## Quadrant II – Notes

Paper Code: ECD 112

Module Name: Concept of Technological Progress

Module No: 02

The term "technological progress" is used in different forms:

- 1) The effects of changes in technology or more specifically to the role of technical change in the growth process.
- It is used to describe the character of technical improvements -"capital intensive, 'labor intensive' or 'neutral'
- It refers to changes in technology itself, defining technology as useful knowledge pertaining to the art of production.

It emphasizes on describing improvements in the design, sophistication and performance of plant and machinery and the economic activities through which improvements come about – research, invention, development and innovation.

## Classification of technological progress

The classification of technical progress as to whether it is capital saving, labour saving or neutral owe its origins to the work of Harrod (1948) and Hicks (1932).

## 1) Harrod's classification of technical progress employs the concept of capital- output ratio.

Given the rate of profit, technical change is said to be capital - saving if it lowers capital output ratio, labour - saving it is raises capital output ratio and

neutral if it leaves capital output ration unchanged.

This criterion will be an mixture of the effect of pure technical change on factors combination and the effect of the substitution of capital for labour.

Evidences suggests that in most of the advanced countries if technical progress is neutral, it must be due to substitution of capital for labour. It takes place because as countries become richer price of labour relative to capital tends to rise which only induces 'pure' substitution effect but also encourages invention towards labour saving which becomes expensive ans scarce.

The difficulty stems from the problem of defining capital.

If certain expenditures add to capital stock are excluded from measurement of capital and if these expenditures have grown faster than measured capital, the capital – output ratio will be biased.

Thus while technical progress may appear neutral in Harrod sense, it may not be the case. Investment in human capital is not considered.

## 2) Hick's classification of technical progress

Takes the concept of marginal rate of substitution between factors, which is the rate at which one factor must be substituted for another, leaving output unchanged.

The marginal rate of substitution is given by the ratio of marginal products of factors.

Holding constant the ratio of labour to capital, technical progress is said to be: capital – saving if it raises the marginal product of labour in greater proportion than the marginal product of capital, labour – saving if it raises the marginal product of capital in greater proportion than the marginal product of labour, neutral if it leaves unchanged the ratio of marginal products.