

CHAPTER - IV

**PRODUCTION/
PRODUCTIVITY & EFFICIENCY**

C H A P T E R - I V

PRODUCTION

In this chapter - I would like to clarify the concepts of production and productivity (efficiency) in detail and the effects and impact of absenteeism on production and efficiency by giving various informative tables.

To study the impact of absenteeism on efficiency, I considered the concept of productivity, because productivity is the form of efficiency.

In my research study I have taken productivity concept as efficiency of workers. Productivity can be measured but efficiency can not. Therefore for study purpose I have taken into consideration the concept of productivity as efficiency and shown the impact of absenteeism on the productivity through different tables.

DEFINITION :

Production is the process concerned with the conversion of inputs (raw materials, machinery, information, manpower and other factors of production) into output (Semi-finished and finished products & services) with the help of certain processes (Planning, scheduling, controlling etc.)

In our everyday speech many times we say that this factory

produces machines and that some other factory produces cloth. Both machines and cloth are goods or things that satisfy human wants. In other words these things are useful to human beings. The word "production" used in this sense has the same meaning as the term "production" in the science of Economics denotes.

Production, in Economics, means producing things or goods that can satisfy some human wants, food and drinks satisfy hunger and thirst. Books satisfy man's thirst for knowledge. It is thus that goods satisfy human wants and this capacity of goods or thing is termed as 'utility'.

In brief production means the creation of goods and services in the process.

FACTORS OF PRODUCTION :

For the act of producing utilities, the aid of certain factors or agents is required. These agents or factors are termed as factors or agents of production.

The factors of production may be in the shape of material goods or services and help in the production utilities. Anything which contributes towards output is a factor of production. Below given are the factors of production.

1. LAND :

The first factor is 'land'. Here the term 'land' is used in a wider sense. It stands for all natural resources which yield an income or which have exchange value. It represents those natural

resources which are useful and scarce actually or potentially wood which the forest yields or the coal taken out of the mines can be considered as 'land'.

2. LABOUR :

Labour as a factor of production means physical and mental work undertaken with a view to some goods other than pleasure derived directly from the work. Labour involves mental and physical work of routine type.

3. ORGANISATION AND ENTERPRISE :

'Organisation' stands for work which involves making decisions and giving orders. The proprietor of any industry has also to take the risks and bear risk or loss.

In my research work study the labour factor of production is considered. The labourers absentee and the effect of that on the quantity of production. If the labour absentee is more there is reduction in the quantity of production. Some time the absentee is more, but there is no reduction in the quantity of production, because of certain motivational, atmospheric factors, there is increase in the quantity of production. But usually due to absentee there is decrease in quantity of production.

4. CAPITAL :

The term 'capital' is used to describe all the instruments of production which are deliberately made by man to be used to carry on production in future. The chief types of capital assets are

machines, factories, railways, vehicles and the like. The shed that the producer from the above example built and all the instruments used for making future can be called as capital.

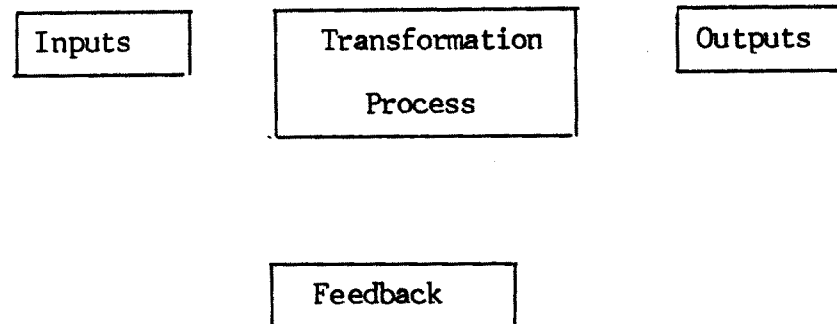
Goods are produced for sale. That means production is always for a market. A man may produce a thing for his personal use. An engineer has to devise a technique that will produce goods at a reasonable cost at which they can be sold in the market. If the goods cannot be sold in the market, all efforts that have gone into their production are nothing but a waste.

CONCEPT OF PRODUCTION :

Production is the process concerned with the conversion of inputs into output.

It is the responsibility of the production manager to see to it that this conversion of inputs into output takes place in such a manner that it adds to the 'value' or 'utility' of goods & services. The difference between the value of inputs and the value of output represents the value created through production activities. In order to maximise the value, the production manager should either assemble inputs at cheaper rates or utilise them in the most effective and efficient manner. It is mostly the second alternative utilising inputs effectively to which the production manager is expected to pay the most attention because the former one is almost dictated by the market. The same he does by scheduling jobs on machines, assigning men to different jobs, control of quality in

production, improving methods of doing jobs and materials handling within the company while producing goods and service. It is only after undertaking these activities that the creation of value can take place and the ultimate objective of the organisation can be conveniently achieved.



PRODUCTION SYSTEM :

To understand properly the Economics of production; the concept of 'production system' is pertinent to be understood. Simply stated, the framework within which the creation of utility can occur is termed as "production system". Obviously at one end of the system are the inputs and at the other outputs, connecting both the ends are certain operations, processes or activities imparting value to the inputs.

BASIC TYPES OF PRODUCTION SYSTEMS :

Production systems vary with different industries & companies, At the outset, it may be clarified that there are so many differences in products and in how they are made that we can not

talk about them all individually, so we have to consider classes or groups of manufacturing situation. Most manufacturing processes fall reasonably well into two groups.

- A) Mass production companies, (those in "continuous" production)
- B) Companies in job lot work, (those in "intermittent" production)

The first group makes big volumes of a limited variety of products, while the second group makes a wide variety of products, each in limited quantities usually. A brief description of the distinct characteristics of these basic types of production system is in point.

