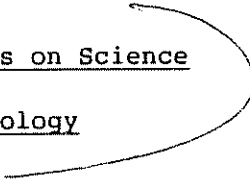


SCIENCE AND TECHNOLOGY STATISTICS

Unesco Statistics on Science
and Technology



Report prepared by Unesco

Office of Statistics

UNESCO STATISTICS ON SCIENCE AND
TECHNOLOGY

The Unesco Office of Statistics started collecting statistical data on science and technology, more particularly on scientific research and experimental development (R&D) in 1969; but, it was only in 1970 when the first world-wide survey on R&D activities was launched.

The survey instrument used in collecting statistical data on R&D activities is the questionnaire. Prepared in three languages (English, French and Spanish), the questionnaire requests data on the two main inputs to R&D - personnel and expenditure. Data variables are classified in accordance with international standards which have been progressively developed by Unesco with the aid of national specialists from the various regions of the world and have been discussed at length during missions to Member countries and at meetings convened for this purpose by the Organization. These standards are embodied in the Recommendation concerning the international standardization of statistics on science and technology (for brevity, may be referred to as S&T Recommendation) adopted by the General Conference of Unesco at its twentieth session on 27 November 1978.

In order to facilitate the reporting of statistical data on R&D, the Office of Statistics has decided to prepare questionnaires for different levels of information as set out in the above-mentioned Recommendation. The abridged statistical questionnaire in its present form, which is sent to all countries and territories (numbering around 200), requests the minimum basic and essential information. The detailed questionnaire is distributed to these same countries and territories every second year. In the latter questionnaire, data on scientific and technical manpower potential are likewise requested. The scheduled date of despatch of the annual R&D questionnaire is July.

Almost all developed countries and a good number of developing countries, have established statistical services responsible for the collection of S&T data, especially R&D data, within the Ministry or National Council of Science and Technology and/or within the central statistical offices. Some of them issue regularly publications on R&D statistics which are examined carefully by the Office to determine if they are, or could be aligned with the Unesco international standard of classification before using them to complement or update R&D data furnished through the questionnaire, or to fill in the missing information.

Based on countries' replies to the annual statistical questionnaire, the Unesco Office of Statistics prepares and publishes a set of R&D indicators relating to: (i) personnel engaged in R&D activities by category, level of education, field of study and activity, sector of performance, sex and nationality; (ii) expenditure on R&D activities distributed by type of expenditure, source of funds, sector, type of R&D activities and field of activity.

In spite of the efforts of the Unesco Office of Statistics relating to the harmonization and standardization of the concepts, definitions and classification on scientific and technological activities, the concepts and methods of data collection vary considerably from one country to another thus rendering international comparison very difficult, if not impossible, and a multitude of footnotes are needed to draw attention to the divergences of coverage, concepts and classification.

Pursuant to the 1978 S&T Recommendation, the scope of S&T statistical surveys of the Office of Statistics was extended further to include scientific and technological information and documentation (STID) activities. The first world-wide survey on these activities was launched on a trial basis in October 1987. It covered only specialized information and documentation centres and was aimed at collecting data on personnel, expenditure and facilities for STID activities in 1986.

The 1989 questionnaire on R&D was sent to 183 countries and territories as follows: 51 to Africa, 32 to North America, 13 to South America, 40 to Asia, 32 to Europe and 15 to Oceania.

Only 8 African, 7 North American, 6 South American, 16 Asian, 20 European and 2 Oceanian countries have replied to the questionnaire, of which a few replies were used - partially or totally - which means a very low rate of response.

To reinforce the statistical capacity of the national statistical services, the Unesco Office of Statistics has also embarked on an intensive training programme in the field of science and technology at national and regional levels. The aim was to train specialists/statisticians on the following: (i) implementation of international statistical standards developed by Unesco for collecting data on S&T, particularly R&D activities; (ii) methods of collecting such data; (iii) developing S&T indicators; (iv) analyses and utilization of R&D statistics; and (v) implementation of international statistical standards and methods of data collection on STID activities.

During the period 1980-1989, twenty regional and national seminars have been organized, training about 500 specialists/statisticians from Asia, Africa, Latin America and the Caribbean.

The Office of Statistics has published in 5 languages a Manual for statistics on scientific and technological activities and a Guide to statistics on science and technology as well as a provisional Guide to statistics on scientific and technological information and documentation (STID) in 3 languages; a methodological series was prepared on the national statistical systems of 9 Latin American countries on scientific and technological activities with a conversion into the Unesco standardized concepts.

The Unesco Office of Statistics would like to express its dissatisfaction of the international level and quality of R&D statistics and welcomes any comments and suggestions from the United Nations Statistical Office, other agencies and regional commissions relating to the improvement of coverage and quality of S&T statistics.