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Absorption and diffusion of imported technology

Proceedings of a workshop
held in Singapore,
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Contents

Foreword 5

Introduction 7

ADIT: A Review 13

Case Studies

Accumulation of technological capability and assimilation of imported industrial production systems in the cotton textile industry in Bangladesh
Quazi H. Ahmed 21

Absorption and diffusion of imported technology: a case study of four industries in Sri Lanka
Marga Institute 28

Some issues pertaining to technical change in the cotton textile sector in Sri Lanka
W.D. Lakshman 37

Absorption, assimilation, and diffusion of imported technology in Pakistan: a case study of the textile and pharmaceutical industries
Firasat Ali and Jamal Ahad Khan 41

Technological change, transfer, and diffusion in the textile industry in India
Amitav Rath 49

Technology and market structure under government regulation: a case study of the Indian textile industry
Ashok V. Desai 61

The Philippine ADIT project: a summary paper
Luke Kho and Lope Cuaresma 73

Absorption and diffusion of imported technology: a case study in the Republic of Korea
Woo Hee Park 79

Analysis of systems behaviour in the absorption and diffusion of imported technology
Suck-chul Yoon 90

Comparative Studies

Similarities and differences: the Indonesian case
Nilyardi Kahar 95

Japanese investments in South Asia from a global perspective	
W.D. Lakshman	97
Comparative analysis of technology policies of ADIT network countries	
Quazi H. Ahmed	105
Workshop Conclusions	109
Participants	112

Comparative Analysis of Technology Policies of ADIT Network Countries

Quazi H. Ahmed¹

During the last ADIT work-in-progress meeting, held in Delhi, five of the six participating countries (i.e., Bangladesh, India, Korea, Philippines, and Sri Lanka) presented progress reports. The report of the Indian team contained only some basic statistics on the textile industry of India, due to the fact that work on the project had just begun. For this reason, only four

country reports are considered in this comparative analysis. In most of these reports, policy issues have not been discussed explicitly and adequately. Moreover, there are wide differences between the countries with respect to methodological approach (e.g., measurement of performance and technical change, analysis, etc.). A complete and meaningful comparative analysis of the technology policy of Bangladesh with other ADIT network countries, therefore, cannot be carried out.

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Table 1. Process of accumulation of technological capacity in the ADIT network countries.

Country	Nature and extent of local efforts to accumulate technological capability	Accumulation through the transfer process
Bangladesh	College of textile technology produces textile technologists Some efforts toward imparting training from abroad and from local institutions	Locals have picked up the skills and experience to provide investment-related services from the textile machinery suppliers
Korea	Local efforts have been demonstrated by providing opportunities to local engineers and firms Positive steps have been taken to increase "human capital" through training and research Diffusion has been taking place through seminars, exhibitions, and the formation of professional societies	Training of local engineers and technicians by the technology supplier Technological collaboration with other foreign firms
Philippines ^a	Formal research and development activities in recent years Formation of a human resources division for imparting effective training	Visits by local engineers to the installations of potential technology suppliers Import of foreign experts as and when necessary "Mutual licencing agreements" with foreign firms (provides opportunity for free transfer of technical know-how from either party) Exchange of engineers and technicians for mutual benefit Joint ventures
Sri Lanka ^a	Fragmentary evidence of local training efforts	Training of local junior level technicians by the technology supplier Working closely with foreign experts

^aThe processes reported here have not been found in all of the mills in the sample. Therefore, these processes cannot be generalized.

Table 2. Degree of assimilation of imported production techniques in the ADIT network countries.

