Book Reviews

Clem Tisdell and Priyatosh Maitra (eds.). *Technological Change, Development and the Environment: Socio-economic Perspective.* London: Routledge, 1988. 351 pp. £ 30.00 (Hardbound).

This book is a collection of 15 papers presented to the Fourth Congress of Social Economics held at Toronto in 1986, which was organized by the International Institute of Social Economics, Hull, England. The papers relate to the appropriateness, the development and the dissemination of technology, and the effect of technological change on social environment. The book highlights various issues which include, among others, the extent to which socially appropriate technology is being developed and applied in both the developing and the developed countries; the control of developing countries over the application of the most appropriate technology; the impact of information-intensive technologies on family work, both within the home and at the workplace; changes in service industries in response to the advancement in telecommunications technologies; probable characteristics of future technological developments and their social consequences; the problems encountered by the developing countries in their development process due to their late start; environmental and social problems given rise by technological developments; and new dimensions in the analysis of increases in productivity.

There are fifteen papers in the volume including a chapter summarizing the main contributions by various authors. However, surprisingly enough, the book is without any proper editorial or an introductory chapter. As a matter of fact, the absence of an editorial leaves the reader bewildered as to what can be made of the conflicting views presented in the various papers. Similarly, while five papers present the experience of developing countries and six others narrate the experience of the developed countries, there is no overlap in the coverage of sectors in studies done for developing countries in comparison with those for the developed countries and, as such, a comparative picture of the experiences of developed and developing economies does not emerge. Nevertheless, the book does provide very useful information on various aspects of technological change although some of the studies are somewhat deficient from the standpoint of analytic content.

Chapter 1 traces the role of technology in economic development and socio-economic and environmental change. It also attempts to summarize the main contributions in each of the studies presented in the book, but Tisdell makes no effort to synthesize the results of the various studies.

Chapters 2, 4 and 5 present the role of imported technology *vis-à-vis* indigenous technological developments in the development process of a country. Maitra explores factors responsible for the lack of technological development in India in Chapter 2. Using the Marxian framework to analyse and challenge the basic assumptions generally made about technology, such as its neutrality to history, class, country and factor endowments, he has argued that the introduction of an alien technology in British India with fundamentally different production relationships, has destroyed the potential indigenous forces of social and economic development in India. Therefore, he concludes that for economic, cultural and political development it is essential that traditional technology is developed to transform traditional technology into industrial technology. He vehemently opposes the use of imported technology.

Contrary to what Maitra concludes in Chapter 2, Podder has argued in Chapter 4 that it is both impracticable and self-defeating to banish all modern technology in order to develop indigenous technology in accordance with factor endowments. He argues that while the development of indigenous technology in the absence of imported technology would be improbable, such a policy would definitely ensure a country's technological isolation. Podder's conclusions are based on the argument that technological development is a continuous process with logical steps to be taken sequentially. The process of technological development or even the adoption of technological innovation may effectively be accelerated or retarded by the existing socio-economic conditions. These constraints are basically the lack of appropriate infrastructure, including skilled labour with a positive attitude and one that is psychologically disciplined to operate and manage the technology. Moreover, because new technology can only be embodied in new machines, sufficient investable funds are basic to the adoption of technical change. The developing countries generally lack sufficient investable funds and as such technological development is mutated.

While Podder favours import of technology, he is conscious of the fact that such technologies are capital-intensive. Nevertheless, that does not seem to worry him much because he is of the opinion that the formal sector, in any case, cannot generate sufficient employment, and as such the developing countries will have to rely on the services sector for generation of sufficient employment. He goes on to argue that foreign technology used in developing countries could not be blamed for low employment generation as it has been successful in a number of countries, though the author fails to inform the readers as to which countries have been able to overcome unemployment problems using capital-intensive technology. Since he

favours the use of imported technology, it is no wonder that he underlines the need to take measures which help in the transfer of technology.

Remeryi explores the possibilities of partnership in research in Chapter 5 as a preferred means for the development of technology for developing countries. Specially focusing on the problems of generation and transfer of technology, Remeryi argues that where the indigenous capacity of research is weak and limited, joint research between developed and developing countries would ensure the promotion of research activities. He argues for an institutional innovation wherein there is an equal partnership between the developed and developing countries. He favours an institution on the pattern of the Australian Centre for International Agricultural Research. As a matter of fact, the study does present an evaluation of the Centre and concludes that as long as mutuality of benefits is ensured, the developing countries prefer collaborative projects as they provide for complementarity of skills. However, he hastens to add that such projects should supplement rather than substitute local research.

