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 cpinion 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.

(S)

FOREWORD

The importance of scientific and technical information in development process was not lost on the participants at Nations Conference on Science and Technology United 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 issues dealt with were the need for developing countries formulate and adopt national information policies as integral parts of their overall national development plans, strengthen and co-ordinate agricultural and industrial extension service develop or improve library services and use mass media services, The Conference and technology. popularize science scientific recommended the establishment of a global network of The global network was meant and technological information. 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 development process the Intergovernmental Committee on the Science and Technology for Development decided at its session, in resolution $6({\tt VI})$ of 8 June 1984, to focus sixth information systems for science and technology for development as 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 Force on Science and Technology for Development of Administrative Committee on Co-ordination to give a substantial part of their attention to an in-depth investigation of In response to selected by the Committee. themes 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 <u>ad hoc</u> 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:

364

- (a) Strengthening of international assistance to developing ountries 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.

Secretary-General also stressed the 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; 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 The existing situation is characterized by considerable diversity in institutional facilities and infrastructure and the degree of usage of scientific and technological information. Broadly, most developing countries can be categorized in one three different groups in terms of the extent of such information activities as the formulation of information policies; computer infrastructure, including development οf telecommunications facilities and institutional arrangements; and capability for collecting, storing and disseminating scientific and technological information.

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

	page
FOREWORD	iii
INTRODUCTION	i
PART ONE. REPORT ON THE INTERREGIONAL SEMINAR	•
Organization of the Seminar	4
Scope of the Seminar	7
Present status of development of scientific and technical	
	10
Problems of access to, adaptation and use of advanced information	17
Global Information Network	17
Recommendations	18
•	
PART TWO. SITUATIONS IN DEVELOPING COUNTRIES	
Some problems of information activities and the role of	
the Central Statistical Office of the Democratic Parchitic	
of Afghanistan M. H. Askaryar	2.0
	2 2
Evolution of scientific and technological information services in Algeria	
R. Mazouz	2 4
Patent documents as technological information source:	
ine Argentine experience	
H. N. Batto	3 2
Scientific and technological information services in Bangladesh	
L. Rahman	
	40
The trends and activities in the development of scientific and technological information in China	
Zhang Jing-Jing	47
	47
Cuba's national system of scientific and technical information	
R. Gonzalez	53
Information activities in the People's Democratic	
Republic of Yemen	
A. Assakkaf	58