1. CONTINUOUS PRODUCTION SYSTEM :

It is one which is applicable to continuous process industries. Industries which convert raw materials into finished products by putting them through a series of successive connected operations are called continuous process industries. Examples of such industries would be petroleum refineries, chemical plants, and mass production industries like those producing automobiles, home appliances etc.

Characteristics :

- i) Large volume and small variety of production.
- ii) Production lines are use machines required for successive operations on the product are placed side by side.
- iii) Machine capacities are balanced if one operation takes longer than the others it will be a bottleneck if their production

capacities are not properly synchronised.

- iv) Special purpose machines are used they are designed and built to do one specific operation. For example a drill press that would drill all the holes at one time.
- v) Fixed path materials handling equipment are used. It is so because continuous proudction system is based on one or few standardised products which are manufactured with a pre-determined sequence of operations. Fixed path equipment includes conveyors, rails etc.
- vi) Machine operators are not very highly skilled and fever operators are needed for a given volume of output. It is so because most machines used in continuous manufacture are almost fully automatic. Once the operator puts the materials in the machine, it will charge the materials form in the intended way.
- vii) Few job instructions are necessary.
- viii) Raw materials' stocks are low because they are used at a steady rate and in large quantities. The in process inventories are also low.
- ix) Little storage space is required.

It is clear from the above charateristics that continuous proudction system makes full use of mechanisation and automation development. As such this production system is best suited to automated plants and where standardised products are to be

manufactured.

The best thing about continuous production is its low unit cost when there is large volume and nearly complete standardisation. However in such as system work stoppages are serious, change in the rate of outputs is rather impossible, line of production activity is very difficult to change and requires massive investment of financial resources.

2. INTERMITTENT PRODUCTION SYSTEM :

When continuous manufacture is not possible either for large or small quantities of product, intermittent production system is employed. In this type of manufacture the product is processed in lots rather than on a continuous flow basis.

3. JOB LOT MANUFACTURE :

Some writers take job lot manufacture as a different type of production system. This is not so job lot manufacture, as a matter of fact, is part of the intermittent production system. Now the question is what is job lot manufacture ? Intermittent manufacture is often referred to as job lot production when manufacturing takes place to a customer's purchase order or specification job lot production is characteristic of concerns manufacturing large or expensive machines or equipment or products. For example furniture factory, printing press, machine tools factory, electrical goods manufacturing plants etc.

Characteristics :

- i) Large variety of products are made in small quantities.
- ii) Similiar equipment is grouped.
- iii) Work loads are unbalanced some departments working overtime while others are on short hours, or within a department one may find some machines working overtime, while others are on short hours or are idle.
- iv) General purpose machines are used, like sharpeners, grinders, drills etc.
- v) Variable path materials handling equipments are used, such as carts, lift trucks, crane etc.
- vi) Machine operators are highly skilled.
- vii) Raw materials inventories and in process inventories are high.
The use of any particular raw material is somewhat irregular, so one has to keep a relatively large stock of raw materials.
- viii) Ample storage space is needed.

The intermittent production system lends itself to those activities. when production is done according to the specific orders of the customers, in small or large quantity.

PRODUCTION PLANNING :

Production planning is defined as the technique of forecasting or picturing ahead every step in a long series of

separate operations, each step to be taken in the right place of the right degree and at the right time, and each operation to be done at maximum efficiency. Production planning is an essential pre requisite to production control.

OBJECTIVES :

The main objectives of production planning are :

- i) To determine from sales forecasts & engineering information the kind of materials, machines, tools, buildings, methods and labour necessary in the proper quantities and qualities when and as required to produce the desired goods in the most economical way.
- ii) To make all operations necessary for manufacturing to reach the production goals established in the production budget and master schedule and by the fluctuating demands of the customers.
- iii) Planning of the supply of materials, parts and components so that they are brought together, at the right time and in the right work location.
- iv) Making the most economical use of plant and equipment by smoothing out production process and scheduling to the best machine utilisation.
- v) Arrangement for the best use of labour in fulfilling the promises as per the sales order book.
- vi) Supply of up to date statements of the progress of all

orders through the factory.

vii) To plan for the provision of adequate stock of finished goods according to marketing needs.

viii) Provision of an information service for controlling the distribution of products.

PRODUCTION CONTROL :

Production planning and control is one of the most important phases of production management. In manufacturing organisation, it is essential that production is carried on in the best manners at the lowest cost and the goods are of right quality and are produced at the proper time. This can be ensured only through proper planning of production.

But mere planning of production will not solve the problem because production plans are not capable of self actuating and do not lead to automatic accomplishment. For that the production manager has to take certain steps like, he has to regulate work assignment, review the work progress and devise methods to bring conformity between the actual performance and planned performance, So that plans chalked out as adhered to and the standards set at the planning stage are properly attained and improved. This is the function of "Production Control" Production control, therefore is a directive function which involves the co-ordination and integration of operations and activities of different factors of production with a view to optimising efficiency.

Objectives :

- i) Issuing the necessary orders to the proper personnel through prescribed channels for effecting the plan.
- ii) To insure availability of the means of carrying out the orders the materials, machines, tools, equipment and manpower in the required quantity of the required quality and at the planned time.
- iii) To ensure the carrying out of the orders by the personnel so that goods are produced in the required quantities of the specified quality of the predetermined time.

PROCEDURE IN PRODUCTION CONTROL :

Following factors are involved in the practice of production control.

- i) Control of Activities.
- ii) Control of Material Movement

The time at which material is received from the supplier and issued to the plants is observed and a close watch is kept on its movement from one plant to another to ensure that this movement is in accordance with the production plans.

