

3.1 Introduction

Research and Development is an activity which is carried out over a wide range of sectors and sub-sectors of the economy. Consequently, there are a multitude of statistical sources which contain data on resources (money and personnel) used for R&D. A major source of such information is obtained through regular official surveys designed specifically to collect R&D statistics for a whole economic sector (government, industry, institutions of higher learning, etc.) using standard instructions and classifications.

This is the fourth R&D survey report produced by MASTIC. The first official attempt by MASTIC to calculate the total amount of national resources devoted to R&D was made for the National Council for Scientific Research and Development (MPKSN) for the year 1992. The National R&D survey presents the results of a very comprehensive survey of various aspects of R&D efforts in Malaysia carried out by three sectors; government agencies and research institutions, institutes of higher learning and private companies.

3.1 The Objectives of the Survey

The main objectives of the survey are

- (i) to provide an overview of the status of R&D activities in Malaysia
- (ii) to highlight strengths and priorities pertaining to the performance of R&D activities in Malaysia.
- (iii) to recommend strategies and action plans that need to be taken to enhance the R&D performance in Malaysia.
- (iv) to propose possible new indicators that would give better insights of R&D activities in Malaysia.

The recommendations based on the findings will help the formulation of Science and Technology (S&T) policy in the promotion of R&D activities in various sectors, namely, *government agencies and research institutes (GRI), institutes of higher learning (IHL), and private sectors.*

3.2 Methodology

The definition of indicators (e.g., the GERD/GDP ratio, FTE, etc.) and methodologies adopted in the survey were based on the internationally agreed guidelines as put forward by the Organisation for Economic Co-operation and Development (OECD) member countries. The data is also presented according to the broadly standardised way of presentation with a view of facilitating international comparisons.

In the national context, the classification of field of research (FOR), socio-economic objectives (SEO), industries etc., is based on the official classification endorsed by the Ministry of Science, Technology and the Environment (MOSTE).

3.2.1 Questionnaire Design for Data Collection

In the national survey, questionnaires are used as a tool for collecting data on R&D activities in some selected sectors. Three set of questionnaires were developed for the following sectors, namely,

- (i) the Private Sector
- (ii) the Government Agencies and Research Institutes (GRI)
- (iii) the Institutes of Higher Learning (IHL)

The questionnaires used in this survey are given in Appendix C.

3.2.2 Survey Administration

Mail survey was used to collect data on R&D activities. The survey was administered in accordance with a standard procedure documented in the procedure manual. Several procedures were added onto the survey methodology to ensure high quality outputs, namely

- (i) The third revised version of “Malaysian R&D Classification System” was used together with the survey form.
- (ii) Briefings on the procedures for completing the questionnaire by respondents were organised by MASTIC through road-shows in Sabah, Sarawak and Kuala Lumpur.
- (iii) Telephone and facsimile hot-line services were made available for the respondents to seek any queries pertaining to the survey.
- (iv) A strict quality assurance program was implemented throughout the data input and analyses.

3.2.3 Review of Survey Findings

An *ad hoc* committee was formed by MASTIC to assess the conduct and findings of the survey. The members of the committee are representatives of the following agencies;

- (i) Palm Oil Research Institute of Malaysia (PORIM)
- (ii) Research and Consultancy Unit, Northern University of Malaysia (UUM)
- (iii) Department of Research and Development, University of Technology Malaysia (UTM)
- (iv) Veterinary Research Institute
- (v) Fisheries Research Institute
- (vi) Forestry Research Institute of Malaysia (FRIM)
- (vii) Malaysian Department of Statistics
- (viii) Malaysian Industry- Government Group for High Technology (MiGHT)
- (ix) Ministry of International Trade and Industry (MITI)
- (x) Institute For Medical Research (IMR)
- (xi) Academy of Science, Malaysia

- (xii) Ministry of Education, Malaysia
- (xiii) Space Science Studies Division (BAKSA)
- (xiv) Bureau of Research and Consultancy, University Technology MARA (UiTM)
- (xv) Federal Malaysian Manufacturer (FMM)
- (xvi) Research and Development Unit, University of Malaya (UM)

3.3 Response Rate of the Survey and Organisations with R&D

The survey covers three sectors; Private sector, Government agencies and Research Institutes (GRI), and Institutes of Higher Learning (IHL). The figures below give the response rates obtained from the 1998 survey and comparison with those in 1996.

