866-67 and 1901-05; no growth between 1901-05 and 1.5 per cent growth between 1936-40 to 1951-53. However, a breakthrough of 4.8 per cent was observed only in the post World War period of 1951-53 to 1961-63. Only in Japan the growth rate was above 1 per cent per annum during the corresponding two periods.

12.2.2 Post-independence Period

Independence brought several changes in India. The government took several steps towards (i) fulfilling the aspirations and expectations of the population in feeding them, (ii) developing agriculture in the direction of achieving self sufficiency in food, (iii) providing raw material to industry, and (iv) keeping the prices under control so that urban consumers (the purchaser of foodgrains) can be taken care of. Several initiatives were launched such as:

- a) Introduction of Five Year Plans: This helped in (i) setting sectoral targets, (ii) mapping the available and required resources to meet the targets, and (iii) realizing the objective of higher growth along with equitable distribution of the benefits of growth.
- b) Launching land reforms: This helped in (i) abolition of intermediaries such as Zamindars, Watandars, Zagirdars, Taluqdars, etc., (ii) conferring ownership rights to the tenants, (iii) consolidation of holdings, (iv) introduction of tenancy reforms (fixation of rents, protection of rights of tenants), and (v) fixation of land ceilings through legislation.
- c) Creation of institutions: The Government created several institutions to make adjustments/corrections in demand supply situation such as maintenance of buffer stocks through FCI, setting up of agricultural prices commission; National water commission, and National Agricultural Commissions. These institutions were expected to suggest policy measures to tackle the problems of growth and distribution.
- d) Introduction of rural development schemes: The Government introduced several programmes to tackle the problems of poverty. Several Schemes were launched to boost production such as IADP and Grow More Food Campaign. Some areas were targeted to boost agricultural production.

Some other areas were also given emphasis. These are: i) improvements in local varieties of seeds, ii) application of fertilisers and other changes in agricultural practices, iii) expansion of area under crops, and iv) expansion of irrigated area (by creating several minor and major irrigation projects).

All these efforts resulted in some improvement in agricultural production especially food products. Minor changes in agricultural technology continued off and on as had always. But because of public health policies (massive immunization, creating public hospitals in towns and public health centres in rural areas) the mortality rates came down considerably and the birth rates increased. As a result, the population increased by leaps and bounds which gave rise to imbalances between food availability and the population growth. All these efforts in increasing food production did not match the requirements of population.

12.2.3 Extent of Foodgrains Shortage

Between 1949-50 and 1964-65 the compound growth rate of agricultural production was 2.98 per cent per annum for foodgrains and 3.19 per cent per annum for all

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crops. Productivity growth rates were 1.60 per cent per annum for both foodgrains and all crops. This is not stagnation, but in view of the annual growth of population at 2.2 per cent the balance between food availability and population became precarious.

During the middle of 1960s two successive disastrous droughts brought down foodgrains production from 89 million tonnes in 1964-65 to 72 million tonnes in 1965-66 and 74.2 million tonnes in 1966-67. Foodgrains had to be imported to the extent of 10 million tonnes in 1966. However, it was not sufficient to compensate the shortfall in domestic production. The Government looked into the options of increasing domestic production of foodgrains.

Several policies were experimented in this respect. During the 1950s the Grow More Food Campaign (GMFC) was tried to improve food production. First three years of Second Plan (1956-61) witnessed stagnation in production. 1957-58 was particularly a bad year. At this juncture the Ford Foundation Team recommended Indian government to concentrate development effort on crops and areas that had the greatest potentialities for increase in food production. This led to the adoption of Intensive Agriculture District programme (IADP), which had two salient features, viz., (a) development of a package of improved agriculture practices for each crop through research, and (b) assistance to cultivators to develop farm production through supply of required inputs and the amount of credit required to acquire these inputs. This package approach was extended in a slightly diluted form under IAAP – Intensive Agriculture Area Programme that covered nearly 10 per cent of cultivated area in 1966-67.

But the two consecutive disastrous droughts in 1965-66 and 1966-67 wiped off all the gains in production achieved through IADP and IAAP. As stated earlier, foodgrains production dropped by 17 million tonnes in 1965-66 from the peak of 89 million tonnes in 1964-65. In the next year, i.e., 1966-67, production increased by a meager two million tonnes. During this year foodgrains imports reached an all time high of 10.4 million tonnes, which created a desperate situation (see Table 12.2). We observe from the table that cereal imports went up to more than 10 million tonnes in 1966 from 0.6 million tonnes in 1955. Per capita availability of foodgrains was diminishing despite the imports. The index of foodgrain prices rose by 30 per cent in five years.

Table 12.2 : Gross Imports on Government Account 1951-1966

(in thousand tonnes)

Year	Total Cereal Imports	Year	Total Cereal Imports	Year	Total Cereal Imports
1951	4800	1957	3630	1963	4556
1952	3930	1958	3224	1964	6266
1953	2040	1959	3868	1965	7450
1954	830	1960	5137	1966	10340
1955	600	1961	3495		
1956	1400	1962	3640		

Source: Dantwala (1996)

Low foreign exchange reserve and adverse balance of payment conditions compelled the government to import food with political strings attached from the US. This led the country into further crisis. Several international organisations and scholars questioned the capability of India to survive the calamity of food shortages.

Government found itself at its wits end. It was groping for strategies to boost production on sustainable basis - to get out of the need to import and to feed its millions without

going for begging bowl. All the measures resorted to, given the obsolete techniques of production, could not improve the yields further; area and irrigation expansion were going on as usual at a slow pace. There was a need to do something urgent to boost production.

Around this time by coincidence, HYV seeds, particularly wheat, were developed in the developed countries. The HYV technology broke the barriers on yield improvement as these seeds were capable of absorbing a lot of chemical fertilisers in irrigated condition and gave very high yields. This technology was immediately adopted by the government in India. It was focused on all possible areas that had the necessary pre-requisites like assured irrigation and other infrastructure like roads, electricity and a dynamic peasantry. The necessary inputs like seeds and fertilisers were provided by the government liberally.

12.3 INNOVATION OF HYV IN DEVELOPED ECONOMIES

According to induced innovation hypothesis put forth by Yujiro Hayami and Kennon L. Ruttan (1931) the relative abundance of capital and scarcity of labour are two important factors which led to discovery and use of HYVs, in land scarce (Japan) and labour abundant economies. Steep decline in relative price of fertilisers was also an additional factor. In response to this research was focused on discovery of seeds which are highly fertiliser consuming.

The challenge of growing population pressure on land and food scarcity compelled the developing economies like India to borrow yield-increasing technologies from developed countries. The transfer of this technology was made possible by coordinated, adaptive research by international research centres like CIMMYT and IRRI. In India it was adopted initially in land abundant regions and much later in land scarce regions. The reason was mainly the environmental or agro-climatic suitability of new technology. The areas endowed with a favourable environment are also resourceful both in terms of investible capacity and institutional preparedness. The regions with low to medium rainfall but served with assured sources of irrigation happened to be the most appropriate site for application of the HYV technology. These areas are sufficiently exposed to sunshine and are relatively free from pests and diseases. Punjab and Haryana are such states with assured irrigation where farmers are resourceful and state governments were efficient with responsive administration. Governments in democracies have to be responsive to the needs of consumers and poor farmers who are in majority. Hence agri-research slowly expanded into new areas to respond to resource poor regions and farmers. The scientists attempted to evolve technologies suited to unfavourable agro-climatic environments and came out with packages and practices to suit resource-poor regions and farmers.

In this context biotechnology has an important role to play in raising yields. If technological progress could be scale-neutral (i.e., yield would increase irrespective of the size of the firm) then all sections of farmers can equally derive benefits. This is possible as biotechnology focuses on seeds, rather than on fertilisers and pesticides as seeds are expected to (i) be genetically modified to yield more, (ii) be pest resistant, and (iii) have stability in yields. Hence it can be beneficial to poor farmers and poor regions as well.

12.4 FEATURES OF HYV

The core of the green revolution was the development and propagation of High Yielding Varieties (HYV) of seeds, particularly rice and wheat, adaptable to local ecologies. The new HYVs are designed to be high yielding in response to high levels of inputs. These sturdy, short-stemmed plant types are capable of carrying the heavy growth of grains.

HYV technology comes in a package of HYV seeds – water – fertilisers. All these are needed together, in correct proportions and at various stages of growth and yields can be increased by 50 to 200 percent. You may note that HYV seeds are land-saving and labour-using innovations. They are also neutral to scale of operations and therefore usable by all farmers regardless of farm size.

12.4.1 Sensitivity to Water

Performance of HYV seeds would depend upon adequate control of weeds and pests. However, water control is the most critical factor. Even in irrigated areas minor laterals are often insufficient and drainages are rarely built. Thus the exact water control required for HYVs can hardly be expected. As mentioned earlier, the HYVs were developed according to the prototypes in the temperate zone. The prototype had been developed within the favourable environmental conditions with irrigation systems that allowed precise water control. Both inadequacy and excessive water are harmful to the HYVs. Not only water should be available in desired quantity, its use has to be tailored to the needs of the plant at different stages of its growth.

12.4.2 Sensitivity to Fertiliser and Pesticides

The HYV seeds have the technical capacity of turning soil nutrients into larger amounts of grains than leaf growth. Hence any increase over and above that is possible with the existing natural nutrients of the soil can be brought about by application of chemical fertilisers. Higher the amount of such inorganic fertilisers, larger is the output of grains.

Use of fertilisers gives rise to the growth of weeds on a large scale. These seeds being new to the soil and non-acclimatized to the region these are prone to local pests and diseases, which is not the case with indigenous traditional varieties. Hence there is a greater need for application of germicides and pesticides.

12.4.3 Short-duration Maturity

These seeds mature into plants in a shorter period of time and these are non-photosensitive, i.e., their period of maturity is independent of the length of exposure to the sunlight. Moreover, these plants are dwarf in size, i.e., the plants are of much shorter stature as compared to the indigenous variety. But HYVs are laden with abundant grains. For these reasons it becomes necessary that harvesting is done over a short period.

Two consequences follow from the above.

- a) Because of short-duration and photo-insensitivity there is a possibility of multiple cropping in a year. In this respect, new technology is land-saving. Since each crop requires lesser time to mature, land is available for more than one crop.
- b) The quick maturing requires the protection of harvested crops. As a result, drying and storage are also important.

The initial results of HYV in terms of production yields were dramatic in the ideal conditions causing observers to call this development nothing short of revolution though green variety. Since such prerequisites for introduction of HYVs was present in only North West region of the country (consisting of Punjab, Haryana and Western UP) and the South Eastern regions, (consisting of coastal Andhra, Tanjore district in Tamil Nadu) these were introduced first in those regions. Since the results in terms of improved yields and profits were good, the existing regional inequalities between these regions and other regions increased further. Adoption of this technology helped in realisation of the immediate objectives such as: i) boosting production, ii) doing away with imports, and iii) feeding millions of people.

As we discussed in Unit 11 India has much variations in terms of climatic condition across regions. These regions differ in terms of climate, soils, irrigation systems, farming systems and historical developments. Keeping this in view the country is divided into agro-climatic zones. Basically we have the following major types:

- 1) Alluvial Plains (North Western) consisting of Punjab, Haryana and Western UP.
- 2) South East Deltas (Krishna, Godavari and Kaveri deltas consisting of coastal Andhra, Tanjore in Tamil Nadu).
- 3) Poor but potentially rich areas (Middle and lower Gangetic basin consisting of Eastern Uttar Pradesh, Bihar, Bengal, Assam and Orissa).
- 4) Peninsular India / semi arid areas: consisting of Maharashtra, parts of Gujarat, Andhra Pradesh and Karnataka)
- 5) Arid Areas (Rajasthan and parts of Gujarat)

In terms of economic development, these agro-climatic zones can be divided into three groups: (a) advanced area, consisting of (1) and (2); (b) potentially rich but still very poor zones consisting of (3); and (c) Peninsular India consisting of (4) and (5) which face severe natural constraints.

All the ingredients for introducing HYVs were present in alluvial plains and South Eastern deltas, viz., rich irrigation sources (tube wells in North West and canal irrigation in South East); (ii) developed infrastructure (with roads and electrified villages); (iii) resourceful and dynamic farming communities eager to welcome new innovations with a view to get richer; and (iv) political stability and more responsive government machinery. Government provided inputs such as seeds, fertilisers and pesticides. In addition, institutional credit to facilitate easier purchase of these inputs was also emphasised. This led to immediate spurt in growth, providing cushion to the government.

Check Your Progress 1

- 1) What are the initiatives taken by the government in the post-independence period to boost agricultural development?

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- 2) What are the technical features of HYV seeds?

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12.5 IMPACT OF GREEN REVOLUTION ON OUTPUT GROWTH

Introduction of new technology resulted in substantial increase in agricultural output. However, the rate of growth has not been uniform throughout. According to Michael Lipton (1989) the green revolution period can be divided into four phases as follows:

- Phase I characterised by Euphoria. This comprises the late-Sixties.
- Phase II (early 1970s) characterized by growing fears of accentuating inequalities, pauperisation.
- Phase III (late 1970s) characterised by recognition of poor gaining absolutely but losing relatively.
- Phase IV (1980s) characterised by extreme optimism.

Thus the initial euphoria yielded to pessimism, slowly being replaced by optimism and finally realistic assessments of the efficiency, relevance and significance of technological changes.

There is another view (V.M. Rao), which divides the green revolution period into two sub-periods. The first round of green revolution: 1965-66 to 1980-81 (15 years) and the second round of green revolution: 1980-81 to 2000-01 (20 years).

12.5.1 Growth in Output

The growth rates after mid-sixties and before mid sixties (post and pre-green revolution periods) is a matter of controversy, especially the rates during the initial phase. There is a view that growth rates in post-green revolution period are dramatically high and the period was termed as a turn around in agriculture by some (Dantwala, Mellor, for example). There is another view that the growth in fifties was higher than the first round of green revolution period (C.H.H.Rao, C.T. Kurien, etc.).

According to J.M. Rao and S. Storm (see Table 12.3) the trend growth rate of overall crop output fell sharply from 3.1 per cent per annum in pre-green revolution period during 1949-65 to 2.3 per cent per annum in the first round of green revolution (1967-82) However, it made a strong recovery to 3.4 per cent per annum during 1981-92 (the second round of green revolution period).

The controversy regarding pre-and post-green revolution growth rates is due to the method of calculation and due to selection of base and terminal years. For example, if one takes 1960-61 to 1970-71 (as done by CHH Rao) agricultural productivity increased by 2.1 per cent per annum for all crops and 2.5 per cent per annum for foodgrains. If we make adjustment for drought years 1965-66 and 1966-67, the respective growth rates shifts up to 2.3 per cent per annum (all crops) and 2.8 per cent per annum (foodgrains). However, these growth rates are far less than those observed during the earlier decade of 1949-50 to 1959-60.

On the other hand, if one takes 1962-63 to 1970-73 period the growth rates are: 2.25 per cent per annum(all crops) and 2.74 per cent per annum (food grains). For the period 1954-57 to 1967-65, these are 2.60 and 2.54. Thus, in the case of foodgrains, the growth rates are clearly higher (2.74% p.a.) in 1960s than (2.54% p.a.) in 1950s. (JNU, PPD study).

Researches have analysed the growth performance of Indian agriculture in another way — by comparable weather years. CHH Rao has compared the growth rates in foodgrains output between peak years during 1950s and 1960s. According to him, there are reasons to believe that even without the green revolution, the growth rate

(of foodgrains output) would have been maintained at about 2 to 2.5 per cent per annum.

On the other hand, Mellor (1974) using similar methodology reaches a different conclusion. According to him both 1964-65 and 1970-71 witnessed favourable weather throughout most of India and excellent crop production. During this period foodgrains production increased by 19.1 million tonnes, a compound annual growth rate of 3.3 per cent. As a comparison it is 1.8 per cent per annum higher than the growth rate shown by the same measure between similar crop years 1949-50 to 1960-61.

The impact of HYV on agricultural output growth is considered to be exaggerated by CT Kurien. After analysing Tamil Nadu agriculture he felt that often the impact of HYV programme was evaluated against the background of poor performance of mid - 1960s. The 13.01 per cent increase in the production of paddy between 1968-69 and 1969-70 and even the more striking 24.80 per cent increase between 1969-70 and 1970-71 are cited as the contribution of 'green revolution'. By looking into these figures alone it gives a 'revolutionary' appearance. But in longer perspective the achievements of green revolution are much more modest. The post-green revolution growth rates are much lower than what was achieved in 1950s. The growth performance between 1968-71, and the even more spectacular one between 1974-76, must be regarded as " recovery growths."

According to Kurien, if we do not take into account 'recovery rates', the post HYV performance has been of the order of less than 6 per cent increase from year to year compared to the 7 to 8 per cent which were frequent in the 1950s.

12.5.2 Sources of Growth

There is near unanimity on the sources of growth in the post-green revolution period vis-à-vis the pre-green revolution period. In the pre-green revolution period (Period II in Table 12.3), the growth in foodgrain output was almost equally accounted for by area expansion and yield increases. On the other hand, agricultural growth in the first round of the green revolution (Period III in Table 12.3) output growth was marked by sharp reduction in area expansion and a perceptible upward shift in yields. Expansion in area contributed 0.37 per cent to output while yields contributed to 1.85 percent per annum. However, during this period the yield, improvement across all the crops was too modest to compensate for the decrease in the rate of area expansion. As a result, growth rate of production came down from 3.13 per cent per annum during Period II (1949-65) to 2.29 per cent per annum during Period III (1967-81).

Table 12.3 : Agricultural Growth, 1891-1991 (Percent Per Annum)

	Pre-Independence period (1891-1946)			Pre-Green Revolution period (1949-50 to 1964-65)			Early Green Revolution period (1967-68 to 1981-82)			Late Green Revolution period (1981-82 to 1991-92)			During the last decade (1990-91 to 1998-99)		
	I			II			III			IV			V		
	Area	Yield	Output	Area	Yield	Output	Area	Yield	Output	Area	Yield	Output	Area	Yield	Output*
A. Foodgrains	0.31	-0.18	0.11	1.41	1.43	2.93	0.37	1.85	2.21	-0.26	3.19	2.92	-0.1	1.4	1.8
i) Rice				1.33	2.13	3.49	0.69	1.45	2.16	0.62	3.25	3.87	0.5	1.3	1.9
ii) Wheat				2.68	1.27	3.99	2.60	2.55	5.21	0.28	3.06	3.33	1.7	1.6	3.1
iii) Jowar				0.99	1.50	2.50	-0.84	3.50	2.61	-1.96	1.83	-0.10			
iv) Bajra				1.08	1.24	2.34	-1.03	0.33	-0.78	-0.90	2.33	1.49	-1.8	2.0	0.2
v) Maize				2.66	1.18	3.87	0.10	0.49	0.58	0.11	2.46	2.62			
vi) Pulses				1.90	-0.22	1.39	0.47	-0.65	-0.17	0.10	1.13	1.26	-0.2	1.7	1.0
B. Non-food grains	0.42	0.86	1.31	2.52	0.93	3.54	1.06	1.34	2.41	1.71	2.55	4.30	1.5	1.4	3.3
All Crops (A+B)	0.40	0.01	0.37	1.61	1.30	3.13	0.54	1.74	2.29	0.49	2.93	3.43	0.4	1.4	2.2

Note: * Output growth rate presented in column V is for the period 1990-91 to 1999-2000.

Sources: Mohan Rao (1998) and V. M. Rao (2000)

The second round of green revolution (1980-92), i.e., period IV in Table 12.3, had a more creditable record with almost the entire growth rate of 3.43 per cent per annum coming from improvement in yields. The creditable performance of Indian agriculture during the post-independence period is incontrovertible when compared with the pre-independence period (see Table 12.3).

Table 12.4 : Growth Performance of Major Crop Groups in Pre and Post Independence Periods

(per cent per annum)

Sl. no.	Major Crop Groups	Pre-Independence Period (1891 to 1946)			Post-independence Period (1949-50 to 1985-86)		
		Area	Yield	Output	Area	Yield	Output
1)	Foodgrains	0.31	-0.18	0.11	0.69	1.73	2.64
2)	Non-foodgrains	0.42	0.86	1.31	1.12	1.11	2.62
3)	All Crops	1.40	0.01	0.37	0.78	1.54	2.64

Source: V.M. Rao (1991)

12.6 SPREAD OF HYV TECHNOLOGY

The spread of HYV seeds in terms of area and use of fertilisers (second most important component of this package) is often described as swift and dramatic. The spread of area under HYV technology is usually explained in terms of a generalized model of adoption process. This would explain the spread of an innovation across different sections of farmers as well as different states.

Adoption of an innovation by farmers increases at a slow pace in the beginning. However, over time the rate of adoption catches on and it increases at an accelerated rate till about half of the potential adopters come to adopt it. Thereafter, the adoption increases but at a diminishing rate. Thus, we notice three phases: Percentage of adopting farmers rises very slowly in the initial stage, rises rapidly in the second stage and tapers off in the third stage. This is the familiar growth path, which implies that adoption of an innovation follows a *normal distribution*. In this approach adopters of an innovation are generally classified into three groups: early adopters, majority and late adopters.

Distinctive characteristics of early adopters are that they are younger, more educated, venturesome and willing to take risks. They operate large farms and have high income and social status. Late adopters, in contrast are older, less educated, security minded (conservative) operators of small farms with low income. Given these characteristics, early adopters of an innovation would reap large income benefits and *abnormal profits*. By the time the majority adopt the innovation, income gains realized by early adopters would disappear, unit costs of production would rise and product prices would fall. The average adopter therefore does not gain much from an innovation while the later adopters gain nothing.

Along with yield and net returns costs of production (paid out in cash) for HYVs also turned out to be several times greater than the cash costs of production for local varieties.

12.6.1 Spread in Area

From a modest beginning in 1965, use of HYVs spread to 9 million hectares in 1968-69. By the end of the first round (1967-81), it covered nearly half of the cropped area. Over the years it has spread to other parts and presently covers more than three fourths of cropped area (see Table 12.5). However, you have to keep in mind that area under HYV varies from crop to crop. Its spread has been the highest in the case of wheat. By late 1980s nearly 90% of wheat area came under HYV. In the case of rice it is moderate at about 60% of the area. Only about one third of area is under HYV in the case of Maize, Jawar and Bajra crops are under HYV presently.

You will have an idea of the spread of HYV seeds from the fact that in Tamil Nadu the area under HYV expanded from a modest beginning of 4% in 1969 to more than 25% of the area within five years, i.e., by 1974.

Table 12.5 : Progress of HYV Programme in India: 1966-98

(Area under HYV, in million hectares)

Crop	1966-67	1971-72	1976-77	1981-82	1986-87	1987-88	1988-89	1990-91	1991-95	1997-98
Paddy	0.88 (2.00)	7.41 (19.62)	13.34 (34.64)	19.69 (48.37)	24.02 (58.90)	20.75 (54.78)	29.00	27.4	31.0	32.2
Wheat	0.54 (4.10)	7.86 (41.07)	14.52 (69.40)	16.75 (75.64)	19.14 (83.90)	19.61 (86.50)	22.00	21.0	23.2	23.0
Maize	0.21 (4.10)	0.44 (7.76)	1.05 (17.67)	1.60 (26.96)	2.19 (37.30)	1.94 (35.19)	2.50	2.6	3.4	3.6
Jowar	0.19 (4.11)	0.69 (15.03)	2.37 (23.37)	3.88 (35.20)	5.50 (34.74)	5.44	6.00	7.1	7.1	9.0
Bajra	0.06 (0.50)	1.77 (19.20)	2.27 (21.11)	4.57 (38.78)	5.27 (47.00)	3.49 (36.09)	5.50	5.7	5.4	7.0
Total HYVs	1.88	18.17	33.56	46.49	56.12	51.23	65.00	65.0	71.3	76.0

(Figures in parentheses indicate percentages to the total area under the crop).

Source: Dantwala (ed.) 1991 and Economic Survey 2000.

12.6.2 Spread of Inputs

The spread in use of almost all inputs is another indicator of spread of HYV technology at a rapid pace. We will consider fertilisers and machineries in this section.

Table 12.6 shows that, consumption of nitrogenous fertilisers have grown by more than 100 fold and that of phosphatic fertilisers by 329 folds during the period 1951-52 to 1995-96. Consumption of potassic fertilisers has risen from almost nil to 120 million tonnes during the same period. Total consumption of fertilisers has increased by 230 times. The growth rate for total fertilisers was 14.65 per cent per annum during 1951-88.

Table 12.6 : Consumption of Chemical Fertilisers in India: 1951-52 to 1995-96

(‘000 tonnes of nutrients)

Year	Nitrogeous	Phosphatic	Potassic	Total
1951-52	58.7	6.9	-	65.6
1960-61	211.7	53.1	29.0	293.4
1970-71	1487.1	462.0	228.2	2117.3
1980-81	3678.1	1213.6	623.9	5515.6
1995-96	9800.0	2900.0	1200.0	13900.0
Growth Rates (per cent per annum)				
1951-88	13.62	17.47	17.45	14.65
1951-66	17.29	23.48	27.50	19.09
1966-88	9.66	11.10	10.37	10.06
1966-77	11.34	12.02	10.68	10.98
1977-88	7.17	10.11	6.16	7.71

Source: Dantwala (ed.) 1991 and Economic Survey 2000

Table 12.7 : Input Use in Indian Agriculture 1950-51 to 1990-91

Item	Unit	1950-51	1960-61	1970-71	1980-81	1990-91
Bullocks	No./1000 ha GCA	0.5	0.5	0.5	0.5	5.8
Tractors	No./1000 ha GCA	0.1	0.2	0.9	2.7	
Electrical	No./1000 ha GCA	1.0	16.8	52.0	59.8	
Diesel Pumps	No./1000 ha GCA	2.7	19.1	50.1	56.0	
Chemical Fertiliser	Kg./hectare	Negligible	1.9	13.1	31.8	69.7
Electricity	Million KWH	203	833	4470	14489	50321
Net irrigated area	(Million hectares)	20.9	24.7	31.1	38.7	47.4
Gross Irrigated area	(Million hectares)	22.6	28.0	38.2	49.8	61.8
<i>Share of modern inputs in</i>						
a) Total Inputs (% share)		1.1	2.9	13.5	21.5	36.2
b) Output (% share)		0.3	0.7	3.3	7.1	11.8

Source: J. Mohan Rao (1998)

Table 12.7 on input use shows that absolute increments of ‘modern’ inputs including tractors, pumpsets, fertilisers were large in the post HYV period reflecting a marked shift to mechanization. The cost of cultivation, per hectare, thus increased over time.

12.6.3 Constraints on the Spread of HYVs

The spread of HYV seeds is limited by the quality of irrigation and other pre-requisites. In the case of rice, water logging and overhanging cloud cover during maturity period reduce the yield. It becomes susceptible to pests under these conditions. Strong sunshine alone in the Rabi season adds about 20-25 percent to yields. In the case of wheat, timing and spacing of irrigation can raise yield by as much as 40 per cent. To meet such requirements there must be controlled sources of water. Thus irrigation is a pre-requisite to determine the success of HYV technology.

The major obstacles to the spread of new technology in rice are variously narrated as the following: (i) poor farm management, (ii) lack of farmer's knowledge, (iii) inadequate extension, (iv) low prices, (v) unsatisfactory land tenure system, and (vi) inadequate institutional credit. These factors, however, have not affected the area under HYV for wheat crop. How do the same technology affected one cereal (rice) adversely and not the others (wheat)? Probably the factors noted above would not have an adverse affect in favourable physical environmental conditions like adequate water supply and quality of irrigation. Wheat meets these conditions in India and Pakistan while rice meets these only in Pakistan.

It may be noted that the yields of new varieties are considerably greater than those of local varieties even without fertiliser application. The operator of an irrigated holding can always harvest a larger crop even if he has no cash to purchase fertilisers. The operator of an un-irrigated holding is not that fortunate. The absence of irrigation entirely rules out the possibility of growing HYV— without irrigation other inputs are of no use.

You know from Unit 10 that irrigation development in India has a long history. In the North Western India and Punjab (including the part now in Pakistan) the new wheat varieties have got the greatest impact. During the pre-independence period large investments in the development of water resources were made in this region. In fact, about 50 per cent of gross investment in irrigation was in Punjab alone in the period 1898 - 1914. In addition, since 1947, considerable investment has been made in irrigation development and in the expansion of irrigated area. You may recall that the HYVs were introduced in this part of the country first because of availability of irrigation fertilisers.

12.7 LET US SUM UP

During the 1960s there was an acute shortage of foodgrains in India. In order to overcome the problem the government put emphasis on introduction of new technology. There was limited scope for bringing in additional area under cultivation and increase in yield through new technology was a viable option. Around that time a scientific break through was made in the field of high yielding varieties of seeds. Through concerted efforts by the government the HYV technology was introduced on a massive scale in India.

The HYV technology increased agricultural output manifold, mainly through increase in yield of crops. This technology was also adopted very fast among cultivators. However, it was adopted more in the case of wheat than in the case of rice and other cereals. Assured irrigation facilities is often cited as an important reason for such discrepancy. Along with adoption of HYV technology, the use of chemical fertiliser and modern equipment has increased.

Check Your Progress 2

1) Discuss the impact of green revolution on output growth in India

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2) What are the constraints on the spread of HYV in India?

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12.8 KEY WORDS

- Commercialisation of agriculture** : Commercialisation usually implies cultivation for the market, not self-consumption. Thus cultivation of cash crops such as cotton, tobacco, sugarcane, etc., leads to commercialisation of agriculture. The British are blamed for forcing Indian farmers to cultivate cash crops rather than foodgrains. This is largely because at that point of time India needed foodgrains while cash crops were promoted or forced upon so that these can be exported to Britain.
- Land-saving technology** : Any improvement in technology that reduces the use of land in agricultural production. Short-duration maturity and multiple cropping implies that the same plot of land can be utilized more than once in a year (in the presence of irrigation facility).
- Yield** : Productivity of land measured through production per hectare.

12.9 SOME USEFUL BOOKS

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12.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) The initiatives taken were introduction of Five Year Plans, land reform measures and rural development schemes. See Sub-section 12.2.2 for details.
- 2) The HYV seeds are sensitive to inputs like water fertilisers. They have short-duration maturity and short stem. Thus they convert soil nutrients into grains rather than leaves.

Check Your Progress 2

- 1) Point out the growth rates in agricultural output in different phases of Post-green revolution period. See Table 12.3 also. Look into the growth rates of foodgrains, wheat and rice and bring out the contrast between wheat and rice during different phases.
- 2) Read Sub-section 12.6.3 and point out the major obstacles to spread of HYV. These obstacles would provide an idea on why HYV could not be successful in the case of rice, particularly in Eastern India.

UNIT 13 NEW TECHNOLOGY AND DISTRIBUTION OF GAINS

Structure

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Impact of Green Revolution
- 13.3 Regional Inequalities
- 13.4 Inequalities Across Farms
- 13.5 Impact on Agricultural Labourers
- 13.6 Inequalities across Crops
- 13.7 Limitations of HYV Technology
- 13.8 Let Us Sum Up
- 13.9 Key Words
- 13.10 Some Useful Books
- 13.11 Answer/Hints to Check Your Progress Exercises

13.1 INTRODUCTION

In the previous unit we discussed the impact of new technology on agricultural output growth in India. The introduction of new technology, popularly called green revolution, comprised use of HYV seeds in the presence of chemical fertiliser and irrigation facilities. Within few years of introduction India witnessed a rapid growth in agricultural output, which was made possible mainly by increase in yield of crops. The new technology could solve the intense food crises that India faced during the 1960s.

However, quite a few questions come up in our minds: Who gained from the green revolution? Was its positive impact felt throughout the country or was it limited to few pockets? Did all categories of farmers gained from the introduction of the new technology?

We will attempt to answer some of these questions in this unit and will discuss the gains from HYV technology mainly under three heads:

- effect on regional inequalities
- effect on inequalities among farmers (farm size)
- effect on inequalities in growth of yield among crops.

13.2 IMPACT OF GREEN REVOLUTION

Before discussing the gains from green revolution we recapitulate its impact that accrued to the country.

- 1) The real significance of HYV technology lies in the fact that it provided a base for further development of agriculture. It helped in achieving self-sufficiency and even some exports are being made in the last few years; thus it contributed to India's journey from begging bowl to export capability. The new technology not only cut down food imports, it also saved from the humiliation of strings being attached to food aid from developed countries, especially the USA. It helped agriculture in keeping pace with population explosion after 1950s (see Table 13.1).

Table 13.1 : Population Growth vs. Agricultural Growth

Year	Population Growth Total Population	Annual Compound Growth Rate (%)	Period	Agricultural output growth (% per annum)
1951	361.1	1.25	1949-50 to 1964-65	3.13
1961	439.2	1.96	1967-68 to 1980-81	2.38
1971	548.2	2.20	1980-81 to 1991-92	3.21
1981	685.2	2.22	1949-50 to 1991-92	2.70
1991	844.3	2.11		
2000	987.3	1.09		

Source: V.M. Rao (2000)

Table 13.2 : Indices of Area, Production and Yield – All Crops

(Base: Triennium Ending 1981-82 = 100)

Year	Area	Production	Yield
1964-65	91.7	76.4	88.3
1965-66*	90.7	63.7	73.2
1966-67*	90.6	63.0	73.6
1967-68	94.6	77.1	86.8
1971-72	95.8	85.2	91.6
1972-73*	92.5	78.2	86.0
1973-74	98.2	86.5	91.1
1986-87	100.3	115.2	112.4
1987-88*	96.0	115.3	114.4
1988-89	103.4	140.0	130.5

Note: Drought years are indicated by asterisk. Rest of the years in the table are considered to be free of the effect of drought.

Source: V.M. Rao (2000)

- 3) The ability to withstand the impact of recurrent droughts has increased over the years. Thus the overall resilience of Indian agriculture in the face of natural calamities has increased. Though the instability of year-to-year foodgrains output has increased in post-HYV period (see Table 13.2), a heartening feature of recent period is that Indian agriculture is getting more and more resilient to the vagaries of monsoon. For most of the crops, the sensitivity of output to fluctuations in rainfall has declined. This development is all the more impressive as in seven out of ten years ending 1994-95, rainfall index for all crop production was below normal, four of which were particularly bad rainfall years. In spite of this, agriculture output did not show sharp declines, unlike earlier years. Recent periods of severe drought provide convincing evidence of the ability of Indian Agriculture to withstand the stress created by such critical situations, which used to cause widespread devastation in the past.

- 4) The new technology gave impetus to irrigation expansion as without irrigation the technology is of no use. Irrigated area in post-green revolution period increased at a much higher rate than in the earlier period as we saw in Table 12.8 in Unit 12.
- 5) The new technology might have encouraged own cultivation because of the higher returns. Several researchers have observed that in HYV areas owners resumed cultivation on a large scale. The extent of tenancy and absentee landlordism might have gone down. Hence the ill effects of both these on growth might have come down.
- 6) By raising the net returns from agriculture the new technology might have arrested the tendency for concentration of land and in saving small and marginal farmers. This is observed in all states except Punjab.
- 7) The fragmentation of land that is observed is more due to population growth and division of land among family members, than due to adverse effects of HYV technology. The HYV technology might have given further impetus to consolidation of holdings, as it is easier to go for tube-well which caters to a bigger plot than tiny and scattered plots. Tube-well irrigation is more stable, and controlled and efficient than canal irrigation and farm-to-farm irrigation. Though canal irrigation is cheaper for individual farmer, its social costs are very high.
- 8) The HYV technology by increasing the cropping intensity – (due to short duration maturity more number of crops may be grown on the same plot) – helped creating more employment (see Table 13.3). This benefits especially landless labour households who eke out their living by hiring out their labour. As we know, improvement in employment gives more income to people. Though the additional employment per worker per year varies across states (more in wheat growing states, moderate in rice growing states and least in other states) overall employment generation is modest compared to the growth rate in workforce dependent on agriculture. Still this is one of the positive aspects of new technology.

Table 13.3 : Employment Potential of New Technology

State	Irrigated area under cereals (000ha)	Irrigated area as % of cultivated area	Number of farm workers (in thousand)	Farm workers per 100 ha	Additional days of employment per worker per year
Andhra Pradesh	3442	26	12592	98	11
Assam	571	20	2815	97	9
Bihar	2249	21	14474	133	7
Gujarat	599	6	5484	53	5
Kerala	460	17	2992	108	6
Madhya Pradesh	898	5	12188	62	3
Karnataka	911	9	6737	65	6
Orissa	996	13	5295	71	7
Punjab/Haryana	2896	27	4168	39	29
Rajasthan	1292	8	6024	36	9
Tamil Nadu	2855	39	9060	124	13
Uttar Pradesh	4146	18	21407	94	8
West Bengal	1354	20	7249	104	8
Total	23553		122487	76	8

Source: B. Sen (1974)

- 9) Maturity period of HYV seeds is short and quick. Hence we need to complete the harvesting in a very brief period unlike local varieties. This pushes the demand for labour to high level for sometime, thus pushing up the wages – which benefits the labourers. Trends in real agricultural wages show improvement in all the states in the post-HYV period as against stagnant wages in the earlier period. The increase in wages is high in the initial low wage areas, especially in the second round of green revolution (see Table 13.4). Thus the labourers gained more in low wage areas (relatively). As a result, the wage differentials across regions narrowed down in post-HYV period. See the last column of Table 13.4 and compare the figures between ‘low wage areas’ and ‘high wage areas’ to appreciate the convergence of wage differentials across regions.

Table 13.4 : Trends in Real Agricultural Wages

(Base year 1970-71 = 100)

States	1970-71 to 1971-72	1987-88 to 1988-89	Percent increase
<i>High Wage Areas</i>			
Punjab	99.2	108.2	9.1
Haryana	98.7	98.1	0.7
Himachal Pradesh	105.3	119.8	13.8
Kerala	105.6	161.7	53.6
<i>Low Wage Areas</i>			
Andhra Pradesh	97.6	155.4	59.2
Bihar	98.5	150.0	55.2
Orissa	99.8	141.7	42.0
Madhya Pradesh	99.7	158.0	59.0

Source: C.H.H. Rao (1994).

- 10) The increased income provides scope for improvement in related non-farm activities, which in turn gives rise to backward and forward linkages. Machine repairing services (pump sets, tractors, threshers, sprayers, etc.) trade and commerce related activities such as dairying, poultry, agro-processing units are some examples. Perceptive observers like Blyn concluded that in post-HYV period, incomes from family resources increased relatively more for families with smaller holdings. Thus income inequalities tend to get reduced.
- 11) All these would lead to withdrawing of male labourers from agriculture and their shifting into higher paid jobs. The increasing feminisation of agriculture is observed.
- 12) The brief peak seasons and increased demand for labour and improvement in non-farm activities all necessitated the movement of agricultural labourers from backward areas to advanced areas particularly during cultivation seasons. According to an estimate by Sidhu and Grewal (1984) the estimated number of migrant labourers in Punjab for the years 1978-79 and 1983-84 were 2,20,000 and 2,86,000 respectively. You can have an idea on the extent of migration of agricultural labourers.
- 13) Thus we observe that the new technology resulted in the emergence of national labour markets. There is also a tendency of convergence of agricultural wages across different regions, (see Table 13.4) which may be due to migration of labourers from stagnant and backward areas where there is hardly any expansion of employment sources.

13.3 REGIONAL INEQUALITIES

Inequality across regions is inevitable because of natural factors. Some areas may be endowed with rich productive land while others may be arid zones.

Existing regional inequalities increased further as a result of initial benefits/gains accrued from HYVs. But given the desperate situation the strategy adopted was almost inevitable. The important point, however, is that the government did not focus with the same enthusiasm in the development of other regions after overcoming the food crisis. But as it happened, the benefits percolated to other regions as well in the form of migration of labourers from backward regions to these HYV pockets. These migrant labourers would earn and save here and invest back home in whatever way they can. Moreover, they would carry the tales of success to their home regions. Of course government: i) made available HYVs seeds, ii) increased supply of inputs like fertilisers, iii) increased irrigated areas in the usual course, iv) provided institutional credit through nationalization of banks, and v) invested in agricultural research development by establishing public agro research institutions, universities etc.

All these helped the backward regions in overcoming their sluggishness and catching up with the advanced districts. Though inequalities persisted, it narrowed down over time (in the next round of green revolution) as several studies showed.

Breakthroughs were observed especially in Eastern States (mainly West Bengal) where operation *Barga* and other land reform measures and other government, initiatives caused fast developments in agriculture.

The fact that regional inequalities over a period are narrowing is illustrated by two cases, viz., Punjab and West Bengal. Despite its smaller size, West Bengal's cultivated area is 50 per cent larger than Punjab's. However, Punjab produces about 50 per cent more food than West Bengal. This is made possible by higher yield and multiple cropping in Punjab.

Table 13.5 : Net and Gross cropped Area in Punjab and West Bengal ('000 Ha.)

State	1971-72		1981-82		1991-92	
	Net	Gross	Net	Gross	Net	Gross
Punjab	4076	5724	4210	6929	4139	7552
West Bengal	5463	7170	5565	7393	5334	8540
India	139721	165186	142121	177101	142509	185487

Source: CMIE, 1996.

Table 13.6 : Food Production in Various States (million Tonnes)

Year	West Bengal	Punjab	Haryana	AP	UP
1990-91	11.3	19.3	9.6	12.4	35.7
1991-92	12.9	19.6	9.1	11.7	35.5
1992-93	12.4	20.0	10.3	11.7	36.2
1993-94	13.1	21.6	10.3	12.2	37.2
1994-95	13.5	21.8	11.0	11.6	38.2
Growth 1990-95	19.5	13.0	14.6	-6.9	8.4

Source: Government of India (1996)

As we observe from Table 13.7, Punjab uses much more inputs (fertilizer, etc.) per hectare than West Bengal.

Table 13.7 : Fertiliser Consumption in Punjab and West Bengal (kg. per hectare)

Year	Punjab	West Bengal	India
1980-81	111.9	35.9	31.9
1990-91	171.2	90.9	72.4
1994-95	170.9	86.6	74.0

Source: CMIE (1996)

An average holding in West Bengal used half the fertilizer employed by its Punjab counterpart per unit of land. Only about one third of cultivated land is irrigated in West Bengal; Punjab is moving fast towards one hundred per cent coverage (see Table 13.8) in 1991-92.

Table 13.8 : Net and Gross Irrigated Area as percent of Total Cropped Area in Punjab and West Bengal

State	1971-72		1981-82		1991-92	
	A	B	A	B	A	B
Punjab	72.5	76.5	80.9	86.1	93.3	94.6
West Bengal	27.3	21.5	30.3	23.5	35.8	22.4
India	22.6	23.3	28.2	29.1	35.2	35.7

A) Net irrigated Area; B) Gross Irrigated Area

Source: CMIE (1996)

Higher level of input application has also resulted in higher yield per unit of land in Punjab. In 1992-93, the yield per hectare of land was 3627 kg. in Punjab compared to 2027 kg. in West Bengal. The growth in West Bengal agriculture is attributed to land reform measures during 1977 to 1980 and establishment of the elected three-tier panchayat system in 1978. From 1983-84, West Bengal has been one of the fast developing Indian states in terms of growth rates in agricultural output. For the 12-year period during 1983-84 to 1994-95, West Bengal's annual rate of growth of food production has averaged 6.7 per cent, compared to 4 per cent for Punjab. During 1990-95, West Bengal increased production by 19 per cent, compared with 13 per cent by Punjab. It is more difficult to sustain high growth rates at higher production levels. Punjab has the proven record of more than three decades of sustained development while West Bengal's is not even two decades old in this regard. Still it is creditable that West Bengal is growing faster over a reasonably long period despite a much lower level of mechanization and input application. Table 13.9 shows that the earlier laggard states have been catching up with the advanced states in the second round of green revolution. Growth rates in eastern states, viz., West Bengal, Bihar, Orissa and Assam and also in Madhya Pradesh had picked up later on. These states showed much higher growth rates in the second round than in the first round of green revolution, thus, indicating the spread of new technology to these areas. The performance of these laggard states has been particularly better in the case of rice crop.

Table 13.9 : State-wise Growth Rates in Output (per cent per annum)

States	Rice		Foodgrains	
	1967-68 to 1977-78	1978-79 to 1988-89	1967-68 to 1977-78	1977-78 to 1988-89
Andhra Pradesh	2.66	1.70	2.56	0.41
Assam	0.8	2.21	1.27	1.63
Bihar	0.82	2.83	1.14	3.52
Gujarat	3.39	-0.43	2.23	-4.97
Haryana	11.34	5.12	2.86	3.94
Himachal Pradesh	0.04	-1.14	1.24	0.36
Jammu and Kashmir	1.73	0.09	1.47	0.36
Karnataka	-0.01	-0.04	2.50	-0.58
Kerala	0.54	-2.36	0.48	-2.30
Madhya Pradesh	0.96	5.30	1.23	4.36
Maharashtra	4.79	-0.44	4.84	-0.46
Orissa	-1.00	2.61	0.80	2.59
Punjab	18.21	7.04	5.29	4.57
Rajasthan	10.90	-1.77	3.03	1.37
Tamil Nadu	1.45	0.89	1.69	0.74
Uttar Pradesh	4.06	7.32	4.06	5.16
West Bengal	1.71	5.23	2.60	4.53
All India	2.16	3.19	2.31	2.68

Source: Directorate of Economics and Statistics, Government of India.

Research in dryland agro-technologies has also helped in reducing the regional inequalities further. The prospect of developments in biotechnology, tissue culture and genetic engineering would reduce the disadvantage experienced by these backward regions further as these technologies are effective equally, in all areas irrespective of agro climatic conditions and irrigation endowments.

Check Your Progress 1

- 1) Bring out five positive effects of HYV Technology in India.

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2) What are the reasons for accentuation of regional inequality due to introduction of new technology?

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13.4 INEQUALITIES ACROSS FARMS

Inequalities have another dimension in that different farming groups within the same region are differently endowed, reaping the benefits differently. How much a particular group would be benefited depends on how much irrigated area the particular group happens to possess and operate. Also how much they are able to invest on inputs matters a lot as the technology is effective only in a package (seed, water, fertilizers). Hence the resource rich farmers had the initial advantage in introducing HYVs and using costly inputs; these paid high returns. As it happens in any new innovation the early adopters always have the maximum benefits; the late adopters the least benefited and the middle adopters reaping in between. Hence in the initial period inequalities among different size groups of farmers widened. The Government was more concerned with boosting production (economic aspect) rather than about social aspect of reducing inequalities.

The supply of inputs (seeds, fertilisers) at subsidized rates and providing liberal institutional credit was seized upon by the early adopters. This was also inevitable as the objective was to make immediate boost in production. This does not mean other sections did not benefit. Whoever could adopt HYVs were benefited because HYVs give higher yields in irrigated fields without fertilisers also, though lower than those who could apply fertilisers. But without irrigation HYVs would not yield higher than local variety. With improved returns gradually even small and marginal farmers could adopt HYVs.

Traditionally, it is observed that there is an inverse relationship between size of land holding and productivity. This implies small farms have higher yield than large farms because of personal supervision the small farmers could provide. However, the inverse relationship between farm size and productivity got reversed in the early period because of the advantage employed by resource rich farmers who could spend on capital-intensive inputs. It was even observed that the traditional patterns of large farmers leasing out land to small farmers got reversed as large farmers retained land for self cultivation after seeing the improved returns due to new technology. In some cases the large farmers leased in land from small farmers. This phenomenon is described as 'reverse tenancy'. Thus, the inequalities between the two groups further widened. The reverse tenancy defeated the gains made by tenants as a result of land reform measures.

But all these changes though contributed to increase in inequality it helped in increasing the returns of small and marginal farmers in absolute terms. Irrespective of the size of the farm on which it is tried, the new technology benefits all. Those small and marginal farmers who could buy inputs from their incomes from supplementary sources like non-farm activities (dairy, poultry, kitchen gardening, petty trade, traditional crafts, etc.) got benefited. The increased employment on HYV farms as a result of increased cropping intensity (due to short duration crops) made small farmers to withdraw from labour market and concentrate on getting employed in their own cultivation. If the

family size is large enough one or two would work in own field while others would supply their labour to the market as labourers.

There are some studies which show that the traditionally observed inverse relationship between farm size and productivity got restored due to all these factors. Consequently, smaller the farm higher is the returns.

