

C H A P T E R - I

INTRODUCTION TO CONCEPTUAL BACKGROUND

- A. INTRODUCTION
- B. HORTICULTURE DISTINGUISHED
FROM AGRICULTURE
- C. PRESERVATION AND PROCESSING
- D. FRUIT BY PRODUCTS
- E. MARKETING

* * * *

Chapter I

Introduction to Conceptual Background

a) Introduction :-

An agro-industry is an enterprise that processes bio-mass, i.e. agricultural raw materials which includes ground and tree crops, as well as livestock and fisheries, to create edible or usable forms, improve storage, and shelf life, create easily transportable forms, enhance nutritive value and extract chemicals for other uses. It includes two categories.

1. Agro-Food Industries,
2. Agro Non-food Industries.

Agro-industry provides the crucial farm industry linkage which helps to accelerate agricultural development by creating backward linkages (supply of credits, inputs and other production enhancement services) and forward linkages (processing and marketing) adding value to farmers' produce, generating employment opportunities and increasing farmers' net income. This in turn motivates the farmers for better productivity and further opens-up possibilities of industrial development. Agro-industries display unique characteristics of seasonality, perishability, and variability based on the raw materials processed by them. This calls for greater speed in

handling, storage and processing efficient system of marketing.

India is a country of villages. Seventy per cent of population comes from villages and more than 60% depend on agriculture for their food, shelter, and clothing. Agriculture is the backbone of the industry. Agro industries at present have been contributing 35% to 40% of total exports.¹ Increasing demand for various agro-based products for direct consumption, industrial use, and export has led to agro-based industrialisation in our country. It is labour intensive in character, needs less capital, and more working capital. The industry includes, jute, cotton, sugar, edible oil, sericulture, handicraft, khadi, powerlooms, khandsari, dairy, poultry, cattlefeed, fruit processing and food articles, certain consumer goods.

It may be noted that recent trends in the development of agro-processing industries has attracted higher capital investments, enhanced technological complexities, and managerial requirements.² Many companies have also found the agro-processing and processed foods as lucrative avenue for diversification. The degree of processing has been considerably intensified and modernised by the growth of processed food industry which is based on cooking, mixing, and

chemical alteration producing a textured vegetable food. By-product processing of major agriculture commodities has opened up the vast potential of agro-industrial growth in the rural India in recent years.

b) Horticulture distinguished

from Agriculture :-

Origin :-

The word 'Horticulture' is derived from Latin root 'Hortus' which means garden and 'Colere', to cultivate.³ The concept of culture of gardens as distinct from culture of fields i.e. agriculture is a medieval concept, indicative of practices of that period. Agriculture now refers to the technology of raising plants and animals. Horticulture is that part of agriculture concerned with so called 'Garden Crops' as contrasted with 'agronomy' and 'forestry'. Horticulture is first mentioned in English by E. Philips, in the new world of English words London 1678. The first known use of the word 'Horticulture' is in Peter Laurenberg's treatise of that name written in 1631.

Definition :-

Horticulture may be defined as the branch of agriculture concerned with intensively cultured plants, directly used by people for food, for

medicinal purposes, or Esthetic gratification.⁴ The esthetic use of plants as a unique feature of horticulture distinguishing from other agricultural activities. It is this aspect of horticulture that has led to its universal popularity. The industry subdivided according to the kinds of products and the uses to which they are put.

1. Pomology :-

It is concerned with the production of edibles and fruit crops of varied types.

2. Olericulture :-

It refers to the production of vegetable crops.

3. Floriculture and

Landscape Horticulture :-

It is that branch of horticulture which is devoted for the production of ornamental plants and crops.

The above three terms are not mutually exclusive. Depending upon the purpose they may cross the boundaries of classification.

Scope :-

Horticulture crops are classified into four categories.⁵

1. Crops grown for their food/vitamins/mineral contents such as apple, sweet potato etc.
2. Crops grown for their beverage properties such as tea, coffee, etc.
3. Crops grown to beautify environment. Grass for show, roses and other decorating plants.
4. Miscellaneous groups including crops grown for perfume or spices.

