

**International Environmental  
Information System  
INFOTERRA  
in the Soviet Union**



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1977 \* 10 Years of Information Effort \* 1987

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1987

INTERNATIONAL ENVIRONMENTAL INFORMATION  
SYSTEM OF THE UNITED NATIONS  
ENVIRONMENT PROGRAMME (UNEP) —  
INFOTERRA

USSR COMMISSION FOR UNEP

INTERNATIONAL ENVIRONMENTAL  
INFORMATION SYSTEM  
INFOTERRA  
IN THE SOVIET UNION

(10 Years of Operation)

All-Union Institute of Scientific and Technical Information --  
the National Focal Point  
of the USSR in INFOTERRA

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This edition has been prepared at the initiative of the USSR Commission for UNEP to introduce foreign readers to the main results of the Soviet Union's cooperation with the International Environmental Information System (INFOTERRA) of the United Nations Environment Programme (UNEP) over its decade of operation.

Providing general information about the aims and structure of INFOTERRA, the publication describes cooperative projects of the Soviet organisations concerned with the system and INFOTERRA-related work in the CMEA region.

The inputs used to prepare the brochure included official documents and data of the INFOTERRA Programme Activity Centre, national focal points and information sources, coupled with materials of the International Centre for Scientific and Technical Information.

The edition was shaped for printing at the All-Union Institute of Scientific and Technical Information (VINITI) — the National Focal Point of the USSR in INFOTERRA. The text was co-authored by VINITI staff members A. N. Gratsiansky, R. Y. Malakhova and J. V. Polskaya, with specific sections contributed by V. N. Tikhomirov from the USSR Commission for UNEP, V. E. Kodola from the International Centre for Scientific and Technical Information, R. K. Kozhevnikova from the Byelorussian Institute of Scientific and Technical Information and Techno-Economic Research, R. G. Yurkovsky from the Ukrainian Institute of Scientific and Technical Information and Techno-Economic Research, and B. N. Shechkov from the All-Union Research Institute of Hydro-meteorological Information/World Data Centre. The editor is A. N. Gratsiansky.

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## INTRODUCTION

Protection of the environment and rational use of natural resources is a major global problem of modern times. The need to preserve nature on our planet for the present and future generations becomes an ever increasing concern.

The Soviet Union made environmental protection a national goal and its environmental policies are set in the Constitution of the USSR, decrees and decisions of supreme Party and Government authorities. The ecological problem is approached with the realization that it is beyond any one country or even several countries to resolve. This motivates the Soviet Union's commitment to wide international cooperation in the environmental area: including rational resource use, and participation in a large number of inter- and non-governmental organisations addressing environmental concerns such as CMEA, UNEP, UNESCO, WHO, FAO, IAEA, WMO, ESCAP, IUCN, and others.

Hundreds of Soviet research centres, laboratories and other organisations are seeking solutions to complex interdisciplinary environmental problems, making each its own contribution to major international programmes e. g. the Overall Expanded Programme of Cooperation of CMEA Member Countries for 1986-1990 in the Field of Protection and Improvement of the Environment and Related Rational Use of Natural Resources; UNEP System-Wide Medium-Term Environment Programme, and UNESCO «Man and the Biosphere» Programme.

The Soviet Union signed a series of important conventions and other international documents; notable among them are the Convention on Long-Range Transboundary Air Pollution and Declaration on Low-Waste and Non-Waste Technology and Reutilization and Recycling of Wastes. Together, they constitute perhaps the most important and practically relevant outcome of the All-European Summit Meeting on the Protection of the Environment, held in 1979. The USSR ratified two other conventions, On Early Notification of a Nuclear Accident and On Assistance in the Case of a Nuclear Accident or Radiological Emergency.

Much importance is attached in the USSR to cooperation with the United Nations Environment Programme, UNEP, mandated

to be an effective means for coordination and stimulation of efforts and activities by international inter- and non-governmental organisations to deal with problems of the environment. One specific confirmation of that came with the creation of a dedicated body, the USSR Commission for UNEP, that was instituted by a Soviet Government decision to support the Soviet Union's participation in UNEP. Membership of the Commission includes representatives of the ministries, agencies and organisations concerned on the national and republican level; prominent individuals in science, education and culture; leading experts from the environmental community, industry and agriculture; and members of the public.

The Soviet Union offers UNEP financial support, contributing eight million rubles every three years to its Voluntary Fund.

In meeting its responsibilities, the USSR Commission for UNEP relies on the head ministries, agencies and public organisations—those designated to lead specific areas of cooperation with UNEP, and employs a variety of forms and mechanisms to carry out cooperative programmes with UNEP and other international organisations.

An example worth mentioning in the present context refers to fruitful cooperation in the Global Environmental Monitoring System—GEMS, International Register of Potentially Toxic Chemicals—IRPTC, and International Environmental Information System—INFOTERRA; for all of these adequate facilities were provided by the apex Soviet organisations to form and maintain the respective national specialized centres, or focal points. In a similar move, the Institute of Deserts in the Academy of Sciences of the Turkmen Republic was designated as a Soviet national focal point to promote desertification control activities in the ESCAP region after a network of regional focal points was established for research and personnel training in this area of concern.

Vigorous work in toxicology is done under the International Programme of Chemical Safety, IPCS, co-sponsored by UNEP, ILO and WHO; in pedology Soviet soil scientists have been part of the effort to develop the World Soil Policy; experts from the Soviet Union are importantly involved with foreign counterparts on the UNEP Industrial Programme. The USSR remains loyal to its commitments on two conventions developed with UNEP sponsorship, one related to the protection of the ozone layer and the other to international trade in endangered rare species of plants and animals. It contributes significantly to implementing the Action Plan to Combat Desertification and to drafting international legislation on the environment and other relevant fields.

The scope of the Soviet Union's cooperation with UNEP is clearly suggested by the fact that in the period of 1981-1986 al-



ne the USSR Commission for UNEP hosted in the Soviet Union, drawing from the Soviet contribution to the UNEP Voluntary Fund, more than 170 international functions with a total attendance of 2.3 thousand people from 120 states. The largest and most important of these were the First International Conference on Environmental Education (1977, in Tbilisi), First International Biosphere Reserve Congress (1983, in Minsk), and ECE Seminar on Non-Waste Technology (1984, in Tashkent).

To assist developing countries with manpower development, about sixty international training courses and seminars have been provided in the USSR in subjects covering health and the environment, desertification control, management of water resources, information services, initiation and management of protected areas, environmental impacts of agriculture, biotechnology, and prevention of environmental pollution by chemicals. Their participation involved around 1000 specialists on varying levels of expertise from more than 100 countries, along with five thousand Soviet scientists and specialists from 400 organisations of 65 national and republican ministries and agencies.

Importantly, results of the cooperation with UNEP are made available to all countries concerned, developing nations above all. Through enrollment in the collaborative efforts with UNEP attendees from developing countries of Asia, Africa and Latin America become exposed to the achievements of Soviet science and advanced practices, and their application in dealing with the problems that confront these countries in the conservation of nature and rational use of its resources to further the interests of their socio-economic development. Numerous groups of Soviet scientists and specialists travel to developing countries for immediate practical assistance and advice.

As part of the Soviet cooperation programmes with UNEP this country's printing houses brought out over 300 publications in scientific and applied fields in a variety of foreign languages to allow their wide dissemination abroad via the UNEP channels and those of other international organisations.

The Soviet Union considers international cooperation in environmental issues an important factor promoting mutual understanding and strengthening world peace. The USSR has in fact initiated the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques and, in concert with several other states, proposed the resolution on The Historical Responsibility of States for the Preservation of Nature for Present and Future Generations.

This brochure is addressed to the USSR/UNEP cooperation within the framework of the International Environmental Information System—INFOTERRA—whose ten years of operation as an information system is marked in this current year of 1987.

## INFOTERRA: ACTIVITIES AND SERVICES

Scientific and technical information keeps growing in importance under present-day conditions. This growth is especially noted in the areas concerned with complex interdisciplinary problems which include, first and foremost, the protection of the environment and rational use of natural resources. Virtually all scientific and technological fields are involved in theoretical or practical work on the problem. The results are publicized by thousands of editions in numerous languages or amassed and stored by various agencies throughout the world. The vast scope of information diffusion makes it difficult to access and utilize for the scientists and specialists gathered around environmental concerns. All too often they fail to apply independently and timely relevant domestic and foreign experience, spending too much time and money to locate the needed published, more so unpublished information.

Given this situation, information systems and services become all-important with their capabilities for information gathering and processing and its conveyance to the user as information publications, computer-readable carriers and other formats convenient to use. Since the environment is a global concern, added significance goes to the international information systems active in ecological information exchanges among countries as a way to increase international cooperation and mutual understanding in the environmental field.

INFOTERRA, the International Environmental Information System, currently ranks among the most advanced and reputed information systems on the global level. Its origin goes back to the decisions of the 1972 United Nations Conference on the Human Environment in Stockholm.

INFOTERRA amounts at present to a ramified international mechanism to bring in contact those who need information, or information users, with those who possess and are able to supply the information needed, or information sources. Originally, INFOTERRA was conceived as a referral system designed to respond to user inquiries by providing lists of information sources concerned with a specific environmental dimension. This pattern of operation was integrated into the name of the system known first as the International Referral System—IRS. In 1977 it began to function as an operating system and in 1979 took on the name now used—which is not an abbreviation but rather translates as Information about the Earth.

As the system kept expanding, the need to multiply its functions so as to get it to provide besides referral also substantive information became increasingly obvious. The present-day INFOTERRA is an advanced referral and substantive information

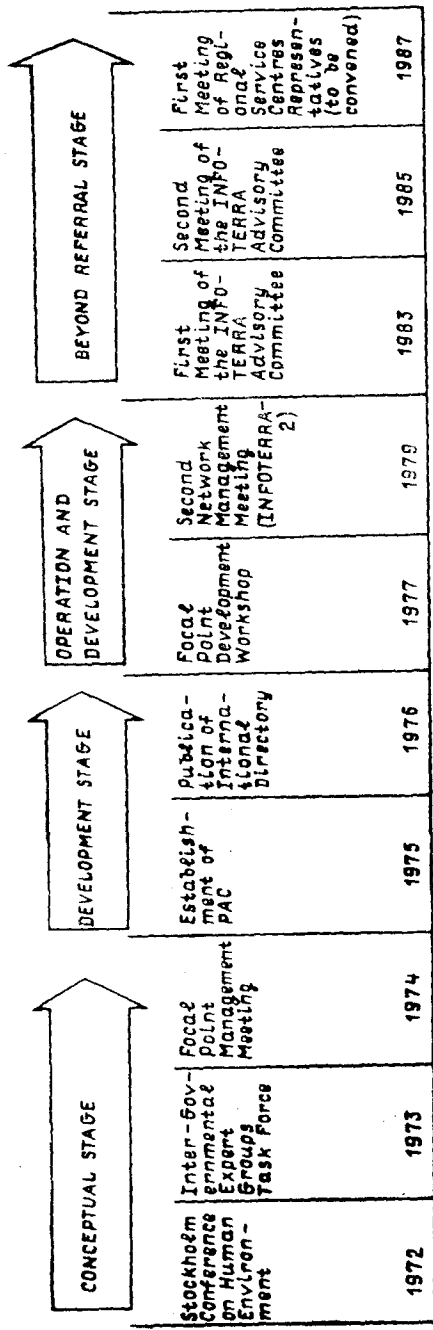


Diagram 1. Key development stages of INFOTERRA



system, with the proportion of the inquiries on which users are given substantive information increasing with each year.