Chapter 3 presents the role of technological change in the agricultural growth of Bangladesh where food production has increased as a result of following intensive cultivation techniques. However, there are two concerns which have been underlined in this study. First, the growth rate in crop yields and cropping intensities is tapering off, which may reflect the possibility that ecologically or socially Bangladesh may not be able to sustain such growth. Second, while agricultural production has increased rather sharply, the country may have become even more dependent on imports as she has to import technology and inputs besides food. However, the paper fails to suggest what should be Bangladesh's strategy. Can it be argued that in the absence of technological development Bangladesh's dependence on imports would be any less, or that because dependence has increased Bangladesh should abandon modern technology?

Chapter 6 explores the possibility of using standard project evaluation methods in the appraisal of urban transport development projects in the centrally planned economies such as China. The need for such an analysis assumes significance because the development of roads to meet the growing demand for transport requires large amounts of resources, and also that road development will have a strong bearing on the social environment. Taking into consideration the data requirements for estimation of demand and supply of transport and the limited Chinese expertise in project appraisal, O'Keefe concludes that in the short run more emphasis needs to be given to the appraisal of foreign technology in the urban transport system, and that project evaluation may be initiated only when more trained persons become available. He identifies various problems in project evaluation and underlines the fact that unless the price system is reformed, any meaningful project appraisal cannot be done.

In Chapter 7 Musgrave examines the nature and speed of adjustments in the

agricultural sector in particular, and in rural areas in general, as the share of the agricultural sector in GDP falls in Australia. He points out that frictions in the adjustment process, such as liquidation of some of the assets or borrowing money by using them as security, slow down the adjustment process. The slow adjustment, fluctuations in income, high incidence of unemployment, and longer duration of unemployment lead to a higher level of poverty in rural areas. In order to reduce rural poverty, Musgrave has argued that apart from the removal of price distortions, income smoothing, provision of the rural adjustment system, incomes support arrangements and financial counselling services need to be strengthened. The other measures to remove poverty, in this study, include integration of social justice with the pursuit of economic efficiency, provision of income support to small businessmen, and provision of income support parallel to the promotion of structural change. He rightly concludes that the basis of any such programme has to involve provision of income support to poor farmers in an efficient and equitable way which does not destroy the competitiveness of a sector of the economy when the world markets are distorted and commodity markets are depressed. Consequently, he calls for three policy actions: reduction in world protectionism, removal of domestic impediment on the traded-goods sector, as well as the removal of domestic impediment within the traded-goods sector.

In Chapter 8 Khan and Zerby have explored the relationship between technical development and socio-development for 126 countries. Using five different indices to measure technology, i.e., capital-labour ratio, scientific manpower, and the indicators constructed on the basis of scientific and technological knowledge possessed by the country, they have ranked 126 countries on the basis of technology. Similarly, the countries have been ranked on the basis of economic and social development. Alternatively, 126 countries are classified into three groups. They correlate technological development and socio-economic development and conclude that the adoption of new technical knowledge varies considerably with the level of development, and that technological change both affects and is affected by the level of socio-economic development. The novelty of the study is not in the results, as one could hardly expect the contrary to the findings of the study; it is in fact in the use of distance functions and in the construction of an index on that basis.

The authors have rightly cautioned the readers against problems of measurement in technical change. These have been enumerated as the definition of sector, specification of technical change, and the construction indicators of relative knowledge intensity. These, in turn, are based on the income elasticity of demand, the historic rate of increase in productivity, environment density, skill content, and source of saving. No doubt, these are real problems, and the results need to be qualified accordingly.

Chapter 9, contributed by Chisholm, focuses on rational decision-making when

the effect of a decision is irreversible and there is uncertainty regarding the probable effect on environments. It evaluates various decision rules including the social benefit approach, expected utility approach, and regret functions and concludes that these would not be able to evaluate such projects efficiently. However, Minimum Standard Strategy, i.e., conservation of sites beyond the threshold or a critical zone derived from the mini-max strategy of game theory has been preferred by the author.