It provides a very lucrative career in the field of production and processing, buying and selling, landscaping, public and private properties. It also provides interesting and challenging task in the field of research, teaching and extension services.

Significance :-

The cost of production is comparatively less in case of horticulture.

Pharmaceutical Use :-

Certain plants, seeds, leaves, roots have medicinal value. They are raw materials to certain pharmaceutical industries. Sometimes they are directly used without any processing.

Industrial Use :-

Seeds and cuttings are used by nurseries. Fruits and vegetables are processed to get higher value. Yarn in sericulture, certain preserved perishable products have industrial uses.

Nutrition Value :-⁶

Fruits and vegetables are natural sources of important vitamins such as Vitamin 'C', 'A', 'B', 'P', 'E' etc. Citrus fruits, guava, mango, tomato are rich in vitamin 'C'. Tomato contains vitamin 'C' also. Citrus peel contains vitamin 'P'. Green vegetable contain vitamin 'E'. Modern methods are efficient enough to minimise the destruction of vitamins in them during processing.

Decoration Value :-

Certain plants are wonderfully beautiful with fantastic combination of colours, leaves, flowers, fruits. They facilitate interior and exterior decorations indicating decorative value.

Ecological Balance :-⁷

Control of pollution is one of the serious social challenge to business. Social forestry, garden culture are the steps to minimise or control air pollution and maintain ecological balance.

Food processing industry assures a stable market to farmers and horticulturists, enable them to expand their production without fear of fall in demand.

c) Preservation and Processing :-

1) Brief history of food preservation

and Canning Industry in the World :-

The canning industry was actually conceived at the time of war in France, when Napoleon army men were in great difficulty to get food materials. In the year 1795 the French Government announced a prize of 12,000 Francs for the discovery of a satisfactory method of preservation so that food could be transported to the fighting forces over long distances without spoilage. In 1810 Nicholas Appert, a Paris confectioner and distiller invented a process for preserving food in glass container, took out a patent for his process and won the prize. He also published a book 'The Art of Preserving Animal and Vegetable Substances for many years'. This is the first known work on modern canning. In honour of his discovery canning is still known as 'Apperlizing'.⁸



Preservation of food in one form or other has been practised in all parts of the world since time immemorial, though scientific methods for it came to be developed only about a 100 years back. The main reasons for the growth of this industry are as follows :-

- a) Wartime needs for food preservation.
- b) Demand for certain foods and vegetables during the off season.
- c) Minimising waste or spoilage of perishable products.
- d) To make it more and more portable.
- e) To assure availability from abundance to scarce conditions.

In a short span of time the industry has developed to such a degree of perfection that fruits, vegetables, food articles produced by any country in any season are available all over the world at all times. There are more than 350 different kinds of canned foods which are found in the international market and a total annual pack of major producing countries of the world is estimated at more than 15,000 million Pounds. The production of canned foods and vegetables produced in U.S.A. alone is over 7 Million Tonnes.⁹

2) Scope of Fruits and

Vegetable Preservation in India :-

Development of horticulture will be uneconomical in a country with poor communication and marketing facilities unless the fruits and vegetable preservation industry keeps pace with the development work. Its progress in India has been rather slow mainly because of lack of adequate scientific knowledge about the various process of food preservation. In India because of ideal soil and climatic conditions many of the fruits and vegetables are produced with ease. Many fruits which are very cheap in the season are wasted to an extent of crores of rupees annually (i.e. tomato 25 Ps. Kg.). In addition to their food value, fruits and vegetable constitute appreciable quantities of minerals and vitamins which are main source of nourishment and body building. But processing and preservation industry is still in its infancy in our country. The total annual production of all kinds of fruits and vegetable preserves does not amount to more than Rs. 2 Crores in value. Many products are too expensive for a majority of people. The preserved products mainly consists of jams and pickles which continue to be produced by traditional methods.¹⁰ Till only about 20 years ago, other well known methods of preservation such as making of juices, squashes, cordials, jellies, marmalades etc. were confined only to a few larger industries.