The key development stages of INFOTERRA are illustrated in Diagram 1.

The membership of INFOTERRA consists at present of 127 countries:

Algeria	India
Argentina	Indonesia
Australia	Iraq
Austria	Ireland
Bahamas	Israel
Bahrain	Italy
Bangladesh	Jamaica
Barbados	Japan
Belgium	Jordan
Belize	Kenya
Benin	Kuwait
Bolivia	Lebanon
Botswana	Liberia
Brazil	Libya
Bulgaria	Madagascar
Burkina Faso	Malawi
Burundi	Malaysia
Byelorussian SSR	Mali
Cameroon, United Republic	Malta
Canada	Mauritania
Cape Verde Islands	Mauritius
Central African Republic	Mexico
Chad	Mongolia
Chile	Morocco
China	Nepal
Colombia	Netherlands
Comoro Islands	New Zealand
Congo	Niger
Costa Rica	Nigeria
Côte d'Ivoire	Norway
Cyprus	Oman
Czechoslovakia	Pakistan
Denmark	Panama
Ecuador	Papua-New Guinea
Egypt	Paraguay
Ethiopia	Peru
Federal Republic of Germany	Philippines
Fiji	Poland
Finland	Portugal
France	Qatar
Gabon	Romania
Gambia	Rwanda
German Democratic Republic	Saint Lucia
Ghana	Salvador
Greece	Saudi Arabia
Guatemala	Senegal
Guinea	Seychelles
Guinea-Bissau	Somalia
Guyana	South Korea
Honduras	Spain
Hong Kong	Sri Lanka
Hungary	Sudan

Sweden  
Switzerland  
Syria  
Tanzania, United Republic  
Thailand  
Togo  
Tunisia  
Turkey  
Uganda  
Ukrainian SSR  
United Arab Emirates  
United Kingdom

United States of America  
Uruguay  
USSR  
Venezuela  
Vietnam  
Western Samoa  
Yemen Arab Republic  
Yugoslavia  
Zaire  
Zambia  
Zimbabwe

The location of INFOTERRA national focal points is shown in Diagram 2.

The subjects covered by INFOTERRA are presented below in alphabetic order:

Atmosphere and climate  
Chemistry and biology  
Disasters  
Education, training and information  
Energy  
Food and Agriculture  
Freshwater environments  
Human health and well-being  
Human settlements and habitat  
Land use  
Management and planning  
Marine environments  
Monitoring and assessment  
Natural resources  
Physics  
Pollution  
Socio-economic aspects  
Subject disciplines  
Technology and industry  
Transportation  
Wastes  
Wildlife — animal and plant

Within its scope of coverage INFOTERRA interacts with many national and international organisations.

### **INFOTERRA System Design**

INFOTERRA is a decentralized network of national, regional, and sectoral centres which are held together by the Programme Activity Centre, PAC (Diagram 3). The national centres and information sources are free with respect to the information they provide to meet inquiries of the INFOTERRA system, and the terms on which they provide it. Suggestions on improved opera-



□ - PAC   ★ - NFP of the USSR   ★ - NFP of the Byelorussian SSR and Ukrainian SSR   ● - Foreign NFPs

Diagram 2. Geographic location of INFOTERRA focal points



tion and the system's updating are drafted by the INFOTERRA Advisory Committee.

The INFOTERRA Programme Activity Centre situated at UNEP Headquarters in Nairobi, is the coordinating unit of the INFOTERRA system and acts as a focal point for the United Nations and other intergovernmental organisations, as well as for countries not yet participating in INFOTERRA.

When general matters of the system's functioning or upbuilding need to be discussed it is the PAC that calls up a meeting of representatives of the national focal points. The latest of these, known as INFOTERRA-2, took place in Moscow in 1979.

An important PAC objective is maintenance of the INFOTERRA International Directory containing data on institutions or individuals who have information on specific environmental topics as well as other INFOTERRA tools, and their timely updating and publication.

On NFP queries, the PAC searches information in the International Directory and responds to incoming requests for information. Computerized search in the Directory is carried out by the INFOTERRA Computer Unit, Geneva-based and using the facilities of the UN Computer Centre there, which is linked with the PAC through a constant communication line. In addition, the PAC assists national focal points on responses and on the reception of substantive information in uncommonly intricate subjects.

The PAC issues in English, French and Spanish a bimonthly information bulletin of INFOTERRA which reviews current operations at the NFPs and the whole INFOTERRA system.

**The INFOTERRA Advisory Committee (IAC)** is appointed by the Executive Director of UNEP out of NFP representatives and specialists in information and environment from outside the INFOTERRA network.

The IAC is a consultative body with the duty of aiding the PAC to keep the INFOTERRA system development in line with present and future requirements to it. The IAC sessions examine the possibilities that exist for evolving further the whole network and its components and make appropriate recommendations to this effect, and evaluate cost-effectiveness of INFOTERRA performance. If necessary the recommendations are brought to the attention of the UNEP Governing Council, with the IAC taking responsibility for supervising proper fulfilment of the latter's decisions.

For the first time the IAC met in Athens, Greece, in October 1983 and came up with specific recommendations for ways to expand the INFOTERRA functions beyond the referral services. The second IAC meeting at Sochi, USSR, in April 1985 discussed further expansion of INFOTERRA as a substantive information system (photo 1).

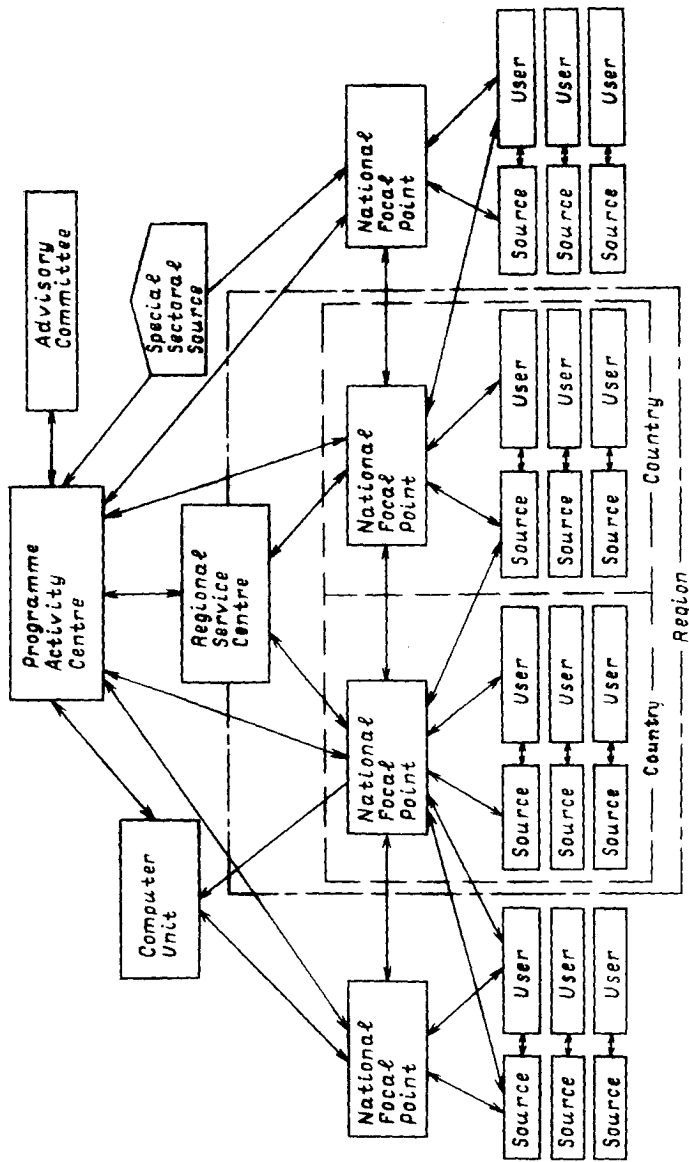


Diagram 3. INFOFERRA: structure and communications

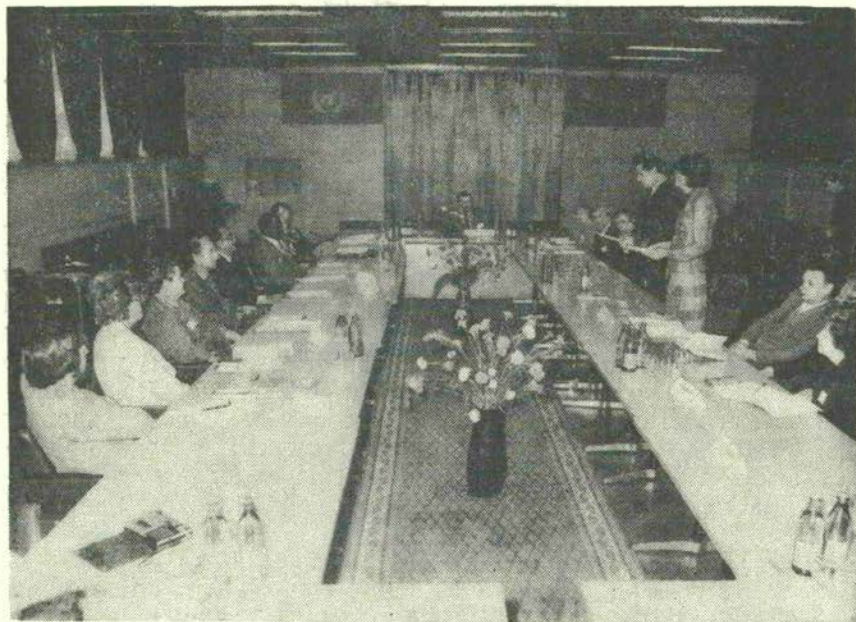


Photo 1. Meeting of INFOTERRA Advisory Committee in Sochi, 1985. Participants of the meeting are greeted by Sochi Mayor I. Kuzmenko

**National Focal Points** are designated by the member countries' governments to represent these countries in the INFOTERRA system. They provide contacts between information users and sources and maintain communications with the PAC and other INFOTERRA divisions.

The National Focal Points:

- identify information users/sources in their respective countries and introduce them to the INFOTERRA system;
- supply the PAC with data on the national information sources which the country concerned deems it necessary to include in the International Directory, and update their inventory on a regular basis;
- make sure that the queries of national information users are met through the INFOTERRA channels;
- keep INFOTERRA performance consistent with the workings of the national environmental information system and of the international information systems in which the country in question is affiliated;
- maintain the International Directory and review it to recognize sources with a potential to handle the requests of user communities at home and abroad;
- process and store the materials made available on user



requests through the focal point with a view to their provision if requested again;

— spread INFOTERRA awareness among national user communities and assist in its upbuilding.

The NFP maintains a National Information Directory and lists there all agencies, organisations and enterprises that are likely to possess specific environmental information and able to provide it on request by national and foreign information users.

Vigorous work is in progress to spawn **Regional Service Centres (RSC)** whose responsibilities are usually assumed by one of the NFPs in the countries comprising the region or one of the regional international organisations. Regional Centres act to coordinate NFP performance in the countries of that region, keep and issue on request the information materials that are products of concerted effort by the region's countries, and sponsor INFOTERRA-related functions in the region. The RSCs objectives and the problems facing them will come for review by representatives of the INFOTERRA Regional Centres at their first seminar due later this year.

**INFOTERRA users** include any organisations, agencies or enterprises seeking information on the environment and rational use of natural resources. Information sources may likewise appear as users if registered in the INFOTERRA International Directory.

In industrialized countries research centres and universities represent 46 percent of the INFOTERRA user community; government agencies, 34 percent; industrial users, 11 percent; in developing countries the respective figures are 23, 46 and 15 percent.

