Agricultural Marketing—
Definition and Scope

Marketing is as critical to better performance in agriculture as farming itself. Therefore, market reform and marketing system improvement ought to be an integral part of policy and strategy for agricultural development. Although a considerable progress has been achieved in technological improvements in agriculture by the use of high-yielding variety seeds and chemical fertilisers, and by the adoption of plant protection measures, the rate of growth in farming in developing countries has not attained the expected levels. This has been largely attributed to the fact that not enough attention has been devoted to the facilities and services which must be available to farmers if agriculture is to develop.

Agricultural marketing was, till recently, not fully accepted as an essential element in agricultural development in the countries of Asia and the Far East. Although opinions differ as to the extent and precedence, there was general agreement till 1970 that the question of markets for agricultural commodities had been neglected[1]. Agricultural marketing occupies a fairly low place in agricultural development policies of developing countries. The National Commission on Agriculture (1976) had emphasised that it is not enough to produce a crop or an animal product; it must be satisfactorily marketed.

CONCEPT AND DEFINITION

The term *agricultural marketing* is composed of two words—agriculture and marketing. Agriculture, in the broadest sense, means activities aimed at the use of natural resources for human welfare, *i.e.*, it includes all the primary activities of production. But, generally, it is used to mean growing and/or raising crops and livestock. Marketing connotes a series of activities involved in moving the goods from the point of production to the point of consumption. It includes all activities involved in the creation of time, place, form and possession utility.

Philip Kotler has defined marketing as a human activity directed at satisfying the needs and wants through exchange process. American Marketing Association defined marketing as the performance of business activities that

directs the flow of goods and services from producers to users.

According to Thomsen[2], the study of agricultural marketing comprises all the operations, and the agencies conducting them, involved in the movement of farm-produced foods, raw materials and their derivatives, such as textiles, from the farms to the final consumers, and the effects of such operations on farmers, middlemen and consumers. This definition does not include the input side of agriculture.

Agricultural marketing system in developing countries including India can be understood to compose of two major sub-systems *viz.*, product marketing and input (factor) marketing. The actors in the product marketing sub-system include farmers, village/primary traders, wholesalers, processors, importers, exporters, marketing cooperatives, regulated market committees and retailers. The input sub-system includes input manufacturers, distributors, related associations, importers, exporters and others who make available various farm production inputs to the farmers.

Agricultural marketing is the study of all the activities, agencies and policies involved in the procurement of farm inputs by the farmers and the movement of agricultural products from the farms to the consumers. The agricultural marketing system is a link between the farm and the non-farm sectors. It includes the organisation of agricultural raw materials supply to processing industries, the assessment of demand for farm inputs and raw materials, and the policy relating to the marketing of farm products and inputs.

According to the National Commission on Agriculture (XII Report, 1976), agricultural marketing is a process which starts with a decision to produce a saleable farm commodity, and it involves all the aspects of market structure or system, both functional and institutional, based on technical and economic considerations, and includes pre- and post-harvest operations, assembling, grading, storage, transportation and distribution.

However, as Acharya[3] has described, in a dynamic and growing agricultural sector, the agricultural marketing system ought to be understood and developed as a link between the farm and the non-farm sectors. A dynamic and growing agricultural sector, requires fertilisers, pesticides, farm equipments, machinery, diesel, electricity, packing material and repair services which are produced and supplied by the industry and non-farm enterprises. The expansion in the size of farm output stimulates forward linkages by providing surpluses of food and natural fibres which require transportation, storage, milling or processing, packaging and retailing to the consumers. These functions are variously performed by non-farm enterprises. Further, if the increase in agricultural production is accompanied by a rise in real incomes of farm families, the demand of these families for non-farm consumer goods goes up as the proportion of income spent on non-food consumables and durables tends to rise with the increase in real per capita income. Several industries, thus find new markets for their products in the farm sector.

Agricultural marketing, therefore, can be defined as comprising of all activities involved in supply of farm inputs to the farmers and movement of agricultural products from the farms to the consumers. Agricultural marketing system includes the assessment of demand for farm-inputs and their supply, post-harvest handling of farm products, performance of various activities required in transferring farm products from farm gate to processing industries and/or ultimate consumers, assessment of demand for farm products and public policies and programmes relating to the pricing, handling, and purchase and sale of farm inputs and agricultural products.

NEED FOR UNDERSTANDING

A decision on an appropriate strategy, the evolution of a proper policy and a choice of policy instruments calls for a continual flow of advice, information and assessment of the existing system. Every system generates impulses as a result of environmental changes. These impulses have to be observed, recorded, analysed and interpreted for the benefit of the policy-makers.

A study of the agricultural marketing system is necessary for an understanding of the complexities involved and the identification of bottlenecks with a view to providing efficient services in the transfer of farm products and inputs from producers to consumers. An efficient marketing system minimizes costs, and benefits all the sections of the society.

The expectations from the system vary from group to group; and, generally, the objectives are in conflict. The efficiency and success of the system depends on how best these conflicting objectives are reconciled.

Producers: Producer-farmers want the marketing system to purchase their produce without loss of time and provide the maximum share in the consumer's rupee. They want the maximum possible price for their surplus produce from the system. Similarly, they want the system to supply them the inputs at the lowest possible price.

Consumers: The consumers of agricultural products are interested in a marketing system that can provide food and other items in the quantity and of the quality required by them at the lowest possible price. However, this objective of marketing for consumers is contrary to the objective of marketing for the farmer-producers.

Market Middlemen and Traders: Market middlemen and traders are interested in a marketing system which provides them a steady and increasing income from the purchase and sale of agricultural commodities. This objective of market middlemen may be achieved by purchasing the agricultural products from the farmers at low prices and selling them to consumers at high prices.

Government: The objectives and expectations of all the three-groups of society—producers, consumers and market middlemen—conflict with one

another. All the three groups are indispensable to society. The government has to act as a watch-dog to safeguard the interests of all the groups associated in marketing. It tries to provide the maximum share to the producer in the consumer's rupee; food and other farm products of the required quality to consumers at the lowest possible price; and enough margin to market middlemen so that they may remain in the trade and not think of going out of trade and jeopardise the whole marketing mechanism. Thus, the government wants that the marketing system should be such as may bring about the overall welfare to all the segments of society.

The overall objective of agricultural marketing system in a developing country like India should be to help the primary producers viz., the farmers in getting remunerative prices for their produce on the one hand and to provide right type of goods at the right place, in the right quantity and quality at a right time and at right prices to the processors and/or ultimate consumers on the other.

SCOPE AND SUBJECT MATTER

Agricultural marketing in a broader sense is concerned with the marketing of farm products produced by farmers and of farm inputs and services required by them in the production of these farm products. Thus, the subject of agricultural marketing includes product marketing as well as input marketing.

The subject of output marketing is as old as civilization itself. The importance of output marketing has become more conspicuous in the recent past with the increased marketable surplus of the crops and other agricultural commodities following the technological breakthrough. The market orientation of farming has increased. Input marketing is a comparatively new subject. Farmers in the past used such farm sector inputs as local seeds and farmyard manure. These inputs were available with them; the purchase of inputs for production of crops from the market by the farmers was almost negligible. The importance of farm inputs—improved seeds, fertilizers, insecticides and pesticides, farm machinery, implements and credit—in the production of farm products has increased in recent decades. The new agricultural technology is input-responsive. Thus, the scope of agricultural marketing must include both product marketing and input marketing. In this book, the subject-matter of agricultural marketing has been dealt with; both from the theoretical and practical points of view. It covers what the system is, how it functions, and how the given methods or techniques may be modified to get the maximum benefits.

Specially, the subject of agricultural marketing includes marketing functions, agencies, channels, efficiency and costs, price spread and market integration, producer's surplus, government policy and research, training and statistics on agricultural marketing and imports/exports of agricultural commodities.

NEW ROLE OF AGRICULTURAL MARKETING

Agricultural marketing scenario in the country has undergone a sea-change over the last five decades owing to the increases in the output of agricultural commodities and consequently in their marketed surpluses; increase in urbanization and income levels and thereby changes in the pattern of demand for farm products and their derivatives; slow and steady increase in the linkages with the overseas markets; and changes in the form and degree of government intervention in agricultural markets. Therefore, the framework under which agricultural produce markets function and the factors which influence the prices received by the farmers now need to be understood in a different perspective compared to that in the past. The role of marketing now starts right from the time of decision relating to what to produce, which variety to produce and how to prepare the product for marketing rather than limiting it to when, where and to whom to sell.

DIFFERENCES IN MARKETING OF AGRICULTURAL AND MANUFACTURED GOODS

The marketing of agricultural commodities is different from the marketing of manufactured commodities because of the special characteristics of the agricultural sector (demand and supply) which have a bearing on marketing. Because of these characteristics, the subject of agricultural marketing has been treated as a separate discipline—and this fact makes the subject somewhat complicated. These special characteristics of the agricultural sector affect the supply and demand of agricultural products in a manner different from that governing the supply and demand of manufactured commodities. The special characteristics which the agricultural sector possesses, and which are different from those of the manufactured sector, are:

(i) *Perishability of the Product*

Most farm products are perishable in nature; but the period of their perishability varies from a few hours to a few months. To a large extent, the marketing of farm products is virtually a race with death and decay. Their perishability makes it almost impossible for producers to fix the reserve price for their farm-grown products. The supply of agricultural products is irregular; the price of the crop therefore fluctuates both during the year and from year to year. The extent of perishability of farm products may be reduced by the processing function; but they cannot be made non-perishable like manufactured products. Nor can their supply be made regular.

(ii) *Seasonality of Production*

Farm products are produced in a particular season; they cannot be

8

literature on agricultural marketing has been presented in the Bibliography at the end. Some common abbreviations in agricultural marketing have been also given at the end.

NOTES AND REFERENCES

1. Spinks, G.R., "Attitude Towards Agricultural Marketing in Asia and the Far East", Agricultural Development in Developing Countries—Comparative Experience, The Indian Society of Agricultural Economics, Bombay, 1972, p. 205.
2. Thomsen, F.L., *Agricultural Marketing*, McGraw-Hill Book Company, Inc., New York, 1951, p.1.
3. Acharya, S.S., "Agriculture-Industry Linkages: Public Policy and Some Areas of Concern", Agricultural Economics Research Review, Vol. 10, No. 2, July–Dec. 1997, p. 162.

Markets and Market Structure

This chapter deals with the concept and components of a market, classification of markets based on 12 criteria, and growth of markets. It also covers market structure, conduct and performance. The concept of market forces and simplest theory of price determination have also been presented in this chapter.

MARKET
MEANING
The word *market* comes from the latin word 'marcatus' which means merchandise or trade or a place where business is conducted.

Word 'market' has been widely and variedly 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.

There is an old English saying that two women and a goose may make a market. However, in common parlance, a market includes any place where persons assemble for the sale or purchase of commodities intended for satisfying human wants. Other terms used for describing markets in India are *Haats, Painths, Shandies and Bazar.*

The word *market* in the economic sense carries a broad meaning. Some of the definitions of *market* are given as follows:

1. A *market* is the sphere within which price determining forces operate.[1]

2. A *market* is the area within which the forces of demand and supply converge to establish a single price.[2]

3. The term *market* means not a particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such a free intercourse with one another that the prices of the same goods tend to equality, easily and quickly.[3]

4. *Market* means a social institution which performs activities and provides facilities for exchanging commodities between buyers and sellers.[4]

5. Economically interpreted, the term *market* refers, not to a place but to,

a commodity or commodities and buyers and sellers are in free intercourse with one another.[5]

6. The American Marketing Association has defined a market as the aggregate demand of the potential buyers for a product/service, while Kotler defined market as an area for potential exchanges.[6]

A market exists when buyers wishing to exchange the money for a good or service are in contact with the sellers who are willing to exchange goods or services for money. Thus, a market is defined in terms of the existence of fundamental forces of supply and demand and is not necessarily confined to a particular geographical location. The concept of a market is basic to most of the contemporary economies, since in a free market economy, this is the mechanism by which resources are allocated.

COMPONENTS OF A MARKET

For a market to exist, certain conditions must be satisfied. These conditions should be both necessary and sufficient. They may also be termed as the components of a market.

1. The existence of a good or commodity for transactions (physical existence is, however, not necessary);
2. The existence of buyers and sellers;
3. Business relationship or intercourse between buyers and sellers; and
4. Demarcation of area such as place, region, country or the whole world.

The existence of perfect competition or a uniform price is not necessary.

DIMENSIONS OF A MARKET

There are various dimensions of any specified market. These dimensions are:

1. Location or place of operation
2. Area or coverage
3. Time span
4. Volume of transactions
5. Nature of transactions
6. Number of commodities
7. Degree of competition
8. Nature of commodities
9. Stage of marketing
10. Extent of public intervention
11. Type of population served
12. Accrual of marketing margins.

Any individual market may be classified in a twelve-dimensional space.

CLASSIFICATION OF MARKETS

Markets may be classified on the basis of each of the twelve dimensions already listed.

1. ON THE BASIS OF LOCATION OR PLACE OF OPERATION

On the basis of the place of location or place of operation, markets are of the following types:

(a) *Village Market* : A market which is located in a small village, where major transactions take place among the buyers and sellers of a village, is called a village market.

(b) *Primary Markets* : These markets are located in towns near the centres of production of agricultural commodities. In these markets, a major part of the produce is brought for sale by the producer-farmers themselves. Transactions in these markets usually take place between the farmers and primary traders.

(c) *Secondary Wholesale Markets* : These markets are located generally at district headquarters or important trade centres or near railway junctions. The major transactions in commodities in these markets take place between the village traders and wholesalers. The bulk of the arrivals in these markets is from other markets. The produce in these markets is handled in large quantities. There are, therefore, specialized marketing agencies performing different marketing functions, such as those of commission agents, brokers and weighmen in these markets.

(d) *Terminal Markets* : A terminal market is one where the produce is either finally disposed of to the consumers or processors, or assembled for export. In these markets, merchants are well organized and use modern methods of marketing. Commodity exchanges exist in these markets which provide facilities for forward trading in specific commodities. Such markets are located either in metropolitan cities or at sea-ports. Delhi, Mumbai, Chennai, Kolkatta and Cochin are terminal markets for many commodities.

(e) *Seaboard Markets* : Markets which are located near the seashore and are meant mainly for the import and/or export of goods are known as seaboard markets. These are generally seaport towns. Examples of these markets in India are Mumbai, Chennai, Kolkatta and Cochin (Kochy).

2. ON THE BASIS OF AREA/COVERAGE

On the basis of the area from which buyers and sellers usually come for transactions, markets may be classified into the following four classes:

(a) *Local or Village Markets* : A market in which the buying and selling activities are confined among the buyers and sellers drawn from the same village or nearby villages. The village markets exist mostly for perishable commodities in small lots, *e.g.*, local milk market or vegetable market.

(b) *Regional Markets* : A market in which buyers and sellers for a commodity are drawn from a larger area than the local markets. Regional markets in India usually exist for foodgrains.

(c) *National Markets* : A market in which buyers and sellers spread at the national level. Earlier national markets existed for only durable goods like jute

and tea. But with the expansion of roads, transport and communication facilities, the markets for most of the products have taken the form of national markets.

(d) *World or International Market* : A market in which the buyers and sellers are drawn from more than one country or the whole world. These are the biggest markets from the area point of view.

These markets exist in the commodities which have a world-wide demand and/or supply, such as coffee, machinery, gold, silver, etc. In recent years many countries are moving towards a regime of liberal international trade in agricultural products like raw cotton, sugar, rice and wheat. It is expected that the international trade in such commodities will become free from many restrictions as they exist now.

3. ON THE BASIS OF TIME SPAN

On this basis, markets are of the following types:

(a) *Short period Markets* : The markets which are held only for a day or few hours are called short-period markets. The products dealt within these markets are of a highly perishable nature, such as fish, fresh vegetables, and liquid milk. In these markets, the prices of commodities are governed mainly by the extent of demand for, rather than by the supply of, the commodity.

(b) *Periodic Markets* : The periodic markets are congregation of buyers and sellers at specified places either in villages, semi-urban areas or some parts of urban areas on specific days and time. Major commodities traded in these markets is the farm produce grown in the hinterlands. The periodic markets are held weekly, biweekly, fortnightly or monthly according to the local traditions. These are similar to 'spontaneous markets' in several developed countries.

(c) *Long-period Markets* : These markets are held for a longer period than the short-period markets. The commodities traded in these markets are less perishable and can be stored for some time; like foodgrains and oilseeds. The prices are governed both by the supply and demand forces.

(d) *Secular Markets* : These are markets of a permanent nature. The commodities traded in these markets are durable in nature and can be stored for many years. Examples are markets for machinery and manufactured goods.

4. ON THE BASIS OF VOLUMES OF TRANSACTIONS

There are two types of markets on the basis of volume of transactions at a time.

(a) *Wholesale Markets* : A wholesale market is one in which commodities are bought and sold in large lots or in bulk. These markets are generally located in either towns or cities. The economic activities in and around these markets are so intense that over time the population tends to get concentrated around these markets. These markets occupy an extremely important link in the marketing chain of all the commodities including farm products.

Apart from balancing the supply and demand and discovery of the prices of a commodity, these markets and functionaries in them serve as a link between the production system and consumption system. The wholesale markets for farm products in India can be classified as primary, secondary and terminal wholesale markets. The primary wholesale markets are in the nature of assembling centres located in and around producing regions. The transactions in primary wholesale markets take place mainly between farmers and traders. Secondary wholesale markets are generally located between primary wholesale and terminal markets. The transactions in these markets take place between primary wholesalers and traders of terminal market. The terminal markets are generally located at the large urban metropolitan cities or export centres catering to the large consuming population around them or in the overseas markets.

(b) *Retail Markets* : A retail market is one in which commodities are bought by and sold to the consumers as per their requirements. Transactions in these markets take place between retailers and consumers. The retailers purchase the goods from wholesale market and sell in small lots to the consumers in retail markets. These markets are very near to the consumers.

The distinction between the wholesale and retail market can be made mainly on the basis of buyer. A retail market means that the buyers are generally ultimate consumers, whereas in the wholesale market the buyers can be wholesalers or retailers. But sometimes-bulk consumers also purchase from the wholesale markets. The quantity transacted in retail markets is generally smaller than that in the wholesale markets.

5. ON THE BASIS OF NATURE OF TRANSACTIONS

The markets which are based on the types of transactions in which people are engaged are of two types:

(a) *Spot or Cash Markets* : A market in which goods are exchanged for money immediately after the sale is called the spot or cash market.

(b) *Forward Markets* : A market in which the purchase and sale of a commodity takes place at time t but the exchange of the commodity takes place on some specified date in future *i.e.*, time $t + 1$. Sometimes even on the specified date in the future $(t + 1)$, there may not be any exchange of the commodity. Instead, the differences in the purchase and sale prices are paid or taken.

6. ON THE BASIS OF NUMBER OF COMMODITIES IN WHICH TRANSACTION TAKES PLACE

A market may be general or specialized on the basis of the number of commodities in which transactions are completed:

(a) *General Markets* : A market in which all types of commodities, such as foodgrains, oilseeds, fibre crops, gur, etc., are bought and sold is known as general market. These markets deal in a large number of commodities.

(b) *Specialized Markets* : A market in which transactions take place only in one or two commodities is known as a specialized market. For every group of commodities, separate markets exist. The examples of specialized markets are foodgrain markets, vegetable markets, wool market and cotton market.

7. ON THE BASIS OF DEGREE OF COMPETITION

Each market can be placed on a continuous scale, starting from a perfectly competitive point to a pure monopoly or monopsony situation. Extreme forms are almost non-existent. Nevertheless, it is useful to know their characteristics. In addition to these two extremes, various midpoints of this continuum have been identified. On the basis of competition, markets may be classified into the following categories:

(a) *Perfect Markets* : A perfect market is one in which the following conditions hold good:

(i) There is a large number of buyers and sellers;

(ii) All the buyers and sellers in the market have perfect knowledge of demand, supply and prices;

(iii) Prices at any one time are uniform over a geographical area, plus or minus the cost of getting supplies from surplus to deficit areas;

(iv) The prices are uniform at any one place over periods of time, plus or minus the cost of storage from one period to another;

(v) The prices of different forms of a product are uniform, plus or minus the cost of converting the product from one form to another.

(b) *Imperfect Markets* : The markets in which the conditions of perfect competition are lacking are characterized as imperfect markets. The following situations, each based on the degree of imperfection, may be identified:

(i) *Monopoly Market* : Monopoly is a market situation in which there is only one seller of a commodity. He exercises sole control over the quantity or price of the commodity. In this market, the price of a commodity is generally higher than in other markets. Indian farmers operate in monopoly market when purchasing electricity for irrigation. When there is only one buyer of a product, the market is termed as a monopsony market.

(ii) *Duopoly Market* : A duopoly market is one which has only two sellers of a commodity. They may mutually agree to charge a common price which is higher than the hypothetical price in a common market. The market situation in which there are only two buyers of a commodity is known as the duopsony market.

(iii) *Oligopoly Market* : A market in which there are more than two but still a few sellers of a commodity is termed as an oligopoly market. A market having a few (more than two) buyers is known as oligopsony market.

(iv) *Monopolistic Competition* : When a large number of sellers deal in heterogeneous and differentiated form of a commodity, the situation is called monopolistic competition. The difference is made conspicuous by different

trade marks on the product. Different prices prevail for the same basic product. Examples of monopolistic competition faced by farmers may be drawn from the input markets. For example, they have to chose between various makes of insecticides, pumpsets, fertilizers and equipments.

