



CHAPTER 1

INTRODUCTION

Science and technology play an increasingly important role in sustaining and improving the competitiveness of Malaysia. The World Competitiveness Year Book placed Malaysia in the 16th position for 2004, ahead of more developed nations such as Germany (21), United Kingdom (22), Japan (23), South Korea (35), and New Zealand (18) (IMD, 2004). This enviable position can be attributed to, among others, impressive economic performance and business efficiency. The weakness of Malaysia lies in its scientific infrastructure and innovation system that lacks innovative capability. Therefore, addressing weaknesses in the area of S&T and building scientific capabilities are the strategic directions that Malaysia must seriously consider whilst continuing to exploit our strengths and capabilities that are already embedded in our competitive structure.

In charting the future direction of Malaysia towards greater competitiveness, science and technology development in terms of scientific infrastructure and human resource is crucial. In line with Malaysia's vision to transform our nation into a knowledge-based economy, education, training and retraining in science and technology deserve special attention. In other words, competitiveness that is driven by science and technology requires capacity building in human resource through education and scientific infrastructure development.

The world today is characterised by increasing globalisation, regionalism and bilateralism, and competition both domestic and global has become stiffer and more complex over the years. Public intervention in the form of policies with regards to investment in scientific infrastructure, education and training is seen as necessary, if not highly desired in achieving the explicit goal of increasing science and technology capability and innovativeness.

Besides the present national agenda to build scientific capabilities, regional and international cooperation is taking place in order to cooperate, collaborate and hasten the development of technologies and the dissemination of knowledge in identified areas (ASEAN Annual Report, 2002-2003, pp.62-95;

OECD, 2004). Amongst the OECD member countries, much attention has been devoted to two major issues: ensuring sustained development of human resources in science and technology and enhanced international co-operation in science and technology. Co-operation in science and technology towards sustainable development, notably by transferring knowledge and technology among member countries as well as to less developed ones, has been given due attention.

The co-operation among ASEAN Member Countries as well as ASEAN + 3 are excellent examples of a regional co-operation. One of the areas that is of interest to governments in ASEAN and ASEAN + 3 relates to Science Policy Development in which the development of technology competitiveness indicators as a policy making tool is being undertaken. A common set of benchmarks for ASEAN Member Countries to assess their science and technology capabilities and technology competitiveness is being undertaken by the ASEAN Science and Technology Community for Innovation, Competitiveness and Knowledge. Therefore, the preparation of the Science and Technology (S&T) Indicators Report should be the continuous effort of the Malaysian Government to assess its capabilities in S&T, vis-à-vis other nations. At the same time, the S&T indicators report provides feedback to public policy makers to enable them to evaluate existing policies, to design and implement new ones.

Indicators for science and technology may be defined as a set of statistics which measure quantifiable aspects of the creation, dissemination and application of science and technology, arranged to answer a specific question. The indicators that are recorded over a period of time allow us to see trends and to benchmark.

Science and Technology Indicators Report, 2004 is the sixth volume published by the Malaysian Science and Technology Information Centre (MASTIC), Ministry of Science, Technology and Innovation. This biennial report is a catalogue of the inputs of Malaysia's scientific endeavours and the outputs of these efforts.

1.1 Organisation of the Report

The presentation of the chapters closely adheres to the input-output model, i.e., the inputs to scientific efforts are presented followed by outputs. In this report, data are organised and categorised into groups: individuals and institutions. Findings that are individual-based are those from the Survey of Public Awareness toward Science and Technology, 2002; while data that are institution-based are from R&D Survey, 2002, The National Survey of Innovation, 2000-2001, as well as institutional reports from relevant agencies. The sectors that are covered are government, business, and institutions of higher education. The chapters in this report are :

- Chapter 1 – Introduction
- Chapter 2 – General Overview of Malaysia's Achievements in S&T
- Chapter 3 – Education in S&T
- Chapter 4 – Human Resource for S&T
- Chapter 5 – Research and Development Activities
- Chapter 6 – Innovation in the Malaysian Manufacturing Sector
- Chapter 7 – Trade in Technology
- Chapter 8 – Publications and Citations
- Chapter 9 – Awareness, Knowledge and Attitude Towards S&T
- Chapter 10 – Public Support for S&T
- Chapter 11 – International Comparisons

A new chapter "Publications and Citations" has been added to this report. Publications and citations are in a way, a measurement of output in R&D activities. One major usage of this indicator is for international comparison. It also helps to identify high impact papers and journals and the authors, leading universities and corporations as well as to understand the latest development in the scientific fields. Although this is a direct measure for the university sector, works of scientists and inventors in other sectors are not necessarily disseminated through publications and citations unless they choose to disseminate their findings through publications. In reality, private companies that are R&D-driven and are innovative often keep their work confidential. Hence publications and citation reports are in a way an inadequate measure of scientific knowledge and achievement. Reference could be made to Chapter 8 for more discussions relating to publications and citations as indicators.

In addition to this new chapter, S&T Indicators Report 2004 gives readers a deeper understanding on the innovative activities in Malaysia. The chapter on innovation which is derived from the findings obtained in the second national survey of innovation provides information on the status of innovation among companies in Malaysia as well as the trends in innovative activities.