India being vast country agriculture and horticulture is the backbone of the rural India. During the last two decades there is remarkable growth of horticulture. This makes a strong case for establishing and developing horticulture based agro-industries. As noted earlier, in country like India, employment generating, labour intensive industries have better scope. Canning industry in India has yet to exploit its full potentialities. The pace of progress is not as fast as it should be.

3) Spoilage in Preserved Food :-

Canned foods are liable to spoilage in storage for various reasons. Even there may be pre-process spoilage, under-process spoilage, infection due to leakage, buckling, a flat sour etc. Fruit products often loose their normal and attractive appearance and become unsellable although they may remain quite fit for consumption. The causes are varied. It may be due to physical factors, rough handling, faulty technique, poor storage etc. Preserved food spoilage can be broadly grouped into two categories.¹¹

- a) Micro-biological spoilage
- b) Chemical and physical spoilage.

a) Micro-biological Spoilage :-

Due to the action of micro organism, gases are formed inside the can where there is no gas production as in case of flat sour spoilage. The can retains its original shape without any bulging of the ends. Micro biological spoilage of canned food is generally of two kinds.

1. Non-poisonous
2. Poisonous

Non-Poisonous Spoilage :-

This is usually due to under sterilisation. It is most commonly caused by a variety of yeasts present in the product. Bacteria are very seldom present in the canned food/fruits of fancy choice and standard grades which are carefully packed. They, however, appear occasionally in pie grade fruit. Spoilage in case is easily detected by the bulged appearance of their ends which is caused by the presence of Carbon dioxide generated inside.

Poisonous Spoilage :-

This is caused by thermophylic bacteria. In this case gas formation is very rare and the can retains its normal shape. The taste and flavour of the

product inside do, however, suffer. It usually occurs in pasty and viscous materials and in solid packs which are difficult to sterilize adequately.

Thermophilic bacteria are heat resistant and persist even at 100°C. If the can is stacked in a pile without adequate cooling the content inside remain at a favourable incubation temperature for a fairly long time with the result that these bacteria multiply and spoil the product. The indications of spoilage are swell, hydrogen swell, springer*, flipper*, leaker, breather, bursting of cans.

b) Spoilage due to

Physical and Chemical Changes :-

Discolouration of canned foods may be owing to biological causes or metallic contamination or both.¹²

Biological Cases :-

Cut and peeled apples and pears when kept in air, turn brown due to oxidation. This change of colour is induced by coxidases (enzymes) present in fruit itself.

Brown discolouration of a fruit product may also be caused by reactions other than enzymetic, in which case it is generally known as non-enzymatic browning.

* a mild swell at one or both ends of a can.

* a can with a mild positive pressure it may be due to over filling or under exhausting.

Any of these reactions may go on independently. The colour changes may be caused by reactions between :-

1. Nitrogenous matter and sugar.
2. Nitrogenous matter and organic acid.
3. Sugar and organic acid.
4. Organic acid among themselves.

These reactions are generally known as 'Maillard'. Reactions are of great importance to food preservation.

Metallic Contamination :-

This type of discolouration is generally caused by iron and copper salts. The following are significant ones :-

1. Ferric tannate :-

Some fruits and vegetables contain tannins. Sometimes tannins may get into the product through the spices used for seasoning. These tannins coming into contact with the exposed iron of the tin plate form ferric tannate which is black and spoils the appearance of the canned product.

2. Iron sulphide :-

Sulphur dioxide may get into the can through sugar which is made by the sulphitation instead of

carbonation process. It may also be formed inside the can itself owing to the decomposition of the proteins in the product. The gas may react with the hydrogen formed by the fruit acid acting on the tin plate and get reduced to hydrogen sulphide, which in turn will react with the iron of the can and form the black iron sulphide. This will spoil the appearance of the product.

3. Copper Sulphide :-

When the plant is shut down for sometime and started after sometime, even though it is washed thoroughly copper oxide or copper salt may still remain sticking to the surface of the metal. The product coming in contact with the hydrogen sulphide which may be formed inside the can due to several causes will form black copper sulphide which will discolour the product.