8. ON THE BASIS OF NATURE OF COMMODITIES

On the basis of the type of goods dealt in, market may be classified into the following categories:

(a) *Commodity Markets* : A market which deals in goods and raw materials, such as wheat, barley, cotton, fertilizer, seed, etc., are termed as commodity markets.

(b) *Capital Markets* : The market in which bonds, shares and securities are bought and sold are called capital markets; for example, money markets and share markets.

9. ON THE BASIS OF STAGE OF MARKETING

On the basis of the stage of marketing, markets may be classified into two categories:

(a) *Producing Markets* : Those markets which mainly assemble the commodity for further distribution to other markets are termed as producing markets. Such markets are located in producing areas.

(b) *Consuming Markets* : Markets which collect the produce for final disposal to the consuming population are called consumer markets. Such markets are generally located in areas where production is inadequate, or in thickly populated urban centres.

10. ON THE BASIS OF EXTENT OF PUBLIC INTERVENTION

Based on the extent of public intervention, markets may be placed in any one of the following two classes:

(a) *Regulated Markets* : These are those markets in which business is done in accordance with the rules and regulations framed by the statutory market organization representing different sections involved in markets. The marketing costs in such markets are standardized and, marketing practices are regulated.

(b) *Unregulated Markets* : These are the markets in which business is conducted without any set rules and regulations. Traders frame the rules for the conduct of the business and run the market. These markets suffer from many ills, ranging from unstandardised charges for marketing functions to imperfections in the determination of prices.

11. ON THE BASIS OF TYPE OF POPULATION SERVED

On the basis of population served by a market, it can be classified as either urban or rural market:

(a) *Urban Market* : A market which serves mainly the population residing in an urban area is called an urban market. The nature and quantum of demand for agricultural products arising from the urban population is characterised as urban market for farm products.

(b) *Rural Market* : The word rural market usually refers to the demand originating from the rural population. There is considerable difference in the nature of embedded services required with a farm product between urban and rural demands.

Rural markets generally have poor marketing facilities as compared to urban markets. According to the survey of the Directorate of Marketing and Inspection (DMI) of Government of India[7], only 46 percent of rural primary markets of the country have the facility of market yards; 6.4 percent have office buildings, 3.2 percent have cattle shed, 3 percent have canteen, 4.9 percent have storage facilities, 5.1 percent have auction platforms, 12.9 percent have drinking water facility and 5.2 percent markets have electricity facility. Marketing support services such as godowns, cleaning, price information and extension services were found completely non-existent in most of these rural markets.

12. ON THE BASIS OF MARKET FUNCTIONARIES AND ACCRUAL OF MARKETING MARGINS
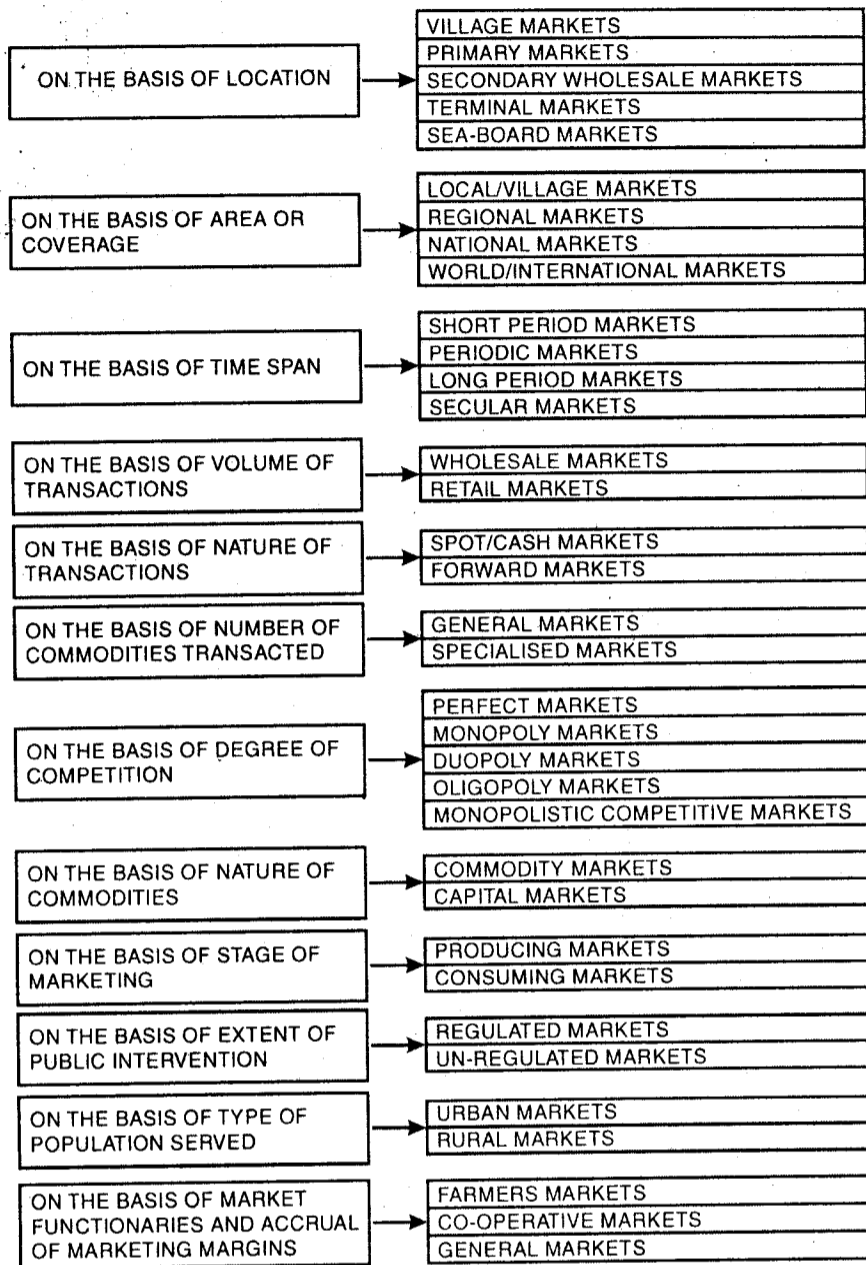
Markets can also be classified on the basis of as to who are the market functionaries and to whom the marketing margins accrue. Over the years, there has been a considerable increase in the producers or consumers co-operatives or other organizations handling marketing of various products. Though private trade still handles bulk of the trade in farm products, the co-operative marketing has increased its share in the trade of some agricultural commodities like milk, fertilizers, sugarcane and sugar. In the case of marketing activities undertaken by producers or consumers co-operatives, the marketing margins are either negligible or shared amongst their members. In some cases, farmers themselve work as sellers of their produce to the consumers. On this basis, the market can be (a) farmers markets, (b) cooperative markets or (c) general markets.

It must be noted that each market or market place can be classified on the basis of the 12 criteria mentioned above. A 12-dimensional classification of markets is shown in Chart 2.1.

GROWTH OF MARKETS

Following the economic development of society, there is a tendency among the markets to grow. This tendency is termed as market development or growth. The growth of a market may be natural or induced. Market development takes place, both qualitatively and quantitatively. Two of the important dimensions of the growth of a market are functional and geographical.

CHART : 2.1
12 – DIMENSIONAL CLASSIFICATION OF MARKETS

ON THE BASIS OF LOCATION	→	VILLAGE MARKETS
		PRIMARY MARKETS
		SECONDARY WHOLESALE MARKETS
		TERMINAL MARKETS
		SEA-BOARD MARKETS

ON THE BASIS OF AREA OR COVERAGE	→	LOCAL/VILLAGE MARKETS
		REGIONAL MARKETS
		NATIONAL MARKETS
		WORLD/INTERNATIONAL MARKETS

ON THE BASIS OF TIME SPAN	→	SHORT PERIOD MARKETS
		PERIODIC MARKETS
		LONG PERIOD MARKETS
		SECULAR MARKETS

| ON THE BASIS OF VOLUME OF TRANSACTIONS | → | WHOLESALE MARKETS |
| | | RETAIL MARKETS |

| ON THE BASIS OF NATURE OF TRANSACTIONS | → | SPOT/CASH MARKETS |
| | | FORWARD MARKETS |

| ON THE BASIS OF NUMBER OF COMMODITIES TRANSACTED | → | GENERAL MARKETS |
| | | SPECIALISED MARKETS |

ON THE BASIS OF DEGREE OF COMPETITION	→	PERFECT MARKETS
		MONOPOLY MARKETS
		DUOPOLY MARKETS
		OLIGOPOLY MARKETS
		MONOPOLISTIC COMPETITIVE MARKETS

| ON THE BASIS OF NATURE OF COMMODITIES | → | COMMODITY MARKETS |
| | | CAPITAL MARKETS |

| ON THE BASIS OF STAGE OF MARKETING | → | PRODUCING MARKETS |
| | | CONSUMING MARKETS |

| ON THE BASIS OF EXTENT OF PUBLIC INTERVENTION | → | REGULATED MARKETS |
| | | UN-REGULATED MARKETS |

| ON THE BASIS OF TYPE OF POPULATION SERVED | → | URBAN MARKETS |
| | | RURAL MARKETS |

ON THE BASIS OF MARKET FUNCTIONARIES AND ACCRUAL OF MARKETING MARGINS	→	FARMERS MARKETS
		CO-OPERATIVE MARKETS
		GENERAL MARKETS

COMPONENTS OF MARKET STRUCTURE

The components of the market structure, which together determine the conduct and performance of the market, are :

1. Concentration of Market Power

The concentration of market power is an important element determining the nature of competition and consequently of market conduct and performance. This is measured by the number and size of firms existing in the market. The extent of concentration represents the control of an individual firm or a group of firms over the buying and selling of the produce. A high degree of market concentration restricts the movement of goods between buyers and sellers at fair and competitive prices, and creates an oligopoly or oligopsony situation in the market.

2. Degree of Product Differentiation

Whether or not the products are homogeneous affects the market structure. If products are homogeneous, the price variations in the market will not be wide. When products are heterogeneous, firms have the tendency to charge different prices for their products. Everyone tries to prove that his product is superior to the products of others.

3. Conditions for entry of Firms in the Market

Another dimension of the market structure is the restriction, if any, on the entry of firms in the market. Sometimes, a few big firms do not allow new firms to enter the market or make their entry difficult by their dominance in the market. There may also be some government restrictions on the entry of firms.

4. Flow of Market Information

A well-organized market intelligence information system helps all the buyers and sellers to freely interact with one another in arriving at prices and striking deals.

5. Degree of Integration

The behaviour of an integrated market will be different from that of a market where there is no or less integration either among the firms or of their activities.

Firms plan their strategies in respect of the methods to be employed in determining prices, increasing sales, co-ordinating with competing firms and adopting predatory practices against rivals or potential entrants. The structural characteristics of the market govern the behaviour of the firms in planning strategies for their selling and buying operations.

DYNAMICS OF MARKET STRUCTURE—CONDUCT AND PERFORMANCE

The market structure determines the market conduct and performance. The term *market* conduct refers to the patterns of behaviour of firms, specially in relation to pricing and their practices in adapting and adjusting to the market in which they function. Specifically, market conduct includes:

(a) Market sharing and price setting policies;

(b) Policies aimed at coercing rivals; and

(c) Policies towards setting the quality of products.

The term *market performance* refers to the economic results that flow from the industry as each firm pursues its particular line of conduct.[12] Society has to decide the criteria for satisfactory market performance. Some of the criteria for measuring market performance and of the efficiency of the market structure are:

1. Efficiency in the use of resources, including real cost of performing various functions;

2. The existence of monopoly or monopoly profits, including the relationship of margins with the average cost of performing various functions;

3. Dynamic progressiveness of the system in adjusting the size and number of firms in relation to the volume of business, in adopting technological innovations and in finding and/or inventing new forms of products so as to maximize general social welfare.

4. Whether or not the system aggravates the problem of inequalities in inter-personal, inter-regional, or inter-group incomes. For example, inequalities increase under the following situations:

(a) A market intermediary may pocket a return greater than its real contribution to the national product;

(b) Small farmers are discriminated against when they are offered a lower return because of the low quantum of surplus;

(c) Inter-product price parity is substantially disturbed by new uses for some products and wide variations and rigidities in the production pattern between regions.

The market structure, therefore, has always to keep on adjusting to changing environment if it has to satisfy the social goals. A static market structure soon becomes obsolete because of the changes in the physical, economic, institutional and technological factors. For a satisfactory market performance, the market structure should keep pace with the following changes:

(i) *Production Pattern*

Significant changes occur in the production pattern because of technological, economic and institutional factors. The market structure should be re-oriented to keep pace with such changes.

much will be needed or desired?" Sometimes, a distinction is made between demand and desire by defining demand as the desire which is backed by purchasing power or the capacity to purchase.

(b) *Derived Demand* : The demand for some commodities exists only because they are used in producing other commodities which satisfy human wants. The demand for such commodities is termed as a *derived demand*. For example, farmyard manure and fertilizers are demanded not because they satisfy any human want directly but because these are used in producing goods—crops which are directly demanded by consumers. In a strict sense, therefore, the demand for farm inputs is a derived demand, for it is derived from the demands for goods produced with their help.

(c) *Reservation Demand and Price* : The term *reservation demand* refers to the quantity of a product a seller would like to retain (rather than sell) at a given price. At each price, the seller himself has a demand to keep a certain quantity with himself for later sale. He may not like to sell a particular "lot" if the price offered for it is lower than some preconceived price, which is known as the *reservation price*.

At any point in time, a schedule showing the quantity to be retained or, for that matter, the quantity to be sold at each price may be developed for each stockist. Such a schedule may be termed as *reservation demand and price schedule*.

(d) *Demand Function* : The demand for a commodity is not affected by price alone, whether one thinks of an individual consumer or a group of consumers. Factors such as income, tastes, habits, weather, the prices of substitutes and incentives for savings affect demand in the sense that they shift the whole range of price-quantity relationship. A demand schedule is usually expressed as

$$Q = f(P_q)$$

where

Q = Quantity demanded
P_q = Price per unit of Q.

The demand function for the same commodity is expressed as

$$Q = f(P_q, P_s, P, Y, W, ...)$$

where

P_s = Price of substitute or complementary goods
P = Population or family size
Y = Income
W = Weather

and the dots show that some more factors may be identified, depending upon the purpose of analysis, the group of consumers and the commodity that is considered.

Factors affecting Demand for Farm Products

Farm products are demanded by consumers to satisfy their nutritional wants, and by cattle raisers to feed their livestock, by traders for sale and by manufacturers for converting them into processed foods or other goods.

At the macro or national level, aggregate demand for farm products is determined by the size of the population and per capita income. Changes in tastes, processing technology and income distribution affect the aggregate, as well as the composition of the demand for farm products.

The effect of an increase in population and per capita incomes on the demand for foodgrains may be expressed in simple terms as

$$D = P + eY$$

where

D = rate of increase in aggregate demand for foodgrains

P = rate of growth in population

e = income elasticity of demand for foodgrains

Y = rate of growth in per capita income.

In other words, if the population of a country increases at a rate of 2.2 percent per year and if the per capita income increases at a rate of 3 percent per year, assuming an income elasticity of demand as 0.6, the demand for foodgrains in the country would grow at a rate of 4.0 percent [2.2 + (0.6) 3.0] per year.

The estimates of the rates of growth of population and per capita incomes are readily available. The coefficient of income elasticity of demand is very important in determining the pressure of demand. The coefficient varies from commodity to commodity, from area to area, and between income levels.

Estimates have been made from time to time to study the relationship between consumer income and consumption of various farm products. Most of the estimates are based on the cross-sectional data obtained from the National Sample Surveys (NSS) and show the relationship between total consumer expenditure and expenditure on individual items rather than that between income and purchased quantity. These are, therefore, sometimes expressed as expenditure elasticities of demand. The estimates of income elasticities of demand for foodgrains and edible oils as worked out by Murty[13] from the data for seventies are shown in Table 2.2. The estimates for a large number of commodities generated by Bhalla[14] from the data for the eighties are shown in Table 2.3. For policy formulation, one should always look at the estimates based on the latest data. A comparison of data in Tables 2.2 and 2.3 shows that there has occurred a considerable change in the income elasticity of demand for farm products in India.

The income elasticity of demand differs between rural and urban areas. In the case of cereals, the income elasticity of demand in rural areas (as per Bhalla) is 0.33 and that in urban areas is 0.18. Another important point to be

The demand for individual farm products is also affected by the availability of substitutes. Foodgrains are the basic items of necessity, and there are no substitutes for them as a group. However, within the group, one commodity may be substituted for another.

SUPPLY
MEANING

The term *supply* refers to schedule or quantities of a product that will be offered for sale at different prices at a given time and in a given market. There is a logical relationship between supply and price. The higher the price, the larger the quantity that is offered for sale, and vice versa. Thus, supply indicates a relationship between the quantity and price of a commodity from the seller's viewpoint. A hypothetical supply schedule for milk is given in Table 2.5.

Table 2.5
Hypothetical Market Supply Schedule for Milk in 'A' Market

Price (Rs. per litre)	Quantity Offered for Sale (Thousand litres)
20	10
18	9
16	8
14	7
12	6
10	5
8	4
6	3
4	2

The graphical presentation of the supply schedule is known as the supply curve. The supply curve is positively sloped; and it always slopes upward left to right on a graph, as shown in Fig. 2.2

Time is a very important consideration in supply analysis. The given supply exists at a given time. The time periods can be of different lengths.

, (a) *Short Run* : This means that the existing production is already on hand and that the cost incurred on its production does not influence its price. The response of the quantity offered for sale to a change in price is very low.

(b) *Intermediate Run* : This refers to the time during which goods can be produced only with the existing production facilities. The existing capacity puts an upper limit on the quantity that can be offered for sale:

(c) *Long Run* : The term *long run* refers to the time during which production facilities themselves may be expanded or contracted. In the long run, supply is more responsive to prices and other incentives. The time element greatly complicates the process of the analysis of agricultural supply.
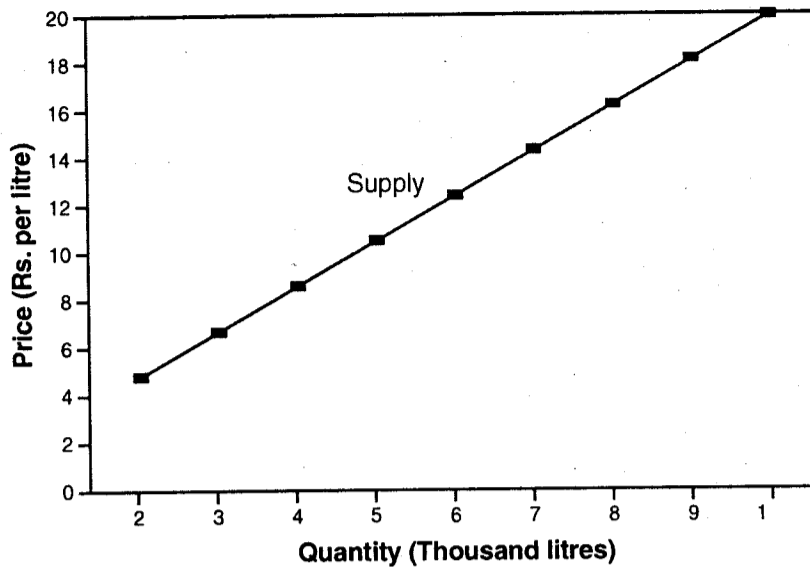
Fig. 2.2 Hypothetical Supply Curve for Milk.

FACTORS AFFECTING SUPPLY OF FARM PRODUCTS

There are two main sources of supply of farm products at the national level: one is the production on the farms and the other is import from other countries.

The factors which affect the domestic production of farm products are weather, technology, irrigation facilities, land suitable for cultivation, acreage under various crops, availability of inputs and relative inter-crop and input-output prices. The effect of prices and other factors on supply or production through the acreage may be studied by using the supply response models suggested by Nerlove. The basic supply response models have been presented in Appendix 2.1.

Domestic supply of a product can be either augmented by imports or restricted by allowing exports. The use of such instruments to affect the domestic supply depends on: (a) the difference between the domestic price and the international price after allowing for the shipment costs; (b) the objective of the national policy in terms of protection of the domestic producers and safeguarding the interests of the consumers in the immediate future; (c) the ability of the country to resort to imports (*i.e.*, the availability of the foreign exchange); and (d) the need of the country to earn foreign exchange by resorting to exports. The relative importance of these factors varies from country to country and even within the same country, from time to time.