- iii) Availability of Tools is controlled.

This involves steps taken to ensure that tools specified in the production plan are available as and when required.

- iv) Control of Due Dates :

Effects of delays in or stoppages of work on machine loading are observed, so that work assigned to each machine is completed in time.

v) Quantity produced is controlled :

Work in process at predetermined stages of production is observed to determine that right quantity of specified that right quantity of specified quality work is processed.

vi) Control of Replacement :

Quantity of raw material and work in process which fails to pass each stage of inspection is observed provision is made to issue replacement orders for each material or work.

vii) Labour Efficiency Control :

Time taken on each unit of work in process is observed and recorded. Comparison of time taken is made with the time allowed in scheduling . Also comparison is made between total manhours consumed and that allowed in the plan for any specified period.

viii) Control of the progress on the orders made :

Completed work is marked off on the production schedule and on the copy of the combined manufacturing order of the production department as well as the route sheet.

Requirements for production control :

Factors needed to make production control successful are summarised below.

I) Reliable information about requirements & productive capacities :

- a) Complete knowledge of products to be produced.
- b) Detail information about the number and types of each machine and processing unit together with the complete tabulated data on power, speeds and feeds of all machines.
- c) Information in detail about the time and sequence of operations for each part of the final product and for the finished product as a whole.
- d) Accurate information regarding total material requirements , materials in stores, the quantities used per unit of production.
- e) All the information regarding the manufacturing operations for each part, the special tools such as jigs, and fixtures needed for each part and their availability.
- f) Information in detail about the labour force in the plant and their productive capacities.
- g) Complete information on time taken and costs incurred on previous performances.
- h) Records of best performance on similar work with best combinations of tools, feeds and speeds.
- i) Exact knowledge of the progress of the work in process.

II) The following should conform to Scientifically determined standards :

- a) Fabricated and purchase materials.
- b) Tools and equipment to the extent possible.
- c) Operations on all parts, depending on the designs and the procedure of these operations.
- d) Production standards for labour force.
- e) Requirements of quality with provision for adequate inspection to make sure that quality is maintained.
- f) Reports on production performance in comparison with the schedules production.

III) THE BEST ORGANISATION STRUCTURE AND SET UP :

- a) Support from the top management with recognition of the need for production planning followed by delegation of their authority with fixed responsibility.
- b) Full understanding on the part of the supervisory staff that the determination of their work schedule from the central planning room is just extension of the functional principles and in no way amounts to erosion of their prestige or power.

IV) SUITABLE PERSONNEL SHOULD BE AVAILABLE :

- a) Personnel should understand the schedule operations.
- b) They should have full training to fit into the requirements of the particular system adopted.

- c) They should possess the planning, clerical and operational capacities and requisite aptitude and interest in the work to be done.
- d) They should be properly remunerated to enlist their interests. Method of incentives should be scientifically determined.

ADVANTAGES OF PRODUCTION PLANNING AND CONTROL :

A good production planning and control system means greater production on the same investment without unduly speeding up workers.

The advantages of production planning and control are listed below.

1) Better Service to customers :

Promised delivery dates are kept, production flows as per scheduled time.

2) Less overtime work :

As flow of production is evened out matched with the promised delivery dates or expected demand periods, there will be few rush orders. Therefore less overtime work will be needed as compared to other firms in the same industry without adequate production planning and control system.

3) Need of smaller inventories of work in process and finished goods :

Enterprise working under an effective production planning and

control system require lower inventories of material, parts, components etc. for work in process and less of finished goods in stocks. This results in less investment in inventory.

4) More effective purchasing :

Due to better materials management leading to effective inventory control purchasing is more scientific, economical and timely.

5) More effective use of equipment :

Management is constantly kept informed on current position of all orders in process and on equipment and personnel requirements for next few weeks ahead. Therefore workers can be informed in advance of possible lay offs transferences. Also belated purchases of equipment and materials can be avoided and idleness of men and machine eliminated or minimised.

6) Less loss of time :

Because of phased flow of material workers need not wait for the material for long. Hence there will be less loss of workmen hours.

7) Savings in the cost :

A properly designed and introduced system of production planning and control frequently results in major cost savings. These savings are greater in amount than the cost involved in introduction of the planning & control system.

8) LESS WORK STOPPAGES :

Work stoppages are avoided or minimised in terms of time

duration. Therefore delays in despatch of goods to customers are very infrequent

a) Industrial harmony :

Effective production control helps in establishing harmonious industrial relations.

Steps in production planning & control :

Following may be said to be the main steps or functions of production planning and control programme.

1) Planning :

i.e. forecasting & estimating productive operations in detail.

2) Routing :

i.e. laying down the path which the work shall follow and the order in which various operations will be carried out.

3) Scheduling :

i.e. determining the starting, processing and completion time of each operation.

4) Dispatching :

i.e. issuing of necessary orders and taking all other steps to ensure that time targets set in the schedules will be achieved.

5) Follow up :

i.e. checking on the progress of work, and taking corrective steps to bring conformity between actual performance and planned performance.

Relationship of production with other functions of Business :

1) Production in relation to marketing function :

At every stage, right from conceiving the product idea down to aftersale service, production and marketing departments have to work in unison. Several decisions in marketing and production have common premises and inputs, product designs, sizes and quality ranges have to be determined keeping in view the preferences of the various customer groups as studied by the marketing people. Decision on introduction of new products, improvement of existing products and elimination of slow moving and absolute products have to be taken in consultation with the manufacturing department. There are several areas in which both the departments can co-operate and integrate their activities.

