THE ROLE OF SCIENTIFIC AND TECHNICAL INFORMATION IN DEVELOPMENT

Proceedings of the Interregional Seminar
on the Vienna Programme of Action:

Role of Information in Accelerating Scientific and Technological Progress in Developing Countries and Prospects for the Establishment of a Global Information System

held at
Moscow, USSR, 24 September — 5 October 1985

Centre for Science and Technology for Development

THE ROLE OF SCIENTIFIC AND TECHNICAL INFORMATION IN DEVELOPMENT

Proceedings of the Interregional Seminar on the Vienna Programme of Action: Role of Information in Accelerating Scientific and Technological Progress in Developing Countries and Prospects for the Establishment of a Global Information System

held at

Moscow, 24 September - 5 October 1985

Edited by K. Aning

Editorial Committee: A.I. Mikhailov, S.V. Tsukanov, and V.K. Pavlov

Note

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

This document has been reproduced without formal editing.

The views expressed in signed papers are those of the individual authors and do not necessarily reflect those of the organization with which they are associated or those of the Secretariat of the United Nations.

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

FOREWORD

The importance of scientific and technical information in the development process was not lost on the participants at the United Nations Conference on Science and Technology for Development, held in 1979 in Vienna. The Programme of Action that was adopted contained many recommendations on information systems for science and technology for development. Among the issues dealt with were the need for developing countries to formulate and adopt national information policies as integral parts of their overall national development plans, strengthen and co-ordinate agricultural and industrial extension services, develop or improve library services and use mass media to popularize science and technology. The Conference also recommended the establishment of a global network of scientific and technological information. The global network was meant to ensure an effective and intensive coupling of problem solvers and information services in both the developing and developed countries.

In recognition of the crucial role that information plays in the development process the Intergovernmental Committee on Science and Technology for Development decided at its sixth session, in resolution 6(VI) of 8 June 1984, to focus on information systems for science and technology for development as a substantive subject for in-depth discussion at its seventh session held from 28 May to 7 June 1985, and invited the Advisory Committee on Science and Technology for Development and the Task Force on Science and Technology for Development of the Administrative Committee on Co-ordination to give a substantial part of their attention to an in-depth investigation of the themes selected by the Committee. In response to this resolution, the Advisory Committee on Science and Technology for Development, in co-operation with the Government of Italy and the Istituto di Studi Sulla Ricerca e la Documentzione Scientifica of the Consiglio Nazionale delle Richerche (CNR) and the Comitato Nazionale dell' Energia Nuclear e delle Energie Alternative (ENEA), organized an *ad hoc* Panel of Experts on Information Systems for Science and Technology for Development, which met in Rome, from 21 to 25 January 1985. The recommendations of the Panel were considered by the Advisory Committee at its fifth session in February 1985.

Based on the views expressed by Member States in response to a questionnaire, the Advisory Committee on Science and Technology for Development, the ACC Task Force on Science and Technology for Development and other individual experts, the Secretary-General proposed to the Intergovernmental Committee the following measures:

(a) Strengthening of international assistance to developing countries in setting up their own national information systems and networks, especially through the strengthening of the Intergovernmental Programme for Co-operation in the Field of Scientific and Technological Information (UNISIST);

(b) Full activation of the source referral function and of the corresponding network of national focal points, building upon the structure of the International Referral System for Sources of Environmental Information (INFOTERRA), which would provide greater knowledge of existing systems and networks, their coverage, and ways and means to access them, and would thus promote their effective use;

(c) Enhancement of the inter-agency co-ordination and co-operation mechanisms and procedures of the ACC Task Force on Science and Technology for Development, in co-operation with the Advisory Committee for the Co-ordination of Information Systems (ACCIS);

(d) Formulation of pioneer projects to provide developing countries with basic primary information sources - journals, magazines and so on - through voluntary contributions.

These proposals were meant to strengthen existing mechanisms and structures. The Secretary-General also emphasized that for the global network to achieve its main objective of providing needed information to users in developing countries, national systems would have to be developed first.

The Secretary-General also stressed the vital and indispensable role of scientific and technological information policy in the overall development process and the accelerated growth in the production of goods and services. For Governments, scientific and technological information indicates the direction of scientific progress and technological change in different areas; for the educational and research institutions, it provides the essential material for scientific development, research and application in various fields and the sources of such data; for the production and service sectors, it provides the critical knowledge of technological alternatives and development in each field. Such information is the basic prerequisite for effective technological decision-making by policy-makers at the national level and by the various institutes and enterprises.

In the developed world, the rapid advances in information and communication technologies have led to a society dominated by information. These advanced technological facilities are used

largely for bibliographical references and information search and compilation, while the principal base of scientific and technological information in most developed countries is still provided through books, journals, published and unpublished research papers, and inter-institutional lending and reproduction services. It is emphasized, however, that with the rapid decline in the cost of micro-processors in recent years, scientific and technological information will increasingly be available only in machine-readable format on commercial terms and that there is an urgent need for developing countries to intensify their efforts to familiarize themselves with these new technologies.