Hydrogen :-

Fruit acids, reacting on the metal of the can produce hydrogen.¹³

In modern days monel metal and stainless steel equipments are used. They can be easily cleaned and spoilage can be minimised. Use of glass container instead of tin container helps to avoid metallic contaminations.

Total estimated production of fruits in India is about 129 Million mounds, but as substantial quantity is wasted, only 1 ounce per individual per day is the net availability. This contrast marked with the consumption in other advanced countries which ranges between 4 and 16 ounces per day per individual.

4) Factors affecting growth of

Fruits and Vegetable preservation industry :-

1. Availability of raw materials.
2. Supply of skilled labour.
3. Provision for finance - short, medium and long-term.
4. The extent of interest and the specialised knowledge.
5. Marketing facilities.
6. Transport and communication facilities.
7. Availability of cans and bottles.
8. The state of advertisement and publicity.
9. Government policy towards the industry in general and food processing in particular.
10. Phase of business cycle and political stability.

5) Methods of Preservation :-

The fundamental principle of preserving food by heat is known as 'processing'. It consists basically in application of heat in varying degrees to the food in closed containers for a sufficiently long time to sterilise the contents before they are hermetically sealed. The method of processing varies from food to food. In the majority of cases heat or cold was the principle agent employed to preserve food. Even today the same principle is employed for preservation of perishable foods although the technical advances in its application have been most amazing. The modern methods of food preservation in general and of fruits and vegetables preservation in particular may be classified as follows :-

a) Physical Methods :-

There are 4 categories of physical methods.¹⁴

They are as follows :-

i) By removal of heat :-

This method involves preservation by cold. Freeze preservation which is the extension of the well known method of increasing the storage life of fresh fruits and vegetables and similar other fresh food stuffs

is extensively employed more in case of fish and meat, although it is being employed to a limited extent in case of some fruits and vegetables such as peach, pear, beans etc. Removal of heat can be done by refrigeration, freezing preservation, dehydro-freezing preservation or carbonation.

ii) By addition of heat :-

Preservation by addition of heat in various waste is perhaps the earliest and the most common method of preservation. It is generally known as preservation by canning or heat processing in hermetically sealed containers made of tin plates or glass or more recently of heat resistant plastic materials. Both solid and liquid foods are preserved on a very large scale by this method. This may be by way of stationary pasteurisation or agitating pasteurisation or sterilization.

iii) By removal of water :-

It may be by evaporation or dehydration. Sun drying is extensively employed to dry variety of fruits, meat, fish etc. Artificial drying of fruits and vegetables is extensively used. Many improvements have been made to obtain dried fruits of excellent quality. Low temperature drying, freeze drying, accelerated freeze drying, foam mat drying are refinements in the techniques of dehydration.

iv) By Irradiation :-

Preservation of fruits and vegetables by application of U.V. and ionizing radiation is of recent origin. The cheap source of irradiation have become easily available because of atomic energy installations in some parts of the world. Even though the result appears to be promising, it will take quite some time before it would be guaranteed as completely harmless and free from any health hazard.

b) Chemical Methods :-

i) Use of Chemical Additives :-

Chemical additives are permitted as harmless within limits is fairly widespread in the case of variety of squashes, cordials and other beverages. Vinegar or Lactic acid is used in pickled vegetables, meat, fish.

ii) Salting and Brining :-

Salting and brining of vegetables such as cucumber, cabbage, bamboo shoots etc. and of unripe fruits such as mango, lime, lemon etc. is very common in many parts of the world. Indian pickles are well known in the world.

iii) By Addition of Sugar :-

Preservation by addition of sugar and application of heat is highly important method in case of fruits which are utilised in a very large quantity to make jams, jellies, marmalades and preserves. This method is simple, cheap, easy to adopt and hence its universal popularity.

iv) By Addition of

Chemical Preservatives :-

It refers to using water soluble salts of sulphur dioxide, benzoic acid, sorbic acid and a few like hydrogen peroxide etc. which are permitted as harmless in foods. By means of substances of bacterial origin such as tylocin, rasin etc. which are permitted to limited extent in some cases are harmless additives.

c) By Fermentation :-

Preservation by fermentation is very ancient and well known method. Yeast fermented fruit wines, which contain ethol, alcohol as a natural preservative have been prepared and used for hundreds of years. Such alcoholic liquids undergo further acetic acid fermentation into vinegar which is acidulant and is widely employed in pickling. Other well known fruit wines besides grape wine are apple cider berry wines etc.

d) Other Methods :-

It includes judicious combinations of one or more of the methods mentioned above for synergistic preservation.