13.5 IMPACT ON AGRICULTURAL LABOURERS

We have seen in Unit 2 that the colonial policy threw the traditional craftsmen, artisans out of their livelihood source and as there was no other way to go, they joined the ranks of agricultural labourers. The independent India came up with land reform measures but these were confined mainly to abolition of inter-me diaries and consolidation of holdings. It did not deliver on the promise of implementing land ceiling and distribution of surplus land from the landlord class to the landless. Instead the policies were confined to indirect approach of tackling labourers through developmental programmes. All these could not address the problem of landlessness and improvement in their incomes and employment.

Of all these measures, the HYV technology made indirect attack on the poverty of labour households by increasing the yields of farms. In the process it increased the cropping intensity thus generating higher demand for labour and causing more employment. The increased yields and returns also caused the emergence of non-farm avenues which provided further employment sources. As a result of improved returns from HYV foodcrops, farmers could switch over to commercial crops which are remunerative. This resulted in shifts in cropping pattern from foodcrops to commercial crops such as cotton, tobacco, chilli and sugarcane. This was another source of improved employment avenues for agricultural labourers.

All these changes facilitated the withdrawal of small farmers from the labour market (to devote more time on own operated farms and in non-farm activities). It improved the probability of employment for agricultural labourers and thus improved their bargaining strength for higher wages. Studies show improved real wages across the country, especially in advanced HYV districts, since the seventies. The withdrawal from agricultural labour market is mainly by the male labourers, thus leaving the agriculture to more and more female labourers. Thus agriculture is increasingly getting feminised, according to observers of agricultural scene.

One more phenomenon after the introduction of HYV technology is the emergence of national labour markets. Agriculture product markets got more and more integrated. Due to the improved employment in HYV pockets, the labourers from poor, non-HYV backward areas started migrating to HYV pockets in search of employment and income. There they received much higher wages and employment than in their home regions. The short duration nature of HYVs, increased cropping intensity, the squeezing of peak operations in HYV farms, improved non-farm avenues for local labour all necessitated this migration from backward areas. As a result, their bargaining strength at the home region (which is backward with relatively low wage rate) increased. Thus, the labour markets got integrated at the national level. The seasonal movement of labourers from poor regions like Eastern Uttar Pradesh and Bihar to the North West region, viz., Punjab, Western Uttar Pradesh and Haryana is taking place since the seventies. All these changes improved the incomes of labourers in developed as well as backward regions. Moreover, the widening wage differentials (observed in 1970s) across regions narrowed down over a period of time.

13.6 INEQUALITIES ACROSS CROPS

A third dimension of inequalities is the inter-crop differentials in terms of adoption levels, production and yields. The green revolution is often referred to as the 'wheat

revolution,' showing the pre-eminence of wheat vis-à-vis other crops in adoption, production and yields. HYV technology started with wheat; later on rice varieties came on the scene. Since these are the two principal cereals in the country, green revolution is also referred to as cereal revolution as it has not done much in the other crops, especially in non-foodgrains. The yield improvements in wheat were spectacular whereas the same was not the case with rice.

The yield of wheat in India is comparable to the world average while the yield of rice is only three fourths of world average (see Table 13.11 given at page 31). There are several reasons for these differences across crops.

One of the reasons is the traditional wheat producing areas in India (consisting of Punjab, Haryana and Western Uttar Pradesh) have been the most advanced agriculturally – whereas the traditional rice growing areas (Bihar, Bengal, Assam, Orissa) are among the poorest regions barring few districts. The poor areas are characterised by: i) stifling agrarian structures (high level of land inequalities), ii) poor infrastructure (roads, electricity), iii) heavy rainfall and frequent cyclone but poor drainage, leading to recurring floods, iv) stagnant farming communities, and v) acute poverty stricken population. On the other hand, traditional wheat growing areas are characterised by: i) successful land reforms (abolition of intermediaries, consolidation of land holdings), controlled irrigation such as tube wells, ii) reasonably good irrigation facilities, iii) infrastructure (road, electricity), iv) proximity to big metro city, v) industrious and dynamic farming community willing to adopt improved farming techniques, and vi) generally better standards of living. These contrasting factors cause definite differentials in cultivation of rice and wheat crops. In 1983-84 out of 24 million hectares of wheat growing areas 16 million (67%) were irrigated while only 18 million hectare out of 40 million hectare (45%) of rice growing area was irrigated.

Secondly, certain technical complexity of rice cultivation adds to the differentials in these two crops. For example, rice can adapt to several climates and soils. Moreover, the farming methods differ widely: direct sowing or transplantation from seed beds; irrigated or rainfed; low land, upland or hillsides; long cycle or early variety; tall or short stem; floating rice that survives in 2 or 3 metres of water. This diversity has its advantages (in that rice can adapt to several physical surroundings) and also some inconveniences. The introduction of new varieties of rice is more complicated than for wheat, the latter being cultivated in less diversified climatic conditions and with less varied techniques. The initial varieties of HYV wheat from Mexico gave good results (1965-67) almost throughout Asia. However, one needs a large number of varieties of rice to suit each environment, seeds from Taiwan (tried in 1966 and 1967) were unsuccessful in the Gangetic basin. The IR-8 from Indian Rice Research Institute (IRRI) was highly productive in some districts in India but not in others. Secondly, those paddy fields which are dependent on rainfall are subject to the whims of monsoon. That is why irrigation becomes essential as a complement to rainfall and large scale efforts are needed to control the rivers. Regarding drainage, the low lying lands that suffer from an excess of water even in times of normal monsoon can be found in Bengal, Assam, Orissa, Eastern Uttar Pradesh and Bihar. This constitutes a key problem of the entire Eastern part of India, which is compounded by floods when the monsoon is heavy. The paddy fields situated in the North Eastern part of Deccan are, by and large, dependent on rainfall and thus subject to irregularities.

Thirdly, Rice is much more vulnerable to diseases and parasites than wheat. Rice grows mainly during the monsoon, which period is more conducive to pests than the dry season. Pesticides are therefore required in greater quantities, which in turn creates difficulties for the introduction of new varieties.

Besides technical aspects, there are other variables which explain the differences; man's behaviour, his outlook towards agriculture, the part played by State governments and administration. All these factors together contributed to the spectacular success of HYV wheat in contrast to poor performance in HYV rice varieties.

The other cereals performed even worse than rice. Coarse cereals like Jowar, Maize and Bajra were only briefly touched by HYV technology. These crops are grown mostly on non-irrigated land. As we have seen in Unit 11 dryland technology is altogether different from HYV technology (which is irrigation based). Only some success is reported with respect to maize and jowar - ICRISAT made some progress in introducing new varieties in these crops and yields improved to some extent.

Crop-wise yields in the 1980's and the 1990's are given by VM Rao (2000), which shows declining yields in the 1990s compared to 1980s (see Table 13.10). Yields have gone down in 1990s in all crops except coarse cereals and pulses while growth rates in production have gone down in 1990s compared to 1980s among all crops without exception.

Table 13.10 : Trend Growth Rate of Area, Production and Yield of Important Crops

(percent per annum)

Sl. No.	Crops	Area		Production		Yield	
		80s	90s	80s	90s	80s	90s
1.	All Crops	0.1	0.4	3.2	2.2	2.6	1.4
2.	Foodgrains	-0.2	-0.1	2.9	1.8	2.7	1.4
3.	Non-food grains	1.1	1.5	3.8	3.3	2.3	1.4
4.	Rice	0.3	0.5	3.6	1.9	3.2	1.3
5.	Wheat	0.5	1.7	3.6	3.1	3.1	1.6
6.	Coarse Cereals	-1.4	-1.8	0.4	0.2	1.7	2.0
7.	Pulses	-0.1	-0.2	1.5	1.0	1.6	1.7
8.	Oilseeds	2.4	0.8	5.5	3.4	2.9	2.6
9.	Sugarcane	1.5	1.8	2.7	2.5	1.2	0.7
10.	Cotton	-1.3	3.3	2.8	1.7	4.1	-2.0

Source: V.M. Rao (2000).

13.7 LIMITATIONS OF HYV TECHNOLOGY

Several studies have highlighted the negative consequences of HYV technology. It is pointed out that the new technology: i) accentuated inter-regional and inter-class inequalities; ii) benefited only one or two crops at the cost of other crops; iii) helped concentration of landholdings; iv) marginalized the small farmers; v) increased the landlessness, and swelled the ranks of agricultural labourers; and vi) increased the cost of cultivation.

Some prominent observers of agricultural scene counter all these arguments. Quite a few of the critics emerged from the first round of green revolution period. There is some realisation that most of these criticisms were made too soon and do not hold the scrutiny from experience of the second round of green revolution.

But some other criticisms made against the HYV technology seem to continue, highlighting the limitations of HYV technology. The HYV technology is suited for agriculture in developed economics as it is capital intensive (requiring costly inputs like

chemical fertilisers, pesticides) and; energy intensive (requiring high doses of petroleum-based products to produce chemical fertilisers). The nature of HYV seeds being pest and disease prone requires high doses of pesticides leading to harmful environment effects. Moreover, it has a tendency to push up mechanization (the brief harvest season makes it advantageous to go for combined harvesters, threshers as it happened in Punjab). This sort of cultivation is often considered as inappropriate for a country like India with low per capita income and high poverty. According to these critics India should have gone for more labour intensive technologies. It should have emphasised more on irrigation especially minor irrigation, water harvesting technologies, water maintenance systems and development of organic fertilizers.

We have mentioned earlier that adoption of HYV technology was inevitable because of food crisis. However, according to the critics, there was a need to rethink on the continuity of the same strategy after overcoming the food shortage. Green revolution should have been used only as an immediate outlet rather than as panacea for all the ills of Indian agricultural scene. The ills emanating from the agrarian structure, irrigation, production and distribution strategies, all seemed to be addressed with this strategy. The chronic problems of surplus labour, unemployment, underemployment, poverty and low purchasing power would not find solution with a single strategy.

In any case the HYV technology cannot be a permanent success story given its limitations. The agro climatic and agrarian structural constraints come in the way of agricultural expansion.

It has not yet resulted in bringing the agricultural production and yields up to the world averages in the most successful crops like wheat and rice also (see Table 13.11). Even before reaching these average and while still lagging behind the major producing countries in respect of yields, the growth rates in yields, already started showing declining tendency.

Compared to 1980s these have already come down in 1990s (see Table 13.10). Of late the agricultural performance is also being classified into two periods by the researchers as well as in the government documents. The periods are: (a) a decade immediately preceding the economic reforms introduced in 1991 and a decade after, i.e., after 1991. Table 13.10 gives the growth rates in area, production and yields of important crops for the 1980s and 1990s. In this classification it is possible to interpret that production or yields declined in the post reform period.

It seemed to have reached its limits even in the regions where it has succeeded most. In fact its ill effects are too obvious to be able to ignore – For example, over-exploitation of ground water in terms of (a) fall in water table forcing the farmers either to deepen the well or abandon it depending on the accessibility of financial resources, (b) adverse effects on equity issues, and (c) abandoning agriculture itself and becoming agricultural or non-agricultural labourers. The adverse effects of land degradation due to salinity and water logging are: decline in farm production and income, unemployment and migration, disparities and ecological imbalances.

Table 13.11 : Yield of Important Crops in Major Producing Countries in 1997 (kg/ha)

Sl. No.	Paddy		Wheat		Ground Nut		Sugarcane		Cotton		Jute	
	Country	Yield	Country	Yield	Country	Yield	Country	Yield	Country	Yield	Country	Yield
1	China	6331	China	4087	China	2574	Brazil	69021	China	943	Bangladesh	1577
2	Indonesia	4561	France	6530	Nigeria	1124	China	75982	USA	769	China	2517
3	Pakistan	2827	USA	2673	USA	2828	Thailand	55878	Pakistan	552	Thailand	3548
4	Philippines	2933	Australia	1712	Indonesia	1519	Mexico	72734	Turkey	1065	Myanmar	939
5	Thailand	2143	Canada	2128	Sudan	762	Australia	97337	Argentina	368	Brazil	1714
6	India	2915	India	2654	India	988	India	69737	India	321	India	1830
7	World	3827	World	2686	World	1273	World	63324	World	584	World	1734
	Yield in India as % of World Average	76.2		98.8		77.6		110.1		55.0		105.5

Source: Production Year Book, Food and Agriculture Organisation, 1997.

Another breakthrough is needed in Indian agriculture as the one introduced in 1960s has reached a plateau. This is especially needed in the context of globalisation where only the best can survive in the global markets. Cost effective technologies to compete with the major producing countries with their far superior productivity levels (see Table 13.11) are imperative, if Indian agriculture has to prosper now that it is a part of WTO. Indian agriculture has to meet the growing food and non-food demands from increasing population and from a prospective reduction in the acreage under crops. According to Abul Kalam, scientist turned President of India, the present 200 million tonnes of food production from 170 million hectares will have to be raised to 300 million tonnes by the year 2020 from 100 million hectares. It is possible only by doubling the present productivity levels. Hence he called for a second green revolution, which, of course, should avoid the negative consequences of the first one. The next breakthrough is anticipated from two sides: (a) from the effective management of water resources, and (b) from the impending strides by biotechnology.

Check Your Progress 2

- 1) Do you think that agricultural labourers have benefited due to introduction of HYV technology?

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- 2) Why did the HYV technology realise lower success in rice growing areas?

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13.8 LET US SUM UP

HYV technology in India has helped in overcoming the acute food shortage of the 1960s. It increased foodgrains production mostly through increase in yield. The overall gains to the country from this new technology can be discussed broadly in terms of its impact on the inequalities across regions, farms and crops.

In the beginning the new technology was introduced in Punjab, Haryana and western Uttar Pradesh keeping in view the availability of accompanying inputs. The higher returns from use of HYV seeds encouraged farmers to adopt it in these areas. Farmers in other areas, however, could not adopt the new technology. As a result, inter-regional inequality increased in the beginning years. Over time, farmers in other states have accepted the HYV technology and the gap in yield across states is lessening.

There is a definite increase in employment opportunities for agricultural labourers. There is large-scale seasonal migration of agricultural labourers from backward to

advanced regions. Mobility of labour and employment opportunity has increased the real wage.

In the beginning HYV technology was introduced in wheat. Later on, adoption of HYV rice also picked up. However, in the case of other crops the relative gains from HYV technology are rather limited.

13.9 KEY WORDS

Population explosion : Before Independence both birth rate and death rate in India were quite high. Consequently population growth rate was reasonably low. In the post-independence period because of better health care facilities death rate declined whereas birth rate continued to remain high. This resulted in high population growth rate.

Cropping intensity : Number of crops grown on the same plot in a year. Any technology that helps raise cropping intensity augments land resource which is very scarce.

Real wage : The money wage deflated by consumer price index for agricultural labourers gives real wage. Real wage, thus, is a more realistic measurement of wage and can be compound overtime as price index is constructed with a base year.

13.10 SOME USEFUL BOOKS

Blyn, G, 1983, *The Green Revolution Revisited, Economic Development and Cultural Change*.

Byres, T. J., 1972, 'The Dialectic of India's Green Revolution', *South Asian Review*, Vol. 5, No. 2.

Dantwala, M.L., 1991, *Indian Agricultural Development since Independence: A Collection of Essays*, Oxford and IBH Publishing Co.

Etienne, G., 1988, *Food and Poverty: India's Half Won Battle*, Sage Publications.

Kurien, C. T., 1981, *Dynamics of Rural Transformation: A Study of Tamil Nadu, 1950-1975*, Orient Longman.

Rao, C. H. H., 1994, *Agricultural Growth, Rural Poverty and Environmental Degradation in India*, Oxford University press, Delhi.

Rao, V. M., 2000, *Modernising Indian Agriculture: Priority Tasks and Critical Policies*, DRG Study No.21, Reserve Bank of India, Mumbai.

Sen, B., 1974, *The Green Revolution in India: A Perspective*, New York, Wiley.

13.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Go through Section 13.2 and bring out five positive aspects.
- 2) The reasons for accentuation of inequality across regions could be differences in adoption of new technology, availability of accompanying inputs, etc. See Section 13.3 and answer.

Check Your Progress 2

- 1) Agricultural labourers have benefited from introduction of new technology because of increase in demand for labour, increase in real wage and creation of national labour market. See Section 13.5 for details.
- 2) Bring out the adverse conditions in rice growing areas and answer the question.

UNIT 14 TRENDS IN AGRICULTURAL PRODUCTIVITY

Structure

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Trends in Agricultural Output
 - 14.2.1 Changes in Trends since Independence
 - 14.2.2 Changes in Area under Cultivation
 - 14.2.3 Changes in Yield
- 14.3 International Comparison of Agricultural Yield
- 14.4 Regional Variation in Productivity
- 14.5 Causes of Low Agricultural Productivity in India
 - 14.5.1 Institutional Deficiencies
 - 14.5.2 Technological Backwardness
 - 14.5.3 Sociological and other Factors
 - 14.5.4 Accumulated Backlog of Investment in Agriculture
- 14.6 Measures to Raise Productivity
 - 14.6.1 Institutional Measures
 - 14.6.2 Technological Changes
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 - 14.6.4 State Policies
- 14.7 Let Us Sum Up
- 14.8 Key Words
- 14.9 Some Useful Books
- 14.10 Answers/Hints to Check Your Progress Exercises

14.0 OBJECTIVES

This Unit will enable you to:

- explain the trend in agricultural production;
- examine the trends in productivity;
- identify the causes of low agricultural productivity in India; and
- examine the measures taken to raise the level of productivity.

14.1 INTRODUCTION

At the time of Independence, agricultural situation in India could be characterised by low productivity of labour as well as land. The economy suffered from persistent food shortage with occasional famines. The rapidly growing population was creating a pressure on agricultural sector. Moreover, a very high proportion of the labour force was engaged in agriculture, which resulted in disguised unemployment and underemployment in rural areas. Irrigation facilities were non-existent for more than 80 per cent of the cultivated area. Agricultural economy of India was described as a “gamble in monsoon” because of the high degree of dependence on rainfall and the uncertainty of a good monsoon.

Technological backwardness of Indian agriculture was all pervasive. Tools and implements used were traditional and even primitive. Source of energy for agricultural

production was either animal power or muscle power with their obvious drawbacks. Cultivation techniques were largely traditional. Cowdung was the predominant source of manure.

In the absence of technological progress, production and employment in agriculture could be increased only by bringing more area under cultivation. This was causing a disturbance in the ecological balance leading to greater intensity of floods, droughts and soil erosion. Without improving the irrigation facilities, area under cultivation could be used only once when rain water was available. There was thus an intensely felt need for improving the production technology, the quality of seeds, storage facilities, etc. Without its modernisation, the agricultural sector was threatening to become a drag on the Indian economy.

We have learnt in Unit 5 that growth of the agricultural sector in India is necessary for a number of reasons. Firstly, it sustains a large proportion of work force which draws its income from agricultural activities. The incomes of this work force can rise only if the agricultural production and productivity grow rapidly. Secondly, agricultural sector provides vital support to the industrial sector by supplying raw-materials and food on the one hand and generating demand for industrial products on the other. Thirdly, agriculture still remains a very large sector of the Indian economy and its growth can give a thrust to the growth of the economy. Finally, growth in the agricultural sector will help generate surpluses which are vital for resource mobilization in the economy.

14.2 TRENDS IN AGRICULTURAL OUTPUT

As you know, agricultural output can be increased by two means, viz., (i) bringing in more area under cultivation, and (ii) increasing productivity of land. If land were abundantly available, agricultural production can be increased easily, given the surplus labour available in India.

However, increase in the area under cultivation is not without a limit. More and more area can be brought under cultivation only at the cost of reducing forest covers, green pastures, drainage channels for rain water, etc. All these are likely to have a negative impact on agricultural production because the ecological balance will be adversely affected. Thus, long term growth in agricultural production in India can be realised primarily by increasing the productivity or yield of land. Increase in productivity, thus, holds the key to growth in agricultural production in India.

14.2.1 Changes in Trends since Independence

You may be aware that India produces a variety of crops. Therefore, quantitative measurement of agricultural production becomes difficult because we cannot add up the production of different crops. Usually the growth of agricultural production is measured in terms of the changes in the index number of agricultural production. The index number of agricultural production gives a comparative picture on the level of production with respect to a stipulated base-year. Keeping in view the fact that agricultural output is subject to annual fluctuation, usually an average of a few adjacent years are taken as the base. An index number for a group of crops is obtained by combining individual production levels through suitable weights. The movement in this number provides us with an overall estimate of the growth rate in the crops included in the group. Let us examine the growth rates in production over time for all the crops and some major crop groups.

Table 14.1 : Growth Rate in Agricultural Production during 1949-50 to 1997-98

(All India, in Percentages, Base 1979-82 = 100)

Crop Period	All Crops	Foodgrains			Non-Food'grains		
		All Food	Rice	Wheat	Oilseeds	Fibres	All Non-foodgrains
1949-50 to 1997-98	2.68	2.50	2.67	5.47	2.77	2.40	2.98
1949-50 to 1964-65 (I)	3.15	2.82	3.50	3.98	3.20	4.56	3.74
1967-68 to 1997-98 (II)	2.88	2.39	2.85	4.59	3.60	2.68	3.35
1967-68 to 1980-81 (II-A)	2.19	2.15	2.22	5.65	0.98	2.53	2.26
1980-81 to 1997-98 (II-B)	3.23	2.58	3.06	3.57	5.36	3.63	4.45

Source: Agricultural Statistics at a Glance, Government of India.

Table 14.1 gives the compound rate of growth of production of (i) all crops combined together, (ii) foodgrains, and (iii) non-foodgrains. The table also shows the rate of growth of production of some major crop groups in foodgrains (wheat and rice), and non-foodgrains (oilseeds and fibres).

The period covered is 1949-50 to 1997-98. We have divided this period into two sub periods for our analysis, viz., i) Period I: 1949-50 to 1964-65, and ii) Period II: 1967-68 to 1997-98. Figures for 1949-50 to 1964-65 (Period I) show the growth in agricultural production before the adoption of new agricultural strategy known as the green revolution. The subsequent period, i.e., 1967-68 to 1997-98 (Period II) relates to the green revolution period. We should expect the figures to show the impact of green revolution on agricultural production during period II. This period has been further sub-divided into two sub-periods, i.e., 1967-68 to 1980-81, (Period II-A) and 1980-81 to 1997-98 (Period II-B) in order to examine the changes in the trends that may be taking place.

We observe from Table 14.1 that the overall rate of growth of agricultural production (foodgrains plus non-foodgrains) for the period 1949-50 to 1997-98 was around 2.68 per cent per annum. During this period the growth rate in non-foodgrains is 2.98 per cent per annum while that of foodgrains has been around 2.50 per cent per annum. Of the foodgrains, the rate of growth in the production of wheat has been very high, i.e., 5.47 per cent per annum whereas that of rice has been close to the average rate of growth for all crops, i.e., 2.67 per cent per annum. During this period the population growth in India has been around 2% per annum. Thus, the growth in per capita agricultural output has been negligible. We will discuss the issue of per capita availability and food security later in Unit 21.

A comparison between Periods I and II, i.e., pre-, and post- green revolution periods, shows that the rate of growth of production for all crops was higher for the pre-green revolution period (Period I). It was 3.15 per cent per annum as compared to 2.88 per cent per annum in the Period II. This tendency is visible for the foodgrains as well as non-foodgrains. It is only in the case of wheat that the compound rate of growth of production in Period I (3.98 per cent) was less than that in Period II (4.59 per cent). Another aspect of these rates of growth is that within the Period II, the rate of growth in production has been higher in Period II-B, i.e., between 1980-81 and 1997-98 in comparison to that in Period II-A, i.e., 1967-68 to 1980-81. This should give an idea that the rise in rate of growth is being maintained.

Table 14.1 also shows that wheat has experienced the highest rate of growth over the entire 49-year period. Moreover, the rate of growth in wheat production accelerated sharply, immediately after the introduction of the new agricultural strategy. The rate of growth in wheat production which was around 3.98 per cent per annum during period I, increased to 4.59 per cent per annum in Period II. Further analysis of Period II shows that growth rate of wheat production was higher during period II-A than Period II-B. Thus, the initial growth in wheat could not be sustained for a longer period. On the other hand, growth rate in rice production was lower in Period II than Period I. It declined from 3.50 per cent per annum in Period I to 2.22 per cent in Period II-A but later rose to 3.06 per cent in Period II-B. In fact, all the crop groups like oilseeds, fibres, and non-foodgrains, except wheat have experienced a higher rate of growth in production since 1980-81 as compared to the period between 1967-68 and 1980-81. We can infer that the gains from new agricultural strategy was initially confined to wheat but later steadily spread to all the crops. Secondly, there is a tendency for the rate of growth in agricultural production to accelerate.

14.2.2 Changes in Area Under Cultivation

As stated earlier, the increase in agricultural production can be attributed to an increase in either area under cultivation or yield per hectare. We shall examine how the increase in production at the rate of 2.68 per cent per annum during the period 1949-98 has been achieved. Here we will examine the contribution of i) increase in area under cultivation, and ii) yield per hectare to this rate of growth in agricultural production.

Table 14.2 shows the compound growth rate in area under cultivation for all crops as well as some of the major crops and crop groups.

Table 14.2 : Growth Rate in Area under Cultivation during 1949-98

(Base: Triennium Ending 1981-82 = 100; in percentage)

Crop Period	All Crops	Foodgrains			Non-Food grains		
		All Food	Rice	Wheat	Non-foodgrains	Oilseeds	Fibres
1949-50 to 1997-98	0.62	0.41	0.77	2.21	1.27	1.23	0.26
1949-50 to 1964-65 (I)	1.58	1.35	1.21	2.69	2.44	2.67	2.71
1967-68 to 1997-98 (II)	0.38	0.03	0.62	1.51	1.42	1.41	0.07
1967-68 to 1980-81 (II-A)	0.51	0.38	0.77	2.94	0.94	0.26	0.19
1980-81 to 1997-98 (II-B)	0.31	-0.28	0.52	0.81	1.98	2.35	0.45

Source: Agricultural Statistics at a Glance, Government of India.

It is important to note that during 1949-50 to 1997-98 the growth rate in production for all crops was 2.68 per cent per annum while the increase in area under cultivation was only 0.62 per cent per annum. Thus a very small proportion of the output growth has been contributed by the increase in area. You can see from Table 14.2 that the largest increase in area under cultivation was during the pre-green revolution period, i.e., Period I, which was to the extent of 1.58% p.a. Remember from Table 14.1 that during this period agricultural production increased by 3.15% p.a. Thus, the higher growth rate achieved during this period was largely contributed by the increase in the area under cultivation. However, we get a different picture in Period II when the increase in area under cultivation was only 0.38 per cent per annum compared to output growth of 2.88% p.a. The share of increase in area to the increase in production has fallen further in Period II-B.

A crop-wise analysis of the rate of growth in area under cultivation shows that during the Period I, i.e. 1949-50 to 1964-65 the area under most of the crop groups increased sharply. For non-foodgrains in general it increased at the rate of 2.44 per cent per annum. Thus the growth rate in area under cultivation was higher in the case of non-foodgrains than in foodgrains. For the foodgrain crops it increased at a rate of 1.35 per cent per annum. However, the area under wheat crop increased at almost double that rate, i.e., 2.69 per cent per annum. Even in the post-green revolution period the area under wheat crop has been rising rather sharply. For instance, while the area under foodgrains decreased at the rate of 0.28 per cent per annum during Period II-B, i.e., 1980-81 to 1997-98 the area under wheat was increasing at the rate of 0.81 per cent per annum. This may partly be due to shifting of area from other food crops to wheat as well as non-foodgrains.

The high growth rate achieved in non-foodgrains production in general and oilseeds in particular (see Table 14.1) during Period II-B is partly attributable to the rather high rate of growth in area under these crops during the same period. This implies that more areas have been diverted to cultivation of non-foodgrains.

On the whole, the growth rate in area was not a major factor for growth in agricultural production in India. It is only during the early years after Independence that increase in area under cultivation was fairly high. The increase in area is much less responsible for the increase in production in the post green revolution period as a whole.

14.2.3 Changes in Yield

Having analysed the role of the growth in area in the growth of production it is equally pertinent to examine the role of change in productivity. As there are limits to the expansion of area, increase in productivity is the major contributor to the growth in agricultural production over a long period of time in most of the countries. The same should be the situation pertaining to Indian agriculture.

The increase in productivity of important crop groups since Independence are given in Table 14.3. The time period and sub-periods are the same as the previous table.

Table 14.3 : Growth Rate in Productivity during 1949-98

(Base: Triennium ending 1981-82 = 100, in percentages)

Crop Period	All Crops	Foodgrains			Non-Food grains		
		Food gring	Rice	Wheat	Non-foodgrains	Oilseeds	Fibres
1949-50 to 1997-98	1.60	1.70	1.89	2.18	1.37	1.14	2.12
1949-50 to 1964-65 (I)	1.21	1.36	2.25	1.27	0.89	0.30	1.88
1967-68 to 1997-98 (II)	1.99	1.98	2.27	3.04	1.74	1.70	2.56
1967-68 to 1980-81 (II-A)	1.28	1.33	1.45	2.62	1.19	0.68	2.31
1980-81 to 1997-98 (II-B)	2.24	2.40	2.52	2.73	2.13	2.30	3.13

Source: Agricultural Statistics at a Glance, Government of India.

As mentioned earlier, the increase in agricultural production during the period 1949-50 to 1997-98 has been about 2.68 per cent per annum. The increase in area has been around 0.62 per cent per annum while the rate of growth in productivity has been around 1.60 per cent per annum. The increase in productivity was highest, i.e., at the rate of 3.18 per cent per annum for wheat crop. For the non-foodgrains in general the growth in productivity has been less than that in the foodgrains.

Technological Change in Agriculture

As stated earlier the rate of growth of production during the post green revolution period (1867-68 to 1997-98) was 2.88 per cent per annum. During this period the compound rate of growth in area was only 0.38 per cent whereas productivity increased at the rate of 1.99 per cent per annum. The sharpest rate of growth in productivity was for the wheat crop followed by that of fibres. Table 14.3 show that the rate of growth of productivity in the post green revolution period was higher than that in the pre-green revolution period.

Analysis of the sub-periods 1967-68 to 1980-81 (Period II-A) and 1980-81 to 1997-98 (Period II-B) shows that the compound rate of growth of productivity has been higher in the later period for all crops as well as for the different crop-groups. The increase in the production of foodgrains during this period is primarily due to the increase in productivity of the foodgrains. It must also be noted that since 1980-81 the rate of growth of productivity is more evenly spread and is not confined to wheat alone. The rate of growth of productivity of non-foodgrains in general and fibres and oilseeds in particular is much higher in Period II-B than in Period II-A

The increase in the productivity is no more confined to the North Western India. In Period II-B, i.e., 1980-81 onwards there has been a dispersal of the phenomenon of the growth in productivity to a number of regions. Foodgrains productivity has grown more sharply in some of the less developed areas of Central and Eastern India where the growth in yield per hectare was much less in the early phase of green revolution. In brief, with wider dispersal of the growth in productivity among different crops and regions, the sustained growth in agricultural production is a real possibility. It augurs well for the future growth of agricultural production.

Check Your Progress 1

- 1) Point out whether the following statements are true or false:
 - a) The scope for increasing agricultural production through increase in yield is limited.
 - b) Increase in area under cultivation is the only source of increase in agricultural production.
 - c) The rate of growth of agricultural production in the pre-green revolution period, i.e., 1949-50 to 1964-65 was higher than that in the post green revolution period 1967-68 to 1997-98.
 - d) Increase in productivity contributed more to the rate of growth of production in the post green revolution period.
 - e) Wheat is the only crop which continues to experience rapid growth in productivity. For all other crops this rate of growth in productivity is tending to slow down.
- 2) Briefly examine the trends in agricultural production since Independence.

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- 3) Briefly analyse the contribution of growth in yield to the growth in agricultural production in India since Independence.

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- 4) Examine the role of growth in the area under cultivation in increasing agricultural production in India since Independence.

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14.3 INTERNATIONAL COMPARISON OF AGRICULTURAL YIELD

After five decades of development planning and more than three decades after the adoption of new agricultural strategy the overall productivity in Indian agriculture is still very low. A comparison of productivity of some of the major crops in India with that in some other countries reveals that there is still a vast scope for raising the level of productivity in India.

A comparison of productivity of different crops between 1989-91 (average for three years) and 1998 is presented in the following table. These figures are drawn from the FAO year book of 1998 and show the vast difference in productivity between India and other countries (China, Japan, USA, etc.).

Table 14.4 : Productivity per hectare of Selected Crops

(in quintals per hectare)

Crop Period	Rice		Wheat		Groundnut		Cotton (Lint)	
	1989-91	1998	1989-91	1998	1989-91	1998	1989-91	1998
World Average	35	37	25	21	12	13	16	16
India	26	29	22	26	9	13	7	15
Asia	36	38	24	27	12	15	16	16
China	56	61	31	37	21	26	24	25
Japan	61	62	34	35	20	25	na	Na
USA	64	63	24	29	26	30	19	18
Egypt	71	85	49	60	22	27	21	21
Pakistan	23	28	18	22	11	11	19	16

Source: Agricultural Production Year Book, FAO.

Technological Change in Agriculture

Area under rice in India in comparison to other crops is the largest. In that sense it is the most important crop for the agricultural sector. However, productivity of paddy per hectare is very low. In the year 1998 it was less than 50% per cent of that in USA, Japan and China. In comparison to Egypt it was only 34 per cent. In comparison to the world as a whole the productivity level for rice was 85 per cent in India. A comparison with 1989-91, however, shows that China has achieved a growth in productivity of around 9 per cent. The growth in productivity was about 11.5 per cent in India and about 22 per cent in Pakistan.

The productivity situation in the case of wheat is comparatively better. The productivity in India in 1998 is more than the world average and slightly below the Asian average. However, it is less than that of China, Japan USA and Egypt. The growth in productivity of wheat witnessed in India was, however, not as much as that in China or Pakistan.

In the case of groundnut, a major oilseed, productivity in India is not only below the world average but is nearly one-third of that in USA and 40 per cent of that in Japan. It is below the average for Asia and is lower than that of other countries shown in the Table 14.4. The growth in the productivity of groundnut in India has been slower than that in China, Japan and Egypt.

Although India has experienced a sharp increase in the productivity of Cotton (a major fibre crop) it is still far below the productivity per hectare in China, Egypt and USA. It is slightly below that in Asian countries as a whole.

It should be evident from this comparative analysis of crop-wise yield in India with other countries that even after fifty years of Independence, the level of productivity is far below some other countries. It is important to note that productivity in China, another country with large population, far exceeds the productivity levels in India. Moreover, China is experiencing faster rate of growth in productivity in the case of several major crops. Indian agriculture needs to accelerate the rate of growth of agricultural productivity.

Check Your Progress 2

- 1) Point out whether the following statements are true or false.
 - a) Growth in agricultural productivity has been a major contributor to the growth in agricultural production.
 - b) The rate of growth in productivity of all crops since Independence has been more than 2 per cent.
 - c) The rate of growth of productivity in the case of foodgrains has been more than that for the non-foodgrains.
 - d) Rate of growth of productivity of most crops has tended to accelerate in the period since 1980-81.
 - d) Productivity of wheat in India in the year 1998 was more than the world average but less than the average for Asian countries.
- 2) Give a brief assessment of the growth in agricultural productivity in India. Are these trends encouraging for India?

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- 2) “A comparison of agricultural productivity levels in India with some other countries reveals the scope for improvement”. Examine.

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14.4 REGIONAL VARIATION IN PRODUCTIVITY

There is considerable variation in yield of crops across regions in India. For a crop, say rice, average yield per hectare is not the same in all the states. You may be aware that yield of wheat per hectare of land in Punjab and Haryana are quite high; almost comparable to that of developed countries. On the other hand, yield of wheat in Punjab is nearly double of that in Bihar.

Table 14.5 : Yield and Area under Crops at the State Level (1998-99)

(Yield in kg/hectare; Area in thousand hectares)

State	Rice				Wheat				Foodgrains			
	Yield	Index	Area	% of GCA	Yield	Index	Area	% of GCA	Yield	Index	Area	% of GCA
Andhra Pradesh	2601	138	4109	30.6	720	26.9	12.5	0.1	1877	116.3	7286	54.3
Assam	1340	71	2491	62.6	1330	49.6	87.9	2.2	1290	79.9	2729	68.6
Bihar	1437	76	5067	50.0	2183	81.5	2089	20.6	1593	98.7	9049	89.2
Gujarat	1470	78	642	5.8	2300	85.9	581	5.3	1303	80.7	3997	36.3
Haryana	2964	157	831	13.7	3880	144.8	2017	33.2	2482	153.8	4027	66.3
Karnataka	2364	126	1358	11.0	766	28.6	248	2.0	1250	77.4	7371	59.8
Kerala	1960	104	425	14.1				0.0	1877	116.3	454	15.0
Madhya Pradesh	1100	58	5396	21.2	1800	67.2	4327	17.0	1103	68.3	17666	69.4
Maharashtra	1770	94	1478	6.8	1460	54.5	799	3.7	1058	65.6	13802	63.5
Orissa	993	53	4469	54.4	1320	49.3	5	0.1	903	55.9	5351	65.1
Punjab	3400	181	2159	27.5	4230	157.9	3229	41.2	3786	234.6	5693	72.6
Rajasthan	1180	63	147	0.7	2740	102.3	2474	12.0	998	61.8	12851	62.1
Tamil Nadu	2670	142	2174	33.7				0.0	1948	120.7	3558	55.1
Uttar Pradesh	2120	113	5549	21.2	2670	99.7	9014	34.5	2088	129.4	20301	77.7
West Bengal	2180	116	5801	64.0	2390	89.2	351	3.9	2135	132.3	6444	71.1
India	1882	100	43433	22.9	2679	100.0	25887	13.7	1614	100.0	12358	165.2

Source: Economic Survey of India, 2002-03

The yield of foodgrains in India for the year 1998-99 was 16.2 quintals per hectare. You can observe from Table 14.5 that among the major states Punjab had the highest yield in foodgrains while the lowest was in Orissa. Moreover, you can see that the yield of foodgrains in Punjab was more than 4 times of that in Orissa. Of the major states Andhra Pradesh, Haryana, Kerala, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal had higher yield than the national average. On the other hand, Assam, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Rajasthan had lower yield than the national average.

We see that there is a strong linkage between the level of development of a state and yield of foodgrains. The developed states generally have higher yield also. There are some exceptions such as Gujarat and Maharashtra where yield is lower than national average although these states have comparatively higher per capita income and level of development.

In Table 14.6 we present the yield of foodgrains per hectare for the years 1970-71, 1980-81, 1990-91 and 1998-99. Column 6 in the table shows the yield in 1998-99 as a ratio of 1970-71. We see from the table that compared to 1970-71 yield of foodgrains in 1998-99 has been nearly two fold (1.9 times) on an all-India average basis. Andhra Pradesh, Haryana, Maharashtra, Punjab and Uttar Pradesh have been able to increase yield of foodgrains at a higher rate than the national average. On the other hand, Assam, Kerala, Orissa and Rajasthan have achieved very little growth in yield of foodgrains. The growth in yield in the case of Kerala and Maharashtra is quite in contrast. Kerala had a yield of 1430 kg/ha in 1970-71 which was nearly 3 times that of Maharashtra. However, in 1998-99 this ratio for Maharashtra has been narrowed down to less than 2. Among the 15 major states given in Table 14.6, Kerala has slipped down from the second rank (in terms of yield of foodgrains) in 1970-71 to the ninth rank in 1998-99.

Traditionally the states in the eastern part of the country are rice producing. The area under rice crop in the states of Assam, Bihar, Orissa, and West Bengal are more than 50% of GCA of these states. However, yield of rice in these states is quite low compared to that in Punjab and Haryana (see Table 14.5) Punjab and Haryana are traditionally wheat-producing states. In the 1960s they were considered to be not suitable for production of rice. However, development of new varieties of rice suitable for dry and cold climate did wonders in these states. You can see from Table 14.5 that yield of rice in Haryana and Punjab is quite high compared to that in Orissa and Bihar.

Table 14.6 : Yield of Foodgrains over time

(in kg/hectare)

State	1970-71	1980-81	1990-91	1998-99	1998-99/1970-71
1	2	3	4	5	6
1 Andhra Pradesh	780	1140	1590	2000	2.6
2 Assam	970	1070	1270	1290	1.3
3 Bihar	800	990	1300	1440	1.8
4 Gujarat	860	1000	1050	1430	1.7
5 Haryana	1240	1520	2350	2700	2.2
6 Karnataka	830	890	910	1350	1.6
7 Kerala	1430	1540	1870	1770	1.2
8 Madhya Pradesh	650	700	1000	1110	1.7
9 Maharashtra	430	690	850	970	2.3
10 Orissa	880	870	1000	1080	1.2
11 Punjab	1860	2460	3390	3740	2.0
12 Rajasthan	690	530	860	960	1.4
13 Tamil Nadu	1340	1340	1910	2280	1.7
14 Uttar Pradesh	1000	1220	1740	1960	2.0
15 West Bengal	1220	1360	1740	2200	1.8
India	870	1020	1380	1620	1.9

Source: Economic Survey of India, 2002-03

14.5 CAUSES OF LOW AGRICULTURAL PRODUCTIVITY IN INDIA

Ever since Independence the policy makers have stressed the need for a rapid increase in agricultural productivity. For this purpose it was necessary to identify the factors responsible for the low level of productivity and eliminate them to the extent possible. The factors responsible for the low productivity of land in Indian agriculture have been generally divided into four categories. These are:

- a) Institutional deficiencies
- b) Technological backwardness
- c) Sociological and general factors
- d) Accumulated backlog of investment

We examine the impact of each one of these factors on agricultural productivity.

14.5.1 Institutional Deficiencies

These deficiencies refer to the inherent weaknesses of the agricultural system and its operations. The aspects of the system which particularly affect its working and progress are: (i) the land-relations system, (ii) the credit and marketing system, and (iii) absence of the growth impulses in the economy.

A detailed study of the system of agrarian relations was taken up in Block 1. We may briefly examine how this system adversely affected agricultural productivity. The landowning classes, before Independence, used their ownership rights to their advantage. In a situation of rapidly growing population, the demand for land was on the rise. The conditions of tenancy of the cultivators were largely unsettled with very few cultivators having hereditary rights. The landowners, thus, were able to escalate rents on land. The cultivators were drained of all the capacity to make any improvement on land. The landowners themselves were also not interested in making any such improvements in view of their ability to raise rents. The distribution of land was also highly unequal and the owners used the abundant labour situation in the rural areas entirely to their advantage. Attempts were made immediately after Independence, to redress this situation through a set of measures generally known as land reforms. Measures like the abolition of intermediaries, tenancy reforms to provide greater security of tenure to the cultivators, regulation of land rents and some efforts to redistribute land by imposing ceiling on land holdings have been adopted. These have only been partially successful and quite often a near failure.

Highly usurious credit system and lack of easy access to the markets were the other factors responsible for low agricultural productivity. In the absence of a marketing system, the producer is unable to get the full value of the produce. The intermediaries in the market corner most of the gains leaving little incentive for the producer to produce more. High cost of credit and its inadequacy were also making it impossible for the cultivators to make any improvement on land. These issues will be discussed in detail in Block 5.

Absence of significant growth and industrialisation of the Indian economy acted as a systemic weakness which caused agriculture to bear the brunt of a growing labour force. More and more labour remained tied to agriculture in the absence of employment opportunities in non-agricultural sectors. Most of the additional labour force did not add to the agricultural production, they only shared the existing work opportunities.

It was fairly evident that the agricultural system was crumbling because of its inherent weaknesses. In the post-independence era, therefore, stress was laid on the need for

removing some of these weaknesses. While we are not making an assessment of the success of the measures taken to eliminate the institutional deficiencies in Indian agriculture we shall enumerate some of them in the following section.

14.5.2 Technological Backwardness

You have learnt from Unit-12 that technological backwardness of the Indian agriculture is an important factor causing low productivity. Backwardness of technology is reflected in traditional tools and implements as well as source of energy. Wooden plough and a pair of bullocks have remained the predominant means of carrying on cultivation operations. Although some mechanisation of agricultural operations has taken place since Independence, the overall use of tractors, harvesters, dryers and other mechanical devices has been confined to a few regions. The farmers in a large majority continue to use the age-old tools and implements.

Besides the use of traditional tools and equipment at the dawn of Independence, use of fertiliser was almost confined to manures based on cow dung. Even though the use of chemical fertilisers has received a fillip particularly since the application of new agricultural technology since 1966-67, the use of such fertilisers is highly unevenly spread across regions.

Agricultural operations depend critically on the supply of water and cultivation operations are deeply dependent on the moisture levels of the soil. Water has, therefore to be applied to soil in appropriate quantities and at appropriate times. In a predominantly rain-fed system of irrigation this is difficult to achieve unless rainfall always comes at the right time and in right intensity. Any deviation from this, causes problems and has a harmful impact on productivity. More than 80 per cent of the area under cultivation at the time of Independence and almost 66 per cent of the cultivable area at present is dependent on rainfall for irrigation. The improvement in irrigation facilities has increased the intensity of cultivation on the irrigated land. On a large part of such land, more than one crop and in some cases even three crops are being harvested. But the area which is dependent on rainfall continues to remain a large proportion of the total cultivated area. The average productivity for the country as a whole, therefore, continues to remain low.

14.5.3 Sociological and other Factors

Indian agricultural system is closely related to the social system that governs the community engaged in agricultural activities. India's village community is governed by caste divisions and social hierarchy within the community. Religious attitudes and social rituals besides the social traditions bind the community with tradition and act as hurdles in the way of modernization. Religious and social rituals connected with birth, deaths and marriages breed expenditure which is often financed by borrowing. The repayment capacity being non-existent in most cases leads to transfer of land and growth of landless labour. Similarly rapid growth of population and inheritance laws lead to sub-division of land holdings which are becoming too small to remain economic for any family. There is a significant waste of social resources in the rural areas because some of the community services are divided on caste or communal lines. General apathy towards female education in particular and education of children in general has its inherent social weakness. This in turn has a harmful impact on the future growth of population and agricultural productivity. Excessive social divisions do not enable cohesive social action for the modernisation of attitudes and reducing the rigors of labour through improvements in technology. Absence of health services, drinking water, all weather roads add to the general environment of apathy towards change.

14.5.4 Accumulated Backlog of Investment in Agriculture

One of the important factors behind the continuation of low productivity in Indian agriculture is the long period of neglect of the investment requirements. Public sector investment was minimal almost throughout the British rule in India. Whatever investments were undertaken were to overcome the chronic famine conditions that started emerging towards the end of the nineteenth century. But the progress towards building up the irrigation projects was very slow and almost negligible. Private sector investment in agriculture was also not undertaken because the landowners were able to exploit the system to their advantage and did not have any interest in making investments.

Immediately after Independence measures were taken to redress this situation. But the long period of neglect and the vast size of the agricultural sector called for massive investments to overcome the backlog. For a poor economy, mobilising enough resources for rapid industrialisation and overcoming the problems of agriculture caused by accumulated backlog of investment were daunting tasks. Efforts to build up multipurpose river valley projects with an objective to harness water resources for irrigation, supply of hydroelectric power and control floods were made. The investment involved was, however, massive. There was also the problem of displacement of population that such schemes invariably involved.

On the whole, the public sector investment to improve irrigation system in the post-Independence period was much more than that in the pre-Independence period. But the overall effort was not enough to undo the damage done by long period neglect of the agricultural sector. The existing canal system had to be improved and refurbished. The technology had to be researched and carried from laboratory to the land. Resources had to be generated for dispersion of new technology. Community services had to be improved. The agricultural sector continued to suffer from lack of adequate investment. The priority accorded to agriculture in the plans remained lower than that of industry.

Check Your Progress 3

- 1) Point out whether the following statements are true or false.
 - a) Landowners charged such high rents that very little was left with the cultivators for investment after meeting their subsistence needs.
 - b) Irrigation sources had developed to a fair extent during the British rule.
 - c) British rulers invested large sums for the development of agriculture in India.
 - d) Technological backwardness still prevails on a large number of farms.
 - e) Rural sociological conditions are also responsible for low productivity in agricultural in India.
- 2) Explain the role of technological backwardness in causing low agricultural productivity in India.

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- 3) Comment on the sociological factors contributing to the persistence of low agricultural productivity in India.

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14.6 MEASURES TO RAISE PRODUCTIVITY

It is now relevant for us to identify the measures that have been taken to increase agricultural productivity. The measures taken so far to overcome institutional deficiencies, technological backwardness and infrastructural problems vitiating the agricultural economy have no doubt contributed to the increase in productivity that has been witnessed. However, what extra efforts need to be done are discussed below.