Apart from the current production and net imports/exports, the carryover

30

Table 2.6
Production, Imports and Net Availability of Foodgrains in India

Year	Population (million persons)	Cereals (Million tonnes)				Pulses net availability (million tonnes)	Foodgrains net availability (million tonnes)	Per capita net availability of foodgrains (gms. per day)
		Net production	Net imports	Change in government stocks	Net availability			
1951	363.2	40.10	4.10	+ 0.6	44.3	8.00	52.30	394.9
1956	397.3	50.43	1.39	– 0.6	52.42	10.23	62.65	430.9
1961	442.4	60.89	3.49	– 0.17	64.55	11.14	75.69	468.7
1971	551.3	84.53	2.03	+ 2.57	83.99	10.32	94.31	468.7
1976	617.2	94.50	0.66	+ 10.74	84.42	11.41	95.83	424.3
1981	688.5	104.09	0.52	– 0.24	104.85	9.44	114.29	454.8
1986	766.1	119.94	(–) 0.06	– 1.58	121.46	12.30	133.76	478.1
1991	851.7	141.90	(–) 0.60	(–) 4.40	145.70	12.90	158.60	510.1
1995	922.0	155.3	(–) 3.0	(–) 1.7	154.0	12.7	166.7	495.3
1996	939.5	147.1	(–) 3.5	(–) 8.5	152.0	11.3	163.4	476.2
1997	955.2	162.0	(–) 0.6	(–) 1.8	163.2	13.0	176.2	505.5
1998	978.1	156.9	(–) 2.9	(+) 6.1	147.9	11.7	159.6	447.0
1999	996.4	165.1	(–) 1.5	(+) 7.5	156.1	13.3	169.4	465.7
2000	1014.8	171.8	(–) 1.4	(+) 13.9	156.6	11.3	167.9	454.4
2001	1033.3	162.1	(–) 4.5	(+) 12.3	145.2	11.0	156.2	414.1

Note : Net production is 87.5 percent of total production, remaining 12.5 percent being provided for seed, feed and wastage.
Source : Government of India, Bulletin on Food Statistics 1987–89, Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi, pp. 144–148 and Economic Survey 2002–03, Ministry of Finance, Government of India.

stocks determine the quantity which is actually available to the consumers during a given year. For example, the net availability of cereals in a country during any given year is equal to the carryover stocks plus current year's net production plus imports minus exports minus balance at the end of the year. Net availability, defined in this way, is the quantity which is actually available in the domestic market during a given period. This has been illustrated by using a case of cereals in India in Table 2.6. The net availability of pulses and total foodgrains along with per capita availability have also been shown.

SIMPLE MARKET MODEL AND PRICE DETERMINATION

The simplest of the simple market models is one where it is assumed that the quantity demanded and quantity supplied are affected only by the price of the commodity. The price and quantity which satisfies both the buyer(s) and seller(s) are called the equilibrium price and equilibrium quantity. Price determination in the case of this simplified model is illustrated below by three alternative approaches.

TABULAR APPROACH

The hypothetical demand and supply schedules given in Tables 2.1 and 2.5 have been reproduced in Table 2.7. It is evident from the table that at the price of Rs. 12.0 per litre, the quantity demanded by consumers (6,000 litres) is equal to the quantity offered for sale by the sellers. The equilibrium price, therefore, is Rs. 12.0 per litre and the equilibrium quantity is 6,000 litres. At a price below Rs. 12.0, the quantity demanded exceeds the quantity supplied; there is thus a pressure on the price to rise. At a price higher than Rs. 12.0, the quantity supplied exceeds the quantity demanded, there is thus a downward pressure on price.

Table 2.7
Equilibrium Price and Quantity of Milk

Price (Rs. per Litre)	Quantity Demanded ('000 Litres)	Quantity Supplied ('000 Litres)
4	10	2
6	9	3
8	8	4
10	7	5
12 — — —	6 — — —	6 (equilibrium)
14	5	7
16	4	8
18	3	9
20	2	10

GRAPHICAL APPROACH

Graphs of demand and supply schedules drawn in Fig. 2.1 and Fig. 2.2

have been reproduced in Fig. 2.3. The intersection of the demand and supply curves indicates the equilibrium price and quantity. Since the demand and supply curves represent the same demand and supply schedules as were used in the tabular analysis, the equilibrium price and equilibrium quantity obtained by the graphical analysis are the same as those obtained from the tabular analysis, *i.e.*, Rs. 12 per litre and 6,000 litres respectively.
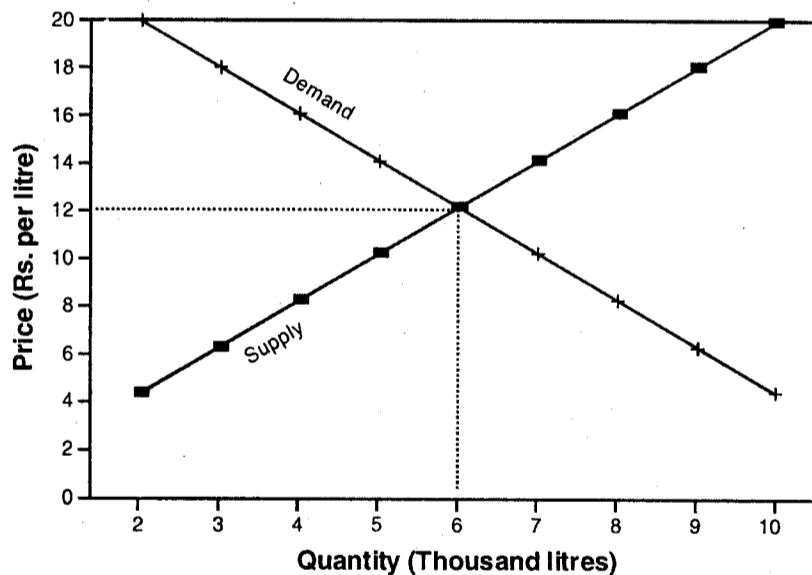

Fig. 2.3 Equilibrium Price and Quantity.

SIMULTANEOUS EQUATIONS APPROACH

The simplified market model may also be expressed in three equations:

Demand	$Qd = f(p_q)$
Supply	$Qs = f(P_q)$
Equilibrium conditions	$Qd = Qs$

Assuming a linear and exact demand and supply relationship (for simplification), the hypothetical market model may be written as follows:

General		Specific
$Qd = a + bP$	$b < 0$	$Qd = 12 - 0.5P$
$Qs = c + dP$	$d > 0$	$Qs = 0 + 0.5P$
$Qd = Qs$		$Qd = Qs$

where

Qd = Quantity demanded in '000 litres
Qs = Quantity supplied in '000 litres

P = Price per unit of milk in Rs. per litre.

From the equilibrium condition stated in the last equation, the equilibrium value of P may be calculated as follows:

General	Specific
$a + b\overline{P} = c + d\overline{P}$	$12 - 0.5\overline{P} = 0 + 0.5\overline{P}$

or

$b\overline{P} - d\overline{P} = -a + c$	$-0.5\overline{P} - 0.5\overline{P} = 0 - 12$

or

$\overline{P} = \dfrac{-a+c}{b-d}$	$\overline{P} = \dfrac{-12}{-1} = 12.0$

By substituting the equilibrium value of P (Rs. 12) in either the demand or the supply relation, the equilibrium value of Q may be calculated as follows:

General	Specific
$\overline{Q} = a + b\left(\dfrac{-a+c}{b-d}\right)$	$\overline{Q} = 12 - 0.5\,(12) = 6$

or

$\overline{Q} = c + d\left(\dfrac{-a+c}{b-d}\right)$	$\overline{Q} = 0 + 0.5\,(12) = 6$

The mechanism of determination at the macro level may now be understood. One may think of a demand schedule for, say, foodgrains at the national level.

Over the years, the demand schedule shifts to the right because of the growth in population and incomes and other factors stated earlier. If aggregate supply expands so that the aggregate supply curve also shifts appropriately, the price level may not rise and the equilibrium may be established at the same level of price and at higher quantity. But this rarely happens. At least in India, it has not happened.

To illustrate this point, let us consider Fig. 2.4. Let D_1 and S_1 be the demand and supply schedules respectively in period t_1. The equilibrium price and quantity during this period are P_1 and Q_1 respectively. Assume that, in period t_2. the demand schedule shifts to D_2. Now if there is no shift in the supply schedule, the equilibrium will be established at a price of P_2 (higher than P_1) and the quantity of Q_2 (higher than Q_1). If the supply curve in period t_2 shifts to S_2, the equilibrium will be established at the old price level and higher quantity (Q_4). But as the experience in India shows that the supply of farm products does not shift to the extent shown by the supply curve S_2. Nevertheless, barring a few exceptionally bad crop years, the supply schedule does shift to the right, say, as S_3, resulting in an increase in the price level
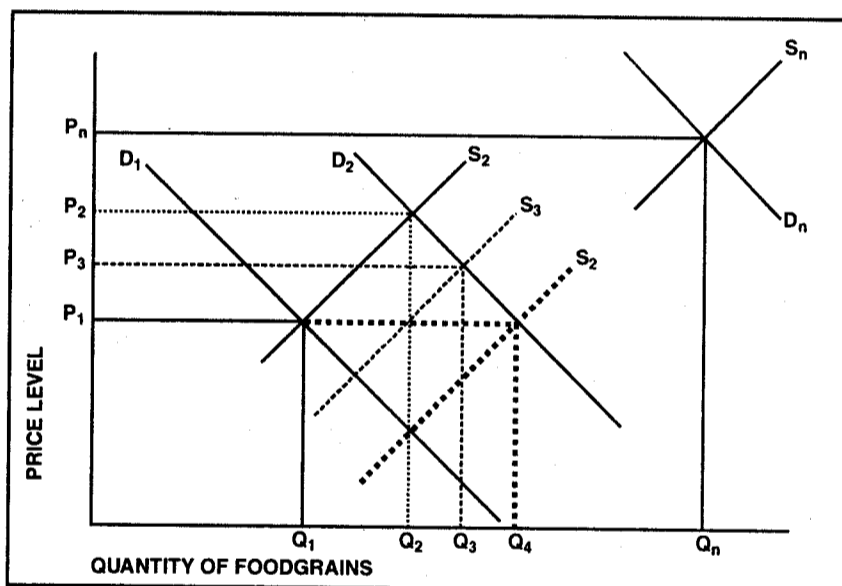
Fig. 2.4 Determination of Price Level of Foodgrains
Over Time at Macro Level.

from P_1 to P_3, and the higher equilibrium supply and demand Q_3. Every year, the process continues; and one observes larger quantities of supply and purchases at higher and higher levels of prices. The magnitude of the rise in prices from year to year depends on the relative shifts in, and the relative slopes of, the demand and supply schedules. In the nth year if the demand curve shifts to D_n and the supply curve shifts to S_n the equilibrium price would be P_n and the equilibrium quantity would be Q_n.

SOME GENERAL CONCEPTS USED IN MARKETING

For a better understanding of agricultural marketing, it is necessary to familiarise with some common concepts which are used in the field of general marketing. Some of these are given in this section.

Balance of Trade – The balance of trade is the difference between the value of exports and imports. The value of nation's exports less its imports is called balance of trade.

Brand and Branding – Brand is any name, sign, symbol and/or design used to identify the product of one firm which set them apart from competitor's offerings. Branding is a practice of giving a specified name to a product or group of products from one seller. The specified name creates individuality for the product and on account of this the specified brand of the product can be easily distinguished or recognized in the market from the rival products of-

fered by other sellers. The sole purpose of the branding is to distinguish the branded product from those sold by the competitors.

Cartel – An association of firms that attempts to regulate industry output and prices through mutual agreement is termed as cartel.

Consumer Franchise – The consumer franchise connotes the consumer loyalty to a branch or to a firm as a result of past experience or promotional efforts.

Consumerism – Consumerism can be defined as a movement or social force designed to protect consumers' interest in the market. It is in a sense organized consumers' pressure on the marketing system. Consumerism is an attempt to redress the existing imbalance in the exchange transactions between sellers and buyers. Consumerism is also a form of protest of consumers against unfair business practices and business injustices. The basic aim of consumerism is to remove injustices and eliminate unfair marketing practices which put the consumers to loss. Such practices could be in the nature of mis-branding of products; sale of spurious and unsafe products; sale of obsolete products; adulteration of products; price collusion among sellers; deceptive packaging of products; misleading advertisement; defective warranties; hoarding, profiteering and black marketing of the products; and use of short weights and measures.

In the normal marketing system, producer has the right of power to design the product, distribute, advertise and price it; while the consumer has only the power of not buying it. As such the consumer often feels that while he/she has the power of veto but is not always fully equipped to exercise that power in his/her best interest. This situation may be the result of lack of information or misinformation from one or several competing producers. All these situations have led to the movement of consumerism.

Consumer organizations could provide united and organized efforts to fight against unfair marketing practices and to secure consumers protection. Commendable work has been done by voluntary organizations in extending the rights of the consumers by keeping the producers conscious of consumer rights and interests. These consumer organizations/agencies help the consumers by providing information and knowledge in following areas:

(i) Consumer education – They provide information about the availability of consumer goods, their prices, standard trade practices, consumer expectations and consumer's rights.

(ii) Product rating – Consumer organizations also guide the consumers in their choice of the products by carrying tests for products and provide knowledge about the rating scale.

(iii) Maintaining liaison with government and producer companies of the products to protect the interests of producers in providing good quality goods at reasonable prices.

Differentiated Marketing – The practice whereby firms develop separate marketing programmes for different target consumer groups is known as differentiated marketing.

Farmers' Terms of Trade – The farmers' terms of trade connote the ratio of the indices of prices received to the indices of prices paid by the farmers. This ratio indicates whether farmers as a group are gainers or losers in the price situation prevailing in the country.

Food Retailing – Food retailing is sale of food items in small lots to the consumers. Food retailing has emerged as a big business in India accounting for 40 percent of all retail outlets in the country. The estimated annual revenues are $ 16 billion annually. However, modern retailing including grocery is only a small proportion of total retailing. It is mainly the traditional thelas, kiosks and small shop type of food retailing. With increasing trend towards dining-out-culture, its growth is likely to be much higher than the present growth of 6 percent per annum.

Free Market – A market with no direct involvement of government in market decisions is called a free market.

Law of One Price (LOOP) – The law of one price connotes a marketing principle which holds that under perfectly competitive market conditions, all prices within a market will be uniform after the costs of place, time and form utilities are taken into consideration.

Marketing Mix – The marketing mix connotes the way in which a firm or industry combines is pricing, promotional and distribution strategies which appeal the consumers. A successful marketing strategy must have a marketing mix as well as a target market for which the marketing mix is prepared. There are four elements of marketing mix viz., (a) product mix; (b) price mix; (c) distribution mix; and (d) promotional mix. Marketing manager is a mixer of all marketing ingredients and creates a mix of all the marketing elements and resources. The marketing mix offers an optimum combination (least cost combination) of all marketing ingredients to maximize company's objectives/goals viz., profit, return on investment, sales volume and market share. Marketing mix has to change according to the changes in marketing conditions and environmental factors which affect the market.

Marketing Process – Marketing process is the sequence of events and actions that coordinate the flow of goods and the value adding activities in the marketing system. Marketing is a matching process by which a producer provides a marketing-mix that meets consumer demand of a target market. The marketing process brings together producers and consumers for the exchange of the product. Each producer or seller has certain goals in marketing. The exchange takes place when market offering is acceptable to the consumer. In the process of exchange, both parties, i.e., producer-sellers and consumers derive some gains. The producer gets the surplus value in the form of profit and the consumer gets the surplus in the form of utility or indi-

vidual satisfaction. The marketing process is influenced by competition, government laws and policy, media of communication and consumer advocates.

Marketing Strategy – Marketing strategy is a particular procedure used by the seller to achieve a marketing goal. For example, one firm may use the strategy of low prices to attract the consumers, while the other might employ the strategy of selling quality products. The marketing strategy is a functional strategy. Thus, marketing strategy is a comprehensive plan of action designed to meet the needs of a certain enterprise operating in a particular environment. The marketing strategy of a firm can be made unique by emphasizing certain elements of the marketing mix. Formulation of a marketing strategy involves the following steps:

    (i)   Determination of marketing objectives;

    (ii) Generating alternative marketing mix options;

    (iii) Selecting the most profitable marketing mix option; and

    (iv) Creating conditions for implementing the chosen marketing mix.

Market Segmentation – The marketing technique of developing separate products and marketing programmes to appear to different consumer classes is called market segmentation. Market segmentation is a method for achieving maximum market response from limited marketing characteristics of various parts of the market. As such the market segmentation is the strategy of divide and conquer, *i.e.,* dividing markets to conquer them. Market segmentation enables the marketers to give better attention to the selected customers and offer an appropriate marketing mix for each chosen segment or group of buyers having homogenous demand. Each sub-division or segment is selected as a market target to be reached with a distinct marketing mix. In the imperfect competition, generally two types of marketing strategies are adopted *viz.,* (a) product differentiation through branding; and (b) market segmentation. Segmentation strategy is a customer oriented philosophy and offers following benefits:

(a) Marketers are in a better position to locate and compare marketing opportunities;

(b) Marketers can effectively formulate and implement marketing programmes which will be tuned with the demand of the particular segment of the market;

(c) Marketers can make finer adjustments in their products and marketing communication;

(d) Marketers can avoid fierce competition by assessing the strengths and weaknesses of the competitors and can use resources more profitably by catering to customers demand; and

(e) Segmentation leads to a more effective utilization of marketing resources because customer is the focus of marketing effort and in this only target markets are served.

38

Terms of Trade – The terms of trade connotes the relationship of prices of one country or a sector with the other. In international trade, it is the rate at which a country exchanges its exports with imports. Within a country, this term is used for inter-sectoral exchanges reflected through relative prices. In a two sector economy (agriculture and industry), it can be defined as the ratio of the index of agricultural prices to the index of industrial prices with reference to a common base year.

Trade Mark – Trade mark is a legal term given to a particular branded product duly registered under the Trade Names and Trade Marks Act. Thus, a branded product enjoys legal protection. The english letter 'R' in a circle on each package indicates that this brand of the product is duly registered.

NOTES AND REFERENCES

1. Hibbard, B.H., *Marketing Agricultural Products*, D. Appleton and Company, Inc., New York, 1921, pp. 13–15.
2. *Encyclopaedia of Social Sciences*, Vol. 10, 1933, p. 133.
3. Cournot, Recher Sur les Principles Mathematics de la Theorie des Richesses, Chap. IV.
4. Gupta, A.P. *Marketing of Agricultural Produce in India*, Vora and Co. Publishers Pvt. Limited, Bombay, 1975, p. 15.
5. Chapman, *Economics*, Quoted in Jain S.C. *Principles and Practice of Agricultural Marketing and Prices*, Vora and Co. Publishers Pvt. Limited, Bombay, 1971, p. 2.
6. Sherleker, S. A., *Marketing Management*, Himalayan Publishing House, Mumbai, 1981, p.1.
7. Directorate of Marketing and Inspection (DMI), Survey of Planning of Rural Markets in India, MPDC, Report No. 23, July 1987, p. 39.
8. Acharya S.S., "*Agricultural-Industry Linkages : Public Policy and Some Areas of Concern*", Agricultural Economics Research Review, Vol. 10, No. 2, July–Dec. 1997.
9. George, M.V. and A.J. Singh, "Structure, Conduct and Performance of Wholesale Vegetable Market in Punjab," Proceedings of the Second All-India Agriculture Marketing Research Conference held at Jabalpur on June 8–9, 1970, pp. 80–81.
10. Stifel, L.D., *Teaching and Research Forum*. Series No. 3, Agricultural Development Council, New York, October, 1976.
11. Amarchand, D. and B. Varadharajan. *An Introduction to Marketing*, Vikas Publishing House Pvt. Ltd., New Delhi, 1980, p. 18.
12. George, M.V. and A.J. Singh, *op. cit.*, pp. 80–81.
13. Murty, K.N., Consumption and Nutritional Patterns of ICRISAT Mandate Crops in India, ICRISAT, Progress Report No. 53, Aug. 1983, pp. 10–11.
14. Bhalla, G.S., "*Globalisation and Agricultural Policy in India*", Indian Journal of Agricultural Economics, Vol. 50, No. I, Jan–March 1995, pp. 1–26.
15. Kumar, P. and V.C. Mathur, "*Agriculture in Future: Demand-Supply Projections for the Ninth Five Year Plan*" ; Economic and Political Weekly, Vol. 31 (39), Sept. 28, 1996, pp A-131 to 139.

Appendix 2.1

BASIC NERLOVIAN PRICE EXPECTATION AND ACREAGE ADJUSTMENT MODELS

These models were initially suggested and used by Nerlove to estimate the effect of price on the acreage under crops. In the price expectation model, it was hypothesized that farmers would react not only to the last year's prices but to the price they expected, and that this expected price would depend, but only to a limited extent, on last year's price. This model is known as the Nerlovian Price Expectation Model and is of the following form:[1]

$$A_t = a + bP_t^* + U_t \qquad \qquad ...(1)$$

$$\left(P_t^* - P_{t-1}^*\right) = \beta\left(P_{t-1} - P_{t-1}^*\right) \qquad ...(2)$$

$$0 < \beta < 1$$

where

A_t = actual acreage under the crop in year t

P_t^* = expected price of the crop in year t

P_{t-1}^* = expected price of the crop in the preceding year

P_{t-1} = actual price of the crop in year $t-1$

U_t = error term

a and b = constants

β = coefficient of expectation.

The Nerlovian model of price expectation was modified by other workers. Rainfall, relative yield and total irrigated area in the first equation of basic Nerlovian model were included as the explanatory variables to explain the variation in acreage.[2] Further, the price variability as one of the independent variables in the basic Nerlovian model was added as a measure of uncertainty in the price by Behrman[3].

In the acreage adjustment model, the hypothesis is that the desired acreage $\left(A_t^*\right)$ depends on last year's price (P_{t-1}) and that the acreage adjustment from one year to another depends on the difference between last year's acreage (A_{t-1}) and the desired area for the current year $\left(A_t^*\right)$. The two equation acreage adjustment model can be expressed as:

$$A_t^* = a + bP_{t-1} + U_t \qquad \qquad ...(3)$$

$$A_t - A_{t-1} = \gamma\left(A_t^* - A_{t-1}\right) \qquad ...(4)$$

$$0 < \gamma < 1$$

where a, b and the coefficient of adjustment (γ) are the parameters to be

40

estimated.