Although all main classes of preservation have been employed in varying extents in case of a variety of fruits and vegetables, some of them are of particular significance now in a view of their economic importance. They are efficient, comparatively simple in operation, have universal application and as such have attained commercial importance.

6) Some important products

prepared from different fruits :-

Fruit products are refreshing, pleasing, nutritive, fine in taste and nice in appearance. As mentioned in Chart-I, various glasses of processed liquid and solid products are placed in the market. The following are the important agro-based horticulture products processed, preserved and placed in the market for consumption.

C H A R T - I

FRUIT PRODUCTS

Solids/Processed Food

1. James & Jelleys
2. Canned Ripe Fruits
3. Candys
4. Catch-ups
5. Pastes
6. Pickles*
7. Chipps
8. Powders
9. Fruit Preserves

Liquids or Fruit Beverages

Alcoholic or Fermented Drinks	Non-Alcoholic or Un Fermented
1. Wine	Airated or Carbonated
2. Cider	Drinks
3. Perry	Still Drinks
4. Orrange Wine	Flavoured
5. Berry Wine	Drinks
6. Champange	1. Rose
7. Muscat	2. Kewra
8. Port	3. Almond
9. Sherry	4. Khus
10. Tokay	1. Fruit Juices
	2. Squashes
	3. Cardials
	4. Syrups
	5. Barley Water
	Drinks Pre- pared from fress juices

* Pickles may be solid as well as liquid.



1. Apple Products :-

- a) Apple chetny
- b) Apple cider
- c) Apple juice
- d) Apple morabba

2. Banana Products :-

- a) Canned ripe banana.
- b) Dehydrated ripe banana.
- c) Banana chips
- d) Banana juice

3. Cashew Apple Products :-

- a) Cashew apple candy
- b) Cashew apple jam
- c) Cashew apple juice
- d) Cashew apple syrup

4. Mango Products :-¹⁵

- 1. Dried Mango Slices
- 2. Mango juice
- 3. Brined Mango "
- 4. Mango chetny
- 5. Sweet mango chetny
- 6. Mango candy
- 7. Sweet mango pickle
- 8. Mango morabba
- 9. Mango pickle in oil
- 10. Mango jelly
- 11. Green mango squash
- 12. Milange*
- 13. Mango cheese
- 14. Mango squash
- 15. Mango honey cocktail
- 16. Mango jam
- 17. Canned mango slices
- 18. Mango lether
- 19. Mango catch-up
- 20. Canned mango

* (A hot weather drink)

5. Pineapple Products :-

- a) Pineapple juice
- b) Pineapple jam
- c) Canned " slices
- d) Pineapple squash

6. Grape Fruits :-

- a) Canned grape fruits
- b) Grape wine
- c) Grape fruit juice
- d) Grape fruit squash

7. Orange :-

- a) Orange squash
- b) Orange murmlade

8. Limes and Lemons :-

- a) Lime juice cardial
- b) Lime and lemon barley water
- c) Lime and lemon squash
- d) Lime and lemon pickle
- e) Lime and green chilly pickle

9. Guava Products :-

- a) Canned guava
- b) Guava jelly
- c) Guava cheese or toffee

10. Jackfruit Products :-

- a) Canned Jackfruit pieces
- b) Jackfruit jelly
- c) Jackfruit nector/papads
- d) Jackfruit pickles