**INFOTERRA sources** are government or public organisations which possess information on environmental problems and rational use of natural resources; have consented to participation in INFOTERRA; and can provide the information through the system when so requested. They are research centres, currently representing 60 percent of their total; universities and other schools of higher learning; libraries, museums, scientific societies, scientific and technical information bodies, printing houses and other agencies concerned with environmental issues.

Where an organisation totally applies itself to a specific environmental subject it constitutes a single information source. With several divisions in an organisation, each concerned with its own set of environmental questions, every one of them can be registered as an independent information source.

The sources are registered by their respective NFPs and are listed in the International Directory with a coded description of their subject area, the type of available information, and the terms of its provision. Upon registration the source must be able to reply to all requests for information channelled to it via

INFOTERRA. The reply may be a. provision of the information requested; b. a statement to inform the user of the specific conditions under which the information can be provided, and c. in some cases, a statement to inform the user that the desired information is not available.

Faced with circumstances causing a delay in the provision of a reply to a query the source should advise the user of: a. the time taken to fulfil the request; b. any restrictions on the provision or use of the information requested; and c. the financial terms for providing the information.

INFOTERRA performs quality control of the information sources at their selection and revalidation and constantly monitors the nature and quality of the replies from them by continuously testing the extent of user satisfaction.

Keenly conscious that the future of INFOTERRA is in many ways dependent upon the type and quality of its user services, the PAC management emphasizes increasingly the expansion of information services to include the provision of primary sources, and the integration of latter-day information technologies into the system. But because the PAC itself has neither adequate personnel nor the needed technological support to organize and run large data bases on interdisciplinary problems such as environmental protection, the main accent is made on exploiting the information capabilities of specific and most representative specialized information agencies on the national and international level. For purpose of the INFOTERRA system, such organizations appear in the capacity of special sectoral sources of information, or Sectoral Centres.

In 1986 information services to users were provided by 15 sectoral sources in the following subjects:

- industry and the environment
- environmental management
- monitoring and assessment
- transport
- toxic chemicals
- environmental legislation
- water supply and sanitation
- new and renewable energy
- arid lands and desertification
- environmental education and training
- hydrometeorology
- appropriate technology
- agriculture and the environment
- waste management.

Notable among the sectoral sources are internationally acknowledged information services such as ASLIB (UK), INIS (USA), and All-Union Research Institute of Hydrometeorological Information (USSR). The sectoral source initiation is a conti-



nuing effort and to date the IAC has identified twenty three priority subject areas central to sectoral source performance.

The sectoral sources generally undertake a search in a few days since the arrival of a request whereafter the results, formatted as printouts with bibliographic refer information, are sent to the user by airmail. After the bibliographies have been received the user may request the sectoral source to provide copies of the primary source.

Within reasonable limits the PAC is prepared to pay for the information services rendered by sectoral sources, notably to developing countries. The requests to these sources should be therefore addressed to the PAC. The INFOTERRA NFPs or users willing to pay for information services on their own are free to approach the sectoral sources without PAC intermediary by merely indicating the willingness in their requests.

### INFOTERRA Tools

The system's routine working tools are the International Directory with an Index; the Thesaurus; and the INFOTERRA Operations Manual.

**INFOTERRA International Directory**, the principal working document, is prepared at the PAC from inputs by NFPs. It contains references to the various national and international organisations that are registered with INFOTERRA as information sources, giving the particulars of their activity, potential, subjects areas, and the terms of offering information on queries from INFOTERRA users.

Each registered source receives an accession number which incorporates: a. a three—digit identifier assigned by INFOTERRA to each specific focal point; b. a four—digit code which groups sources within a country and is assigned by focal points; and c. a two-digit code to identify ordinal numbers of sources accountable to one superior organisation. The accession number is followed by the name and address of the source and a brief general free text description of the source's activity and potential.

The further source description in the INFOTERRA International Directory is structured on the following scheme:

- subject attributes to characterize the source's subject coverage;
- working languages in which the source is prepared to deliver information;
- geographical coverage that lists the countries and regions on which the source can provide information;
- significance of information source, whether national or international, governmental or nongovernmental, and so forth;
- functions of information source;
- information availability; and



— information form and format.

There are several ways to carry out a search of the International Directory. Many NFPs opt for computer search, using local computers with computer tapes and programs provided by PAC. A request for computerized retrieval may be also directed to the PAC.

Also, the Computer Unit in Geneva offers a telex search to INFOTERRA focal points who have access to a telex machine in a country which can be reached by direct dialling from Switzerland. When this is the case the NFP makes a search telex to an accepted format similar to the general format for computer retrieval of sources. These telex services are available daily around the clock. If the telex lines are not busy the answer-back telex with a source listing should be expected within fifteen minutes.

Manual searching of the Directory is also possible. The main tool for manual searching is the Cumulative Index to the International Directory — a list of subject attributes together with all registered sources which specified the given attribute as most relevant.

The Directory, together with its Index volume, is published in four languages (English, French, Russian and Spanish).

The large scope of the Directory and Index makes their maintenance and use impractical anywhere except in the PAC and NFPs and it is at the PAC that organisations concerned, whether users or sources, can acquire the Directory.

**INFOTERRA Specialized Directories** are compiled by the INFOTERRA PAC in priority areas of environmental concern. They comprise relevant source descriptions from the International Directory as well as bibliographies and other information compiled in collaboration with other UNEP divisions. The Specialized Directories published to date address major subjects of current concern such as desertification, chemical safety, drinking water supply and sanitation, new and renewable energy sources, pulp and paper manufacture, appropriate technology, and conservation of nature.

**INFOTERRA Thesaurus of Environmental Terms** is an indispensable tool for retrieval of information on INFOTERRA sources, it is a revised edition of the Attributes List published by INFOTERRA in 1977 as part of its Operations Manual.

The Thesaurus consists of five sections. The first of these holds organisational attributes which describe the functions of information sources along with their geographical coverage, working languages, and the availability and format of their information. The second section lists subject categories. The third presents subject attributes by their categories so making it in effect the principal coding tool. Indeed the user first examines the list of subject categories and sub-categories and then picks out the descriptors (subject attributes) that most accurately match

the content of an inquiry. The listing of subject attributes totals about 900 terms and definitions. The fourth and fifth sections in the Thesaurus provide listings of subject attributes in the alphabetic sequence and the sequence of their code numbers, respectively.

The INFOTERRA Thesaurus is published in English, French, Russian, and Spanish, with the same four-digit record applied to code an attribute in each of these languages.

In most cases the content of an inquiry can be adequately conveyed with a few logically connected definitions. As an example, the subject attributes below are sufficient to express a query about the wildlife of tropical ecosystems:

2450 wildlife

1721 tropical ecosystems

If one considers further that extensive information under the subject relates to work in national parks, it seems natural to add the supplementary attribute of «national parks and protected areas (2390)». In computer search of relevant sources a few supplementary attributes can be integrated as long as they do not exceed the established maximum of 20 attributes beyond which the simultaneous use of their excess quantity will make the search counter-productive.

In the case of computer searches quantitative characteristics, or «weights» can be given to the attributes in order to identify the descriptors, into those which more (or less) completely express the original query. The weights assigned to each attribute range from one to nine. However improperly weighted attributes are likely to distort the search results i. e. misrepresent the sequence of source listing according to their relevance.

**INFOTERRA Operations Manual** contains a description of the system and of the operations in communicating information down its datalinks. The Manual is arranged in three parts: Management, Technical Operations, and Computer Operations, which are addressed, respectively, to INFOTERRA national focal point managers, technical staff responsible for day-to-day INFOTERRA operations; and computer experts at those focal points which opt to use computers in INFOTERRA work.

The new edition of the Operations Manual (its Russian version will see the light in 1987) accommodates the changes of INFOTERRA activities taking place over the recent years—expanded INFOTERRA functions, updated terminology, and more careful selection of sources before registration.

**INFOTERRA Promotion Manual** offers guidance on compiling media statements to promote INFOTERRA information services.

### **INFOTERRA Information Services**

INFOTERRA was started as a referral system which provided in response to user requests little else than addresses of the information sources which could be approached for the informa-



tion requested. Upon obtaining the sought for reference the user turned to the source to see if he could have desired information. The INFOTERRA-2 Meeting and subsequent evaluation of the system's performance recognized progress of INFOTERRA from a purely referral type information system treating the user exclusively with the addresses of the information sources relevant to his request to a referral cum substantive information system which delivered «hard copies» as well.

As a result of the INFOTERRA upgrading, the past three to four years have seen marked growth of the system's utilization by its participants. By some crucial indicators it has reached the standard of performance matching the best-known commercial information systems in the West. It accomodated a total of 6.200 requests in 1983; 9.100 in 1984; and 11.000 in 1986. About a half of these come from developing countries and 16 percent from socialist states. 60 percent of the queries were answered by provision of substantive information, almost 70 percent of it on paper and the balance 30 percent on microfiche.

Data presentation formats also vary widely: 71 percent of the sources provide publications or reports, 46 percent offer assistance through expert services or recommendations, and 28 percent render bibliographic services. Numerous sources make information available in a variety of formats.

The most common subjects of requests are environmental management and planning, pollution control practices and technologies, and environmental health effects.

For any information system, its usefulness is defined by the amount of materials channelled through it and timing in their delivery to the user. With respect to INFOTERRA, these performance characteristics were assessed from the evaluations feedbacked by the users ninety percent of whom rated the information services obtained as being «useful» and «very useful». The average delivery schedules through the PAC, which transmits about one third of all requests, took one to three days for referral type services.

In 1983 the INFOTERRA system assembled over 10.000 information sources in 88 countries. Before revalidation of the sources in 1984 it was decided that their total number be reduced to keep only those which were very active and provided information of high quality. The revalidation left just over one half of the sources so that by 1986 INFOTERRA comprised nearly six thousand sources from 70 countries and several international organisations.

In the next few years INFOTERRA contemplates vigorous and broad transfer into its operations of modern-day information technologies using computers and computer-based communications with emphasis on personal computers. For a longer term there are prospects of developing problem-oriented data bases on

particular environmental facets and a multidisciplinary distributed environmental data base with on-line access and with many national and international agencies taking part.

The first phase involves the transfer of microcomputers into a number of INFOTERRA NFPs. In 1986 the PAC completed a new version of the INFOTERRA computerized directory using an application package of the mini-ISIS type (a number of Soviet organisations, notably the International Centre for Scientific and Technical Information already have some experience with the use of the «large» ISIS to support EC computer applications).

Based on UNEP membership in the Advisory Committee for the Coordination of Information Systems of the UN (ACCIS) and bilateral UNEP/INFOTERRA agreements with specialized UN agencies, provisions are made to organize access for the INFOTERRA community to the UN data bases that bear wholly or partially on the protection of the environment.

At present ACCIS has created three technical expert panels and made one of them responsible for the provision of access to the UN data bases. According to a 1984 survey of the data bases there were 241 of them storing UN-generated data which had been collected, for the main part, in Washington, New York, Montreal, Paris, Geneva, Rome, and Vienna. Comprising 118 reference and 123 source type data bases, up to 60 percent of their number was set aside in full or in part to environmental concerns. Because national information systems are utilized in their hundreds to form these data bases, access to them implies in effect a possible access to numerous national systems.

To exploit these data bases for INFOTERRA purposes is possible in two basic formats: either through their distribution on computer-readable carriers such as magnetic tapes, floppy and compact disks or by providing on-line access to them via communications lines. Already seven points are available for direct access to the UN data bases. But with text processing computers currently utilized in the UN on a grand scale, ACCIS believes it possible for all UN agencies to move in the near term to the use of computer-readable carriers for all documents and information materials functioning in their respective areas of endeavor.

