2.4 Efforts to Develop New Science and Technology Indicators

The indicators discussed in Chapters 2.1 to 2.3, such as R&D expenditures, numbers of researchers, numbers of scientific papers, numbers of patent applications and grants, and value of technology trade, are important as basic data for use in planning Japan's science and technology policies. While various surveys and investigations have helped to provide the above data, under the increasing complexity and globalization, etc., of scientific and technological activities in recent years, the current indicators and survey methods are being reviewed, and new indicators are being developed to grasp the shape of the national scientific and technological activities more accurately. In this section, we introduce the efforts being taken by the OECD and those being taken in Japan.

2.4.1 Efforts by the OECD

The OECD established the Working Party of National Experts on Science and Technology Indicators (NESTI) as a subsidiary organization within the Council for Science and Technology Policy (CSTP). The NESTI is working to improve methods for collecting internationally comparable R&D data and on the development of new indicators.

At its June 2003 meeting, NESTI revised the Oslo Manual, an international standard for the collection and interpretation of data on innovation activities. The preparation of the revision proposal—work in which Japan is participating—is currently underway.

Additionally, NESTI is reviewing Field of Science (FOS) classifications used in R&D statistics and is also moving forward with a study aimed at the development of indicators regarding Human Resources in Science and Technology (HRST).

2.4.2 Efforts in Japan

2.4.2.1 Ministry of Internal Affairs and Communications

The Ministry of Internal Affairs and Communications has been conducting surveys of business enterprises, non-profit institutions, public organizations, and universities concerning science and technology indicators for R&D expenditure, the numbers of researchers, the amount of technology transfer, etc., in Japan. This survey was originally started in 1953 as the Basic Statistical Survey of Research Institution, with the name changing in 1960 to the current Survey of Research & Development. Since that time, the coverage of the survey has been expanded and new variables added several times, to reach its present focus. To reflect the increasingly important roles of software and services in industry, and to improve the quality of international comparisons, the survey was subjected to an exhaustive review by the Statistics Council in FY2001, after which a new survey was launched in FY2002 with new survey categories and survey coverage.

2.4.2.2 Ministry of Education, Culture, Sports, Science and Technology

In November 2002, the MEXT conducted the "Survey of Full-time Equivalency Data at Universities," targeting teachers and doctoral students at all types of universities across Japan in order to gain an understanding of the Full-Time Equivalency (FTE) of researchers at "universities" in the "Survey of Research and Development."

The total results for valid replies showed that the full-time equivalencies of teachers and doctoral students at universities are annual averages of 46.5% and 70.9%, respectively.

Table 2-4-1 Full-Time Equivalency (FTE) for university faculty and doctoral students (2002)

	Persons	FTE factor	FTE
Faculty members	171,094	0.465	79,604
Doctoral students	64,019	0.709	45,419

Note: Data on the number of people comes from the "FY2002 Report on the Survey of Research and Development."

Since 1991, the National Institute of Science and Technology Policy (NISTEP) has revised the science and technology indicators every three to four years and drawn up reports for the purpose of obtaining a comprehensive, objective grasp of scientific and technological activities. The fifth edition of the "Science and Technology Indicators Report (FY2004)" was released in April 2004. The 2004 edition improves the science and technology indicators in the following ways:

1. Introduces indicators that demonstrate the progress of a knowledge-based society
2. Introduces indicators that demonstrate transformations in knowledge production methods for science and technology
3. Introduces data on industry-academia collaboration
4. Enhances indicators relating to dissertations and patents
5. Improves the reliability and applicability of comprehensive science and technology indicators

In addition to the revisions made every three to four years to the science and technology indicators, the data has been updated and published annually since FY2001.