Both the price expectation and acreage adjustment models lead to the same form of the estimating equation, which is given below :

$$A_t = \pi_0 + \pi_1 P_{t-1} + \pi_2 A_{t-1} + W_t$$

where

$\pi_0 = a\beta$ or $a\gamma$

$\pi_1 = b\beta$ or $b\gamma$

$\pi_2 = 1 - \beta$ or $1 - \gamma$

W_t = new disturbance term.

The relationship of the new disturbance term in the estimating (reduced form) equation and the structural equations, and the corresponding assumptions about the behaviour of these terms, specially in respect of auto-correlation, differ between the price expectation and acreage adjustment models.

REFERENCES

1. Nerlove, Marc. "Distributed Lags and Estimation of Long-run Supply and Demand Elasticities: Theoretical Considerations." *Journal of Farm Economics*, Vol. 40, 1958, pp. 302–11.

2. Rajkrishna. Farm Supply Response in India-Pakistan : A Case Study of Punjab Region, *The Economic Journal*, Vol. 73, 1963, pp. 447–87

3. Behrman, J.R. *Supply Response in Underdeveloped Agriculture*, North Holland Publishing Co., Amsterdam, 1968.

Agricultural Marketing and Economic Development

Orderly and efficient marketing of foodgrains plays an important role in solving the problem of hunger. Most of those who go hungry do so because they can not pay higher prices for foodgrains. If marketing system is not efficient, price signals arising at the consumers' level are not adequately transferred to the producers, as a result farmers do not get sufficient price incentive to increase the production of the commodities which are in short supply. Thus, an inefficient marketing system adversely affects the living standards of both the farmers and consumers. In agricultural-oriented developing countries like India, agricultural marketing plays a pivotal role in fostering and sustaining the tempo of rural and economic development. Markets trigger the process of development.

The development of an efficient marketing system is important in ensuring that scarce and essential commodities reach different classes of consumers. Marketing is not only an economic link between the producers and the consumers; it maintains a balance between demand and supply. The objectives of price stability, rapid economic growth and equitable distribution of goods and services cannot be achieved without the support of an efficient marketing system.

IMPORTANCE OF AGRICULTURAL MARKETING

Agricultural marketing plays an important role not only in stimulating production and consumption, but in accelerating the pace of economic development. Its dynamic functions are of primary importance in promoting economic development. For this reason, it has been described as the most important multiplier of agricultural development.

India's age-old farming practices have taken a turn in recent decades. There has been a technological breakthrough—the evolution of high-yielding variety seeds, increasing use of fertilizers, insecticides, pesticides, the installation of pumping sets, and tractorization. This technological breakthrough has led to a substantial increase in production on the farms and to the larger marketable and marketed surplus. To maintain this tempo and pace of

increased production through technological development, an assurance of remunerative prices to the farmer is a prerequisite, and this assurance can be given to the farmer by developing an efficient marketing system. .

The agricultural marketing system plays a dual role in economic development in countries whose resources are primarily agricultural. Increasing demands for money with which to purchase other goods leads to increasing sensitivity to relative prices on the part of the producers, and specialization in the cultivation of those crops on which the returns are the greatest, subject to socio-cultural, ecological and economic constraints. It is the marketing system that transmits the crucial price signals. On the other hand, and in order to sustain the growth of the non-agricultural sector, resources have to be extracted from the agricultural sector—physical resources to guarantee supplies of food and raw materials for the agro-industry and financial resources for investment in non-farm economy as well as for re-investment in agriculture.

On the basis of IADP experience, Kiehl[1] has shown that the "marketing problem" begins to emerge in the process of shifting from traditional to modern agriculture because of production surpluses generated by the shift. Indeed, the term *modern agriculture* implies a *market-oriented agriculture*. The scope for moving towards modern agriculture must include market dimensions if the momentum of production transformation is to be sustained.

The importance of agricultural marketing in economic development is revealed from the following :

(i) *Optimization of Resource use and Output Management*

An efficient agricultural marketing system leads to the optimisation of resource use and output management. An efficient marketing system can also contribute to an increase in the marketable surplus by scaling down the losses arising out of inefficient processing, storage and transportation. A well-designed system of marketing can effectively distribute the available stock of modern inputs, and thereby sustain a faster rate of growth in the agricultural sector.

(ii) *Increase in Farm Income*

An efficient marketing system ensures higher levels of income for the farmers reducing the number of middlemen or by restricting the cost of marketing services and the malpractices. In the marketing of farm products. An efficient system guarantees the farmers better prices for farm products and induces them to invest their surpluses in the purchase of modern inputs so that productivity and production may increase. This again results in an increase in the marketed surplus and income of the farmers. If the producer does not have an easily accessible market-outlet where he can sell his surplus produce, he has little incentive to produce more. The need for providing adequate incentives for increased production is, therefore, very important, and this can be made possible only by streamlining the marketing system.

(iii) Widening of Markets

An efficient and well-knit marketing system widens the market for the products by taking them to remote corners both within and outside the country, *i.e.*, to areas far away from the production points. The widening of the market helps in increasing the demand on a continuous basis, and thereby guarantees a higher income to the producer.

(iv) Growth of Agro-based Industries

An improved and efficient system of agricultural marketing helps in the growth of agro-based industries and stimulates the overall development process of the economy. Many industries like cotton, sugar, edible oils, food processing and jute depend on agriculture for the supply of raw materials.

(v) Price Signals

An efficient marketing system helps the farmers in planning their production in accordance with the needs of the economy. This work is carried out through transmitting price signals.

(vi) Adoption and Spread of New Technology

The marketing system helps the farmers in the adoption of new scientific and technical knowledge. New technology requires higher investment and farmers would invest only if they are assured of market clearance at remunerative prices.

(vii) Employment Creation

The marketing system provides employment to millions of persons engaged in various activities, such as packaging, transportation, storage and processing. Persons like commission agents, brokers, traders, retailers, weighmen, *hamals*, packagers and regulating staff are directly employed in the marketing system. This apart, several others find employment in supplying goods and services required by the marketing system.

(viii) Addition to National Income

Marketing activities add value to the product thereby increasing the nation's gross national product and net national product.

(ix) Better Living

The marketing system is essential for the success of the development programmes which are designed to uplift the population as a whole. Any plan of economic development that aims at diminishing the poverty of the agricultural population, reducing consumer food prices, earning more foreign exchange or eliminating economic waste has, therefore, to pay special attention to the development of an efficient marketing for food and agricultural products.

(x) *Creation of Utility*

Marketing is productive, and is as necessary as the farm production. It is, in fact, a part of production itself, for production is complete only when the product reaches a place in the form and at the time required by the consumers. Marketing adds cost to the product, but, at the same time, it adds utilities to the product. The following four types of utilities of the product are created by marketing:

(a) *Form Utility :* The processing function adds form utility to the product by changing the raw material into a finished form. With this change, the product becomes more useful than it is in the form in which it is produced by the farmer. For example, through processing, oilseeds are converted into oil, sugarcane into sugar, cotton into cloth and wheat into flour and bread. The processed forms are more useful than the original raw materials.

(b) *Place Utility :* The transportation function adds place utility to products by shifting them to a place of need from the place of plenty. Products command higher prices at the place of need than at the place of production because of the increased utility of the product.

(c) *Time Utility :* The storage function adds time utility to the products by making them available at the time when they are needed.

(d) *Possession Utility :* The marketing function of buying and selling helps in the transfer of ownership from one person to another. Products are transferred through marketing to persons having a higher utility from persons having a low utility.

The foodgrain marketing system is more important in India than the marketing of other agricultural commodities because of the following reasons:

(a) Foodgrains account for around two-thirds of the gross cropped area and 40 percent of the gross value of crop output in the country. Foodgrain marketing, therefore, provides income to most Indian farmers so that they may buy the required inputs for the farm as well as purchase items of domestic need;

(b) The foodgrain marketing business provides livelihood to lakhs of traders, processors, commission agents and other persons engaged in the foodgrain trade; and

(c) The foodgrain marketing system helps in providing food for consumers and fodder for livestock.

HISTORY AND GROWTH OF AGRICULTURAL MARKETING

Marketing had its beginning in agriculture. It developed only after man was able to produce more food than he needed for himself, and only after a way of exchanging the products of his labour for those of others had been found. This transition from production for consumption to production for exchange came about slowly. About a century ago, farmers used to consume most of

what they produced; but, now, most of what the farmers produce is exchanged for the other things which they require. To reach this stage, farmers became production-minded. This tendency has increased their dependence on marketing, which has resulted in the overall development of the market mechanism.

The early pioneers of our country did not face much of the marketing problem. Producers and consumers, if not actually the same individuals, lived next door to each other. The following factors have led to the growth of agricultural marketing in India.

(i) *Specialization*

The tendency towards increasing specialization by farmers and regions in certain crops or livestock has resulted in an increase in their efficiency and the breakdown in the self-sufficiency of the family unit. Specialization, thus, has resulted in increased production, which is the base for the growth of marketing and, in turn, of the economy.

(ii) *Urbanization*

Urban people are the main buyers of agricultural surpluses. The urban population of India had increased from 33.5 million in 1931, to 62.4 million in 1951, to 109.1 million in 1971, to 162.3 million in 1981, to 217.6 million in 1991 and to 285.5 million in 2001. This has necessitated a faster growth of agricultural marketing activities.

(iii) *Transportation and Communication*

The increases in transportation and communication facilities have widened the market for farm products. The length and breadth of the market to which a product is taken from the production areas have increased. In the absence of these facilities, the movement of produce from one area to another was limited, and the consumption of a product was restricted only to the areas of production or, at the most, to nearby areas.

(iv) *Technological Change in Agriculture*

Technological developments in agriculture, such as the evolution of high-yielding varieties of seeds, increased use of modern inputs and cultivation practices in the agricultural sector, have resulted in substantial increase in farm production. The marketed surplus of the agricultural produce has therefore increased. Production-conscious farmers have also become income/price conscious. This has resulted in the growth of the marketing system.

The importance of an efficient marketing system as a vital link between the farmer and the consumer was recognized way back in 1928 by the Royal Commission on Agriculture. Since then, a good deal of progress has been made in organizing agricultural marketing by the adoption of the various ad-

ministrative and legislative measures by the Government from time to time. The establishment of the Directorate of Marketing and Inspection in 1935, the enactment of the Act for the grading and standardization of agricultural commodities in 1937, the conduct of commodity market surveys, and the establishment of regulated markets in the country—these are some of measures which have been taken up to improve the marketing situation and to make agricultural marketing as efficient as possible.

During the First and Second Five Year Plans, agricultural marketing did not receive importance. Whatever development that took place in the sphere of marketing was due to the gradual progress towards the commercialization of agriculture, as a result of its own dynamic nature, and not because of any specific government efforts.

The National Commission on Agriculture[2] (the first commission which suggested measures for the development of agriculture in the post-independence period) remarked: "There is an increasing awareness that it is not enough to produce a crop or animal product, it must be marketed well. Increased production, resulting in a greater percentage increase in the marketable surplus accompanied by the increase in demand from urban population, calls for a rapid improvement in the existing marketing system." This statement emphasized the increasing importance of marketing of agricultural commodities and the need for the adoption of measures to increase production.

PRODUCER'S SURPLUS OF AGRICULTURAL COMMODITIES

In any developing economy, the producer's surplus of agricultural product plays a significant rote. This is the quantity which is actually made available to the non-producing population of the country. From the marketing point of view, this surplus is more important than the total production of commodities. The arrangements for marketing and the expansion of markets have to be made only for the surplus quantity available with the farmers, and not for the total production.

The rate at which agricultural production expands determines the pace of agricultural development, while the growth in the marketable surplus determines the pace of economic development. An increase in production must be accompanied by an increase in the marketable surplus for the economic development of the country. Though the marketing system is more concerned with the surplus which enters or is likely to enter the market, the quantum of total production is essential for this surplus. The larger the production of a commodity, the greater the surplus of that commodity and vice versa. The knowledge of marketed and marketable surplus helps the policy-makers as well as the traders in the following areas:

(i) *Framing Sound Price Policies:* Price support programmes are an inte-

gral part of agricultural policies necessary for stimulating agricultural production. The knowledge of quantum of marketable surplus helps in framing these policies.

(ii) *Developing Proper Procurement and Purchase Strategies:* The procurement policy for feeding the public distribution system has to take into account the quantum and behaviour of marketable and marketed surplus. Similarly, the traders, processors and exporters have to decide their purchase strategies on the basis of marketed quantities.

(iii) *Checking Undue Price Fluctuations:* A knowledge of the magnitude and extent of the surplus helps in the minimization of price fluctuations in agricultural commodities because it enables the government and the traders to make proper arrangements for the movement of produce from one area, where they are in surplus, to another area which is deficient.

(iv) Advanced estimates of the surpluses of such commodities which have the potential of external trade are useful in decisions related to the export and import of the commodity. If surplus is expected to be less than what is necessary, the country can plan for imports and if surplus is expected to be more than what is necessary, avenues for exporting such a surplus can be explored.

(v) *Development of Transport and Storage Systems:* The knowledge of marketed surplus helps in developing adequate capacity of transport and storage system to handle it.

MEANING AND TYPES OF PRODUCER'S SURPLUS

The producer's surplus is the quantity of produce which is, or can be, made available by the farmers to the non-farm population. The producer's surplus is of two types:

1. Marketable Surplus

The marketable surplus is that quantity of the produce which can be made available to the non-farm population of the country. It is a theoretical concept of surplus. The marketable surplus is the residual left with the producer-farmer after meeting his requirements for family consumption, farm needs for seeds and feed for cattle, payment to labour in kind, payment to artisans—carpenter, blacksmith, potter and mechanic—payment to landlord as rent, and social and religious payments in kind. This may be expressed as follows :

$$MS = P - C$$

where

MS = Marketable surplus,

P = Total production, and

C = Total requirements (family consumption, farm needs, payment to labour, artisans, landlord and payment for social and religious work).

2. Marketed Surplus

Marketed surplus is that quantity of the produce which the producer-farmer actually sells in the market, irrespective of his requirements for family consumption, farm needs and other payments. The marketed surplus may be more, less or equal to the marketable surplus.

Whether the marketed surplus increases with the increase in production has been under continual theoretical scrutiny. It has been argued that poor and subsistence farmers sell that part of the produce which is necessary to enable them to meet their cash obligations. This results in distress sale on some farms. In such a situation, any increase in the production of marginal and small farms should first result in increased on-farm consumption.

An increase in the real income of farmers also has a positive effect on on-farm consumption because of positive income elasticity. Since the contribution of this group to the total marketed quantity is not substantial, the overall effect of increase in production must lead to an increase in the marketed surplus.

Bansil[3] writes that there is only one term—*marketable surplus.* This may be defined subjectively or objectively. Subjectively, the term *marketable surplus* refers to theoretical surplus available for sale with the producer-farmer after he has met his own genuine consumption requirements and the requirements of his family, the payment of wages in kind, his feed and seed requirements, and his social and religious payments. Objectively, the marketable surplus is the total quantity of arrivals in the market out of the new crop.

RELATIONSHIP BETWEEN MARKETED SURPLUS AND MARKETABLE SURPLUS

The marketed surplus may be more, less or equal to the marketable surplus, depending upon the condition of the farmer and type of the crop. The relationship between the two terms may be stated as follows:

$$\text{Marketed surplus} \gtreqless \text{Marketable surplus}$$

1. The marketed surplus is more than the marketable surplus when the farmer retains a smaller quantity of the crop than his actual requirements for family and farm needs. This is true especially for small and marginal farmers, whose need for cash is more pressing and immediate. This situation of selling more than the marketable surplus is termed as distress or forced sale. Such farmers generally buy the produce from the market in a later period to meet their family and/or farm requirements. The quantity of distress sale increases with the fall in the price of the product. A lower price means that a larger quantity will be sold to meet some fixed cash requirements.

2. The marketed surplus is less than the marketable surplus when the farmer retains some of the surplus produce. This situation holds true under the following conditions:

(a) Large farmers generally sell less than the marketable surplus because of their better retention capacity. They retain extra produce in the hope that they would get a higher price in the later period. Sometimes, farmers retain the produce even up to the next production season.

(b) Farmers may substitute one crop for another crop either for family consumption purpose or for feeding their livestock because of the variation in prices. With the fall in the price of the crop relative to a competing crop, the farmers may consume more of the first and less of the second crop.

3. The marketed surplus may be equal to the marketable surplus when the farmer neither retains more nor less than his requirement. This holds true for perishable commodities and of the average farmer.

FACTORS AFFECTING MARKETABLE SURPLUS

The marketable surplus differs from region to region and, within the same region, from crop to crop. It also varies from farm to farm. On a particular farm, the quantity of marketable surplus depends on the following factors:

(i) *Size of Holding* : There is positive relationship between the size of the holding and the marketable surplus.

(ii) *Production* : The higher the production on a farm, the larger will be the marketable surplus, and vice versa.

(iii) *Price of the Commodity* : The price of the commodity and the marketable surplus have a positive as well as a negative relationship, depending upon whether one considers the short and long run or the micro and macro levels.

(iv) *Size of Family* : The larger the number of members in a family, the smaller the surplus on the farm.

(v) *Requirement of Seed and Feed* : The higher the requirement for these uses, the smaller the marketable surplus of the crop.

(vi) *Nature of Commodity* : The marketable surplus of non-food crops is generally higher than that for food crops. For example, in the case of cotton, jute and rubber, the quantity retained for family consumption is either negligible or very small part of the total output. For these crops, a very large proportion of total output is marketable surplus. Even among food crops, for such commodities like sugarcane, spices and oilseeds which require some processing before final consumption, the marketable surplus as a proportion of total output is larger than that for other food crops.

(vii) *Consumption Habits* : The quantity of output retained by the farm family depends on the consumption habits. For example, in Punjab, rice forms a relatively small proportion of total cereals consumed by farm-families compared to those in southern or eastern states. Therefore, out of a given output

of paddy/rice, Punjab farmers sell a greater proportion than that sold by rice eating farmers of other states.

The functional relationship between the marketed surplus of a crop and factors affecting the marketed surplus may be expressed as:

$$M = f(x_1, x_2, x_3, x_4, ...x_n)$$

where

M = Total marketed surplus of a crop in quintals

x_1 = Size of holding in hectares

x_2 = Size of family in adult units

x_3 = Total production of the crop in quintals

x_4 = Price of the crop

the other factors may be specified.

In a study of wheat in Rajasthan[4] during 1969–70 and 1970–71, the marketed surplus was estimated as 50.3 percent of the total production. A linear regression of the marketed surplus of production was estimated as follows:

$$MS = -2.15 + 0.58P \qquad R^2 = 0.66$$
$$(0.01) \qquad N = 240$$

where

MS = Marketed surplus of wheat per farm

P = Total production of wheat per farm.

The elasticity of marketed surplus with respect to total production was estimated at more than unity (1.09).

Some later studies also indicate that the marketed surplus-output elasticity of wheat and rice in India is more than one. This implies that as the production of these commodities expands, the market sales increase proportionately more than the increase in output and if the output of these commodities falls, the decrease in the market sales is proportionately more than the fail in output.

RELATIONSHIP BETWEEN PRICES AND MARKETABLE SURPLUS

Two main hypotheses have been advanced to explain the relationship between prices and the marketable surplus of foodgrains.

1. INVERSE RELATIONSHIP : There is an inverse relationship between prices and the marketable surplus. This hypothesis was presented by P.N. Mathur and M. Ezekiel. They postulate that the farmers' cash requirements are nearly fixed, and given the price level, the marketed portion of the output is determined. This implies that the farmers' consumption is a residual, and that the marketed surplus is inversely proportional to the price level. This behaviour assumes that farmers have inelastic cash requirements.

The argument is that, in the poor economy of underdeveloped countries, farmers sell that quantity of the output which gives them the amount of money they need to satisfy their cash requirements; they retain the balance of output for their own consumption purpose. With a rise in the prices of foodgrains, they sell a smaller quantity of foodgrains to get the cash they need, and vice versa. In other words, with a rise in price, farmers sell a smaller, and with the fall in price, they sell a larger quantity. Olson and Krishnan have argued that the marketed surplus varies inversely with the market price. They contend that a higher price for a subsistence crop may increase the producer's real income sufficiently to ensure that the income effect on demand for the consumption of the crop outweighs the price effect on production and consumption.

2. POSITIVE RELATIONSHIP : V.M. Dandekar and Rajkrishna put forward the case for a positive relationship between prices and the marketed surplus of foodgrains in India. This relationship is based on the assumption that farmers are price conscious. With a rise in the prices of foodgrains, farmers are tempted to sell more and retain less. As a result, there is increased surplus. The converse, too, holds true.

Rajkrishna has pointed that the elasticity of the marketable surplus is not negative so long-as the substitution effect is non–zero.

Three models to indirectly investigate the size and magnitude of the elasticity of the marketed surplus of a subsistence crop are given below. The detailed derivation is given in Appendix 3.1.

(a) *Rajkrishna Model* [5].

$$M = Q - C$$
$$e = rb - (r - 1)(g + mkh)$$

where

M. = Marketed surplus of the crop

Q = Total production of the crop

C = On-farm consumption of the crop

e = Elasticity of marketed surplus with respect to price of the crop

r = Reciprocal of sales ratio (M/Q)

b = Output price elasticity of the crop

g = Consumption price elasticity of the crop

m = Sales ratio (M/Q)

h = Consumption income elasticity

k = $(PQ)/L$ = Ratio of the total value of production to the total net income of the producers.