The all-round access to the UN data bases will enable INFOTERRA to go beyond the establishment of unique environmental information files to install also an adequate infrastructure for their use, complete with hardware, software, personnel, and other requisites. By now almost thirty countries seem all set to tap up this potential, having the packet-switching facilities required for the direct on-line access to the data bases. However, within the UN itself the International UN Centre in Vienna and the International Computer Centre in Geneva are the only ones to possess the equipment necessary for remote access via the packet-switching networks.



INFOTERRA has further plans for organizing access to the UN data bases or their fragments for its interested NFPs and their users; it additionally intends to aid countries and regions on launching environmental information files of their own, based on present-day informatics technologies. The objective seems an extremely complex one both technologically and organisationally so the specific ways to achieve it are as yet at the conceptual development stage.

## INFOTERRA IN CMEA MEMBER COUNTRIES AND YUGOSLAVIA

More vigorous and dynamic regional activity is one of the general directions of progress in INFOTERRA. One particularly effective form of it derives from INFOTERRA cooperation with regional specialized systems and centres; in the member states of the Council for Mutual Economic Assistance these are the International Problem-Oriented Information Subsystem on Environment Protection and Improvement of the Concerned CMEA Member Countries and Yugoslavia, INFORMOOS, and the International Centre for Scientific and Technical Information (ICSTI).

INFORMOOS is a subsystem in the CMEA International Scientific and Technical Information System—ISTIS—an assemblage of functionally and organisationally interconnected segments of the member countries' national information systems and those of the coordination centres and international organisations these countries have instituted and whose subject scope involves a varying measure of concern with environmental protection and improvement (Diagram 4). The system's aims include:

- information services to the users;
- coordinated management of processes in gathering, processing, circulating, and utilizing environmental information to avoid unwarranted duplication of the effort in the member states, based on international division of labour and cooperation;
- assistance in the development of member countries' environmental information services and those of the international organisations of CMEA member states and Yugoslavia, and of the coordination centres dedicated to specific particular problems of the environment;
- assistance to the member countries in providing the needed information support for an integrated approach to problem areas in environmental protection and improvement.

One principal INFORMOOS objective requires adequate information support for the research and development accomplished under the Overall Expanded Programme of Cooperation of CMEA Member Countries for 1986-1990 in the Field of Protection and

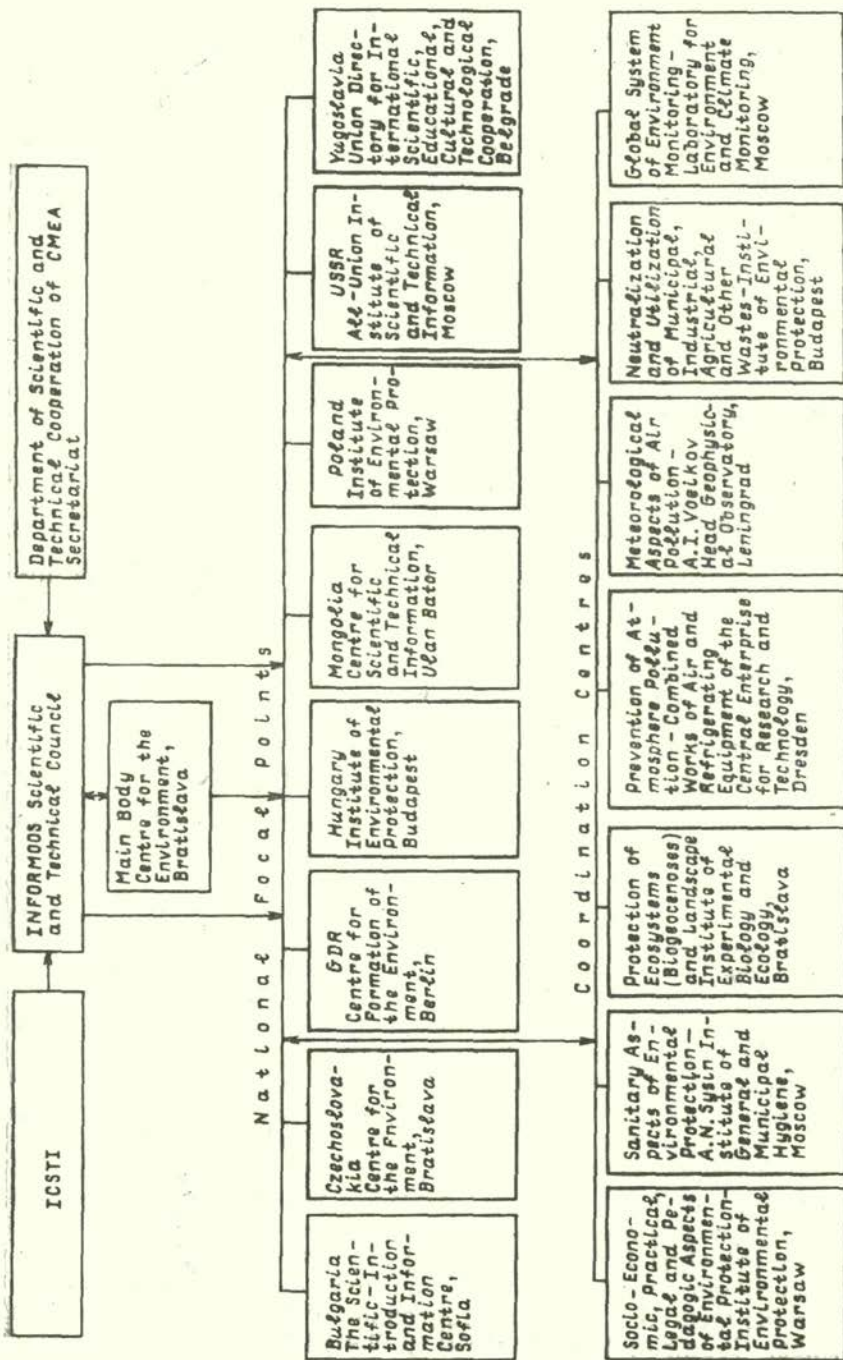


Diagram 4. INFOMOOS: structure and communications



Improvement of the Environment and Related Rational Use of Natural Resources. There are fourteen problem areas in the Programme to-wit:

- socio-economic, organisational, legal, and educational aspects of environmental protection;
- health aspects of environmental protection;
- protection of ecosystems (biocenoses) and landscape;
- control of air pollution by harmful substances;
- meteorological aspects of atmospheric pollution;
- noise and vibration control;
- control of water pollution;
- detoxication and recycling of domestic, industrial, agricultural and other effluents;
- radiological safety;
- major trends in planning cities, their suburbia and settlement systems, incorporating concerns with environmental protection and improvement in the CMEA member states;
- protection of the subsurface and rational use of natural resources;
- global environmental monitoring system;
- development of low- and non-waste technologies;
- information support for environmental protection and improvement programmes.

From the list of the problem areas addressed by the Expanded Programme and INFORMOOS they will be seen to be similar to or identical with the purposes of INFOTERRA. But INFORMOOS provides, in addition, an essential means for ecological information supply to scientists in the CMEA member countries and Yugoslavia. It is important, therefore, that the INFORMOOS and INFOTERRA efforts in this region be coordinated and the systems themselves mutually supplement each other. For the CMEA region INFOTERRA permits recruiting for environmental information exchanges national organisations of countries from other regions, and international organisations. On the other hand, INFOTERRA users may well access the information generated in INFORMOOS via its Main Body, the Centre for the Environment at Bratislava, Czechoslovakia, or through the national focal points of the subsystem's participating countries. In most socialist countries the focal points of INFORMOOS are concurrently the national focal points of INFOTERRA and hence the greater ease and higher efficiency of interaction between the two information systems.

ICSTI, the primary source of guidance on methods of information effort in ISTIS, is also commissioned by the INFOTERRA PAC to design and carry out trial operation of the Information Service Centre in environmental protection and improvement throughout the region of the CMEA member countries and Yugoslavia.



To get the Centre off to a good and effective start, it seems practical from an analysis of existing world practices in running information services and a recognition of the well-established INFOTERRA structure and its development prospects to construct a substantive information network through grouping national focal points by regions and designating a Regional Service Centre (RSC) in each one of them. The RSCs will bear the primary responsibility of starting and updating a centralized data base and adequate reference information services as well as other functions.

The overriding RSC objective is to further the interests of their respective regions by maximizing the use of world (UN system's, national, commercial, etc.) data bases related to environmental protection and by mounting a system for supply of copies of the primary source document.

Clearly, the subject coverage and specific implementation of the regional system and RSC depend a great deal on the information user needs and categories in the region and its geographic location, and to that extent it is unique. On the other hand, all regional systems must share common principles structuring data handling procedures and services.

The availability of regional information systems with this set of functions will provide INFOTERRA with an additional circuit including the system of the Regional Substantive Information Service Centres which in turn are connected with one another and with the PAC to enhance file-sharing and uniformity of their organisation and the methods used.

With this in mind, ICSTI has signed an agreement with UNEP for 1986-1987 to accomplish research and development that should lead to:

- a general concept of INFOTERRA regional activities in CMEA member countries to support their substantive information systems on published sources;

- a partly developed integrated environmental data base run as a prototype facility, with its operational procedures that are available for use by other INFOTERRA partner countries;

- published recommendations, manuals and other materials for use in the CMEA member countries and other concerned INFOTERRA partner countries, concerning the various management and technical aspects of implementing globally the INFOTERRA concept to support substantive environmental information services.

Two assumptions underlying the R & D effort are:

- first, that this is a target-oriented project dedicated to organising reference information services in the CMEA region countries in a way that takes into account and matches the character of the information required, the national information systems as they exist today, and the latter's links with ICSTI; and

— second, that this is a standard technology of sorts which may be suggested as a conceptual foundation for other INFOTERRA regions as well, and as an effective means of interaction among them in utilizing the computer technologies manufactured in the CMEA countries or compatible equipment.

In developing the regional computerized substantive information system it is assumed that the RSCs concerned will attend to a number of INFOTERRA systems support functions and interaction with the PAC and interested regional centres, as well as focal points in other regions.

The Regional Centre functions referred-to above should, as far as practical, involve:

— interaction with the PAC on organisational and functional matters on the region's behalf;

— support of an integrated data base (IDB) and services in the region;

— interaction over information handling with focal points of other regions;

— capability to process and feed into the INFOTERRA International Directory information source data;

— personnel training for the INFOTERRA information activities;

— aids to progress of particular national information systems active in the environmental area;

— promotion of the INFOTERRA and RSC activities.

As an advisory body on matters of extending regional centre activities, representatives of the Centre, PAC and concerned NFPs affiliated in the regional centre should meet for a conference as and when necessary. All decisions on services are to be made:

— through a general agreement between RSCs and INFOTERRA PAC;

— through bilateral agreements between RSCs and concerned NFPs and other users.

Central to the now proposed facility should be an integrated environmental information data base, presently conceived of as a computer-readable, on-line-accessible information file. A product of merging together multiple-subject, subject-oriented and problem-oriented substantive data bases, the file should be able to meet the agreed requirements for source coverage by the scope and types of documents used; also, the file should be operated on the basis of a single information technology and adequately provided with primary data sources.