2) Production in relation to finance and accounting function :

Production function is closely interlinked with finance and accounting function. Long range and short range financial planning has to take into consideration production costs which are a sizeable component of total costs of products. In evaluation of production performance, aspects at cost minimisation get the attention of finance manager. Any proposal for capital expenditure for acquisition and replacement of assets balancing equipment etc. emanating from production department should be cleared by the finance department.

3) Production in relation to personnel function :

The personnel manager in a manufacturing organisation helps the production department in several matters such as manpower planning, recruitment and selection, training, design of wage incentive systems, discipline and grievance settlement process, welfare and safety programmes and relation with labour unions. Apart from those aspects, personnel manager also assists the production department in motivating employees and workers.

4) Production in relation to office function :

Like other functions, production stands in interdependent and interactional position with office function. The production function can not be satisfactorily performed if an efficient office does not exist in the organisation. It is the office that will inform the production department, through relevant records about the time schedule of production, the quantities of production and the quality specifications of production. It is the office that makes arrangements for the procurement of raw materials and other production inputs at reasonable rates. It is from the office that raw materials and other supplies are issued to the production department, on requisition.

5) Production in relation to R. and D. Function :

In a large sized manufacturing organisation there is an organic link between the production department and R & D unit. R & D is a melting pot of ideas with regard to products, processes and

technique employed in production. It feeds the production department with new, improved and innovative product ideas and production methods. All technical aspects, specifications, and designs of products are generally cleared in R & D unit. Likewise R & D unit has to depend on production department for understanding the environmental setting in which production people work, availability and acquisition of plant and equipment, skills, of personnel and so on.

PRODUCTION MANAGEMENT :

Meaning :

Production is creation of goods & services. Major emphasis is on the creation of goods. Production mostly involves manufacturing, forming, finishing or assembling. Manufacturing production is the systematic, step-by-step conversion of raw materials through creation of firm utility in goods. It is done in factories, the work centres of manufacturing processes, more broadly speaking, the production system.

Producing goods is an intricate and complex process. Goods on the shelves ready to sell do not just happen. They are the end result of much careful thought and planning. It is the focusing of knowledge and facts on their manufacture, involving the proper use of men, materials and machinery.

The job of production management is to weave together these factors (men, material and machines) for the sole purpose of

economical delivery of an industrial enterprise goes a long way in generating profitable operations.

The production management is concerned with the production process that, is with all the decisions, activities, restraints, controls and plans which, as Harding puts it, "enable the process to convert these inputs into outputs". The inputs refer to all the efforts put in and the outputs to the products produced.

In this process production management is dependent on many other series of activities, products and the process by which goods and services are created.

Production management deals with decision making related to production processes, so that the resulting goods or services are produced according to the specifications, in the quantities and by the schedules demanded and at the minimum costs. In the words of Buffa, "in accomplishing these objectives, production management is associated with two broad areas of activity, the design and control of product system".

Thus in broader sense production management is concerned with co-ordination of materials, men, methods, machine and money in manufacturing good. In a narrow sense it means planning, scheduling and controlling the flow of materials through a plant.

The problems of production Management :

It has been said earlier that production management has to take two major types of decision one relating to the design of the production system and second, relating to the operation and control of the system.

Decision regarding the design has to attend to the following problems

- 1) Selection of product design.
- 2) Selection of equipment and process.

There are alternative equipments and processes available.

Production management has to decide which of them to employ.

- 3) Production design and parts to be processed, production costs vary much with the designs of parts, products, forms (for paper work) used in the process of production.
- 4) Location of the plant.
- 5) Plant layout.

These are the decisions of long run importance. Decision relating to the operation and control are of short run importance and has to meet the following problems :

- i) Inventory and production control.
- ii) Quality control.
- iii) Labour control.
- iv) Cost control and improvement.

PRODUCTIVITY AND EFFICIENCY

The rate of economic growth is reflected in the increase of output of goods and services of a nation over a given period. In the process of economic growth production and productivity are two significant elements. The link between productivity and economic growth is almost self evident. A net addition to the total national product and acceleration of economic growth will obviously result, if the same production factors are employed efficiently. In other words, increase in productivity in an industry is an essential factor for stepping up of the rate of economic growth.

Productivity drive has a great role to play in increasing the production per unit of in put and there by augmenting national income. A growing economy must achieve a surplus in production over consumption. To increase total production would not normally be difficult if this was to be done at any cost. The problem is really of increasing the output consistently with less than proportionate increase in the costs of production. In other words mere increase in production is not satisfactory criterion for measuring economic growth. Increase in production must be accompanied by a reduction in the cost of production of every additional unit. This means securing higher productivity. Hence, productivity drive is essential in economic planning of underdeveloped countries which suffer from inadequacy of capital, raw material and skilled manpower.

DEFINITION :

"Productivity' is a word which we use broadly to express the over all efficiency with which our industries perform". Ewan Claugue.

Over all efficiency embraces all the factors of production and measuring all the dissimilar factors of production in one group is impracticable.

*Russel W fenske defines the term "Productivity" in five ways.

- i) Productivity is a form of efficiency.
- ii) Productivity is the utilisation of resources or effectiveness of utilisation of resources.
- iii) Productivity is a ratio (rather than a phenomenon)
- iv) Productivity is a measure of some kind (rather than a variable requiring measurement).
- v) Productivity is a rate of return (primarily in monetary terms).

" Productivity is a physical ratio it relates to the quality of goods produced or services given in comparison with the quantity of resources consumed". J.M.S. Risk.

The variety of resources consumed, namely, human effort, use of machinery and rawmaterial etc. when converted into money terms.

According to the International Labour Office" the ratio between output and one of the factors of inputs is generally known as productivity of the factor considered".