The variation in the marketed and marketable surplus of some cereal crops across farm size groups can be seen from the estimates available from some sample studies given in Tables 3.1 and 3.2.

Table 3.1
Marketable and Marketed Surplus of Wheat, Rice and Maize on Different Size Groups of Farms in India

(% of Production)

Commodity/State/Particulars		Marginal	Small	Medium	Large	Overall
WHEAT						
Uttar Pradesh	ML	− 11.0	48.1	52.7	64.0	45.7
	MS	17.1	22.7	48.6	68.3	42.2
Haryana	ML	32.0	50.0	65.0	63.0	62.0
	MS	38.9	60.8	76.9	69.1	70.7
Punjab	ML	61.3	70.1	80.7	88.1	83.1
	MS	54.2	62.3	91.8	91.1	87.2
Rajasthan	ML	− 31.2	0.8	47.1	41.4	32.9
	MS	18.5	13.7	53.2	49.7	49.1
All India	ML	4.1	49.6	61.4	70.8	59.7
	MS	23.5	32.3	62.3	73.0	58.9
PADDY/RICE						
Haryana	ML	77.5	75.0	92.7	84.7	88.0
	MS	74.2	72.3	83.8	61.3	73.5
Punjab	ML	81.8	87.1	94.2	98.0	96.0
	MS	92.6	79.1	93.8	87.1	89.2
Orissa	ML	4.4	15.7	74.3	49.6	56.1
	MS	18.4	19.8	5.5	21.8	12.1
West Bengal	ML	− 27.3	68.0	70.4	74.4	53.6
	MS	31.5	55.8	62.9	86.7	59.4
Andhra Pradesh	ML	33.3	77.3	70.3	90.3	77.2
	MS	19.5	21.7	37.4	33.1	30.1
Tamil Nadu	ML	13.3	31.1	26.4	52.8	30.1
	MS	32.5	33.0	46.1	31.0	35.3
All India	ML	− 9.0	23.9	61.7	76.4	46.5
	MS	27.6	34.8	43.8	51.7	41.7
MAIZE						
Uttar Pradesh	ML	16.1	44.7	46.2	52.0	40.3
	MS	22.5	32.7	51.9	52.7	40.8
Rajasthan	ML	16.8	20.6	31.0	34.7	24.0
	MS	4.1	9.6	10.5	21.9	10.9
All India	ML	5.8	28.1	41.6	50.5	32.3
	MS	12.8	20.6	38.1	45.0	28.9

ML = Marketable Surplus   MS = Marketed Surplus

Source : Directorate of Marketing and Inspection, Production, Utilization, Marketable and Marketed Surpluses of Wheat, Rice and Maize, Government of India, Faridabad, 1995, pp. 53–73.

Table 3.2
Marketed and Marketable Surplus of some Agricultural Commodities

(% of production)

Commodity/ State/Particulars	Small	Farm size Medium	Large	Overall
Bajra (Rajasthan)				
Marketable Surplus	40.58	49.67	63.74	51.29
Groundnut (Gujarat)				
Marketable surplus	70.33	78.47	80.01	78.56
Gram (Rajasthan)				
Marketable surplus	71.1	75.7	79.7	76.6
Marketed Surplus	78.7	81.2	86.3	83.6
Mustard (Rajasthan)				
Marketed surplus	91.88	93.29	93.89	92.88

Source : (a) Acharya, S.S., Agricultural Production, Marketing and Price Policy in India, Mittal Publications, 1988, p. 268.
  (b) Patel, G.N., Price Behaviour and Marketing of Groundnut in Gujarat, Ph.D. Thesis, Rajasthan Agricultural University, 1991.
  (c) Hari Om, Marketing of Rapeseed and Mustard in Bharatpur District of Rajasthan, M.Sc. (A9. Eco.) Thesis, Rajasthan Agricultural University, 1988.

In the case of staple food like cereals, the marketable surplus-output ratio on marginal farms is negative which means that such farmers are net buyers of cereals. The marketed or marketable surplus as a proportion of the total output of oilseeds and pulses is considerably higher than that of cereals. Among cereals, the marketed surplus-output ratio for paddy/rice and wheat is generally higher than that for maize. This is mainly owing to higher per farm output of rice and wheat. Another important point to be noted is that marketed surplus-output ratio for paddy/rice in Punjab and Haryana is higher than that in Orissa, West Bengal, Andhra Pradesh and Tamil Nadu. This is on account of both higher per farm output in Punjab and Haryana than other states and differences in consumption pattern of the farmers in these two groups of states.

Due to low level of production on marginal and small farms coupled with higher proportion of output being consumed by the farm families, the contribution of these size groups of farms to the total marketed quantity is considerably lower than medium and large farmers. The estimates given in Table 3.3 reveal that marginal and small farmers contribute 12.5 percent to the total marketed quantity of wheat. In the case of rice and maize, the shares of marginal and small farmers in total marketed quantities are 29.4 percent and 32.0 percent respectively.

The quantum of market arrivals in main wholesale assembling markets also provides an assessment of at least that part of the marketed surplus which the marketing system has to handle. But these are often under esti-

Table 3.3
Percent Contribution of different Size Groups of Farms to Total
Marketed Surplus in India

Farm size	Wheat	Rice	Maize
Marginal	3.1	11.3	7.1
Small	9.4	18.1	24.9
Medium	41.8	30.8	46.9
Large	45.7	39.8	21.1
Total	100.0	100.0	100.0

Source : Directorate of Marketing and Inspection, "Production, Utilisation, Marketable and Marketed Surplus of Wheat, Rice and Maize", Government of India, Faridabad, 1995, p. 72.

mates of the total marketed surplus originating at the farm level as a part of the marketed surplus reaches the consumers specially of the rural areas either directly from the farmers or through village traders. This apart, there is also some under reporting of arrivals in the wholesale assembling markets. The market arrival figures reported in various official publications should, therefore, be used with care. However, there is ample evidence to show that there has occurred a considerable increase in the market arrivals of farm products.

The estimated arrivals of four important foodgrains—wheat, gram, rice and jowar from villages into wholesale assembling markets of India during 1970–71 to 1997–98 are presented in Table 3.4.

The increase in the market arrivals during the last two decades has been due to the following factors:

(i) Increase in the productivity per unit of land area and production per farm;

(ii) Increase in the inter-regional specialization in crop production which requires larger quantities be to moved from one area to the other;

(iii) Increases in the monetisation of the farm economy;

(iv) Migration of population from rural to urban areas as also from farm to the non-farm jobs which decreases the on-farm consumption requirements;

(v) Expansions in area under higher yielding and improved seeds which reduces the on-farm requirements of grains for seed; and

(vi) Increase in the processing facilities which decreased on-farm processing and consequently the consumption of the unprocessed or on-farm, processed grains by the farm families.

Planning for marketing system improvement requires estimates of quantities of various farm products entering the market network. While the production statistics is regularly generated by various official and non-officials agencies, the information of marketed quantities is derived from the estimates of

Table 3.4

Estimated Arrivals of Wheat, Gram, Rice and Jowar from Villages into Wholesale Assembling Markets in India

(% of production)

Year	Wheat	Gram	Rice	Jowar
1970–71	29.8	28.2	25.2	12.2
1975–76	30.5	33.6	15.2	11.2
1980–81	31.9	36.3	30.2	12.1
1981–82	25.7	29.2	30.7	15.2
1982–83	28.0	33.0	32.8	12.5
1983–84	26.7	30.7	30.3	11.8
1984–85	24.9	30.8	31.6	10.2
1985–86	20.2	29.5	31.2	12.0
1986–87	28.7	30.3	32.3	12.1
1987–88	26.2	31.2	32.9	14.0
1988–89	27.1	32.9	29.7	10.3
1989–90	27.0	30.6	30.7	10.5
1990–91	29.5	32.3	30.9	11.0
1991–92	27.8	32.0	29.8	10.3
1992–93	29.3	36.3	38.3	11.5
1993–94	32.2	37.4	44.8	9.3
1994–95	32.4	39.6	37.7	9.9
1995–96	31.3	37.4	39.7	10.7
1996–97	30.3	40.9	42.3	10.4
1997–98(P)	29.3	38.7	40.9	15.3

Source : Indian Agriculture in Brief, 28th Edition, 2000, Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, New Delhi, p. 229.

marketed surplus-output ratios. Such ratios are essentially based on sample surveys. However, the sample surveys are neither regular nor cover all agricultural products at a time.

Dharam Narain[8] estimated that in 1950–51 considering all agricultural commodities as a group, marketed surplus as a percentage of gross value of output was around 33.4 percent. There are no such comprehensive estimates available for the recent period. The Task Force[9] on Terms of Trade appointed by the Ministry of Agriculture, Government of India for the purpose of working out the weights for constructing the index of prices received by the agricultural sector estimated the value of marketed surplus in triennium ending (TE) 1990–91. According to these estimates, the marketed surplus output ratio during TE 1990–91 was 64.1 percent. This ratio is expected to have gone up further to around 70 percent during the last decade.

The marketed surplus-output ratio for various agricultural commodities for 1950–51, 1997 and 2002 are given in Table 3.5.

Table 3.5
Marketed Surplus Output-Ratios of Important Agricultural
Commodities in India at Different Points of Time

(% of production)

Commodity	1950–51	1997	2002
Rice	30.0	60.1	69.1
Wheat	30.0	61.4	66.3
Bajra	27.0	47.2	59.8
Maize	24.0	59.1	67.2
Jowar	24.0	55.0	55.3
Barley	–	55.8 (Rajasthan)	45.2
Other Cereals	18.0	–	31.1
Total Cereals	29.2	–	66.5
Gram	35.0	–	74.3
Arhar	50.0	47.2	77.5
Urad	–	53.2	85.9
Moong	–	76.5	73.0
Other Pulses	55.0	72.1	72.1
Total Pulses	45.3	–	77.1
Total Foodgrains	30.3	72.4	67.2
Groundnut	68.3	–	77.7
Mustard	84.3	82.4	77.2
Sesamum	–	69.3	94.1
Sunflower	–	86.9	100
Soyabean	–	93.8	92.1
Other Oilseeds	86.3	94.1	94.1
Total Oilseeds	73.6	86.3	85.8
Sugarcane	100.0	92.5	97.9
Cotton	100.0	100.0	100
Jute & Mesta	100.0	87.3/96.5	84.6
Spices	–	–	92.5
Total Fruits	–	97.0	89.9
Total Vegetables	–	83.0	79.2
Total F & V	70.0	–	–
Flowers	–	–	100
Tobacco	–	–	96.8
Fodder	–	–	23.3
Milk	50.0	60.0	–
Meat	98.0	100.0	–
Fish	98.0	98.0	–
Eggs	98.0	88.2	–
Raw wool, Skin, hides	–	100.0	–

Sources : (i) Dharam Narain (1961), Distribution of Marketed Surplus of Agricultural Produce by Size Level of Holdings in India, Institute of Economic Growth, Occasional Paper No. 2, pp. 33–38 for 1950–51.

(ii) Acharya, S.S., Agricultural Marketing in India, Millennium Study of Indian Farmers, Ministry of Agriculture, GoI, 2003 for 1997.

(iii) For 2002, Weighted averages calculated by us based on crop data given in Agricultural Statistics at a Glance 2003, Ministry of Agriculture, Government of India New Delhi.

The marketed surplus-output ratio for all agricultural commodities has shown an upward rise overtime. This increased from around 30 percent in rice and wheat in 1950–51 to over 66 percent in 2002. Similarly, for coarse cereals (bajra, jowar and maize), the marketed surplus-output ratio went up from 24 percent in 1950–51 to 59.8 percent in bajra and 67.2 percent in maize in 2002. Among the crops, there existed considerable difference in the marketed surplus-output ratios. The ratio is:

(a) Lower for coarse grains among cereals;

(b) Lower for cereals among foodgrains;

(c) Lower for foodgrains than for other crops;

(d) The ratio is almost equal to one for non-food crops like cotton, jute and non-edible oils;

(e) For edible oilseeds this ratio is estimated to be more than 85 percent.

The marketed surplus-output ratios also differ across size group of farmers. Small sized farmers with lower output per farm usually sell a smaller proportion of their output than the larger sized farmers. The marketed surplus output ratios also increases with the increase in per farm output.

There is considerable inter-state variation in the marketed surplus-output ratios of crops. State-wise marketed surplus-output ratios for six important

Table 3.6
State-wise Marketed Surplus-Output Ratios of Foodgrains in India

						(% of Production)
States	Paddy	Wheat	Maize	Jowar	Bajra	Gram
Andhra Pradesh	78	N.A.	96	53	37	N.A.
Assam	39	N.A.	N.A.	N.A.	N.A.	N.A.
Bihar	68	67	48	N.A.	N.A.	60
Gujarat	N.A.	74	52	38	69	N.A.
Haryana	91	78	N.A.	N.A.	83	55
Himachal Pradesh	N.A.	26	35	N.A.	N.A.	N.A.
Karnataka	77	N.A.	97	56	40	N.A.
Madhya Pradesh	54	55	61	56	N.A.	80
Maharashtra	53	N.A.	N.A.	59	64	30
Orissa	57	N.A.	N.A.	N.A.	N.A.	N.A.
Punjab	96	80	82	N.A.	N.A.	N.A.
Rajasthan	N.A.	63	39	55	38	72
Tamil Nadu	72	N.A.	N.A.	N.A.	56	N.A.
Uttar Pradesh	73	57	67	47	80	61
West Bengal	55	N.A.	N.A.	N.A.	N.A.	N.A.
Average of Above States	69	66	67	55	60	74

N.A. = Estimates not available.

Source : Weighted Average Calculated by us based on COP data given in Agricultural Statistics at a Glance, 2003, Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

foodgrains are shown in Table 3.6. The MS-O ratios are considerably higher for Punjab and Haryana states compared to other states.

The estimated quantity of marketed surplus of individual agricultural products and product groups and changes therein during the last 50 years are given in Table 3.7.

The marketed surplus of cereals is estimate to have gone up from 11.5 million tonnes during 1950–51 to 132.2 million tonnes during 2001–02. This has happened on account of increase in both output and marketed surplus output ratio. The marketed surplus of rice is estimated to have gone up from 6.2 to 64.3 million tonnes, wheat from 1.9 to 47.6 million tonnes and of coarse cereals from 3.4 to 20.3 million tonnes. In the case of pulses, the marketed

Table 3.7
Marketed Surplus of Agricultural Commodities

(Million Tonnes)

Commodities	1951			2001-02		
	Production	MS Ratio	MS	Production	MS Ratio	MS
Rice	20.58	30.0	6.2	93.08	69.1	64.3
Wheat	6.46	30.0	1.9	71.81	66.3	47.6
Bajra	2.60	27.0	0.7	8.35	59.8	5.0
Maize	1.73	24.0	0.4	13.30	67.2	8.9
Jowar	5.50	24.0	1.3	7.79	55.3	4.3
Others	5.54	18.0	1.0	4.50	46.7	2.1
Total Cereals	42.41	29.2	11.5	198.83	66.5	132.2
Gram	3.65	35.0	1.3	5.27	74.3	3.9
Arhar	1.72	50.0	0.9	2.30	77.5	1.8
Other Pulses	3.04	55.0	1.7	5.62	80.1	4.5
Total Pulses	8.41	45.3	3.9	13.19	77.1	10.2
Total Foodgrains	50.82	30.2	15.4	212.02	67.2	142.4
Groundnut	3.48	68.3	2.4	7.21	77.7	5.6
Mustard	0.76	84.3	0.6	5.04	77.2	3.9
Other Oilseeds	0.92	86.3	0.8	8.55	95.9	8.2
Total Oilseeds	5.16	73.6	3.8	20.80	85.1	17.7
Sugarcane	57.05	100.0	57.0	300.10	97.9	293.8
Cotton*	3.04	100.0	3.0	10.09	100.0	10.1
Jute & Mesta*	3.31	100.0	3.3	11.64	84.6	9.8
Fruits	N.A.	N.A.	N.A.	49.50	89.9	44.5
Vegetables	N.A.	N.A.	N.A.	85.00	79.2	67.3
Total F&V	54.52**	70.0	38.2	134.50	83.1	111.8
Milk	17.0	50.0	8.5	84.60	60.0	50.8
Meat	N.A.	98.0	N.A.	4.50	100.0	4.5
Fish	0.75	98.0	0.7	6.00	98.0	5.9
Eggs***	1.83	98.0	1.8	34.0	88.2	30.0

* Million Bales

** Pertain to 1981–82

*** Billion Number

quantity is estimated to have gone up from 3.9 million tonnes during 1950-51 to 10.2 million tonnes during 2001–02. For foodgrains as a whole, the marketed surplus is estimated as 142.4 million tonnes for 2001–02 as against 15.4 million tonnes for 1950–51.

The marketed surplus of oilseeds went up from 3.8 million tonnes to 17.7 million tonnes and of sugarcane from 57.0 million tonnes to 293.8 million tonnes during this period. In the case of cotton, almost whole of the output is marketed. There has been considerable increase in the marketed quantities of vegetables and fruits. The marketed surplus of both of these crop groups taken together is estimated to have gone up from 38.2 million tonnes during 1981–82 to 111.8 million tonnes during 2001–02. Marketed surplus of live-stock products also went up considerably during this period. It increased from 8.5 million tonnes to 50.8 million tonnes of milk, from 0.7 million tonnes to 5.9 million tonnes of fish and from 1.8 billion to 30 billion eggs during this period.

PATTERN OF DISPOSAL OF MARKETED SURPLUS

For understanding the marketing system, it is important to know the pattern of disposal of marketed surplus according to place and time of sale.

1. PLACE OF SALE : Based on the place of disposal, the sale by farmers may be divided into village sale and market sale. The quantity of the produce marketed by the farmers in the villages and markets varies with the commodity and the size group of the farmers. The extent of the sales made in the villages and in the markets by the farmers in Rajasthan is shown in Table 3.8.

About 70 to 75 percent of the marketed surplus of foodgrains is marketed by the farmers in the market, and only 25 to 30 percent in the village; but 50 percent of groundnut is marketed in the village and the remaining 50 percent

Table 3.8
Extent of Sale Within Villages and in Markets

(Percentage of Total Sales)

Commodity	Place of sale	Size group of farms			
		Small	Medium	Large	Overall
Wheat	Within village	39.90	32.60	16.80	23.70
	In market	60.10	67.40	83.20	76.30
Maize	Within village	46.93	36.19	23.81	30.65
	In market	53.07	63.81	76.19	69.35
Bajra	Within village	24.26	26.90	21.65	23.36
	In market	75.74	73.10	78.35	76.64
Groundnut	Within village	57.28	67.81	28.13	49.90
	In market	42.72	32.19	71.87	50.10

Source : Research Report of the Department of Agricultural Economics, University of Udaipur, Campus Jobner, 1976.

in the market. The percentage of the quantity marketed in the villages decreases with the increase in the size of the farm or the quantity of the produce available for marketing.

There is one more important factor which affects the choice of place of sale by the farmers. The farmers living in a village located away from the market sell more in the village as compared to those living in the villages located near the market. Similarly, the farmers of those villages which are not connected to the markets by roads usually sell a higher percentage of their marketed surplus in the villages as compared to the farmers of the villages which are connected to the markets by roads.

2. TIME OF SALE : The producer's decision to sell his produce at a particular time is of vital importance, for it may bring about a glut or scarcity in the market, which ultimately affects the price of the produce.

Earlier, as a normal practice nearly half of the marketed surplus of cereals used to reach the markets during the first three months after harvest and

Table 3.9
Changes in Time Pattern of Market Arrivals of Wheat and Rice in Some States of India

(% of Total Arrivals)

Crop/State	Year	Quarters after harvest			
		I	II	III	IV
Wheat					
All India	1961–62	51.2	17.1	16.4	15.3
	1970–71	56.8	21.5	12.6	9.1
	1983–84	63.6	13.0	13.0	10.4
Punjab	1961–62	52.5	22.3	15.6	9.6
	1970–71	70.1	19.6	7.6	2.7
	1983–84	93.2	4.7	1.3	0.8
Haryana	1961–62*	52.5	22.3	15.6	9.6
	1970–71	67.0	21.7	7.3	4.0
	1983–84	88.7	6.0	4.3	1.1
Rice					
All India	1961–62	28.6	33.5	23.1	14.8
	1970–71	36.4	23.3	20.4	10.9
	1983–84	51.4	22.2	17.4	9.0
Punjab	1961–62	71.6	26.6	1.8	–
	1970–71	87.2	9.3	2.2	1.3
	1983–84	96.6	2.0	0.3	1.2
Haryana	1961–62*	71.6	26.6	1.8	–
	1970–71	91.6	7.8	0.5	0.1
	1983–84	95.7	3.6	0.7	–

*Same as for Punjab as at that time they were parts of one State, First quarter is April–June for wheat and October–December for rice.
Source : Tyagi, D.S., Managing India's Food Economy, Sage Publications, 1990, pp. 114–6.

other half was spread over the remaining nine months; farmers or traders performing the function of carrying stocks from post-harvest season to the later part of the season. But as a consequence of increase in the involvement of public agencies in the foodgrains trade and increase in the cost of carrying stocks, some significant changes in the pattern of market arrivals have taken place as has been brought out by Tyagi[10]. Though Tyagi's results pertain to mid-eighties, no significant change occurred since then in the time pattern of sale of wheat and rice by the farmers.