	I u	p	1	e	Σī	e	t	а	t	i	0 1	1	0	£	t	: b	e		N.	a t	į	0	IJ	a	1	S	c	i	e:	n I	t i	f	i	c	ε	n	d	3	Гe	c	h r	ıi	. с	а	1					
	Ιn	I	٥	r	El.	a t	: 1	0	n A	ľ	le P	t	۳ ۳	٥			0	f		£ و	У	P	t																											_
																																																		7
	r h	e		r	e.	a 1	. i	t	i (e s	.	0	f		sc	i	e	n	t.	i f	i	c		a i	n d	t	ţ	e	c I	μt	3 (1	0	g	i c	a	1	i	'n	f	0 1	c w	a	t	i	0	מ			
	s y	S	ţ	eı	m	j	Π.		Ľ 1	ול	1 1	. 0	D	1 4	a																																			
								,	κ.	•	1	1	ĸ	u	•	•	•	•	•	• •	٠	•	٠	•	• •	•	٠	•	•	• •	• •	•	•	•	• •	•	•	• •	•	•	• •	•	•	•	•	•	•			8
:	N a	t	i	0	n.	a 1		e:	x [ρ €	ì	·i	e	n e	: ε	•	٥	f	(3 b	a	n	a		i r	1	E	h	e	f	fi	۵	1	a	Č	F	•	2.2	T											
	i n	f	0	r ı	D 4	a t	i	0 1	n																																									
								(G.	•	0	t	0	0	K	w	â	d	e ;	7	•	•	•	•		•	•	4				•		•		•				•						•				96
1	ם ר	17	_	1.	_			_	-	_	, F				e .		_	_	٠.		_			_																	_									
	: e	ċ	h:	ה ה	0	lo	2	v.	ب غ	in	, ,	I	ת הימ	d:	i a	, [т Ш	a	C :	. C	s	۵	S; ni	y : -	S (: e	m e	S to		: C	10	'n	\$: A	: c	le :,,	ם +	C (<u> </u>	a	n	1									
1	r	0	s	P	e (: t	S																																											
								3	D,	•	S	e	h	g	1		٠	•						•		•																								105
	, _							_							,								_			_																								
•		1	e :	C. 1	[]	LI	1	C 1	a 	חו	a M	_	t : 1 :	ec ir	: h	п	0	1 () §	1	С	a	1	1	. 17	Ī	0	r 1	n e	t	i	0	ם	i	ח		M e	X	i	c ()									
								•	-		••	Č	•	٠.			•	•	•	٠	•	•	•	• •	•	•	•	•	• •	•	•	٠	•	• •	٠	•	• •	•	•	• •	•	•	٠	• •	• •	•	• .			22
1	h	e	:	s t	: 8	t	e	á	3 11	đ		d	e٦	v e	: 1	0	ρı	n e	e r	ţ		0 :	£	t	h	e		S	t a	ı t	: e		s y	y s	t	ei	מ	٥	f											
5	C	1	e I	ı t	. 1	. f	10	2	а	n	ď		t e	e c	h	n	i	2 4	1		i	n:	E c	1	D.	8	t	i	ח	ı	i	ם	t	: h	e	1	M c	n	g (o 1	li	a	n							
ŀ	, е	0	Ρ.	L e	• '	S)	Κe	e p	u	ь	I	Ì٤	:																																				
								-	٠.			η.	a .	ננ	: а	r	K	זמ	ı	٠	٠	•	• •	•	•	٠	•	•	• •	•	٠	•	• •	• •	•	•	• •	•	•	• •	•	•	٠		•		•		1	28
9	c	i	e i	1 t	: i	f	i	2	а	מ	d		t e	e c	h	מ	o :	l c	9	i	c.	a :	1	i	n	£	0	rı	o a	t	i	0	n :			T :	h		10			_	÷	aп						
S	i	ŧ,	1 6	ŧ	: i	0	n																																											
								J	Ι.		I	•	(C h	i	n	ed	i)	•	•	•		•	•	•			٠.	•		•			•	•		•	•			•	•	٠.			,			136
R	. 0	1 4		a	חו	a	1	•	٠.	a	۰	n					٠.			_	e				_	_	_			_			_ ,						ic											
i	n :	Ē (-) 1		a	t	i	ם מכ		a	c	t :	i v	'n	t	i	e :	 }	'i	n	٠,	ri Ti		i	1	u a i	r. na	1	. 1	. C		8 1	n o	ı	τ	e	מי	n	10	: а	I									
								A	٠.		S	iı	n g	h	a	b l	h a	ı	đ	h:	ı	٠,				•																							1	42
																																													Ī	Ī			•	7.
		-								p	Δ 1	p 1	r	T	ш	D:	ė			77	T 1	CT.	10			b T 1				_	_	.						_		_		_								
										•	Α.	Į	J N	ı	0	N.	<u>.</u> ر	F		v Si	01	C M	. E	т	A	N I	u na	1 7	X.	r	E T	K.) S.1	l E r	N D	C.	E :	j TR	I	N I (Ţ	H	E								
				٠																																														
T	h e	2	r	0	1	e	C	f		S	c :	iε	2 [t	i	f:	i c	:	i	n:	Εc) [m	а	t	i	9 6	2	a	c	t	i١	, i	. t	i	2 6	:	i	n	t	b	e								
ď	e٦	7 €	1	0	P	ED (e n	t		0	f	S	C	i	e:	n c	: 6	:	а	D.	1	t	e	c	h	n (o 1	l a	٤	v																				
								A	•		Ι.	•	M	1	ĸ	h a	1 1	. 1	0	٧	•	•	•	•	•	•	٠.	•	٠	•	•	• •	• •	•	•		•	•	٠.	•	•	٠.			•	•			1	58
I	n f	÷ c	r	m	а	t	ic	n		SI	u I	ם כ	0	r	ŧ		ı f		ш	a ı	ء د	10	۵		i :	a 1	,	_	_			٠.		_	1				ρi	_										
9	c i	e	n	t	i	f	ic		a	n c	ì	t	: e	c	h i	n j	ί¢	a	1	1	0	١ (i	c	ν																_									
								D	•	:	s.		C	h	e:	r e	2 S	h	k	i	1						٠.																						1	68
Ŧ			_	_																																									Ī	-			٠	•
8	y s	. e	-	n.	а	t : n f	. O	n	a h	ī	s	C M	1	e	n I	t 1		l L	c	-	ı	d		t	ec	: 1	מנ	i	C.	a i	1	i	n.	£	0 1	ī	a	t:	i o	n										
-	, ,	٠	_			~ 1	•	Ĺ	•••	- }	١.	61	S	a U	נ המ	u e	. П	k	e o	ζ.	C	S	u.	n	C I	r 1	.e	8	Δ.	.	٠,			۵.	17														,	^-
																																									•	• •	•	•	•	•			1	8 5
T	h e		r	0	1	9	0	f	á	a u	t	0	Œ.	a	t i	0	n		iı	1	i	n	f	0	ru	a	t	i	0 1	ם	s	u	Р	p	o r	·t		f c) ד											
5 (i	e	n	ζ:	1 :	. 1	. c	4	a t	n d	L	t	e	C.	h r	ıo	1	٥.	g	i c	a	1		p:	7	g	r	e	6 :	S																				
				•	٠	-			u (υį	. 0	S	п	11	1							_	_																										•	

