TECHNOLOGICAL CHANGE AND UNDERDEVELOPMENT: A STUDY OF PUBLIC POLICY AND ORGANIZATIONAL BEHAVIOUR IN THE RUBBER INDUSTRY OF SRI LANKA

by

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ABSTRACT

This study examines the relationship between technological change and underdevelopment. Two interrelated problems are focused: identifying key determinants of the orientation of indigenous technological innovation, and assessing the consequences of technological change, including indigenous innovations, in the rubber industry of Sri Lanka in terms of socio-economic development or underdevelopment.

The relationship between technological change and underdevelopment is viewed within the perspective of dependency theory. It is argued that in a poor country the development or underdevelopment orientation of technology is determined in two fundamental processes of technological change: the process of innovation, and the process of diffusion of technology. The process of innovation is seen as a decision-making process in which crucial choices determining the orientation of technology are made with respect to three elements of technology: the knowledge element, the economic element, and the social element. These choices are made under certain constraints determined by (i) the process of technology diffusion in the production system, (ii) the public policies for science and technology, and (iv) the value system of the scientific and technological community.

Technological change is assessed in terms of economic consequences -- impact on production linkages and methods of production -- and social welfare consequences -- satisfaction of human needs and income distribution. These consequences are assumed to have

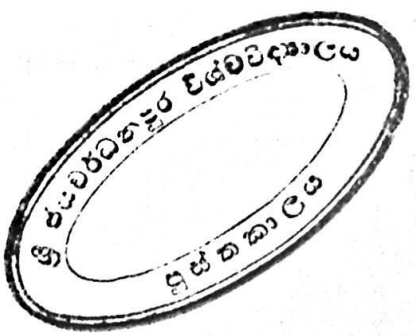
been determined in the process of innovation and diffusion of technology.

The approach to the study is multi-disciplinary. Major sources of data are historical data, aggregate data, and survey research data. A sample of 63 professionals (17 public administrators, 35 R&D personnel, and 11 business administrators) in top and middle level management in some selected organizations dealing with policy-making, research and development, and manufacturing in the rubber industry are interviewed and their responses coded in machine-readable form. A set of hypotheses relating to (i) unequal relationships between the periphery and the centre, (ii) organization of production and diffusion of technology, (iii) socio-economic consequences of technological change, and (iv) dependency orientation of the process of innovation, is tested.

The study finds that the process of technological diffusion is closely associated with the patterns of dependency of the industry and its contribution to the socio-economic crisis of the country. The process of technological innovation itself is dependency oriented because the constraints under which the choices are made in that process have a strong dependency orientation. The patterns of demand that the production system generate help maintain the existing structures of dependent production. Public policy for the organization and financing of science and technology (S&T) activities supports the dependency patterns of technological change. There is a significant relationship between the value system of S&T personnel and the dependency patterns of innovations. The dependency

syndrome of the process of innovation is constituted of three basic components: the dependency orientation, the theoretical orientation, and the foreign linkage. Thus, the dependency syndrome is a state of mind of the individual who makes choices in the process of innovation.

Some of the important implications of the study are: (i) orientation of technology must receive priority over the expansion of local S&T capacity; (ii) re-structuring of the production system must be linked to S&T policy; (iii) the need for sectoral S&T policies adopting selective strategy is re-affirmed; (iv) integration of S&T institutions rather than differentiation, and an integrative approach to R&D project management is suggested; and (v) a new form of operational links between S&T and public policy institutions is urgent.



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