As shown in Table 3.9 out of the total market arrivals of wheat, the proportion arriving in the first quarter after harvest has increased from 51.2 percent in 1961–62 to 63.6 percent in 1983–84 at the all-India level. In major wheat producing States of Punjab and Haryana, the concentration of market arrivals in the first quarter after harvest has sharply increased from 52.5 percent in 1961–62 to more than 88 percent in 1983–84. In the case of rice, the concentration of arrivals in the post-harvest season is even more than that in wheat. This phenomenon of very high concentration of market arrivals during a short period has been termed by Tyagi as 'Markets Getting Choked'.

PROJECTIONS OF DEMAND AND SUPPLY OF FARM PRODUCTS

The interest in the projections of demand and supply has increased considerably after the launch of a programme of economic reforms in 1991. Several studies provide the demand and supply projections for farm products, particularly for foodgrains.

DEMAND PROJECTIONS

The National Commission on Agriculture[11] using a particular methodology and on the basis of various assumptions, had projected the aggregate consumer demand for selected agricultural commodities for the year 2000 A.D. In addition to the consumer demand, there is also a demand for farm products for purposes of seeds, feed and wastage. In respect of these uses, the demand was assumed as a certain proportion of the gross production of the relevant agricultural commodities. It has been assumed that 12.5 percent of the gross production of foodgrains is used for seed, feed and wastage as follows:

    Seed   —   5   percent of gross production
    Feed   —   5   percent of gross production
    Wastage —   2.5 percent of gross production
    Total   — 12.5 percent of gross production

The gross demand for selected agricultural commodities for 2000 A.D. was also projected by the National Commission on Agriculture. These, however, have now become obsolete.

The demand projections for agricultural commodities are also available from several studies conducted in the recent past. The estimates of demand for foodgrains made in these studies differ mainly owing to the differences in the assumptions made about: (a) income elasticity of demand, (b) rate of growth of per capita income, and (c) demand for feed and wastage. Wide variation in projections of demand made in some recent studies can be seen in Table 3.10.

Kumar and Mathur[12] have projected the demand for the year 2006-07, i.e., the terminal year of the 10th Five Year Plan. Their projections of demand for foodgrains and some other agricultural commodities are given in Table 3.11. According to these projections, the domestic demand for cereals in the year 2006-07 would be 213.9 million tonnes and that for pulses 21 million tonnes. The demand for edible oils would go up to 9.5 million tonnes, vegetables 108.5 million tonnes and fruits 69.1 million tonnes. The domestic demand for other commodities would also go up to 19.6 million tonnes for sugar and 119.5 million tonnes for milk.

Table 3.10
Alternative Projections of Demand for Foodgrains in India in 2000 A.D.

			(Million tonnes)
Studies/Source		Human demand	Domestic demand
(i)	National Commission on Agriculture, 1976	–	205–225
(ii)	World Bank, 1981	–	191–205
(iii)	IFPRI study, 1984	–	210
(iv)	Planning Commission (VII Five Year Plan), 1985	–	240
(v)	Radha Krishna and Ravi, 1990	205	234
(vi)	Sarma and Gandhi, IFPRI, 1990	–	206–241
(vii)	Bansil, P.C., 1996	168–170	194–196
(viii)	Kumar, P., 1994	–	206–210
(ix)	IARI — IFPRI Study	–	205
(x)	Bhalla, G.S., 1995	–	243–259
(xi)	Kumar, P. and V.C. Mathur, 1996	182	209
(xii)	Mark Rosegrant etc., 1996, IFPRI Vision Study	–	215

Sources : (i) Bhalla, G.S., Globalisation and Agricultural Policy in India, Indian Journal of Agricultural Economics, Vol. 50, No. 1, Jan–March 1995, pp. 7–26.

(ii) Kumar, P. and V.C. Mathur, Agriculture in Future: Demand-Supply Perspective for the Ninth Five Year Plan, Economic and Political Weekly, Vol. 31(39), September 28, 1996, pp. A–131–39.

SUPPLY PROJECTIONS

Based on the growth rates of production already achieved and potential that exists for increasing the production in several areas, it is possible to not only attain the levels of production needed to meet the projected demand but

Table 3.11
Domestic Demand for Agricultural Commodities in India (2006–07)

(Million tonnes)

Commodities	Domestic Demand	
	2001–02	2006–07
Rice	89.8	98.8
Wheat	72.5	80.7
Coarse Cereals	32.6	34.4
Total Cereals	194.9	213.9
Pulses	18.2	21.0
Foodgrains	213.1	234.9
Edible Oils	7.9	9.5
Vegetables	91.7	108.5
Fruits	52.6	69.1
Sugar	16.8	19.6
Cotton	2.4	2.9
Milk	93.4	119.5
Meat and Eggs	4.6	6.0
Fish	7.1	9.3

Source : Kumar, P. and V.C. Mathur, *Ibid.*, Economic and Political Weekly, Sept. 28, 1996.

Table 3.12
Production Levels of Agricultural Commodities to be Attained by 2006–07 A.D.

(Million tonnes)

Commodities	Production	Surplus for Export
Rice	103.5	4.7
Wheat	84.3	3.6
Coarse Cereals	34.4	–
Total Cereals	222.2	8.3
Pulses	21.0	–
Foodgrains	243.2	.8.3
Edible Oils	9.5	–
Vegetables	110.7	2.2
Fruits	70.5	1.4
Sugar	19.6	–
Cotton	3.2	0.3
Milk	119.5	–
Meat and Eggs	6.0	–
Fish/Marine Products	9.8	0.5

Source : Kumar, P. and V.C. Mathur (1996), *Ibid.*, Economic and Political Weekly, Sept. 28, 1996.

also generate some surpluses for export. Kumar and Mathur (1996) have made several suggestions to achieve the levels of production by the year 2006–07 which would enable the country to gain from exports of certain commodities like rice, wheat, vegetables, fruits, cotton and fish (Table 3.12).

The Tenth Five-Year Plan (1992–97) document[13] brought out by the Planning Commission has also made projections of demand and supply of foodgrains for the terminal year of the Five Year Plan. According to these projections, the demand for foodgrains during 2006–07 is placed at 236 million tonnes. However, using the norms of National Institute of Nutrition (182.5 kg per capita per year) and projected population of 1135 million, the requirement of foodgrains during 2006–07 is placed at 221.4 million tonnes. The expected supply of foodgrains is in the range of 225 to 243 million tonnes (Planning Commission, 2002).

Projections of demand and supply of cereals in India has also been made for the year 2020 by Kumar, Rosegrant and Hazell[14] as a part of IARI–IFPRI study. Their projections are shown in Table 3.13. According to these projections, total demand for cereals in 2020 is likely to be 293.4 million tonnes. As regards supply prospects, if the current productivity growth is sustained, the production would exceed the demand by 15.9 million tonnes. However, if productivity growth declines, India may have to import 23 million tonnes of cereals by the year 2020.

Projections of demand for livestock products were made by Dastagiri[15]

Table 3.13
India : Projected Cereal Supply, Demand and Net Trade (2020 A.D.)

(Million tonnes)

Particulars	Rice	Wheat	Coarse Cereals	Total
Declining Productivity Growth				
Supply	120.5	107.6	42.3	270.4
Demand	124.5	111.0	57.9	293.4
Net Exports	– 4.0	– 3.4	– 15.6	– 23.0
Sustained Productivity Growth				
Supply	134.0	127.3	48.0	309.3
Demand	124.5	111.0	57.9	293.4
Net Exports	9.5	16.3	– 9.9	15.9

Source : Kumar, P., Mark Rosegrant and Peter Hazell, Cereals Prospects in India to 2020: Implications for Policy, IFPRI Vision 2020, Brief 23 June, 1995.

Table 3.14
Projections of Demand for Livestock Products in India

(Million tonnes)

Product		2010	2020
Milk		94.21	147.21
	Rural	52.66	70.19
	Urban	41.55	77.02
Mutton & Goat Meat		3.80	12.72
	Rural	0.65	0.77
	Urban	3.15	11.95
Beef & Buffalo Meat		0.84	1.14
	Rural	0.46	0.55
	Urban	0.38	0.59
Chicken		0.52	0.81
	Rural	0.28	0.39
	Urban	0.24	0.42
Fish		1.79	1.63
	Rural	1.29	1.18
	Urban	0.50	0.45
Eggs*		24.79	44.05
	Rural	10.87	16.67
	Urban	13.92	27.38

* Billion Numbers
Source: Dastagiri, M.B., Demand for Livestock Products in India — Current Status and Projections for 2020, Agricultural Economics Research Review, 2002, pp. 176–82.

(2002) using simple growth rate model. His projections are shown in Table 3.14.

CHARACTERISTICS OF DEVELOPED MARKETS AND IDEAL SYSTEM OF AGRICULTURAL MARKETING

A developed market is the *sine qua non* of any developing economy. It should satisfy the objectives of marketing system for all the persons associated with marketing in the process of the movement of produce from producer to the consumer.

A good developed market should possess the following characteristics:

1. A good developed market should provide commodities which the consumers want and are ready to pay for.

2. It should provide a wide variety of products to consumers so that they may easily choose for themselves. The variety should not be so wide as to create a confusion for him.

3. No harmful products should be offered for sale in the market. Precau-

tions should be taken to protect consumers.

4. The information on the presence of goods in the market and their relative merits should be available to all the prospective consumers.

5. There should not be any sort of pressure on the consumers to buy products from a particular trader or class of traders.

6. The retailing services should be available in the market (together with wholesale facilities) for small consumers.

7. Prices should be fair and uniform for the products for all categories of consumers.

8. There should not be any inefficiency or wastage in the market.

9. The producer should be able to sell his surplus quickly and get a price which is consistent with the demand and supply situation.

IDEAL MARKETING SYSTEM

In agriculture-oriented developing countries like India, agricultural product marketing services play a pivot role in fostering and sustaining the tempo of agricultural and rural development. The ideal marketing system has been defined by Moore, Johl and Khusro[16] in the following words:

"The ideal marketing system is one that maximizes the long run welfare of society. To do this, it must be physically efficient; otherwise the same output could be produced with fewer resources; and it must be allocatively efficient; otherwise a change in allocation could increase the total welfare where income distribution is not a consideration."

An ideal marketing system should operate with maximum physical and allocative efficiency. For maximum physical efficiency, such basic physical functions as transportation, storage, and processing should be carried on in such a way as to achieve the highest output per unit of cost incurred on them. Similarly, an ideal marketing system must allocate agricultural products in time, space and form to intermediaries and consumers in such proportions and at such prices as to ensure that no other allocation would make consumers better off. To achieve these conditions, prices throughout the marketing system must be efficient and must, at the same time, be equal to the marginal costs of production and marginal consumer utility.

The pricing system is efficient when it fulfils the following conditions:

1. The prices through space (geographically) should vary on the basis of the cost of transportation from one point to another. This can be judged by observing the price differential between the markets and comparing it with the cost of transportation, as well as by studying the correlation coefficient between the prices obtaining in the various markets. Higher correlation coefficients indicate that the prices in different markets move closely with one another.

2. The prices through time vary no more than the cost of storage from one period to another.

3. The prices of different forms of products vary no more than the differences in the costs of processing.

CHARACTERISTICS OF A GOOD MARKETING SYSTEM
The following characteristics should exist in a good marketing system:

1. One of the conditions of an efficient agricultural marketing system is that there should not be any government interference in free market transactions. The methods of intervention include restrictions on foodgrain movements, restrictions on the quantity to be processed or on the construction of processing plant, price supports, rationing, price ceiling, entry of persons in the trade, etc. When these conditions are violated, the inefficiency in the marketing system creeps in, and commodities pass into the black market. They are not then easily available at fair prices to the consumers.

2. The marketing system should operate on the basis of the independent, but systematic and orderly, decisions of the millions of the individual consumers and producers whose lives are affected by it.

3. The marketing system should be capable of developing into an intricate and far-flung marketing system in view of the rapid development of the urban-industrial economy.

4. The marketing system should bring demand and supply together and should establish an equilibrium between the two.

5. The marketing system should be able to generate employment by ensuring the development of processing industries and convincing the people to consume more processed foods, consistent with their tastes, habits and income levels.

SCIENTIFIC MARKETING OF FARM PRODUCTS

The tendency among the farmers to market their produce has been increasing. Production is complete only when the product is marketed at a price remunerative to the farmer. Increasing specialization in production, higher marketable/marketed surplus of the produce and alternative channels of marketing have increased the importance of the marketing activity for the farmers.

COMMANDMENTS OF SCIENTIFIC MARKETING
The farmers can gain more if they follow the following commandments of scientific marketing:

1. *Bring the Produce for Sale after Cleaning.* The produce brought by the farmers for sale in the market must be clean and free from such impurities as dirt, sand and pebbles, and should be unmixed with produce of another quality. Impurities, when present, lower the price offered by the trader-buyer in the market. The fall in price is more than the extent of the impurity present in the

produce would warrant. Many buyers are interested in buying only clean produce, and are ready to pay a higher price for it. Clean produce attracts more buyers and in turn higher prices to the seller.

2. *Sell Different Qualities of Products Separately.* The produce of different varieties should be marketed separately. Many farmers mix the lots because of their small quantity, and get a low price for the mixed lot. It has been observed that when different varieties of products are marketed separately, the farmers get a higher average price because of the buyer's preference for specific varieties.

3. *Sell the Produce after Grading.* It is always advantageous for the farmer to market the produce after grading and standardizing it. Graded produce is sold off quickly. Studies have shown that sellers get a higher total income when they sell the produce after grading it. The additional income generated by the adoption of grading and standardization is more than the cost incurred on the process of grading and standardization. This shows that there is an incentive for the farmers for the production of good quality products.

4. *Keep Abreast of Market Information.* The farmer must keep in touch with market news in order to know the prices that prevail in different markets. Price information helps him to take decisions about when and where to sell the produce so that a better price may be obtained. Farmers who go to the market for sale without prior knowledge of the prevailing prices repent later. By and large, they agree to sell at a price which is lower than the price expected by them because it is difficult and cumbersome for them to postpone the sale or take the produce to another market.

5. *Carry Bags/Packs of Standard Weighs.* Farmers should weigh their produce and fill each bag with fixed quantity before moving to the market for sale. A majority of the farmers do not weigh their produce before taking it for sale and suffer loss by way of a possible malpractice in weighing; or they may have to make excess payments in transit (octroi, transport costs).

6. *Avoid Immediate Post-harvest Sales.* Farmers should avoid sales immediately after a harvest. The prices of the produce touch the lowest level in the peak marketing season. Farmers can get better prices by availing themselves of the warehousing facilities existing in their area. Farmers can meet their cash needs by pledging the warehouse receipts to nationalized banks. However, before taking such decisions, they should carefully compare the expected rise in the prices from the post-harvest season to the later months with cost of storage and interest on the value of the produce.

7. *Patronize Co-operative Marketing Societies.* Farmers can get better prices by sales through a co-operative marketing society and can avoid the possibility of being cheated in the process of marketing their produce. The cost of marketing, particularly the transportation cost for farmers having a small quantity of marketable surplus, is minimized, for transportation is ar-

ranged cooperatively by the society, and the profit earned by the society is shared among its members.

8. *Sell the Produce in Regulated Markets.* The farmers should take their produce for sale to the nearby regulated markets rather than selling them in villages or unregulated markets. In regulated markets, farmers are not required to bear, many of the marketing charges. They get the sale slips in the regulated markets, which show the quantity of the produce marketed and the amount of charges deducted from the value of the produce. Sale slips protect farmers against the malpractice of deliberate erroneous accounting or unauthorized deductions.

9. *Choose the Right Varieties.* Different varieties fetch different prices in the market. Certain varieties enjoy a price premium in the market. For example, basmati varieties of paddy command a higher price than others. Scented varieties are priced higher than non–scented varieties. In the case of cotton, long staple varieties fetch better prices. The farmers should, therefore, ought to be selective and look for varieties which can be sold at relatively higher prices.

10. *Minimise Chemical Residues.* Over the years, the consumers are becoming increasingly conscious of chemical residues in the products. So much so that the products grown on land without the application of chemical fertilizers and insecticidal sprays/dustings (organic products) are bought at premium prices. Given this change in consumer preferences, the growers would need to avoid the indiscriminate use of chemicals in farming for realizing higher prices of their products.

MECHANIZATION/MODERNIZATION OF FOODGRAIN MARKETS

Mechanization has become popular in almost every human activity. In recent years, the pace of mechanization in all stages of farm production, including harvesting and threshing, has gained momentum. Increased mechanization in agriculture has reduced the time taken in performing various farm operations as well as the cost of these operations. It has also saved farmers from the drudgery of farm operations. Mechanization has led to increased production. As a result, the marketable and marketed surplus has also gone up. This has created overcrowding and congestion in the markets, specially those of foodgrains.

Indian grain markets are intensive users of human labour in all the marketing processes, from the unloading of the produce to the final sale. This results in a higher cost of performing marketing functions, a high spread of marketing margin/price, and inconvenience to the sellers because more time is taken in loading, unloading, weighing and preparing the sale slips of the produce. At present, virtually no mechanical device is used either to unload, clean, dry, weigh, bag or load the grains for moving out of the markets. As a result, the present market yards are congested and call for an enlargement of market

capacity. This market capacity can be enlarged either by enlarging the size of the market yard or by building a new market yard. The building of a new market yard is very costly because of the high cost of land and building materials. Moreover, the construction of a new market yard necessitates the development of such infrastructural facilities as roads, telephones, telegraph, light, water, godowns and banking; and all these are capital intensive in nature. Therefore, the only alternative to the enlargement of market capacity is the enlargement of the size of the market yard; and this can be done by the introduction of mechanization for various marketing operations. And this is precisely what has been suggested by many.

Mechanization may be introduced at three stages of the *marketing process, i.e.,* movement of goods from the production point to the market; buying and selling operations; and movement of the produce from the market to the consumers.

The introduction of mechanization in the following marketing operations will enlarge the market capacity:

1. *Drying of Produce* : The produce, after harvesting/threshing, has to be dried to the desired moisture level to prevent losses during storage and to prolong its keeping quality. The presence of excess moisture makes milling operations difficult and unsatisfactory. At present, the drying of produce is mostly done by placing it in the sun. This takes a long time, and at times, the produce gets spoiled, particularly when the weather is bad. Quick drying is necessary if the price advantage is to be taken. The drying of the produce up to the desired level of moisture can be done by mechanical driers. Mechanical driers of different capacity are available, and can easily dry up to 20 quintals produce in an hour. The cost of mechanical drying comes to about Rs. 3 to 4 per quintal. These driers reduce the moisture content to the extent needed.

The Central Storage Institute, Chandigarh, has developed a special electronic device for the measurement of moisture in the grains. The principle behind the device is that grains have a dielectric constant, which varies with the moisture content of the grain. The variation in the dielectric constant is used to vary the effective capacitance of a suitable capacitor assembly. By measuring this capacitance, it is possible to indicate the moisture content of the grains. The device can measure the moisture over a range of 5 to 30 percent. Such moisture meters should be made available in all the markets.

2. *Cleaning the Produce* : The second stage, at which mechanization may be introduced in the marketing process, is in the clearing of the produce to make it free from extraneous matter and admixture of other grains. This operation is presently manually performed. The grain is passed over a set of screens (sieves) and then subjected to oscillations. A single person is able to clean only about one quintal of grains per hour. As a result, the market process is slowed down. The process of the cleaning of the produce can be mechanized by using the available electric or diesel-operated cleaners with air blowers.

Scalper cleaners are also available. Power-operated cleaners comprise either oscillating or rotating screens and aspiration arrangements. In these units, grain is lifted to the hopper by a conveyor; and as it passes from the hopper to the screens, it is subjected to aspirations. Almost all extraneous matter, except that having the same size and weight as the grain, is removed by this cleaner. The capacity of these cleaners equipped with electricity or diesel-driven engines ranges between 25 and 100 quintals per hour. However, for a small quantity of the produce, manual cleaners, with some fixed screen and a blow fan, and having a capacity of 10 to 15 quintals per hour per pair of workers, may be used.

The Central Institute of Agricultural Engineering, Bhopal has developed a hand-operated double screen grain cleaner. The cleaner assembly consisting of three sieves is suspended at an elevated point with the help of four ropes and is operated by oscillating it to and fro with hands. Grain is fed to the topmost sieve in batches of 5 to 10 kg. Separation takes place on the basis of difference in the size of the foreign matter and grains. The grain cleaner can clean 1.5 to 2 quintals of grain per hour. For such markets as in Punjab and Haryana, where arrivals are very high, automatic grain cleaning machines are needed. The Punjab State Agricultural Marketing Board is arranging to provide movable cleaning units to the farmers to ease the problem of labour faced in major markets during the peak marketing seasons.

3. *Grading of Produce* : The importance of the grading and standardization of grains in the marketing process has been increasingly realized. The produce of one grade can be auctioned at one time instead of auctioning each lot separately. But this procedure calls for the grading of the produce on commercial lines. Mechanical graders are available and can be used. Oscillating screens for the "shape" separation of the produce, vibratory boards and airblasts for gravity separation, and the photo-electric or magnetic eye for reflection separation—all these be used.

4. *Bagging and Stitching* : This is another marketing operation which requires a lot of manual labour. In the peak season, it is difficult for the available palledars in the market to bag and stitch the total grain arriving on a particular day. Mechanical baggers and automatic stitching machines can help in completing the work in time.

5. *Weighing* : Weighment of the produce in the market is done either by beam scales or platform scales. Both the methods are labour-intensive and slow. A mechanical device to weigh the produce has become necessary to facilitate the bulk handling of increased production and marketed surplus. A weighbridge can weigh a full cartload or truckload. This reduces time as well as cost. Weighbridges have been installed in several areas and markets of the country.