Urilizatio	on of information resources for economic	
developmen		207
developme.	nt of a region I. F. Bogdanov	207
Clobal pro	oblems of scientific and technical information	
Global pro		
and inter	R. B. Seiful-Mulukov · · · · · · · · · · · · · · · · · · ·	214
	K. B. Selidi-nalakov vivi	
	e system of scientific and technical	
State-wid	e system of screatific and the	
informati	on in the USSR Yu. M. Ivanov	225
	Yu. M. Ivanov	
Basic dir	ections in the development of informatics	231
	G. S. Pospelov	
	, of aniontific and	
Patent in	formation as an instrument of scientific and	
technolog		253
•	ical development O. V. Kedrovsky	
	TO NOT THE TONG OF	
	PART FOUR. EXPERIENCES OF THE ORGANIZATIONS OF	
	THE UNITED NATIONS SYSTEM	
	•	
Clobal ne	etwork for scientific and technological	
informati		
INTOLMACI	K. Aning	
	a and Technology	
	for Development (CSTD)	264
a.	nce Technology Alert System (ATAS) as an	
The Advan	ion source for new technologies	
informat:	A. Lemma and R.A. Vitro	
	- c c i and Tachnology	
	for Development (CSTD)	277
	for Development (GSID)	
	- Poformal System of the	
INFOTERR	A: The International Referral System of the	
United N.	ations Environment Programme (Char)	
		285
	T. Munetic United Nations Environment Programme (UNEP)	5
Users an	d use of patent information in developing	
countrie	s - some insights gained from an assistance	
programm	e	
1.00	R.Blumstengel	
	World Intellectual Property Organization	296
•	(WIPO)	

ANNEXES

I.	Agenda	and organization of work	302
II.	List of	participants	304
ııı.	List of	documents	319

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 International Economic Co-operation, the Centre for Science and and Technology for Development of the United Nations Secretarist. in co-operation with concerned organizations in developing and developed countries, as well as in the United Nations system, is promoting world-wide efforts relating to engaged in οf the Vienna Programme of Action and objectives In-depth discussion of the salient features of implementation. 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.