11. Sapota Products :-

- a) Sapota jam
- b) Sapota squash

12. Papaya Products :-

- a) Canned papaya slices
- b) Papaya chetny

13. Tomato Products :-

- a) Tomato juice
- b) Tomato jam
- c) Canned tomatoes
- d) Tomato cocktail
- e) Tomato catch-up
- f) Tomato soup
- g) Tomato chetny
- h) Tomato paste

14. Litchi Products :-

- a) Canned litchi fruits
- b) Litchi squash

15. Loquat Products :-

- a) Canned loquat
- b) Loquat jelly
- c) Loquat jam

d) Fruit By-Products :-

The production of waste product cannot be avoided while canning fruits and the preparation of jams, jellies, squashes, juices, dried fruits etc. These products are wasted if not utilised properly,

hence it proves to be a matter of great importance for a man engaged in this industry in order to reduce the cost of production of main products. The following products can be prepared from waste materials of different fruits while preparing fancy products.¹⁶

1. Apple :-

The pomace obtained after extraction can be used for preparing pectin.

2. Citrus Fruits :-

Peels are most important waste materials. Peels can be used for candying. Extraction of essential oil, citric acid, can also be prepared. Orange recidue can be used for vinegar preparations.

3. Grapes :-

The stem of grapes left after preparation of juice and wines is used for preparing cream of tartar. Oil can also be extracted from the seeds. oil cake can be used for cattlefeed.

4. Guava :-

Guava cheese is an important by-product prepared out of guava waste. It is prepared from pulp left after extracting the juice while jelly making.

5. Jackfruit :-

The thick rind and the inner perigons yield a high class jelly. Pectin can also be extracted from it. Seeds can be taken after roasting and they can also be grounded into flour.

6. Passion fruit :-

Pectin can be prepared from the rind and oil from the seeds.

7. Mango :-

Peels can be fermented into vinegar. Kernels taken out from stones can be dried and powdered and used in the place of flour, chocolates and cattlefeed.

8. Pear :-

Peels and cores can be dried and used as an animal feed or can be fermented into perry or vinegar.

9. Apricot :-

Kernels of white apricot are sweet and can be added to the jam after removing seed coat. It improves the colour and appearance. Oil can also be extracted from the kernels after refining. It is just like almond oil, which can be used in pharmaceutical and cosmetic preparations. The oil cake is very rich in protein and can be used as cattlefeed.

10. Peach :-

Same as for apricot above.

11. Pineapple :-

Refined juice extracted from shells, trimmings and other waste materials, can be used while canning pineapples. Citric acid also can be prepared out of this juice. Alcohol also can be prepared by fermenting it. The cores can be used for preparing candy or taken out juice. Press cake after taking out juice is used as cattlefeed.

12. Tomato :-

The seeds can be used for extracting an edible oil. The trimmings can be used for preparing juice or sauce.

e) Marketing :-

Meaning :-

In the broadest sense marketing is the creation and delivery of standard of living to the society and a total system of interacting the business activities designed to plan price, promote, distribute want satisfying products and services to present and potential consumers.

Definition :-

"Marketing is the performance of business activities that direct the flow of goods and services from producer to the consumer or end user."¹⁷

Marketing Process :-

It covers three main activities. Concentration, dispersion and equalisation.

Marketing Functions :-

a) Functions of Exchange :-

It includes buying and assembling and selling.

Selling involves demand creation, product planning and development, finding of buyers, negotiations of terms of sale such as price, quantity, quality etc.

and sale contract leading to a transfer of title and possession of goods.

Buying is the second function of equation of exchange. It requires planning of purchases. Intelligent search for probable sellers, selection of goods to be sold, assembling of goods in right quantity and quality at the right place and time and at the right price. Assembling implies concentrating or bringing together of goods of similar type.

b) Functions of Physical Supply :-

It includes transportation and storage. Transportation is the physical means by which goods are moved from place of availability to place of requirement. Land, water, air transport are contributing to the development of marketing.

Storage implies holding the stock of goods. Seasonal goods are stored. Storage is necessary to ensure regular supply. It helps to achieve stability.

c) Facilitating Functions :-

1. Standardization and Grading :-

This function involves determination of quality limits and division of lots into distinct groups according to pre-determined quality. It has special

significance in agriculture marketing. It enhances marketing efficiency.