Country	Technoeconomic operating performance			Degree of structural integration		Intervintage technology change	
	Level	Trends	Current inputs	Investment goods and services	Minor	Radical	
<i>Bangladesh</i>							
Cotton textiles	Low levels of performance	Decline of machine and labour productivity and capacity utilization	Some spare parts manufactured locally (not properly organized)	Some evidence of the use of locally manufactured machinery (not organized)	None	None	
<i>Korea</i>							
Petrochemical sector (one plant)	NA	Increase in productivity indexes Reduction in ratio of input to output Some evidence of minor technical change, which resulted in a reduction in cost of output	Substantial portion of required spare parts manufactured locally (organized efforts)	Small portion of investment goods manufactured locally for expansion Investment-related services also provided from within the economy (since the construction of the second plant)	None	None	
Nylon manufacturing (one plant)	Various problems during commissioning of the plant	Increase in labour productivity Reduction in cost per unit output Developed new products	None	None	None	None	
Diesel-engine production	Problems during start-up phase	NA	NA	None	None	None	
Tissue manufacturing	NA	NA	NA	Started with locally produced machinery (only the design was imported) Locally produced machinery also exported	NA	NA	

Philippines

Integrated textile mills (four mills)	Low capacity utilization (A-Text) High ratio of idle to installed machines (A-Text)	NA	Use of locally manufactured spare parts (C-Text)	Redesigning of imported machinery (Rami-Text) Portion of investment-related services provided by locals (B-Text)	Process improvement (Rami-Text) Modification of imported machinery (C-Text)	None
Synthetic fibre manufacture (five mills)	Problems during start-up Low capacity utilization	Decline of labour productivity (Textfibre) Increase in wastage rate (Textfibre)	None	None	None	None
<i>Sri Lanka</i>						
Cotton textiles	Low level of capacity utilization	NA	NA	NA	NA	NA
Synthetic textiles	Low level of capacity utilization	NA	Evidence of locally manufactured accessories (reportedly of poor quality)	Evidence of locally manufactured (simple) textile machinery	NA	NA
Pulp and paper	Unsatisfactory performance	Some improvements in performance achieved (with the help of hired overseas consultants)	None	None	None	None

NA = information not available.

In spite of these constraints, however, an attempt to assess the degree of assimilation of imported techniques and the process of accumulation of technological capabilities and make some tentative comments about the technological policies of these countries has been made. Tables 1 and 2 show the comparative pictures of the process of accumulation and the degree of assimilation of local technological capabilities respectively.²

From Table 2, it appears that South Korea assimilated more imported techniques than the other countries. The Philippines also shows some success in this respect. Sri Lanka and Bangladesh have shown low degrees of assimilation. Table 1 indicates that South Korea had the best structure for accumulating technological capability through organized efforts toward local research and development and in-plant training. Benefits have also been derived from overseas training of engineers. In the case of Sri Lanka (for the warp-knitting process), it appears that there have been some efforts in this direction but with apparently less success. The situation in Bangladesh is somewhat similar to that of Sri Lanka. In the Philippines, there was some degree of research and development activity (in Rami-Text). There was also an effort to impart effective training to

²The structure of the comparison is based on the analytical framework developed and used for the analysis of the performance of the Bangladesh textile industry.

operatives and the services of foreign experts seem to have played some role in the process of assimilation.

It is not clear from the country reports which technology policies helped or hindered local technological capability development. However, it appears that Korea has a policy to support and encourage local efforts for such activities. In the Sri Lankan case, import liberalization policies seem to have affected the product market and also the process of local technological capability accumulation. Import liberalization has put local manufacturers of textile machinery and parts in an uncompetitive situation. For example, due to the imposition of very low duties (5%) on imported textile machinery, local manufacturers are being forced out of business. Also, there seems to have been no technology policy for the pulp and paper industry.

In the case of Bangladesh, there seems to have been no explicit technology policy regarding the cotton textile sector. There is, apparently, no conscious effort to improve local technological capabilities and the low level of assimilation in order to become more self-reliant.

In conclusion, it should again be stressed that this analysis is incomplete due to the nature of the information available from the work-in-progress reports of these countries. It does, however, provide a tentative analytical framework for such comparisons and should, therefore, be used only for that purpose.