The underlying information principles of the integrated data base (IDB) are:

— centralized pattern, performance and provision of information services to the region's user community;

— decentralized pattern of the primary source files and the information services rendered by them;



— cooperation among the regional NFPs, regional centre and INFOTERRA PAC in defining the IDB subject scope and maintaining the accession of or financing the acquisition of data base for the IDB upbuilding.

The Regional Centre and NFPs identify the IDB subject scope with close consideration of the information resources available in the region's countries, IDB accessibility, and the practices that have evolved over the years in the national information system's interaction within their region. For the IDB, the INFOTERRA rubricator and thesaurus guide the selection of its subject scope because they characterize subject areas and reflect the regional partner countries' interest in having a certain information file.

The environmental IDB is organized in two parts:

1. IDB — A: the part open to general access by the region's organisations, the PAC, and concerned NFPs and RSCs from other regions;

2. IDB — B: the restricted part open only to the NFPs of the INFOTERRA region concerned.

Diagram 5 illustrates the IDB construction and services in the CMEA region, specifying its four user communities, namely:

— INFOTERRA NFPs of Bulgaria, Byelorussian SSR, Czechoslovakia, GDR, Hungary, Mongolia, Poland, Ukrainian SSR, USSR, and Vietnam;

— CMEA Secretariat and international organisations of CMEA member states;

— INFOTERRA PAC, users in UNEP Secretariat, and specific UN organisations;

— NFPs of other regions and INFOTERRA regional centres (restricted services).

Users will access the IDB via their regional or other network. In particular, the CMEA countries' user communities will access the IDB in the interactive mode using the facilities of the now operating computerized system for remotely accessing scientific and technical information data bases in the CMEA member countries — the ISTIS network.

As a regional service centre, the proposed facility will:

— prepare information products and services;

— coordinate information services on environmental subjects;

— review the results of information services to users to make recommendations for ways to further evolve the information support, offer access to primary sources files, and improve the quality and efficiency in offering information products and services.

The regional centre should interact with concerned NFPs and RSCs of other regions in:

— rendering information services on request (from the generally accessible part of the IDB) within the information reference service scope and character agreed-upon with the PAC;



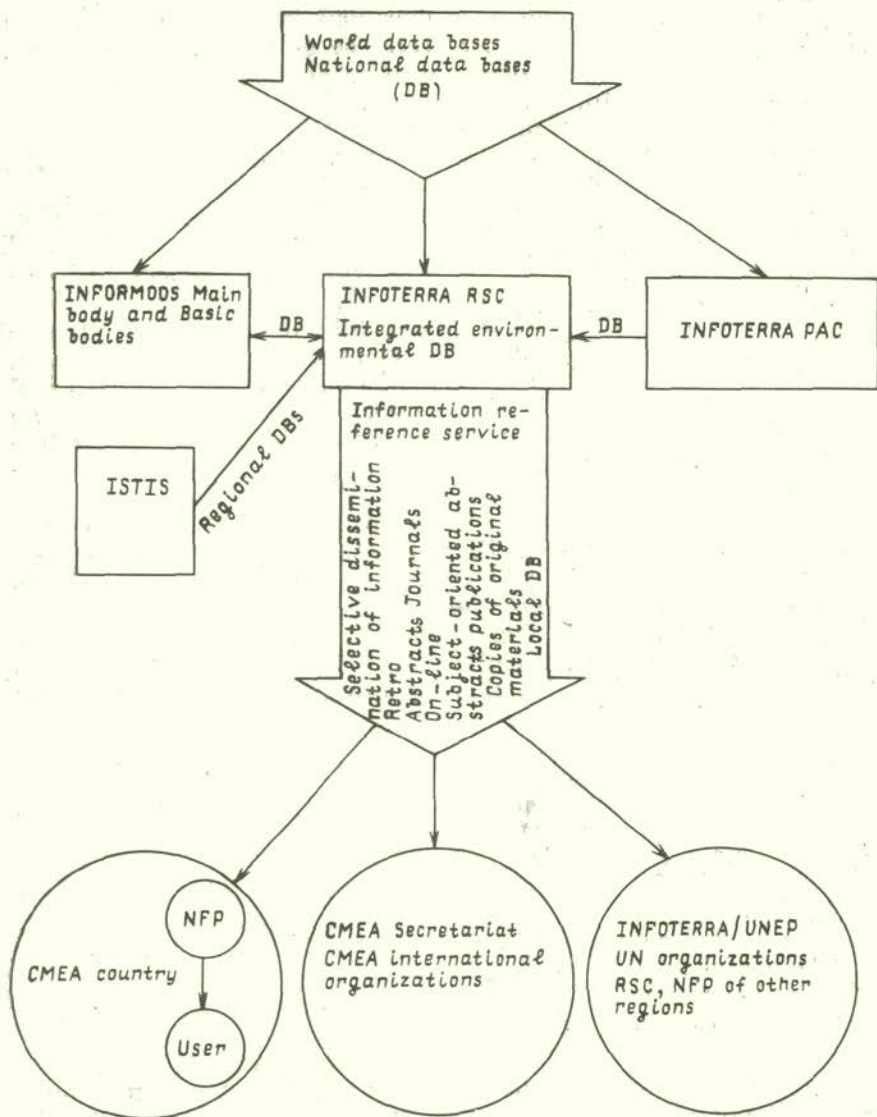


Diagram 5. IDB construction and services in the CMEA region

- sharing experiences of launching the IDB and IRS in the region and staging jointly experiments on remote access to the data bases;
- providing each other with specific applied program packages and other elements of information handling technologies;
- exchange on copyright terms of specific data base and their segments.

All organisational and legal questions involved, together with all the transactions should generally be governed by a contract, except when the PAC chooses itself to define the format of its participation in a proposed interaction.

The regional centre may undertake to feed data on environmental information sources from the region into the INFOTERRA International Directory and to update them as appropriate.

Effective IDB performance requires that there is a specialist force trained in data base handling at the region's NFPs and in at least the major of the research centres that appear as information users.

The regional centre joins efforts with the PAC to prepare and conduct in the RSC a system of scheduled training courses, primarily for the specialist personnel of the NFPs and interested scientific organisations in the region. Where an NFP shows an interest in such courses, they can be arranged for the appropriate national specialists (with some PAC contribution) in the country concerned.

An important goal of the regional centre will address the effort to progress the operating environmental information structure in the region's specific countries with emphasis on the less developed of them. For the CMEA region in particular, this kind of assistance to Vietnam, Cuba and Mongolia will be needed. The effort is maintained by the RSC under special-purpose bilateral agreements, with possible organisational and financial backing of the PAC.

The regional centre depends for much of its effectiveness upon the extent of awareness among the potential users of the system of services from and possibilities of access to it. To kindle and maintain the awareness, the regional centre will issue special information materials, put up displays in collaboration with the NFP and PAC, and arrange demonstrations of the system in operation.

The overall concept outlined above has been implemented into design decisions and environmental IDB segments in ICSTI giving sufficient capability to start services on a pilot scale. With increasing operational experience further decisions will be made on the transfer into INFOTERRA practices of modern forms and methods of reference information services to an ever increasing user community over a growing range of environmental subjects.

## **INFOTERRA NETWORK IN THE USSR AND ITS DEVELOPMENT**

Soviet scientists and specialists have been a part of the INFOTERRA project through all of its development stages, specifically the INFOTERRA-1 and INFOTERRA-2 Conferences.



The INFOTERRA-1 Meeting in Nairobi, Kenya (the title is a mere convention as the system was then called the International Referral System of environmental information sources), laid down the principal system's activities as an international mechanism to keep in contact information users and sources throughout the world. Success in carrying out the Conference decisions made INFOTERRA an operational system by 1977.

The INFOTERRA-2 Meeting was convened in Moscow in 1979 with delegates from 82 countries and international organisations taking part. It made a thorough-going assessment of INFOTERRA performance in the interim years and declared that its further extension proceed by gradual transition from referral to substantive information services providing the user not only with reference to where the desired information might be obtainable but the very information materials needed.

Of major importance to progress of information efforts in the CMEA member countries and Yugoslavia, and the Soviet Union in particular, have been INFOTERRA regional seminars, arranged invariably with the collaboration of INFORMOOS and with the participation of the system's agencies — the first in 1976 in Moscow, USSR; the second in 1978 in Bratislava, Czechoslovakia, and the third in Tashkent, USSR in October—November of 1982.

The seminars were chiefly dedicated to exchange of experience among the member countries' NFPs, discussion of key directions for concerted efforts, and cooperation with other international organisations. One example is the fourth regional seminar in 1986 in Donetsk, Ukraine, which brought together INFOTERRA with the INFORMOOS Scientific and Technical Council to discuss interaction with the Environmental Law Information Service (ELIS) of IUCN (photo 2).

The INFOTERRA network in the USSR took off from the establishment of a Soviet national focal point in 1982 and in keeping with their UN membership — of similar national focal points in Byelorussia (1982) and the Ukraine (1984).

The system's avowed catalytical role brings new information sources and users into its scope. In this country with its advanced and ramified scientific and technical information system the impact of these ideas is important not only to the provision of new materials via the INFOTERRA channels, but also to focusing the attention of scientists, specialists and wide public interests on environmental concerns and making them realize the importance of environmental information.

Backed with vigorous support of the USSR Commission for UNEP, the national focal point stimulated the INFOTERRA centres in Union Republics and several larger cities. As of today, the Soviet INFOTERRA network consists of the NFPs of the USSR, Byelorussia and the Ukraine; the system's centres in other Union





Photo 2. Group of participants of regional INFOTERRA seminar for CMEA member countries with participation of members of INFORMOOS Scientific and Technical Council and ELIS, Donetsk, 1986

Republics and large cities; numerous research, data-handling and other organisations that are INFOTERRA information sources or users.

The network is basically designed to enhance vigor and efficiency of information services to scientists and specialists, based on INFOTERRA capabilities and promote collaboration with the USSR Commission for UNEP in making possible further advances of the network and increasing cooperation with the INFOTERRA PAC and NFPs of other countries. In this latter context one must note specially among the PAC-sponsored functions, held in the USSR over the recent years, the INFOTERRA Advisory Committee meeting of 1985 in Sochi for the comprehensive way in which it reviewed the network's status and sketched out ways of its future upbuilding as a specialized global environmental information system.

#### **VINITI as the USSR National Focal Point in INFOTERRA**

All-Union Institute of Scientific and Technical Information (VINITI) is one of the world's largest generators of information publications, producing them both on conventional and computer-

readable carriers. VINITI issues an Abstract Journal in sciences and technological disciplines, and also on the national economy sectors and some multidisciplinary problem areas; abstracts cards files and computer-readable data bases. The VINITI other publications include current awareness bulletin, express information bulletin, reviews «Achievements in Science and Technology», collections of scientific and technical articles, international journal of information science, bulletins, thesauri and bibliographic indexes.



Photo 3. All-Union Institute of Scientific and Technical Information (VINITI)

The VINITI Abstract Journal consists of composite volumes comprising each a range of issues that are otherwise published independently, and those separate issues not included in the composite volumes. 1987 will see 28 of them, comprising 175 issues along with 63 separate issues. All 238 Abstract Journal issues will be published monthly, except chemistry issues that are to be produced every two weeks.



Alongside the information publications, VINITI annually prepares and disseminates computer-readable data bases on science and technology totalling 1.2 million documents in 226 data bases, which are designed for reference information services. They considerably reduce the time taken to bring their information to the users, broaden the information awareness of current advances in science and technology in the USSR and abroad, and save labour inputs in information searches.

In its work as the USSR National Focal Point in INFOTERRA VINITI relies on the scientific and technical environmental information subsystem, a constituent part of the National System of Scientific and Technical Information of the USSR (GSNTI).