14.6.1 Institutional Measures

On the institutional front, the urgency to bring about comprehensive change in land relations was realised even before Independence. Land reform measures in the form of abolition of intermediaries, tenancy reforms to provide security of tenure, regulate land rents and confer ownership rights on the cultivators have been only partially successful. Measures to impose ceilings on land holdings have not been very effective. Measures to consolidate fragmented holdings have been successful only in some regions. The importance of effective institutional reforms is fully recognized but various legal hurdles and political pressures have been responsible for the lack of success in this respect.

The role of the land reform measures is however, not to be negated. The abolition of intermediaries (namely Zamindars) made considerable impact and a large number of cultivators got benefited. Even tenancy reforms and ceilings on land holdings have been implemented with some degree of success in some states. The sluggishness in the implementation of the land reform measures in some states particularly the central and western India has to be overhauled. Without the implementation of land reforms other measures for the improvement in productivity will only have a limited impact.

14.6.2 Technological Changes

Even though high priority was accorded to institutional reforms immediately after Independence, there was also a great stress on harnessing the abundant water resources of the country through multipurpose river valley projects. Large irrigation projects like Bhakra Nangal Project, Hirakund Project and Damodar Valley Project have become not only major sources of irrigation but also of flood control and supply of hydro-electric power.

By the mid-sixties, particularly after the 1965 War with Pakistan, the need for food security was realised. The excessive dependence on food import became a source of strategic weakness. The successive years of droughts had further accentuated the problem. It was therefore realised that immediate measures to raise productivity particularly of foodgrains, should be undertaken.

14.6.3 Infrastructural Changes

There has been a significant growth and dispersion in the infrastructure serving agricultural sector. This has facilitated the growth in productivity in the sector.

First, marketing system in the country for agricultural products has been considerably streamlined. At present there are about 7062 regulated markets for agricultural products. Grading and standardisation of the products is being promoted and nearly 162 agricultural and allied products have been graded National Agricultural Cooperative Marketing Federation of India (NAFED) has been extending support to the farmers for various types of commodities. It has encouraged the marketing of agricultural produce through cooperatives.

Secondly, the agricultural sector has also received considerable financial support from the banking sector. This has, to some extent, reduced the dependence of farmers on the extortionist money lending system which had been draining the agricultural sector of its resources. Several schemes to facilitate the supply of credit to farmers have been undertaken to ensure smooth growth of agricultural production.

Third, several other schemes and measures which tend to reduce the gaps between the rural and urban areas are also likely to facilitate the growth of productivity and general attitude towards modernisation. Electrification of villages, improvement of telecommunication in the rural areas, augmenting the health services are all expected to facilitate the increase in productivity.

14.6.4 State Policies

The concern of the state and central governments for the agricultural sector and its progress is reflected in the policy measures. Besides providing institutional support the government has introduced such schemes as crop insurance and price support. Moreover, the agricultural research programmes of IARI (Indian Agricultural Research Institute) have been responsible for generating a desire for modernization of agricultural operations.

Increase in public investment in the agricultural sector in the post-Independence period particularly till the end of decade of the 1970s has been responsible for bringing about some changes in the agricultural sector. This investment has not, however accelerated at the desired rate and public investment in the agricultural sector has been more or less static in the nineties.

The overall growth in the economy has not been such as to release the pressure of growing population on agriculture. The natural growth of population has its immediate impact on the agricultural sector. This sector continues to support nearly two thirds of the workforce in India directly and a large proportion indirectly. The slow industrial growth and its pattern has not generated adequate employment opportunities to release this pressure on agriculture. Consequently, a large segment of the agricultural sector continues to remain unaffected by the technological and other developments.

Check Your Progress 4

- 1) Which of the following are not measures promoting the growth of agricultural productivity?
 - a) Introduction of HYV seeds
 - b) Abolition of intermediaries
 - c) Flood relief measures
 - d) Irrigation facilities provided through multipurpose river valley projects.

- 2) Point out whether the following statements are true or false:
- a) Land reforms have had no impact on agricultural productivity
 - b) Technological changes after the adoption of new agricultural strategy affected growth in the productivity in the decade of seventies only.
 - c) Infrastructural changes in the area of marketing of agricultural produce have facilitated growth in agricultural productivity.
 - d) Public investment in the agricultural sector in the decade of nineties has been static.
- 3) Comment on the role of technological improvements in promoting the growth of agricultural productivity in India since Independence.

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- 4) Briefly discuss the role of land reform measures in promoting agricultural productivity in India.

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14.7 LET US SUM UP

Indian agriculture, at the time of Independence was in a state of decay and there were no signs of growth. In the post Independence period the long period growth rate of agricultural production has been around 2.7 per cent per annum. The rate of growth of area under cultivation was only 0.62 per cent per annum whereas that of the productivity was 1.60 per cent per annum. There is significant difference in the growth rate of productivity in the post-green revolution period as compared to the earlier period. The growth of productivity in the case of foodgrains and other crops are also improving.

Despite the growth in productivity the current levels of productivity in India are much below the levels of productivity in developed and many developing countries. There is thus a vast scope for improvement in productivity. Low productivity in agriculture in India is attributed to the exploitative land relations, backwardness of technology and certain social factors besides the neglect of agricultural investment in pre-Independence period. In the post-Independence era measures to improve the agrarian relations through land reforms, technological improvement in the shape of new agricultural strategy, strengthening of marketing and financial infrastructure as well as other policy measures adopted by the government have had a limited impact on the agricultural performance and prospects.

The overall rate of growth of nearly 2.7 per cent per annum in agricultural production since 1949-50 may be much higher than the rate of growth experienced in the first

half of the twentieth century. However, the low growth rate in agriculture is responsible for keeping the rate of economic growth in India much lower than required. Some of the advantages of growth in production experienced since Independence are however important to note. The Indian economy has been able to become largely free of food imports, which were undermining the food security of the country. High rates of growth of food production have also helped in reducing the impact of inflationary pressures.

The spread and dispersion of the growth in production and productivity in recent years has given a hope that technological change is being adopted in more regions. But, for a continued dispersal of this technology land reforms have to be carried on to fulfill their objectives. Without the land reforms the benefits of new technology will remain limited to the rich farmers alone.

14.8 KEY WORDS

- Base Year** : It implies the reference year with reference to which changes are measured.
- Compound Growth Rate** : It is the average rate of growth experienced for a period of time. It is calculated on the same basis as the compound rate of interest 'r' between two periods (t and 0) given by $P_t = P_0 (1 + r)^t$.
- Crop-group** : Means a group of crops belonging to the same general category. For example, foodgrains is a crop-group including such crops as rice, wheat, maize and millets. Similarly, fibres is a crop group consisting of several crops like cotton, jute and mesta.
- Triennium** : It is a period of three years. In this case Triennium ending 1981-82 = 100 means the base year is the average levels of production for the years 1979-80, 1980-81 and 1981-82. This three-year average is taken to ensure that the base year is not affected by abnormal fluctuations.
- Usurious Credit System** : A credit system based on excessively high rates of interest.
- Yield** : Production per unit of land. For example, if a farmer produces 60 quintals of wheat from 2 hectares of land then yield of wheat is 30 quintals per hectare.

14.9 SOME USEFUL BOOKS

Agrawal, A.N. and Kundan Lal (1990): *Rural Economy of India: Problems, Progress and Prospects*, Vikas Publishing House, New Delhi.

Agrawal A.N. (1999): *Indian Economy: Problems of Development and Planning*, Vishwa Prakashan, New Delhi.

Datt, Ruddar and K.P.M. Sundharam (1999): *Indian Economy*, S. Chand & Co., New Delhi.

Mishra, S.K. and V.K. Puri (1999): *Indian Economy*, Himalaya Publishing House, Bombay.

14.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) a) F b) F c) T d) T e) F
- 2) Draw your answer with reference to section 14.2.1.
- 3) Refer to Sub-section 14.2.3.
- 4) Refer to Sub-section 14.2.2.

Check Your Progress 2

- 1) a) T b) F c) T d) T e) T
- 2) Draw your answer by referring to Sub-section 14.2.3 and Section 14.3
- 3) Refer to Section 14.3.

Check Your Progress 3

- 1) a) T b) F c) F d) T e) T
- 2) Refer to Sub-section 14.5.2.
- 3) Refer to Sub-section 14.5.3.

Check Your Progress 4

- 1) c
- 2) a) F b) F c) T d) T
- 3) Refer to Sub-section 14.6.2.
- 4) Refer to Sub-section 14.6.1.

UNIT 15 CAPITAL FORMATION IN INDIAN AGRICULTURE

Structure

- 15.0 Objectives
- 15.1 Introduction
- 15.2 What is Capital?
- 15.3 Types of Capital in Agriculture
 - 15.3.1 Working and Investment Capital
 - 15.3.2 Private and Social Capital
- 15.4 Capital Formation: Basic Concepts
 - 15.4.1 Gross and Net Capital Formation
 - 15.4.2 Fixed Capital Formation
 - 15.4.3 Household Capital Formation
- 15.5 Accumulation of Capital
- 15.6 Role of Capital Formation in Agriculture
- 15.7 Demand for Capital in Agriculture
 - 15.7.1 Agricultural Credit Needs
 - 15.7.2 Credit for Non-farm Business
- 15.8 Supply of Capital to Agriculture
 - 15.8.1 Institutional Capital
 - 15.8.2 Non-institutional Capital
- 15.9 System of Accounting Capital Formation in Agriculture
- 15.10 Trends of Capital Formation in Agriculture in India
 - 15.10.1 Structure of Private Sector Investments in Agriculture
 - 15.10.2 Structure of Public Sector Investments in Agriculture
 - 15.10.3 Public and Private Sector Investments in Agriculture: Complementary or Competitive?
 - 15.10.4 Impact of Investment Deceleration on Agricultural Growth
 - 15.10.5 Reasons for Decline in Public Sector Investments in Agriculture
- 15.11 Let Us Sum Up
- 15.12 Key Words
- 15.13 Some Useful Books
- 15.14 Answers/Hints to Check Your Progress Exercises

15.0 OBJECTIVES

After going through this unit you will be in a position to:

- explain the concept of capital formation and its types;
- explain the role of capital formation in agriculture;
- identify the demand for and supply of capital in agriculture;
- explain the system of accounting of capital formation; and
- identify the trend of private and public capital formation in Indian agriculture.

15.1 INTRODUCTION

Agricultural sector has always remained short of capital, especially in developing countries like India. It is mainly because most of the farm operators do not invest

adequate amount of money needed in farming business. Successful farming depends upon adequate provision of capital input as it enables the farmer to carry out agricultural operations efficiently. Any inadequacy of capital supply or its malfunctioning is bound to have serious repercussions on agriculture.

Indian agriculture has witnessed major technological breakthroughs and undergone progressive commercialization during the past few decades. Several programmes including Intensive Agricultural District Programme (IADP) (started in 1963-64) and Intensive Agricultural Areas Programme (IAAP) (started in 1964-65) have emphasized on modern technology in agriculture. Moreover, the high yielding varieties (HYV) seeds programme and introduction of green revolution during the late 1960s envisaged packages of superior inputs and assured supply of such inputs to the farm sector. With the introduction of such technological innovations, the importance of capital in agriculture in India has increased remarkably.

15.2 WHAT IS CAPITAL?

You may be aware that capital input is defined as a produced means of production. In this sense capital is quite different from other inputs such as land and labour. Different economists have defined capital in different ways. To some, it is simply 'a tool of production'. Though such an explanation is concise and communicable, it approximately designates one of the prime characteristics of total capital, i.e., its use in production. For some others, capital means only tangible items such as physical plants, equipment, machines, etc. But this is only a part of capital. T. W. Schultz remarks that investment in human beings through education, technical training and managerial knowledge also forms part of capital, particularly human capital. The contribution of human capital ranges between two-third and three-fourth of the total output growth of the developed countries.

In its simplest form capital can be defined as an input in production. But simplicity is not the only characteristic of a good definition. Let us look at some other definitions.

- 1) Capital refers to all man-made goods and services, which are used for further production. – Murray and Nelson.
- 2) Capital goods are those goods produced by the economic system to be used as productive inputs for further production of consumption and other goods and services. – Paul A. Samuelson.
- 3) Capital consists of produced goods and services saved for consumption and used by, or as a part of human agent in further production. - Kenneth E. Boulding.

15.3 TYPES OF CAPITAL IN AGRICULTURE

We can classify capital in agriculture into various categories as given below.

15.3.1 Working and Investment Capital

Agricultural capital is usually of two kinds: i) operating or working capital, and ii) fixed or investment capital. The first refers to the expenses incurred on inputs like seeds, fertilizers, wages and irrigation charges. On the other hand, the second represents investment in fixed assets such as land, machinery and construction of wells. Working capital relates to short-run investments while investment capital represents long-term farm investments.

15.3.2 Private and Social Capital

Capital may also be classified as private or social capital. Any capital owned by private individuals such as agricultural farms, land, draught animals, tractors, pump

sets, etc. can be classified as private capital. Public expenditure incurred by local, state or other public agencies for dams, canals, and barrages belong to the social capital category. Both kinds of capital help in the socio-economic development of a region.

15.4 CAPITAL FORMATION: BASIC CONCEPTS

We discuss below some of the basic concepts related to capital formation.

15.4.1 Gross and Net Capital Formation

Gross capital formation refers to the total addition to capital stock, both fixed capital and inventories, in a year. It includes gross fixed capital formation and change in stocks. Net capital formation denotes the extent of addition to capital stock after allowance for capital consumption or depreciation, i.e., fixed capital stock used up in the process of production during the year. Thus, net capital formation is obtained after deducting depreciation from gross capital. Depreciation represents the amount of fixed capital used up in the production process. It depends on the expected economic life of individual assets and is designed to cover loss in value due to normal wear and tear as well as due to foreseeable obsolescence.

15.4.2 Fixed Capital Formation

Fixed capital can be of two types: gross and net. If we deduct depreciation from gross fixed capital we obtain net fixed capital. Let us find out the components that are included in gross fixed capital. First we include the outlays (i.e., purchases and own account production) on addition of commodities to their stocks of fixed assets by i) industries, ii) government, and iii) private non-profit organizations. Secondly, we include the net additions (i.e., purchase minus sale) of second-hand and scrapped goods. Thirdly, we include i) acquisitions of reproducible and non-reproducible durable goods (except land, mineral deposits, timber tracts, fisheries and the like) for civilian use, ii) work-in-progress on construction projects, capital repairs, iii) outlays on improvement of land, and on the development and extension of timber tracts, plantations, vineyards, etc., and iv) the acquisition of breeding stock, draught animals, dairy cattle and the like, and transfer costs in connection with purchase and sale of land, mineral deposits, timber tracts, etc. Fourthly, similar outlays by households on residential construction are also included. However, remember that we exclude the outlays of government services on durable goods for military use.

15.4.3 Household Capital Formation

Household capital formation refers to i) the acquisition of new capital by households, ii) increase in stock of producer households, and iii) acquisition of *new* residential buildings by households (purchase of a secondhand building is not included). Household sector includes: i) individuals, ii) non-government non-corporate enterprises such as farm and non-farm business, iii) unincorporated establishments like sole proprietorship and partnership, and iv) non-profit institutions like charitable trusts, religious endowments and educational institutions.

15.5 ACCUMULATION OF CAPITAL

Measurement of capital in real terms is quite ambiguous. A simpler approach is to measure it in terms of money. However, remember that capital is not money itself. Like money, accumulation of capital is the result of savings or borrowings. There are several ways in which farmers may obtain major part of the capital they use in their farm operations. The important ones under Indian conditions are:

- Personal savings,
 - Contracts, and
 - Borrowing from various lending institutions.
- 1) **Savings:** Capital accumulated through savings forms the backbone of farm finance and provides risk-bearing ability. As you know, saving is the surplus income over consumption. Farmers generally set aside a part of their produce and/or farm income in the form of seeds, grains, etc. It is used in the next crop season to purchase inputs and manage farm operations.
 - 2) **Contract farming:** Contract farming has gained special significance in recent years in agricultural sector. Under this system, tie-up arrangements are made between farmers and contracting firms for production and purchase of a specific product. Contract farming is quite common in agricultural commodities used as inputs in processing industries such as sugarcane, oilseeds, fruits and vegetables, plantation crops, etc. Farmers are provided with information, quality planting materials, other material inputs, technical guidance, marketing facilities and financial support by the contracting firms. The contracting firms supply necessary capital to farmers under the agreements. A purchase contract thus provides another method of supplementing farmer's capital.
 - 3) **Borrowing:** The word 'borrowing' means to receive something with the understanding that either the same or its equivalent will be returned. In other words, borrowing means the ability to command capital or services currently for a promise to repay at some future date. In India, the system of borrowing capital is very common. Capital can be borrowed from (i) institutional lending agencies such as commercial banks, regional rural banks, and co-operative banks, and (ii) non-institutional lending agencies like moneylenders, traders, middlemen, friends and relatives. Though second source is the easiest way of getting money, it is rather costly because often the interest burden is very heavy, especially when borrowed from moneylenders.

Check Your Progress 1

- 1) Explain the concept of capital in agriculture.
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- 2) Distinguish between the followings:
 - a) working capital and physical capital
 - b) private capital and social capital.....
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3) What are the important sources of capital in agriculture?

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15.6 ROLE OF CAPITAL FORMATION IN AGRICULTURE

When we use the terms farm and farming, we think of such things as land, crops, seeds, fertilizers, pesticides, draught animals, pump sets and tractors. The idea of capital hardly comes to mind. But it is a fact that all these things – whether land or machine, animal or crop – are nothing but *physical capital* and for acquiring these items, capital investment is required. Similarly, expenses are incurred before the farm produce is ready for sale. The fields are prepared, seeds are sown, water and fertilizer are added, weeding is done, crop is harvested, threshed, bagged and stored or sent to the market for sale. For all these operations, services of labour are needed and for that wages have to be paid. All these expenses together constitute *working capital*. Therefore, without capital (physical and working) it is impossible to run a farm.

The concept of capital formation in agriculture comprises investment in agriculture, land development, soil conservation, rural roads, agricultural machinery, storage and other items. The return from such investments is expected over a period of time. In the developed countries even the investment made on research, education and technical training for the development of human capital is also included in capital formation as it increases the efficiency of the operator and output of the farm. There is considerable literature putting forward numerous hypotheses regarding capital formation in underdeveloped countries. For example, Ragnar Nurkse points out that the supply of capital is governed by the ability and willingness to save; the demand for capital is governed by the incentives to invest. Arthur Lewis attributes low investment to low saving which in turn is due to the small ratio of profit to national income. According to H. W. Singer, it is the lack of investment opportunities, which inhibits peoples' desire to save and invest. Dearth of entrepreneurship and institutional barriers are among the other factors usually mentioned for low capital formation.

Capital formation is an important factor in economic development. Nurkse has rightly pointed out that the *vicious circle of poverty* in underdeveloped countries can be broken only through capital formation. It is capital formation that leads to further utilization of available resources and thus increase in output, income and employment. Since agriculture is the predominant sector in Indian economy capital formation in agriculture plays a crucial role in the economic development of the nation.

Use of adequate amount of capital increases productivity in agriculture and allied sectors. India has been far behind developed economies in per capita consumption of food, milk and other edibles. Adequacy of capital formation in agriculture not only will augment production and availability of food items but also can add to the purchasing power of farmer households in the country.

Capital formation leads to *technical progress*, which helps economies of large-scale production. With the advancement of farm technologies come several benefits such

as: i) increase in yield, ii) timely completion of farm operations, iii) maximum possible land utilization, iv) innovations in crops and cropping pattern, and v) diversification of agriculture.

Capital formation leads to expansion of market. Since capital formation results in higher production it leaves more *marketable surplus* with the farmer, which can be sold in the market. In a state of increasing population, as is the case of India, capital formation is quite important for increasing agricultural production.

Capital formation can also help in improvement of the quality of the produce. This in turn can augment the scope for exporting and entering the world market. It has the potentialities to improve the balance of payments of a country. Since India has very large land area and labour force under agriculture, the nation can play a major role in global market for farm products. Role of capital formation in agriculture is inevitable for this.

Capital formation in agriculture can lead to self-sufficiency in the country in farm produce and consumables. This ultimately can dispense with the need for foreign aid and minimize the burden of foreign debt.

The strain of inflationary pressure can be removed through adequate capital formation. As we know, use of capital leads to increase in production. In the long run capital formation can bring price stability and remove price fluctuations. This can be instrumental in making food available at a low price and in reducing poverty.

The process of capital formation helps in raising gross domestic product (GDP). Thus capital formation is the principal instrument to enhance per capita income and push the economy away from a state of underdevelopment.

Capital formation not only helps in income generation, but also enlarges the capacity of an economy to produce. The magnitude of increase is determined by the *incremental capital output ratio* (ICOR). For example, suppose ICOR is 4 and we invested Rs.4 crore, then output will increase by Rs.1 crore.

15.7 DEMAND FOR CAPITAL IN AGRICULTURE

The need for capital in Indian agriculture can be explored by asking a question: “When and how much capital is employed in agriculture?” This can be judged from two viewpoints: i) from the farmer’s point of view, and ii) from the point of view of agriculture as a whole. The two viewpoints have many things in common. The farmer needs capital for meeting the fixed and operating expenses, such as investment in machinery, livestock, crops, real estate and household furnishings. However, the nation needs other forms of capital, which are required by the farming community, but the farmers do not like to invest. Examples are roads, canals, road side plantation, irrigation projects, warehouses, cold storages, agricultural research, etc. On the whole, the demand for capital for agriculture should be examined from the standpoint of (i) the needs of individual farmers, (ii) the need for investment in human capital, (iii) the needs of firms marketing agricultural products and inputs, (iv) community needs, (v) the need for accumulating capital in the form of new technology, and (vi) the need for agro-based industries as a whole.

Significant amount of capital is used in agriculture for the development of new technology, community facilities and the marketing of farm products and inputs. The

capital used to support these activities comes from various sources. Support for the development of new technology is largely provided by government and suppliers of farming inputs. Both private and public funds are used in financing community facilities. In the case of firms engaged in the marketing of agricultural products or inputs, the sources of capital are similar to those generally available to business in other parts of the economy.

Rural credit needs can be classified on the basis of purpose and duration. Accordingly, it is classified as agricultural credit and non-agricultural credit. On the other hand, it can be short-term, medium-term and long-term credits.

15.7.1 Agricultural Credit Needs

- i) **Short-Term Credit:** The short term agricultural credit is given for seasonal agricultural operations directed towards raising of crops on land, including reasonable amount for the maintenance of the farmer and his family. Short-term loans are generally made for 12 months. They are given for purchasing seeds, manure, fertilizer, and pesticides or for meeting labour charges. Such loans are to be repaid after the harvest of the crop.
- ii) **Medium-Term Credit:** Medium-term loans are given for a period ranging from 12 months to 5 years for purposes such as land reclamation, bounding and other land improvements, purchase of live stock, machinery and other implements, orchard plantation, sinking of wells and construction of pucca drain in the field, etc.
- iii) **Long-term Credit:** The long term credit is given for a period ranging between 5 to 20 years for purposes such as the redemption of land, liquidation of debt, purchase of tractors, installation of tubewell and improvement of permanent nature in land.

15.7.2 Credit for Non-farm Business

Such credit is provided to meet the working capital requirements of non-farm business such as: i) purchase of transport equipment and furniture, ii) purchase/construction and repair of buildings, iii) purchase of non-farm equipment, and iv) establishment of cottage and small scale industries. It is of long-term nature and repayment takes place between 5 to 20 years period.

15.8 SUPPLY OF CAPITAL TO AGRICULTURE

The supply of capital to agriculture is solely dependent on the total or aggregate supply of capital for the entire economy. The determinants of total amount of capital that a society is willing to hold and the amount it is willing to add to these holdings each year are complex. A list of these determinants would include such items as: i) national income and its distribution, ii) the structure of institutions, customs, values of the people, and iii) interest rates. The major variable among these determinants is the interest rate or the price that people will pay for the use of the capital.

Suppliers of capital to agriculture can be broadly classified into two categories: (i) individual or non- institutional (moneylenders, relations, etc.), and (ii) institutional (commercial and rural banks, land development banks, cooperatives, life insurance companies, etc).

15.8.1 Institutional Capital

India follows multi-agency approach in supply of rural and agricultural credit. This means more than one institutions are involved in supply of rural credit. The important institutions are: i) cooperatives, ii) commercial banks, and iii) regional rural banks. Moreover, the National Bank for Rural Development (NABARD) provides refinance facilities to the above three institutions towards credit advanced for agricultural and rural development.

Cooperative Banks

The cooperative banking structure provides short term credit for agricultural production operations and long term credit for improvement in farming. The short-term cooperative structure is generally a three-tier system in most of the states comprising of State Cooperative Bank (SCB) at the state level, District Cooperative Central Banks (DCCB) at the district level and Primary Agricultural Credit Societies (PACS) at the village level. On the other hand, long-term credit needs of farmers are met by Cooperative Agricultural and Rural Development Banks (formerly Land Development Banks). You can find from Fig. 15.1 that there are 30 SCBs with 831 branches and 367 DCCBs with 12560 branches. You will be introduced to the functioning of cooperative banks in Units 17 and 18.

Commercial Banks

Scheduled commercial banks have turned out to be a major source of agricultural credit in India. Before nationalisation of commercial banks, credit flow from this source was not substantial. However, with nationalisation the commercial banks have entered into agricultural financing in an important way. These banks have met the long term credit needs of the farmers for purchase of tractors, pump sets, installation of tubewells and other improvement of permanent nature. Moreover, allied activities such as animal husbandry, dairy farming, pisciculture, piggery, poultry farming and horticulture, etc. have also been financed by commercial banks. As we observe from Fig. 15.1, there are 100 commercial banks with more than 20 thousand rural branches that provide agricultural credit.

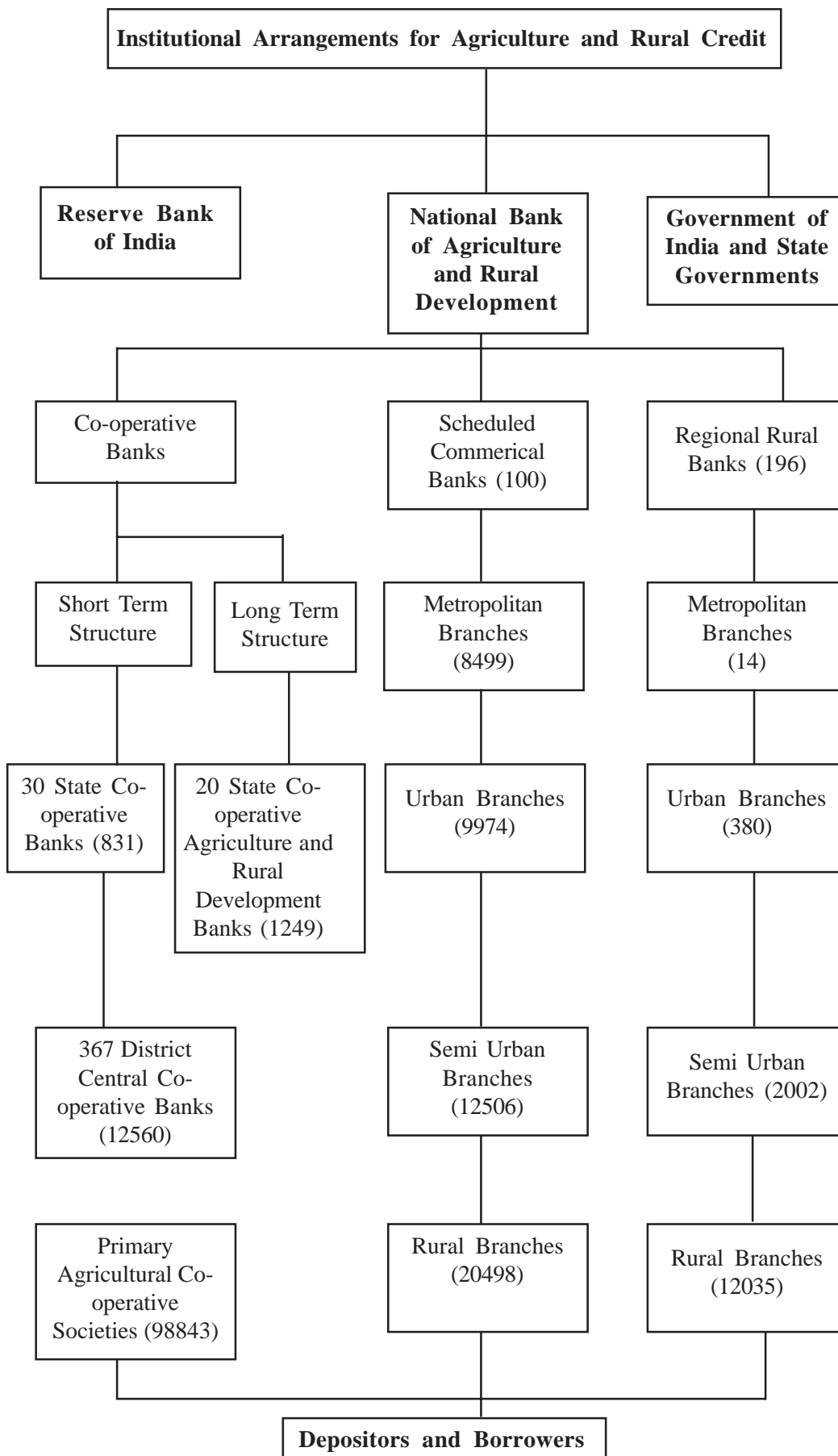
Regional Rural Banks

In order to provide adequate credit to the agricultural sector the Lead Bank Scheme was introduced in 1974. Under this scheme a particular nationalised commercial bank was made responsible for credit disbursements in an identified district. The concerned bank was directed to have branch expansion in rural area and provide credit to the farmers to the maximum extent. Due to high operational cost in rural areas and urban oriented attitude the commercial banks were not in a position to face the challenge. In order to overcome the difficulties and provide adequate institutional arrangements in rural areas especially where co-operative credit delivery system was weak, the Regional Rural Banks (RRB) were set up in 1975.

The RRBs are expected to provide low cost banking services in rural areas, particularly to the weaker sections. The RRBs were established with the objective that they would 'combine the local feel and the familiarity with rural problems which the cooperatives possess and the degree of business organization, ability to mobilize deposits, access to central money markets and modernized outlook which the commercial banks have'.

From a modest beginning with 6 RRBs in 1975, as many as 196 RRBs were operating in 500 districts with a network of 14,313 branches as on 31 March, 2001 excluding satellite branches and extension counters. The branch network comprises 6 metropolitan,

348 urban, 1875 semi-urban and 12,084 rural branches. RRBs have a large branch network in the rural area, which forms nearly 37% of the total rural branch network of all scheduled commercial banks.



Note: Figures in parentheses indicate the number of branches. The position is as of 31 March 2001.

Fig. 15.1: Institutional Arrangements for Rural Credit

National Bank for Rural Development (NABARD)

The NABARD is an apex institution, accredited with all matters concerning policy, planning and operations in the field of credit for agriculture and other activities in rural areas in India. It was established in 1982 ‘for providing and regulating credit and other facilities for the promotion and development of agriculture, small scale industries, cottage and village industries, handicrafts and other rural crafts and other allied economic activities in rural areas with a view to promoting integrated rural development and securing prosperity of rural areas’.

The functions of NABARD can be summarized as follows:

- i) It serves as an apex refinancing agency for the institutions providing investment and production credit for promoting the various developmental activities in rural areas;
- ii) It takes measures towards institution building for improving absorptive capacity of the credit delivery system, including monitoring, formulation of rehabilitation schemes, restructuring of credit institutions, training of personnel, etc.
- iii) It co-ordinates the rural financing activities of all institutions engaged in developmental work at the field level and maintains liaison with Government of India, State Governments, Reserve Bank of India (RBI) and other national level institutions concerned with policy formulation.
- iv) It undertakes monitoring and evaluation of projects refinanced by it.

NABARD’s refinance is available to cooperative banks, commercial banks and regional rural banks. It operates throughout the country through its Regional Offices and District Offices.

15.8.2 Non-institutional Capital

The non-institutional credit suppliers include professional moneylenders, relatives and personally known individuals. Though the credit is often available without much difficulty, with minimum paperwork and at a short span of time, particularly from the professional moneylenders, it carries exorbitant rate of interest. The government has placed several restrictions on such operations such as registration of business, and regulation of interest rates. However, the professional moneylenders continue to be an important source of credit especially among the rural small farmers. Though no correct statistics are as yet available, during the early 1950s this sector was contributing above 90 percent of rural credit. Its share decreased to 81. 3% in 1961-62 and further down to 69. 7% in 1970-71. The factors responsible for the decline in non-institutional credit are: i) nationalization of commercial banks, ii) opening of branches in rural areas, and iii) augmenting awareness and education of rural people.

Check Your Progress 2

- 1) What is the role of capital in agriculture?

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2) What is the need for credit in agriculture?

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3) What are the major institutional sources of capital in agriculture?

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15.9 SYSTEM OF ACCOUNTING CAPITAL FORMATION IN AGRICULTURE

The practice of accounting capital formation is generally standardized by the United Nations System of National Accounts (UNSNA), which gets revised from time to time with better understanding and improvement in the techniques of data collection. The guidelines under USSNA were released first in 1953, revised in 1968 and then in 1993. It has facilitated many countries to adopt a standardized system of estimating national income. While nearly all the nations have adopted the system as given by the United Nations, there are variations across countries in the methodology of compiling estimates. The departure emerges due to differences in organizational functioning of services in many sectors classified. Nonetheless the methodology is gradually coming closer to the United Nations standards. The Indian System of National Accounts (ISNA) is said to broadly follow the UNSNA, but there are some minor deviations at sector-specific level.

As per the UNSNA, the economy is divided into eleven industries, all of which fall under the primary (agriculture and allied activities), secondary and tertiary sectors. Classification of these industries closely follows the International Standard Industrial Classification (ISIC) of all economic activities. The estimates of Gross Capital Formation are classified into three categories. The estimates are set in as per (a) Product Classification (types of capital goods which are acquired), (b) industrial uses to which these capital goods are put, and (c) institutions that have undertaken the capital outlay. In each of the categories, separate account is presented for fixed asset formation and change in stock. A sketch of the broad items covered under each classification is given in Table 15.1.

In India, capital formation in the SNA is defined as investment in physical goods that result in creation of income over a longer period of time. Construction and machinery equipments are the two physical assets that are considered to be capital in nature. Generating statistics on capital formation is a joint effort of two organizations, Central Statistical Organization (CSO) and Reserve Bank of India (RBI). At the first instance, estimates are made for the whole economy according to the assets, viz, construction and machinery, and equipment and change in stocks/inventories using commodity flow

approach, except for change in stock. These are, then, categorized into two institutional categories, viz, public and private sectors where the latter encompasses the corporate and the household sectors. The estimates by industry of use are derived by using expenditure approach for each of the institutional sectors.

Table 15.1 : Estimation of Gross Capital Formation

Capital Formation	Product Classification	Institutional Classification	Institutional Classification
Fixed asset Formation	<p>a) Reproducible tangible fixed assets: residential buildings, non-residential buildings, other construction works, land improvement, plantations and orchards, machinery & equipment, transport equipment, etc.</p> <p>b) Non-reproducible tangible assets : land, subsoil assets, water resources, biological resources, timber tracts and forests, fisheries, etc.</p>	<p>a) Agriculture, forestry, fishing</p> <p>b) Mining and quarrying</p> <p>c) Manufacturing,</p> <p>d) Construction</p> <p>e) Electricity, gas and water works</p> <p>f) Transportation, storage and communication</p> <p>g) Wholesale and retail trade, hotels and restaurants.</p> <p>h) Ownership of dwellings</p> <p>i) Public administration and defense</p> <p>j) Banking, insurance and real estate</p> <p>k) Other services like social, community and personal services</p>	<p>a) Private enterprises: incorporated and unincorporated</p> <p>b) Public corporations: incorporated and unincorporated</p> <p>c) Government enterprises</p> <p>d) General Government</p>
Change in Stocks	<p>i) Raw materials,</p> <p>ii) Finished goods held for sale,</p> <p>iii) Work in progress for livestock and other fixed assets, etc.</p>	<p>i) Agriculture, forestry and fishing: livestock and other</p> <p>ii) Wholesale trade</p> <p>iii) Retail trade</p>	<p>a) Private enterprises: incorporated and unincorporated</p> <p>b) Public enterprises: incorporated and unincorporated</p> <p>c) Government enterprises</p> <p>d) General government</p>

In the Indian System of National Accounting, nine industries of use are defined. The estimates of capital assets are used to arrive at the capital account and the originating industry or establishment engaged in the production of goods and services under consideration. The classification or grouping of industries into nine groups in the system is independent of whether the activity is carried out by the household, private or public sector in the economy. The capital assets are valued at market price. The transacted assets are then allocated as per the industry of use and the sectors of purchase. The value of the capitalized item in the year of purchase and its apportionment according to the capital consumption allowance (or depreciation) over the life of the asset is done in the accounts of each of the industries. The allocation of physical capital produced in an industry of use is carried out as per the designated role of a particular industry. The capital formation as a result of construction activities is allocated as per the establishment approach. For example, if construction is for creating a dam for irrigation purposes then, it is considered as part of agricultural sector on public account. Similarly, if construction is towards creation of a fertilizer plant, then, it is accounted for in the manufacturing sector. In the case of machinery and equipment purchased by the households, end use or service approach is the

criterion for allocating that asset into a particular sector. For example, thresher and tractor used for cultivation of land and generator purchased for running an irrigation well by a household are considered as part of agriculture sector, irrespective of the fact that their production takes place in the manufacturing sector. In some cases, instead of direct consumptive use approach, establishment approach as based on industry of use is followed. The final output, thus obtained with the use of inputs from different industries is a result of combined effort of all the capital assets used in the process.

Estimates of capital assets, which form gross capital formation (GCF) in agriculture and allied activities as well as other sectors, are also made separately for three institutions under the capital account, viz., i) public, ii) private corporate, and iii) households. The public sector comprises: i) Departmental Commercial Undertakings (DCUs), ii) Non-Departmental Commercial Undertakings (NDCUs), and iii) administration. While estimating GCF all the commercial activities carried out in the economy are categorized under the DCUs. An activity is considered commercial, if there is production of some good/services in the process. Examples are irrigation, electricity, communication, railways, currency and coinage, civil aviation, manufacturing, radio and television broadcasting, road and water transport, etc. Of these activities, irrigation works and forestry are two such activities that are charged for and form part of the DCUs under the agriculture sector. The non-departmental commercial undertakings comprise financial and non-financial enterprises, in which the Central or the State government companies have not less than 5 per cent of the paid-up capital.

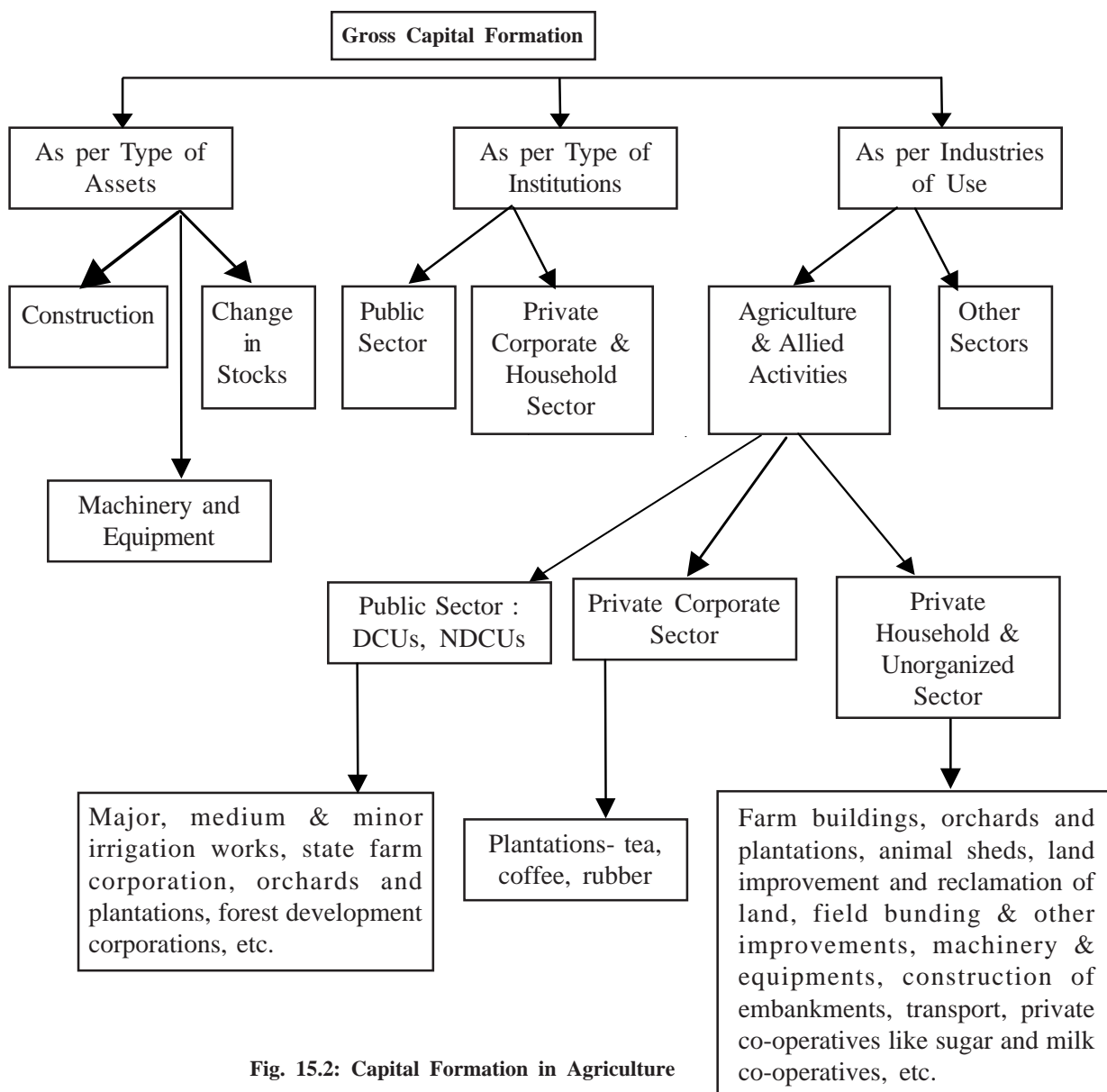


Fig. 15.2: Capital Formation in Agriculture

15.10 TREND OF CAPITAL FORMATION IN AGRICULTURE IN INDIA

15.10.1 Structure of Private Sector Investments in Agriculture

Private sector investment in agriculture comprises primarily investments in the corporate sector and household sector. Corporate sector in India is normally categorized into organized and unorganized segments. The organized segment contains big firms primarily in the plantation sector, and their estimates of capital formation are available in their accounting books. The unorganized sector, however, does not have any such systematic information. They are basically private co-operatives (sugar, milk, poultry, etc.) and other very small and cottage agricultural enterprises (dairy, agricultural implements, etc.). Information on their contribution to capital formation in agriculture is diverse and diffused. It is accounted through surveys conducted by the Central Statistical Organization (CSO) at regular intervals. Similarly, for households' component, CSO along with Reserve Bank of India (RBI) conducts surveys (All India Debt and Investment Surveys, popularly known as AIDIS) once in ten years to estimate their contribution to capital formation in agriculture. For the intervening years, estimates are *interpolated* using the combined index of agricultural production and industrial production. Additions to livestock, which are treated as fixed assets, are extracted from data on number of livestock given in the Indian Livestock Census. Their *interpolation* on annual basis is done with the help of geometric rate of growth from the given quantitative data.

Within the private sector, the organized corporate component accounts for less than five per cent of the capital formation in agriculture at the all India level during 1990s. The overwhelming share is that of the household sector, which may include the share of unorganized corporate sector and private co-operatives as well.

National Accounts Statistics do not provide detailed information on the type of investment undertaken or the assets created in the agriculture sector on public and private accounts. However, within private accounts such information at the household level is given in the All India Debt and Investment Survey (AIDIS). In all, household fixed capital formation in agriculture is categorized into six major components. These are: (i) land reclamation, bunding and other land improvements, (ii) orchards and plantations, (iii) wells and other irrigation, (iv) agricultural implements, machinery and transport equipment, etc., (v) farm houses, barns and animal sheds, and (vi) other capital expenditure.

The distribution and share of these fixed expenditure heads by the rural and urban agricultural households together with total fixed capital expenditure at the all India level for three reference periods are given in Table 15. 2.

Table 15. 2 : Percentage Distribution of Fixed Capital Expenditure of Households in Agriculture

Components	1971-72	1981-82	1991-92
Machinery, equipment & transport	43. 20	51. 95	47. 80
Wells and other irrigation sources	26. 80	20. 45	24. 70
Land improvements	16. 50	15. 25	12. 71
Farm houses & animal sheds	10. 50	4. 55	3. 47
Orchards and plantation	1. 80	2. 80	5. 06
Other capital expenditure	1. 20	5. 00	6. 26
Total	100. 00	100. 00	100. 00

We see from Table 15.2 that for the household sector, agricultural implements, machinery and transport equipment constitute the most important item of fixed capital formation in agriculture. It accounts for nearly half of the total capital formation in farm sector by both rural and urban households at the all India level as well as across states. The second important item of fixed capital formation is investment on wells and other irrigation works. It accounts for a high share ranging from 20 to 27 per cent in the total investment. Over the period, there has been an increase in the shares of orchards and plantations and other investments in total fixed capital.

Across states, investment in wells and other irrigation works was highest in agriculture-dominated states like Andhra Pradesh, Gujarat, Haryana, Madhya Pradesh, Karnataka, Maharashtra, Rajasthan and Tamil Nadu, excluding Punjab, where there has already been maximum exploitation of irrigation potential. The percentage share of expenditure on improvement and reclamation of land/buildings in total fixed expenditure in agriculture in 1991-92 was highest in Andhra Pradesh, Assam, Bihar, Kerala, Orissa and West Bengal. The share of this category in the total fixed capital formation in agriculture varied between 27% and 61.5%. The share of agricultural machinery and transport equipment in total investment was high in almost all the major states, except in Kerala and Maharashtra. These two states along with Jammu and Kashmir, however, had more investment in orchards and plantations. Household investment in farmhouses was relatively more in Haryana, Himachal Pradesh, Jammu and Kashmir, Assam and West Bengal.

15.10.2 Structure of Public Sector Investments in Agriculture

As far as behaviour of public sector investments in agriculture is concerned, both at the all India level as well as for states, the trend has been declining in most cases since 1980s. There are variations across states in these trends. But the fact remains that public sector investment in agriculture has been declining since early 1980s. The decline continued almost till 1993-94, and thereafter there are some signs of marginal recovery. Before we venture into the reasons behind this decline and its likely consequences for agricultural growth, it may be worth looking into the structure of public sector investments in agriculture.

Public sector investment in agriculture is estimated through investments by Departmental Commercial Undertakings (DCU) and Non-Departmental Commercial Undertakings (NDCU). The NDCU consist of agriculture, irrigation and water resource development corporations (like tubewell corporations), tea corporations and plantation and development corporations, etc. owned by the central and the respective state governments. Further, public sector investment in agriculture and allied activities is also decomposed into three sub-sectors, viz., i) agriculture proper, ii) forestry, and iii) fishery. Investments by the public sector in fisheries have been almost negligible, less than half a per cent of the total investment in agriculture. It is agriculture proper, which accounted for almost 94% of the investments in agriculture and allied activities during 1980s. Its share marginally came down to about 88% by the mid 1990s, but rose to 90.7% during 1996-97. Accordingly, the share of forestry, which hovered around 5% in 1980s increased to about 9% by the late 1990s. In both the cases of agriculture proper and forestry, the overwhelming share is that of DCU. Also, within the forestry sector plantations and orchards occupy bulk of the share in total Gross Capital Formation. In the total public sector investments in agriculture and allied activities, the share of irrigation (basically on major, medium and minor schemes) investment being incurred through DCU is the most dominant. It accounts for as much as 90% (Table 15.3). The NDCU accounts for about 10% of total public sector investment in agriculture and allied activities.