Thus productivity means the ratio between output and any of the factors of production-land, labour, capital and organisation.

The International Labour Organisation opined that in as much as the interest most often centred round the relationship of production and labour the word 'Productivity' always referred to output in relation to labour.

" The ration of output to the corresponding input of labour".

Though there is a difficulty in arriving at the mon ugency of data concerning labour due to difference in skills, energy, training, environment incentives and rates of pay etc. this ratio of output to labour is universally acknowledged to have some uniformity subject to those limitations mentioned and probable adjustments in actual working out of the productivity in quantitave terms.

Measurement of productivity :

Productivity is generally expressed as the ratio between output and input, symbolically it may be expressed as follows.

$$\text{Productivity} = \frac{\text{Net output}}{\text{Effort input}}$$

If productivity is to be calculated as a ratio between output and labour. Symbolically it may be expressed as :

$$\text{Labour productivity} = \frac{\text{Net output}}{\text{Number of workers or number of man-hours.}}$$

If productivity is to be calculated as a ratio between output and capital, symbolically it may be expressed as :

$$\text{Capital productivity} = \frac{\text{Net output}}{\text{Net capital employed.}}$$

Usually labour is selected as the unit of input factor for various reasons in calculating productivity in any country labour force is one of the most important resources, when output perworker is increasing, the country's economy would show improvements in national income (production). Further, all other factors of production are subject to laws of mechanics, i.e. their output increases in a more or less fixed production to their input.

Thus, in various countries, including India, productivity is measured as a ration between output and labour.

In my research study I have adopted the below given equation for the purpose of calculation of total productivity of the labours. i.e.

$$\text{Labour productivity} = \frac{\text{Net output}}{\text{Number of manhours}}$$

Some Problems of Productivity Measurement :

There are certain limitations in the measurement of industrial productivity.

- 1) It is not possible to measure productivity of service industries like banking, insurance etc, as the output cannot be directly measurable in terms of physical units.

- 2) If the finished products are homogeneous in nature, measurement of productivity is easier. But it is somewhat difficult to compute productivity of certain industries producing heterogeneous goods like chemicals, engineering, electric and glass industries.
- 3) The difficulty involved in measurement of output is of a technical character.
- 4) It is not possible to take into account many invisible and intangible outputs or associated services which may have no bearing on current production while measuring productivity as in the case of maintenance of scientific and industrial research laboratories, market research bureaus, etc.
- 5) Though labour productivity is the most important in measuring industrial productivity it lacks certain measure of precision & clarity. The question arises whether the labour productivity should be worked out on the basis of man hours worked or the total number of workers employed. The use of both these concepts of labour suffer from some defects. The man-hours concept does not take into account the qualitative difference in the character and composition of labour. If we take the number of workers employed for the purpose, it is difficult to fix any specific weights for all the categories of labour.
- 6) The compilation of international comparison is highly complicated and a very difficult task. They are subject to

more details of limitations and qualifying conditions under which they are complied. The difficulty in selecting a suitable yardstick for measuring productivity is the cause for such a situation.

Scope and Significance :

Since productivity indicated the magnitude of change in the economic activity, its scope encompasses all the facets of economic welfare. From cost centres to countries, productivity reflects the rate of energy of production. The macro-economic aspect of average productivity implies international indicators of productivity for comparison and remedial action at appropriate levels, and the micro economic aspect of productivity premeates consideration of various industries in a country including inter-industrial, inter-regional, inter-departmental etc.

During recent years much reliance has been put on productivity studies as objective and scientific indicators of the change in the economic & industrial organisation of the country. At the national level productivity indices have been used as objective & scientific measures for forecasting the trends in the major sectors of the country's economy and in the appraisal of economic conditions and prospects. They have been characterised as barometers of "benchmarks" of the country's economic and industrial advancement, and have been extensively used both by economic historians and analytical statisticians for the inductive and historical study of

such abstractions like economic development, growth and progress. On the national level, productivity indices are also used for estimating the measurement of protection to be granted to an industry or product against internal or external competition, the formulation of appropriate taxation and fiscal policies and in the extension of social insurance and labour welfare schemes.

Productivity indices, at this level, would assist in analysing and forecasting the economic trends, in evaluating the influence of technological changes on the volume of production and employment, and in allocating the natural, financial and human resources which would maximise the national welfare. At the inter regional level, the productivity indices reveal the differences in effectiveness of production between two regions in terms of output, when similar products are produced.

Preference for alternative locations can be studied and locational policy is considerably influenced by the analytical study of inter-regional productivity indices. These indices are one of the useful tools used for economic analysis by policy makers in formulating regional policy, dispersal of industries, etc. Further productivity indices at departmental level help in evaluating the effectiveness of the various schemes of rationalisation and scientific management. They would help in finding out the overall improvement of the unit, whether the introduction of a new labour-saving device or new wage system has led to a significant increase

or decrease in the productivity of labour or other input factor. The indices also serve as guidelines for future planning of production.

Tools of Productivity :

The following are the tools of industrial productivity.

- 1) Use of scientific management technique and practice.
- 2) Work, Time and Motion studies for scientifically determining better and quicker ways of doing a job.
- 3) Developing better human relations including the modern concept of industrial relations between the employer and employee.
- 4) Provision of wage and bonus incentives, adoption of collective bargaining, management workers consultations, workers participation in management, training of workers and labour welfare schemes.
- 5) Adoption of standardisation, specialisation and simplification programmes in the methods of production.
- 6) Adoption of control techniques (including production and planning control) cost control, and quality control at each level.
- 7) Improvements in working conditions, material handling and plant layout.
- 8) Selection and training of personnel at the various levels of management.

