Chapter 16
Technology Transfer Means and Processes:
Improving the System of Transmitting Scientific Knowledge and Know-How to Recipient Emerging Nations

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ABSTRACT

This chapter defines technology and technology transfer and the nature of the challenges posed by technology transfer and decision processes to recipient emerging nations; it discusses types of technology, mechanisms, or channels of technology transfer, as well as the appropriateness of technology to receiving states; reviews related literature and research on the theme; discusses technology transfer decision processes; determines factors that drive as well as impede technology transfer; and it explores other aspects or dimensions of technology transfer, such as the meaning of technology transfer, technology diffusion, and the need to transfer technology. Further, it assesses the impacts, strengths, and weaknesses of the experiences of technology seller-states and consumer-states as informed by empirical research on the issue. The research concludes with recommendations of the best practices of how to improve the system of technology transfer from developed to developing states from infrastructural development and sustainability points of view. The strategies include upgrading research and development, as well as appropriateness of information systems; effective methods of transferring technology and most suitable methods for introduction into a country and the efficacy and types of problems it can solve, including developing capacity, technical upgrading, and increased financial support, providing subsidies for recipient entities through the purchase of exclusive technology licenses.

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INTRODUCTION

Technology transfer from developed to developing nations serves many purposes. One purpose, according to Huang (1992) is that it promotes rapid economic transformation in the destination society. Shepherd (2007) observes another goals technology importation, especially environmentally sound one as fighting climate change. Another goal as observed by the Kyoto Protocol (1997) was to reduce or eliminate toxic waste.

These technologies are acquired through different methods, according to Huang (1992). The methods include machinery or other intermediate goods; turn-key package; license agreement, Joint Venture, Purchase of equipment, and management contract. In pursuit of these goals, through technological acquisition, developing countries' efforts are marred by a series of setbacks that include but not limited to lack of technological infrastructures, lack of education and training, problems of technological packaging, government corruption and instability, cultural impediments as well as high risks for foreign investment.

Trotter and Risdon (1990) argue that the said technical transfer processes undergo stages of decision activities designed to culminate in the adoption of appropriate technology, such as innovation, confirmation, targeting, marketing, application and evaluation. Furthermore, Kebede at al. (2008) claimed that critical assessment decisions must take place in the technology transfer process that will take into account such factors as: needs, analysis, make or transfer, assessment, decision on technology, transferring process, implementation and measuring the success.

In order to improve their ability to attract, implement and sustain appropriate technology from developed (exporter) countries, developing (consumer) states have embarked on strategies designed to reduce the risks – maintaining enabling environment, use of financial subsidies, tax relief, lowering tariffs, providing insurance and guarantees against risks associated with promoting and exporting technology, attracting foreign investment and developing capacity and establishing clear policies regarding pricing, ownership and enforcing contracts.

The purpose of this paper is to explore the means and decision processes involved in the transfer of technology as well as the challenges confronted in this process by recipient emerging nations. While this paper helps to shed light on the problems, challenges and opportunities posed by technology transfer and management processes, it nonetheless, contributes to available literature on the topic. The investigation relies primarily on secondary (journal and academic research papers), as well as primary sources, such as relevant policy papers.

This paper defines technology and technology transfer; explores the nature of the challenges posed by technology transfer and decision processes to recipient emerging nations; discusses types of technology, mechanisms or channels of technology transfer as well as the appropriateness of technology to receiving states; reviews related literature and research on the theme; discusses technology transfer decision processes; determines factors that drive as well as impede technology transfer; explores other aspects or dimensions of technology transfer, such as the meaning of technology transfer; the meaning of technology diffusion, and the need to transfer technology. Further, it assesses the impacts, strengths and weaknesses of the experiences of technology seller-states and consumers-states as informed by empirical research and then makes appropriate recommendations.

Literature Review on Technology Transfer

Several studies conducted by selected scholars have contributed to our understanding of the range of critical factors and forces that enhance or in some cases impede the progress in or successful transfer of technology. Ramanathan (1994) makes