Table 15.3 : Percentage Share of Public Investment in Agriculture by type of Enterprise

(1993-94 prices)

Years	Aggregate			DCU		NDCU		
	Agri-proper	Forestry	Fishing	Agri-proper	Forestry	Agri-proper	Forestry	Fishing
1980-81	94. 93	5. 02	0. 05	92. 45	4. 86	2. 48	0. 16	0. 05
1981-82	94. 77	5. 18	0. 05	90. 90	4. 84	3. 87	0. 34	0. 05
1982-83	92. 97	6. 99	0. 04	90. 95	5. 36	2. 02	1. 63	0. 04
1983-84	91. 30	8. 62	0. 08	89. 26	6. 29	2. 04	2. 33	0. 08
1984-85	91. 98	7. 91	0. 11	89. 47	6. 28	2. 51	1. 63	0. 11
1985-86	92. 93	6. 93	0. 14	90. 75	5. 70	2. 18	1. 23	0. 14
1986-87	92. 00	7. 83	0. 17	90. 46	7. 25	1. 54	0. 58	0. 14
1987-88	92. 40	7. 48	0. 12	90. 80	6. 71	1. 60	0. 77	0. 17
1988-89	91. 87	8. 08	0. 06	90. 27	7. 62	1. 60	0. 46	0. 12
1989-90	89. 11	10. 80	0. 09	87. 74	9. 66	1. 37	1. 14	0. 06
1990-91	88. 01	11. 93	0. 06	86. 52	10. 58	1. 49	1. 35	0. 09
1991-92	88. 42	11. 50	0. 08	87. 49	10. 92	0. 93	0. 58	0. 06
1992-93	89. 82	10. 13	0. 05	88. 65	9. 84	1. 17	0. 29	0. 08
1993-94	90. 83	9. 11	0. 06	90. 00	8. 87	0. 83	0. 24	0. 05
1994-95	92. 11	7. 89	0. 00	90. 37	7. 50	1. 74	0. 39	0. 06
1995-96	91. 14	8. 84	0. 02	72. 09	8. 23	19. 05	0. 61	0. 02
1996-97	90. 70	9. 28	0. 02	83. 23	8. 78	7. 47	0. 50	0. 02
1997-98	89. 68	10. 30	0. 02	82. 09	9. 69	7. 59	0. 61	0. 02

There has been a slowdown in the rate of public sector investment in agriculture, especially during 1980-91. However, there has been some marginal improvement during 1990s. The private sector investment in agriculture also decelerated during 1980-86, but started recovering after 1986 (Table 15. 4). In fact, in the later half of 1980s and early 1990s, private sector investments showed not only remarkable improvements, but also rising behaviour even when public sector investments in agriculture was either going down or stagnating (Fig.15. 1). This raised several questions in the Indian literature on the subject in the late 1980s through 1990s, and the debate is still on. The questions being posed are: Is there any relation between the public and private sector investments in agriculture? Do they complement or compete with each other? How is deceleration of investment in agriculture likely to affect growth in agriculture? Why is public sector investment in agriculture declining so fast?

Table 15. 4 :Gross Capital Formation in Agriculture, Forestry and Fishing

(Rs. Crore)

Years	At 1993-94 Prices			At Current Prices		
	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total
1981-82	7130	6949	14079	2041	2263	4304
1982-83	7092	7437	14529	2263	2636	4899
1983-84	7196	7529	14725	2466	2902	5368
1984-85	6921	8027	14948	2678	3413	6091
1985-86	6213	7919	14132	2818	3768	6586
1986-87	5864	7844	13708	2895	4033	6928
1987-88	6045	8249	14294	3304	4642	7946
1988-89	5699	9063	14762	3442	5577	9019
1989-90	4972	8452	13424	3354	5833	9187
1990-91	4992	11424	16416	3628	8596	12224
1991-92	4376	10589	14965	3653	9000	12653
1992-93	4539	11602	16141	4175	10804	14979
1993-94	4918	10331	15249	4918	10331	15249
1994-95	8369	11416	16785	6002	12381	18383
1995-96	5322	12367	17689	6762	14605	21367
1996-97	5150	13176	18326	7296	17119	24415
1997-98	4503	13802	18305	6921	19101	26022
1998-99	4421	14543	18964	7549	21174	28723
1999-2000	NA	NA	21388	NA	NA	33755

GCF in Agriculture in India
(1993-94 prices)

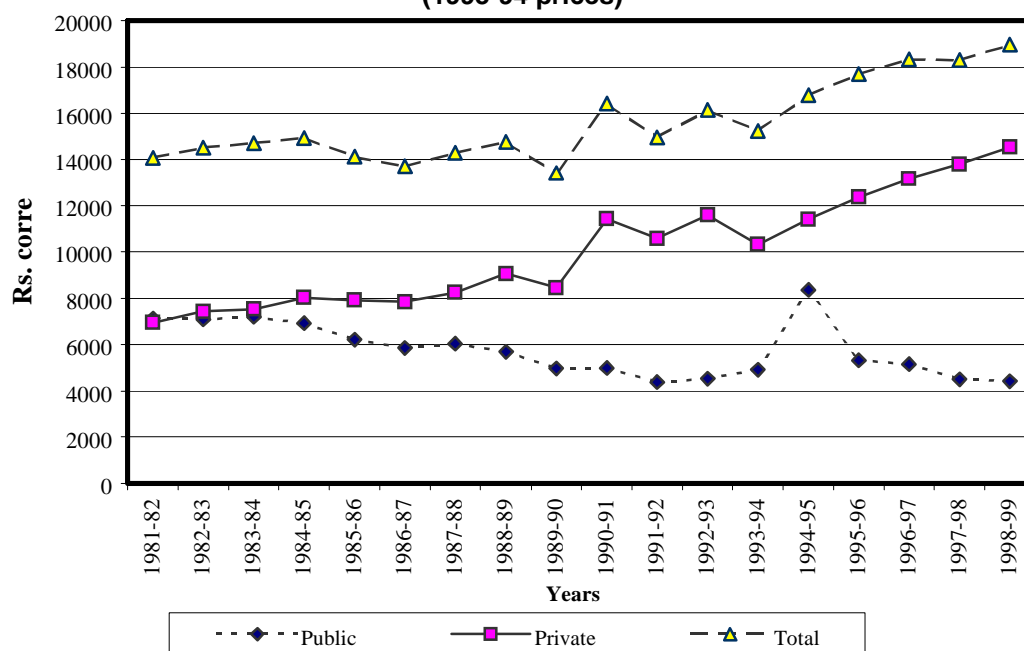


Fig. 15.1: Trend of Public and Private Capital Formation in Agriculture in India

15.10.3 Public and Private Sector Investments in Agriculture: Complementary or Competitive?

Several scholars have responded to this question with empirical analysis of data. The research works resulted three different thoughts. One group opined that the private sector investment in agriculture was dependent on public sector investment and support from institutional credit. Neglect of public sector investment in agriculture is likely to affect growth of agriculture in due course. The followers of this group accepted that public and private sector investments are complementary to each other.

The complementarity between public and private capital formation in agriculture was examined on the basis of direction of movement of both public and private investments and the statistical relationship between the two. A recapitulation of macro data on real public and private capital formation in agriculture indicates that from 1960s to late 1970s the movement of both the investments was in the same direction. Such positive association between public and private investments in agriculture over a long period was interpreted as having complementarity effects.

Some studies established that public investment had an inducement effect on private investment and hence there is a 'complementarity' between public and private investments in agriculture. It also contented that public investment creates conditions for private investment in agriculture. In other words, private investment is contingent upon public investment. For instance, one rupee of public investment in agriculture induces private investment of more than a rupee. The stimulating role of public investment on private investment was observed while public investments in canals and rural electrification had positive bearing on the private household investment in machinery and construction of dug-wells, etc.

Since 1986-87, however, there has been divergent movement between public and private investments with the former falling and the latter rising steadily. This generated an intense debate regarding the subsiding effect of an established complementarity between public and private capital formation in agriculture. The second group of researchers therefore, advocated for only a weak complementarity between public and private sector investments. The proponents of third view however challenged that there was no apparent complementarity between public and private sector investments in agriculture. The validity of any kind of relation between public and private investments in agriculture was questioned on conceptual, methodological and factual issues.

15.10.4 Impact of Investment Deceleration on Agricultural Growth

As a result of higher investments in the economy during 1990s, the annual growth rate in the GDP in the agriculture and allied activities has increased from 2.95 per cent during 1980s to 3.5 per cent during 1990s. Public investment has significant influence on growth in agriculture. The estimated elasticity for cumulative public GCFA in irrigation works, measured in financial terms, reveals that with an 10% increase in these investments, GDP from agriculture (GDPA) would increase by 2.53 %. More interestingly, activities under agriculture and allied activities also get affected by the decline in public investment. Data reveals that agricultural crop activities were affected more (75%) than the allied activities (25%) due to the fall in investments in agriculture during the 1980s.

Within the agricultural activities production of cereals, pulses, oilseeds, sugarcane, etc. were worse affected. This verifies that within the agriculture sector, the trend is towards diversification away from foodgrain crops. This fact is also corroborated by the falling growth rates in the area under production of wheat and paddy and a rising trend in the same for fruits and vegetables. This may be attributed to falling public investments in irrigation projects during the 1980s and early 1990s. This in turn has

dissuaded private investments in cultivation of irrigation-intensive crops such as cereals and pulses.

15.10.5 Reasons for Decline in Public Sector Investment in Agriculture

Various factors have been put forth behind the observed declining trend in the public gross capital formation in agriculture since the early 1980s. These are: i) increase in subsidies to agriculture, ii) adverse terms of trade, iii) decline in international price of rice and wheat, iv) steep rise in construction activities, v) reduction in resource flows from centre to states, vi) decline in capital outlays by the states, vii) slowing down of public expenditure on special rural and area development programmes, and viii) the state agricultural policies to augment private investments. The major factors for declining private investments could be: i) low growth rate of per capita income in agriculture, ii) squeezing of rural savings, iii) low net bank credit to agriculture, and iv) decline in profitability of investments in agriculture vis-à-vis other sectors.

Check Your Progress 3

1) Give some examples of reproducible tangible fixed asset.

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2) Bring out the complementary nature of private and public sector investments in agriculture.

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15.11 LET US SUM UP

Capital formation plays a crucial role in the development of an economy. It facilitates technological innovations, product diversification, optimal allocation of resources, product diversification and commercialization in agriculture. The relevance of capital formation in agriculture is more prominent in a predominantly agrarian economy like India. There was a steady increase in the capital formation during 1950s to early 1970s. But unfortunately capital formation in agriculture has remained low in India. It has been declining since the early 1980s in the public sector. The complementarity of public and private sector investments in agriculture and the induced effects of the former on the latter is a debatable issue. The reasons for decline in capital formation are cited as slowing down in public expenditure on agricultural sector, low profitability of farm sector compared to other investments and low per capita income of farmers.

15.12 KEY WORDS

- Capital accumulation** : Capital as an input remains in use for a longer period although its productive capacity depreciates over time. Therefore, capital input accumulates and increases as we invest year after year.
- Marketable surplus** : It indicates the surplus output of the farmers after consumption. For small and marginal farmers almost the entire agricultural output produced is for self-consumption. Thus the marketable surplus in their case is nil. The case of big farmers may be different as they are in a position to sell after retaining output for self-consumption.
- Marketed surplus** : It indicates the amount sold by the farmers in the market. Marginal and small farmers sell part of their produced output immediately after harvest to meet their non-food requirements. Later on they purchase foodgrains from the market for consumption. In this case there is a 'marketed surplus' but the 'marketable surplus' is zero.
- Vicious circle of poverty** : Due to low level of investment the production technology in an economy is low. Such low technology results in low levels of productivity and output. Low level of output gives rise to low income, low consumption and low saving. Due to low savings investment is low again. Thus the economy moves in a vicious circle of poverty.

15.13 SOME USEFUL BOOKS

Desai, B. M. (ed.), *Agricultural Development Paradigm for the Ninth Plan under New Economic Environment*, Oxford & IBH Publications, New Delhi.

Economic and Political Weekly Research Foundation, 2003, *National Accounts Statistics 1950-51 to 2000-01*, Mumbai.

Government of India, 1996, *Capital Formation and Savings in India: 1950-51 to 1979-80*, Report of the Working group on Savings, Central Statistical Organisation, New Delhi.

Government of India, 2001, *National Accounts Statistics 2000*, Central Statistical Organisation., New Delhi.

15.14 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Section 15.2 and answer.
- 2) See Section 15.3 and answer.
- 3) See section 15.5 and answer.

Check Your Progress 2

- 1) Capital formation in agriculture leads to an increase in productivity through technological progress. The indirect effects are increase in marketable surplus, exports and self-sufficiency in foodgrains. See Section 15.6 for details.
- 2) Credit is required for agricultural production activities and for non-farm business. Credit needs could be short-term, medium-term or long-term.
- 3) The major institutional sources of credit are commercial banks, cooperatives and regional rural banks.

Check Your Progress 3

- 1) Examples of reproducible tangible fixed assets are buildings, construction works, plantations, machinery and transport equipments.
- 2) Go through Sub-section 15.10.3 and answer.

Structure

- 16.0 Objectives
- 16.1 Introduction
- 16.2 Special Features of Agricultural Marketing
- 16.3 Market Structure of Agricultural Produce
 - 16.3.1 Types of Markets
 - 16.3.2 Market Functionaries
 - 16.3.3 Market Structure for Some Agricultural Commodities
- 16.4 Marketing Channels for Important Agricultural Commodities
 - 16.4.1 Length of Marketing Channels
 - 16.4.2 Marketing Channels for Foodgrains
 - 16.4.3 Marketing Channels for Oilseeds
 - 16.4.4 Marketing Channels for Fruits and Vegetables
 - 16.4.5 Marketing Channels for Eggs
- 16.5 Marketing Costs
- 16.6 Cooperative Marketing
 - 16.6.1 Objectives of Cooperative Marketing
 - 16.6.2 Advantages of Cooperative Marketing
- 16.7 Cooperative Marketing Structure
 - 16.7.1 Primary Marketing Societies
 - 16.7.2 District Marketing Societies
 - 16.7.3 State Marketing Federations
 - 16.7.4 National Agricultural Cooperative Marketing Federation of India Ltd.
 - 16.7.5 Problems of Cooperative Marketing Structure
 - 16.7.6 Need for Integrated Approach
- 16.8 Government Efforts to Improve Agricultural Marketing
- 16.9 Regulated Markets
 - 16.9.1 Objectives of Regulated Markets
 - 16.9.2 Progress in Market Regulation
 - 16.9.3 Important Features of Regulated Markets
 - 16.9.4 Other Regulatory Measures
- 16.10 Warehousing
 - 16.10.1 Functions of Warehousing
 - 16.10.2 Use of Warehousing Facilities
 - 16.10.3 License for Running a Warehouse
- 16.11 Forward Trading
 - 16.11.1 Price Support Scheme
 - 16.11.2 Market Intervention Scheme
- 16.12 Let Us Sum Up
- 16.13 Key Words
- 16.14 Some Useful Books
- 16.15 Answer/ Hints to Check Your Progress Exercises

16.0 OBJECTIVES

After going through this unit, you will be in a position to:

- identify various types of marketing institutions prevalent in India;
- explain the cooperative marketing structure and its problems; and
- identify the role and efforts of the central and state governments in regulating marketing of farm produce.

16.1 INTRODUCTION

The term marketing is derived from the term market, which in turn is derived from the Latin word 'marcatu' meaning merchandise, wares, traffic or place where business is conducted.

The word 'market' has been widely and variably used to mean: (a) a place or a building where commodities are bought and sold, e.g., super market; (b) potential buyers and sellers of a product, e.g., wheat market and cotton market; (c) potential buyers and sellers of a country or region, e.g., Indian market and Asian market; (d) an organization which provides facilities for exchange of commodities, e.g., Bombay stock exchange; and (e) a phase or a course of commercial activity, e.g., a dull market or bright market.

Marketing occupies an important place in agriculture. It motivates the farmers to produce more and earn higher income. Traditionally, marketing consisted of those efforts which affect transfers in ownership of goods and care for their physical distribution. But in the modern concept marketing is a comprehensive term covering a large number of functions such as (i) collection of surpluses from the individual farmers; (ii) transportation to nearest assembling centre; (iii) grading and standardisation; (iv) pooling; (v) processing; (vi) warehousing; (vii) packing; (viii) transportation to the consuming centres; (ix) bringing the buyers and sellers together; and (x) sale to the ultimate consumers. All these functions require capital and also involve risk due to fluctuation in prices, losses, deterioration in quality, etc. The arrangements made for raising the requisite finance for the above activities bearing market risks at various levels, also, therefore, form part of marketing.

16.2 SPECIAL FEATURES OF AGRICULTURAL MARKETING

Agricultural marketing has certain special characteristic features such as:

- a) The agricultural produce is bulky for its value in comparison with many manufactured goods. The demand it makes on storage and transport facilities is heavy and specialized, resulting in heavy costs.
- b) The farm output is seasonal in character, whereas its demand by the consumers is spread over the whole year. The market system has, therefore, to balance suitably the seasonal outflow of the produce from the farm with the relatively steady and continuous consumer demand.
- c) The marketable surplus with individual farmers (who are small farmers, spread over larger area) is in small lots. Its collection becomes a complicated process particularly as the consumers are concentrated in urban areas.
- d) Agricultural commodities are perishable in nature and suffer loss and deterioration in quality during storage and transportation. Thus, they require special type of storage and transport facilities.

- e) The production of certain crops like fruits and plantation crops is highly localised but consumption is widespread, their marketing becomes more difficult.
- f) In India most of the farmers are small and medium scale producers with weak financial position. They are unable to undertake the above functions individually, whereas these functions are usually in the hands of intermediaries or middlemen, who exploit them.

16.3 MARKET STRUCTURE OF AGRICULTURAL PRODUCE

16.3.1 Types of Markets

In India markets for agricultural produce have been classified under three main groups, viz., (a) primary, (b) secondary, and (c) terminal.

Primary Markets

These include mainly the periodical markets called 'hats' 'peths', or 'shandies' at the village level and are held at weekly or fixed intervals. In all there are 22, 000 such markets in India. Such markets serve an area of 5 to 10 kms. radius each.

Secondary Markets

These markets are called 'mandis' or 'gunjs' and are wholesale daily markets usually situated at the district and taluka head quarters or important trade centres near railway stations. There are about 3, 400 important secondary markets or mandi centres in the country. These markets have good communication facilities and draw supplies from their hinterland spread within a radius of 10 to 30 kms.

Terminal Markets

In these markets the produce is finally disposed of to the consumers directly or to the processors or is assembled for shipment to foreign destinations. The port markets are such terminal markets. The area served by these markets is very large.

16.3.2 Market Functionaries

The functionaries for marketing of agricultural commodities vary from region to region as well as from commodity to commodity. However, the following are the important functionaries operating in all regions:

- a) *The village/itinerant Merchant*: He is the main functionary in the primary market. He sometimes also produces, and buys locally for sale to itinerant merchants.
- b) *Kutchi Arhatia*: He mainly functions as a link between the primary seller (producer or village merchant) and the buyer in the 'mandis' and arranges for disposal of the sellers' produce on commission basis and charges commission from both the seller and the buyer.
- c) *Pucca Arhatia*: He generally acts on behalf of the outside purchaser on commission basis, also operates as a wholesale agent and buys and sells on his own account. These arhatias attend to cleaning of produce, processing (where necessary), weighing, packing and forwarding upto the rail head. They own big capital and finance their own agents.
- d) *Dalal*: He assists arhatia in bringing together the sellers and buyers and arranges for sale of produce. He thus acts as an broker between two traders.

- e) *Tolas (weighmen)*: Weighing in wholesale market is done by a functionary called Tolas who generally works as a separate entity.
- f) *Hammals and Palledars (Market laborers)*: They attend to the collection and handling of produce in the market. They are generally independent workers.
- g) *Other Functionaries*: There are a number of other minor functionaries such as sweepers, water carriers and other servants of arhatia who attend to the affairs of arhatia's clients.

16.3.3 Market Structure for Some Agricultural Commodities

Notwithstanding the direct intervention by the government, the markets for agricultural products in India have remained dominated by the private sector. According to one estimate, the quantity of agricultural produce handled by the government agencies has been not more than 10 per cent of the total value of *marketed surplus*. Further, around 10 per cent of the surplus is handled by the cooperatives. Thus 80 per cent of the marketed surplus of agricultural products in India is handled by the private trade. Even in the case of cereals, the share of private trade is quite large and increasing. Of the estimated marketed surplus of cereals, the share of private trade which was 72.5 per cent during triennium ending (TE) 1982-83 went upto 74.0 per cent during TE 1996-97. Out of the incremental output of 57.4 million tonnes between TE 1982-83 and TE 1996-97, the quantity handled by the public agencies was around 8 million tonnes. With larger quantities required to be handled by the private trade, the size and structure of the market for cereals have considerably expanded.

Trade in foodgrains in India is handled by around two million wholesalers and five million retailers. In the area of retailing, there are more than 4.10 lakh fair price shops, of which nearly three-fourths are in the private sector, operating under the public distribution system (PDS). On average, there is one retail shop of foodgrains for a population of 200. Apart from traders, processors play an important role as they also enter the market as bulk buyers and sellers. In the case of paddy/rice, there are 91,801 hullers, 4,538 shellers, 8,365 huller-cum-shellers and 34,688 rice mills, which process the entire output of around 120 million tonnes of paddy. In the wheat market, the roller flour mills command considerable share of total quantity handled. There are now 812 roller flour millers who buy, process and sell 10.5 million tonnes of wheat and wheat products. Out of the total output of pulses, nearly 75 per cent is processed in the organised as well as unorganised sector. The number of organised pulse (*dal*) mills is now more than 10,000.

Nearly 98 per cent of the fruits and vegetables produced in India are traded as fresh products. The commercial processing segment accounts for only 1.8 percent of the total output. Though the processing capacity has gone up to 19.1 lakh tonnes, due to the seasonality in production and lack of farmer-processor linkages, only half of the capacity is being utilised.

The food-processing sector is assuming increasing importance owing to the increased urbanisation and rise in the income levels. Of the total Indian food market the processed segment is only 10 per cent, semi-processed 15 per cent and remaining 75 per cent is fresh food segment. The food processing in India is presently dominated by the unorganised sector. The organised processing sector comprises 18,000 units producing Rs.9000 crore worth of processed foods. The processing segment of the food market is growing rapidly and projected to increase by 200 per cent by the year 2005 with high investment potential. This segment is attracting massive investment and since July 1991 several ventures in the private, joint and cooperative sectors, some with foreign collaboration and 100 per cent export oriented units, have been approved, sanctioned or commissioned.

The market structure for meat includes 3,600 slaughter-houses, six modern abattoirs and 25 meat processing plants, besides several poultry dressing units. There are 104 licences functioning under the Meat Food Products Order, 1973. The structure of the processing capacity needs to be examined in relation to the total meat output in the country which is estimated at 3.9 million tonnes per year.

Oilseeds and vegetable oils constitute another important segment of the Indian agricultural markets. The oilseed processing industry consists of mechanical crushing and solvent extraction units. The mechanical crushing units include 20,000 expellers and 1,31,600 cottage level crushers (*ghanies*). The number of solvent extraction units is 761. In addition, there are 130 oil refining and 145 hydrogenation units. The capacity utilisation of the industry is less than half. One important structural change observed in oilseeds processing sector is that the share of cottage units in the total volume of crushing is going down. The capacity utilization in cottage units is reported to be around 10 per cent whereas it is 30 per cent for expellers, 34 per cent for solvent extraction units, 50 per cent for oil refining and 37 per cent for hydrogenation units.

Some preliminary information presented here indicates some general features of the agricultural produce markets, viz., (a) the market size is already large and expanding; (b) it is dominated by the private sector; (c) by and large, unorganised segment is much larger than the organised sector and the share of organized sector is increasing; and (d) despite the market being large, due to infrastructure bottlenecks coupled with geographically dispersed market places, the possibilities of localised monopolies or oligopolies cannot be ruled out.

16.4 MARKETING CHANNELS FOR IMPORTANT AGRICULTURAL COMMODITIES

Marketing channels are routes through which agricultural products move from producers to consumers. The length of channel varies from commodity to commodity, depending on the quantity to be moved, the form of consumer demand and degree of regional specialization in production.

16.4.1 Length of Marketing Channels

Marketing channels for agricultural products vary from product to product, country to country, lot to lot and time to time. For example, the marketing channels for fruits are different from those of foodgrains. Packers play a crucial role in the marketing of fruits. The level of development of a society or country determines the final form in which consumers demand the product. For example, consumers in developed countries demand more of processed foods in packaged form. Wheat has to be supplied in the form of bread. Most of the eatables have to be cooked and packed properly before they reach the consumers. Processors play a dominant role in such societies. In developing countries like India, however, most foodgrains are purchased by consumers in the raw form and processing is done at the consumer's level. Again, the lots originating at small farms follow different routes or channels from the one originating in large farms. For example, small farms usually sell their produce to village traders; it may or may not enter the main market. But large farms usually sell their produce in the main market, where it goes into the hands of wholesalers. The produce sold immediately after the harvest usually follows longer channel than the one sold in later months.

With the expansion in transportation and communication network, changes in the structure of demand and the development of markets, marketing channels for farm products in India have undergone a considerable change, both in terms of length and quality.

16.4.2 Marketing Channels for Foodgrains

Marketing channels for various cereals in India are more or less similar, except the channel for paddy (or rice) where rice millers come into the picture. Some common channels for wheat have been identified as follows:

- i) Farmer to consumer
- ii) Farmer to retailer or village trader to consumer
- iii) Farmer to wholesaler to retailer to consumer
- iv) Farmer to village trader to wholesaler to retailer to consumer
- v) Farmer to co-operative marketing society to retailer to consumer
- vi) Farmer to a government agency (FCI etc) to a fair price shop-owner to consumer
- vii) Farmer to wholesaler to flour miller to retailer to consumer

The channels for paddy and pulse are broadly the same, except that the rice millers or *dal* millers come into the picture before the produce reaches retailers or consumers.

16.4.3 Marketing Channels for Oilseeds

Marketing channels for oilseeds are different from those for foodgrains, mainly because the extraction of oil from oilseeds is an important marketing function for oilseeds. The most common marketing channels for oilseeds in India are:

- i) Producer to consumer (who either directly consumes oilseeds or gets it processed on custom basis)
- ii) Producer to village trader to retailer to consumer
- iii) Producer to oilseed wholesaler to processor to oil wholesaler to oil retailer to oil consumer
- iv) Producer to village trader to processor to oil consumer
- v) Producer to government agency to processor to oil wholesaler to oil retailer to oil consumer

16.4.4 Marketing Channels for Fruits and Vegetables

Marketing channels for fruits and vegetables vary from commodity to commodity and from producer to producer. In rural areas and small towns, many producers perform the functions of retail sellers. Large producers directly sell their produce to the processing firms. Some of the common marketing channels for fruits and vegetables are:

- i) Producer to consumer
- ii) Producer to primary wholesaler to retailer or hawker to consumer
- iii) Producer to processor (for conversion into juices, preserves, etc.)
- iv) Producer to primary wholesaler to processor
- v) Producer to primary wholesaler to secondary wholesaler to retailer or hawker to consumer
- vi) Producer to local assembler to primary wholesaler to retailer or hawker to consumer

16.4.5 Marketing Channels for Eggs

The prevalent marketing channels for eggs are:

- i) Producer to consumer
- ii) Producer to retailer to consumer
- iii) Producer to wholesaler to retailer to consumer
- iv) Producer to co-operative marketing society to wholesaler to retailers to consumer
- v) Producer to egg powder factory

Sometimes, the wholesaling and retailing functions are performed by a single firm.

Check Your Progress 1

- 1) Justify the statement that marketing of agricultural commodities differs from that of industrial goods.

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- 2) What are the essential components of market structure?

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- 3) What are the types of markets for agricultural produce in India?

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- 4) What are the marketing channels for fruits and vegetables?

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16.5 MARKETING COSTS

The difference between the price received by the farmer and price paid by the consumer is called marketing cost. This includes middlemen's charges for the services rendered in performing marketing functions. Studies have shown that a large proportion of consumer's income is taken away by the middlemen. The reasons for the prevalence of high marketing costs are scattered farms, small size of individual lots of produce, their variability in quality, poor transport facilities, inadequate development of market information services, lack of capital for storage and processing, etc.

The following are some of the *marketing disabilities*, which cause high marketing costs.

- a) *Multiplicity of Market Charges*: The producer is required to pay a large number of market charges without any justification and often for no services rendered. 'charity' or 'dharmada' charges, storage charges without the produce having been stored are some of the examples of unwanted charges.
- b) *Trade Allowance*: Traders in most of the unregulated markets make deductions which are unwanted and heavy. For example, allowances for drayage, moisture, dirt, etc. even when the produce is displayed in a heap and inspected by the buyers before purchases are made. These are unjustified trade allowances.
- c) *Adulteration and lack of grading*: The producers of agricultural commodities and traders by and large, have not yet realized the importance and advantages of grading the produce, with the result that the transaction takes place on a sample basis and the producer does not get full worth of his produce.
- d) *Method of Sale*: The under-over (or *hatha*) system of sale is widely prevalent in many of the unregulated markets. This system is open to various malpractice, because only the negotiators know the price being negotiated. It generally operates to the detriment of the producer and to the benefit of the trader, particularly the commission agent.
- e) *Weighment*: In many markets the weights used are not correct. Besides, there is no supervision over the persons engaged in weighing, who are mostly employees of the trader and often manipulate the scale.
- f) *Large Samples*: Large samples are taken by the buyers without payment.
- g) *Delayed payment of sale proceeds*: The producer in most cases is not paid immediately the full value of his produce sold. Advances are made and final settlement is made after some delay. If advances are made before harvest, heavy interests are also charged.
- h) *Superfluous Middlemen*: There are large number of middlemen between the producer and the consumer resulting in high cost to the consumer and low returns to the producer.
- i) *Inadequate Storage Facilities*: In most of the villages, there is hardly any institutional storage facility is available as a result the farmers dispose of their produce as soon as it is harvested at any cost. It is estimated that the storage losses at the farmers level are about 5% of the total produce.
- j) *Defective Transport*: The transport system in rural areas is also in the bad state of affairs and is practically non-existent during rainy season. It is a well known fact that good transport and communication systems are pre-requisite for efficient marketing.

- k) *Lack of Market Information*: There is hardly any agency providing reliable information about prices in rural areas. The villagers have no contact with the outside world and act on the hearsay reports.
- l) *Absence of Regulated Markets*: As many as 2,000 out of the 3,400 important markets have not been regulated so far. Even in the regulated markets the rules and regulations are not properly enforced by the officials, with the result that the malpractices continue in one form or other.

Organised marketing is of considerable significance to the economy of the country. It would be useless to increase the output of food and equally futile to set up optimum standards of nutrition, unless food moves to the consumers from producers at a price which provides fair remuneration to the producers and is within the consumer's ability to pay.

16.6 COOPERATIVE MARKETING

The need for cooperative marketing is keenly felt in India against the background of defects and malpractices that exist in agricultural marketing system. Although, certain statutory measures have been adopted by the central as well as state governments, yet many malpractices still continue in one form or other. This is because even today a large number of farmers continue to be indebted to the trader-cum-money lenders, as they control credit, marketing, transport and storage.

Cooperative marketing is a process of marketing through a cooperative association formed to perform one or more of the marketing functions in respect of the produce of its members. It is a voluntary business organisation established by its members to market farm produce collectively for their direct benefits.

16.6.1 Objectives of Cooperative Marketing

The broad aim of cooperative marketing society is to rationalise the whole marketing system so as to make it beneficial to the producer. Its immediate objectives are to:

- a) strengthen the bargaining capacity of the cultivator,
- b) secure the members a better price for their produce,
- c) eliminate superfluous middlemen,
- d) provide the members with needed finance,
- e) persuade the farmer to grow better quality goods,
- f) stabilise prices,
- g) develop fair trading practices,
- h) provide facility of grading, storage and transportation,
- i) act as an agent of the government for the procurement and implementation of price support and market intervention schemes,
- j) promote the economic interest of its members by encouraging self-help, thrift and better farming among members,
- k) act as a distributive centre for agricultural inputs such as seeds, fertilisers, chemicals, implements, etc., and
- l) help in the expansion of agricultural credit programme by linking marketing with credit.

16.6.2 Advantages of Cooperative Marketing

The cooperative marketing is beneficial to the producer, consumer and the whole society at large. Some of the specific advantages are:

- a) *Economy in cost of marketing*: Since the society handles large volume of business as well as takes up various activities like assembling, grading, storing, risk bearing, etc. it might be possible to render these services at a minimum cost due to economies of scale.
- b) *Better prices*: The marketing society strengthens the bargaining capacity of the farmers, as such they get better prices for their produce. The society also provides advances which helps the farmers to sell the commodity when prices are high.
- c) *Credit facilities*: The cooperative marketing society is in a position to borrow from cooperative banks at lower rate of interests and finance members on reasonable terms. It, thus, saves the members from the clutches of money lenders on the one hand and ensures better recovery position of cooperative banks.
- d) *Supply of quality goods to consumers*: The members of a cooperative marketing society are also consumers. The society, therefore, provides quality consumer goods to its members at reasonable/lower prices.
- e) *Help in growing better crops*: Market societies, by providing quality seeds, fertilisers and other input help their members in growing high quality crops and better production.
- f) *Distribution of surplus*: The profits of a marketing society become property of its members and are distributed in proportion to the patronage. This becomes additional income to the members.
- g) *Educative value*: The marketing society educates its members about scientific methods of farming, provides market information and so on. Thus, it has become a source of education.

Check Your Progress 2

1) What are the various marketing disabilities prevalent in Indian agricultural markets?

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2) Discuss the advantages of cooperative marketing.

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3) What are the important objectives of cooperative marketing?

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16.7 COOPERATIVE MARKETING STRUCTURE

The structure of cooperative marketing societies consists of the National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) at the national level, the state cooperative marketing federations at the state level and primary marketing cooperative societies at the agricultural market (Mandi) level. The organisational structure of cooperative marketing in the country is federal type but the pattern of organisation is not uniform in all the states. It is two-tier, consisting of primary marketing cooperatives at the mandi level and state marketing federation, at the state level, in the states of Assam, Bihar, Kerala, Karnataka, M.P., Orissa, Rajasthan, West Bengal, and North-eastern states. On the other hand, it is three tier consisting of primary marketing cooperatives at the base, central marketing societies at the district and state marketing federations at the state levels in the rest of the states.

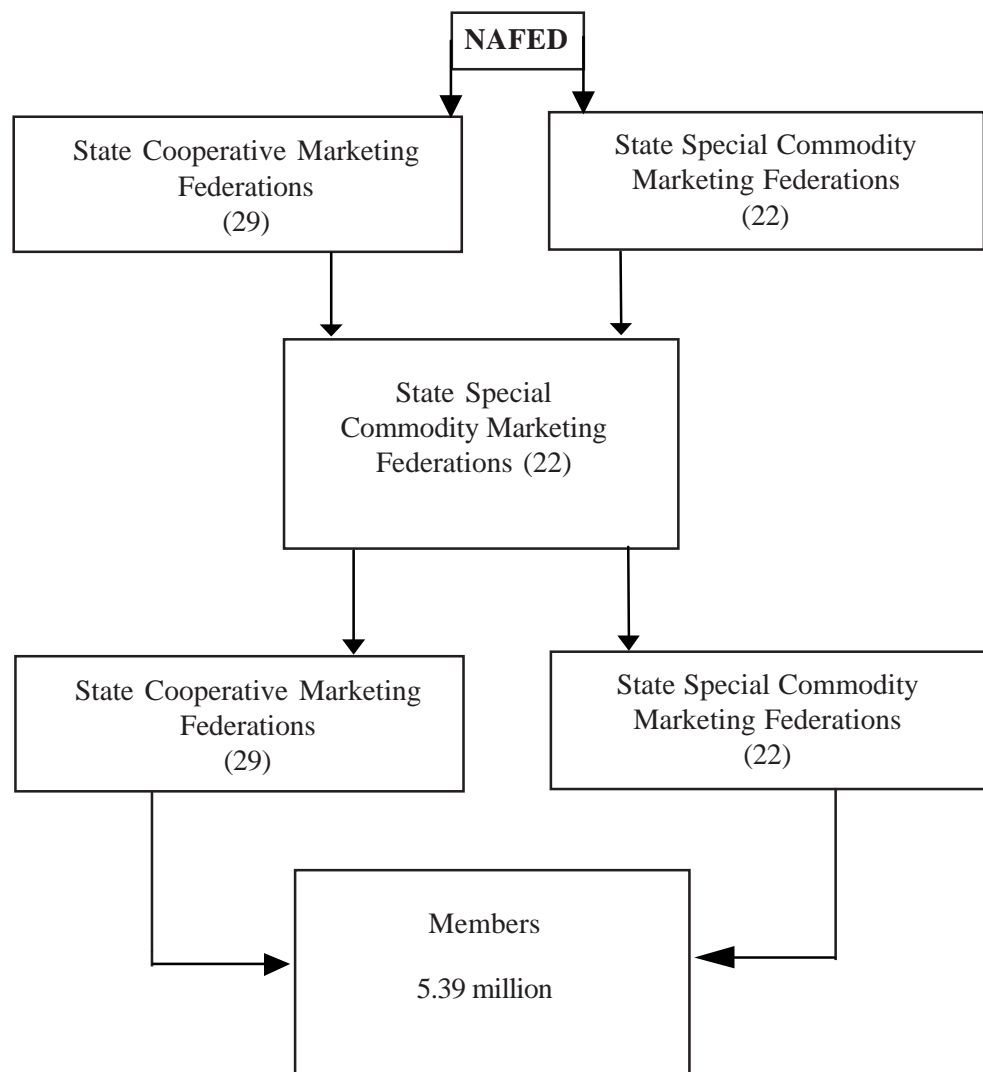


Fig. 16.1: Structure of Agricultural Marketing Cooperatives

The structure of Cooperative Marketing Societies in India is given in Fig. 16.1

As of March 1998 there were 29 state marketing federations, 22 state level special marketing federations, 397 district/central marketing societies and 8,422 primary cooperative marketing societies in the country. The business turnover of primary societies was Rs.5803 crore and that of state and district societies/federations to the tune of Rs.1,05,845 crore.

The National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED) which is the national body of marketing cooperatives handled agricultural commodities worth Rs.546 crore during 1997-98. Of this amount, Rs.208 crore was through internal trade and Rs.339 crore through exports. It has also implemented price support scheme and market intervention scheme of Government of India. It had earned a net profit of Rs.11 crore in that year.

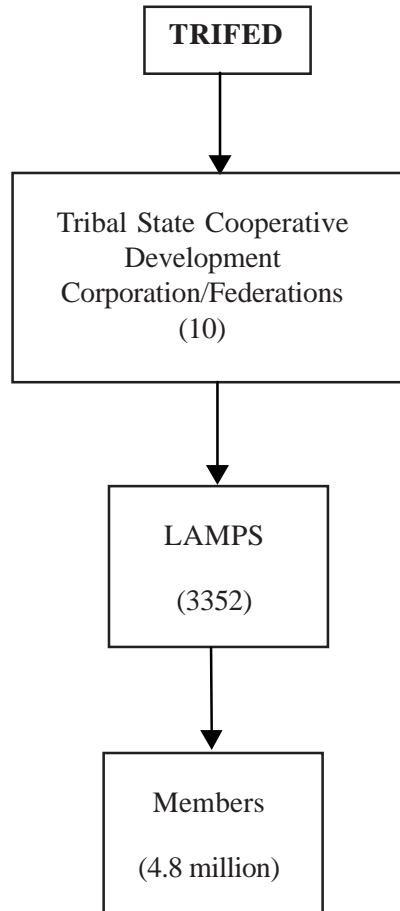


Fig. 16.2: Structure of Tribal Cooperatives

In ten states having a higher concentration of tribal population, minor forest produce is marketed by Large-sized Agricultural Multi-purpose cooperative societies (LAMPS) at the primary level and Tribal Development Cooperative Corporations / Federations at the state level. The Tribal Cooperative Societies Marketing Development Federation of India Ltd. (TRIFED) is a national level body which provides support to the tribal cooperatives in marketing of minor forest produce. In 1996-97 TRIFED conducted business of Rs.132 crore of which export component was Rs.22 crore. The structure of Tribal Cooperatives is given in Fig. 16.2

16.7.1 Primary Marketing Societies

The primary marketing societies (PMS) perform the following functions:

- a) arrange sale of agricultural produce of members by undertaking functions like pooling, grading, packing, transportation, storage, etc.

- b) give loans to the members on pledging their produce
- c) procure agricultural commodities, implement price support and market intervention schemes and act as an agent of the government
- d) undertake processing of agricultural commodities
- e) act as an agent of PACs for recovery of production loans from the members
- f) distribution of fertilisers and other agricultural inputs.

16.7.2 District Marketing Societies

These societies exist in those states where the marketing structure is three-tier. These societies were organised to coordinate the functions of PMSs both in regard to marketing of agricultural produce and distribution of agricultural inputs and consumer goods. These societies were also to undertake processing where necessary and inter-district trade in agricultural commodities. But in actual practice these societies are mostly involved in the distribution of agricultural inputs and essential consumer goods.

16.7.3 State Marketing Federations

The state cooperative marketing societies have crucial role to play in the development of PMSs. These federations are organised for undertaking operations on behalf of their affiliated societies particularly in the field of inter-state trade and export of agricultural commodities, They also undertake procurement of agricultural inputs and consumer goods required by the farmers. The following functions in particular are performed by the state federations:

- a) marketing and processing of agricultural produce
- b) supply of improved implements, fertilisers and other agricultural inputs
- c) coordinate member societies in marketing
- d) implement price support scheme and market intervention scheme as an agency of NAFED
- e) provide remunerative prices to farmers for their produce.

16.7.4 National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED)

It is the national level body of cooperative marketing societies. Its main function is to coordinate the activities of state federations and render expert advice and technical guidance to them on problems relating to marketing, processing, inter-state trade, export trade, market and price trends, commercial intelligence, business techniques, etc. The following are the specific functions:

- a) marketing of agricultural produce in the country and exports.
- b) processing and storage of agricultural produce.
- c) coordinate member societies in promotion of internal trade.
- d) canalizing agency for export of onion, niger seeds and monitoring agency for import of pulses, maize, onion, etc.
- e) nodal agency of Government of India for price support operations and market intervention schemes.
- f) production and marketing of agricultural machinery, implements and bio-fertilisers.
- g) inter-state trade to stabilize consumer price in agricultural commodities.

16.7.5 Problems of Cooperative Marketing Structure

Although steady growth in the marketing of agricultural produce by cooperatives has been recorded year after year, yet the structure suffers from many ills, which are as under:

- a) absence of forward and backward linkages in the structure.
- b) most of the marketing cooperatives are mainly engaged in supply activities rather than marketing activities.
- c) only few societies are making outright purchases and selling farmers' produce through pooling.
- d) cooperative marketing societies are undertaking marketing of agricultural produce by handling the produce of farmers on commission basis.
- e) very few societies are providing finance against the pledge of farm produce.
- f) marketing cooperatives are financially weak and are unable to mobilise adequate working capital for business activities.
- g) marketing cooperatives engage themselves in the business activities involving lesser risk with the result that no long term perspective planning is resorted to.
- h) most of the marketing cooperatives have failed to create their own employees as manager, instead departmental officers work as managers in these cooperatives who do not take the marketing business seriously.

16.7.6 Need for Integrated Approach

The cooperative marketing structure has to compete with private trade which is entrenched firmly in the business. Integration and collective steps in various activities are a must for the cooperative structure. Such integration is possible when following principles are fully recognised by all concerned at all levels:

- a) unhealthy competition and duplication of functions at various levels are avoided.
- b) higher level organisation should always work for the benefit and development of lower level institutions and not independently in competition with them.
- c) undue concentration of too many functions/ resources should be avoided. Gradual decentralization and specialisation in different fields should be the aim.

Check Your Progress 3

1) What are the important functions of NAFED?

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2) What are the problems of cooperative marketing?

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3) Discuss the functions of primary marketing societies.

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4) Explain the structure of cooperative marketing in India.

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16.8 GOVERNMENT EFFORTS TO IMPROVE AGRICULTURAL MARKETING

In order to secure remunerative prices to the producers of agricultural and horticultural commodities, the central as well as the state governments have been taking various steps to regulate working of markets and stop malpractice. One of the steps followed was encouraging and supporting establishment of cooperative marketing societies/federations, which have already been discussed in detail earlier. The other steps are establishment of: i) regulated markets, ii) forward trading, iii) storage and warehousing facilities, and iv) implementation of price support and market intervention schemes. We will discuss issues related to the first three topics below while the fourth one will be taken up in Block 6.

The government keeps a watch and monitors the market conduct through several mandatory regulations. The regulatory framework for agricultural commodities in India is unique and consists of two distinct sets of measures. One of these is the development and regulation of primary markets, popularly called 'Regulated Markets' and the second set is the regulation of market conduct through a series of legal instruments.

16.9 REGULATED MARKETS

Under the traditional system of marketing of agricultural produce, producer is the seller. He incurs a high marketing cost and suffers from unauthorized deductions of marketing charges and the prevalence of various malpractices. Improvement in marketing conditions with a view to creating fair competitive conditions and increase the bargaining power of producer-sellers was considered to be the most important pre-requisite of orderly marketing. Most of the defects of, and malpractices under, the traditional marketing system of agricultural produce have been more or less removed by the exercise of public control over markets, i.e., by the establishment of regulated markets in the country.

The establishment of regulated markets is not intended at creating an alternative marketing system. The basic objective is to create conditions for efficient performance of the private trade, through facilitating free and informal competition. In regulated markets, the farmer is able to sell his marketed surplus in the presence of several buyers through open and competitive bidding. The legislation for the establishment of regulated markets does not make it compulsory for the farmer to sell his produce in the regulated market yard. Instead, voluntary action on the part of the farmers to take advantage of such a market is assumed. The basic philosophy of the establishment of regulated markets is elimination of malpractices in the system and assignment of dominating power to the farmers or their representatives in the functioning of markets.

16.9.1 Objectives of Regulated Markets

The specific objectives of regulated markets are:

- i) To prevent the exploitation of farmers by overcoming the handicaps in the marketing of their products;
- ii) To make the marketing system most effective and efficient so that farmers may get better prices for their produce, and the goods are made available to consumers at reasonable prices;
- iii) To provide incentive prices to farmers for inducing them to increase the production both in quantitative and qualitative terms; and
- iv) To promote an orderly marketing of agricultural produce by improving the infrastructure facilities.

16.9.2 Progress in Market Regulation

Though the establishment of regulated markets was started during the 1930s, the programme got momentum only after the independence. The number of regulated markets before the commencement of First Five Year Plan (April 1951) was 236. However, this number increased to 715 in March 1961, 5776 in April 1986, and further to 6968 in March 1996. At present, 98.5 per cent of wholesale markets are functioning under the regulation programme (Table 16.1).

The number of commodities under regulation also varies from state to state; but they include almost all the important agricultural commodities such as foodgrains, oilseeds, fibre crops, commercial crops, fruits and vegetables, forest produce and livestock products. There is also wide variation across states in infrastructure facilities in the regulated markets. The facilities in many markets are less than what they should have been.

Table 16.1 : Progress of Market Regulation in India

Year Ending	Number of Regulated Markets	Regulated Markets as Percent of Total Wholesale Assembling Markets (7077)
March, 1951	236	3.33
March, 1956	470	6.64
March, 1961	715	10.10
March, 1966	1012	14.30
March, 1976	3528	49.85
March, 1980	4446	62.82
March, 1986	5766	81.48
March, 1991	6640	93.83
March, 1996	6968	98.46

16.9.3 Important Features of Regulated Markets

Under the provisions of Agricultural Produce Market Act, the state government gives notice of its intention to bring a particular area under regulation by notifying the market area, market yard, main assembling market and submarket yard, if any, under the principal regulated market. The meaning of these terms is explained below.

- i) *Market Area*: The area from which the produce naturally and abundantly flows to a commercial centre, i.e., the market, and which assures adequate business and income to the market committee.
- ii) *Principal Assembling Market*: It is the main market which is declared as a principal yard on the basis of transactions and income generated for the market committee.
- iii) *Market Yard*: This is a specified portion of the market area where the sale and purchase of any of the specified agricultural commodities are carried out.
- iv) *Sub-Market Yard*: It is the sub-yard of the principal assembling market. This is a small market and does not generate sufficient income to be declared as a principal assembling market.

In the regulated markets, (a) the sale of produce is undertaken generally by open auction or by close tender method; (b) weighing of the produce is done by licensed weighing; (c) the produce is put to auction generally after cleaning and/ or grading; (d) market information is appropriately disseminated; (e) market charges are specified; (f) the payment to the seller is made by the buyer within the stipulated time; and (g) all the functionaries are required to obtain a license.

The day-to-day functioning of regulated markets is supervised by the officials of market committee, viz., the secretary, auction clerks, and other staff. The administrative decisions are taken by the nominated/ elected market committee.

