

2. Labour Productivity:

$$\text{Labour productivity} = \frac{\text{Aggregate Number of units}}{\text{Amount of Man hours}}$$

Output can be measured in total quantity produced and labour can be measured in total man hours required to produce that output.

Output and labour can also be measured in terms of their value in money value. Thus,

$\text{Labour productivity} = \frac{\text{Total Revenue from Production}}{\text{Expenditure on Labour}}$
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Labour productivity can be increased by:

- i. Providing training to use best method of production.
- ii. Constantly motivating the workers by providing financial and non-financial incentives
- iii. Keeping high morale of the employees.
- iv. Improving working condition on the plant.

For Example: A worker was assembling 10 pieces of mobile sets per hour and the same worker, by improved methods of the work is able to produce 13 pieces of mobile sets. The productivity is improved by

$$= (13-10) \times 100 / 10 = 30 \%$$

3. Machine Productivity

$$\text{M/C Productivity} = \frac{\text{Output}}{\text{Actual machine hours utilized}}$$

Machine productivity can be improved by:

- i. Preventive maintenance;
- ii. Use of proper speed, feed, etc.
- iii. Using method study techniques(Using best method)
- iv. Use of skilled, properly trained workers.

For Example: A machine was producing only 100 pieces per working day of 8 hours. The machine tool has fitted with a better tool that permitted more depth of cut and higher cutting speed. As a result the output from the machine increased to 130 pieces in a day of 8 hours. In this case the productivity has increased by

$$\frac{(130 - 100) \times 100}{100} = 30\%$$

4. Capital Productivity

Turn Over
Capital Productivity = -----
Actual Machine Hours Utilized

Capital productivity can be improved by:

- i. Better utilization of capital resources like land, building machines etc.
- ii. Careful make or buy decision.
- iii. By using modern techniques of production, maintenance, flexible manufacturing system, proper plant layout etc.

General Measure of Productivity:

$\text{Aggregate productivity} = \frac{\text{Output}}{\text{Land} + \text{Labour} + \text{Material} + \text{Machine} + \text{Capital} + \text{Other Inputs}}$

Productivity Index

- ✎ The average productivity index of a department or of a plant would be the total standard times or standard hours produced by all employees divided by the actual hours worked multiplied by 100.
- ✎ This assumes that all of the operations are covered by time standards. Thus a performance index can be used company wide as a labour productivity index.

Total Productivity Index

$$\frac{\text{Sales} + \text{Inventory} + \text{Plant}}{\text{Labour} + \text{Material} + \text{Services} + \text{Depreciation} + \text{Investment}}$$

(3) It is found that if the standard time to assemble a band saw machine is 120 min. (2 hrs.) per unit and if an operator assemble 5 machines during the day, the output is 600 standard minutes (5X 120 = 600). If the operator works for 8 hours or 480 minutes in a day, the input be 480 minutes. The operator’s performance index would be

$$\text{Performance Index} = (600/480) \times 100 = 124\%$$

Productivity Index on Base year

It is the ratio of output produced and the resources used in the measured period, divided by the similar ratio from a base period.

$$\frac{\text{Aggregate output in the measured period}}{\text{Aggregate Input in the measured period}}$$