Factors Influencing Industrial Productivity :

An increase in industrial productivity from time to time or from region to region is a result of certain factors they are as follows.

1) Technical :

Technological innovations play a vital role in affecting productivity. The application of motive power and mechanical improvements to the process of production has accelerated the pace of industrialisation to an unprecedented degree, & has given us the vision of the vast and unexplored frontiers that still lie ahead of us in the realm of applied science and technology. The most dominant factors that have contributed the spectacular advances in the industrial productivity are the application of mechanical power introduction of highly specialised and semi-automatic and automatic machines, improvements in the production process, more efficient co-ordination and integration of productive processes and the greater degree of specialisation both of work and output.

2) Quality of Labour Force :

The skill, experience, qualifications, intensity of work etc. of the worker have a dominating pull in influencing the level of industrial productivity. In times of peace as well as war, the might of a nation undoubtedly depends upon the inherent qualities of its labour force. There is a positive correlation between the standard of living of a nation and the skill that the country is

labour force an acquire. Further, wage payment, working conditions, work places, the degree of mechanisation of work and specilisation, material used in production, tools supplied, the innate ability of the worker, etc. eercise an important infludence on labour productivity which has a great impact in determining the industrial productivity.

3) Financial :

The productivity increases due to technological innovations. But it is difficult to adopt such innovations in the absence of adequate financial facilities. Where the capital is relatively abundant and the supply of labour is comparatively scarce, the movement for mechnisation would accelerate industrial productivity.

4) Size of the Industrial Unit :

Some economists have pointed out that the increase in productivity is not the measure of technical progress and hard work waged by the labour alone, but also economies of large scale when other factors like technology, labour etc. remain at the same level, large scale unit as a rule sould be more efficient than a small scale unit. This is because large sized industrial unit is at an advantageous position in obtaining the supplies of raw material at lower prices. Further the large sized unit can drive advantages of specilisation of managerial ability, in utilising plant and machinery, securing greater economies in the marketing of finished product and in utilising the by products and in raising the

required finance. Generally, large units spend substantial sums of money on scientific, technical and marketing research which lead to a greater productivity.

5) Natural :

The natural factors like physical, geographical and climatic variations exercise greater influence on the industrial productivity in any country. However, the relative importance of the aforesaid factors depends upon the nature and character of the industry, the extent of control on the physical conditions and the type of output. The geological and physical factors play a very dominant role in determining the productivity of extractive industries like coal-mining in which the physical output per head is greatly influenced by the depth of the coal mines, the thickness of the coal seams, the topography of the region and the quality of coal available. In other industries like tailoring, grain-milling, hosiery, soap making, confectionery etc. the geographical, geological and physical factors exercise little influence on productivity. Further, in the case of agricultural industries climate and geographical factors play a vital role in determining industrial productivity.

6) Managerial :

Managerial factors have come to play a very dominating role in determining the relative productivity of different industrial units, with the growing complexity of the productive system with

the growth of giant enterprises the responsibility of management have enormously increased. Under the present system of industrial production, management has to perform a wide variety of functions i.e decision making, laying down policy, organising, planning, directing controlling, staffing, co-ordinating getting goods produced and selling. Primarily manager's job is to increase productivity, which is the key to prosperity. For doing this the manager has to take decisions in different fields of management which determine the future course of action for the organisation over the short run and long run. If the manager commits any mistake while taking decisions or in discharging any one of the responsibilities, productivity of the unit would be affected.

7) Socio Economic Factors :

Generally, the influence of socio-economic factors in determining the industrial productivity is indirect. If the existing economic & social institutions are not conducive to improvements, it would be pretty difficult to anticipate substantial gains in industrial productivity, even in the presence of adequate amount of raw material and abundant supply of technical know-how. The socio-economic factors such as the role of decision making capacity of the individuals or group of individuals, property rights, consumers sovereignty, living conditions, standard of living of the people, family system, religion, willingness to save etc. may stimulate or dampen the urge for higher industrial productivity.

8) Governmental Policies :

Mostly, industrial policies and decisions will be influenced by the Government policies such as taxation, tariff, financial and administrative policies. Certain industries may be granted protection, incentives may be given to certain industries for their development in view of national interest by the Government under such circumstances, the productivity of such industrial units would adversely affect.

Wrong Notions of Productivity :

According to soloman fabricant "Productivity is a subject surrounded by considerable confusion". The workers generally appose implementation of productivity schemes in industrial units. They feel that they have to work harder if productivity schemes are implemented. They also fear that productivity methods leads to displacement of workers. There is also another misconception that the managements alone stand to gain from higher productivity or if at all any share is given to the workers, it is insignificant. All the above misconceptionsa are due to lack of proper understanding of the productivity drive on the part of the workers and to some extent the management. The workers should recognise that productivity drive ultimately leads to their prosperity. No doubt some sort of short run displacement of workers may be there. Measures should be taken by the management to see that the

displacement would not result in loss of earnings to the workers. Management also should evolve a proper scheme of sharing the benefits of productivity drive.

Productivity Movement In India :

Though the developing countries differ in many respect, for instance in regard to the size of population, its density, the nature and the character of political system, the capacity to absorb social change economic potentiality and income levels, they make for a common purpose in their determined bid to modernise the society and ensure minimum levels of livelihood to the people. The productivity movement attained significant place in the country's economic growth in the era of planning.

The Indian planners, on the eve of the first five year plan, realised that the key to solving problems of India's poverty lies in raising the levels of productivity. The significant advances in the economy are not possible without maximum economy in the utilisation of scarce resources.