It is against this background that the existing information institutions and facilities in developing countries must be viewed. The existing situation is characterized by considerable diversity in institutional facilities and infrastructure and in the degree of usage of scientific and technological information. Broadly, most developing countries can be categorized in one of three different groups in terms of the extent of such information activities as the formulation of information policies; the development of infrastructure, including computer and telecommunications facilities and institutional arrangements; and the capability for collecting, storing and disseminating scientific and technological information.

There are relatively few developing countries in the first category and within this group there are wide variations. In most of these countries, policies relating to scientific and technological development are fairly well-defined, as are those regarding scientific and technological information. Institutional and other facilities for the provision of information processing and communications technology have been developed, though institutional co-ordination is generally inadequate. In most developing countries in this category, the documentation centres have major cataloguing and indexing activities and a collection of relevant periodicals is maintained, though most such collections are fragmentary. In some countries, a National Union List of periodicals is maintained, together with a document delivery system, and published abstracts are generally available. Access to foreign data bases is, however, limited, mainly because of cost considerations.

The second group of developing countries is composed of countries where information facilities are less developed and have been set up mainly in certain key sectors of the economy. Basic institutional facilities and information dissemination mechanisms may also exist. In this group, information policies are not generally well defined and collection and dissemination of technical information is fragmentary and confined usually to certain fields. Institutional facilities for research are limited and information sources are linked to certain sectors. Only a few periodicals are available in complete collection and document delivery systems are available only in some subject areas. The collection of books and monographs is generally poor

and there is difficulty in acquiring new titles. Some collections of abstracts may be available in certain organizations, but these are often not comprehensive or even adequate. Computer facilities for acquiring scientific and technological information are fairly limited in these countries and can rarely be used for on-line searches of external data bases. Telecommunications facilities are generally inadequate for interlinking information subsystems in different areas of these countries, though access to external information systems may be available.

The third group comprises a large number of developing countries where information activities in science and technology barely exist or in which capability and use are at a very low level. In these countries, there is little awareness, at the user level, of the importance of technical information. The demand for and use of such information have not developed sufficiently and there is little effort in this regard. The collection of periodicals is quite limited and fragmentary with hardly any titles in various fields; the collections of books and monographs are also inadequate and are generally out of date. Computer facilities are not used for information processing because there are few skilled persons to deal with such information. In this group of countries, information activities and infrastructure facilities are, in general, extremely limited.

The problems are numerous and complex and there is no single prescription for the resolution of all of them. Each country is unique and its problems must be looked at within the national context. There is therefore a need for deliberate and concentrated efforts, especially on the part of the Governments of developing countries, international organizations, and donor agencies and Governments, to provide technical assistance for the development of national information systems and appropriate infrastructure.

It was in an effort to help this process along that this Seminar was organized. The distinguished information experts came from countries whose experiences in scientific and technical information activities vary widely. It is hoped that experiences were shared on the problems of scientific and technical information and that everyone was enriched by these experiences.

I wish to take this opportunity to thank the Government of the USSR for their support in organizing the Seminar. In particular, my sincere thanks go to the USSR State Committee for Science and Technology, the USSR State Committee for External Economic Relations and the All-Union Institute for Scientific and Technical Information (VINITI). I am grateful to the participants for the presentation of the papers contained in this volume. I also wish to acknowledge the assistance of the

Department of Technical Co-operation for Development of the United Nations Secretariat and the United Nations Development Programme for assistance in all phases of the Seminar. I deeply appreciate the enthusiasm of the staff of our Centre in the organization of the Seminar and the preparation of this volume.

Amilcar F. Ferrari
Executive Director
Centre for Science and Technology
for Development
United Nations, New York

CONTENTS

ANNEXES

INTRODUCTION

The Vienna Programme of Action, adotped by the United Nations Conference on Science and Technology for Development in August 1979, constitutes a principal basis for national, regional and international action in strengthening the endogenous scientific and technological capacities of developing countries.

The Intergovernmental Committee on Science and Technology for Development (IGCSTD) of the United Nations General Assembly provides the guidance and the directions for the implementation of the Vienna Programme of Action.

The Advisory Committee on Science and Technology for Development (ACSTD) assists the IGCSTD through identification and analysis of critical issues governing the effective use of science and technology for development.

Under the guidance of the Director-General for Development and International Economic Co-operation, the Centre for Science and Technology for Development of the United Nations Secretariat, in co-operation with concerned organizations in developing and developed countries, as well as in the United Nations system, is engaged in promoting world-wide efforts relating to the objectives of the Vienna Programme of Action and its implementation. In-depth discussion of the salient features of the Vienna Programme is facilitated through panels, seminars and other small gatherings of knowledgeable and experienced persons to focus attention on specific steps which can be accomplished with reasonable efforts. This publication is the outcome of an interregional seminar in this process.