Chapters 10 to 13 discuss the effect of technological development, especially in the fields of electronics, telecommunications, and information on the social environment. Darton and O'Neill examine the use of new technologies within the house and their social implications. They have made use of Planning for Social Change Survey (PS) for Britain, which is carried out each year, and identify five factors giving rise to various household activities. These relate to the home environment, individualism vs. collectivism within the household; home technology; the relative attractiveness of Away-from-Home-Activities, and the level of economic development in terms of employment/income structure. Analyzing the survey data the authors predict that by the end of the century, the formal/informal distinction in economic activities would vanish and will be replaced with a distinction between information and casual economies. The information economy would be characterized by an integration of the production of high-tech goods and services with the household economy. On the other hand, casual economy will be characterized by an increasing overlap between low-tech industries and residual economic activities confined to the black economy and concentrated among poorer households. These conclusions are, no doubt, interesting and significant. However, they are quite bold and need verification on the basis of some other data set as well as that for other countries, and the authors acknowledge that.

Chapter 11 is quite interesting and, analytically, competent work to determine logically the effect of computer and telecommunications technologies on work patterns. Hall has argued that remote work is not always utility-maximizing for individuals and profit-maximizing for firms. The decision would be based on the nature of information processing work.

Remote work made possible by new technologies would not be necessarily favourable because it allows the persons flexibility of work at home. It would also have to be true regarding organizational flexibility at the centre. As a matter of fact, if such flexibilities do not exist the perceived costs and benefits of remote and centralized work will have to be taken into consideration. The physical commuting costs associated with centralized work need to be compared with the telecommunications costs of remote work. These costs may include rental transmission charges for information processing equipment; sacrificed living space; reduction of utility due to lack of personal contact; potential for domestic interruption; and reduction in utility due to lesser leisure. On the other hand, firms may prefer central work in

preference to remote work. Obviously, the nature of the task and motivation for an individual would be basic to the choice and, as such, the decision remains uncertain. The study by Hall does suggest that Darton and O'Neill may have been reading too much from the survey and their conclusion regarding the prevalence of information economy will have to be greatly qualified.

Chapters 12 and 13 analyse the impact of advances in electronics, telecommunications, and computer equipment on the banking industries of South Africa, Australia and New Zealand. Based on a survey for South Africa in 1984, Suchards has concluded that contrary to general perceptions bank employees do not find new technologies to be a threat to their jobs. As a matter of fact, the academically qualified see new technologies to be beneficial in the performance of their duties. Nevertheless, the respondents, in general, underlined the need for more specialized training to enable them to cope with new technologies.

Weston and Williams, in Chapter 13, examine the available evidence on a number of issues including capital or labour intensity as a consequences of technological change in banking. The study reviews developments in the banking sectors of the two countries and examine questions such as electronic banking and the institutional consumer, consumer response, and labour market issues. The Australian evidence suggests that the human resource consequences implicit in a manifest shift from labour- to capital-intensive industries cannot be ascertained one way or the other. He points out that the socio-economic effects arising from the induction of technology in the banking industry may not only change the shape of the industry but also the very cultures which have determined the nature of the organizational growth and development of banking.

Doelman raises a number of issues such as the desirability of rapid and profound technical developments to assess whether modern history signifies progress or decay of human species, to determine the extent to which individual decision-making and the political processes are capable of exerting control over the speed and direction of the dynamics of history. He has forcefully argued that economic eternalities, geographic and social externalities, and dynamic externalities force a technological decision. Dynamic externalities provide for the better life of individuals, but due to socio-economic controls, they become a threat to society. However, these negative influences can be offset by economic, legal, bureaucratic, and political internalization techniques.

Wyk reviews standard methods of estimating technical change but argues that these methods are void as regards their contribution to the development of technology. He has, instead, suggested a direct technological forecasting approach with a view to properly understanding and managing technology. Accordingly, he presents the general theory of technology with four analytical tools, viz., a classification of technological artefacts, a standard set of technological trends, a chart of technolog-

ical limits, and a socio-technical preference profile. He has tested the construct on micro data and has concluded that it can successfully map out the major thrust of technological change. However, as the author has himself admitted, further refinement of technological analysis is desirable, and it should be tested in a macro context.

The volume is very informative and brings the reader up-to-date information on various aspects of technological development. One only wishes there were an editorial note synthesizing the results of the various studies and presenting a comparative picture of technological development in the developing and the developed countries.

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