Sector	Year	No. Org. surveyed	No. Org. responded	% Org. responded	No. Org. with R&D	No. Org. without R&D
GRI	1998	57	54	94.7	33(12.1%)	20
	1996	62	50	80.6	28	22
Private	1998	2524	798	29.5	228 (83.5%)	570
	1996	1743	759	43.5	158	601
IHL	1998	14	14	100	12 (4.4%)	1
	1996	11	10	90.9	9	1
Total	1998	2595	822	31.7	273	591
	1996	1874	829	44.2	196	633

Overall, the response rate in the 1998 survey was approximately 32%, down from 44.2% recorded in the 1996 survey. However, an interesting scenario from the latest survey is that it managed to attract more organisations with R&D (up 39.3%), particularly for the private sector (83.5% of the total number) compared to those in the previous survey. A most notable is the increased number (up 44.3%) of organisations carrying out R&D in the private sector. Figure 3.1 shows the upward trend for the number of companies with R&D from the 1994 to 1998 survey period. However, the number of organisations with R&D in both the GRI and IHL has not changed much over the 1994-1998 survey period.

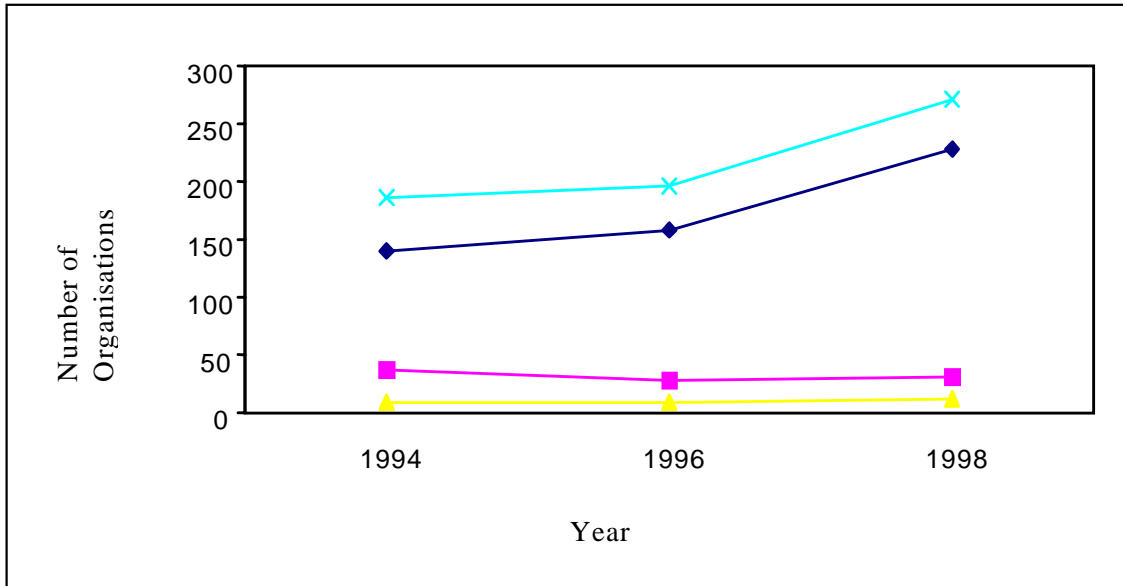


Figure 3.1: Number of Organisations with R&D (1994 – 1998)

3.4 The Reporting of R&D Expenditures and Research Personnel

It should be noted that the reporting of R&D expenditures and research personnel in this survey is only based on research projects with R&D funds as reported to MASTIC by the surveyed organisations. However, information on R&D activities (with or without funds) not reported by the surveyed organisations is not known. Therefore, the possibility of 'under-reporting' of the R&D activities (in particular, the expenditures and total number of research personnel) in this survey cannot be ruled out.