Aimed at providing integrated information for main user categories, the subsystem processes the world document flow, provides coordination of information work and supports effective widescale international cooperation in developing information tools and techniques and the generation and exchange of environmental information.

Information on the environment is variously handled by virtually all GSNTI levels — all-union scientific and technical information institutions, sectoral information institutions, territorial institutions and centres (republican and regional), as well as numerous information departments and offices in large research centres, higher schools, industrial associations and enterprises. VINITI, the GSNTI Main Body, is also the main generator of environmental information in conventional formats and on computer-readable carriers.

VINITI duties as the Soviet focal point in INFOTERRA have a great deal to do with its responsibilities as the GSNTI Main Body and the basic entity in INFORMOOS. It is thus not unreasonable to see VINITI not just as another NFP, but largely as the INFOTERRA system source and user.

The VINITI efforts in its capacity of the National Focal Point in INFOTERRA involve coordination of INFOTERRA-related work in the USSR, preparation of INFOTERRA documents and tools in Russian, survey and inventory of national users and information sources, information management in the request-response mode, and dissemination of information on INFOTERRA. All these INFOTERRA-related activities have the backing of the VINITI environmental information system.

### *VINITI Environmental Information System*

The system comprises a specific issue of the VINITI Abstract Journal to deal with the conservation of nature and reproduction of natural resources, special sections in the sectoral Abstract Journal issues, subject abstract collections, review publication «Achievements in Science and Technology», other infor-



mation publications, and an environmental data base on magnetic tape.

The VINITI Abstracts Journal issue called «**Conservation of Nature and Reproduction of Natural Resources**» is one of the 238 issues published by VINITI on nearly all branches of science and technology. The subject headings include a general section dedicated to general and theoretical issues, environment monitoring, personnel training, and dissemination of environmental knowledge; international cooperation; protection of the environment and natural resources world-wide; reserve management; environmental pollution and its control in industry, transport, agriculture and forestry; pollutants — substances and materials; wastes — their treatment and recycling; pollution and protection of air, water, and soil; impact of environmental pollution on natural complexes, animals, plants, and human health.

Every issue has about 900 to 1000 publications totalling 11,500 publications a year incoming from 130 countries in 66 languages and in widely diverse fields of science and technology. One issue averages over a year upwards of 2400 periodical, serial and other publications, of which 29 percent is in Russian and 71 percent in foreign languages. The core publications providing for 50 percent of the coverage actually consist of 165 sources while 70 percent of the publications covered were derived from 365 sources. The remaining sources yield one to three publications annually but they are chiefly monographs, topical collections and proceedings of various conferences, meetings and symposia that may be of great scientific and applied value. Exhaustive coverage of these numerous if low-productive sources is, therefore, essential. Completeness of the coverage is enhanced through transnational involvement in preparing the issue via the INFORMOOS system.

Document searches within the issue can be carried out using annual cumulative authors and subject indexes. The publication is available not only on paper but, being a data base, also on tape.

The VINITI environmental magnetic tape data base contains documents presented in «**Conservation of Nature and Reproduction of Natural Resources**». The data base incorporates bibliographic descriptions and document abstracts, and also the keywords making up the document search pattern. Computer-assisted online and retrospective searches (since 1981) utilize the rubricator and keywords with the help of the thesaurus and descriptor vocabulary; both direct and remote access is provided. VINITI licenses its data base to various customers.

The data base is designed to provide reference information services without any manual or intellectual adjustment; it can be used for selection of topical and specific files by specified criteria, production of various information publications and other

information services. The data base currently contains ca. 70,000 documents.

The Abstract Journal «Conservation of Nature and Reproduction of Natural Resources» and the VINITI environmental data base are addressed to experts and professionals who take interest in multidisciplinary ecological problems of environmental protection. The problems are relevant to all levels of planning and management, notably to planning construction projects and estimating their ecological impact. Skills in approaching such problems are also essential to the specialists in specific technological aspects of environmental protection. Thus, specialists on ways to reduce toxicity of exhaust gases should be conversant with the toxicants mode of action upon humans, animals and plants, enabling them to treat abatement of toxicity as a cross-disciplinary problem.

Sectoral VINITI Abstract Journal issues in biology, chemistry, metallurgy, power and mechanical engineering, transport, and other branches of science and technology contain information on specific technological aspects of environmental protection. Across the board, there are over 110 such monthly issues covering more than 20,000 publications per year. That information on the environment should be integrated into these specialised publications is only natural as it caters to a specialist user need. Yet these materials in each subject area may be so few that they often fail to be identified in the subject heading system. It is rather difficult to search information on multidisciplinary environmental issues in numerous sectoral issues. To solve the problem Abstract Collections are published on the main environmental subjects. They include abstracts on any item from all the issues of the VINITI Abstract Journal.

The monthly abstract collections brought out today include Urban Environment Protection and Improvement; Technological Aspects of Environmental Protection; Systems, Devices and Methods of Environment Quality Control; Human Ecology; and Environment Management Abstracts; the latter is published in English. These information publications are widely used by professionals and information services.

The Abstract Collection «**Technological Aspects of Environmental Protection**» contains around 550 communications from about 50 VINITI Abstract Journal issues. The collection features the following rubrics:

- a general section (concerned with current state and projected development of low- and non-waste technologies; socio-economic and legal aspects, etc.);
- low-waste and regenerated-flow technologies, processes and equipment in industry, agriculture and transport;
- equipment and methods for detoxication, treatment and recycling of industrial, community and household effluents;



— instruments and automation facilities for pollution control.  
The «Urban Environment Protection and Improvement» Abstract Collection contains around 400 entries from 40 Abstract Journal issues distributed by the following subject headings:

— theoretical and general problems (functional urban structure and its ecological impact; systems approach to research on the urban environment; prediction and modeling; legal socio-economic and other aspects);

— investigation and monitoring of ecological changes in the urban environment;

— ecological aspects of urban development and planning;

— condition of the natural environment in cities: pollution and its control;

— urban environmental impacts of industry, transport and public services: their monitoring and control of environmental damage;

— noise abatement;

— energy fields and vibration;

— plant and animal life in cities and suburbia;

— recreation of the urban population;

— natural disasters and measures to combat their consequences;

— recreation of the urban population;

The Abstract Collection «Systems, Devices and Methods of Environment Quality Control» finds use in all fields of science and technology, offering vital data to a broad cross-section of professionals. Every issue carries about 200 entries originating from more than 50 information publications. The subject headings include:

— general aspects of measuring equipment in environmental protection;

— systems, instruments and methods for control of air pollution, industrial emissions and exhaust gases;

— systems, instruments and methods for control of pollution of inland, sea and ocean water and of waste water;

— systems, instruments and methods for control of noise, vibration, electric fields and radiation;

— control of impact by environmental pollution on the condition of animal and plant organisms;

— sampling and flowmeter devices;

— metrological support for priority economic programmes.

The Abstract Collection «Human Ecology», out since early 1987 and still at the formative stage, carries about 400 abstracts distributed by the following subject headings:

— general questions of human ecology;

— theoretical and methodological issues of human ecology;

— ecological aspects of human life;



- natural environment health effects and influence on social and working human potential;
- anthropogenic environment health effects and influence on social and working human potential;
- long-term effects of anthropogenic environmental changes in humans;
- hygienic aspects of environmental quality control and optimisation.

**Environment Management Abstracts** — EMA is an English-language publication produced by VINITI as the USSR National Focal Point in INFOTERRA. It is a bimonthly launched in January 1987. The collection carries abstracts and annotations of papers, collected articles and monographs contributed by scientists and professionals, from the USSR and other CMEA member countries and Yugoslavia which are covered in the VINITI Abstract Journal issue «Conservation of Nature and Reproduction of Natural Resources». Every EMA issue contains 450-500 abstracts and a source index. The index furnishes numbers of the publications included in the given issue for each source (journal, collection, etc.). A cumulative authors index and subject index are appended, the latter compiled in conformity with the INFOTERRA subject attributes given in the system's thesaurus.

EMA has the purpose to acquaint English-speaking readers abroad with current research efforts on the environment and rational utilisation of natural resources that are reported in socialist countries.

EMA subject headings match those of the «Conservation of Nature and Reproduction of Natural Resources» Abstract Journal in spanning all basic trends in environmental protection, namely:

- general problems of environmental protection;
- theory and methods of the study and protection of the environment and natural resources;
- international cooperation on environment and natural resources protection;
- environment pollution. Pollution control;
- waste, degradation and utilization of waste, low-waste and non-waste technologies;
- abatement of noise, vibration, electric and magnetic fields, and radiations;
- air pollution and protection;
- pollution and protection of inland, sea and ocean waters;
- soil conservation;
- mineral resources conservation;
- wildlife conservation;
- impact of environmental pollution on natural complexes, populations and individual organisms;

- nature reserves management. Protected territories and water areas;
- landscape management. Landscape planning;
- impact of anthropogenic environmental changes on human health;
- natural disasters, measures to combat them and their consequences;
- rational utilization and reproduction of natural resources;
- environment and natural resources conservation in selected regions and countries.

EMA subject headings are furnished with UDC indexes. The description of every paper (monograph) contains the publication title and an extended abstract of the content in English, and the title and publisher's imprint in the source language. Copies of the originals covered in EMA are available in VINITI.

In the USSR one can subscribe to EMA through SOYUZPECHAT, foreign readers can subscribe to the Collection through V/O Mezhdunarodnaya Kniga agencies in their respective countries. Inquiries on the content and subscription particulars can be sent to the following address: Environmental Protection Department, VINITI, 14 Baltijskaya ul., Moscow 125219, USSR.

The series «Conservation of Nature and Reproduction of Natural Resources» in the part of the «Achievements in Science and Technology» continued publication presenting R&D surveys on the key areas of environmental protection and rational use of natural resources. The surveys largely involve papers covered in Abstract Journal and abstract collections and comprise extensive citation lists. Surveys to appear in 1987 deal with low- and non-waste technologies, natural water quality control, and prevention of adverse environmental impact of transport systems.

#### *Current Activities of the USSR National Focal Point in INFOTERRA*

The NFP routine activities include constant dissemination of knowledge on INFOTERRA among the Soviet scientific community; preparation, publication and dissemination of INFOTERRA tools and bulletins in Russian; updating of the National Directory of Sources; work with user queries and replies, dissemination of information on Soviet environmental experiences, training projects, and other efforts.

The objective of the National Focal Point is to keep national users informed about possible ways to obtain ecological information through the INFOTERRA system. Accordingly, one of the first NFP's activities centred on the production and publication of the prospectus «INFOTERRA: Activities and Services», fresh editions of which are run biannually. The prospectus informs users on:



- INFOTERRA in general;
- data and materials obtainable through INFOTERRA;
- duties of INFOTERRA sources and users;
- a request-making procedure to the system in order to obtain desired information, not least by using INFOTERRA codes.

The prospectus indicates that though the user can make an instructed request it is more expedient to support the request with an array of codes, since it is the user who can select the most complete array of relevant codes. This is the reason why the codes appended to the prospectus are widely disseminated among users, whereas the INFOTERRA International Directory of Sources can be accessed only in the NFP.

Distribution of the INFOTERRA prospectus to the users is not the only form of disseminating knowledge on INFOTERRA in this country. Information on the System is given in separate papers, at exhibitions and various meetings on the problems of ecology. A short-term course on INFOTERRA is being prepared for information trainees at some higher schools. Along with the data pertaining to INFOTERRA the edition called. The United Nations Environment Programme, which defines the place of INFOTERRA in the UNEP system, has been widely distributed in this country. As is known, this edition is distributed in all official languages of UNEP — English, French, Russian and Spanish.

