

Preface

Advances in science and technology (S&T) result in expanding roles for scientific and technological activities in socioeconomic development. It is therefore important to objectively assess S&T activities.

S&T indicators are seen as a means of assisting in these assessments. The publication of this report on Japanese S&T indicators, the first of its kind, is in response to this pressing social need. Indicators are developed to quantitatively examine country trends in S&T activities from diverse angles. Moreover, because S&T activities are related in complicated ways and comprise extensive and diverse activities, assessment must be from a long-term viewpoint. The objective of this macro analysis therefore goes beyond the inappropriate compiling of fragmentary indicators. The major objective of this report is thus the development of systematically structured indicators.

In preparing this report efforts have been made to systematically construct S&T indicators by collecting and classifying related data based on this system. S&T indicators have already been published in the U.S., OECD and by other governments and organizations. UNESCO studies are also available in providing indicators covering, in particular, developing countries. However, classification is often in input/output form, and moreover an integrating system is often lacking. Therefore there have been criticisms such as the criteria for selecting of indicators is not clear or that only easy-to-collect data are used. The development of indicators attempted in this report is designed to respond to such criticisms. The indicator system and the specific indicators themselves are believed to exceed many of those now available. The present indicator system structure referred to here is called the cascade structure. The Introduction which follows outlines the characteristics and objectives of the cascade structure.

In addition to development of indicators, this report also has the following characteristics. Based on the system, new indicators are developed which were previously not in existence. For example most of the indicators presented in the chapter on science, technology and society

(Chapter 8) are not found in similar works. Also, in other chapters several new indicators have been developed and added and novel analyses regarding existing indicators is presented. For example, Japanese R&D trends are clarified in the context of the international community from a multilateral viewpoint. Moreover, in conducting international comparisons, the report attempts to adhere to international standards as much as possible.

Much time and effort has been spent in developing specific indicators and preparing this report.

Collecting diverse and acquiring up-to-date statistical data and preparing and analyzing tables based on such data is a time consuming process. Despite these constraints, this indicator report has been published for the first time in Japan. Science and technology indicators would be meaningless if they are published only once, therefore the writers would like to receive frank opinions and criticisms from readers for future editions. The hope is to receive the opinions of others in order to improve future editions. Fortunately this report will be published regularly allowing for this exchange of opinions and suggestions to contribute to future reports.

In preparing this report, a Science and Technology Indicators Study Group has been established within the National Institute of Science and Technology Policy (NISTEP) as of January 1990.

Members examined and presented diverse opinions and cooperated in many ways such as reading and checking the prepared manuscripts. Their names are listed on the following page. We would like to express our appreciation for their assistance and advice.

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This report has been prepared by the Second Theory-Oriented Research Group. A major work such as this however is not accomplished by just one research group made up of several members. It is a result of cooperation by many NISTEP members. Below are the names of those who cooperated directly in the writing of this report. We would like to express our appreciation to them.

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