PROBLEM SET 5:

ECONOMIC APPRAISAL
        OF
NONTRADABLE PROJECTS

1. THE BACKGROUND

The growth of the textile industry of Globidia had been hampered in recent years by a severe shortage of cotton yarn. This is in spite of the production subsidy of 20 per cent of retail price offered to producers of yarn in the country. In order to rectify the situation, the Government has decided to set up a spinning mill to produce adequate yarn for distribution and sale to the weaving mills. At present, 16 million kgs. of yarn are bought and sold in the market for a price of Rz.32.00 per kg.

2. THE PROJECT

The Government plans to install a new spinning mill with a capacity to produce 6,000,000 kgs. of yarn annually. It is estimated that the total cost of investment in the project will be Rz.133,450,000; and that the entire project can be installed and commissioned in one year. The mill will go into full production from the next year onwards. The breakdown of investment costs is as follows:

	Rz.000s	Economic Life
Land	Rz.900	
Buildings	Rz.11,800	20 years
Machinery (inclusive of tax 12%)		
	Rz.120,750	15 years

It is possible to dispose of the buildings and machinery after they have been used, and the market determines the salvage value of the buildings and machinery by the formula:

Salvage Value = [(Purchase Price)*(E.L.- Number of years used)/E.L.]

where E.L. = Economic Life (This is the method for calculating straight line depreciation).

Other details of the project are as follows:

a)   A report of the Technical Committee states that 1.2 kgs. of raw cotton yield 1 kg. of yarn. Cotton growers in the area are willing to sell as much as required at a price of Rz.17.00 per kg. to the spinning mill.

b)   The labor requirements for the mill will be:

		Number of workers	Monthly salary per person (Rz.)
Head Office	Skilled	25	5,200
Factory	Skilled	85	3,500
	Unskilled	475	2,200

Real wages are expected to increase by 2.5 percent every year.

c)   Energy costs are estimated at Rz.2.10 per kg. of yarn produced.

d)   Packaging material used for yarn will be available in the market at a price of Rz.10 per kg. In addition to this price, buyers have to pay a sales tax of 10 percent. Approximately 100 gms. of packaging material are required to pack a kilogram of yarn. Presently, packaging material is produced entirely by the private sector, and the government buys 30 percent of all production. The elasticity of demand for packaging material is -0.4, and the elasticity of supply is 1.2. The quantity supplied of packaging material in the country is so large that the additional demand imposed by the project will have a negligible effect on the prevailing market price.

e)   The machinery needed to be installed carries a sales tax of 12 percent. The elasticity of demand for the machinery is estimated at -0.5 and the elasticity of supply at 1.6. However, the supply of machinery is currently so large that the project will have a negligible impact on the prevailing market prices of machinery.

f)   A recent study estimates the elasticity of demand for yarn at -0.4, and the elasticity of supply of yarn at 1.3.

g)   The financial discount rate for evaluating such projects is 10 percent, while the economic discount rate for Globidia is 12 percent. No inflation is expected in Globidia.

THE ASSIGNMENT

1.) Assume that the project has an operating life of 5 years and the assets are liquidated in year 6. Should the project be undertaken? Evaluate the project from the following two different points of view:

    a) From the Financial viewpoint of the project manager.

    b) From the Economic Point of view.

    Note: Use the average price while calculating economic benefits per kg. of yarn.

2.) We are interested in the distributional effects of the project. With this in mind, calculate the change in consumers surplus, producers surplus and value of subsidies in the yarn market from year 0 to year 1. Illustrate the changes with a diagram.

HINT 1.)

With the introduction of the new project, the price of yarn etc., will change. The post-project prices will have to be calculated in order to carry out financial and economic appraisal. To do so, the following formulae will be useful.

Change in Market (Demand) Price:

$\wedge Pd = [Qp*(Po/Qo)]/(Nd - Es)$

Change in Quantity Demanded:

$\wedge Qd = (Nd*Qo*\wedge P /Po)$

where:

Qo = Quantity before project

Po = Price before project

Qp = Quantity produced by the project

Nd = Elasticity of Demand

Es = Elasticity of Supply

$\wedge Pd$ =   Change in Market (Demand) Price

$\wedge Qd$ =   Change in Quantity Demanded

Note: Although we should use average prices and average quantities, it is adequate for purposes of this assignment to approximate the values by using initial price and quantity, i.e., Po and Qo.

HINT 2.)

Remember that Qd refers to the quantity demanded by the private sector before the project.