Another useful vehicle for disseminating knowledge on INFOTERRA is the INFOTERRA bulletin prepared and published in Russian by VINITI which distributes it among domestic users and Russian-speaking users in other socialist countries. To disseminate information and knowledge on INFOTERRA a movable stand displaying data on the participants, subject scope and structure is extensively used.

The INFOTERRA tools such as the International Directory of Sources, Thesaurus and INFOTERRA Operations Manual are prepared by VINITI in Russian to be diffused in the USSR and other socialist countries. In 1986 VINITI published the International Directory in four volumes with an index. A new six-volume edition is currently in preparation.

The USSR National Directory of Sources presently lists 148 sources; of these 129 are entered into the 1986 International Directory, including 20 Ukrainian and 20 Byelorussian sources. Rigorous source selection has ensured representation of the most authoritative bodies that can provide valuable information pertinent to their activities. The sources comprise 34 information institutions, 67 research centres, 7 higher educational establishments and 25 other organisations. Presentation of the registration certificates to the sources is normally a solemn occasion. The certificate issued to the Research and Production Association for Industrial Floriculture and Mountain Horticulture was



delivered, for instance, by INFOTERRA Director Dd. Woyen Lee attending at the time (1985) the Advisory Committee meeting in Sochi (photo 4). Certificates to representatives of the Soviet Republican Committees of UNESCO «Man and the Biosphere» Programme (MAB) were presented by VINITI Director at the meeting held on the occasion of the World Environment Day in Moscow on 5 June, 1985.



Photo 4. INFOTERRA Director Dr. Woyen Lee presents registration certificate of INFOTERRA information source to Director of Research and Production Association for Industrial Floriculture and Mountain Horticulture (Sochi, 1985)

Reference information services, particularly to answer the requests of domestic and foreign users, constitute an important NFP activity.

A ramified system of scientific and technical information in this country mainly provides for user needs. The INFOTERRA services, however important, represent a supplementary source of environmental information.

Domestic users address their information requests to VINITI as the USSR INFOTERRA NFP when desired information is not available from national sources such as the VINITI information publications or reference information provided by national, sectoral and territorial information bodies or when they require

some supplementary data. User requests for specific information may be unstructured. In his request the user should indicate:

1. Ministry of department.
2. Name of organisation.
3. Office address and the post office code.
4. Officer in charge and his telephone number.
5. Demands with respect to selection of information sources, e. g. «CMEA member countries' sources only» or «the GDR sources only».
6. Information format (bibliographic information, reports, graphical materials, abstract journals, etc.).
7. Language (Russian, English, French, etc.).
8. Delivery time.
9. Request formulation.
10. Subject attributes and their digital codes (optional).

When a user request is received at the National Focal Point, the National Directory of Sources and other reference documentation is scanned to find out whether or not the request can be met through national sources. If it can, the user is informed as to the address of the national source or receives the information directly. If the user request cannot be complied with through the national sources, the National Focal Point conducts either manual or computer searches of the International Directory. Manual searches of the Directory are performed using the Cumulative Index to the Directory.

The National Focal Point then contacts the PAC or the data bank in Geneva, or other appropriate sources and subsequently mails the information obtained to the user or informs him about the terms of providing it.

Requests sent to the INFOTERRA system should concentrate exclusively on issues of environmental protection and rational use of natural resources. Good examples of rational requests and their outcomes can be set.

The Siberian Research and Design Institute of Fishery (SIB-RYBNIIPROEKT) of the Russian Federation's Ministry of Fish Farming and Fishery turned to the USSR INFOTERRA NFP requesting information in Russian and in English on Effects of Drilling Muds and Oil on Aquatic Ecosystems. VINITI answered by mailing the pertinent materials it had, but besides sent the request to the US Environmental Protection Agency, EPA, which represents the USA in INFOTERRA. A month later the EPA report, Potential of Drilling Muds to Affect Estuary Productivity was received on a microfiche which was reloaded by VINITI in an accepted Soviet format and forwarded to the user.

Another instance of effectively using INFOTERRA resources to receive information on a current environmental concern has been the acquisition of 400 abstracts on transmissible diseases



of arid-zone mass mammal species from the International Centre for Arid and Semi-Arid Lands, the Texas Technical University, Texas, USA, on the request of the Soviet Committee of the UNESCO MAB Programme.

In its turn, VINITI provides information to foreign users. In those cases when some specific information is missing VINITI contacts the source organisations in the country. For instance, a request was received from the INFOTERRA PAC Director for information on commercial production of Trichogrammas in the USSR to the user in the People's Republic of China. VINITI contacted the Lenin National Academy of Agricultural Sciences to obtain the proceedings of the National Trichogramma Conference containing data on the materials and equipment used in the USSR for commercial production of Trichogrammas; the information was then delivered to the user.

Almost 70 percent of foreign user requests is satisfied by turning to the VINITI collection and the balance 30 percent by reference to other national sources.

In 1986 the total number of information requests, including requests for original publication copies, amounted to 4,000; 80 of them were received from foreign users. The subjects of the foreign user requests involved nature conservation legislation, standards for the concentrations of pollutants, tools and techniques of environmental quality control and recycling of industrial wastes and domestic garbage. Substantive information was provided in reply to all user queries.

Besides meeting user needs, the NFP circulates in large numbers copies of the INFOTERRA tools and other information documents in Russian and English among domestic and foreign users; issues on a regular basis the minutes of the annual meeting held in Moscow on 5 June to mark the World Environment Day. The NFP annually prepares and publishes an English-language collection of topical papers written by official and public figures and scientists, titled «Environmental Management in the USSR», for distribution among foreign users. The sixth issue of this series is due in 1987 containing the Soviet reports at the Moscow session of the World Commission on Environment and Development last December, chaired by Prime Minister of Norway Mrs. Gro Harlem Brundtland.

The NFP-sponsored training schemes seek to upgrade skills of NFP staff from socialist and developing countries. To cite an example, in 1983 a training course on informatics was given in French to NFP staffers from developing countries under an agreement with the Programme Activity Centre. Such training undoubtedly promotes an effective exchange of experience in INFOTERRA-related information work.



## The National Focal Point of the Byelorussian Soviet Socialist Republic in INFOTERRA

The functions of the Byelorussian National Focal Point in INFOTERRA are implemented by BelNIINTI—the Byelorussian Institute of Scientific and Technical Information and Techno-Economic Research under the State Planning Committee of Byelorussia. The Institute collects, classifies and analyzes documents on domestic and foreign research and engineering developments and advances in production with the aim of promoting their utilization in Byelorussia's economy; it provides reference information and library services to enterprises and organisations, individual researchers, professionals and innovators. The BelNIINTI workers monitor the current state and development prospects of specific scientific and technical fields in the USSR and abroad, identify trends of progress in particular areas of research, and prepare surveys and other cumulative information sheets based on domestic and foreign information sources as inputs for decision-making to define guidelines of scientific and technological development in the Byelorussian Republic.

Since 1980 BelNIINTI has been operating a subdivision specialized for environmental protection. All basic forms and practices of information services are employed there to disseminate ecological information in the network of intersectoral information bodies. Also, it publishes information documents at the rate of 100 per year.

In 1980 the Republican Automated scientific and technical information system was put in operation at BelNIINTI which set about to compile a document collection on environmental protection as the system's component. The collection includes documents on protection of crops from pests, weeds and diseases; prevention of environmental contamination by livestock wastes and exhaust gases; on waste water treatment technologies and facilities and their operation, water-regeneration systems, non- and low-waste technologies, and other issues.

The subdivision takes charge of ecological data collection, accumulation, classification, publishing and dissemination, in which the preparation of analytical reports and memoranda for decision-making bodies overriding significant industrial and agricultural enterprises are efficiently provided with current information in response to their requests. The subdivision staff edit reviews and produce express information. Particular attention is given to publication of information sheets introducing production personnel to advances in the conservation of nature. The sheets are intended to speed up production transfer of up-to-date environmental protection practices, advanced waste management equipment, measuring instruments and the very latest techniques to prevent environmental pollution.

Along with the publishing effort, the staffers are engaged in research over a wide range of subjects. A programme of surveying and appraising modern methods for control of environmental pollution was completed in 1985.

All known forms of public awareness are used to publicize advances of science and technology in the field of environmental protection. One or two scientific and technical conferences and several seminars are held each year. Nature conservation concerns are extensively aired by the press and broadcasting media.

The subdivision closely interacts with the Byelorussian State Committee for the Protection of Nature. BelNIINTI was charged with the Byelorussian NFP functions in June of 1982. Since that time its Director has managed the focal point and the environmental protection subdivision has acted as the main working body.

In 1983 the subdivision surveyed several enterprises and organisations in the Byelorussian Republic to see if they could be entered into the National Directory of Sources. A nation wide seminar was held to boost INFOTERRA activities in Byelorussia. 20 primary sources have been selected, described and encoded, ranging from research institutions to higher schools and nature reserves, i. e. all those institutions which possess the latest information on the most sound and sparing ways of natural resource management. Examples are the Institute of Peat of the Byelorussian Academy of Sciences, Byelorussian Research Institute of Sanitation and Hygiene, Research Institute of Urban Planning, Research Institute of Soil Science and Agrochemistry and the Beresina Biosphere Reserve.

The information that Byelorussia can make available to foreign users involves many environmental aspects such as preservation and restoration of rare and endangered animal and plant species, impact of land reclamation on the hydrological conditions, creation of man-made agro-landscapes on drained lands, regulation of gaseous emissions from heat power plant boilers to ensure clean air over cities, genetic monitoring, and anthropogenic impact on soil cenoses.

To disseminate information of the INFOTERRA activities and potentials the Byelorussian NFP employs diverse forms of promotion — e. g. publication of the express information. «The International Referral System for Sources of Environmental Information», and the booklet «INFOTERRA: Activities and Services», articles by the staff of the environmental subdivision in periodicals, their media appearances and lectures on the information support for nature protection and on the INFOTERRA potentialities for acquisition of environmental information.

Three nationwide seminars with the participation of representatives from source-organisations and all potential users of



ecological information were held in Byelorussia between 1982 and 1987. The seminars emphasized the need for enhanced vigor to be shown by the suppliers and users of environmental information. Each seminar ended with concrete recommendations for more effective functioning of the National Focal Point of Byelorussia, and environmental protection in general. It was pointed out that the ministries, departments, enterprises and organisations concerned must do more to promote INFOTERRA activities via all forms of education, personnel retraining, seminars and lectures. The ministries, government committees, departments, Byelorussian Academy of Sciences, and research and higher educational institutions must become actively involved in the activities of the Byelorussian INFOTERRA NFP both as sources and customers, while drawing more heavily on the system's potential to improve on the forms and methods of nature protection and use of natural resources.

In 1985 the Byelorussian NFP introduced the computerized version of the INFOTERRA International Directory, using software developed by the INFOTERRA Programme Activity Centre.

In 1986 the Byelorussian NFP processed 43 inquiries of national users. Their subject scope testifies to multidimensionality of ecological interests, including the protection and rational utilization of water resources waste water treatment at alcohol distilleries, starch-producing factories and dairy-and-meat combines; electroplating processes; introduction of non- and low-effluent technologies at chemical, petrochemical and microbiological industries; treatment of gas emissions; non-waste technology in wood-working and timbering; industrial discharges — their health effects and influence on crop productivity and environmental protection management. The users who requested and obtained reference services were 29 while foreign primary sources were obtained by 20 users in Byelorussia. In general the users appraised well the materials received by them.