The market committee consists of representatives of all sections, viz., farmers, traders, co-operative marketing societies, co-operative or commercial banks, autonomous bodies (panchayat samiti and municipal board of the area) and government officials. Prior to the establishment of regulated markets, the rules for the conduct of the business in the market were framed by traders without any consideration for the interests of other groups of persons, (farmers and consumers).

Disputes arising between producer-seller and traders on the ground of quality of the produce, accounts and deductions of unauthorized charges are solved by the sub-committee of the market committee. This avoids the legal complications and unnecessary expenditure. Prior to regulation, no such facility existed. If a farmer was not satisfied, he had to go to the court of law to get his due share, which involved a lot of expenditure and wastage of time.

Regulated markets have brought about a general awakening among producer-sellers. This awakening enables them to protect themselves against a number of malpractices which were formerly prevalent in the unregulated markets. Now the sale slips of the produce sold are given to farmers, showing the details of the quantity sold, the rate of sale and deductions, if any. A copy of the sales slip is supplied to the market committee for the purpose of checking. The malpractices like taking away of samples by the bidders have also been stopped.

The market committee provides the amenities required for a smooth and efficient marketing of the produce of farmer-sellers. These amenities encourage the farmers to bring their produce for sale in the regulated market, and check the tendency on their part to sell locally. There is also a check on the tendency to aversion of city markets for one reason or the other.

Various amenities provided by the market committee in the market area are:

- i) Link roads and culverts in the area
- ii) A spacious market yard and/ or subyards
- iii) Rest houses, cattlesheds and water trough
- iv) Light, watchmen, drinking water and parking space for carts in the market yard
- v) Infrastructure facilities, such as banks, canteens and post offices in the market yard.

The amenities vary from state to state and from market to market, depending upon the financial status of the market committee.

16.9.4 Other Regulatory Measures

While primary markets are regulated under Agricultural Produce Market Acts of various states, several other activities are regulated by the legal instruments promulgated by the centre. These include the following:

- Agriculture Produce (Grading and Marking) Act, 1937, 1986.
- Prevention of Food Adulteration (PFA) Act, 1954, 1964, 1976, 1986.
- Essential Commodities Act, 1955.
- Solvent Extracted Oil, Deoiled Meal and Edible Oil (Control) Order, 1967.
- Meat Food Products Order, 1973.
- Standards of Weights and Measures Act, 1976.
- Pulses, Edible Oilseeds and Edible Oils (Storage Control) Order 1977.
- Vegetable Oil Products (Control) Order, 1977.
- Prevention of Black Marketing and Maintenance of Supply of Essential Commodities Act, 1980.
- The Cold Storage Order 1964, 1980 (rescinded in 1997).
- Consumer Protection Act, 1986.
- Bureau of Indian Standards Act, 1986.
- Milk and Milk Products Order, 1992.
- Fruit Products Order (FPO) 1955, 1997.

The provisions under the legal instruments are used to regulate the activities of traders and processors pertaining to trading, stocking, maintenance of quality, grading, packing, processing, blending and movements. These instruments are administered by different Ministries and Departments.

16.10 WAREHOUSING

Storage is an important marketing function which involves holding and preserving goods from the time they are produced until they are needed for consumption. The storage function is as old as human civilization and is performed at all the stages of marketing. However, in traditional storage methods there is a considerable loss of the produce. The storage losses could be 3 to 5 per cent depending on the type of storage structures used. The losses to the produce during storage is caused by rodents, insects and pests and also by dampness in the grain as well as the storage structure. With a view to reducing these avoidable losses, there is a need for scientific storage to prevent national loss.

16.10.1 Functions of Warehousing

Warehouses are scientific storage specially constructed for the protection of the quantity and quality of stored products. The produce stored in warehouses is protected against rodents, insects, pests, moisture and dampness.

The history of warehousing in India can be traced back to the recommendations of the Royal Commission on Agriculture in 1928. Later on several Committees and Commissions emphasised the need for warehousing in India. Government of India undertook legislative measures in this regard and established Central and State Warehousing Corporations (CWC and SWCs).

The warehousing scheme in India is an integrated scheme of scientific storage, rural credit, price stabilization and market intelligence and is intended to supplement the efforts of co-operative institutions.

The capacity utilization of public sector warehouses is estimated as 85 to 96 per cent, most of which is used by public agencies or traders. Studies have shown that around 30 per cent of warehousing capacity of CWC and six per cent of SWCs is utilised by farmers or their cooperatives. Foodgrains, sugar and fertilizer account for 78 per cent of the total utilised storage capacity in the country. Investment in construction and maintenance of warehouses has enabled the country to save considerable losses of foodgrains and other important food and non-food commodities. In that sense, calling warehouses as protectors of national wealth is no exaggeration.

Apart from large warehouses created by CWC, SWCs, FCI and Cooperative Organizations, need for constructing small size storage structures in rural area was felt to enable the farmers to store their small surpluses till they are able to sell in the market. To meet this requirement, the government had launched a scheme of establishment of National Grid of Rural Godowns in 1979. The storage capacity of these godowns is around 12 million tonnes. These godowns are being used to store fertilizers and other commodities including foodgrains for sale/ distribution in the villages. However, there is considerable scope to increase and strengthen warehousing and storage infrastructure in remote rural areas.

16.10.2 Use of Warehousing Facilities

Eligibility: Any person may store notified commodities in a warehouse on agreeing to pay the specified charges.

Warehouse Receipt (Warrant): This is a receipt/ warrant issued by the warehouse manager/ owner to the person storing his produce in the warehouse. This receipt mentions the name and location of the warehouse, the date of issue, a description of the commodities, including the grade, weight and approximate value of the produce based on the present price.

The warehouse warrant is negotiable and can be transferred by a simple endorsement. A delivery of part of the goods may be taken through this warrant by the depositor. Sometimes, the warrant may be non-negotiable.

Use of Chemicals: The produce accepted at the warehouse is preserved scientifically and protected against rodents, insects and pests and other infestations. Periodical dusting and fumigation are done at the cost of the warehouse in order to preserve the goods.

Financing: The warehouse receipt serves as a collateral security for the purpose of getting credit. Commercial banks advance upto 75 per cent of the value of the produce stored in the warehouse.

Delivery of Produce: The warehouse receipt has to be surrendered to the warehouse owner before the withdrawal of the goods. The holder may take delivery of a part of the total produce stored after paying the storage charges.

16.10.3 License for Running a Warehouse

The main provisions of the Act governing the grant of a license to run warehouses are:

- i) Any person, including a company, association or corporate body may apply to the state government for the grant of a license to carry on the business of warehousing.
- ii) The government grants the license after examining the warehouse building and the financial soundness of the party, and after the realization of the prescribed fees.
- iii) The license has to be renewed periodically on payment of prescribed fees.
- iv) The warehouse owner is authorised to receive only notified commodities for storage in his warehouse and issue receipts in prescribed form.
- v) It is the responsibility of the warehouse owner to keep the premises clean, keep different lots of goods separately in the warehouse, and carry on such operations as are necessary to protect the goods against losses from the damage and pilferage.

At the end of March 1996, there were 1829 warehouses in the country with a storage capacity of 18.4 million tonnes. Apart from the warehouses owned by CWC and SWCs, the Food Corporation of India has also established storage capacity of 16.8 million tonnes. The cooperative societies have also built a storage capacity of 13.36 million tonnes.

The warehouses can also be constructed in the private sector which are licensed under the provisions of the prevailing Act in that regard. Depending on the commodities stored, warehouses are classified into general warehouse, special commodity warehouse or refrigerated warehouse.

16.11 FORWARD TRADING

In order to control unhealthy practices in forward trading in agricultural commodities, which ultimately reflect on prices in primary and secondary markets, Forward Contracts (Regulation) Act was passed by the Central Government in 1952. Under this Act, a Forward Markets Commission has been set up whose functions are both quasi-judicial and executive. The functions include:

- a) study of the forward market in a particular commodity with a view to deciding if the market should be brought under the regulatory provisions of the Act.
- b) enquiry into claims of associations for recognition to conduct forward trading.
- c) supervision and inspection of recognised association.
- d) collection of factual data, and
- e) keeping the different forward markets under observation.

16.11.1 Price Support Scheme

In order to protect the farmers from the distress sale of agricultural commodities, Government of India set up Agricultural Costs and Prices Commission. The commission fixes minimum support prices of foodgrains, oilseeds and pulses, taking the cost of production and other costs into account. In the event of a fall in market rates of the above commodities below the minimum support price fixed by the Central Government,

Food Corporation of India (FCI) in the case of foodgrains and pulses makes purchases from the markets. In the case of oil seeds as well as the commodities which are not procured by the FCI, the NAFED is asked to procure these commodities. Government of India meets the losses, if any, suffered by the NAFED.

16.11.2 Market Intervention Scheme

In the case of perishable agricultural and horticultural commodities such as fruits and vegetables, the producers usually suffer heavy losses in the event of bumper crop. With a view to protect them from fall of prices and distress sale, Market Intervention Scheme has been introduced. The scheme is implemented on request from the state Government concerned. The procurement is made on the pre-determined price during the specified period jointly by the NAFED, as an agent of Government of India and state designated agency as their agent on 50:50 basis. At the end of the operation the loss (or profit) is shared by the State and Central Governments on 50:50 basis.

The scheme in the past has been implemented in commodities like apples, pine apples, ginger, potatoes, chilies, coriander, grapes, oranges, etc. in the states of Himachal Pradesh, Jammu & Kashmir, Uttar Pradesh, North Eastern States, Andhra Pradesh, Rajashtan and Karnataka.

Check Your Progress 4

- 1) What is the role of market committee in a regulated market?
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- 2) What are the facilities provided by warehouse owners to farmers and traders?
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- 3) What are the various efforts initiated by the Central and State Governments for improving agricultural marketing?
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4) Discuss the Market Intervention Schemes initiated by Government of India.

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16.12 LET US SUM UP

Marketing comprises collection, transportation, grading, standadisation, pooling, processing and finally distribution to the ultimate consumers. There are a number of functionaries involved in the above process. As a result, the costs of goods and services increase considerably. Cooperative marketing as well as regulated markets have been introduced in order to reduce the costs of marketing with a view to benefit both producers and consumers.

The cooperative marketing structure in India is generally federal type having three tiers: primary marketing societies at the *taluka/tahsil* level, central marketing societies at the district level and state marketing federations/ societies at the state level.

16.13 KEY WORDS

- FAO** : Food and Agricultural Organisation of United Nations
- NAFED** : National Agricultural Cooperative Marketing Federation of India Ltd.
- TRIFED** : Tribal Cooperative Marketing Federation Ltd.
- LAMPS** : Large-sized Agricultural Multi-Purpose Cooperative Societies

16.14 SOME USEFUL BOOKS

Abott, J., 1993, Agricultural and Food Marketing in Developing Countries: Selected Readings, Technical Centre for Agricultural and Rural Cooperation, UK.

Ellis, F., 1992, Agricultural Policies in Developing Countries, Cambridge University Press, UK.

Jat, D.R., 1991, Marketing of Agricultural Produce, Radha Publications; New Delhi.

Vyas, V. S. and P. Bhargava, 1997, Policies for Agricultural Development, Rawat Publications, New Delhi.

16.15 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) The special features of agricultural marketing are given in Section 16.2. Read these features carefully and answer the question.
- 2) The essential components of market structures are the types of market and the market functionaries.

- 3) There are three types of markets: Primary, secondary and territory.
- 4) Read Sub-section 16.4.4 and answer the question.

Check Your Progress 2

- 1) The disabilities of Indian agricultural markets are given in Section 16.5. Discuss these problems.
- 2) Read Sub-section 16.6.2 and answer.
- 3) Bring out the important objectives given in Sub-section 16.6.1 and answer the question.

Check Your Progress 3

- 1) Bring out the important functions given in Sub-section 16.7.4 and answer the question.
- 2) Read Sub-section 16.7.5 and answer.
- 3) Read Sub-section 16.7.1 and answer.
- 4) You can explain the cooperative marketing structure on the basis of Fig.16.1. Discuss about the hierarchy of national, state and village levels cooperative institutions.

Check Your Progress 4

- 1) Read Sub-section 16.9.3 and answer.
- 2) Read Section 16.10 and answer.
- 3) The government has introduced price support scheme and market intervention scheme, Moreover, the government has encouraged regulated markets and cooperative marketing.
- 4) Read Sub-section 16.11.2 and answer.

UNIT 17 COOPERATIVE MOVEMENT IN AGRICULTURE

Structure

- 17.0 Objectives
- 17.1 Introduction
- 17.2 Evolution of Cooperative Movement in India
- 17.3 Cooperation in a Planned Economy
- 17.4 Cooperative Principles
 - 17.4.1 Evolution of Cooperative Principles
 - 17.4.2 Cooperative Principles, 1995
 - 17.4.3 Open and Voluntary Membership
 - 17.4.4 Democratic Member Control
 - 17.4.5 Economic Participation of Members
 - 17.4.6 Autonomy and Independence
 - 17.4.7 Education Training and Information
 - 17.4.8 Cooperation among Cooperatives
 - 17.4.9 Concern for Community
- 17.5 Philosophy of Cooperation
- 17.6 Distinguishing Features of a Cooperative Society
 - 17.6.1 Forms of Business Organisation
 - 17.6.2 Setting up Objectives
 - 17.6.3 Membership of a Business Organisation
 - 17.6.4 Mobilising Capital
 - 17.6.5 Decision Making and Control
 - 17.6.6 Determining Reward for Capital
 - 17.6.7 Relationship between Management and Members
- 17.7 Let Us Sum Up
- 17.8 Key Words
- 17.9 Some Useful Books
- 17.10 Answers/Hints to Check Your Progress Exercises

17.0 OBJECTIVES

After going through this unit, you will be in a position to:

- explain the process of evolution of the cooperative movement in India;
- define the concept of cooperation; and
- explain the distinguishing features of a cooperative enterprise.

17.1 INTRODUCTION

The success of 'Rochdale Pioneers' established in 1844 by Robert Owen in England enthused many philanthropists for the initiation of Cooperative Movement in their respective countries. The Rochdale Pioneers was a consumer society, based on the principle of self help and mutual help. In 1948 F. W. Raiffeisen founded a cooperative society in Germany for distribution of bread and potato to the poor. In 1949, he founded a loan society. In the same year Schulze and Bernhardt established a friendly society for Relief in Sickness and later they founded an association of shoe makers.

17.2 EVOLUTION OF COOPERATIVE MOVEMENT IN INDIA

In India, the Cooperative Movement, however, started on the initiative of the Central Government, with the enactment of All the India Cooperative Societies Act in 1904 as a purveyor of rural credit in order to protect the peasants from usurious rates of interest charged by the village money-lenders. To ameliorate the conditions of the farmers the Government passed the Taccavi Act, the Land Improvement Loan Act and the Agriculturists Loan Act to facilitate the advance of short-term and long-term loans for farm operations.

The success of Credit Societies encouraged the need for organisation of non-credit societies also. As a consequence, the All India Cooperative Societies Act, 1912 came into being. This Act facilitated the organisation of marketing, insurance, dairy, handloom and consumer cooperative societies. Also societies for retail of farm implements, purchase and sale of manures etc. were organised. In 1914, Maolagan Committee recommended for setting up of a pyramidal structure of the cooperatives with the primary society at the base, Central Bank at the district and Apex Bank at the State levels.

In 1919, under the Montegu-Chelmsford Reforms, cooperation became a provincial (State) subject. Consequently Provincial Governments enacted their own Acts. The Bombay Province was the first one to pass an act, that is the Bombay Provincial Cooperative societies Act, 1925. By 1932, all the provinces (States) either passed their own acts or adopted Bombay Provincial Act.

The policy towards cooperative development has been a subject of frequent review and revision since its inception. The economic depression of the 1930s had a dovetailing effect on the working of the cooperatives. In order to recover the shocks the movement had suffered during depression, rehabilitation efforts were initiated from 1930 onwards which included (i) the re-organisation and revitalization of societies, (ii) scaling down and writing off the dues, and (iii) provision of rehabilitation grants to Central Cooperative Banks. Establishment of the Reserve Bank of India (RBI) in 1935 was another significant development. The RBI took up the programme of providing concessional finance to agriculturists for production purposes.

In order to meet the needs of the village community such as supply of farm implements, seed, fertiliser and household requirements, and assist in the marketing of produce, the primary credit societies were converted into multi-purpose societies. These societies were financed by the Central Cooperative Banks while the requirements of urban population and traders were met by the Urban Cooperative Banks. The organisation of banking institutions like Central Cooperative Banks, Land Mortgage Banks and Urban Cooperative Banks demanded an agency for coordinating their policies and programmes. Consequently the Cooperative Banks Association at the national level was established. Later on, the State and National Associations were renamed as State Central Cooperative (Apex) Bank.

During the Second World War (1939-45) the prices of almost all the commodities including agricultural produce and consumer goods increased considerably. Because of the difficulties in proper distribution of controlled and essential commodities, the need for setting up of consumer cooperatives was increasingly felt. The consumer movement was thus initiated. During the decades of the 1940s and 1950s, cooperatives of sugar growers, dairy producers, fruit and vegetables growers, weavers as well as other industrial producers were established.

In 1942, Multi Unit Cooperative Societies Act was passed. This act paved the way for the establishment of cooperatives with area of operation in more than one state.

Consequently, national level federations and societies such as Indian Farmers' Fertilizers Cooperative, and Krishak Bharti Cooperatives were established. This Act was further broadened and renamed as 'Multi-State Cooperative Societies Act' in 1984.

17.3 COOPERATION IN PLANNED ECONOMY

In spite of the government patronage right from its inception in terms of financial and administrative support, the progress was very slow mainly due to internal weakness of the cooperative structure. Secondly, the policy of the government towards cooperatives was not sufficiently defined. Thirdly, the implementation of the policy was largely left to the states and the cooperative movement itself. Fourthly, the scheme regarding cooperation adopted by various states was also not uniform in their objectives and methods. Fifthly, there was neither an agreed policy for the country as a whole nor any definite target except for the volume of advances to farmers. Consequently, marked unevenness in the development of the cooperative structure in different states was observed.

With the acceptance of the recommendations of the All India Rural Credit Survey Committee Report 1954 with regard to state participation in strengthening the financial resources of the cooperatives, the cooperative movement got the boost during the second and subsequent Five Year Plans. In 1956, the National Cooperative Development and Warehousing Board was established for planning and promoting programmes of production, marketing, storage, warehousing, export and import of agricultural produce through a cooperative society or a warehousing co-operative. It also provided financial assistance to Central and State Warehousing Corporations for the purpose. This Board was subsequently bifurcated and the National Cooperative Development Corporation (NCDC) came into being in 1962 to plan and promote programmes for production, processing, marketing, storage, export and import of agricultural produce and modified commodities through cooperatives.

The Reserve Bank of India Act was also amended and National Agricultural Credit (Long Term Operation) with initial contribution of Rs. 18 crore and National Agriculture Credit (Stabilisation) Fund with initial contribution of Rs. 1 crore were created. In 1982, the RBI was trifurcated and National Bank for Agriculture and Rural Development (NABARD) to take care of agricultural and cooperative development was created.

As a result, 4.5 lakhs cooperatives of various types with their membership of about 20 crores covering almost 100% villages and nearly 96% families have been established. But at the same time, government also participated in the management of cooperative institutions by nominating their representatives thereby imposing various restrictions, eroding cooperatives autonomy and independence.

Check Your Progress 1

- 1) Name the first cooperative established in the world. Who founded this society? In which year, was it founded?

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2) Under which act did the Cooperative Movement in India start in 1904?

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3) Mark 'T' for true and 'F' for false.

- a) All India Cooperative Societies Act, 1912 facilitated establishment of credit societies in the country.
- b) The setting up of Pyramidal structure for cooperative was recommended by Agriculture Commission.
- c) Under Mounford Reforms Cooperation became a State subject.
- d) The policy of Cooperative Development has been a subject of frequent review and revision.

4) Mention the reasons for the slow progress of cooperative movement during pre-independence period.

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5) What were the objectives of establishing the National Cooperative Development Cooperation?

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17.4 COOPERATIVE PRINCIPLES

Every organisation has its own principles, which are to be observed for its smooth working. The principles are formulated keeping in view the objectives, pattern of governance, power and authority structure, accountability, organisational framework, financial structure, etc. In general, any distortion, deviation or non-observance cause aberrations and create various problems. Cooperatives have their own set of principles right from their inception, which are universal in nature, recognition and acceptance.

17.4.1 Evolution of Cooperative Principles

Initially the working practices and rules adopted by the Rochdale Pioneers for their working were accepted as Cooperative Principles world over. However, these principles were debated time and again in the Cooperative congresses of the International Cooperative Alliance (ICA) and suitably modified. The noteworthy modifications were made by the 13th ICA Cooperative Congress held at Vienna in 1930, the 15th ICA Cooperative Congress held at Paris in 1937 and 23rd ICA Cooperative Congress held at Vienna in 1966. The 1966 congress under the Chairmanship of Prof. D. G. Karve, adopted the following principles:

- 1) Open and Voluntary membership
- 2) Democratic Administration
- 3) Limited interest on capital
- 4) Distribution of Surplus to the member in proportion to their transactions
- 5) Cooperative Education
- 6) Cooperation among cooperatives.

17.4.2 Cooperative Principles, 1995

The ICA Cooperative Congress held at Manchester in 1995 adopted the following principles as suggested by Prof. Ian Mac Pherson on the basis of his global study.

- 1) Open and Voluntary Membership
- 2) Democratic Member Control
- 3) Member Economic Participation
- 4) Autonomy and Independence
- 5) Education, Training and Information
- 6) Cooperation among Cooperatives
- 7) Concern for Community

17.4.3 Open and Voluntary Membership

The primary purpose of the Cooperatives is to serve their members who are the users of the service of the Cooperative. These are voluntary organisations, open to all persons who are able to use their services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination.

17.4.4 Democratic Member Control

Cooperatives are democratic organisations controlled by their members, who actively participate in setting their policies and making decisions. In primary cooperatives, members enjoy equal voting right, on a 'one member, one vote' basis. Cooperatives at other levels are also organised in a democratic manner. Persons responsible for administration are accountable to the members.

17.4.5 Economic Participation of Members

Members contribute equitably to the capital and democratically control the capital of their cooperative society. A part of that capital is usually the common property of the cooperative. Members receive limited compensation, if any, on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing the business of the cooperative, setting reserves for further exigencies, benefiting members in proportion to their transaction with the cooperative, and encouraging further development of the cooperative movement.

17.4.6 Autonomy and Independence

Cooperatives are autonomous, self-help organisations controlled by their members. Cooperatives can enter into agreement with other organisations including governments freely and on mutually agreed and acceptable terms.

17.4.7 Education, Training and Information

Cooperatives provide education and training for their members, elected representatives, managers and employees so that they can contribute effectively to the development of their cooperatives. They inform the general public about the nature and benefits of cooperation.

17.4.8 Cooperation among Cooperatives

In order to best serve the interest of their members and the community, cooperatives actively cooperate in every practical way with other cooperatives by working together, through local, national, regional and international structures.

17.4.9 Concern for Community

Cooperatives are concerned about the community in which they exist. While focussing on members needs, they strive for the sustainable development of those communities through policies that are respectful of the environment and acceptable to their members.

17.5 PHILOSOPHY OF COOPERATION

The philosophy of Cooperation is derived from its principles. It has political, economic and social considerations. For example, the principles of open and voluntary membership, democratic member control and autonomy and independence constitute its political philosophy. The principle of member economic participation lays down the economics of cooperation while the principle of concern for community constitute its social philosophy. The principles of cooperation among cooperatives help in the growth and development of cooperative institutions. Likewise the principle of education, training and information makes it possible to have effective observance and application of all other principles.

Check Your Progress 2

- 1) What are the principles of Cooperatives approved by the ICA Cooperative Congress 1995?

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- 2) Explain five important principles of cooperatives.

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3) Discuss the philosophy of cooperation.

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17.6 DISTINGUISHING FEATURES OF A COOPERATIVE SOCIETY

A Cooperative is one of the many forms of business organisation. Its distinctiveness stems from its principles, the incorporation of which constitute cooperative organisation. A cooperative enterprise essentially recognizes the principle of private ownership through certain organisational arrangements visualised to ensure wide dispersal of ownership and economic power incidental to such ownership.

Cooperation has two important approaches to solve the problems of economic life: association and use. In cooperation the emphasis is always on human values. It puts market values in a wider and more human setting.

17.6.1 Form of Business Organisation

You may be aware that a business organisation can be established along the following lines:

- a) Individual or family owned business enterprise
- b) Partnership firm which have more than one partners
- c) Joint Stock Company which is registered as private limited firm
- d) Government undertaking or corporation
- e) Cooperative enterprise

Let us discuss the distinguishing features of cooperatives compared to these organisations.

17.6.2 Setting up Objectives

The individual firm, partnership and Joint Stock Company are organisations of private individuals who use their capital with a profit motive. The owners are not the sole users of the services provided by the firm. These firms, however, compete with other firms in trade. They cannot earn profits unless they are efficient in production. The business firm, therefore, will have to be efficient in use of resources, well managed and service oriented towards its customers.

The Cooperative is similar to private firms so far as its resources are owned by the individuals. But there is a major difference between the cooperative business firm and other private firms. The owners of private business produce a good or service to be

sold to others. Here traders and customers are distinguishable. The cooperatives are set up for the benefit of its members. Thus the trader-customer dichotomy is non-existent.

Since cooperatives conduct trade with their members who are the owners, profit need not be reflected in its transaction. The profits could be shifted to its members in the form of lower prices charged for the services. However, earning of surplus (profit) is as important for a cooperative for its survival and growth as is for a private firm.

The differences between the Cooperative and Private firms with respect to profit are:

- a) the manner of earning profit
- b) the manner of distributing profit
- c) the emphasis on objectives other than profit

17.6.3 Membership of a Business Organisation

The individual family enterprise and partnership firms are closed organisations in the sense that their membership is not open to the public. However, in a joint stock company membership is open to any one who is willing to buy shares. Open and voluntary membership is a feature which cooperatives share with joint stock company. But there are differences:

- 1) The membership of a cooperative is restricted to those who need a service from it. They must be active participants in the trading activity of the society and just not investors who wish to derive profits on their capital.
- 2) A cooperative is an association of people who have come together for mutual help. Thus, personal knowledge of each other is quite important. In a cooperative, the character of a member is as important as the amount of his contribution to capital. This aspect is lacking in a joint stock company.
- 3) The membership of a cooperative should be drawn from weaker sections. An association of rich businessmen to protect their interests cannot be called a cooperative organisation.

17.6.4 Mobilising Capital

Cooperatives lay strong emphasis on self-reliance as capital is collected from those who need the services of the cooperative, i. e., the members. They cannot sell or buy shares in the open market, whereas the private businesses borrow money from the open market as well as float shares.

17.6.5 Decision Making and Control

In the case of family enterprise and partnership firms, the control and management generally vests with the head of the family or the same authority. In the case of joint stock company, the complex nature of business and the size necessitate skilled business managers who control and manage but the risk and uncertainty are not born by them. It is vested with the share holders.

In case of a cooperative, the ultimate control rests with the general body of the members. The degree of control does not depend upon the contribution to capital. One man one vote is the cardinal principle of cooperation. Thus, control of a cooperative is divorced from the liability of risk. This is a revolutionary departure from the conventional methods of business organisation.

17.6.6 Determining Reward for the Capital

In private firms, the investor is given the pride of place. He is vested with the ultimate control of the firm. All other parties in the firm, viz., the workers and the managers, are paid according to the contracts entered into with them. These parties do not bear the risk of the enterprise.

The logic of cooperative is different. The member gets reward for his capital but in a limited way. He does not get the pride of place. The cooperative also emphasises on social responsibility, which is unique for a business firm. Cooperative makes explicit provision for setting apart a portion of profit towards common goals. The concept of development of the community in which cooperative business is located is basic to the underlying philosophy of cooperatives.

17.6.7 Relationship between Management and Members

In a Cooperative the supreme authority remains with the General Body of Members. There is a delegation of authority from members to elected official representatives.

We may thus conclude that a cooperative is a society which:

- a) groups only those people who have a common activity (farming, marketing, etc.) and/or common problems (credit, supply, purchase of consumer goods, finding a job, etc.) and who realise that they cannot carry out their activities or solve their problems individually;
- b) aims at providing its services to its members at cost price (i.e., without profits);
- c) operates on the basis of both mutual and self-help;
- d) gives top priority to group interests without ignoring individual members' desires;
- e) gives priority to the quality of its services rather than to make profits;
- f) aims at cutting all unnecessary costs and expenses, mainly with regard to middlemen and money-lenders;
- g) defends the position of weaker members by giving to every members the same decision-making power (one man one vote); and
- h) aims at eliminating all conflicting positions between producers and consumers.

Check Your Progress 3

1) What are the distinguishing features of a cooperative?

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2) Write 'T' for true and 'F' for false.

- i) Cooperatives can float debentures.
- ii) Only those who are ready to share the responsibility should join a cooperative society.
- iii) Cooperatives are self-help organisations.

- iv) Cooperatives aim at providing services to the members at cost price.
 - v) Cooperatives do not eliminate conflicting positions between producers and consumers.
- 3) In what respects is cooperative different from other forms of business organisation?
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17.7 LET US SUM UP

The discussion above leads to certain broad conclusions when we think of philosophy, principles and characteristics of cooperation. These are:

- 1) Without cooperative principles, cooperative organisation cannot be visualized.
- 2) Member involvement and leadership role can effectively ensure social objectives of cooperatives.
- 3) Professionalisation of management can effectively ensure the achievement of economic goals of cooperatives.
- 4) Horizontal and vertical integration can effectively be achieved only by strengthening cooperative federalism and cooperation among cooperatives.
- 5) Profiteering is ruled out in a cooperative yet surplus has to be earned for future development of the cooperative.
- 6) Cooperatives need to develop forward looking strategies for greater and more efficient service to the members on the one hand and competitive business efficiency on the other.
- 7) Cooperative development will be in direct proportion to the inputs in member educational programmes by the cooperatives themselves at the micro and macro levels.
- 8) Serving the members' interest consistent with the community interest should be the ultimate goal of cooperatives.

17.8 KEY WORDS

- Province** : During pre-independence period states were known as Provinces
- ICA** : International Cooperative Alliance
- Mobilisation of Capital** : Collecting finances for meeting fixed and working capital requirements.

17.9 SOME USEFUL BOOKS

Bhatnagar K. P., 1958, *Cooperation in India and Abroad*, Kishore Publishing House, Kanpur.

Dwivedi, R.C., 1997, *Cooperative Identity, Concept and Reality*, Triveni Enterprises, New Delhi.

Hough E. M., 1959, *The Cooperative Movement in India*, Oxford University Press, London.

Mathur B. S., 1994, *Cooperation in India*, Sahitya Bhavan, Agra.

Sinha, B. K., 1969, *Cooperatives in India*, National Cooperative Union of India, New Delhi.

17.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Rochadale Pioneers, Robert Owne, 1844.
- 2) All India Cooperative Societies Act, 1904
- 3) a) T b) F c) T d) T
- 4) The important reasons are: (i) Internal weakness of cooperative structure.
ii) Government policy towards cooperatives was not sufficiently defined,
iii) Implementation of the policy was left to the state and the cooperative itself.
iv) The schemes regarding cooperation adopted by various states were not uniform in their objectives and methods. v) No agreed policy for the country as a whole nor definite targets.
- 5) NCDC was established to plan and promote programmes for production, processing, marketing, storage, export and import of agricultural produce and essential commodities through cooperatives.

Check Your Progress-2

- 1) Read Sub-section 17.4.2 and answer.
- 2) Read Section 17.4 for the answer.
- 3) The important aspects are: i) political philosophy, ii) social philosophy, iii) economic philosophy, iv) effective observance and application.

Check Your Progress-3

- 1) Read Section 17.6 for the answer.
- 2) i) F ii) T iii) T iv) T v) F
- 3) Read Sub-sections 17.6.2 to 17.6.6. Point out how cooperatives are different from business enterprises with respect to goal setting, ownership, capital mobilisation, decision making and membership.

UNIT 18 COOPERATIVE LEGISLATION IN INDIA

Structure

- 18.0 Objectives
- 18.1 Introduction
- 18.2 Cooperative Credit Societies Act, 1904
- 18.3 Cooperative Societies Act, 1912
- 18.4 Cooperation as a State Subject
- 18.5 Multi-Unit Cooperative Societies Act, 1942
- 18.6 Multi-State Cooperative Societies Act, 1982
 - 18.6.1 Schemes of the Act
 - 18.6.2 Salient Features of the Act
- 18.7 How to Organise a Primary Cooperative Society
 - 18.7.1 Conditions of Registration
 - 18.7.2 Procedure to Prepare the Proposal
 - 18.7.3 Scrutiny of the Registration Proposal
 - 18.7.4 Follow Up Action
- 18.8 Let Us Sum Up
- 18.9 Key Words
- 18.10 Some Useful Books
- 18.11 Answers/Hints to Check Your Progress Exercises

18.0 OBJECTIVES

After going through this unit you will be in a position to:

- explain the evolution process of cooperative legislations in India;
- explain the salient features of the All India Cooperative Credit Societies Act, 1904;
- explain the salient features of the All India Cooperative Societies Act, 1912;
- explain the salient features of Multi-State Cooperative Societies Act, 1984; and
- explain the procedure of establishing a cooperative society.

18.1 INTRODUCTION

Organization and registration of cooperatives is one of the primary functions of cooperative law. It provides for the appointment of Registrar and sub-ordinate officers and entrusts the powers and functions under the statute to them. The following are the basic functions of cooperative law:

- Provision for organization and registration of cooperatives.
- To allow certain privileges, concessions and financial and other assistance.
- To preserve cooperative character by compelling the cooperatives to observe principles and practices of cooperation.
- To exempt cooperatives from provisions of certain other laws.

18.2 COOPERATIVE CREDIT SOCIETIES ACT, 1904

The Cooperative Credit Societies Act 1904 was modeled largely on the English Friendly Societies Act, 1896. It was simple and elastic and was operational throughout India. It followed Nicholson's recommendation for the creation of village banks. Accordingly the operation of the Act was restricted to credit only. The following were the important provisions of this Act:

- 1) Ten persons living in the same village or town or belonging to the same class or caste might be registered as a cooperative society for the encouragement of thrift and self-help among the members.
- 2) The main objectives of a society were to raise funds by deposits from members and loan from non-members, government and other cooperative societies. This money was lent to members or with the special permission of the Registrar of Cooperative Societies, to other cooperative credit societies.
- 3) The organisation and control of cooperative credit societies in each province (state) were put under the charge of the Registrar Cooperative Societies.
- 4) The account of every society were to be audited by the Registrar or by a member of his staff free of charge.
- 5) Rural societies were to have fourth-fifth of their members agriculturists while urban societies should have four-fifth of their members non-agriculturists.
- 6) Liability of members of a rural society will be unlimited. While in the case of urban society it would be either limited or unlimited.
- 7) No dividend would be paid from the profit in a rural society; it would be credited to the Reserve Fund.
- 8) In urban society one-fourth of the profit will be credited to the Reserve Fund.
- 9) Loans will be provided to the members usually on personal guarantee or on security.
- 10) The interest (share capital) of any one member in the society was strictly limited.
- 11) Societies formed under the Act were exempt from fee payable under Stamp, Registration and Income Tax Acts.

Under the provisions of this Act societies were classified into Rural and Urban. The urban societies were given better facilities while the rural societies were with unlimited liability and restricted area of operation. Loans were advanced to members on personal or such other security. There was no provision for high amount of finance in rural societies. The Act also did not permit creation of either non-credit societies or federal societies.

However, the success and usefulness of credit societies encouraged people to create societies in other areas. The necessity of removing deficiencies of the above was also felt. Accordingly, the second Cooperative Societies Act was passed in 1912.

18.3 COOPERATIVE SOCIETIES ACT, 1912

This Act retained the principle of simplicity and elasticity embodied in the 1904 Act. The 1912 Act recognised the necessity of organising large societies for proper supervision of credit and also paved the way for creation of central and non-credit societies. It had 29 sections. The following were the important features of All India Cooperative Societies Act, 1912:

- 1) The Registrar of Cooperative Societies was to be appointed by the State Government. He will, however, appoint his own staff/ officers to assist him.

- 2) A cooperative society may be established and registered:
 - for the promotion of interest of members
 - in accordance with the cooperative principles, and
 - with unlimited and limited liability – the member's liability was limited while society's liability was unlimited.
- 3) At least 10 members were required for registering a cooperative society.
- 4) The Amendment of the bye-laws of the society will not be valid unless registered with the Registrar, who had to satisfy himself that the proposed amendment were not contrary to the act or the rules.
- 5) In an unlimited society one member will have only one vote while in a limited society he may have as many votes as laid down in the bye-laws.
- 6) No member can acquire more than one-fifth of the total shares or not exceeding Rs.1,000/- in a limited liability society.
- 7) The societies were granted exemption from compulsory registration of instruments relating to shares, debentures and other documents.
- 8) The central or the state government may grant exemption to the society from the payment of income tax, stamp duty, registration fee, etc.
- 9) The society may receive deposits and loans from non-members, as may be prescribed by the rules.
- 10) The society may invest or deposit its funds in government saving bank, in trustees securities, in shares of other cooperative societies or in any bank approved by the Registrar.
- 11) One fourth of the net profit of the society must be carried to the reserve funds.
- 12) The registrar on his own motion or on the application of one-third members can undertake an enquiry into the constitution and working of the society.
- 13) On the application of a creditor, the Registrar can undertake an inspection of a cooperative society. After the enquiry/inspection or on the application of three-fourth members of the society, the Registrar can cancel the registration of the society.
- 14) The State government can exempt any society or any class of societies from any of the provisions of the Act.

18.4 COOPERATION AS A STATE SUBJECT

As a result of the implementation of Montegu-Chelmsford reforms in 1919 cooperation was transferred to the Provincial (State) governments and they were required to enact their own legislation. The Bombay Provincial Government was the first to pass its own act, "Bombay Provincial Cooperative Societies Act" in 1925. With exhaustive provisions for registration, membership, funds, management, settlement of disputes, recovery of dues, liquidation, etc. this Act served as a model for many other provinces / States for a fairly long time. The government of United Province (now Uttar Pradesh) passed its Act in 1931. Other provincial governments like Madras, Bengal, Bihar and Punjab followed the Bombay Act and passed their own acts in due course.

It is pertinent to note that if any provincial government had neither passed its own Act nor adopted Bombay Act, the All India Cooperative Societies Act 1912 was applicable to it.

In the post-independence period the Central Government appointed a committee in 1955 on Cooperative Law to draft a model which could serve as guidelines to all State

Governments and Union Territories. Considering the development of cooperative movement and political environment in a particular state, each state passed its new act or amended its existing act thoroughly, as the case may be, in the light of the model bill circulated by the Central Government. The existing cooperative Societies Acts of different states, therefore, differ from state to state. However, there are several common features that exist in all the state acts. These are summarized below:

- 1) Conditions and procedure of registration of a cooperative society and powers of the Registrar in respect of organization, registration and management of cooperative society. The supervision and control over cooperative society remains with the Registrar.
- 2) Conditions and procedure of amendment of bylaws on voluntary basis as well as under compulsion from the Registrar.
- 3) Condition and procedure of amalgamation, division and reorganization/conversion of cooperative societies on voluntary basis as well as under compulsion from the Registrar.
- 4) Types of membership rights and liabilities of members and provision relating to compulsory membership and dismissal of membership. Principle of open membership incorporated.
- 5) Rules regarding management of funds, such as reserve fund and other funds of a cooperative and rules relating to borrowing and lending by a cooperative.
- 6) Provisions relating to privileges extended to a cooperative under the cooperative societies act as well as under other Acts such as Stamp Act, Registration Act, Income Tax Act, etc.
- 7) Provisions relating to management of cooperative: These include: (i) holding of Annual General Meeting, (ii) holding of special General Meeting, (iii) Powers and functions of Board of Directors, (iv) removal of Board of Directors, (v) appointment of Administrator in place of Board of Directors, and (vi) giving directions to a society.
- 8) Provision relating to annual audit of accounts of the society and follow up action on the audit report.
- 9) Powers relating to ordering an inquiry/inspection into the affairs of a society and also instituting surcharge – proceedings against diligent promoters and office bearers of a society who are found responsible for misutilisation or misappropriation of funds of a society causing loss to the society.
- 10) Provision relating to settlement of disputes in a cooperative, execution of awards, recovery of dues, etc.
- 11) Provisions relating to summary recovery of dues of certain types of cooperatives in the interest of cooperative movement.
- 12) Pattern of state assistance and rules relating thereto.
- 13) Provisions relating to winding up the affairs of a society, powers of a liquidator in winding up the affairs of a society as well as provisions regarding disposal of surplus assets, termination of liquidation proceedings.
- 14) Provisions showing nature of offences in a cooperative and quantum of punishment thereto.

Check Your Progress 1

1) What are the functions of Cooperative Law?

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2) Write four important features of the Cooperative Credit Societies Act 1904.

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3) Write five important features of the Cooperative Societies Act 1912.

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4) Identify five important but identical features of state cooperative acts.

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18.5 MULTI UNIT COOPERATIVE SOCIETIES ACT,1942

With the progress of cooperative movement some cooperative societies commenced their operations in other states also. Under such circumstances the question arose whether a society formed in one state can operate in other states? If so, which cooperative act should govern its operation? In order to remove duplicity of provisions of different acts, the central Government passed Multi-Unit Cooperative Societies Act in 1942. This act provided for the regulation of affairs of such society by the provisions of cooperative societies act of the state where the principal business of the society is located. Thus, the State Registrar of Cooperative Societies enjoyed the power of the Central Registrar under the Multi-Unit Cooperative Societies Act.

As a result, within a state, we could see a large number of Multi-Unit Cooperative Societies having similar objects but governed by different cooperative laws. This created a chaotic position. Besides far reaching changes had also occurred in the organizational structure and the size of the multi-unit cooperative societies. Further, a number of national level cooperative societies were also established in different sectors in different states. These development necessitated enactment of a self contained, comprehensive central legislation. Accordingly, the “Multi-State Cooperative Societies Act 1984” was enacted by the Central Government.

18.6 MULTI STATE COOPERATIVE SOCIETIES ACT, 1984

The Multi-State Cooperative Societies Act, 1984 replaced the Multi-Unit Cooperative Societies Act, 1942. The objectives of this act are as given below:

- i) To avoid different multi-unit cooperatives being governed by different state cooperative laws in the country.
- ii) To have common comprehensive central legislation to meet the needs of administration and management of national cooperative societies and federations which have been organised after independence in large numbers.
- iii) To provide for the central authority to be responsible for their promotion, registration and supervision.

18.6.1 Schemes of the Act

The schemes of the Act is the same as any other cooperative law. It provides for:

- a) Appointment of a Central Registrar
- b) Registration of multi-state cooperative societies
- c) Members’ rights and responsibilities
- d) Management of cooperative societies including properties and funds
- e) Privileges of multi-state cooperative societies
- f) Audit, enquiry and inspection
- g) Settlement of disputes
- h) Winding up and cancellation of registration of multi state cooperative societies.

18.6.2 Salient Features of the Act

1) Appointment of Central Registrar

The act provides for the appointment of the Central Registrar by the Central Government to exercise various powers under the act. The central government can also empower any officer of the state government to exercise specific powers of the central registrar in respect of the multi-state cooperative society having registered office in that state. In the case of national cooperative societies/ federations such powers will only be exercised by the Central Registrar.

2) Definition of Cooperative Principles

For the first time in the history of cooperative legislation, cooperative principles have been precisely defined in the Act. Further, the Act specifically mentions that, “only such multi-state cooperative society, which has as its objects the provision of the

economic and social betterment of its members through mutual aid in accordance with the cooperative principles, may be registered under this Act.” The provision, perhaps, intends to promote registration of genuine cooperative societies and to prevent registration of spurious organizations which are cooperative only in name.

3) *Deletion of powers of compulsory Amendment of Bye-laws, Amendment or Division*

Under the provisions of this act the bye-laws of a multi-state cooperative society can be amended, or the society may be amalgamated with other multi-State Cooperative Societies or can be divided into more than one societies when the society itself voluntarily opts for such amendments/ amalgamations/ division. Unlike most of the state laws the Central Registrar does not enjoy the powers to force such amendments / amalgamation or division to unwilling societies.

4) *Conversion of Cooperative Society into Multi-State Cooperative Society*

The Act provides for the conversion of a cooperative society into a Multi-State Cooperative Society. The proposal for amendment of bye-laws extending the area of operation beyond the frontiers of one state has to be approved by the Central Registrar, who has to consult the Registrars of the States concerned before registering the amendment.

5) *Persons who become Members of Multi-State Cooperative Societies*

Section 19 of the Act contains relevant provisions in this behalf. While the provisions are in accordance with the usual provisions existing in the state cooperative laws, it has specifically provided that except in the case of National Cooperative Union of India no individual shall be eligible for admission as a member of a national cooperative society which is defined as a Multi-State cooperative society and specified in the second schedule of the Act. This restriction on admission of individuals to the membership of National Cooperative Societies is intended to preserve and promote the federal character of such cooperatives.

6) *Tenure of the elected member of the Board of Directors*

Sub-section 3 of Section-35 of the Act states that the tenure of the elected member on the Board of Directors of a Multi-State Cooperative Society shall be such, not exceeding 3 years, as may be laid down in the bye-laws of the society.

7) *Holding of Office in a Cooperative Society*

Section 36 of the Act provides that no person shall be eligible to hold at the same time office of a President or Chairman or Vice-Chairman or Vice-President on the Board of more than one Multi-State Cooperative Society. Further, Section-37 of the Act stipulates that no person shall be eligible to hold the office of a President, Chairman, Vice-President, Vice-Chairman of a Multi-State Cooperative Society, after he has held the office for two consecutive terms whether full or part. These provisions are intended to curb growth of vested interests in cooperatives.

8) *Removal of Elected Member by General Body*

Section-39 of the Act empowers the general body of a Multi-State Cooperative Society to remove from the Board of Directors an elected member who has acted adversely to the interests of the society. However, a resolution in this behalf has to be passed by a majority not less than two-third of the members present and voting at the general body meeting. Further, before passing the resolution, the member concerned has to be given a responsible opportunity of being heard in the matter. This provision is based on the concept of sovereign power of the general body of the society.

9) *Chief Executive*

Section-44 of the Act requires that every Multi-State Cooperative Society shall have a chief executive to be appointed by its Board. The chief executive so appointed shall be a full time employee who shall be a member of the Board. In the case of a National Cooperative Society in which the Central Government has subscribed more than half of the share capital, the appointment of chief executive and other functional directors shall be only with the prior approval of the Central Government.

Section 45 of the Act bestows on the Chief Executive specific powers and requires him to discharge specific functions, some of which are indicated below:

- a) Day to day management
- b) Arrangement for safe custody of cash
- c) Arrangement for proper maintenance of books and records and for correct preparation and timely submission of periodical statements and returns in accordance with the provisions of law.
- d) Convening meetings of the general body of the Board of Directors and other committees or sub-committees and maintaining proper record of such meetings.
- e) Making appointments to posts other than those in respect of which powers are specifically reserved to the Board.
- f) Assisting the Board in the formulation of policies.

This section intends to promote professional management in cooperatives. The idea is that vesting specific powers in the Chief Executive and allowing him to exercise them without any interference would ensure result oriented actions and decisions for which the Chief executive could be held accountable.

10) *Central Government's Powers to give Direction in Public Interest*

Section-47 of the Act gives necessary powers to the Central Government in this respect. The power has to be exercised in the public interest or for securing proper implementation of projects and other developmental programmes approved or undertaken by the Central Government. It is obligatory on the Multi-state Cooperative Society to comply with the directions issued by the Central Government.

11) *Constitution of Panel Authority for preparation of a list of persons to be appointed as Chief Executive or other senior executives in National Cooperative Societies*

Section-50 of the Act makes it obligatory to create a panel authority for preparation of list of persons to be appointed as Chief Executives and other senior executives in National Cooperative Societies. The provision is intended to promote professional management by adopting scientific and objective methods of recruitment which are free from nepotism, corruption and other malpractices.

12) *Miscellaneous*

Section-41 of the Act relates to the power of the Central or the State Governments to appoint their nominees (not exceeding one-third of the total number of Directors or 3 which ever is less) on the Board of Directors of a Multi-State Cooperative Society which has received financial assistance (in the shape of share capital, or loans or guarantee for payment of such loan or interest thereon or grant) from the central or the state government. The nominee director shall not have veto power.