Government of India invited a team of experts from International Labour Organisation to show how productivity and earnings of workers in Indian textile and engineering industries can be raised by application in selected plants of modern techniques of works study. The productivity mission had taken up work in 1952. There were two teams, one for textile industry and another for engineering industry. These teams in their findings

asserted that improvement in productivity was possible with existing staff in the industry providing adequate training and supervision and other facilities such as adequate machine maintenance procedures, flexibility of allocating duties etc were provided. Among other things the productivity mission pointed out the need to set up a National Productivity Centre in India to coordinate future field of raising productivity of Indian industries and to assist the rapid industrialisation of the country as envisaged in five year plans.

The productivity movement wave got great momentum in India after submission of Report in March 1957 by the Indian Productivity Delegation to Japan. The Delegation, under the chairmanship of Dr. Vikram A. Sarabhai, was requested to study the constitution, the organisation, the programme of work, and the mode of operation of the Japan productivity centre. The delegation visited Japan in October/November 1956 to observe the procedures adopted for increasing productivity. The Delegation specially studied large scale industries in Japan like iron and steel, engineering, chemicals and textiles.

National Productivity Council :

This established in the year 1958. It was registered under the societies Registration Act 1860. The NPC is an autonomous organisation. The membership should be limited to 60, and the number of representatives should be eleven each from employer's

associations, worker's unions and Government departments. The remaining members have to be co-opted by these representatives from amongst, technicians, scholars, consultants, consumers and local productivity councils. The president of the NPC is the minister for Industrial Development.

At its first meeting which was held in March 1958, the NPC adopted an eight point programme. This programme aims at the following.

- 1) Stimulation and promotion of productivity consciousness by dissemination of information relating to productivity.
- 2) Providing training in productivity techniques and processes for all levels of management.
- 3) Provision of specialist services, if demand emanates from the local productivity councils.
- 4) Encouraging inter plant visits which helps in exchanging views and experiences.
- 5) Undertaking extensive and intensive research in methodology of productivity.
- 6) Sponsoring visits of productivity teams to advanced countries to gather important information that helps to raise productivity.
- 7) Arranging productivity training abroad.
- 8) Inviting foreign technicians and productivity experts for guiding and assisting various sectors of Indian economy.

The year 1966 was declared as, "Indian Productivity Year" to stimulate productivity movement. Top priority was given to organise co.ordination between management, workers and Government and to solve some of the problems facing the country in industrial fields. Other organisations like chambers of commerce, professional institutions, individual enterprises,

Trade unions, universities and Government special organisations have collaborated with the programme of the India productivity year 1966 to make it a success. The importance of this productivity drive is reflected in the creation of industrial productivity council for every industry and productivity cell for every firm in the country.

India is a member in Asian productivity organisation with 13 other member countries. The year 1970 was celebrated as 'Asian productivity' year is "prosperityf through productivity". Indian has produced a film on the topic and it has gained the appreciation of the public at all levels.

In conclusion, the productivity movement in India, through attained significant momentum in the right direction, the results are too poor to be adequate to the needs of the country's industrial development. This is evidenced by the fact that the labour productivity is very low when compared to other Asian

Source : Indian Industrial Economy.

By - K.V. Sivayya. V.B.M. Das.

countries like Japan. India requires more researchers, more practical men replacing the present researchers.

Labour Efficiency :

Meaning :

Efficiency of labour mean the amount of work which a labourer can do within a given time. In other word efficiency denotes the capacity of a labourer to do more or better work in a given time. Therefore, efficiency of any factor of production greatly affects the total amount of wealth produced. However, it has to be noted that efficiency is also a relative ferm. It does not merely mean the amount of work done by a factor of production within a given unit of time, it also means a comparision of this work with its cost to the user.

Speaking in absolute terms a worker who does better or more work within a given time, than another worker is more efficient. But suppose the first worker demands very high wages the payment of which may not be profitable for the employer then in such a case, the first worker will not be so efficient from the point of view of the employer as the second worker who may demand lower wages. Hence, from the absolute point of view, when we talk of efficiency, we see the amount, nature quality of work and the time taken, and from the relative point view, we also see the rate of wages demanded by a worker.

Factors Affecting Efficiency of Labour :

Primarily, efficiency depends upon the health and strength of the worker and his training. There are various factors however, which affect the health and strength of the worker.

1) Racial Qualities :

There are certain classes in every society, the members of which are most efficient in the discharge of a particular work than those of other classes. E.G. Pathans are physically stronger than workers from U.P. or Bengal. It is not because of any difference in their educational training or opportunities but due to heredity qualities.

2) Climate :

A hot and damp climate is not favourable for the development of physical vigour and strength, while a cool and dry climate produces a wholesome influence upon a person's physique.

3) Standard of Living :

A nourishing food, good housing conditions, sufficient clothing, some comforts and luxuries, make a person healthy and more efficient. If these things are denied to a person, he can not put his heart to the work and also he cannot have sufficient strength to pull on with the work.

4) Wages :

Wages affect the standard of living as well as they produce a

psychological effect on the worker to produce more or less work. A well paid worker is generally contented and puts his heart into the job and this is specially so if wages are promptly and punctually paid.

5) Education :

Both general and technical has got direct influence on the efficiency. Education is necessary to bring out the best in man and to enable him to take an intelligent interest the things around him. A technically trained hand is also bound to be more efficient.

6) Conditions of Work :

Good lighting, ventilation, sanitation, artistic structure of the building, a calm, quiet and bright atmosphere have a great psychological effect of concentrate his mind in the work and can produce more.

7) Number of Working Hours :

Long hours, with no suitable rest pauses of leaving no time for relaxation or recreation, cannot but impair labour efficiency.

8) Effect of Family Life :

The fact that the home gives peace to a person, and he is able to recoup his energies for better work.