At present the National Focal Point of Byelorussia continues with the survey and evaluation of Byelorussian enterprises and organisations for possible entry into the national and international Directories. Other work in progress includes verification of data on the already registered sources with a view to updating the Directories and processing of incoming requests.

The National Focal Point of Byelorussia has a permanent commitment to the obligations of the Byelorussian Republic as an INFOTERRA member and a vehicle of increasing international cooperation over environmental protection and rational use of natural resources.

## The National Focal Point of the Ukrainian Soviet Socialist Republic in INFOTERRA

The functions of the Ukrainian Republic's National Focal Point in INFOTERRA are performed by the Ukrainian Institute of Scientific and Technical Information and Techno-Economic Research of the Ukrainian State Planning Committee (UkrNIINTI). The Institute is the Ukraine's head centre of scientific and technical information; its main activities deal with optimizing the structure and supervising the effective utilization of the Republican Reference Information Collection; developing an automated scientific and technical information system; supplying needed information inputs to steering and planning bodies, associations, enterprises and organisations; making techno-economic surveys based on domestic and foreign information sources to generate cumulative information necessary for optimal decision-making by management and promotion of scientific and technical awareness.

The Institute's main body implementing the NFP functions is its subdivision of information on environmental protection and rational use of natural resources—a unit within the department responsible for scientific analysis and generalisation of scientific and technical information and techno-economic industry investigations.

The functions of the subdivision related to the information support for scientific and technical progress in environmental protection and rational use of natural resources stem from the goals in this area set for the Ukraine and the USSR as a whole.

The subject scope of activities carried out by the subdivision is annually defined by the State Planning Committee, Ukraine, with emphasis on priority problems for the Republic. With these goals in mind, the subdivision performs:

- analyses and techno-economic evaluation of break-throughs in science, technology and manufacture related to environmental protection;

- techno-economic studies of advanced technologies, processes and equipment capable of environmental protection;

- development of a National Directory of Sources of Environmental Information and maintenance of information exchanges within the INFOTERRA framework.

The research encompasses highly relevant efforts to the Republic provided in its economic and social development plans;

- development and introduction of advanced technologies for treatment of waste gases, communal and household effluents and industrial waste water;

- improvements in processes and technologies to reduce discharge of harmful substances into the atmosphere and improved



management of flue gas and dust emissions from industrial operations;

— enhancement of the capacity of circulating water supply systems and development and introduction in national economy sectors of water use systems without runoff;

— development and introduction of methods and tools for environmental pollution control.

The subdivision prepares reviewing, analytical/synthetic and express information on pertinent research subjects and topical requests; conducts patent research and provides reference information for decision-makers.

The objective of the Institute as the National Focal Point of the Ukraine in INFOTERRA is to compile the National Directory of Sources to be included into the INFOTERRA International Directory and to support information exchanges as well as efforts to promote the system's activities.

To increase awareness about the system's possibilities the express information publication «INFOTERRA — the International Referral System for Sources of Environmental Information» was released and distributed among the organisations concerned. The first consultative meeting of representatives from 25 organisations selected as information sources/users attended by representatives of the USSR Commission for UNEP and the INFOTERRA PAC took place in July 1985.

In order to compile the National Directory of Sources activities by enterprises, organisations and institutions in matters of environmental protection were surveyed and representatives of the organisations designated as information sources were briefed on their performance sequences as sources/users in INFOTERRA.

30 primary sources were identified and listed in the Republican Directory; 20 of them have since been included in the International Directory of Sources.

Preliminary work is in progress to record the INFOTERRA reference information materials on computer-readable carriers suited for on-line user services.

**All-Union Research Institute of Hydrometeorological  
Information/World Data Centre as the INFOTERRA  
Special Sectoral Source on Hydrometeorology**

The function of the INFOTERRA special sectoral source on hydrometeorology is placed on the Information Centre of the All-Union Research Institute of Hydrometeorological Information/World Data Centre (VNIIGMI/WDC) of the State Committee for Hydrometeorology and Control of the Environment (GOSKOMGIDROMET).

The VNIIGMI/WDC Information centre is the sectoral scientific and technical information centre of GOSKOMGIDROMET—the countrywide depository for scientific and technical information and the centre for depositing typescripts on hydrometeorology and control of the natural environment. The sectoral scientific and technical information system has been developed to supply the sectoral information needs, and those of the enterprises, organisations and research establishments of the USSR Academy of Sciences having related concerns; and to meet requests of other Soviet agencies and foreign organisations.

VNIIGMI/WDC carries out international book exchange with 305 organisations from 80 countries.

The VNIIGMI information centre plans and coordinates publishing activities in the sector. VNIIGMI/WDC annually publishes 20 issues of reviewing information, 48 issues of bibliographies, about 150 issues of reference publications, and other materials.

The computer-based VNIIGMI Information Retrieval GIDROMET system includes 85 percent of the world information flow on hydrometeorology generated outside the Soviet Union and 100 percent of Soviet publications formatted as annotations and bibliographic descriptions of papers from national periodicals, scientific literature and documentation. The data base comprises over 90,000 documents, the annual input being 25,000 documents; the information is distributed among four files—meteorology, oceanology, hydrology and environmental pollution. The system is based on documents incoming from VINITI, notably in the form of the environmental protection data base and operated in a way permitting the supply of 3,500 subject requests from 620 users in 71 national organisations monthly. Interfaces with external data bases, including the CMEA ICSTI data bases are maintained.

The main trends of information work in GOSKOMGIDROMET aim at its improvement through the initiation and maintenance of problem-oriented data bases containing factual information, development of regional computerized scientific and technical information centres in Transcaucasia, Central Asia and Siberia; tele-access both to national information bodies and to the GIDROMET data bases from other sectors. These measures will ensure consistent information support for essential programmes, increased efficiency and productivity of information personnel, and attain improved quality of information services. There are plans to further consolidate the interaction with transnational reference information systems on the environment and enhance the VNIIGMI/WDC activities as the specialised sectoral source of INFOTERRA on hydrometeorology.



## INFOTERRA Centres in Other Union Republics and Major Cities of the USSR

Recognition in the USSR of the INFOTERRA concepts has been readily apparent as INFOTERRA centres were spawned not only on the statewide and republican level, exemplified by the USSR, Byelorussian and Ukrainian focal points as an offshoot of their membership in the UN, but also in every other Union Republic and major cities. As a rule, these centres are based at the scientific and technical information and technico-economic research institutes of the Republics concerned. In major cities, they use the facilities of regional committees of scientific and technical societies and regional information centres. While the centres' work is just beginning they have already contributed, in a certain measure, to fuller utilisation of the information resource and given new vigor to information efforts and environmental information exchanges. Following their creation in Union Republics, proposals were made to set up such centres in Autonomous Republics as well. One such proposal came from Ufa, the capital of the Bashkir Autonomous Republic.

In the majority of cases the decisions on the creation of new INFOTERRA centres were taken at nationwide INFOTERRA seminars. Considering the vastness of the country the seminars were held regionally.

The first regional INFOTERRA seminar in the USSR was held in Baku in 1984 and covered the Transcaucasian region. The seminar was hosted by the Republican scientific and technical information institute of the Azerbaijan Republic in its capital city of Baku (photo 5). The participants represented numerous local organisations and those from the neighbouring Armenian and Georgian Republics, motivated by a need for ecological information. The seminar decided to set up INFOTERRA centres in the Caucasian Union Republics — Georgia, Armenia, and Azerbaijan.

The second regional seminar was held in Leningrad in 1985, sponsored by the Leningrad regional council of scientific and technical societies for the North-West of the USSR (photo 6). The seminar, attended by representatives from relevant organisations in Leningrad as well as the Baltic and some other Republics, likewise decided for an INFOTERRA centre to be created in Leningrad. The experience gained in its creation and formulation of its goals has been used to set up such centres in other regions throughout the country.

The Leningrad centre seeks to recruit the scientific and industrial potential of Leningrad and the nearby region for environmental information exchange, to give a new impetus to information work and disseminate experience on the environment



Photo 5. Participants of INFOTERRA seminar in Baku, 1984, are greeted by Academician G. A. Aliev



Photo 6. INFOTERRA regional seminar in Leningrad, 1985. Academician K. Ya. Kondratiev opens the seminar



protection and rational utilization of natural resources, accumulated in the region, and to use the INFOTERRA services for the benefit of the regional scientific community.

The goals of the centre are:

- to disseminate knowledge about environmental information publications and information systems and promote awareness of the INFOTERRA services and opportunities among organisations, scientists and professionals;

- to identify ecological information requirements of regional organisations and those other organisations which can be included in the National Directory as information sources;

- to assist coordination of information activities in the region;

- to meet some of user requests through information resources of the city (region);

- to transfer knowledge of advanced practices in environmental protection and rational use of natural resources to the NFP and other information bodies, to be disseminated in the country and abroad;

- to promote advanced practices and information materials, including the INFOTERRA materials, among users/sources in the city (region).

As well as some Republican centres, the Leningrad centre has already set to work. Centres in the cities of Novosibirsk and Ufa are in the organisational phase. Data concerning the sources to be included in the National Directory and the INFOTERRA International Directory have been received at the USSR NFP from Yerevan, Armenia. A seminar for representatives of all Soviet INFOTERRA centres to share experience and define future trends is scheduled for later in 1987.

## CONCLUSION

The Soviet scientific community views INFOTERRA as an important and effective mechanism stimulating information work at the national level and ecological information exchanges at the international level and promoting international cooperation over environmental protection and rational use of natural resources. In the USSR, with its ramified state system of scientific and technical information, INFOTERRA helps tap additional national and foreign information sources and promote dissemination of knowledge on advanced practices in nature protection.

The INFOTERRA national network is a well-established and growing information effort in the USSR. Relations between INFOTERRA and INFORMOOS, the environmental information system of CMEA member countries and Yugoslavia, are on the

increase. The International Centre for Scientific and Technical Information is extending the scope of its activities through INFOTERRA.

Marking the 10th anniversary of its membership in INFOTERRA, the USSR envisages its active participation in the system's upbuilding within the framework of UNEP. The main trends this may take are as follows:

- further consolidation of the advance by INFOTERRA in changeover to a global-scale substantive information system facilitating user access to world information resources, including non-profit use of the world data bases;

- development of INFOTERRA activities in the CMEA region and Yugoslavia through enhancement of its interaction with INFORMOOS and further activation of the regional service centre;

- consolidation and expansion of the INFOTERRA national network and of its ties with the National System of Scientific and Technical Information of the USSR (GSNTI), involvement of new information users and sources within the INFOTERRA framework;

- consolidation and development of international cooperation in handling problems of improved environmental information flows through broad exchange of information materials, implementation of joint research, training projects and other measures.

As part of the latter, the USSR has decided for regular free distribution of «Environment Management Abstracts» and «Environmental Management in the USSR» which reflect the experience of the USSR and other countries of the socialist community in environmental improvement among all interested NFPs and other INFOTERRA bodies in 1987. The completion in 1986 of the joint effort by the USSR National Focal Point, the INFOTERRA Programme Activity Centre and the INFORMOOS NFPs to prepare the Index of Terms and Abbreviations on Environmental Protection in Russian, English and French can be cited as an example of cooperation in research. These activities can be followed up.

Further development of INFOTERRA must go by way of its strengthening as the specialised substantive information system on the environment. Soviet scientists and professionals are prepared to extend and promote international cooperation in addressing this vital objective.



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### Международная система информации по окружающей среде ИНФО-ТЕРРА в Советском Союзе (англ. яз.)

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