6. *Grain Sampling* : The grain stored in bags is sampled with the help of *purkhi* or a tubular sampler. This sampling technique is difficult when grain is

stored in bulk or is moving over a conveyor. Vacuum samplers operated by power can be employed for drawing samples.

7. *Loading and Unloading*: The facilities for bulk handling of grain in India are very limited. Grain is, therefore, carried in jute bags on the backs of labourers. The process of unloading or loading a truck takes very long time even when two to three *palledars* are employed at a time. Often, because of the availability of a limited number of *palledars* in the market, trucks have to wait for a long period of time till loading/unloading operations are completed. The installation of a mechanical conveying system is inevitable in the present times because of the non-availability of labourers and high labour cost. A mechanical conveying system is in use in rice mills, flour mills and pulse mills. Four different types of conveyors are available for this work. These are:

(a) *Bucket Elevators*: These are similar to Persian wheels and are suitable for vertical lifting up to heights ranging from 2 to 50 metres, with their capacity between 5 to 50 tonnes per hour.

(b) *Belt Conveyors*: They are used for horizontal conveying of grains. Belts mounted on pulleys are used for long distances; trolley-mounted small portable belts are used for short distances.

(e) *Screw Conveyors*: These are horizontal or vertical or inclined, and are used for loading grain into transport vehicle or from vehicle into storage godowns. Their capacity is up to 10 tonnes per hour.

(d) *Pneumatic Conveyors*: These are used for moving the grain upward, downward and side-ways. These are best suited where specialized multi-purpose handling is involved. Their capacity ranges from 5 to 100 tonnes per hour. Their use is mostly confined to Western countries where silo storage structures are used for grain storage. In India, at Hapur (U.P.) and Moga (Punjab), silo structures have been erected and these pneumatic conveyors are in use.

8. *Transportation*: This is one area where mechanization in marketing has become most popular. The produce is transported by trucks/tractor trolleys to a large extent. Even in areas where the produce is transported by bullock/camel carts, there has been an improvement, which has been effected by the introduction of pneumatic tyres. Pneumatic tyres have increased the capacity and speed of the bullock and camel carts and reduced the per quintal transport cost of the grain.

In the natural course, mechanization in marketing operations is bound to increase. But there are social costs of mechanizing marketing operations— the costs in terms of increase in demand for non-renewable sources of energy like electricity and diesel and the displacement of human labour, accentuating the already existing problem of under-employment and unemployment. The level of mechanization, though is still at a growing stage, has helped in improving the efficiency of the marketing system.

NOTES AND REFERENCES

1. Kiehl, Elmer R. *Agricultural Marketing in India—Role, Strategies and Implications*, The Ford Foundation, New Delhi, January 1969, pp. 1–2.

2. National Commission on Agriculture, Report No. XII, Government of India, Ministry of Agriculture and Irrigation, New Delhi, 1976; p.110.

3. Bansil, P.C., "Problems of Marketable Surplus", *Indian Journal of Agricultural Economics*, Vol. XVI, No. I, January–March, 1961, pp. 26–32.

4. Chauhan, K.K.S. and R.V. Singh., *Marketing of Wheat in Rajasthan*, University of Udaipur, SKN College of Agriculture, Jobner, 1973, pp. 96–97.

5. Rajkrishna, "A Note on the Elasticity of the Marketable Surplus of a Subsistence Crop", *Indian Journal of Agricultural Economics*, Vol. XVII, No. 3, July–September 1962, pp. 79–85.

6. Behrman, J.R., "Price Elasticity of the Marketed Surplus of a Subsistence Crop", *Journal of Farm Economics*, Vol. XLVIII, 4 Part I, November 1966, pp. 875–893, and *Supply Response in Underdeveloped Agriculture*, North Holland Publishing Company, 1968, pp. I86–90.

7. Krishnan, T.N., "The Marketed Surplus of Foodgrains—Is it Inversely Related to Price?", *Economic Weekly*, XVII, February 1965, pp. 325–28.

8. Dharam Narain, "Distribution of the Marketed Surplus of Agricultural Produce by Size Level of Holdings in India", Occasional Paper No. 2, Institute of Economic Growth, Delhi, pp. 33–38.

9. Directorate of Economics and Statistics, Indian Agriculture at a Glance, Ministry of Agriculture, Government of India, New Delhi, 2001, 2002.

10. Tyagi, D.S., Managing India's Food Economy, Sage Publications, New Delhi, 1990, pp. 113–16.

11. For detailed methodology, see National Commission on Agriculture, "Demand and Supply", Part III of the Report, Govt. of India, New Delhi, 1976.

12. Kumar, P. and V.C. Mathur, "Agriculture in Future: Demand-Supply perspective for the Ninth Five year Plan "Economic and Political Weekly, Vol. 31(39)" Sept. 28, 1996, pp. A131–39.

13. Planning Commission, Tenth Five Year Plan (2002–07), Government of India, New Delhi.

14. Kumar, P., Rosegrant and P. Hazell, "Cereals Prospects in India to 2020: Implications for Policy", IFPRI Vision 2020, Brief 23, June 1995.

15. Dastagiri, M.B., "Demand for Livestock Products in India — Current Status and Projections for 2020", Agricultural Economics Research Review, Conference Proceedings 2002, pp. 176–82.

16. Moore, J.R., S.S. Johl and A.M. Khusro. *Indian Foodgrain Marketing*, Prentice Hall of India Pvt. Limited, New Delhi, 1973, p. 18.

Appendix 3.1

DERIVATION OF ELASTICITY OF MARKETED SURPLUS OF SUBSISTENCE CROPS

Rajkrishna's Model[1&2]

Only one subsistence crop is considered. The marketed surplus (M) is defined as the difference between production (Q) and consumption (C) by the farm family as follows:

$$M = Q - C \qquad \qquad ...(1)$$

By differentiation with respect to price (P) of the crop concern, we get:

$$\frac{dM}{dP} = \frac{dQ}{dP} - \frac{dC}{dP} \qquad \qquad ...(2)$$

By multiplying all the terms with $\frac{P}{M}$, we get:

$$\frac{dM}{dP} \cdot \frac{P}{M} = \frac{dQ}{dP} \cdot \frac{P}{M} - \frac{dC}{dP} \cdot \frac{P}{M} \qquad \qquad ...(3)$$

or

$$\frac{dM}{dP} \cdot \frac{P}{M} = \frac{dQ}{dP} \cdot \frac{P}{Q} - \frac{dC}{dP} \cdot \frac{P}{C} \cdot \frac{C}{M} \qquad \qquad ...(4)$$

If we denote

$$e = \frac{dM}{dP} \cdot \frac{P}{M} \quad i.e., \text{ Marketed surplus-price elasticity}$$

$$b = \frac{dQ}{dP} \cdot \frac{P}{Q} \quad i.e., \text{ Output-price elasticity}$$

$$g = \frac{dC}{dP} \cdot \frac{P}{C} \quad i.e., \text{ Consumption-price elasticity}$$

$$r = \frac{Q}{M} \quad i.e., \text{ Reciprocal of the sales ratio}$$

(Sales ratio is M/Q)

Then $\frac{C}{M}$ may be expressed as $(r-1)$ and equation (4) may be expressed as:

$$e = rb - (r - 1)g \qquad \qquad ...(5)$$

This may be further extended by the introduction of the effect of a price change on consumption via the income effect because a price change affects

the income of producer.

Thus, equation (2) may be rewritten as

$$\frac{dM}{dP} = \frac{\partial Q}{\partial P} - \left[\frac{\partial C}{\partial P} + \frac{\partial C}{\partial I} \cdot \frac{\partial I}{\partial P}\right] \qquad ...(6)$$

where

I = Total (net) income of the producer. The increase in the income of the producer by one unit increase in price may be taken as equal to Q, i.e., $\frac{dI}{dP}$ = Q, if the farmer is only the producer. But if the farmer is producer as well as consumer, the increase in income per unit increase in price is only M.

i.e.,

$$\frac{dI}{dP} = M \qquad ... (7)$$

By substituting (7) in (6), multiplying all the terms by P/M, and rearranging the terms, we get:

$$\frac{dM}{dP} \cdot \frac{P}{M} = \left[\frac{dQ}{dP} \cdot \frac{PQ}{QM}\right] - \left[\frac{dC}{dP} \cdot \frac{PC}{CM}\right]$$

$$-\left[\frac{dC}{dI} \cdot \frac{I}{C} \frac{C}{M} \frac{M}{Q} \frac{PQ}{I}\right] \qquad ... (8)$$

If we denote

h = consumption–income elasticity i.e., $\frac{dC}{dI} \cdot \frac{I}{C}$

m = sales ratio, i.e., $\frac{M}{Q}$

k = ratio of value of production to income i.e., $\frac{PQ}{I}$, then equation (8) may be expressed as:

or
$$e = rb - (r - 1)\, g - (r - 1)\, hmk$$
$$e = rb - (r - 1)\, (g + mkh)$$

Behrman's Model[3]

Behrman in his model considered more than one commodity and introduced the concept of relative prices. He defines the marketed surplus of a subsistence crop 1 as:

$$M_1 = Q_1 - C_1 \qquad ... (1)$$

where

M_1 = Marketed surplus of Crop 1
Q_1 = Production of Crop 1

C_1 = On-farm consumption of Crop 1.

If we define

P_1 = Absolute price of Crop 1.

P_2 = Aggregate prices of all other crops produced

P_3 = Aggregate prices of other commodities in consumption, then the derivative of (1) with respect to P_1 is

$$\frac{\partial M_1}{\Delta P_1} = \frac{\partial Q_1}{\partial (P_1 / P_2)} \cdot \frac{\partial (P_1 / P_2)}{\partial P_1}$$

$$- \left[\frac{\partial C_1}{\partial (P_1 / P_3)} \cdot \frac{\partial (P_1 / P_3)}{\partial P_1} + \frac{\partial C_1}{\partial I} \cdot \frac{\partial I}{\partial P_1} \right] \qquad \dots (2)$$

Since $\dfrac{\partial (P_1 / P_2)}{\partial P_1} = \dfrac{1}{P_2}$ and $\dfrac{\partial (P_1 / P_3)}{\partial P_1} = \dfrac{1}{P_3}$

equation (2) may be written as:

$$\frac{\partial M_1}{\partial P_1} = \frac{\partial Q_1}{\partial (P_1 / P_2)} \cdot \frac{1}{P_2} - \left[\frac{\partial C_1}{\partial (P_1 / P_3)} \cdot \frac{1}{P_3} + \frac{\partial C_1}{\partial I} \cdot \frac{\partial I}{\partial P_1} \right] \qquad \dots (3)$$

If the net income (I) is considered approximately equal to $P_1 Q_1 + P_2 Q_2$ then:

$$\frac{\partial I}{\partial P_1} = \frac{\partial (P_1 Q_1 + P_2 Q_2)}{\partial P_1}$$

or

$$\frac{\partial I}{\partial P_1} = Q_1 + P_1 \frac{\partial Q_1}{\partial (P_1 / P_2)} \cdot \frac{1}{P_2} + P_2 \frac{\partial Q_2}{\partial (P_1 / P_2)} \cdot \frac{1}{P_2}$$

or

$$\frac{\partial I}{\partial P_1} = Q1 + \frac{P_1}{P_2} \frac{\partial Q_1}{\partial (P_1 / P_2)} + \frac{\partial Q_2}{\partial (P_1 / P_2)} \qquad \dots (4)$$

If we substitute (4) in (3), there will be five terms on the right hand side. Multiply each term on both sides by P_1/M_1. Then multiply and divide the first term on the right hand side by Q_1, the second term by C_1, the third term by I and C_1, the fourth term by Q_1, C_1 and I, and the fifth term by Q_2, C_1, I and P_1/P_2. By a suitable adjustment and rearrangement of terms, we get an approximation of the marketed surplus–price elasticity of subsistence crop as follows:

$$e = rb_1 - (r - 1) [g + kh (1 + b_1)] - (r - 1) hb_2 (1 - k)$$

where

e = Marketed surplus–price elasticity of Crop 1

r = Reciprocal of sales ratio, i.e., Q_1/M_1

g = Consumption (on farm) elasticity of Crop 1 w.r.t. relative price (P_1/P_3)

k = Share of income from Q_1 in total income

h = Consumption elasticity of Crop 1 w.r.t. income

b_1 = Production elasticity of Crop 1 w.r.t. relative price (P_1/P_2)

b_2 = Production elasticity of Crop 2 w.r.t. relative price (P_1/P_2)

REFERENCES

1. Rajkrishna, "The Marketed Surplus Function for a Subsistence Crop: An Analysis with Indian Data", *The Economic Weekly*, XVII, February 1965, pp. 309–20.

2. Rajkrishna, "A Note on the Elasticity of the Marketable Surplus of a Subsistence Crop", *The Indian Journal of Agricultural Economics*, Vol. XVII(3), July–September 1962, pp. 79–84.

3. Behrman, J.R., *Supply Response in Underdeveloped Agriculture*, North Holland Publishing Company, 1968, pp. 186–190.

Marketing Functions

The marketing of farm products is a complex process. It includes all the functions and processes involved in the movement of the produce from the farmers (producers) to the consumers. Neither the producers nor the consumers of farm products are located at one place. They are spread all over the country. Timewise, too, the production and consumption of farm products do not coincide. Moreover, farm products are produced in a form which is different from the one in which they are consumed. They move in different ways and at different places and times. The number and type of functions, the cost of performing these functions, the margins or profits of those who perform these functions, and the competition in the trade—all these vary from commodity to commodity, from time to time and from place to place.

This chapter includes marketing functions and marketing infrastructure.

MARKETING FUNCTIONS—MEANING AND CLASSIFICATION
MEANING

Any single activity performed in carrying a product from the point of its production to the ultimate consumer may be termed as a marketing function. A marketing function may have any one or combination of three dimensions, viz., time, space and form.

The marketing functions involved in the movement of goods from the producer to its ultimate consumer vary from commodity to commodity, market to market, the level of economic development of the country or region, and the final form of the consumption. For example, the marketing of wheat may involve bagging, loading on to a bullock cart, transportation to the primary market, unloading, making heaps in the market yard, auction, weighing, sieving, deciding the price, taking ownership by the purchaser, payment of value, rebagging, loading on to the truck, transportation to the consuming centre, unloading, sale to the retailer, weighing by the retailer, and sale to the consumer. Alternatively, if a farmer sells directly to the consumer in the village itself or at the farm, only weighing, bagging, making payment to the farmer, taking possession and transportation to the consumer's home are involved.

CLASSIFICATION

The marketing functions may be classified in various ways. For example, Thomsen[1] has classified the marketing functions into three broad groups. These are:

(i)	Primary Functions:	Assembling or Procurement Processing Dispersion or Distribution
(ii)	Secondary Functions:	Packing or Packaging Transportation Grading, Standardization and Quality Control Storage and Warehousing Determination or Discovery of Prices Risk Taking Financing Buying and Selling Demand Creation Dissemination of Market Information
(iii)	Tertiary Functions:	Banking Insurance Communications—Posts & Tele-communication Supply of Energy—Electricity

Kohls and Uhl[2] have classified marketing functions as follows:

(i)	Physical Functions:	Storage and Warehousing Grading Processing Transportation
(ii)	Exchange Functions:	Buying Selling
(iii)	Facilitative Functions:	Standardization of Grades Financing Risk Taking Dissemination of Market Information

Converse, Huegy and Mitchell[3] have classified marketing functions in a different way. According to them, the classification is as follows:

(i)	Physical Movement Functions:	Storage Packing Transportation Grading Distribution

(ii)	Ownership Movement Functions:	Determining Need
		Creating Demand
		Finding Buyers and Sellers
		Negotiation of Price
		Rendering Advice
		Transferring the Title to Goods
(iii)	Market Management Functions:	Formulating Policies
		Financing
		Providing Organization
		Supervision
		Accounting
		Securing Information

PACKAGING

Packaging is the first function performed in the marketing of agricultural commodities. It is required for nearly all the farm products at every stage of the marketing process. The type of the container used in the packing of commodities varies with the type of the commodity as well as with the stage of marketing. For example, gunny bags are used for cereals, pulses and oilseeds when they are taken from the farm to the market. For packing milk or milk products, plastic, polythene, aluminium, tin or glass containers are used. Wooden boxes with straw / bamboo baskets and plastic trays are used for packing fruits and vegetables.

MEANING OF PACKING AND PACKAGING

Packing means, the wrapping and crating of goods before they are transported. Goods have to be packed either to preserve them or for delivery to buyers. Packaging is a part of packing, which means placing the goods in small packages like bags, boxes, bottles or parcels for sale to the ultimate consumers. In other words, it means putting goods on the market in the size and pack which are convenient for the buyers.

ADVANTAGES OF PACKING AND PACKAGING

Packaging is a very useful function in the marketing process of agricultural commodities. Most of the commodities are packed with a view to preserving and protecting their quality and quantity during the period of transit and storage. For some commodities, packing acts as a powerful selling tool. The chief advantages of packing and packaging are:

(i) It protects the goods against breakage, spoilage, leakage or pilferage during their movement from the production to the consumption point.

(ii) The packaging of some commodities involves compression, which reduces the bulk like cotton, jute and wool.

(iii) It facilitates the handling of the commodity, specially such fruits as apples, mangoes, etc., during storage and transportation.

(iv) It helps in quality identification, product differentiation, branding and advertisement of the product, e.g., Amul ghee and Amul butter.

(v) Packaging helps in reducing the marketing costs by reducing the handling and retailing costs.

(vi) It helps in checking adulteration.

(vii) Packaging ensures cleanliness of the product.

(viii) Packaging with labelling facilitates the conveying of instructions to the buyers as to how to use or preserve the commodity. The label shows the composition of the product.

(ix) Packaging prolongs the storage quality of the products by providing protection from the ill effects of weather, specially for fruits, vegetables and other perishable goods.

PACKING MATERIAL AND NEW INVENTIONS IN PACKAGING

In recent years, there have been many new developments in the use of the materials for packaging the products. Most of these have been in the area of packaging for consumers with a view to making the commodity more attractive. The introduction of fibre board containers, polythene, pollyshell (polythene + cellofan) and multiwall paper bags are some of the innovations in this direction. The packing material is sometimes changed even during the course of the movement of the produce from the producer to the consumer.

Though packaging is advantageous, it adds to the cost of the product. Some of these are rather fanciful, and add more to the cost than to the utility of the product. In order to reduce the packaging cost, unnecessary use of fancy packing material should be avoided. In general, the material used for packaging must have the following characteristics:

(i) *Protective Strength.* The material used for packaging must have enough strength to protect the goods from breakage, leakage, spoilage and pilferage.

(ii) *Attractive.* The material used must be attractive to tempt the onlooker to try it.

(iii) *Consumer Convenience.* The packing material should be used and the packets be made of such size as is convenient and suits the needs of the consumers.

(iv) *Economy.* It must be cheap and the material used in packaging should be useful for domestic and other purposes after the use of the contents. In case the material cannot be reused, it must be bio-degradable.

(v) *Free from Chemical Reaction.* Packaging material should not give rise to any adverse chemical reaction and should conform to the safety standards prescribed by the health authorities.

The material used for packaging differs from commodity to commodity

depending upon the degree of perishability and according to the stage of marketing.

1. The foodgrains and oilseeds, particularly at the wholesale level, are generally packed in gunny bags made of jute. Even sugar is packed in gunny bags. However, the jute cloth used for making sugar bags is different than that used for other gunny bags. The hessian, another cloth made of jute, is used for packing raw cotton (pressed or loose). In recent years, bags made up of jute blended with synthetics are also being used for packing many commodities like cement and fertilizers.

. 2. For fresh fruits generally wooden crates and straw-board boxes or bamboo baskets are used. However, in recent years some non-conventional packing material have become common mainly on cost considerations. Some of these are as follows:

a) polythene foam wrappers for high value mangoes;

b) thermoformed PVC trays fitting to the size of fruits;

c) wrappers using tissue papers;

d) plastic trays;

e) plastic nets with convenient handles; and

f) multicolour printed duplex/corrugated-board cartons.

3. Vegetables are normally packed in jute bags, bamboo baskets and expensive wooden boxes. Normally, the following material is used for packaging of vegetables:

a) Jute bags – these are used for packaging of less perishable vegetables like cabbage, carrot, radish, beans, turnip, brinjal and cucurbits.

b) Bamboo baskets and wooden boxes – these are used for packaging of tomatoes, cauliflower and chillies.

c) CFB (Corrugated fibre board) containers – these are used for packaging of vegetables both for domestic and export markets.

d) Corrugated craft paper cartons – these are good alternatives for wooden boxes and bamboo baskets in packaging of vegetables.

e) Plastics – plastic film bags, plastic nets, corrugated-board trays, moulded plastic trays and plastic hollow boards are also used for packing vegetables.

It is being felt that for proper transportation, there is need for designing packages of certain modular dimension which can ensure maximum utilisation of space.

4. Processed Food. Packaging materials which are used in packing processed foods are of the following types:

(i) Tin containers — They are easily malleable, ductile and can be put to other uses by the consumer. Such properties as thickness, tolerance and surface finish influence the efficiency in the use of tin containers.