2. Financing :-

This involves the use of money and credit needed by the men engaged in the marketing activity. Finance is the life blood of business. This function covers estimating the requirements and planning the procurement of finance.

3. Risk Bearing :-

Risk implies possibility of loss. Marketing activities involved several risks. Risk due to changes in the market conditions, quality deterioration, damage during transit, natural calamity etc, must be assumed by the men engaged in distribution.

4. Market Research :-

Market research is gathering, recording, analysing of all facts about problems relating to the transfer and sale of goods and services from producer to the consumer.¹⁸

5. Market Information :-

It has assumed unique importance in our business. It covers market intelligence. Spreading of market information among buyers and sellers. Producers

are interested in getting up-to-date information on changing positions of supply, demand and prices ruling in the markets. It helps to reduce the risk of losses where decision making process would be an efficient one.

2-Way flow of information is very much useful for orderly marketing.

6. Branding :-

It implies use of the name, term or symbol or combination of these to identify the product of a seller or manufacturer and to distinguish from those of competitors.

7. Packing and Packaging

It means wrapping and crating of goods before they are transported or stored. It is the function of preparing a suitable container for a product to ensure protection and make it convenient and attractive and ease in handling.

8. Salesmanship and advertising :-

Salesmanship is the art of selling the goods and services with a profit to the seller and benefit to the buyer. Advertising is a technique of making a mass appeal to create, maintain, and expand demand for goods.

Marketing Mix :-

In modern times marketing functions are integrated with other functions of management. It is based on consumer orientation in policies and operations and the goal of organization should be profitable sales.

Planning in marketing starts with customer as well as finish with customer in terms of ensuring satisfaction from the use of products or service purchased.

Marketing mix offers an optimum combination of all marketing ingredients so that we can have realisation of company goals such as profit, return on investment, sales volume, market share and so on. It is a profitable formula of our marketing operations.¹⁹ The basic marketing mix is the blending of four inputs.

- a) Product mix b) Price mix
- c) Distribution mix d) Promotion mix

Product mix covers product range, service after sale, brand and package. Price mix includes pricing, discounts, allowances and terms of credit and deals with price competition. Distribution mix involves choice of the channel of distribution, transportation, warehousing, inventory control and material handling. Promotion mix covers advertising, personal selling, sales promotion, public relation, exhibitions and demonstrations used in promoting sales.

10. Ibid.
11. Giridharlal, G.S. Siddappa, G.L. Tendon., "Preservation of Fruits and Vegetables"., I.Q.A.R., 1986. P-83.
12. Ibid. P-93-94, 100.
13. Ibid. P-170.
14. Ibid. P-320-328.
15. R.P. Shrivatsava., "Preservation of Fruits and Vegetable Products in India"., I.C.A.R., 1962. P-47.
16. Ibid. PP. 53-103.
17. Cundiff F.W. and Still R.L., "Basic Marketing" McGraw., 1972. P. 503.
18. C.B. Memoria and Satish Memoria., "Principles and Practice of Marketing.", Kitab Mahal., 1989. P.9-10.
19. S.A. Sharlekar., "Marketing Management"., Himalaya Publishing House., 1986. P.34-35.



References -

1. U.K.Shrivatsava., "Agro Processing Industries"., Indian Journal of Agricultural Economics., Vol.44, No.3, July-September'1989.
2. Ibid.
3. Jules,Janick., "Horticulture Science"., Surjeet Publication., 1982. - P.1-5.
4. Ibid. P-4.
5. Edmod,Senn,Andrews., "Fundamentals of Horticulture"., McGraw Hill, 1977. P-534.
6. Ibid. P-537.
7. Ibid. P-538.
8. Giridharlal,G.S.siddappa,G.L.Tendon., "Preservation of Fruits and Vegetables"., I.C.A.R. Publication., 1986. P.1-8.
9. Industrial Researcher., "Fruits and Vegetable Processing Industry in India"., Quarterly Journal of Research on Industry., Vol.XVI.,No.3.,Oct.-89.