Law of Diminishing Returns/Law of Increasing Cost:

(Version of Classical and Neo Classical Economists):

Definition:

The *law of diminishing returns (also called the Law of Increasing Costs)* is an important law of micro economics. The law of diminishing returns states that:

"If an increasing amounts of a variable factor are applied to a fixed quantity of other factors per unit of time, the increments in total output will first increase but beyond some point, it begins to decline".

Richard A. Bilas describes the law of diminishing returns in the following words:

"If the input of one resource to other resources are held constant, total product (output) will increase but beyond some point, the resulting output increases will become smaller and smaller".

The law of diminishing return can be studied from two points of view, (i) as it applies to agriculture and (ii) as it applies in the field of industry.

(1) Operation of Law of Diminishing Returns in Agriculture:

**Traditional Point of View.** The classical economists were of the opinion that the law of diminishing returns applies only to agriculture and to some extractive industries, such as mining, fisheries urban land, etc. The law was first stated by a Scottish farmer as such. It is the practical experience of every farmer that if he wishes to raise a large quantity of food or other raw material requirements of the world from a particular piece of land, he cannot do so. He knows it fully that the producing capacity of the soil is limited and is subject to exhaustion.

As he applies more and more units of labor to a given piece of land, the total produce no doubt increases but it increases at a diminishing rate.

**For example,** if the number of labor is doubled, the total yield of his land will not be double. It will be less than double. If it becomes possible to increase the yield in the very same ratio in which the units of labor are increased, then the raw material requirements of the whole world can be met by intensive cultivation in a single flower-pot. As this is not possible, so a rational farmer increases the application of the units of labor on a piece of land up to a point which is most profitable to him. This is in brief, is the law of diminishing returns. Marshall has stated this law as such:

"As Increase in capital and labor applied to the cultivation of land causes in general a less than proportionate increase in the amount of the produce raised, unless it happens to coincide with the improvement in the act of agriculture".

**Explanation and Example:**

This law can be made more clear if we explain it with the help, of a schedule and a curve.

**Schedule:**

<table>
<thead>
<tr>
<th>Fixed Input</th>
<th>Inputs of Variable</th>
<th>Total Produce TP</th>
<th>Marginal product</th>
</tr>
</thead>
</table>

In the schedule given above, a firm first cultivates 12 acres of land (Fixed input) by applying one unit of labor and produces 50 tons of wheat. When it applies 2 units of labor, the total produce increases to 120 tons of wheat, here, the total output increased to more than double by doubling the units of labor. It is because the piece of land is under-cultivated. Had he applied two units of labor in the very beginning, the marginal return would have diminished by the application of second unit of labor.

In our schedules the rate of return is at its maximum when two units of labor are applied. When a third unit of labor is employed, the marginal return comes down to 60 tons of wheat. With the application of 4th unit, the marginal return goes down to 20 tons of wheat and when 5th unit is applied it makes no addition to the total output. The sixth unit decreased it. This tendency of marginal returns to diminish as successive units of a variable resource (labor) are added to a fixed resource (land), is called the law of diminishing returns. The above schedule can be represented graphically as follows:

**Diagram/Graph:**

![Diagram/Graph](image)

In Fig. (11.2) along OX are measured doses of labor applied to a piece of land and along OY, the marginal return. In the beginning the land was not adequately cultivated, so the additional product of the second unit increased more than of first. When 2 units of labor were applied, the total yield was the highest and so was the marginal return. When the number of workers is increased from 2 to 3 and more.
the MP begins to decrease. As fifth unit of labor was applied, the marginal return fell down to zero and then it decreased to 5 tons.

**Assumptions:**

The table and the diagram is based on the following assumptions:

(i) The time is too short for a firm to change the quantity of fixed factors.

(ii) It is assumed that labor is the only variable factor. As output increases, there occurs no change in the factor prices.

(iii) All the units of the variable factor are equally efficient.

(iv) There are no changes in the techniques of production.

(2) **Operation of the Law in the Field of Industry:**

The modern economists are of the opinion that the law of diminishing returns is not exclusively confined to agricultural sector, but it has a much wider application. They are of the view that whenever the supply of any essential factor of production cannot be increased or substituted proportionately with the other sectors, the return per unit of variable factor begins to decline. The law of diminishing returns is therefore, also called the **Law of Variable Proportions**.

In agriculture, the law of diminishing returns sets in at an early stage because one very important factor, i.e., land is a constant factor there and it cannot be increased in right proportion with other variable factors, i.e., labor and capital. In industries, the various factors of production can be co-operated, up to a certain point. So the additional return per unit of labor and capital applied goes on increasing till there takes place a dearth of necessary agents of production. From this, we conclude that the law of diminishing return arises from disproportionate or defective combination of the various agents of production. Or we can any that when increasing amounts of a variable factor are applied to fixed quantities of other factors, the output per unit of the variable factor eventually decreases.

**Mrs. John Robinson** goes deeper into the causes of diminishing returns and says that:

"If all factors of production become perfect substitute for one another, then the law of diminishing returns will not operate at any stage."

**For instance,** if sugarcane runs short of demand and some other raw material takes its place as its perfect substitute, then the elasticity of substitution between sugarcane and the other raw material will be infinite. The price of sugarcane will not rise and so the law of diminishing returns will not operate.

The law of diminishing returns, therefore, in due to Imperfect substitutability of factors of production.

The law of diminishing returns is also called as the **Law of Increasing Cost**. This is because of the fact that as one applies successive units of a variable factor to fixed factor, the marginal returns begin to diminish. With the cost of each variable factor remaining unchanged by assumptions and the marginal returns registering decline, the cost per unit in general goes on increasing. This tendency of the cost per unit to rise as successive units of a variable factor are added to a given quantity of a fixed factor is called the law of Increasing Cost.

**Importance:**
The law of diminishing returns occupies an important place in economic theory. The British classical economists particularly Malthus, and Ricardo propounded various economic theories, on its basis. Malthus, the pessimist economist, has based his famous theory of Population on this law.

The Ricardian theory of rent is also based on the law of diminishing return. The classical economists considered the law as the inexorable law of nature.