Check Your Progress 2

1) What are the objectives of Multi-State Cooperative Societies Act,1984?

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2) Discuss the scheme of the Multi-state Cooperative Societies Act.

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3) Identify five important features of the Multi-state Cooperative Societies Act.

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18.7 HOW TO ORGANISE A PRIMARY COOPERATIVE SOCIETY

A cooperative society needs registration under the Cooperative Societies Act before it could commence its business. Since cooperation is a state subject, the cooperative societies act of the state in which the primary society is to be established, should be read carefully before preparing proposal for its registration. The Act provides conditions for registration and the procedure to prepare and submit registration proposal to the registering authority. It also gives formats to be used, with powers of registering authority. The procedures that are followed in considering the proposal are also given in the Act. These provisions also include the procedure for appeal against decision of the registering authority and effect of registration.

Model bye-laws in respect of all important types of societies (credit, consumers, marketing, industrial, agro-processing societies, etc.) as well as application form are available in printed form with the leading book sellers and also in the office of the Registrar of Cooperative Societies or his sub-ordinate offices at all levels.

18.7.1 Conditions of Registration

- a) The objective of the proposed cooperative society should be promotion of economic interest of its members and/or their general welfare and/or welfare of the community as a whole.
- b) The proposal should reveal that the society has reasonable chances of success as a business organization and that it does not affect the working of the existing societies operating in that area.
- c) It also provides for the joining of minimum number of members called promoters to begin with, who are eligible for membership of a cooperative society, as per provisions laid down in the model by-laws. To avoid organisation of family cooperative (society) 15 promoter members belonging to different families, castes and religions should join hands. There should be proper representation of SC/ST and women in the list of members.
- d) The cooperative must promise that it shall achieve the objective by practicing cooperative principles, viz.,
 - i) open and voluntary membership
 - ii) democratic member control
 - iii) member economic participation
 - iv) autonomy and independence
 - v) education, training and information
 - vi) cooperation among cooperatives
 - vii) concern for community
- e) The proposal should be economically viable and technically feasible. The economic viability and technical feasibility is assessed on the basis of project report and the promoters have to collect the minimum capital required. Thus, the project report prepared on scientific lines should accompany the proposal for registration.
- f) The proposal should demarcate the areas of operation of the proposed society. It should be compact and contiguous.
- g) The proposal should also be accompanied by the draft bye-laws indicating constitution of the society, its area of operation, types of membership, share and authorized capital, etc. The draft by-laws should be prepared on the lines of model by-laws issued by the government. The proposed by-laws should not be contrary to the provisions of Cooperative Societies Act and the rules thereunder.

18.7.2 Procedure to Prepare the Proposal

The procedure of preparing a proposal for establishment of a cooperative society are as follows:

- a) Call a meeting of the promoter members and sympathizers to transact the following:
 - i) Elect the chief promoter
 - ii) Decide the name of the proposed society. While deciding the name, care should be taken that no cooperative in that name should exist in that area/district/state.
 - iii) Decide upon the location of the registered office of the society. The area of operation of the society should also be decided in this meeting.

- iv) Decide about the objectives, share capital, entrance fee, authorized capital, types of membership, etc..
- b) Request the Registrar, Cooperative Societies (district level officer for a Primary Society) through an application (Proceeding of the first meeting duly approved by the members should be attached) for
 - i) reserving the proposal name for the proposed society
 - ii) permission to collect share capital and entrance fee in the name of the proposed cooperative society
 - iii) permission for opening of saving bank account in a cooperative bank.
- c) Preparation of application for registration in the form prescribed under the Act, attaching thereto the bank balance certificate, the copies of proposed bye-laws (3-4 copies) duly signed by (11-15) promoter members, copy of the project report and list of persons who have agreed to join the proposed society with contributions made. Proposed contribution to be made by the general public, other than promoters, should also be mentioned.

18.7.3 Scrutiny of the Registration Proposal

Scrutiny of the registration proposal application is the function of the Registrar, Cooperative Societies. Generally, the powers of registration are delegated to subordinate officers up to the level of Asst. Registrar (AR) who is authorized to register a primary cooperative society with a limited area of operation of a village or a group of villages. On receipt of the proposal, the registering authority has to:

- a) Verify that it includes all the relevant documents that are necessary for consideration of a proposal for registration.
- b) Scrutinize the bye-laws submitted and find out whether the provisions therein conform to the provisions of the cooperative laws and the rules thereunder.
- c) Scrutinize the Project Report and get themselves satisfied about the economic viability and technical feasibility of the proposed society.
- d) See if the promoters have complied with the formalities required under other acts of the land such as Pollution Control Act and Fire Act.
- e) Verify necessary records and documents indicating the availability of resources such as land, building, power and water.

If the registering authority is satisfied with the proposal, he will register the society and issue a registration certificate along with a copy of the byelaws duly signed and sealed.

On registration, the name of the society is published in the Gazette. In case the authority desires to refuse registration, then the chief promoter has to be informed accordingly giving reasons therefor. The decision of refusal to register the society is subject to appeal to a proper higher authority.

18.7.4 Follow Up Action

On receipt of the registration certificate the following steps should be taken by the society:

- a) Board of Directors should be constituted.

- b) Preparation of budget and getting its approval from the general body.
- c) First General Body meeting to be convened within three months of the date of receipt of the registration certificate.
- d) Adoption of byelaws in the General Body meeting.

Check Your Progress 3

- 1) Identify the conditions of registration of a cooperative society.

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- 2) Discuss the procedure that should be followed in preparing proposal for registration.

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- 3) Explain the important steps followed by the registering authority while scrutinizing a proposal for registration of primary cooperative society.

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- 4) Explain the follow-up action the Chief Promoter is required to take after the registration certificate has been obtained by the society.

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18.8 LET US SUM UP

The first Cooperative Societies Act was passed in 1904. It was simple and elastic having 9 sections only. The scope of the act was broadened with the enactment of All India Cooperative Societies Act 1912. This paved the way for creation of Central and Apex Societies and also for the establishment of Cooperatives of non-credit activities.

Under Mountford reforms cooperation was transferred to the Provincial Government, which enacted their own Cooperative Societies Acts during 1925-32.

In order to facilitate the establishment of cooperatives having an area of operation in more than one state and also for the establishment of national level cooperative societies /federations, the multi-unit cooperative societies act, 1942 was enacted. This act was modified and renamed in 1984 as Multi-State Cooperative Societies Act.

Procedure for establishment of cooperative societies at the village to the national levels have been provided in various acts.

18.9 KEY WORDS

RCS	:	Registrar, Cooperative Societies
AR	:	Assistant Registrar (Cooperative Societies)
Provincial Government:		State Government

18.10 SOME USEFUL BOOKS

Government of India, 1915, *Report of the Committee on Cooperation in India*, (Chairman: Sir E.D. Maclagan).

Government of India, 1984, *Multi-State Cooperative Societies Act*.

Government of India, 1959, *Report of the Working Group on Cooperative Policy*, Ministry of Community Development and Cooperation (Chairman: K. R. Damb).

Government of India, 1963, *Report of the Committee on Cooperative Administration*, Ministry of Community Development and Cooperation (Chairman: V. L. Mehta).

Reserve Bank of India, 1981, *CRAFICARD Report* (Chairman B. Shivaraman).

Reserve Bank of India, 1989, *Agricultural Credit Review Committee Report* (Chairman A.M. Khusro).

Reserve Bank of India, 1954, *All India Rural Credit Survey Committee Report* (Chairman: A. D. Gorwala).

18.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Read Section 18.1 for the answer.
- 2) Read Section 18.2 for the answer.

- 3) Read Section 18.3 for the answer.
- 4) Read Sections 18.1 to 18.4 carefully for the answer.

Check Your Progress 2

- 1) Read Section 18.6 for the answer.
- 2) Read Sub-section 18.6.2 for the answer.
- 3) Read Sub-section 18.6.3 for the answer.

Check Your Progress 3

- 1) Read Section 18.7 for the answer.
- 2) Read Section 18.7.2 for the answer.
- 3) Read Section 18.7.3 for the answer.
- 4) Read Section 18.7.4 for the answer.

UNIT 19 AGRICULTURAL PRICING POLICY IN INDIA

Agricultural in the
Context of Globalisation
of the Economy

Structure

- 19.0 Objectives
- 19.1 Introduction
- 19.2 Effects of Agricultural Prices
 - 19.2.1 Effects on Income
 - 19.2.2 Effects on Cropping Pattern
 - 19.2.3 Effects on Resource Allocation
 - 19.2.4 Effects on Income Distribution
 - 19.2.5 Effects on Industrial Output
 - 19.2.6 Effects on Technology
 - 19.2.7 Effects on International Competitiveness
- 19.3 Objectives of Price Policy
 - 19.3.1 Proper Remuneration
 - 19.3.2 Income Distribution
 - 19.3.3 Price Stability
- 19.4 The Commission for Agricultural Costs and Prices
 - 19.4.1 Political Economy of Procurement Prices
 - 19.4.2 Emerging Problems
- 19.5 Let Us Sum UP
- 19.6 Key Words
- 19.7 Some Useful Books
- 19.8 Answers/Hints to Check Your Progress Exercises

19.0 OBJECTIVES

After going through this unit, you will be in a position to:

- explain the influence of agricultural prices on major macroeconomic variables;
- identify the objectives that should be considered in fixing agricultural prices;
- explain the role of the Commission for Agricultural Costs and Prices in price fixation; and
- identify the emerging problems of agricultural pricing policy in India.

19.1 INTRODUCTION

In India nearly two-third of the population is dependent on agriculture directly or indirectly for their livelihood. However, agriculture and allied activities like fishing and forestry account for less than 25 per cent of the national income. This partly explains, why the majority of Indian population is living in poverty and misery. As you know from previous Units, agriculture apart from being carried out using inefficient technology, suffers from extremely low land and labour productivity. Unemployment, disguised unemployment and poverty are some of the resultant ailments. In such a scenario the role of the government in providing a system of just and remunerative prices to the farmers is quite important. A remunerative price for agricultural products ensures that

- a) farmers are not forced to sell at below cost prices in slump times (usually harvest times), which is often the case in a country with low purchasing power and market demand,

- b) agricultural prices do not get out of control in a year of crop failure, and
- c) prices that maximize long run growth of the economy prevail.

In short, pricing of agricultural products tries to strike a right balance between (a) the producers (in terms of ensuring a minimum support price), and (b) the consumers (in terms of ensuring that people in a poor country are able to meet their minimum food and other requirements). In order to maintain a balance, the government has undertaken several measures such as: (i) declaration of minimum support prices (MSP) and procurement prices for important crops, (ii) procurement of foodgrains, (iii) strengthening of agricultural marketing and warehousing, and (iv) distribution of foodgrains through a public distribution system. But how far have these objectives been achieved? We have learnt about the marketing and warehousing aspects in the previous block while public distribution system will be taken up in Unit 21. In the present Unit we will look into the process and effects of fixing of agricultural prices.

19.2 EFFECTS OF AGRICULTURAL PRICES

Fixing of prices of farm products not only determines the income level of the agricultural producers, it has other significant repercussions as well. Since a large section of Indian population live below or just above the poverty line and spend a sizeable portion of their income on food, the impact of food prices on budget allocation of individual households is quite significant. Moreover, agricultural prices influence the pattern of farming in different regions of the country. Higher prices for the farm produce, other things remaining the same, increase the farmers' incomes, which in turn, encourages them to go for newer technology in farming that raises productivity. Let us systematically arrange the implications of agricultural price fixation.

19.2.1 Effects on Income

If the farmers are left to the whims of the market it may cause disaster for the entire economy. The marginal and small farmers constitute a sizable majority of Indian farming population. This segment of the population does not have the economic power to withhold supply to the market when prices are low. In case of a sudden drop in prices (which may happen due to bumper harvest) or strategic collusive behaviour by the crop merchants which artificially suppresses the market price, the income of the farmers are adversely affected. This affects adversely not only the absolute level of poverty and inequality, the effect spills over to other sectors of the economy as well in terms of low demand for industrial products and services. The entire economy may face a downward trend.

19.2.2 Effects on Cropping Pattern

From the above, it is easy to understand that different sets of prices would imply different sets of income for their respective producers. As an example, let us consider two crops, viz., rice and wheat. Let us assume that (i) input prices of these two crops do not change relatively, (ii) the land which is under rice production is just as good to produce wheat, and (iii) the technology of wheat production is available to the rice producers as well. In that case a relative increase in price of wheat in comparison to rice would imply higher profits for wheat producers. In the long run this sort of divergent pricing and resulting profitability would induce the rice producers to transfer their land and capital to wheat production instead. In this way the cropping pattern gets affected. You may be aware that in an economy every production decision is taken on the basis of profitability or revenue generation. Therefore, price fixing of a particular product would ultimately influence the decision to produce the commodity itself.

19.2.3 Effects on Resource Allocation

As a farmer opts for a more profitable crop in place of a less profitable one, the resources he has at his command now get channelised for the production of the new crop. This is true at the individual, micro level. At a broader level also as large number of farmers start cultivating a particular lucrative crop, the authorities get pressurized to divert more resources to facilitate its production and marketing. Thus every kind of resource gets transferred at the service of the crop whose prices are more profit generating than the rest.

Let us take the case of Indian agriculture in the last few decades. Before the 1990s there were many restrictions on agricultural products' exports. As a result, domestic production decisions were quite immune to international price movements. Crops of coarse variety such as jowar, bajra and ragi were produced in abundance which catered to the needs of the poorer sections of the country. After the export restrictions were lifted, the cultivators realised that production of cash crops such as sunflower, soya and cotton was much more paying since these crops fetched much higher prices in the international market. As a consequence, a shift in production is taking place. Production of coarse cereals has been declining and that of cash crops is rising. Results of this switching over have not all been positive. Coarse cereals which provide fodder and fuel as well as form a major part of the consumption basket of the poorer sections of the population, are now available in lesser quantities.

19.2.4 Effects on Income Distribution

Effects of changes in agricultural prices on income distribution work through demand and supply channels. A rise in the agricultural prices, keeping other things constant, would result in a rise in the income of the agricultural producers through the supply side. On the other hand, it would imply a contraction in the real income of the purchasers of agricultural commodities. Particularly, agricultural prices in a poor economy assume much more significance because food constitutes a large part of the budget of the poor people. Moreover, for the poor food is a commodity which has very low price elasticity. This means that if food prices increase the demand for food does not decrease much because it is a primary need for survival. In sum, therefore, a rise in agricultural prices would have a strong effect in terms of lowering the real income level of a sizable portion of the population in a poverty ridden country.

This issue of distributional effects of changes in agricultural prices, however, has other dimension also. If we find that most of the poor people are net purchasers of food then increase in food prices would affect the poverty level: a rise in agricultural prices would raise poverty and vice versa. On the other hand, if food is produced by poor people as well then the issue becomes more complicated. Low prices would benefit the poor consumers but impoverish the producers. High prices on the other hand, would benefit the producers but harm the purchasers. State intervention is needed to equitably solve such a problem.

19.2.5 Effects on Industrial Output

Output of the industrial sector is affected through both demand and supply as a result of changes in agricultural prices. As we have seen above, as a result of the rise in agricultural prices the real income of a large section of the population is adversely affected. Assuming that the rise in real income of the sellers of agricultural goods is less than the fall in the real income of the rest, the net effect would be a contraction of the aggregate income. That means people as a whole would be left with less money to buy industrial goods and services. With output of the industrial sector and services being demand determined their volume would fall. Thus the relative increase in agricultural prices influences the sectoral composition of the economy as well.

Issues Before Agricultural Development

The other effect is through the supply side. You know that agricultural products are used as inputs in the production of a number of industrial goods. Therefore, a rise in agricultural prices would push up the prices of such industrial goods. We know that the demand for industrial goods is inversely related to their prices. Therefore, the demand for industrial goods would fall resulting in shrinkage of their output and employment.

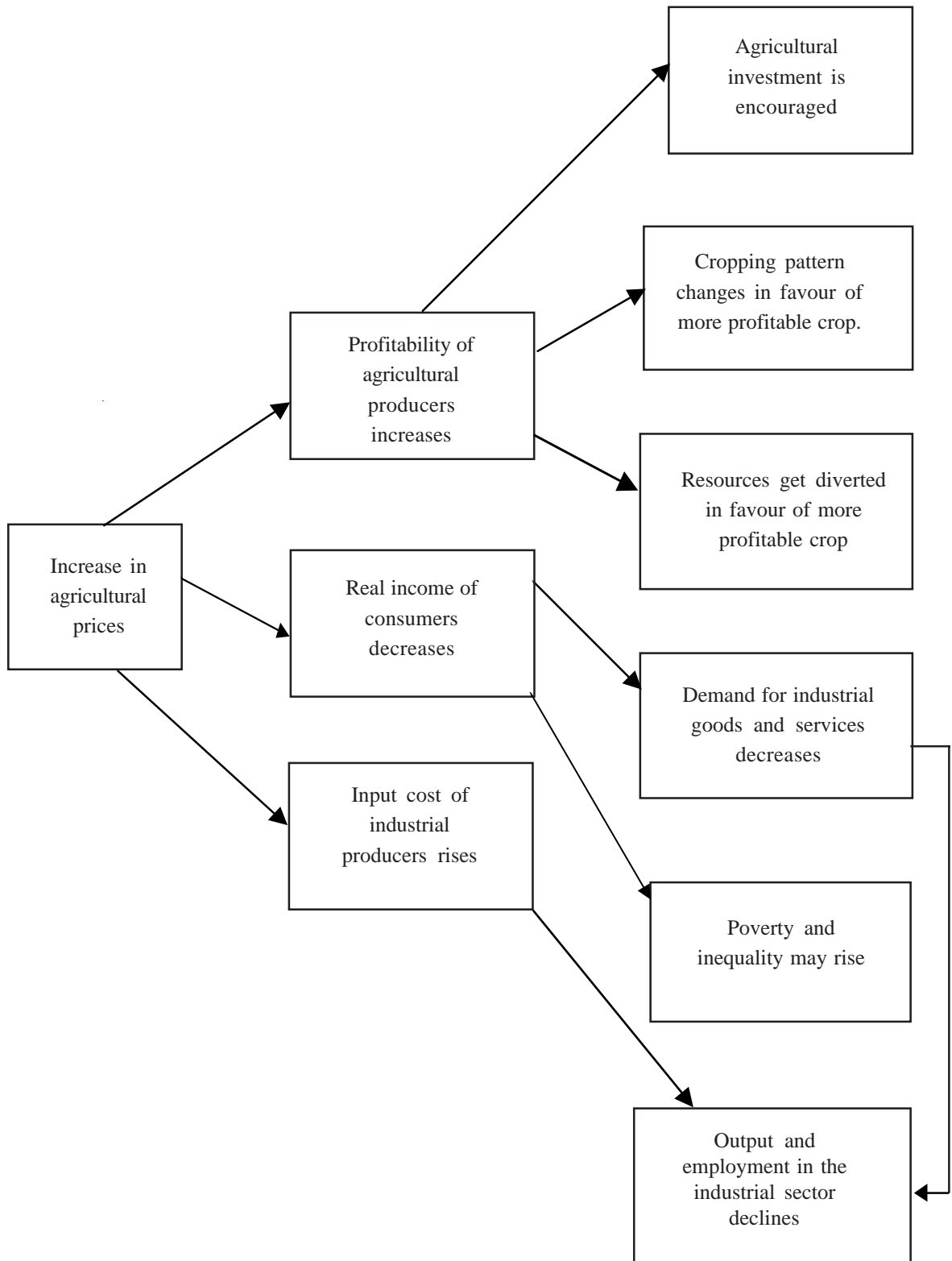


Fig. 19.1

19.2.6 Effects on Technology

More profitability induces producers to raise the productivity of the crop in question by introducing newer technology. Newer technology many a time involves a fixed cost

of introduction. As long as the profits are high that should not be a major problem because higher profits besides encouraging technology also enables the producers to bear this high cost. Thus higher prices for agricultural products help in the introduction and use of new technology. In the Indian context this is illustrated by the following example:

Punjab and Haryana have been the birthplace of green revolution and these are the areas where there is widespread use of more productive technology. This is explained by the fact that a large quantity of grain procurement by the government is undertaken from these two states alone. Regular procurement and higher assured prices offered by the government in purchasing grains from the farmers have encouraged the farmers in these areas to go for more productive techniques.

19.2.7 Effects on International Competitiveness

Besides meeting the domestic needs the agriculture sector also needs to look beyond the national boundaries. Global market for foodgrains obviously is a different play ground than the domestic market. Consumers in importing countries are more quality conscious though the prices there are generally higher than in India. In the international market, the Indian agricultural products have to compete with the products of other countries. Hence, competitive prices are essential to get access to global agricultural market. Changes in agricultural prices in our country definitely affect competitiveness of agricultural products in the global market.

The impact of agricultural price rise can be summarised through Fig. 19.1 given in the previous page.

Check Your Progress 1

1) Point out the effects of agricultural prices on the overall economy.

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2) Industrial production is affected by agricultural prices in two ways. What are those?

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3) In an economy where majority of the population are net food buyers, increase in food price may lead to fall in the general standard of living. Substantiate.

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19.3 OBJECTIVES OF PRICE POLICY

Role of the government in monitoring, fixing and balancing agricultural prices should be clear in the light of the above mentioned points. Prices should not be such that they result in losses for the producers. They should be conducive to higher agricultural production, investments and growth. These aspects are of paramount importance, particularly in a low income country such as India. On the other hand, prices should not be such that they bite into poor consumers' pockets. Retardation of growth of industries and services may come about if people end up spending a larger chunk of their budget in meeting essential food requirements. In this section we briefly point out what should be the objectives of a proper price policy.

19.3.1 Proper Remuneration

About 80 per cent of the farmers fall under the category of small and marginal farmers. Apart from the uncertainty of the monsoon and irrigation, the other main risk they have to bear is the movement in market prices of their product. Unlike industrial products, agricultural commodities have many features of a perfectly competitive market. They are more or less homogenous in nature. There are large number of insignificant buyers and sellers. Therefore, producers have no control over prices and prices are much more volatile than those of industrial goods. Low prices of the produce often ruin the farmer. In such a scenario price-regulating authorities should always try to fix and maintain the range of price variation such that it becomes possible for the agricultural producers to make ends meet. One should also keep in mind that the less endowed farmers often borrow huge sums to carry out production and in the face of unremunerative prices it becomes more difficult for them to repay the loan. You might be aware of the suicidal deaths by cotton farmers in recent years in the face of falling global cotton prices and harvest failures.

The issue of remunerative prices for the producer is interlinked with the input prices. A sharp rise in the price of inputs, other things remaining the same, would adversely affect the profitability of the producer. The authorities, keeping this in mind in the years immediately after Independence, stressed on the importance of subsidized inputs. But in the 1990s with economic liberalization and globalization, most of these subsidies are being scrapped. Free or low priced electricity to the farmers, subsidized fertilizers, seeds and irrigation charges are slowly being withdrawn. This has adversely affected the farmers by increasing cost of production. In fact, the growth rate of output as well as investments in agriculture have declined in the 1990s compared to the previous decade. This issue is also related to the shrinkage of infrastructure facilities in agriculture. In order to cut overall expenditure, the government is not spending enough on basic infrastructural facilities in agriculture. These pressures ultimately lower the profitability of agriculture and the authorities are left with no other choice than raising the prices of agricultural products.

19.3.2 Income Distribution

We mentioned earlier that agricultural prices influence personal income distribution and employment opportunities. The agricultural producers gain as a result of jacking up of prices. But the consumers and industrial producers suffer. In the long run the industrial workers also face declining employment opportunities. So what should the regulatory authorities do? In the post-independence India the dilemma was resolved by envisaging an elaborate system of Minimum Support Prices (MSP) and procurement prices. The procurement prices are the ones at which foodgrains are purchased from the farmers by the government. This food is subsequently distributed through the Public Distribution System (PDS) at controlled cheap rates (the issue price). Often the procurement price is higher than the issue price. The loss is borne by the government as a subsidy given partly to:

- i) the consumers, since the issue price at the PDS outlets is lower than the open market price; and the remaining part to
- ii) the producers, since the procurement price would be higher than the market price.

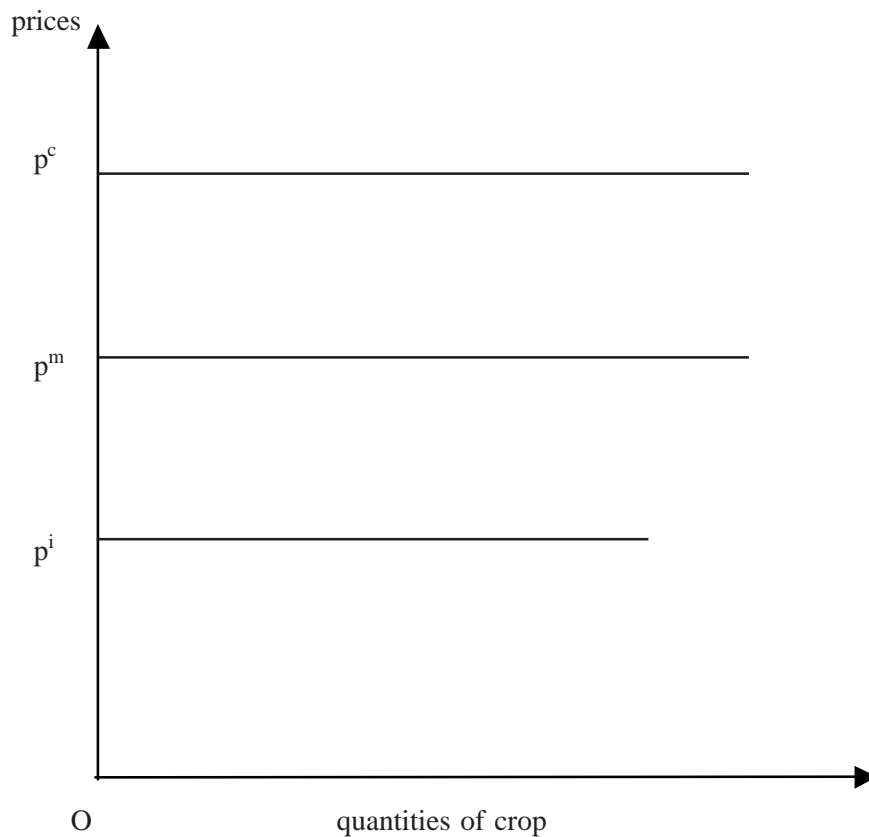


Fig. 19.2

In Fig. 19.2 we explain this diagrammatically. Here P^m is the open market price, which is too low for the producers to earn a reasonable profit and too high for the consumers to satisfy their food requirements. Therefore, the government intervenes in the market. It purchases grains from the farmer at price p^c which is greater than p^m (therefore $p^c - p^m$ is the subsidy to the producers). Subsequently, the grains are sold at price p^i through fair price shops which is less than p^m (therefore $p^m - p^i$ is the subsidy given to the consumers). The total subsidy given per unit of crop is thus the difference between the procurement price (p^c) and issue price (p^i), i.e., $(p^c - p^i)$. The situation depicted in the figure is, however, an ideal one which need not always held. In recent years, an anomalous situation has developed in our country where market price is lower than the issue price.

The government intervention in the prices of agricultural products is not limited to foodgrains only. Cotton, jute and other produce also are protected through the Minimum Support Price scheme. For products which are of non-food nature, various agencies like the CCI (Cotton Corporation of India), JCI (Jute Corporation of India) and Tobacco Board intervene in the market to ensure that the prices harm neither the producer nor the buyer.

Apart from the issue of relative distribution between the producer and the consumer, agricultural pricing policy should also consider the distribution of gains between the producers of various regions. Setting of higher prices in a particular region or for a crop makes the producers of that region and crop better off than the rest. Therefore, the producers of other crops may shift to the production of that particularly remunerative crop. Higher procurement prices in a particular region also results in grievances

among the producers of the same crop in other regions. The regulatory authorities should keep all this in mind while designing the prices. In India since most of the foodgrains procurement is undertaken in Punjab, Haryana and western Uttar Pradesh, the surplus producers from other states such as Andhra Pradesh, Maharashtra and Karnataka often feel that they are not being treated fairly.

19.3.3 Price Stability

We have noted above that the small farmers are adversely affected if there is uncertainty regarding the prices that they are going to receive for their products. If the prices are higher than what is necessary to earn a minimum profit level then the producers earn more than their expectation. If, on the other hand, prices fall below the level at which a minimum profit level can be maintained then the small farmers are affected very badly. Since they are often dependent on the loans to carry out their production such depression in the prices leave them bankrupt. Therefore, the pricing authorities not only have to provide a remunerative price to the producers but also it should be stable and consistent. It is a fact that stability in the procurement prices often has a stabilizing influence on the open market price. Stability of prices also reduces the uncertainty on the part of the producers to make future plans regarding investments, employments, etc.

Check Your Progress 2

- 1) Enumerate the main objectives of agriculture price policy.
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- 2) Through the minimum support price policy government gives subsidy only to the consumers of agriculture produce. True or false?
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- 3) Should issue price be higher than market price? Comment.
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19.4 THE COMMISSION FOR AGRICULTURAL COSTS AND PRICES

In 1965 the Government of India constituted the Agricultural Prices Commission. The commission was to advise the government on “the price policy of agricultural

commodities with a view to evolving a balanced and integrated price structure in the perspective of the overall needs of the economy and with due regard to the interests of the producers and the consumers". While recommending the price policy and relative price structure the commission was enjoined to keep in view among other things, "the need to provide incentive to the producer for adopting improved technology and for maximizing production and the likely effect of the price policy on the rest of the economy, particularly on the cost of living, on wages, industrial cost structure, etc."

It is evident that various policy statements do not show any indication to deliberately keep farm prices low, though the need to protect the consumers from the consequences of an inordinate rise in prices has been kept in view. It has been made clear that the concern for consumer interests should not be allowed to take away the farmer's incentive to adopt improved technology and make necessary investments for the purpose.

But this is as far as the policy goes on paper. Operationally there has been failure more in respect of curbing the inflationary pressure on prices than in maintaining what may be termed as incentive level of prices. The minimum support prices (MSP) set by the commission was always set at a lower level than the procurement prices. Thus MSP was meaningless because the Food Corporation of India always procured necessary articles at procurement prices. In fact procurement operation by the government many a time led to a price rise in the open market. Many state governments sought to protect the consumers by setting an upper limit to the price level but these were never implemented properly. In the years following 1965, severe food crisis due to drought resulted in many parts of the country. Starvation deaths were reported from Andhra Pradesh, Bihar, Bengal and Orissa. Food riots broke out. However, this was the time when green revolution was taking birth largely in Punjab, Haryana and Western UP. This could not have been possible without newer production technology, chemical fertilizers, HYV seeds, etc. The rising prices of agricultural articles therefore we can say, helped the green revolution. The increasing trend of agricultural prices continued till the middle of 1970s. Pricing policy of the government therefore has been more in favour of the producers than the consumers. Perhaps this prompted the government to rename Agricultural Prices Commission as Commission for Agricultural Costs and Prices (CACP) in the year 1985, the emphasis now being more on costs. The Sixth Plan (1980-85) document has the following to say about agricultural prices,

"Prices of agricultural commodities exercise a dominant influence on the behaviour of the overall or general price level. Agriculture accounts for nearly half of the national income...Past experience suggests that relative stability in general price level has more often coincided with years of good harvest and, on the other hand, the inflationary pressure have more often been triggered by a fall in agricultural output and consequent rise in agricultural prices. Agricultural production strategies in the Sixth Plan should hence be based on the need for increasing the production of commodities in short supply and thereby helping to maintain price stability."

The Seventh Plan (1985-90) document has the following to say on agricultural price policy:

"Whereas the use of high yielding varieties aided by incentive prices and public procurement have contributed to a break-through in the output of certain crops, notably wheat, they have also led to the creation of surpluses which cannot readily be absorbed while shortages persist in respect of certain other commodities. Agricultural price policy needs to be increasingly concerned with the maintenance of a scale of appropriate relative prices of crops so that the supplies of different commodities are brought in line with the respective demands. Also procurement operations have to be

strengthened for crops like rice, oilseeds and pulses in areas inadequately served with marketing infrastructure, to ensure that the producers are in fact able to sell at prices fixed by the government.”

**Table 19.1 : Procurement / Minimum Support Prices for Agricultural Commodities
(as on 12.2.2001)**

(Rs. per quintal)

(According to crop year)

CROP	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01
Paddy	360 (5.9)	380 (5.6)	415 (9.2)	440 (6.0)	490 (11.4)	510 (4.1)
Jowar	300 (7.1)	310 (3.3)	360 (16.1)	390 (8.3)	415 (6.4)	445 (7.2)
Bajra	300 (7.1)	310 (3.3)	360 (16.1)	390 (8.3)	415 (6.4)	445 (7.2)
Maize	310 (6.9)	320 (3.2)	360 (12.5)	390 (8.3)	415 (6.4)	445 (7.2)
Ragi	300 (7.1)	310 (3.3)	360 (16.1)	390 (8.3)	415 (6.4)	445 (7.2)
Wheat	380 (5.6)	475 (25.0)	510 (7.4)	550 (7.8)	580 (5.5)	
Barley	295 (3.5)	305 (3.4)	350 (14.8)	385 (10.0)	430 (11.7)	
Tur(Arhar)	800 (5.3)	840 (5.0)	900 (7.1)	960 (6.7)	1105 (15.1)	1200 (8.6)
Moong	800 (5.3)	840 (5.0)	900 (7.1)	960 (6.7)	1105 (15.1)	1200 (8.6)
Urad	800 (5.3)	840 (5.0)	900 (7.1)	960 (6.7)	1105 (15.1)	1200 (8.6)
Gram	700 (4.5)	740 (5.7)	815 (10.1)	895 (9.8)	1015 (13.4)	
Groundnut-in- shell	900 (4.7)	920 (2.2)	980 (6.5)	1040 (6.1)	1155 (11.1)	1220 (5.6)
Soyabean Black	600 (5.3)	620 (3.3)	670 (8.1)	705 (5.2)	755 (7.1)	775
Soyabean Yellow	680 (4.6)	700 (2.9)	750 (7.1)	795 (6.0)	845 (6.3)	865 (2.4)
Sunflower seed	950 (5.6)	960 (1.1)	1000 (4.2)	1060 (6.0)	1155 (9.0)	1170 (1.3)
Rape & Mustard	860 (3.6)	890 (3.5)	940 (5.6)	1000 (6.4)	1100 (10.0)	
Toria	825 (3.1)	855 (3.6)	905 (5.8)	965 (6.6)	1065 (10.4)	
Safflower	800 (2.6)	830 (3.8)	910 (9.6)	990 (8.8)	1100 (11.1)	
Cotton	1150 (15.0)	1180 (2.6)	1330 (12.7)	1440 (8.3)	1575 (9.4)	1625 (3.2)
Jute	490 (4.3)	510 (4.1)	570 (11.8)	650 (14.0)	750 (15.4)	785 (4.7)
Sugarcane	42.50 (8.7)	45.90 (8.0)	48.45 (5.6)	52.70 (8.8)	56.10 (6.5)	
Tobacco(VFC) Black Soil	19.00 (2.7)	19.00 (0.0)	20.50 (7.9)	22.50 (9.8)	25.00 (11.1)	26.00 (4.0)
Light Soil (Rs.per kg.)	21.50 (2.4)	22.00 (2.3)	23.50 (6.8)	25.50 (8.5)	27.00 (5.9)	28.00 (3.7)
Copra Milling	2500 (6.4)	2500 (0.0)	2700 (8.0)	2900 (7.4)	3100 (6.9)	3250 (4.8)
(For Calender Year) Ball	2725 (5.8)	2725 (0.0)	2925 (7.3)	3125 (6.8)	3325 (6.4)	3500 (5.3)
Sesamum	850 -	870 (2.4)	950 (9.2)	1060 (11.6)	1205 (13.7)	1300 (7.9)
Niger Seed (12.0)	700 -	720 (2.9)	800 (11.1)	850 (6.3)	915 (7.6)	1025

Note: Figures in parenthesis indicate percentage increase over previous year.

The following is what the official website for information on agriculture in India says:

“The main objectives of the Government’s price policy for agricultural produce aims at ensuring remunerative prices to the growers for their produce with a view to encourage higher investment and production. Towards this end, minimum support prices for major agricultural products are announced each year which are fixed after taking into account, the recommendations of the Commission for Agricultural Costs and Prices (CACP). The CACP while recommending prices takes into account important factors, viz.

- 1) Cost of production
- 2) Changes in input prices
- 3) Input/Output price parity
- 4) Trends in market prices
- 5) Inter-crop price parity
- 6) Demand and supply situation
- 7) Effect on industrial cost structure
- 8) Effect on general price level
- 9) Effect on cost of living
- 10) International market price situation
- 11) Parity between prices paid and prices received by farmers (terms of trade)

Of all these factors, cost of production is the most tangible factor and it takes into account all operational and fixed costs. Government organises Price Support Scheme (PSS) of the commodities, through various public and cooperative agencies such as FCI, CCI, JCI, NAFED, Tobacco Board, etc., for which the MSPs are fixed. For commodities not covered under PSS, Government also arranges for market intervention on specific request from the States for specific quantity at a mutually agreed price. The losses, if any, are borne by the Centre and the State on a 50:50 basis. The Government have raised substantially the MSPs in recent years as may be seen from the statement enclosed.”

19.4.1 Political Economy of Procurement Prices

We have seen that though the issue of fixing procurement/minimum support prices may seem simple it is not so in reality. Since procurement price influences the terms of trade between the sectors and distribution of income, the pressure groups in the economy try to move the official procurement prices in their favour. This perhaps explains why throughout the whole span of 55 years after Independence procurement prices have been continually raised. Often it has been observed that this price is higher than the prevailing market price. Moreover, the clout of the regionally concentrated rich farmers lobby have ensured that almost the entire procurement of grains take place from the traditional green revolution area.

Since the consumers of agricultural products are not united as the producers, the latter group has been able to influence the pricing policy of the Government in their favour much more than the former.

19.4.2 Emerging Problems

Since the early 1990s, the planners of the Indian economy have more or less adhered to the directives of the IMF and the World Bank. Liberalization and globalization are the two major prescriptions of this new era. The new policy package includes cutting down subsidies and budget deficit. As we learnt earlier the price differential between the procurement price and the issue price is the subsidy that the Government provides. One way to cut this subsidy was to lower the procurement price, and the other way was to raise the issue price of the Public Distribution System (PDS).

Because of political economic problems pointed out above, lowering of procurement prices or curtailing the procurement operations could not be carried out. So the only way out was to further squeeze the ordinary consumers by raising the issue price.

In this context the government declared two issue prices: one for people above Poverty Line (APL) and another for people below Poverty Line (BPL). Price offered to the APL population were found at many a time above the market price; substandard quality food were offered as well. The food earmarked for BPL population actually never reached the target group. Identification of BPL population was fraught with corruption and mismanagement at various levels. Many a time the rich and the influential got themselves recorded as part of the BPL group and cornered the subsidies.

There has been a fall in the per capita food consumption in the last decade, increasing poverty and inequality especially in rural areas. We will discuss more about these issues in Unit 21.

Check Your Progress 3

- 1) Under what circumstances was the Agricultural Prices Commission set up?
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- 2) Procurement prices have been rising consistently in the last few decades. What are the reasons?
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- 3) What is the need for setting different prices for APL and the BPL? Has this Targeted Public Distribution System benefited the country?
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19.5 LET US SUM UP

We have seen that agricultural prices play a major role in a poor country where majority of the population is dependent on agriculture. It affects the overall economy mainly through two channels. First, price affects profitability of producers thus affecting the area under different crops. It affects the resource allocation by the same logic, both at the individual and the aggregate levels. Moreover, the future adoption of technologies and investment decisions are also affected by changes in prices. Second, it affects the real income of the purchasers. With this class constituting the majority in a poor country, if agricultural prices increase rapidly it adversely affects poverty and reduces demand for industrial products. Agricultural goods entering as inputs into the production of industrial goods means their prices go up as well. This leads to a fall in industrial demand and ultimately industrial output and employment.

Therefore, pricing of farm products has to be a well thought exercise and it has to maintain certain balance. However, when we look at the Indian experience we find that throughout the history of independent India the pricing policy has been more tilted in favour of the producers than consumers. Subsidies were granted to make up for the gap in procurement price and issue price but they could not keep pace with the constantly rising procurement prices. To reduce subsidies, issue prices at PDS outlets had to be raised.

In the wake of globalization and liberalization during the 1990s, these issues are moving in a newer direction. Government have been forced to cut subsidies and the result has been that whereas the rise in procurement prices and procurement operations could not be stopped due to political lobbying, it is the PDS which is being dismantled. Issue prices have risen, while PDS operation has shrunk. All these have led to falling cereal consumption, industrial recession, rising rural poverty and above all a wasteful accumulation of PDS stock.

19.6 KEY WORDS

- International Competitiveness** : This determines whether the goods or services we are talking about are capable of getting sold in the global market. It depends upon factors such as the price at which the good in question is offered for sale at the international market, its quality and trading at the global market.
- Issue Price** : The price at which goods are sold through the PDS outlets. This price is decided upon after taking into consideration things like the purchasing power of the poor, market price level and subsidy margin offered by the Government.
- Minimum Support Price (MSP)** : The MSP is fixed by the government. It indicates the minimum price level which is guaranteed to the sellers by the government. If the market price slips down below the MSP level, the government intervenes and undertakes procurement at MSP level. Earlier MSP and procurement prices were set at different levels, MSP being lower than procurement prices. However, in recent years both have been kept at equal level.

- Open Market Price** : The price that is determined in the market by the interaction of demand for and supply of goods, without external intervention.
- Price Elasticity of Demand** : This measures the responsiveness of demand for a good to change in its price. Generally food has low price elasticity of demand especially for the poor people. Food being a necessity, the effect of price rise on reduction in quantity demanded is low.
- Procurement Price** : The price fixed by the Government for different crops. The government buys crop from the farmers at this price.
- Terms of Trade** : It is the ratio of prices prevailing in two sectors. For example, if agricultural price is p_a and industrial price is p_b then the terms of trade between the sectors would be p_a/p_b .

19.7 SOME USEFUL BOOKS

Misra, S. K. and V. K. Puri, 2001, *Indian Economy*, Himalaya Publishing House, New Delhi.

Datt, R. and K.P.M. Sundaram, 2001, *Indian Economy*, S. Chand and Co., New Delhi.

Raj, K. N., 1990, *Organizational Issues in Indian Agriculture*, Oxford University Press, New Delhi.

Patnaik, U., 1999, *The Long Transition*, Tulika Publications, New Delhi.

Kapila, U. (ed.), 1990, *Indian Economy since Independence: Different Aspects of Agricultural Development*, vol II, Academic Foundation, Delhi.

19.8 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Agricultural prices affect profitability, cropping pattern, resource allocation, income distribution, industrial output, technology and international competitiveness. .
- 2) Increase in agricultural prices leads to high input cost. It increases price of industrial goods which reduces demand for them. It also reduces the purchasing power of consumers thus reducing demand and output of industrial goods.
- 3) See Sub-section 19.2.4 and answer.

Check Your Progress 2

- 1) The purpose of agricultural policy is to see that proper remuneration is ensured, income distribution is even and price stability is attained.
- 2) False
- 3) Issue price should be lower than the market price if the purpose of the government is to provide food for the poor and needy.

Check Your Progress 3

- 1) It was the food crisis period of the mid 1960s that prompted the setting up of Agricultural Prices Commission.
- 2) Political influence exerted by the rich farmers lobby has been one major reason.
- 3) Please see Sub-section 19.4.2 and answer.

UNIT 20 AGRICULTURAL TAXATION AND SUBSIDIES

Structure

- 20.0 Objectives
- 20.1 Introduction
- 20.2 Types and Effects of Taxes
 - 20.2.1 Lump-sum Taxation
 - 20.2.2 Per Unit Tax
 - 20.2.3 Ad Valorem Taxation
 - 20.2.4 Tax on the Income of the Producers
 - 20.2.5 Taxation under Imperfect Competition
- 20.3 Existing Indian Tax Policy for Agricultural Income
- 20.4 Subsidies
 - 20.4.1 Rationale for Subsidies
 - 20.4.2 Types of Subsidies
- 20.5 Subsidies: Effectiveness, Extent and Future Problems
- 20.6 Let Us Sum Up
- 20.7 Key Words
- 20.8 Some Useful Books
- 20.9 Answers/Hints to Check Your Progress Exercises

20.0 OBJECTIVES

After going through this unit you will be in a position to:

- explain the types of taxation and their impact on output and prices;
- appreciate Indian policy towards taxation of agricultural income and the political economy of it;
- explain the concept and rationale for agricultural subsidies; and
- examine the extent of agricultural subsidies and their impact on agricultural production and pricing.

20.1 INTRODUCTION

You may be aware that taxes take away money from people and subsidies give money to people. Naturally, the persons who pay taxes are not necessarily the persons who benefit from subsidies. In that sense taxes and subsidies involve transfer of money between people. The main aims government seeks to achieve through a policy combination of taxation and subsidies are to

- generate income for financing its expenditures by imposing reasonable taxes on people who are capable of paying, and
- provide support to people who are less endowed and need assistance to carry out their production and consumption activities through subsidies.

Thus taxes and subsidies result in a re-distribution of income in the society. Besides these two direct objectives, taxes and subsidies affect economic activity in many different ways. As we will see in the following sections, taxes and subsidies affect the price and output levels as well. Therefore, the government should try to formulate tax policies in such a way that is conducive for economic growth and social welfare.

Keeping these in mind we may ask the question as to whether the government in India has used these instruments efficiently.

20.2 TYPES AND EFFECTS OF TAXES

There can be four types of taxes. These are:

- Lump-sum tax
- Per unit of output tax
- Ad-valorem tax
- Profit tax

In the following paragraphs we shall see how each of these taxes affect the output and price decisions of the producer. The market form we have assumed to be *perfectly competitive*. This implies that an individual producer cannot influence the price in the market because he is too small in comparison to the entire size of the market. Secondly, there is no *product differentiation*, i.e., the product sold by a producer is identical to that of any other producer. We would look into the case when there is *monopolistic power* in the hands of the producers later in this section. Let us begin with the analysis of the impact of taxes in the presence of perfect competition.

In a perfectly competitive market the producer (farmer in this case) is a price taker in the sense that he accepts the prevailing market price. At the on-going price he is free to sell as much as he can. On the other hand, monopoly power enables the producer to influence the price by restricting supply to the market.

Indian agriculture if we ignore government intervention in agricultural products markets meets the conditions of perfect competition. There are a large number of farmers, each supplying a negligible fraction to the market. Moreover, the products are more or less homogeneous in quality so that product differentiation is almost absent. Therefore, no individual farmer is in a position to influence the market price.

20.2.1 Lump-sum Taxation

Lump-sum taxes are imposed on the producers irrespective of the level of price or output. Let us analyse the effects of such a tax on price and output of the producer in Fig. 20.1.

In Fig. 20.1, the output produced is represented along the horizontal axis; the price and cost are measured along the vertical axis. The market price is P^m , given as a horizontal straight line. The AC curve in the figure measures the *average cost* of production and MC is the *marginal cost* of production. You may remember from the course 'EEC 11: Fundamentals of Economics' that AC is defined as the total cost divided by the units of output produced. On the other hand, MC measures the rate of change in the total cost if the producer decides to increase the level of output. You can observe from Fig. 20.1 that the producer will be in equilibrium at the level of output where MC and MR are equal (q^* corresponding to point E in Fig. 20.1). This is because the objective of the producer is to maximize profits. If he produces any output for which $MC < P^m$ (to the left of E), he can increase profits by producing more because it adds more to his revenue (P^m) than to his cost (MC). On the other hand at a level of output where $MC > P^m$ (to the right of E), he can raise his profits by reducing the output level. Thus the producer will produce q^* level of output.

At Oq^* level of output the profit per unit is the difference between the average cost (AC) and the price, which is EB. Hence the total profit earned is $EB.Oq^* = \text{area } ABEP^m$. Now, suppose a lump sum tax, of amount T, is imposed on the producer. This can be treated as a sort of fixed cost as the farmer has to pay it irrespective of his output level. Thus imposition of a lump sum tax increases the total cost of production by an amount T. Consequently, the AC curve in Fig. 20.1 shifts upward. However, the MC curve does not change. Thus the intersection point of the P^m line

and the MC curve does not change and there is no change in the quantity produced and the price charged. However, the profits earned decreases by an amount of T . If T is relatively small so that the producer has profits even after payment of the tax, he will continue production. But, if T is large enough, so that the revenue after tax does not cover the variable costs, the producer will stop production. Output will drop to zero. This happens because if he stops production he incurs a loss equivalent to fixed cost; if he does not, his loss is more than that. Thus we conclude the imposition of lump sum tax does not affect output or price unless it is very high.