(ii) Glass containers	— They are chemically inert, impermeable, non-porous and generally more hygienic: If the cover is properly provided, glass containers protect the moisture sensitive food products against atmospheric conditions for a specified period.
(iii) Polyethylene	— This material has made great inroads in the packaging of processed foods due to its low cost, light weight, flexibility and convenience in use. By extrusion or blow moulding process, this material can be easily converted into flexible semi-rigid or rigid containers in the form of wraps, bags and pouches.
(iv) Aluminium foils	— These foils are able to preserve freshness, flavour and texture of such sensitive products as butter and cooked foods. They protect the contents from light, odour, moisture or bacteria. The aluminium foils can be embossed, printed or coated.
(v) Polylaminate pouches	— These pouches possess the property of being good barriers of moisture and volatile oils. Such packages usually have double pouches—the inner one of cellophane and outer one of 250 gauge LDPE.

The packaging industry in India is still at the infancy stage. But with the increase in the consumers awareness and improvement in the living standards of masses, the demand for packaged agricultural commodities is increasing. The growth rate of consumption and demand for packaging in India is envisaged at 12 percent per annum. During 2000, the total use of all packaging material was estimated at around 9.33 million tonnes[4].

TRANSPORTATION

Transportation or the movement of products between places is one of the most important marketing functions at every stage, i.e., right from the threshing floor to the point of consumption. Most of the goods are not consumed where they are produced. All agricultural commodities have to be brought from the farm to the local market and from there to primary wholesale markets, secondary wholesale markets, retail markets and ultimately to the consumers. The inputs from the factories must be taken to the warehouses and from the warehouses to the wholesalers, retailers and finally to the consumers (farmers). Transportation adds the place utility to goods.

Transport is an indispensable marketing function. Its importance has increased with urbanization. For the development of trade in any commodity or

in any area transport is a *sine qua non*. Trade and transport go side by side; the one reinforces and strengthens the other.

ADVANTAGES OF TRANSPORT FUNCTION

The main advantages of the transport function are:

(i) *Widening of the Market* : Transport helps in the development or widening of markets by bridging the gap between the producers and consumers located in different areas. Without transport, the markets would have mainly been local markets. The exchange of goods between different districts, regions or countries would be impossible in the absence of this function. The example is the market for Himachal or Kashmir apples. The producers are located mainly in Himachal Pradesh and Jammu & Kashmir; but apples are consumed throughout the country. Similarly, transportation of fresh vegetables from Indian ports to Gulf countries has expanded the markets for vegetable growers of India.

(ii) *Narrowing Price Difference Over Space* : The transportation of goods from surplus areas to the places of scarcity helps in checking price rise in the scarcity areas and price fall in surplus areas, thus reduce the spatial differences in prices.

(iii) *Creation of Employment* : The transport function provides employment to a large number of persons through the construction of roads, loading and unloading, plying of the means of transportation and repair services.

(iv) *Facilitation of Specialized Farming* : Different areas of the country are suitable for different crops, depending on their soil and agro-climatic conditions. Farmers can go in for specialization in the commodity most suitable to their area, and exchange the goods required by them from other areas at a cheaper price than their own production cost.

(v) *Transformation of the Economy* : Transportation helps in the transformation of the economy from the subsistence stage to the developed commercial stage. Industrial growth is stimulated by being fed with the raw material produced in rural areas. Manufactured goods from industries to village or rural areas, too, can be moved.

(vi) *Mobility of the Factors of Production* : Transport helps in increasing the mobility of capital and labour from one area to another. Entrepreneurs get opportunities for the investment of their capital in newly-opened areas of the country, where the prospects of profit are very bright. Moreover, transportation helps in the migration of people in search of better remunerative jobs.

MEANS OF TRANSPORT

The available means of transportation can be classified as shown in chart 4.1.

The transportation of agricultural commodities is mainly done by bullock or camel carts, tractor-trolleys and trucks, depending upon the availability,

quantity and the stage of marketing. The most common means of transportation used at different stages of marketing are :
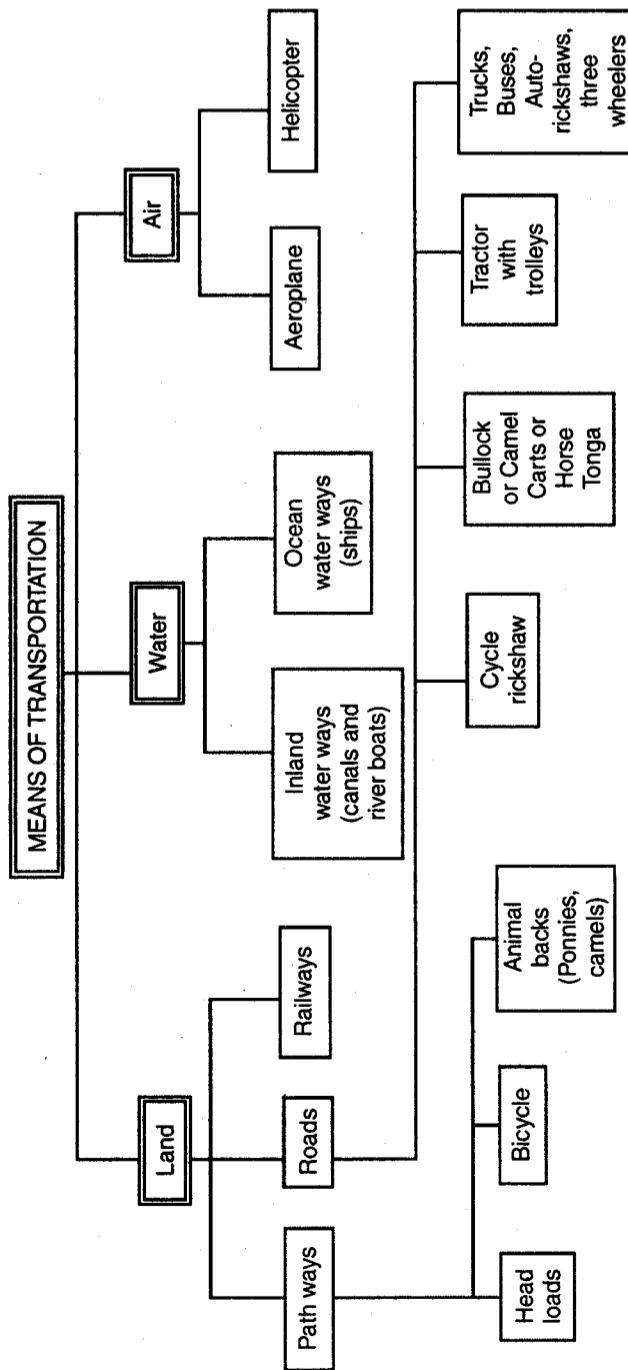
Stage of Marketing	Transportation is Done by	Means of Transport Used
(i) From the threshing floor to the village market nearest to the road or railway point	Farmer	Head loads or bullock or camel carts and tractor-trolleys
(ii) From the village market/railway station to primary/secondary wholesale markets	Traders	Trucks, buses or railway wagons
(iii) From retail or wholesale market to consumers	Consumers	Camel or bullock carts, thela, bicycle, hand carts or by head loads
(iv) International trade	Importer/Exporter	Ship, aircraft, other carriers.

A study by Acharya[5] on the marketing of pulses in Rajasthan has indicated that out of the total quantity transported by the farmers to the primary markets, 58.4 percent is carried by animal carts, 27.6 percent by tractor-trolleys, 5 percent by trucks and 9 percent by other modes. However, in recent years, with the expansion in the road network and increase in the use of faster means of transportation, the use of bullock or camel carts has gone down in most of the regions. According to one estimate, the bullock or camel carts now account for only 25 percent of the total produce arriving in the primary markets. Tractor-trolleys account for 65 percent and trucks around 10 percent of the produce arriving in primary markets. However, the bullock cart or camel cart is still an important means of transport employed by a majority of Indian farmers. It is perhaps the best suited vehicle in the agricultural conditions of the country where all the villages are not connected by tar roads. Bullocks or camel carts will continue to serve as the primary means of transport in rural areas in the times to come. The carrying capacity of bullock carts varies from five to ten quintals. They move slowly at a speed of 2.8 to 3.0 km/ per hour. The cost of transportation by a bullock cart per quintal per km is high compared to any other mechanized means of transportation. Inspite of all these problems of transportation by a bullock cart, it is popular and indispensable because of the following reasons:

(i) It is a cheap and easily available conveyance for the farmer having a small quantity of produce for transportation to short distances;

(ii) Its operational cost is low because the time is so adjusted that no opportunity cost is involved in using bullocks for this purpose;

CHART 4.1

```
                    ┌─────────────────────────┐
                    │ MEANS OF TRANSPORTATION │
                    └─────────────────────────┘
              ┌────────────────┼──────────────────────┐
          ┌───────┐        ┌───────┐              ┌───────┐
          │ Land  │        │ Water │              │  Air  │
          └───────┘        └───────┘              └───────┘
      ┌──────┬────┬──────┐   ┌───────────┬─────────────┐   ┌─────────────┬─────────────┐
```

Land				Water		Air	
Path ways	Roads	Railways		Inland water ways (canals and river boats)	Ocean water ways (ships)	Aeroplane	Helicopter

Head loads	Bicycle	Animal backs (Ponnies, camels)	Cycle rickshaw	Bullock or Camel Carts or Horse Tonga	Tractor with trolleys	Trucks, Buses, Auto-rickshaws, three wheelers

(iii) It can be manufactured by village artisans from the material (wood) obtained from the farm. Farmers are not required to make a heavy initial investment. Repair facilities are also available in the villages;

(iv) It can be used on roads, kaccha paths and even in sandy areas. No special type of road is needed. It can operate even in muddy and stony areas;

(v) It generates employment for village artisans;

(vi) It is multi-purpose transport, for it carries the produce to the market, inputs from the market to villages, farmyard manure from the village to the farm and passengers from one village to another.

TRANSPORTATION INFRASTRUCTURE

Transportation infrastructure consists of roads, railways, and transport vehicles. The status of length of roads in the country at different points of time is shown in Table 4.1.

Table 4.1
Length of Roads in India

('000 km)

Year	Length of Raods		National Highways	State Highways
	Total	Surface		
1950–51	400.0	157.0	19.8	NA
1960–61	524.5	263.0	23.8	NA
1970–71	915.0	398.0	23.8	56.8
1980–81	1485.4	684.0	31.7	94.4
1990–91	1998.2	1024.4	33.7	127.3
1995–96	2302.5	1263.4	34.5	135.2
1998–99	2626.0	1448.6	49.6	137.9
1999–2000	NA	NA	52.0	NA
2000–2001	NA	NA	57.7	NA

Source: Ministry of Road Transport and Highways. Taken from Economic Survey 2002–03, Ministry of Finance and Company Affairs. Division of Economics, Government of India, New Delhi, p. S-29.

The length of roads has considerably gone up during the last fifty years. There has been considerable increase in national and state highways also. The number of vehicles (trucks, trailers, buses and tractors) running on these roads have also increased considerably in the country (Table 4.2).

However, a worrisome aspect is that the surfaced roads comprise only 57 percent of the total road length in the country. The status of roads is poor in the eastern states — Assam, Manipur, Nagaland, Tripura, Bihar and Orissa – where only 40 percent of the roads are surfaced. In the agriculturally and industrially developed states like Punjab, Haryana and Maharashtra, the proportion of surfaced roads is quite high. The road density in relation to the geographical area ranges from 10 per 100 sq. Km in Jammu and Kashmir to 375 km in Kerala with an overall average of 74 km for the country.

Table 4.2
Number of Transport Vehicles in India

Year	Registered Vehicles			Railway Route		Goods carried by railways (billion tonnes km)
	Total (Lakh)	Goods Vehicles (Lakh)	Buses (Lakh)	Total (Lakh km)	Electrified (Lakh Km)	
1950–51	3.06	0.82	0.34	53.6	0.4	44.1
1960–61	6.65	1.68	0.57	56.2	0.7	87.7
1970–71	18.65	3.43	0.94	59.8	3.7	127.4
1980–81	53.91	5.54	1.62	61.2	5.3	158.5
1990–91	213.74	13.56	3.31	62.4	10.0	242.7
1995–96	337.86	20.31	4.49	62.9	12.3	273.5
1999–2000	483.93	26.81	5.59	63.0	14.9	315.5

Source: Economic Survey 2002–03, pp. S-27 and S-29

The number of goods carriers went up from 0.82 lakhs to 26.81 lakhs, route length of electrified railways increased from 0.4 lakh km to 14.9 lakh km and the haulage of goods by railways went up from 44.1 billion tonne kms to 315.5 billion tonne kms during the last fifty years in the country. Railways route availability is relatively poor in the states of Madhya Pradesh, Orissa and Karnataka as is clear by low density of rail route.

The net outcome of the expansion of road network has been the improvement in the village connectivity across the country. The villages with population above 1500 have 92 percent connectivity in all the states (except for Bihar, West Bengal and Karnataka). For villages with population between 1000 and 1500, the connectivity is 76 percent in large number of states. However, only 37.5 percent of villages with a population of less than 1000 were connected with roads as on March 31, 1994 (Table 4.3) reflecting a size bias in terms of providing road facilities to villages. There is need for expansion of roads in rural areas/small villages and also in hilly and desert areas to facilitate marketing of agricultural commodities.

Table 4.3
Road Connectivity of Villages in India

(Till Middle of Nineties)

Group of villages with Population	Villages Connected with Roads	Villages Not Connected with Roads	Total Number of Villages
< 1000	172062 (37.45)	280733 (63.55)	452795 (100)
1000–15000	44031 (75.88)	13904 (24.12)	57935 (100)
> 1500	65698 (91.73)	5713 (8.27)	71411 (100)
Total	281791 (48.41)	300350 (51.59)	582141 (100)

Note: Figures in parentheses are percentages of total number of villages in the respective rows.

TRANSPORTATION COST

The transportation cost accounts for about 50 percent of the total cost of marketing. It is higher when the produce is transported by bullock carts than when it is carried by other means. Further, the low capacity of the bullock cart and its slow moving character restrict its use. In surplus producing areas tractors and trucks have to be used for carrying the produce to the primary assembling markets. The truck industry is not well developed in rural areas for the transportation of agricultural produce because of the absence of proper roads connecting the villages.

The efficiency of transportation depends on the speed and the care with which goods move from one place to another, the extent of the facilities provided, and the degree of care with which goods are handled en route and at terminal stations. However, there is a need for reducing the cost of transportation.

FACTORS AFFECTING THE COST OF TRANSPORTATION

Other things remaining the same, the transportation cost of a commodity depends on the following factors:

(i) *Distance* : With an increase in the distance over which a commodity is transported, the total transportation cost increases; but the transportation cost per unit quantity of the produce decreases after a certain distance.

(ii) *Quantity of the Product* : The transportation cost per unit quantity of a commodity decreases with the increase in the volume. It will be less if a full truckload is available than it would be if only a few quintals are transported.

(iii) *Mode of Transportation* : The cost of transportation varies with the mode of transportation, *e.g.*, bullock cart, tractor, truck, railway, etc.

(iv) *Condition of Road* : The cost of transportation is less where metalled or tar roads have been constructed than in places where gravelled roads exist or where there are no roads at all.

(v) *Nature of Products* : The cost of transportation per unit is higher for the products having the following characters:

(a) Perishability (*e.g.*, vegetables);

(b) Bulkiness (*e.g.*, straw);

(c) Fragility (*e.g.*, tomatoes);

(d) Inflammability (*e.g.*, petrol);

(e) Requirement of a special type of facility (for example, for livestock and milk).

(vi) *Availability of Return Journey Consignment* : If goods are also available for transportation when a truck is to return to its starting place, the per unit cost of transportation is less.

(vii) *Risk Associated* : The transportation cost is less if the produce is transported at the owner's/sender's risk than when the risk is on the agency transporting the produce.

PROBLEMS IN TRANSPORTATION OF AGRICULTURAL COMMODITIES

The problems in the transportation of agricultural commodities are very serious because of the special factors associated with them; for example, the perishability of the produce, its bulkiness, the small quantity in which it is available, and a large number of suppliers and purchasers. The following are some of the important problems arising out of the transportation of agricultural commodities:

(i) The means of transportation used are slow moving;

(ii) There are more losses/damages in transportation because of the use of poor packaging material, overloading of the produce and poor handling, specially of fruits and vegetables, at the time of loading and unloading;

(iii) The transportation cost per 100 rupees worth of the farm produce is higher than that for other goods. This is so because of its bulky character and the prevailing practice of fixing charges on the basis of weight or volume rather than on the basis of its value;

(iv) There is lack of co-ordination between different transportation agencies, e.g., the railways and truck companies. Some of the places are not connected by railway. The produce is often transported for a part of the distance by rail and a part by trucks or other means of transportation.

(v) The multi-gauge system of railways was also a serious problem in transportation of goods by railways. However, now the country is moving towards a uni-gauge system which augurs well for marketing of farm products.

Suggestions for Improvement

The following are some of the suggestions for effecting improvements in the transport function and reducing transport costs:

(i) There must be full utilization of the capacity of the transportation facility in terms of the load. This would reduce the per quintal cost of transportation.

(ii) The transportation cost per quintal can be reduced by fixing the rate of transportation for different means. At present, each agency charges what it likes and not on the basis of any rational computation of the cost factor.

(iii) There should be a reduction in spoilage, damage, breakage and pilferage during the period of movement as a result of better handling, packing and the use of the proper types of wagons.

(iv) There should be a reduction in the barriers to inter-state movement of the produce. If this happens, the time taken in transportation and the quantity of the fuel consumed would be reduced.

(v) A reduction in the bulk of the produce by processing it can help in minimizing the transport cost. For example, milk may be processed into condensed milk, butter or ghee and fruits into juices.

(vi) The speed and capacity of the vehicles used in transportation should be increased. This can be done by research in respective areas. The speed and capacity of bullock carts can be increased by:

(a) The use of pneumatic tyres instead of the existing wooden and iron wheels;

(b) The use of springs in the axle of the cart;

(c) The development of atleast good all-weather roads in the areas.

(vii) It must be recognised that roads and railways are important components of infrastructure, therefore, more public initiative in their expansion is called for. Nearly 50 percent of the villages in the country are still not connected by roads. This apart, there are sharp differences among the states. For example, in states like Orissa, Rajasthan and Madhya Pradesh more than half of the villages are still to be connected by link roads. The rail transport, though capable of transporting agricultural commodities to longer distances in larger quantities with greater speed but it also suffers from multi-gauge system, shortages of wagon capacity and congestion on trunk routes. Therefore, in the overall scheme of public investment, development of this infrastructure should receive more allocation.

GRADING AND STANDARDIZATION

Grading and standardization is a marketing function which facilitates the movement of produce. Without standardization the rule of caveat *emptor* (let the buyer beware) prevails; and there is confusion and unfairness as well. Standardization is a term used in a broader sense. Grade standards for commodities are laid down first and then the commodities are sorted out according to the accepted standards.

Products are graded according to quality specifications. But if these quality specifications vary from seller to seller, there would be a lot of confusion about its grade. The top grade of one seller may be inferior to the second grade of another. This is when buyers lose confidence in grading. To avoid this eventuality, it is necessary to have fixed grade standards which are universally accepted and followed by all in the trade.

MEANING

Standardization means the determination of the standards to be established for different commodities. Pyle has defined standardization as the determination of the basic limits on grades or the establishment of model processes and methods of producing, handling and selling goods and services.

Standards are established on the basis of certain characteristics—such as weight, size, colour, appearance, texture, moisture content, staple length, amount of foreign matter, ripeness, sweetness, taste, chemical content, etc. These characteristics, on the basis of which products are standardized, are termed *grade standards*. Thus, standardization means making the quality specifications of the grades uniform among buyers and sellers over space and over time.

Grading means the sorting of the unlike lots of the produce into different lots according to the quality specifications laid down. Each lot has substantially the same characteristics in so far as quality is concerned. It is a method of dividing products into certain groups or lots in accordance with predetermined standards. Grading follows standardization. It is a sub-function of standardization.

TYPES OF GRADING

Grading may be done on the basis of fixed standards or variable standards. It is of four types:

1. Fixed Grading/Mandatory Grading : This means sorting out of goods according to the size, quality and other characteristics which are of fixed standards. These do not vary over time and space. It is obligatory for a person to follow these grade standards if he wants to sell graded products. For a number of agricultural commodities, grade standards have been fixed by the Agricultural Marketing Advisor, Government of India, and it is compulsory to grade the produce according to these grade specifications. Individuals are not free to change these standards. The use of mandatory standards is compulsory for the export of the agricultural commodities to various countries.

2. Permissive/Variable Grading : The goods are graded under this method according to standards, which vary over time. The grade specifications in this case are fixed over time and space, but changed every year according to the quality of the produce in that year. Under this method, individual choice for grading is permitted. In India, grading by this method is not permissible.

3. Centralised/Decentralised Grading : Based on the degree of supervision exercised by the government agencies on grading of various farm products, the programme of voluntary grading for internal trade can be categorised into centralised and decentralised grading.

Under the centralised grading system, an authorised packer either sets up his own laboratory manned by qualified chemists or seeks access to an approved grading laboratory set up for the purpose by the state authorities/co-operatives/associations/private agencies. Grading in respect of commodities such as ghee, butter and vegetable oils where elaborate testing facilities are needed for checking purity and assessing quality has been placed under centralised grading system. In this system, the Directorate of Marketing and Inspection exercises close supervision on grading work of approved chemists through periodical inspection of the grading stations and the quality of the graded produce.

The decentralised grading system is implemented by State Marketing Authorities under the overall supervision and guidance of the Directorate of Marketing and Inspection. This is followed in those commodities which do not require elaborate testing arrangements for quality assessment. The examples are fruits, vegetables, eggs, cereals and pulses. For these commodities, the grade of the produce is determined on the basis of physical characteristics.