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ENERGY SECTOR
AND
ECONOMIC DEVELOPMENT
IN
SRI LANKA

BY
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Dedicated To
KAMALINEE,
Jayaruwan and Surandala.

ABSTRACT

ENERGY SECTOR AND ECONOMIC DEVELOPMENT IN SRI LANKA

The present study examines (a) the energy demand, supply and investment trends in the process of economic development in Sri Lanka, (b) the relationship between economic development and energy consumption and the major determinants in the energy consumption of the household sector and (c) the issue as to whether there could be an imbalance between the future demand and supply of energy in Sri Lanka and if so, how this gap could be bridged.

The author has endeavoured to analyze the energy trends with special reference to the decades of the 1970's and 80's and to obtain a vivid picture of these trends in the process of economic development. Energy-GDP relationship has been viewed from the perspectives of both consumption and production. The relationship between energy consumption and GDP has been examined through simple, multiple and simultaneous regression techniques and GDP-Energy technical relationship by using the Cobb-Douglas Production Function. Energy-Economy interactions have been explained in terms of Energy-GDP elasticities. The energy imbalance issue has been viewed through the overall energy supply-demand balance based upon energy supply-demand balances of the sources of

energy under different scenarios making use of macro-simulation as a tool. The efficient energy pricing and conservation has assumed increasing importance in meeting energy demand and supply. The efficient prices for electricity and petroleum products have been computed in terms of marginal costs and for fuelwood in terms of incremental annuitized fuelwood cost. Concerning energy conservation in the household sector, the largest consumer of energy, the improved closed wood stoves have been proved to be the most efficient at both market and shadow prices.

The analysis of energy consumption trends over the period 1970-89 in the country has revealed the existence of a consumption-oriented pattern of energy use, the decline in the energy intensity of the economy attributable to the decline in the sectoral energy intensities rather than to the structural changes in the economic sectors and the changes in the growth rates of the GDP in the same directions as those in the energy consumption. The energy supply trends have depicted the non-existence of structural changes between commercial and traditional energy in the composition of the energy supply over the period, 1970-89. However, the sources of commercial energy supply have undergone changes in its composition with the rising share of electricity accompanied by a declining share of the petroleum products over the same period. Concerning investment trends, the history of energy sector development

has been largely a case of hydro-power development with the result of installed capacity of electricity leading to an excess over the optimum electricity capacity over the period, 1983-89.

An empirical verification of the "Energy-GDP" relationship using regression models has confirmed the existence of close relationship between energy consumption and GDP and also brought out income elasticities for energy consumption greater than these obtained for energy price. Energy-GDP relationship, viewed from the standpoint of inter-factor substitution, has confirmed that GDP has been sensitive mostly to energy among the variables, capital, labour and energy. As regards the energy consumption of the household sector, the strong impact of per capita income upon electricity and kerosene consumption has been evident from the result of the Single-Equation Regression Models. Similarly, the strong impact of per capita income upon electricity consumption and the less impact of electricity price upon electricity consumption have been discernible from the results of the Simultaneous-Equation Models.

Overall Energy Supply-demand balance 1990-2000, has resulted in a progressive decline in the surpluses of indigenous energy sources with a deficit in both the hydro-electricity and the fuelwood balances under low scenario projections occurring around mid-1990's. There would be a deficit in

the overall energy balance from 1999 onwards under the low scenario projections. The implementation of efficient energy pricing policies, the conservation of energy particularly in the household sector through the dissemination of improved wood stoves and the shift to less energy intensive modes of transport in the transport sector have to be given serious consideration in meeting energy demand. This study emphasizes the need for energy conservation efforts to be reinforced by the substitution of coal for oil, the expansion of the Refinery capacity, oil exploration and decentralized power generation through non-conventional energy applications in meeting the shortages in the energy supply.

The results of this study of energy trends indicate the need to shift to a production-oriented pattern of energy consumption. The regression results have identified income as the main path through which policy impulses could be transmitted in energy management. In the light of the progressive decline in the future balances of the primary sources of energy, it is vital to utilize the secondary sources of energy and new and renewable sources of energy in addition to the adoption of demand management measures such as efficient energy pricing and end-use energy conservation.

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