20.2.2 Per Unit Tax

By per unit tax we mean that tax is imposed as a levy on the units of output produced. Here we observe that such a tax will affect both the marginal and the average cost of production, both will increase by the amount of per unit of tax imposed. In Fig. 20.2 the MC and AC curves shift upward to MC' and AC' .

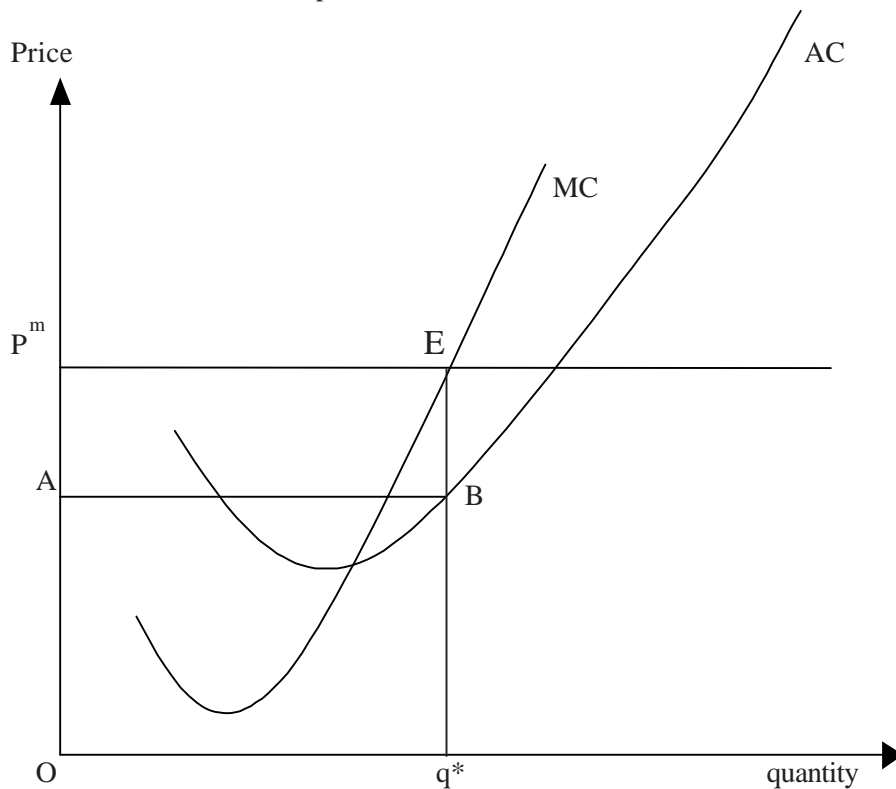


Fig. 20.1

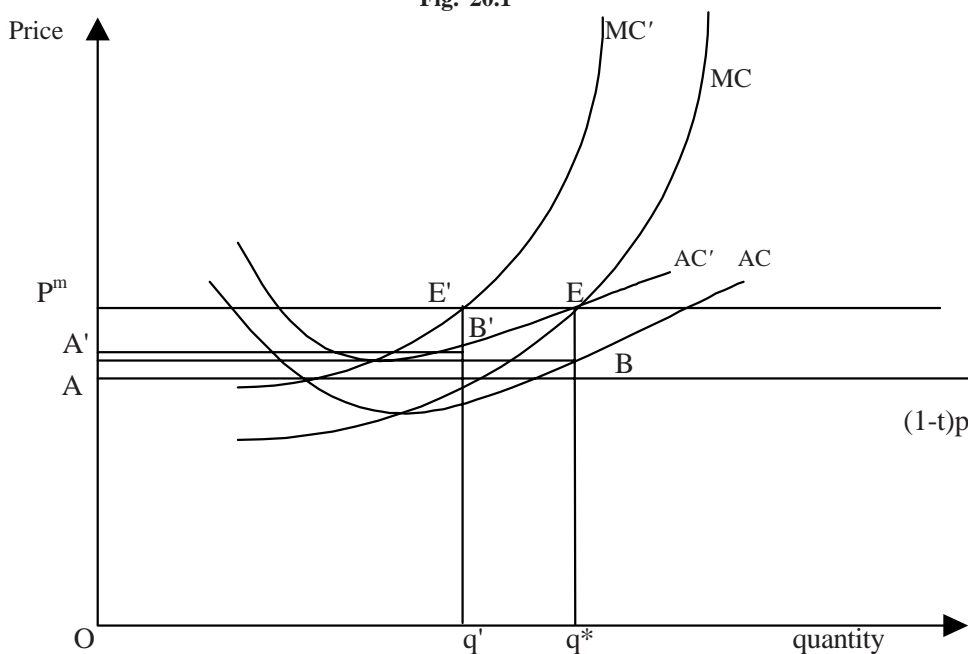


Fig. 20.2

The result is that the new point of interaction between the P^m and the MC' now shifts to E' which is to the left of the previous point E . Therefore, the output level falls to Oq' , which is less than the previous level of Oq^* .

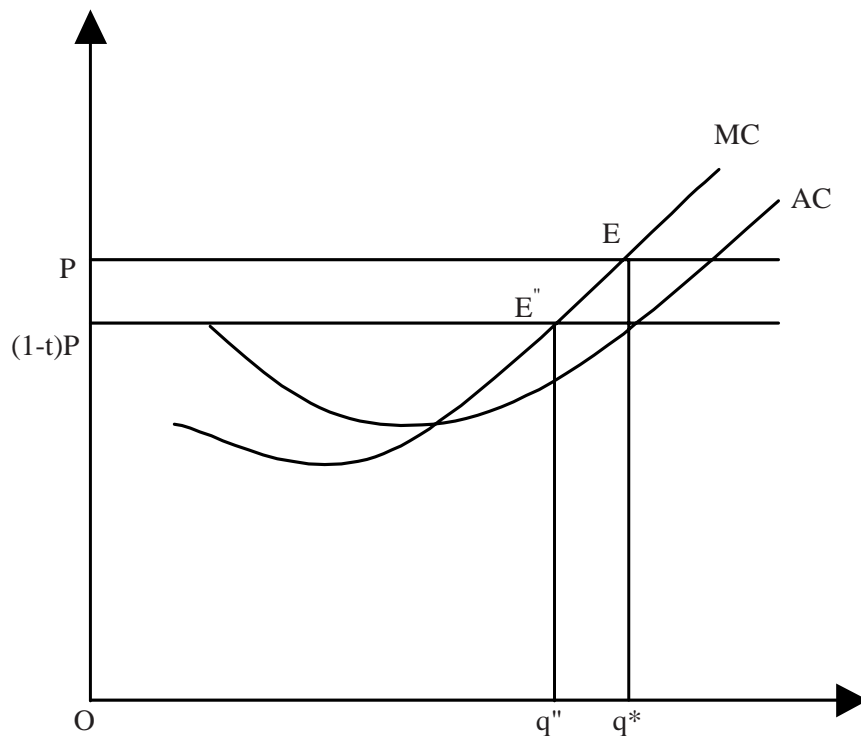


Fig. 20.3

We conclude that tax imposed on the basis of per unit of output produced leads to a fall in the output level. It also leads to fall in the profits earned by the producer as can be seen that the new level of profits, $A'B'E'P^m$ is less than that earned previously, i.e., $ABEP^m$. And this happens no matter how high or low the tax rate is.

20.2.3 Ad-valorem Taxation

Here the tax is imposed not on the output level but on the price charged in the market. The price here is given by p . Therefore, after the imposition of the tax the price that is received by the producer becomes $(1-t)p$, where t is the rate of tax that has been imposed on the price level. Note that in this case nothing happens to the cost curves, only the price line p shifts down to $(1-t)p$. Therefore, from the initial situation of E , the new equilibrium point becomes E' (see Fig. 20.3) and the equilibrium output falls from Oq^* to Oq'' . The profits have also decreased in the new situation.

20.2.4 Tax on the Income of Producers

The income of the producers is the profit earned, which is equal to total revenue minus total cost. If tax t per unit of profit is imposed then the producer is left with $(1-t)(\text{total revenue} - \text{total cost})$. Observe that due to imposition of this tax, the output decision is not going to get affected. Neither the price nor the MC curve is undergoing any change since both total revenue and total cost are unaffected. So here also Oq^* is unchanged. However, the income to the producer which was $(\text{revenue} - \text{total cost})$ falls to $[(1-t)(\text{total revenue} - \text{total cost})]$. And if it falls below some sustainable level then the producer may stop production and exit out of business. In that case output produced falls to zero. This case is similar to the lump-sum tax case covered in Section 20.2.1

20.2.5 Taxation under Imperfect Competition

Let us now turn to an imperfectly competitive market where there is only one producer of a commodity. This producer has monopoly power to influence the market price. We shall take the case of only per unit tax to show how it affects price and output.

Here in Fig.20.4 the average revenue curve is plotted as a downward sloping line, AR. It measures the price that a producer can charge if he wants to produce the corresponding output level. For example, if he decides to sell Oq^* amount of output he cannot charge more than OA price. And if he wants to sell more, say Oq' , he must charge a lesser price. This price is given by OA' in Fig. 20.4. Below the AR line we have the marginal revenue (MR) line. This measures the change in the total revenue if the producer decides to produce one extra unit. The MR also is downward sloping and it is below the AR line because as the seller decides to sell one unit more, he must lower the price for all units including the earlier units which gives MR lower than AR.

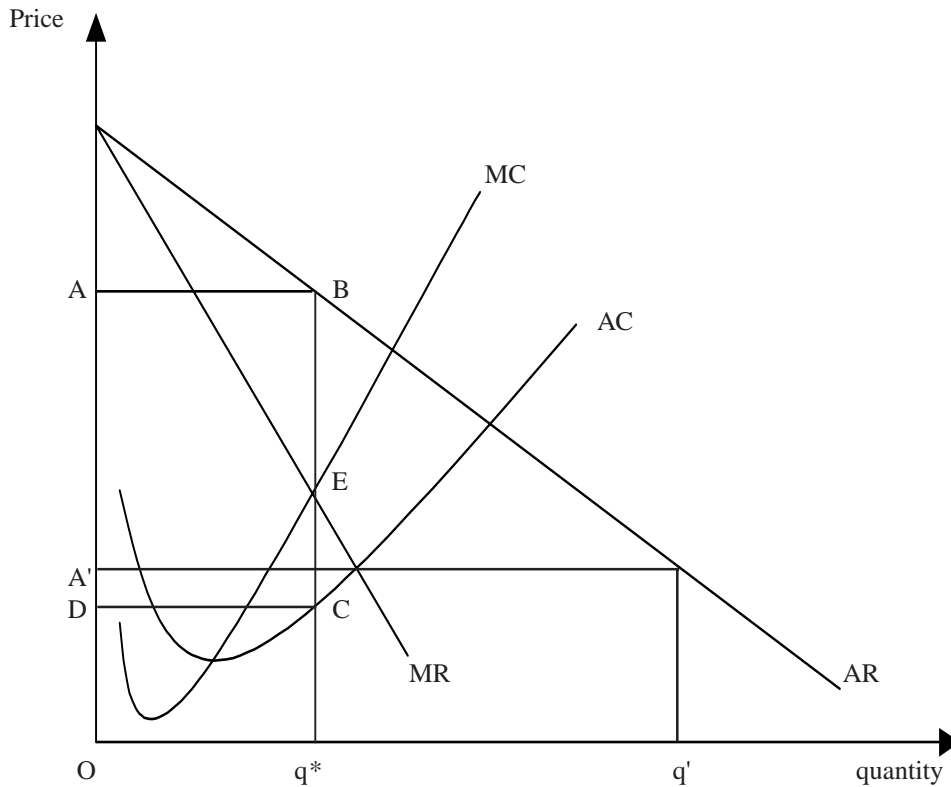


Fig. 20.4

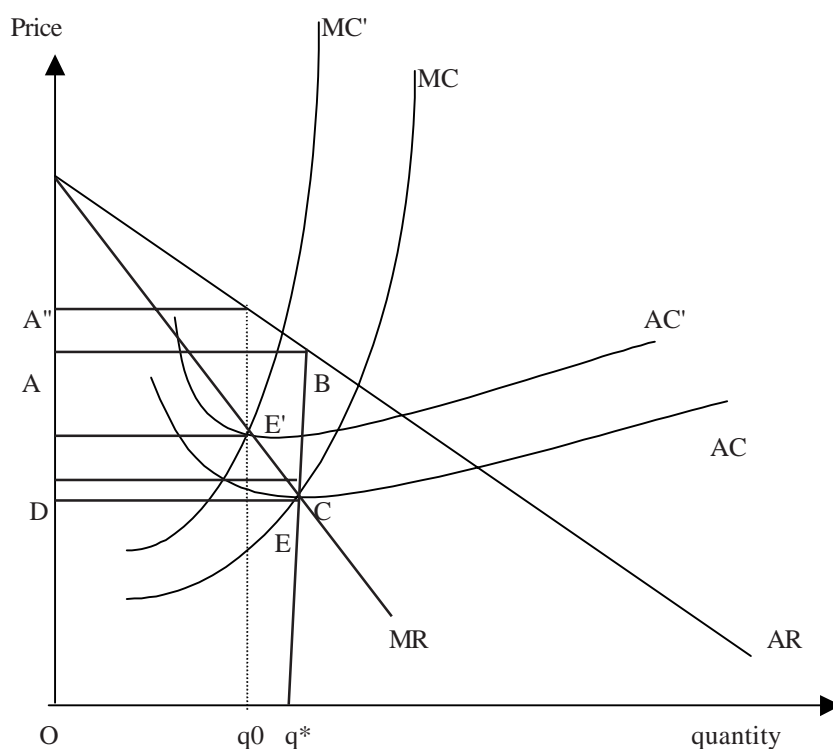


Fig. 20.5

Besides these two lines we have the familiar AC and MC curves. We are familiar with the logic of equilibrium: the producer would produce an output at which MC and MR intersect each other. That is at q^* level of output. Reason is that at an output level lower than q^* , MR is greater than MC. So by producing one unit more the producer raises his revenue more than his cost, therefore the profits will go up. This continues till q^* level of output is reached. And to the right of q^* we find that MR is lower than MC. Therefore, by producing one unit less it reduces his cost more than its revenue. So he will move to the left by producing less. At q^* the price he will charge is given by the AR line, which is Bq^* . Profits earned is total revenue minus total cost, which equals the area ABCD.

If per unit tax, t is now imposed the cost curves change. The MC curve becomes $(1+t)MC = MC'$ and the AC becomes $(1+t)AC = AC'$. In Fig. 20.5 both the curves thus shift upward. As a result, the new point of intersection between the MC' and MR is at E' and output drops to Oq^0 which is less than Oq^* . Price rises to OA'' from OA. Thus such tax reduces output, raises price and decreases the profits earned by the producer.

Check Your Progress 1

- 1) What is the rationale for imposition of taxes?
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- 2) What is the effect of taxes on the income of the producers under perfect competition?
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- 3) Do taxes lead to rise in prices under perfect competition?
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20.3 EXISTING INDIAN TAX POLICY FOR AGRICULTURAL INCOME

In India about two-third of the population are dependent on agriculture for their livelihood. Simultaneously we observe that per capita income in India is one of the

lowest in the world. About one-third of the world's poor live here. One reason for this low income level is the fact that though so many people are engaged in agriculture, productivity of labour in this sector is very low. Massive unemployment, under-employment (which means that workers are allotted far less work than they are capable of doing), unequal landholding structure, extremely low wages are the major problems/features of Indian agriculture. Many measures including taxation of agriculture have been suggested to solve these problems. But given the fact that the average level of output is very low, the issue of taxation of agriculture has always been dealt with carefully. High taxation as we have seen in the previous section may drive people out of production. With virtually no alternative employment opportunities these people may either starve or migrate to the urban areas, which are already faced with so many problems of overcrowding.

Taking this into consideration, the government policy has been not to tax agriculture income at all. Under the constitution of India, taxation of agricultural income is the right of state governments. The Central Government cannot levy tax on such income. Section 2(1A) gives a detailed definition of agricultural income. Income from agriculture up to and exclusive of the processing stage will be agricultural income. Income from processing stage and onwards will be non-agricultural income. Income from a farmhouse used for agricultural purposes will be treated as agricultural income.

Thus income from basic operations on land like cultivation, growing crops and secondary operations like land removal, digging, etc. can be classified as agricultural income and is exempt from tax. However, income from sale of trees, breeding of livestock, fishing activities, poultry farming cannot be classified as agricultural income and is not exempt from income-tax.

This blanket policy has created many problems:

- a) People engaged in non-agricultural sector have a tendency to evade taxes by somehow showing that their income is derived from agriculture. The big rich farmers are not taxed at all which cannot be rationalized. Land tax has been constant in money terms and occupies a very low share of total agricultural income. This has benefited the big farmers as they are not required to pay income tax and land revenue is quite low.
- b) Another debated clause of the agricultural income tax policy is not to tax the rent income in agriculture. Given that tenancy of land is widely practiced in India and the landlords who lease out lands in most cases are quite rich, the policy of exempting the rent income lacks a basis. Supreme Court in a case had ruled that the shareholders of a company, which is engaged in agricultural operations, could be taxed since they are not directly involved in the actual productive activities. The same logic also applies to the landlords who, like the shareholders, are not engaged in the direct agricultural activities and earn their income through merely possessing a piece of land.

In view of the above mentioned problems many proposals have been suggested from time to time to bring agriculture into the fold of direct taxes.

- a) One proposal has been to impose land taxes on the basis of ownership. Marginal and small farmers may be exempted from this tax. The emphasis on ownership in this tax is also important. Many large farmers do not cultivate the land they own; they lease them out to smaller farmers. Therefore, the tax will catch the big farmers, who own land and but do not cultivate it.
- b) To tackle the problem of non-agricultural income shown as agricultural income (for example, the farm houses in sub-urban areas, which are used for housing lavish parties, running pubs or restaurants or gardening, but completely exempted from paying any tax) the policy of imposing tax on land would come handy. There

are however debates regarding the fixation of suitable tax rates. Some contend that it should be based on productivity and potential fertility of soil. More fertile land should be taxed more.

- c) Some argue that this is not the correct policy since the quality of land can be changed by application of fertilizers, etc. Hence it should be taxed according to the nature of the crop grown on it. More valuable crops should invite a higher tax rate to the corresponding land.

While all this debate regarding determining the basis of taxation have been going on for last few decades, no effort has yet actually been made to tax the agricultural income. The agricultural rich still do not pay any tax on the large sums of money they make. The non-agricultural rich own large farmhouses, use them for hotelling, tourism and other industrial purposes and are still exempted from paying tax. In other words, the poverty of the majority of the small and marginal farmers are used by the rich people to gain tax exemption. They always harp on the fact that the Indian farmers are very poor and therefore no direct tax should be imposed on them. By giving this excuse they have ensured that they themselves do not have to pay any taxes.

What explains this state of affairs is that the policy making of our governments are too much influenced by the rich farmers and non-farmers who reap the benefits of such tax exemptions. It is a fact that an average Indian farmer is really poor and has to be provided with tax benefits. But this should not deter the authorities to tax the rich who are getting benefited by the provisions meant for the poor. However, the compulsions to stay in power make the government do things which are contrary to this logic. The farmer lobby has influenced the policy making since Independence in various ways:

- a) by turning the terms of trade in their favour against the industries
- b) securing subsidized seeds, fertilizers and power
- c) securing complete tax relief for their income.

At times the government talked of imposing a more rational tax system based on income and wealth through expert committee reports, but none of them could be implemented.

20.4 SUBSIDIES

Subsidies are just the opposite of taxes. Through taxes the government takes away money from people, subsidies transfer money from the government to the people.

20.4.1 Rationale for Subsidies

For a poor agriculture-dependent country like India, the reasons for agricultural subsidies are easily understood. Since many farmers are close to the subsistence level of living, the subsidies seek to help them carry out their production and consumption activities in a better way. Besides this fundamental objective there are several other reasons for providing subsidies:

- a) In order to increase productivity, subsidies may be given on inputs, such as seeds, fertilizers and irrigation, as a result of which they become cheap for the farmer.
- b) For introduction of improved farming inputs and technology the government may provide subsidized farming machinery (like harvester, tractor, irrigation devices) and HYV seeds.
- c) In order to promote the production of certain crops, price and input subsidies may be granted. Subsidies can be in the form of: i) cheaper inputs, ii) cheaper

transportation facilities for marketing of the harvest, iii) storage facilities, and iv) higher procurement prices offered by the authorities than the current market price.

- d) Subsidies can be granted to the farmers to produce for exports. This type of subsidies helps the farmers in becoming more competitive in the global market and in gaining a larger share of the global demand.

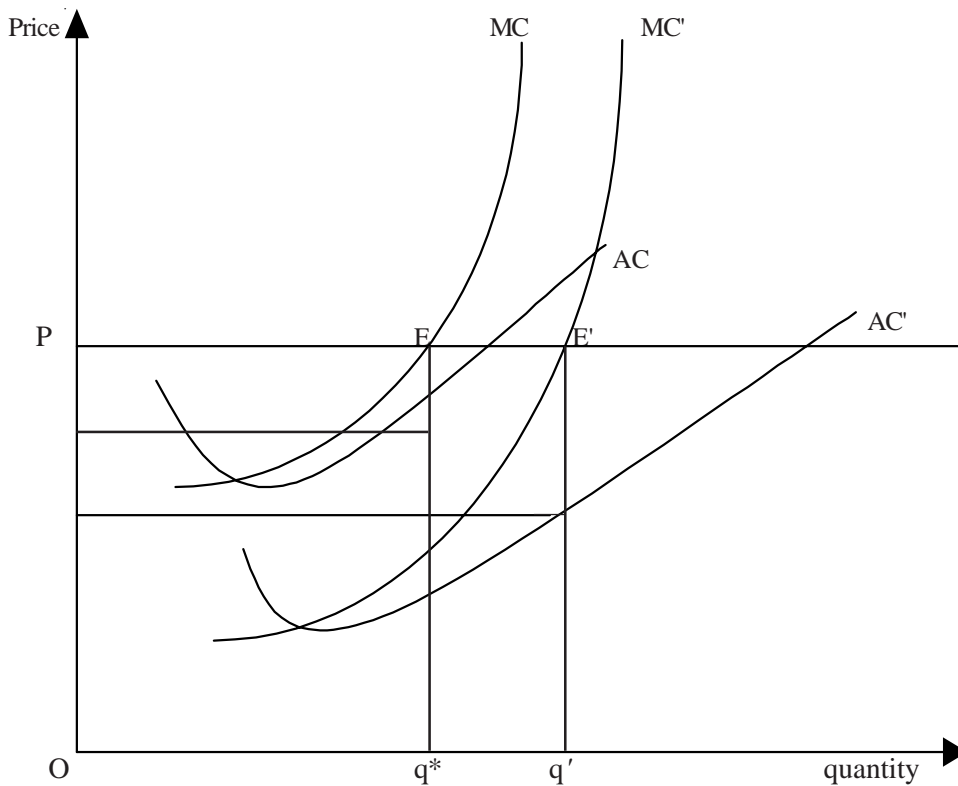


Fig. 20.6

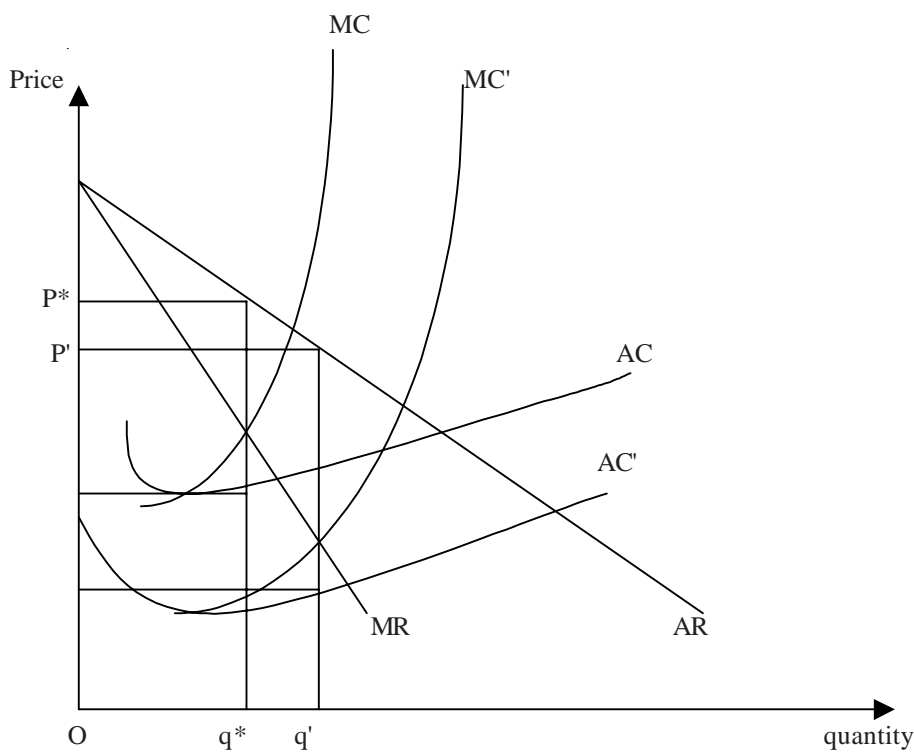


Fig. 20.7

The manner in which subsidies improve the conditions of the farmers can be seen from the tax models that we have developed in Section 20.3 of this unit. Remember that subsidies are the negative of taxes, hence for the per unit subsidy, for example,

the marginal and average cost curves in Fig. 20.1 will shift downwards. This is shown in Fig. 20.6 where the new MC and AC are denoted as MC' and AC'. Thus the point of intersection between of MC' and the p line is at E', which is to the right of E, the previous point of intersection. Thus the output and profits would increase. For an imperfectly competitive market we can similarly show the effects in Fig. 20.7. Here, as before, MC and AC shift downwards to MC' and AC'. The point of intersection with the marginal revenue curve shifts to the right. Thus the output rises and price falls; the profits can be shown to have risen.

The discussion has been entirely with respect to per unit subsidies. But since subsidies are negative of taxes the effects of lump sum subsidies, ad valorem subsidies or profit subsidies will be opposite of lump sum taxes, ad valorem taxes and profit taxes. Output will rise, profits will rise and in imperfect competition prices may fall. The effect of per unit subsidies is that they are just like input subsidies. In input subsidies the per unit cost of production decreases by cheapening seeds, fertilizers, electricity etc. So the result of such subsidies will be that the marginal and average cost will come down and as we have seen before output will rise, profits will rise and under imperfect competitions the prices will fall. Subsidies, when they lead to fall in prices, help the consumers to buy agricultural goods at affordable rates, apart from helping the producers to earn higher profits.

20.4.2 Types of Subsidies

There can be several forms of subsidies, each of which can be used for a definite purpose. We discuss them below in brief.

- a) **Input Subsidies:** Subsidies can be granted through distribution of inputs at prices that are less than the standard market price for these inputs. The magnitude of subsidies will therefore be equal to the difference between the two prices for per unit of input distributed. Naturally several varieties of subsidies can be named in this category.
 - i) **Fertilizer Subsidy:** Distribution of cheap chemical or non-chemical fertilizers among the farmers. It amounts to the difference between price paid to manufacturer of fertilizer (domestic or foreign) and price received from farmers. This subsidy ensures: i) cheap inputs to farmers, ii) reasonable returns to manufacturer, iii) stability in fertilizer prices, and iv) availability of fertilizers to farmers. In some cases this kind of subsidies are granted through lifting the tariff on the import of fertilizers, which otherwise would have been imposed.
 - ii) **Irrigation Subsidy:** Subsidies to the farmers which the government bears on account of providing proper irrigation facilities. Irrigation subsidy is the difference between operating and maintenance cost of irrigation infrastructure in the state and irrigation charges recovered from farmers. This may work through provision of public goods such as canals, dams which the government constructs and charges low prices or no prices at all for their use from the farmers. It may be through cheap private irrigation equipment such as pump sets.
 - iii) **Power Subsidy:** The electricity subsidies which implies that the government charges low rates for the electricity supplied to the farmers. Power is primarily used by the farmers for irrigation purposes. It is the difference between the cost of generating and distributing electricity to farmers and price received from farmers. The State Electricity Boards (SEBs) either generate power themselves or purchase it from other producers such as NTPC and other SEBs. Power subsidy acts as an incentive to farmers to invest in pump sets, bore-wells, etc.

- iv) **Seed Subsidies:** High yielding seeds can be provided by the government at low prices. The research and development activities needed to produce such productive seeds are also undertaken by the government, the expenditure on these is a sort of subsidy granted to the farmers.
- v) **Credit Subsidy:** It is the difference between interest charged from farmers, and actual cost of providing credit, plus other costs such as write-offs on bad loans. Availability of credit is a major problem for poor farmers. They are cash strapped and cannot approach the credit market because they do not have the collateral needed for loans. To carry out production activities they approach the local money lenders. Taking advantage of the helplessness of the poor farmers the lenders charge exorbitantly high rates of interest. Many times even the farmers who have some collateral cannot avail loans because banking institutions are largely urban based and many a time they do not indulge in agricultural credit operations, which is considered to be risky. To tackle these problems the government can provide (1) more banking operations in rural areas which will advance agricultural loans, and (2) the interest rates can be maintained low through subsidization schemes, and (3) the terms of credit (such as collateral requirements) can be relaxed for the poor.
- b) **Price Subsidy:** It is the difference between the price of foodgrains at which FCI procures foodgrains from farmers, and the price at which FCI sells either to traders or to the PDS. The market price may be so low that the farmers will have to bear losses instead of making profits. In such a case the government may promise to buy the crop from the farmers at a price which is higher than the market price. The difference between the two prices is the per unit subsidy granted to the farmers by the government. The effect will be just the opposite of what we have shown in Fig. 20.3 for the case of ad valorem taxes. The output and profits would rise. The price at which the government buys crops from the farmers is called the procurement price. Such procurement by the government also has a long run impact. It encourages the farmers to grow crops which are regularly procured. As discussed earlier, continuous procurements of foodgrains by the government has benefited the farmer.
- c) **Infrastructural Subsidy:** Private efforts in many areas do not prove to be sufficient to improve agricultural production. Good roads, storage facilities, power, information about the market, transportation to the ports, etc., are vital for carrying out production and sale operations. These facilities are in the domain of public goods, the costs of which are huge and whose benefits accrue to all the cultivators in an area. No individual farmer will come forward to provide these facilities because of their bulkiness and inherent problems related to revenue collections (no one can be excluded from its benefit on the ground of non-payment). Therefore the government takes the responsibility of providing these and given the condition of Indian farmers a lower price can be charged from the poorer farmers.
- d) **Export Subsidies:** This type of subsidy is not different from others. But its purpose is special. When a farmer or exporter sells agricultural products in foreign market he earns money for himself, as well as foreign exchange for the country. Therefore, agricultural exports are generally encouraged as long as these do not harm the domestic economy. Subsidies provided to encourage exports are referred as export subsidies.

Check Your Progress 2

- 1) What is the rationale of providing subsidies to the farmers?

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2) What are the different forms in which subsidies can be given to farmers?

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20.5 SUBSIDIES: EFFECTIVENESS, EXTENT AND FUTURE PROBLEMS

One notable point about subsidies is that it raises the profit level of the farmers. And this is true for all farmers who own land, bear cost of production to produce for the market or for self-consumption. But what about the agricultural labourers? You may be aware that about 40 per cent of people who are associated with agriculture are landless labourers. They are not benefited anyway by all these subsidies. So if the purpose of the government is to improve the living conditions of the poorest sections, it should go beyond the subsidies. It should effectively implement measures like fixing of minimum wage and regular, proper amendments of its levels with changing prices.

For the owner cultivators also, how far the subsidies have been helpful is not above doubt. As we have said earlier, procurement prices, HYV seeds, irrigation subsidies granted to the farmers have helped India fight food crisis and achieve self sufficiency in foodgrains. We are also aware that to avail the benefits of cheaper pumpsets, fertilizers, and electricity a farmer has to have a minimum amount of land and capital at his disposal. Some of the new technologies are not scale-neutral with respect to resources; productivity improves if someone has a sizeable volume of resources. So increase in production was achieved by subsidizing the rich farmers and making them richer. The poor farmer today is where he was before. In fact in many cases he became poorer because of the increase in procurement prices. The farmers with very small land-holdings, being net buyers of foodgrains, were left with lower real income level.

Subsidies have remained a major problem in the expenditure structure of the government. In the year 1990-91 major subsidies amounted to 1.7 per cent of the GDP. Over the years however, this has declined and remained at 1.3 per cent of GDP in 2000-01. Food subsidy (due to public distribution system operations) and input subsidy (particularly fertilizer) constitute the major components of total subsidy in India. Low user charges in sectors such as power, road transport, and irrigation have also impaired the state budgets, as these are provided by the state governments.

Table 20.1 gives a comparison of the subsidies granted by India with other developed countries in the field of agriculture.

Table 20.1 : Agricultural Subsidies in Selected OECD Countries and India (in US \$)

Country	Base Year (1986-88)		1997		1998		1999	
	Per Farmer	Per Hectare	Per Farmer	Per Hectare	Per Farmer	Per Hectare	Per Farmer	Per Hectare
1	2	3	4	5	6	7	8	9
Canada	12000	75	7000	42	8000	48	9000	52
E U	11000	707	16000	815	18000	890	17000	831
Japan	15000	10048	21000	10211	22000	10005	26000	11792
USA	17000	98	12000	73	19000	116	21000	129
OECD	11000	187	10000	189	11000	209	11000	218
India	11	8	55	43	61	46	66	53

We observe from Table 20.1 that agricultural subsidies per farmer and per hectare of land are quite low in India compared to OECD countries. However, OECD comprises developed economies. In these economies subsidies account for a very low share of their per capita income.

The question of subsidies is hotly debated in our country. Many people recommend abolition of subsidies. Advocates of the policy of scrapping subsidies say that subsidies distort prices; they do not let the market allocate resources efficiently. Another justification given for scrapping subsidies is that it leads to higher fiscal deficit which causes problems like higher inflation, higher balance of payment difficulties and falling exchange rate.

It is often said that subsidies results in ‘crowding out’ of public investments in agricultural capital formation. The resources available to the government are limited. If it is spent on subsidies, it cannot be utilized on irrigation, roads, health, etc. However, as we have seen earlier, subsidies serve many useful purposes. Decisions regarding changing the nature and extent of subsidies should, therefore, be made only after properly evaluating their consequences.

Check Your Progress 3

1) Does India provide a higher agricultural subsidy than the developed countries?

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2) What is the rationale for abolishing subsidies?

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20.6 LET US SUM UP

Agricultural income on an average in India is very low. Keeping this in view the government has chosen the policy of not taxing it at all. However, it is the rich farmers who are taking the maximum benefits of such exemptions. Same is true for the non-agricultural rich who show their income to be agricultural and reap the benefits. Government provides agricultural subsidies for various reasons. Subsidies in general raise output and profits, and in certain cases reduce price. However, it should be given to poor farmers and for crops which the country needs for development.

In India subsidies has served its purpose at many crucial junctures. It has helped in raising the living standards of poor peasants, mitigated the food crisis. However, in many cases it is cornered by the rich farmers. They use their power and influence to take benefits of the subsidies. In fact in many cases such uneven distribution of subsidies have led to greater inequality in agriculture. The remedy is not to do away with subsidies altogether. The high level of impoverishment of the majority of Indian farmers and the need for food security of the poor justifies that subsidies should be continued. But it must be ensured that it is targeted to the poor farmers and consumers.

20.7 KEY WORDS

Imperfectly competitive market : is the market form where there are only a few producers and where goods are differentiable (i.e., each producer produces goods which are somewhat different from others). Therefore, each producer has some limited power to influence the market price. However, if price is raised output sold falls due to a downward sloping demand curve.

Perfectly competitive market : is the market form where the goods produced by all the producers are identical and each producer produces a very small amount of the aggregate output produced in the market. As a result no producer can influence the price.

Procurement Prices : are the prices at which the government purchases crops from the farmers. Procurement is undertaken to run the public distribution system and to ensure that the poor farmers get remunerative prices for their produce.

- Public distribution system** : This mechanism helps the Indian government to make basic consumption articles available to the poor sections of the country at low prices.
- Public goods** : are those goods whose utility cannot be limited to one or two individuals. Take the case of a street light, it benefits all of those who pass by the street - not any particular individual on the street. Also, consumption of such a good by one person does not exclude anyone else from consuming it.

20.8 SOME USEFUL BOOKS

Datt, R. and K. P. M. Sundaram, 2001, *Indian Economy*, S. Chand and Co., New Delhi.

Kapila, U. (ed.), 1990, *Indian Economy since Independence: Different Aspects of Agricultural Development*, vol II, Academic Foundation, Delhi.

Misra, S. K. and V. K. Puri, 2001, *Indian Economy*, Himalaya Publishing House, New Delhi.

Parikh, K. S., 1997, *India Development Report 1997*, Oxford University Press.

Patnaik, U., 1999, *The Long Transition*, Tulika Publications, New Delhi.

Raj, K. N., 1990, *Organizational Issues in Indian Agriculture*, Oxford University Press, New Delhi.

20.9 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Section 20.1 and answer.
- 2) See Sub-section 20.2.4 and answer.
- 3) No.

Check Your Progress 2

- 1) Go through Section 20.1 and Sub-section 20.4.1
- 2) See Sub-section 20.4.2 and answer.

Check Your Progress 3

- 1) No. See Section 20.5 and answer.
- 2) See Section 20.5 and answer.

UNIT 21 PUBLIC DISTRIBUTION SYSTEM AND FOOD SECURITY

Structure

- 21.0 Objectives
- 21.1 Introduction
- 21.2 Self-sufficiency in Foodgrains
 - 21.2.1 Realisation of Food Self-sufficiency
 - 21.2.2 Food Self-sufficiency and Food Security
 - 21.2.3 Prevalence of Malnutrition
- 21.3 Production and Availability of Foodgrains
- 21.4 Objectives of Public Distribution System
 - 21.4.1 Operational Aspects
 - 21.4.2 Procurement Mechanism
- 21.5 Public Distribution Mechanism
 - 21.5.1 Target Beneficiaries for PDS
 - 21.5.2 Off-take under PDS
 - 21.5.3 Consequences of Excess Stock
 - 21.5.4 Decentralisation of PDS
- 21.6 Welfare Schemes on Food Security
- 21.7 Exports of Foodgrains
- 21.8 Review of Performance of PDS
- 21.9 Let Us Sum Up
- 21.10 Key Words
- 21.11 Some Useful Books
- 21.12 Answers/Hints to Check Your Progress Exercises

21.0 OBJECTIVES

After going through this unit you will be in apposition to:

- explain the concepts of food self-sufficiency and food security;
- explain the role of the public distribution system in providing food security;
- identify the weaknesses of the public distribution system; and
- suggest measures to improve the efficiency of the public distribution system.

21.1 INTRODUCTION

You may agree that everybody in the society should have access to certain basic requirements such as food, shelter and clothing. Apart from these there should be access to essential services such as safe drinking water, health and education. This is referred to as the concept of basic needs. The rich and middle-income groups may not find it difficult to fulfill their basic needs. However, it may be a vital issue for the poor section of the society.

The concept of basic needs is very broad and takes care of many aspects as mentioned above. However, the poor segment of population in India may not have the purchasing power to have adequate amount of food or reasonable shelter or clothing. In such cases it becomes a responsibility of the government to provide the basic needs. In this unit we will discuss the provision of food security to the poor section in India.

21.2 SELF-SUFFICIENCY IN FOODGRAINS

You have learnt in 'EEC 12: Indian Economic Development since Independence' that achievement of self-sufficiency is one of the important objectives of Indian planning. In this context realization of self-sufficiency in foodgrains is quite important.

You have seen in earlier units that the level of agricultural production was low in the early years of planning. Also the growth rate in foodgrains production was low. In order to meet the demand for food India had to depend on imports of foodgrains from abroad. Thus India was not self-sufficient in foodgrains at that time. The severe droughts in 1965 and 1966 forced India to seek food aid from foreign countries on a massive scale.

21.2.1 Realisation of Food Self-sufficiency

During the mid-1960s India adopted the green revolution technology (new high yielding varieties of Mexican wheat and dwarf rice varieties) which led to remarkable growth in agricultural production. India achieved self-sufficiency in foodgrains during the mid-1970s. Since then India's reliance on foodgrains imports for feeding its populace has almost stopped.

It is true that India has been able to avoid large-scale famine deaths in the post-independence years. During the British rule, famine deaths in India used to be a common occurrence. Shortly before Independence, 4 million people died during the Great Bengal Famine of 1943. Since Independence there has not been any such incident of large-scale deaths due to famine. There is, however, widespread prevalence of malnutrition every year. Also there are reports of starvation deaths taking place in various parts of the country. Despite high growth and self-sufficiency in food production over the years, a significant portion of our population still lacks food security.

21.2.2 Food Self-sufficiency and Food Security

In a developing economy like India where foodgrains have the largest share in the food basket of the poor, food security basically means that people have physical and economic access to foodgrains. As far as physical access to foodgrains is concerned, it can be achieved by augmenting production (or even by imports of foodgrains). However, this alone is not sufficient. Food security requires that people also have economic access to food, i.e., they have enough purchasing power so that they can purchase the required amount of food. Although India has become food secure in recent years, there are according to FAO estimates, about 200 million Indians who are "chronically food insecure". These include marginal farmers, Scheduled Tribes, Scheduled Castes, landless labourers and casual labourers.

Secondly, self-sufficiency in foodgrains at the national or macro level does not necessarily mean self-sufficiency at the regional or state level. In India only five states have a surplus food production while other states are food deficit states. In order to maintain food security there should be smooth flow of foodgrains from surplus to deficit states.

Thirdly, higher production of foodgrains does not automatically solve the problem of food security. It alone does not guarantee that food is available to those who need it. Such a situation arises when poor people cannot afford to buy adequate quantities of foodgrains simply because they do not have the required income or purchasing power. This could give rise to a highly deceptive situation of food surplus.

21.2.3 Prevalence of Malnutrition

The physical as well as economic access to food does not guarantee that people get

a balanced diet. Lack of balanced diet results in malnutrition. Moreover, poor households people may not be in a position to afford a diet which will contain adequate calorie intake.

These issues are important as more than one half of women and children in India are undernourished. Almost half the women in the age group of 15-49 and three-fourths of the children are anaemic. According to an ORG-MARG survey, “almost one fifth of all rural households face the prospects of hunger, 14 per cent of all households do not get two square meals a day”. Even by the government’s own estimate (in 2000), around one crore families do not get two square meals a day. The recent survey data from National Families Health Survey 1998-99 show that 47 per cent of children in the 0-4 age group are malnourished on a weight-to-age criteria. According to the National Nutrition Monitoring Bureau data on rural population in ten states only half of the adults had normal nutrition status while the rest suffered from different degrees of chronic energy deficiency.

21.3 PRODUCTION AND AVAILABILITY OF FOODGRAINS

The entire foodgrains produced in India is not available for consumption. Part of it is used as seeds to be used in next year while some portion go as waste due to improper storage or loss during transit. Still some part of the produced foodgrains will be required as animal feed. The remaining portion, which is available for human consumption, is termed as net production. In the Indian case about 87.5 per cent of total foodgrains production is available for human consumption while 12.5 per cent of foodgrains production is used as seeds or animal feed or go as waste.

The availability of foodgrains may be different from production. Availability can be more than production through two means: First, availability can be increased by importing foodgrains from abroad. On the other hand, availability will be reduced if there is exports of foodgrains. Second, stock of foodgrains is maintained by the government and by individuals. Availability in a particular year can be increased by drawing upon the existing stock of foodgrains. Thus change in stock also influences availability.

Growth of agricultural production slowed down considerably in the 1990s as compared to the earlier decade. Compared to 3.2 per cent per year in the 1980s, food production in the 1990s has grown only at 1.5 per cent which is below the population growth rate. This decline in growth has taken place despite the fact that during the greater part of the 1990s normal monsoon rain was received.

Table 21.1: Net Availability, Procurement and Public Distribution of Foodgrains

(million tonnes)

Year	Net Production	Net Imports	Net Availability	Procurement	Public Distribution	Imports as% of availability	Procurement as % of production
1	2	3	4	5	6	7	8
1960-61	72.0	3.5	75.7	0.5	4.0	4.6	0.7
1970-71	94.9	2.0	94.3	8.9	7.8	2.1	9.3
1980-81	113.4	0.7	114.3	13.0	13.0	0.6	11.4
1990-91	154.3	(-)0.1	158.6	19.6	20.8	Neg.	12.7
2000-01	182.8	(-)1.4	167.5	35.5	12.8	(-)0.8	19.7
2001-02	171.6	(-)2.7	156.3	42.2	11.3*	(-)1.7	24.6

* up to November 2001

Source: Economic Survey

As you will see later, the government procures or purchases foodgrains from the market and maintains a stock. The purpose of keeping such a stock is to stabilize prices and assure that the poor get access to food. As the growth rate in foodgrains during the 1990s was lower than the population growth rate, there should have been a decline in the stock of foodgrains because of higher demand. However, this did not happen. Rather the foodgrains stock increased. You can see from Table 21.1 that procurement as a percentage of net production has increased from 9.3 per cent in 1970-71 to nearly 25 per cent in 2001-02. In the absence of commensurate increase in public distribution foodgrains stock with the government has increased to 58 million tonnes in 2002.

As a result of the slow growth in food production and increasing foodgrains stocks, the amount of foodgrains available to the public has declined from an average of 510 grams per day per person in 1991 to 458 grams in 2000 (see Table 21.2). According to the provisional estimates, per capita per day availability of foodgrains is only 417 grams in 2001. Per capita availability of pulses (which are the main source of protein) has fallen much more drastically. It has declined from 67 grams per person per day in 1961 to 32 grams in 2000. According to the provisional estimates, it is only 26.4 grams in 2001.

It is argued by some that consumption of foodgrains per capita is declining because there is growing substitution of foodgrains by non-cereal foods namely fruits, vegetables, milk, fish, egg and meat. The 55th round (1999-2000) of the National Sample Survey (NSS) on household consumption shows declining share of consumption expenditure on food and, within food, on foodgrains in particular. Other researchers, however, point out that, since rising production of animal husbandry products (milk, eggs and meat) means rising animal feed requirements, the total cereal demand in the economy should, in fact, increase rather than decline.

According to the Ninth Five Year Plan document, at the all-India level people spend on an average about 63 per cent of their total expenditure on food in the rural areas and about 55 per cent in the urban areas. Of the expenditure incurred on all food items the expenditure on foodgrains accounts for 45 per cent in the rural areas and about 32 per cent in the urban areas. The bottom 30-40 per cent of the population spend over 70 per cent of the total expenditure on food. Of this expenditure on food, people in rural areas spend about 50 per cent on foodgrains while those in the urban areas spend about 40 per cent.

Table 21.2: Net Availability of Cereals and Pulses

Year	Per capita net availability per day (grams)		
	Cereals	Pulses	Total
1961	399.7	69.0	468.7
1971	417.6	51.2	468.8
1981	417.3	37.5	454.8
1991	468.5	41.6	510.1
2000	426.0	32.0	458.0

Source: Economic Survey

Agricultural Prices

In recent years, there has also been increasing domination of market forces in the food sector. As a result of these factors, including the government policies of continuously raising procurement prices, food prices have soared too high, which has put the food security of millions of households in the country at a risk.

Although the current rate of inflation in the economy is low, high inflation rate all through the decade of 1990s has led to a sharp rise in absolute price levels of most of the essential commodities, especially of food articles. The movement in wholesale price index for agricultural and industrial products during the 1990s indicates that prices of agricultural products have increased at higher rate than the prices of industrial products (see Table 21.3). One of the most important determinants of the standard of living is the price of foodgrains. This has major impact on their real income, especially for the relatively poorer sections whose incomes are largely spent on foodgrains.

Table 21.3 : Index Numbers of Wholesale Prices of Agricultural Commodities Relative to Manufactured Products (Base: 1993-94 =100)

Year	Price Index Agricultural Products*	Price Index of Manufactured Products	Agricultural Price index as per cent of Manufacturing price
1994-95	116.1	112.3	103.3
1995-96	126.0	121.9	103.3
1996-97	136.4	124.4	109.7
1997-98	140.3	128.0	109.6
1998-99	157.2	133.6	117.7
1999-00	159.1	137.2	116.0
2000-01	163.7	141.7	115.5

* Composite index of the sub-groups Food Articles and Non-Food Articles

Source: Economic Survey

Therefore, it is essential to protect the poor from a continuous increase in foodgrains prices. However, an upward pressure on foodgrains prices has been an in-built phenomenon in our system. The procurement prices of foodgrains have been increased every year keeping in view the argument that it will provide an incentive for the farmers to increase production.