9) The Opportunities For Short And Long Trips :

It also widen the outlook of a person and the efficiency becomes greater.

10) Willingness to work and hopefulness and freedom enjoyed, by a

person, also affect the efficiency of a person.

11) Character Of A Worker :

Honesty, punctuality, self confidence, self respect, habit of hard work, and other moral qualities also increase the efficiency of a worker.

12) Labour Organisations :

It also improve the efficiency of the workers. If labour is properly organised into trade unions, he acquire greater confidence in himself and can put in more work.

13) WELFARE ACTIVITIES :

It also influence the efficiency by giving them their chances for recreation and amusement in order to recovery their energies.

ADVANTAGES :

It has to be noted that an efficient labour force is great blessing for a country and a powerful instrument of economic uplift and regeneration. Efficient workers do not need much supervision and do not waste material or damage machinery. They work more intelligently and show initiative and responsibility. They are able to take patriotic interest in the industry. The whole atmosphere is heartening, when co-ordial co-operation prevails all round and as result, production in a country increases greatly.

EFFICIENCY OF INDIAN WORKERS :

The Indian labour is generally regarded as much less efficient than labour in other countries. If by this we mean that

the European labourer is capable of turning out much more work than the Indian labourer in a given time, it will not possible to contradict such a statement.

It was pointed out by the Tariff Board in 1927, that the number of spindles looked after by each operative in India was only 180, in Japan it was 240, in England 540 to 600 and in the U.S.A. 1120. The number looms attended by one weaver in Japan averaged 2 1/2, in U.K. 6, in U.S.A. 9, while in India it was usually 2.

However, such statement do not reflect are innate inferiority of the Indian workers. More workers are employed in India per unit of machinery because labour is cheap and machinery is dear. In England, wages are much higher and it is, therefore, necessary to economise labour. The smaller production per head in India cannot be ascribed entirely to the inferiority of the worker. The lower productivity may be due to the inefficiency of management and to the inferior quality of raw materials and lack of upto date machines and modern techniques of production. Besides hours of work in India are longer, wages low and living conditions deplorable. Hence, in comparing the efficiency of the workers in different countries, we can not pass hasty judgement about the efficiency of Indian workers.

CAUSES WHICH MAKE INDIAN LABOUR INEFFICIENT :

1. Hot climate
2. Illiteracy
3. Low wages
4. Low standard of living
5. Lack of working conditions
6. Migratory character of the worker
7. Drinking habits
8. Indebtedness
9. Bad organisation
10. Industrial disputes
11. Lack of modern techniques.

IS INDIAN LABOUR IS REALLY INEFFICIENT ?

The inefficiency of worker is due to deplorable conditions of work. If the Indian labour is not so efficient today as that of other important countries of the world, it is not because it does not possess the capacity to become highly efficient. Out of from his family domestic surroundings, living in a dirty, highly congested chawl, working like a machine for long hours in a decent noisy smoky atmosphere & not earning enough to make both ends meet in a manner. The Indian industrial labourer can hardly be blamed if he cannot take any active interest in work. It only the factors which affect the efficiency of labour, mentioned above are brought into operation. Indian labour will improve marvellously in a very short time.

The alleged inefficiency of the Indian worker is largely a myth. Granting more or less identical conditions of work, wages, efficiency of management and of the mechanical equipment of the factory, the efficiency of Indian labour generally is no less than that of worker in most other countries. Not only this, but where mechanical equipment or efficiency of management are not factors of any importance, the skill of the Indian labourer has been demonstrated to be even superior in some cases to that of his prototypes in foreign countries.

If the preliminary training is given an individual Indian worker was as efficient as an average American worker. During the recent years also industrial efficiency of the industrial worker has tremendously improved as we find that weavers in some mills in Bombay state have already begun to mind 6 looms and the average individual output has already reached 85% of the output of the Lancashire worker, inspite of the interior working conditions. It is well known that the Indian artisans have made a name in the world for their artistic goods. No one in any part of the world has excelled or even equalled an Indian artisan in the fineness of touch and delicacy of design.

The inefficiency is due to lack of scientific management, lack of high ethical standards of business, and humid environments and poverty of the workers, which and the conditions for which the workers cannot be held responsible. Hence, if efforts continue for

raising the status of the workers and for providing them better conditions of living and work and facilities for proper training, the day will not be far when the Indian workers will be as efficient as, if not more, than the workers in other countries. Indian labour possesses a very great capacity to learn and improve provided that necessary steps are taken by those who are in a position to do so.

CAUSES OF COMPLAINTS OF INEFFICIENCY IN RECENT YEARS :

It may also be pointed out that in recent years we hear general complaints about deterioration in labour efficiency. It is said that labour has become more conscious of its rights and demands higher wages, while it has forged its duties and does not like to work. The chairman of the Tata Iron and Steel Company pointed out in its annual meeting, in 1949, that the average output of steel per employee had fallen from 24.36 tons in 1939-40 to 16.30 tons in 1948-49. He complained that in some departments the majority of the men were working at one third to one half of their capacity. The reasons for this attitude of labour the changed political conditions in the country, growing strength of the labour movement, high cost of living, wrong propaganda of some political parties, have all made the workers impatient and they want an immediate improvement in their conditions. They are also dissatisfied with the traditional methods of management and resist the enforcement of rigid discipline. The wave of rationalisation

and intensification has also created a danger of unemployment among the workers and they are afraid that the number of workers may be reduced, if some of them work harder. Therefore, they want to "share" work with their fellow workers rather than reduce employment by intensive effort. Hence, in the absence of any change in the wage structure, and without any appreciable improvement in the working and living conditional the workers are more disconcerted now than they were before.