Check Your Progress 1

- 1) What is meant by food security? Can self-sufficiency in foodgrain guarantee food security?

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- 2) What is the extent of malnutrition among poorer sections of our society?

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- 3) Describe the trend in growth of food production in the country. What impact the slow growth in food production in recent years has had on per capita net availability of cereals and pulses?

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21.4 OBJECTIVES OF PUBLIC DISTRIBUTION SYSTEM

The objectives of the public distribution system (PDS) are threefold: i) price stability, ii) price support to farmers, and iii) making grain “affordable”, through distribution from surplus to deficit regions and to the poor. You may have observed that immediately after crop harvest there is excess supply in the market which brings down prices. The marginal and small farmers sell part of their produce under distress to meet pending demand. These groups are exploited by local traders who offer very low price for purchase of foodgrains. The procurement of foodgrains by the government helps the farmers in getting remunerative prices. Similarly, in case of temporary shortages the PDS has an important role to play. It guards against sharp price rise by releasing increased supply to the market. Thus PDS works to stabilize prices as well as it offers price support to farmers. Moreover, there is a need to transfer foodgrains from surplus states to deficit states. The PDS caters to this need.

The public distribution system (PDS) is supposed to insulate the poor from the impact of rising prices of essential commodities and maintain their minimum nutritional status. The modern public distribution system for foodgrains was set up in 1965, as part of an overall strategy of food management.

An important aspect of the country’s food management policy is to maintain a *buffer stock*. This constitutes an essential component for ensuring food security through the public distribution system. The buffer stock provides the basic and most flexible instrument for moderating short-term effects of supply or production shortfalls. The prescribed buffer stock level during a year ranges from a maximum of 24.3 million tonnes (14.3 million tonnes of wheat and 10 million tonnes of rice) in July to a minimum of 20.8 million tonnes (4.0 million tonnes of wheat and 11.8 million tonnes of rice) in April.

21.4.1 Operational Aspects

PDS is operated under the joint responsibility of the centre and state governments. The central government has the responsibility for procurement, storage, transportation and bulk allocation of essential commodities namely wheat, rice, sugar, imported edible oil and kerosene to the states. These commodities are made available at fixed Central Issue Prices (CIPs), which are determined by the central government. However, the CIPs has been lower than the economic costs of foodgrains which includes purchase, storage and transportation costs. Thus PDS generally involves subsidies which is borne by the central government. The state governments have the responsibility of distribution to consumers including target groups through a network of 4, 63,000 fair price shops (FPSs).

21.4.2 Procurement Mechanism

The Food Corporation of India (FCI) is the main agency for procurement, storage and distribution of foodgrains. Foodgrains (wheat, paddy & coarsegrains) are procured by the FCI in association with State procuring agencies. Rice is procured from rice millers and dealers under statutory levy. Procurement of foodgrains under price support serves the twin purposes of providing remunerative prices to the farmers and of building buffer stock of foodgrains.

Wheat, paddy, and coarse-grains are procured in Purchase Centers opened in Surplus States by FCI/State Agencies. Quantities procured by the State Governments/Agencies are taken over by FCI on payment of incidental charges etc. The Rabi Marketing Season commences on 1st April every year. Bulk of the procurement is completed within 45 days.

Procurement of rice through statutory levy: A certain percentage of rice milled by millers has to be handed over to FCI under the Levy Orders issued by the State Governments under the Essential Commodities Act. The levy percentage varies from 10% in Pondichery to 75% in Haryana, Punjab and Orissa. The levy prices are announced well before the Kharif Marketing Season, which begins on 1st October every year.

The PDS, however, has not been very successful in providing food security to the poor. In the past few years the importance of the PDS as an outlet for foodgrains at controlled prices has diminished greatly as a result of steep and frequent increases in procurement prices followed by more than proportionate increase in the central issue prices of foodgrain (see Tables 21.4 and 21.5). In 1991-92 the minimum support (procurement) price (MSP) of wheat was Rs. 277 per quintal. It increased to Rs. 610 in 2000-01 while the MSP of wheat for Rabi 2001-02 was fixed at Rs. 620 per quintal. A similar increase is observed in the case of paddy also.

The real beneficiaries of the large increase in procurement prices have been the surplus farmers of wheat and rice in four states, which account for nearly 90 per cent of the procurement. Andhra Pradesh, Punjab and Haryana are the major rice procuring states, while Punjab, Haryana and Uttar Pradesh account for the bulk of wheat procurement. According to R. Radhakrishna, "The strong arm tactics of the powerful farm lobbies in prosperous states like Punjab and Haryana have actually hurt a large number of farmers in other parts of the country".

Table 21.4 : Minimum Support/Procurement Price of Wheat and Paddy

(Rs./quintal)

Crop year	Wheat	Paddy (common variety)
1991-92	275	230
1992-93	330	270
1993-94	350	310
1994-95	360	340
1995-96	380	360
1996-97	475	380
1997-98	510	415
1998-99	550	440
1999-00	580	490
2000-01	610	510
2001-02	620	530

Source: Economic Survey

21.5 PUBLIC DISTRIBUTION MECHANISM

The PDS, till a few years ago was a general entitlement scheme to all consumers without any targeting. This system had many shortcomings. According to the Planning Commission, despite the mounting food subsidy bills, the system has failed to translate the macro level self sufficiency in foodgrains achieved by the country into household level food security for the poor. In a system with access to all, rich and poor alike, the quantum of PDS supply to each household formed only a small proportion of a family's total requirement. Another fallout of the universal PDS has been that the states with the highest incidence of poverty, viz., Orissa, Bihar, Madhya Pradesh and Uttar Pradesh are the ones whose per capita PDS off-take has been the lowest. The universal PDS, thus, did not serve the poor well especially in the poorer states. A need was felt for devising a system of targeting so that the subsidies benefit only those sections that the state wants to protect. A targeted system was also felt necessary in order to contain the total food subsidy to the minimum necessary level.

21.5.1 Target Beneficiaries for PDS

In June 1997, Targeted Public Distribution System (TPDS) was introduced, under which two sets of PDS issue prices were announced, one each for Above Poverty Line (APL) and Below Poverty Line (BPL) households. Since the inception of the TPDS, both the APL and BPL prices have been revised several times.

Table 21.5 : PDS Issue Price of Wheat and Rice

(Rs./quintal)

Year	Wheat	Rice
1990-91	234	289
1991-92	280	377
1992-93	280	377
1993-94	330	437
1994-95	402	537
1995-96	402	537
1996-97	402	537
1997-98		
BPL	250	350
APL	450	700
1998-99		
BPL	250	350
APL	450	905
1999-2000		
BPL	250	350
APL	682	905
2000-01		
BPL	415	565
APL	830	1130
2001-02		
BPL	415	565
APL	610	830
FCI's Economic Cost		
1997-98	799	937
1998-99	800	995
1999-00	872	1111
2000-01	830	1148
2001-02	839	1174

Sources: Economic Survey 2001-02

In order to cut down food subsidy, the Union Budget for 2000-01 proposed drastic revisions in the PDS with far reaching implication for the food security of the poor. The government fixed the final price of foodgrains to below poverty line (BPL) families at 50% of economic cost and to above poverty line (APL) families at the economic cost. Consequently, the selling price of wheat under PDS to BPL and APL families was increased drastically. This, in fact, was the largest ever increase in the PDS prices. The PDS, instead of insulating the poor from rising open market prices, has become an instrument for pushing up prices.

As a result of the hike in PDS prices of foodgrains, the difference between the free market and the PDS prices has narrowed down significantly. In fact, market prices are often lower than APL prices for wheat supplied through PDS. This is because of the massive inefficiencies in the Food Corporation of India (FCI) operations which have made 'the FCI's economic cost' (incurred for procurement, storage and transportation) more than the open market price. The FCI's charges for handling and storage of foodgrains are absurdly high. The annual stockholding cost for Food Corporation of India has been rising rapidly for many years. It was Rs. 13,518 crore in 2001- 02. The government expenditure on buffer-stocking foodgrains is now more than its entire Plan and non-Plan outlay on agriculture, rural development, irrigation and flood control. The difference between the economic cost and the CIP, called the consumer subsidy, is borne by the central government. The consumer subsidy and the carrying cost of buffer stock together add up to total food subsidy. The huge amount of food subsidy helps sustaining food prices at very high levels.

21.5.2 Off-take under PDS

The off-take of foodgrains under PDS has been declining for several years (see Table 21.6). Whenever the off-take is less than procurement, these operations unwittingly reduce overall market supply and push up prices. Procurement of foodgrains, on the other hand, has been witnessing an increasing trend. As a result, stocks of foodgrains at FCI have reached unmanageable levels. The stock of foodgrains was 63 million tonnes in July, 2002. The country does not need a buffer stock of more than 16.8 million tonnes of foodgrains in the month of January to tide over any problems caused by unforeseen factors. Extra stocks are being maintained at an enormous cost to the nation. Even though the problem of malnutrition and semi-starvation is widespread in the country, food stocks at the FCI have been increasing primarily because the people's purchasing power has declined in recent years. Huge stocks give a false impression of abundance.

Table 21.6 : Foodgrains Procurement, Offtake under PDS, and Central Stocks

(Million tonnes)

Year	Procurement (Central Pool)	Offtake (Under PDS)	Central Stocks
1996- 97	20.38	19.66	20.0
1997 -98	23.63	16.98	18.2
1998- 99	24.49	18.69	24.2
1999- 00	31.41	17.07	31.4
2000- 01	35.45	11.72	45.7
2001- 02*	33.96	8.38	58.0

Note: *Procurement as on January 29, 2002; Off-take (under PDS) up to December 2001; Central Stocks as on January 1, 2002.

With the frequently announced hike in the issue prices, the offtake of foodgrains from the PDS has fallen significantly. Purchases in APL category have stopped altogether because of the government policy of selling foodgrains to APL families at the economic cost. The government's policy has in effect eliminated the APL population completely from the PDS network. Faced with the problem of massive stocks, the government in July 2001 lowered the price of wheat and rice sold through the PDS to families in the APL category by 30 per cent.

21.5.3 Consequences of Excess Stock

The Controller and Auditor General of India (CAG) has been highly critical of the government's procurement and distribution policy. CAG, in a paper published in December 2000, states that 'This policy of procurement, without regard to requirement, has had several deleterious consequences. First, it has deprived consumers of more free access to grain. Had the foodgrains not been procured, to that extent a larger quantity would have been available in the market. Second, it is not the case that this additional procurement was in the interest of expanding the buffer stock. The stock of foodgrains has generally been significantly higher than buffer stock norms and this extra stocking has led to extra costs estimated at about Rs.1200 crore per year between 1993-94 and 1997-98. Third, procurement beyond requirement adversely affected prices. Had the additional supplies been available in the market, it would have had a sobering effect on prices. Lastly, it is common knowledge that losses during storage depends upon the duration of storage, the longer the storage the higher the losses.'

Ever rising MSP for wheat and rice has worked to check crop diversification in major grain producing states like Punjab and Haryana. Although ecologically unsustainable in the long-run, the wheat-rice cycle is highly rewarding economically compared to other available options. High procurement prices of rice encourages farmers in these states to produce rice, a highly water-intensive crop, despite the fact that these regions are not suitable for rice production from long-term sustainability point of view. The report on long-term grain management by the Abhijit Sen Committee finds this 'mono-crop-strategy' environmentally unsustainable. Free electricity to the farmers leads to wasteful use of a scarce common property resource like ground water which cannot be sustained for long. As a result of intensive use ground water for irrigation, water table in these regions has gone down. Farmers now have to bore much deeper for water, which has drastically increased irrigation costs.

21.5.4 Decentralisation of PDS

The government in the budget for 2001-02 proposed a significant change in management of the food economy. It was proposed that the Centre plays a considerably reduced role in future. Instead of providing subsidised foodgrains, financial assistance is to be provided to the state governments to enable them to procure and distribute foodgrains to BPL families at subsidised rates. FCI's responsibility will be limited to procurement of foodgrains for maintaining food security reserves and for the state governments who will assign it the task on their behalf. However, given the poor financial condition of most states, it is difficult to imagine state governments adequately discharging this important responsibility. Most of the states are deep into a debt trap. They are borrowing even to pay the salaries to their employees.

The government so far has been unable to effect this policy change towards decentralization of procurement of foodgrains. Decentralised procurement has started only in a few states (UP, MP and West Bengal). State governments of Punjab, Haryana and Andhra Pradesh (which are surplus states) and Kerala (a deficit state) are strongly opposed to the very basic philosophy of decentralized procurement. They point out to the lack of necessary infrastructure and financial resources at the disposal of the states. Without taking steps to remove these deficiencies, decentralized

procurement would increase the likelihood of less procurement, even non-procurement, which would be against the interests of farmers (who would be compelled to resort to distress sales). Traders may be the only beneficiaries of such a system. The high level committee on long-term grain policy, headed by Abhijith Sen, has in its report recommended continuation of the existing minimum support price base system of open-ended procurement of foodgrains by the FCI. The committee has, however, advocated rationalization of the MSP to reflect actual production costs incurred by farmers.

21.6 WELFARE SCHEMES ON FOOD SECURITY

Apart from the distribution of foodgrains at concessional prices to the poor households, the government has introduced a number of grain-based welfare schemes. These schemes cater to the needs of the poorest families, the disabled and aged who do not have regular income support.

The Government in December 2000 launched a scheme, the *Antyodaya Anna Yojana*, with the aim to provide 25 kg. of foodgrains per family per month to one crore poorest of the poor families (out of the total 6.52 crore BPL families) at subsidized rates of Rs.2 per kg. of wheat and Rs.3 per kg. of rice. The identification of the poorest of the poor families is done by gram panchayats and gram-sabhas. In contrast with other components of the public distribution system, this programme is apparently working reasonably well. The scheme is however too limited in scope to make any dent on poverty. The coverage includes only a small fraction of the poor in the country. Given that a typical family's food requirement is about 50 kg per month, 25 kg meets only half of the monthly requirement. The Antyodaya Scheme is also unlikely to result in any significant reduction in foodgrains stocks as it could result in an outflow of 3 million tonnes at most from the stock of over 60 million tonnes.

The Government started *Annapurna Scheme* under the Ministry of Rural Development from 2000–01. 10 kg of foodgrains per person per month is supplied under the scheme free of cost to poor senior citizens or persons above the age of 65 but not drawing pension under the National old Age Pension Scheme.

In August 2001 the Government announced a scheme, the *Sampoorna Gramin Rozgar Yojana* under which states would be supplied 5 million tonnes of foodgrains monthly by the center free of cost for undertaking employment based programmes. Some of the other welfare schemes of the Central Government are Food for Work Programme launched in January 2001 in states/ areas affected by natural calamities and Mid Day Meal Scheme.

21.7 EXPORTS OF FOODGRAINS

As mentioned earlier, India was a major importer of foodgrains till the middle of the 1970s. During the later part of the 1970s and 1980s, Indian imports of foodgrains were quite small. India has now become a net exporter of foodgrains (see Table 21.7). The government has recently removed quantitative restrictions on the export of grain. India exported 1.9 million tonnes of rice in 2001. In 2002, exports of rice are expected to rise to 4.2 million tonnes (16.8% of global rice exports). In 2001–02, more than 5 million tonnes of wheat was exported. India has now become the seventh largest wheat exporter in the world. Our foodgrain exports are rising, even while a large portion of the country's population goes hungry. The export price of wheat has been pegged at Rs. 4310 per tonne. The government is selling grain (wheat and rice) to foreign nationals at a price at which it is sold to the BPL families, i.e., at half of FCI's economic cost. The government refuses to cut issue price for the BPL families on the contention that it would further increase the subsidy burden. But, at the same time, it continues to provide heavy subsidy to foodgrain exports. This way, benefits

of food subsidy, paid for by the Indian tax payer, are being enjoyed more by consumers and animal feed manufacturers in countries like South Korea, Malaysia, Bangladesh, UAE, Indonesia, Oman, Iraq and the Philippines rather than the poor Indian families it was intended for.

Table 21.7 : Net Imports of Foodgrains

(Million Tonnes)

Period	Net Imports
1951 – 60	29.2
1961 – 70	57.3
1971 – 80	17.5
1981 – 90	15.0
1991- 2000	(-) 7.3

Source: Economic Survey

21.8 REVIEW OF PERFORMANCE OF PDS

The government could possibly utilize the bulging stocks of foodgrains to alleviate poor people's misery by undertaking food for work schemes on a large scale. Food stocks can be utilized to create local assets such as pond and undertake water conservation. Some parts of the country face drought every year. Only 40 per cent of the gross cropped area is irrigated, rest of the area depends on rains. There are always some parts in the country every year where rains are not adequate. Drought brings hunger, death and untold misery to millions of people. Given our dependence on rains, droughts cannot be totally avoided, but the ill effects of drought can be managed. You may have observed that foodgrains production falls in drought affected areas.

But shortage of foodgrains is not the real problem. The country has over 60 million tonnes of foodgrains stocked in FCI godowns. As has been clearly pointed out by Amartya Sen, a famine is caused by shortage of purchasing power rather than of foodgrains. In drought-affected areas, there is a big fall in incomes of landless laborers and small farmers. Rural employment schemes are the only effective means of giving some purchasing powers in the hands of these worst affected sections of rural society. Therefore, in a situation of drought, rural employment schemes should be undertaken on a large scale. Since the mid-1990s, there has been a steep decline in employment generation through rural employment schemes. This decline needs to be reversed. Increased budgetary provision should be made for these schemes since they are very essential in our fight against poverty and starvation.

Providing food subsidy is not a populist measure: this cannot be called untargeted expenditure. Such assistance to weaker sections is necessary as it helps them in sustaining themselves. Given the fact that a large segment of the population in the country is still below the poverty line, a pro-people policy framework demands continuation of food subsidy. The cut in food subsidy is against the interest of the poor. The Supreme Court in an interim judgment delivered in November 2001 has decreed that the benefits of nutrition related programmes must be treated as legal entitlements. M.S. Swaminathan has suggested that in addition to integrated food-for-work programmes, grain banks should be set-up in villages as insurance against food scarcity.

It is true that the present PDS is beset with many serious problems. There is widespread leakage of PDS grains to the open market through bogus ration cards. It would not be an exaggeration to say that the real beneficiaries of the PDS subsidy are the unscrupulous traders. Studies show that corruption in the PDS is responsible for more than one-third of foodgrain and sugar not reaching the poor.

According to a study of diversion of PDS commodities into the open market system conducted by Tata Economic Consultancy Services (1998), it was found that, at the national level, there was a diversion of 36 per cent of wheat supplies, 31 per cent of rice and 23 per cent of sugar. The diversion is more in northern, eastern and north-eastern regions. Diversion of rice is estimated to be 64 per cent in Bihar, 54 per cent in Orissa and 53 per cent in Delhi. In the case of wheat, diversion is estimated to be 69 per cent in Punjab and 53 per cent in Haryana and Delhi.

The grain available at PDS outlets is often of low quality. It is feared that a significant portion of the grain held in storage for long periods has been spoiled. The focus of the PDS is mainly on cereals, especially rice and wheat; pulses are given very little attention. This makes goal of nutritional balance (which is an important aspect of food security) hard to achieve.

The PDS has benefited the poor only marginally. NSS consumption data indicates that PDS provided only about 8 to 20 percent of the food purchases of the poor. The rest came from open market. Definitely PDS needs reforms. But a subsidised PDS for the well-targeted groups still remains the best form of food security for the poor. There is absolutely no justification for dismantling of the PDS. There are some people with blind faith in the institution of market that advocate phasing out of the PDS. To the extent that the PDS provided food security to the poor, it is seen as a hindrance to the free play of market forces in a very important sector of the economy, the food sector.

Considering the fact that the poor are ill equipped to face and absorb the shocks of structural changes taking place in the economy. What is required is the institution of a comprehensive structure of safety nets. Notwithstanding many economic, political and administrative factors discussed above which prevent the full realization of its potential, the PDS is a highly relevant scheme, which needs to be further strengthened. In order to effectively serve the purpose of providing food security to the poor, the prices of foodgrains sold through the PDS should be kept at very low levels. A country flush with huge stocks of foodgrains can hardly have any justification for widespread malnutrition and starvation. If supply conditions warrant, certain essential items like pulses, edible oils, sugar, etc. should be imported as a short term measures on public account for the PDS channels. The country now has foreign exchange reserves of over \$100 billion which is far in excess of our needs. Part of these excessive reserves can be spent on import of essential items to meet the shortfall in domestic supply. Steps also need to be taken to discourage exports of fruits, vegetables and pulses which are in short supply.

The *Antyodaya Anna Yojana* can be easily expanded to cover more number of poorest families with an enhanced entitlement. Estimates show that if two crore poorest families are covered under this scheme and each family is provided with 50 kg. of foodgrains per month, it would require about 12 million tonnes of foodgrain per year. This scheme can be easily administered, unlike other schemes such as mid-day meals, which are marred by logistic problems. This would, of course, entail increased subsidy but that would be a small price to pay as it would provide food security to the people living in situation of extreme poverty. In addition, it would also provide a solution to the problem of excessive food stocks.

The Abhijit Sen committee on long-term foodgrains policy of India examined the PDS and conclude that the present excess stocks are more accurately attributed to a fall in consumption than to increased production.

Check Your Progress 2

- 1) What are the main aims of the public distribution system?

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2) Why was the targeted public distribution system started?

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3) Discuss the procurement policies of the government.

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4) What are the main problems facing the public distribution system? In what ways its efficiency can be improved?

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21.9 LET US SUM UP

Although India achieved self-sufficiency in foodgrains in the mid-1970s, a significant portion of our population still lacks food security. The government policy of keeping MSP of foodgrains high has led to bulging stocks of foodgrains which, in turn, has resulted in decline in the amounts of foodgrains available to the public.

The PDS was set up in the mid-1960s, as part of an overall strategy of food management. The aim of PDS is to enhance food security particularly for the economically weaker sections of the society. In practice, however, the PDS has benefited the poor only marginally. It is beset severely with the problem of corruption. There is, however, no justification for dismantling of the PDS. A subsidised PDS for the well-targeted groups still remains the best form of food security for the poor. The massive food stocks, which at present are a burden on the exchequer, can be utilized to alleviate poverty by undertaking food for work programme on a large scale.

21.10 KEY WORDS

- Consumer subsidy** : The consumer subsidy is the difference between the economic cost (the cost incurred by the central government by way of procurement, storage, transport and distribution) and the central issue price (CIP).
- Food security** : Food security means that people have physical and economic access to foodgrains.
- Food subsidy** : The food subsidy is the total of the consumer subsidy and the carrying cost of the buffer stock.
- Minimum Support Price (MSP)** : The price at which the government buys farm produce from farmers. The farmers can sell their produce (e.g. wheat and rice) to the government at this price if they are unable to sell at higher price in the market.

21.11 SOME USEFUL BOOKS

Government of India, *Economic Survey*, recent issue

Planning Commission, *Tenth Five Year Plan 2002-2007*, Government of India.

21.12 ANSWERS/ HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Read Sub-section 21.2.2 and answer.
- 2) Read Sub-section 21.2.3 and answer.
- 3) Read Section 21.3 and answer.

Check Your Progress 2

- 1) Read Section 21.4 and answer.
- 2) Read Sub-section 21.5.1 and answer.
- 3) Read Sub-section 21.4.2 and answer.
- 4) Read Section 21.8 and answer.

UNIT 22 AGRICULTURE IN THE CONTEXT OF GLOBALIZATION OF THE ECONOMY

Structure

- 22.0 Objectives
- 22.1 Introduction
- 22.2 Economic Reforms and Agriculture
- 22.3 Areas of Reforms in Indian Agriculture
 - 22.3.1 Prices
 - 22.3.2 Subsidies
 - 22.3.3 Exports
- 22.4 External Trade in Agri-Products
- 22.5 WTO Recommendations for Indian Agriculture
- 22.6 Implications of WTO Recommendations
- 22.7 Let Us Sum Up
- 22.8 Key Words
- 22.9 Some Useful Books
- 22.10 Answers/Hints to Check Your Progress Exercises

22.0 OBJECTIVES

After going through this unit, you will be in a position to:

- identify the areas where reforms are needed in agriculture;
- explain the export performance of India in the field of agriculture;
- examine the prescriptions of the World Trade Organization (WTO) in the context of Indian agriculture; and
- explain the effects of globalization on Indian agriculture.

22.1 INTRODUCTION

In India the process of economic liberalization and globalization started rapidly in the beginning of the 1990s. It signified a break from the policies that the country had been following since Independence. The important features of the new economic policy are: i) reduced state intervention, ii) withdrawal of licensing system, iii) opening up of more sectors of the economy to private sector and even to foreign concerns, iv) moves towards dismantling of subsidies and public distribution system, v) abolition of import quotas, reducing import tariffs and duties, vi) giving more freedom to capital movements, vii) relaxing the labour laws, and viii) encouraging exports. In short, the government wants to allow greater role for the private sector and confine its operations to governance and minimal production activities.

22.2 ECONOMIC REFORMS AND AGRICULTURE

Economic reforms include a number of issues. They try to correct the basic shortcomings of the economy that hinder its growth and welfare of its people. Purpose of economic reforms is to generate output and employment, and maximize economic growth. In an agriculture dependent economy no effort in this direction can be successful without making agriculture conducive for growth. Therefore, economic reforms have relevance for agriculture as well.

The principal thrusts of reforms in agricultural sector are the following:

- a) **Encourage private investments:** This can be achieved by providing credit facilities, irrigation, transportation, marketing, warehousing facilities, information and export opportunities to the farmers.

- b) **Land Reforms:** In India about 75% of the cultivators own 25% of the total land under cultivation. If these poor farmers could be provided with more land by redistributing the land it will boost agricultural production and investments. This is because land owned by the existing big landlords are often leased out to poor tenants. These tenants do not possess enough money to invest. There is also a large section of landless labourers and tenant farmers who need to be allocated land. Such redistribution of land would ensure a regular source of income to agricultural labourers and tenants besides increasing production. For this measure to be successful supplementary supports in the form of cheap seeds, fertilizers, irrigation and credits have to be provided.
- c) **Taxing the Agricultural Rich:** On the ground that majority of the Indian farmers are poor, the government does not impose taxes on agricultural income. But the benefits of such a policy accrue to the rich landlords and farmers who only get richer by this exemption. Moreover, this concession has become a means of tax evasion. People often show their non-agricultural income as agricultural income and claim tax exemptions. To generate sufficient resources for development purposes, the possibility of taxing rich landlords and farmers needs to be explored.
- d) **Managing the Terms of Trade:** The price relation between the agricultural and industrial sectors is a matter of great importance. It determines the level of real income for the entire population. In a poor country like India, high food prices (which means a high terms of trade for agriculture) mean a low living standard for a large segment of the population. It means high poverty level and low demand for industrial goods. As a result, industrial output and employment may suffer. High procurement prices offered by the government mainly benefit rich farmers with marketable surplus.
- e) **Promoting Exports of Agricultural Goods:** India has the potential of growing a variety of crops because of its differing climatic conditions. Thus this potential should be properly utilized in order to capture the foreign market for these goods. At the same time, however, it should be remembered that in many cases higher global prices often leads to outflow of foodgrains and food products which could lead to shortages in the country.
- f) **Rationalizing Subsidies:** Subsidies have been the subject of much debate in India. In the post-independence period Indian farmers have been given huge amount of subsidies under a number of heads. Be it building of public infrastructure such as dams and irrigation projects, or provision of cheap power, HYV seeds and fertilizer, or even regular procurement of crops at remunerative prices. However, critics question whether the subsidies are reaching the target groups. Many are of the view that only the rich farmers in select northern states get most of these subsidies. Thus a proper scheme for the provision of subsidies, which benefits majority of farmers, needs to be designed.
- g) **Free Trade in Agri-Products:** As we have seen in the previous unit India is facing a problem of over-supply in foodgrains and many other agricultural commodities. However, for many years there was restriction on movement of agri-products across states. These restrictions were imposed in the form of licensing of dealers, placing limits on stocks, and control on movement of commodities under the Essential Commodities Act, 1955. The government has now withdrawn licensing requirement of dealers and restrictions on storage and movement of foodgrains (wheat, paddy, rice, coarse grains), sugar, oilseeds and edible oils. Free movement of agricultural products has another benefit – we do not need self-sufficiency in all agricultural commodities at the regional level. Once self-sufficiency is attained at the national level, free trade will help in movement of foodgrains from surplus to deficit regions. Moreover, free trade will create an integrated national market in agricultural produce.

22.3 AREAS OF REFORMS IN INDIAN AGRICULTURE

Based on the discussion in the previous section we attempt to identify areas in which reforms need to be carried out. We enlist them below.

22.3.1 Prices

The prices which the cultivators get for their crops and the prices at which consumers buy from the market need to be rationalized. We saw in Unit 19 that high remunerative price induces agricultural investments and growth. But it may lead to impoverishment of lower income groups and decelerate industrial growth. The price charged at the public distribution system (PDS) shops also needs to be reformulated. The hike in issue prices in recent years has resulted in low off-take from the PDS outlets. This is because the price levels for the 'Above Poverty Line' (APL) target group exceeded the market price whereas the products on offer were of sub-standard quality. For the 'Below Poverty Line' (BPL) group the prices were somewhat lower but the rich and the influential got themselves registered as BPL and reaped the benefits. The result has been fall in cereal consumption by the poor and rising inequality. There is a need for a well thought out policy in this area which protects the interests of both producers and consumers.

22.3.2 Subsidies

Subsidies are related to the issue of prices. Lower price that the consumers pay at PDS fair price shops is due to the subsidies granted by the government. However, as mentioned above, in many cases subsidies do not reach the target groups. In the case of 'production subsidies' provision of subsidised fertilizers, seeds, pump sets and other equipments have helped the rich farmers, particularly in agriculturally developed states. On the whole, we can say that agricultural subsidies need to be streamlined or reformed. It does not mean that they have to be done away with; rather they have to be properly focussed.

22.3.3 Exports

Exports by a farmer results in higher income for the farmer. It also earns foreign exchange for the country which makes its economic position stronger. Therefore, the government should look at the issue of export promotion of agricultural products and provide necessary support. It should minimize the legal and bureaucratic hassles in the way of setting up of a production unit and exporting abroad. But the considerations which we have talked about earlier, such as not fueling the domestic food price or not contributing to poverty, should also be kept in mind.

Check Your Progress 1

- 1) Point out the areas in which agricultural reforms are needed in India.

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2) What are the effects of high foodgrains prices?

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3) Do you suggest that the agricultural income should be taxed in India? Why?

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22.4 EXTERNAL TRADE OF AGRI-PRODUCTS

In the previous Unit we had learnt that India achieved self-sufficiency in foodgrains during the 1980s. Before that India was a net importer of foodgrains.

India’s agricultural exports include rice, wheat, cereals, tobacco, sugar and molasses, poultry and dairy products, horticulture products, spices, cashew, sesame and niger seed, groundnut, oil meals, castor oil, shellac, fruits and vegetables, cotton, processed vegetables, juices, and meat and marine products. Of these items, marine products have emerged to be the single largest contributor to agricultural exports. In the year 2000-01 agricultural products worth US\$6 billion were exported from the country, 23 per cent of which was contributed by marine products alone. The next important item of agri-exports was cereals, mostly basmati and non-basmati rice, which accounted for 12 per cent of the total.

India has a competitive advantage in several agricultural commodities. Self-sufficiency in agro-inputs, low labour costs and diverse agro-climatic conditions are some of the factors which give India an advantage. However, raising agricultural productivity to international standards is a major challenge before India. Although states such as Punjab, Haryana and Andhra Pradesh have attained productivity levels of world standard, other states are lagging behind.

Table 22.1 : Exports of Agriculture and Allied Products

Year	Rs. Crore	US\$ million	Share in total exports (%)
1960-61	284	596	44.2
1970-71	487	644	31.7
1980-81	2057	2601	30.7
1990-91	6317	3521	19.4
1995-96	21138	6320	19.9
2000-01	28535	6246	14.0

Source: Indian Economic Survey 2001-02.

From Table 22.1 we make two observations. First, export of agricultural products has increased sharply over the years not only in rupee terms but also in terms of dollars. While agricultural exports earned foreign exchange worth \$596 million in 1960-61, the amount increased to \$6246 million in 2000-01. Secondly, the share of agriculture in total exports of India has decreased over time. While agricultural products constituted 44.2 per cent of total exports in 1960-61, it was only 14 per cent of total export in 2000-01. The implication of the above is that exports of non-agricultural products have increased at a faster rate than that of agricultural products.

Agricultural imports are about 5 to 6 per cent of total imports of the country. The major items of imports are edible oil, cotton, pulses and wood products. In the year 2000-01 India's agri-imports were only US\$1.8 billion, much lower than its agri-exports of US\$6 billion. Edible oil, in recent years, has become the single largest item of agri-imports for India. It accounts for about 60 to 70 per cent of the value of total agricultural imports. Raw cashewnut, almonds and pulses are the other major agri-imports of India, each contributing about 5 to 10 percent of total agricultural imports.

From a historical perspective we observe that till the 1980s Indian agricultural exports were limited to some commercial crops like spices, tea and coffee. Imports were largely restricted through quantitative restrictions (QRs) and high level of tariffs. The objective was to regulate the supply of agricultural commodities. Thus restrictions were imposed to check the inflow of agricultural commodities which may result in excess supply and consequently result in adverse terms of trade for agriculture. Similarly, exports of agricultural commodities were restricted keeping in view domestic availability. Excess exports may result in domestic shortages and consequent price rise.

In April 2000 imports of about 700 agricultural items was subjected to QRs. However, the Export-Import Policy of 2001 removed QRs on 228 agricultural items. As per the WTO guidelines QRs would be withdrawn in a phased manner. Thus, agricultural exports as well as imports, in the era of globalization, will be regulated through imposition of tariffs only.

Since the 1990s there has been an increase in openness or outward orientation of India's agricultural sector. However, agricultural sector is less outward-oriented than the economy as a whole.

22.5 WTO RECOMMENDATIONS FOR INDIAN AGRICULTURE

In recent years the mainstream economic policy prescription has given more importance to free trade and market mechanism. There has emerged a view that global trade and capital movement benefit both the developed and developing economies. Thus World Trade Organisation (WTO) and international lending institutions such as World Bank, International Monetary Fund, Asian Development Bank and others have emphasized unrestricted global trade and capital movements. The WTO was established in 1995 with 135 member nations and it replaced the General Agreement on Tariff and Trade (GATT). The major objectives of the WTO are encouraging free trade through negotiations and promoting competitiveness in production. WTO includes issues concerning trade vis-à-vis labour, environment, competition and investment.

The underlying logic behind promotion of free trade is that an economy which cannot produce certain goods at economical costs can import them at cheaper rates.. Conversely it can export goods in which it is efficient to countries that cannot produce these goods at low costs. This way each country specializes in the goods for which it enjoys "comparative advantage". The doctrine of comparative advantage was propounded by David Ricardo two hundred years ago. It says that every country will

have some commodity which it can produce at the minimum relative cost. And it will be beneficial for all the countries if they specialize in production and export of commodities where they have comparative advantage. The aggregate welfare and output will be maximized in this way.

It follows from the above theory that measures which restrict trade or encourage production of commodities in which a country does not have comparative advantage lead to a fall in domestic and global welfare. It then follows that all tariffs and quotas on imports should be scrapped. Subsidies that are given to production of exports goods should be withdrawn because they distort the free market price. Free market price ensures that resources are efficiently allocated between alternative uses. Extending this logic to agricultural goods, it is recommended that all quantitative restrictions (QRs) on the imports of agricultural products should be abolished. The restrictions India had earlier on import of agricultural goods were based on a different understanding. The import quotas sought to guarantee that Indian farmers were protected against foreign competition and dumping. It was argued that dependence of food imports might mean poverty and famine in years when global food shortage occurs.

Another set of measures suggested by the WTO is related to *patent laws* and their implementation. WTO believes that a company inventing a particular product should have the exclusive rights to benefit from it. This will ensure that people do get necessary incentive and money to invent and research on a new product. Result of this policy is that anybody using a patented product or producing it has to pay a royalty to the original inventor. This is called TRIPS (trade related intellectual property rights). It has the implication that in order to use high yielding patented varieties of seeds, fertilizers and pesticides, the users have to pay a fee to the respective patent holders. Anyone who wants to do research on a patented seed is being forbidden to do so without permission and payment of royalty to the patent holder. The impact of such patents is an increase in the cost of production for the farmers.

Other broad WTO recommendations which also affect Indian agriculture are as follows:

- i) Reduction in subsidies to farmers: The WTO believes that subsidies have two adverse effects. First, it distorts free market prices leading to misallocation of resources. Second, it raises government fiscal deficit. High fiscal deficit may lead to balance of payment difficulties and inflation.
- ii) Reduction in government spending: The international organizations such as IMF have been suggesting that the government should cut down on expenditure so as to reduce fiscal deficit. An outcome of such efforts by many governments including India has been a reduction in the outlay on public infrastructure such as roads, electricity, transportation and rural banking. Investments on public irrigation facilities have also declined.
- iii) Privatization of the public sector units: The WTO believes that government should have no economic interventions in production and resource allocation. It should play the role of a facilitator in realization of higher growth and maintain economic stability. An implication of such a prescription has been the selling off of public sector undertakings.
- iv) Dismantling the PDS: The PDS implies two kinds of subsidies to be paid by the government. First to the farmers in terms of procurement price higher than market price. Second to the consumers by selling foodgrains at lower than market price. Such operations raise fiscal deficit and promotes inefficiency.

Check Your Progress 2

- 1) What are the major crops that India exports?

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2) What are the recommendations of the WTO for agricultural reforms?

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22.6 IMPLICATIONS OF WTO RECOMMENDATIONS ON INDIAN AGRICULTURE

India has been able to withstand the WTO prescriptions to some extent. It has not followed all the prescriptions of the WTO. The areas where WTO prescriptions have influenced government policies as follows:

- a) The recommendation on subsidy cuts has been partially followed. This is true in the case of subsidy on provision of public infrastructure. Government intervention on rural electrification, irrigation projects and other infrastructural investments has been falling since the 1980s itself. As a result, the aggregate investments in agriculture have stagnated in absolute terms. It increased from Rs.63 billion in 1960-61 to Rs 182 billion in 1978-79. Thereafter it went on a declining trend and recovered marginally to Rs 190 billion in 1998-99. Thus, far from increasing at a positive rate it has just remained at the same level during the last two decades. One principal reason for this has been the decline in public investment expenditure (see Unit 15). This decline started in the mid-1980s when the government started taking IMF loans, which were tied with conditionalities similar to what the WTO recommends today. The decline has continued till today. As a result, the share of private sector in total investments in the agricultural sector has increased from 50% in 1980-81 to 75% in 1998-99. Though the private investments have risen in absolute terms at constant prices, in recent years these also have stagnated. For agricultural sector as a whole, the increase in private investments have not led to an increase in the aggregate investments, mainly due to the sharp decline in public investments.
- b) Another example where WTO recommendations have been adhered to is the case of abolition of import quotas in agricultural products. Quotas or quantitative restrictions (QRs) were imposed to protect the cultivators against cheap imports or *dumping* by foreign countries. Dumping means that a country, in order to capture the market of another country, exports goods at very low prices to the latter. Once the market is captured and domestic producers are out-competed, the exporting country becomes a monopolist and charges high prices for its exports. Only a rich country with enough financial resources can follow such an aggressive policy.
- c) The recommendations, which were not followed much, were the subsidy cuts on procurement of foodgrains. The WTO has recommended that either the

procurement operations should be curtailed or the procurement prices should be fixed at a low margin over the prevalent market price. Either way the total subsidies will decline. But political compulsions have not let this happen. The farmers' lobby has proven to be more powerful than the WTO prescriptions. Therefore, huge amount of grains are still being procured at prices which are higher than the market price. However, the storage of this grain has been a big problem. Since WTO recommends that the grains cannot be sold at a cheap rate through the PDS (because that is also a kind of subsidy given to consumers), PDS prices have been raised. But poor people who buy food from the PDS shops cannot pay such high prices. Result has been a huge and unmanageable food-stock at the Food Corporation of India (FCI) go-downs. The cost of storage is pretty high; hence much of the stock is ill-managed and is rotting. In July 2002 India had accumulated about 63 million tonnes of foodgrains. This is far higher than the recommended storage.

- d) Besides public infrastructure provisions, other channels of subsidy are cheap seeds, fertilizers, and subsidies on account of private irrigation facilities such as pump sets. These have been declining in the 1990s. This along with the decrease in public investments has retarded agricultural production growth rate in the 1990s compared to the previous decade. The slowing down of growth is more evident in the case of foodgrains production. Compared to a growth rate of 2.9 per cent per annum in the 1980s, in the 1990s this rate was 1.8 per cent per annum. Note that this growth rate is below the annual population growth rate of India.

Following major changes in the field of infrastructure have been noticed:

- i) Expansion of irrigation slowed down because annual growth rate in public investments in agriculture declined from 4.0 per cent in 1980s to 1.9 per cent in the 1990s.
- ii) Low public investments in Research and Development: 0.5% of agricultural GDP against the ICAR (Indian Council of Agricultural Research) recommended norm of 1 per cent.
- iii) Decline in the annual growth rate of use of fertilizers from 7.8 per cent in the 1980s to 4.3 per cent in the 1990s.
- iv) Deceleration of growth rate in area under HYV seeds from 4.9 per cent in the 1980s to 2.8 per cent in the 1990s
- v) Decline in soil fertility due to intensive cultivation and wheat–rice rotations year after year in the north-west region.
- vi) Over-exploitation of ground water through small scale private irrigation: This has led to lowering of water table. It can be linked to the fact that the private investment is the major component in the total investments in agriculture in recent years (see Unit 15). Private irrigation unlike public irrigation draws heavily on the ground water.
- e) Lower agricultural growth rate was accompanied by a favourable terms of trade for agriculture. Taking 1990-91 as the base year the consumer price index (CPI) for agricultural labourer for non-food articles was 100.3 in 1999-2000, whereas the wholesale price index (WPI) for cereals was 126.0. These two figures imply that the input costs have been rising for the industrial producers and the demand has been sluggish. This could have led to a decline in growth rate of output and employment in the industrial sector.

- f) Just as in the case of investments in agricultural sector, employment in the public sector undertakings (PSUs) declined in the 1990s. During 1983 to 1994 the employment growth rate in PSUs was 1.52 per cent per annum. On the other hand, during 1994 to 2000 it decreased at a rate of 0.03 per cent per annum. Private sector suffered on two counts: First due to low demands emanating from agricultural sluggishness and adverse terms of trade. Second, due to the curtailment of public investments, supply side bottlenecks appeared. Employment in the private sector increased during 1983 to 1994 at a rate of 2.04 per cent per year. However, during 1994 to 2000 its growth rate was 0.98 per cent. Moreover, private sector could not generate enough employment to make up for the shrinking employment opportunities in the public sector.
- g) Result of low employment generation and rising food prices has been the decline in per capita cereal consumption. In recent years monthly per capita consumption of cereals decreased from 14.4 kg. in 1987 to 12.8 kg. in 1997 in rural areas. During the same period it decreased from 11.2 kg. to 10.3 kg. in urban areas. Note that the decline in the consumption of cereal has been more for the rural areas than for the urban areas. Since agriculture is the backbone of rural areas, the misery has increased in agricultural households.
- h) Higher exports of foodgrains have also been a feature of the 1990s. However, the prices that our grains have received in the global market have been much less than the standard international prices. Wheat, for example, was sold for \$103 per tonne in 2001, whereas the ruling price at that time was \$130. Second surprising feature of the export push is that we are subsidizing our exports. In the year 2001 the economic cost for a tonne of wheat was Rs 8300 to the FCI; wheat was exported at a price of Rs 4000 per tonne. So we have paid subsidy of Rs 4300 per tonne to the foreign buyers. Contrast this with the fact that issue price of APL did not carry any subsidy.
- i) Opening the farming sector to the global market has brought about a shift in the cropping pattern. Mainly, the shift has been from the food crops (especially of the low quality such as jowar and bajra) to cash crops such as oil seeds (sunflower, soya beans) and cotton. Before the 1990s there were much restrictions on export of agricultural products. As a result, the domestic production decisions were more immune to international price movements. Crops of coarse variety such as jowar, bajra, ragi were produced in abundance which catered to the needs of the poorer sections of the country. In recent years farmers have realized that production of cash crops such as sunflower, soya and cotton are more profitable since they fetch a much higher price in the international market. As a consequence, a shifting in cropping pattern is taking place. Production of coarse cereals has been declining and that of cash crops rising. Results of this switching over have not been positive, particularly for the poorer sections.

Check Your Progress 3

- 1) What has been the trend in the public investment in agriculture in India in the nineties? Have private investments been rising as a result?

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- 2) In spite of bursting food stocks the FCI is procuring more and more foodgrains at higher prices from the farmers. At the same time the public distribution system is being dismantled. How do you explain this?

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22.7 LET US SUM UP

For achievement of higher growth we need to make certain fundamental changes in the economy through appropriate policy measures. These measures are collectively called economic reforms. For an agricultural economy such as India economic reforms cannot ignore the agricultural sector. Therefore, the economy has to make some basic adjustments to its agricultural sector. Some of the changes that are required are: i) taxing the agricultural income while ensuring that only the rich farmers pay, ii) rationalization of subsidies, and iii) proper pricing of agricultural goods. While undertaking these measures we need to consider issues such as remunerative prices to farmers, higher industrial growth and poverty eradication.

While these reforms seem to be very important given the state of Indian agriculture, the WTO has made certain recommendations which are not always in national interest. These are: i) promotion of foodgrains exports, ii) removal of all subsidies, iii) cutting down on government expenditure, iv) removal of import and export quotas, and v) upholding of patent laws in the case of agricultural seeds, insecticides and fertilizers.

While taking steps for implementation of WTO agenda even partially, we should be careful that these measures do not have adverse effects on problems such as i) rising inequality in the distribution of income in agricultural sector, ii) declining agricultural growth rate, iii) rising poverty in the agricultural sector, iv) falling overall cereal consumption of the economy, v) rising food prices faster than average inflation rate, vi) falling demand for the industrial sector and its stagnation, and vii) low employment generation.

22.8 KEY WORDS

- Subsidies** : can be considered as grants given by the government to people. Agricultural subsidies, for example, are given to farmers in the forms of cheap fertilizer, equipment, seeds and higher procurement price.
- Tariffs** : Taxes imposed on value of imports.
- Terms of Trade** : is the ratio of the prices between two sectors. For example, terms of trade between agriculture and industries would be the ratio of agricultural prices to industrial prices.
- Trade Related Intellectual Property Rights** : (TRIPS) is recommended by the WTO to ensure that the inventor of a certain product (or process) is paid royalty by the users.

World Trade Organization : (WTO) was founded in 1995 replacing General Agreement on Tariffs and Trade (GATT). Its purpose is to promote multilateral global trade and welfare.

22.9 SOME USEFUL BOOKS

Datt, R. and K. P. M. Sundaram, 2001, *Indian Economy*, S. Chand and Co., New Delhi.

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Misra, S. K. and V. K. Puri, 2001, *Indian Economy*, Himalaya Publishing House, New Delhi.

Patnaik, U., 1999, *The Long Transition*, Tulika Publications, New Delhi.

Raj, K. N., 1990, *Organizational Issues in Indian Agriculture*, Oxford University Press, New Delhi.

22.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) The areas where reforms are needed are prices, subsidies and exports. Go through Section 22.3 for further details.
- 2) Food being an essential consumption item an increase in its price is likely to generate higher inflation. However, the impact of foodgrains price rise is not limited to inflation alone. It may adversely affect poverty and industrial growth. See Section 22.2 (d).
- 3) Go through Section 2.2 (c) and answer

Check Your Progress 2

- 1) India's agricultural exports include rice, wheat, tobacco, sugar and molasses, poultry and dairy produces, horticulture products, spices, cashews, sesame and niger seed, groundnut, oil meals, castor oil, shellac, fruits and vegetables, cotton, processed vegetables, juices and meat and marine products.
- 2) You may bring out the major policy prescriptions of WTO. Go through Section 22.5 and answer.

Check Your Progress 3

- 1) Go through point (a) of Section 22.6 and answer.
- 2) See point (c) of Section 22.6 and answer.