NEW HORIZONS
IN AGRICULTURAL
INFORMATION MANAGEMENT

PROCEEDINGS
OF AN INTERNATIONAL SYMPOSIUM
MARCH 13-16, 1991
BEIJING, CHINA
The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in six sectors: agriculture; food and nutrition sciences; health sciences; information sciences; social sciences; earth and engineering sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

Le Centre de recherches pour le développement international, société publique créée en 1970 par une loi du Parlement canadien, a pour mission d'appuyer des recherches visant à adapter la science et la technologie aux besoins des pays en développement; il concentre son activité dans six secteurs: agriculture, alimentation et nutrition; information; santé; sciences sociales; sciences de la terre et du génie et communications. Le CRDI est financé entièrement par le Parlement canadien, mais c'est un Conseil des gouverneurs international qui en détermine l'orientation et les politiques. Etabli à Ottawa (Canada), il a des bureaux régionaux en Afrique, en Asie, en Amérique latine et au Moyen-Orient.

El Centro Internacional de Investigaciones para el Desarrollo es una corporación pública creada en 1970 por el Parlamento de Canadá con el objeto de apoyar la investigación destinada a adaptar la ciencia y la tecnología a las necesidades de los países en desarrollo. Su actividad se concentra en seis sectores: ciencias agrícolas, alimentos y nutrición; ciencias de la salud; ciencias de la información; ciencias sociales; ciencias de la tierra e ingeniería; y comunicaciones. El Centro es financiado exclusivamente por el Parlamento de Canadá; sin embargo, sus políticas son trazadas por un Consejo de Gobernadores de carácter internacional. La sede del Centro está en Ottawa, Canadá, y sus oficinas regionales en América Latina, África, Asia y el Medio Oriente.

This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.
New Horizons in Agricultural Information Management

Proceedings of an International Symposium,
March 13-16, 1991, Beijing, China

Compiled and Edited by
Gary K. McConé
Sponsored by
International Development Research Centre

Organized by
Scientech Documentation and Information Centre
Chinese Academy of Agricultural Sciences

Organizing Committee

Main Organizing Committee

Chairman
WANG Xianfu
Vice Chairman
JIAO Bin
HE Chunpei
Secretary
MIAO Zhuoran
Members
HAN Ling
JIA Shangang
HUANG Xuegao
GUO Dianrui
ZHAO Huaying
PAN Shuchun
LI Kaiyang

Secretariat

Chairman
MIAO Zhuoran
Members
CHEN Junying
HU Jia
YU Fenghui
TAI Weidong
FANG Baoqin

Accomodation & Transport

Chairman
HUANG Xuegao
Members
ZHAO Huaying
QIN Juanjuan

Conference Site

Chairman
HE Chunpei
Members
PAN Shuchun
ZHANG Rongchang

Papers

Chairman
JIA Shangang
Members
LI Kaiyang
LIANG Suzhen
WANG Zhenjiang
GUO Jian

Material contained in this report is produced as submitted and has not been subjected to peer review or editing by IDRC Communications Division staff. Unless otherwise stated, copyright for material in this report is held by the authors. Mention of proprietary names does not constitute endorsement of the product and is given only for information.
# Table of Contents

Foreword ........................................................................................................................................ viii

## Keynote Address

Problems, Issues, and Challenges for Agricultural Information Systems and Services in the Developing World  
L. J. HARAVU ............................................................................................................................... 1

## Session I: Management and Development of National Agro-Information Systems

Database Design at ICRISAT and the Experience of Using External Databases  
L. J. HARAVU ............................................................................................................................... 13

Implementation Results, Roles and Effects of the Chinese Agricultural Information Services Project  
WANG Xianfu .............................................................................................................................. 24

The AGRIS System and the Participation of China  
Helga SCHMID .......................................................................................................................... 32

Ten Years’ Progress in China’s Computerized Information Retrieval and Its Future (Abridged)  
ZENG Minzu ................................................................................................................................ 40

A Brief Introduction to the Computerized Agricultural Information Retrieval Systems in China  
Chunpei HE .................................................................................................................................. 47

Efficient Architecture and Development Strategy of Agricultural Information Systems in Developing Countries  
CHEN Qiben .................................................................................................................................. 54

## Session II: Information Management and New Technology Application

The Infusion of Quality in Agricultural Information Services  
Syed Salim AGHA ........................................................................................................................ 58

Access Points to the Database of Bibliographies of Agricultural Documents in China and Their Retrieval Functions  
WU Zeyi ......................................................................................................................................... 64

Management of the AGRIS and CARIS Regional Centers in Southeast Asia  
Josephine C. SISON ..................................................................................................................... 75

Preliminary Study on the Microcomputer-aided System for Compiling an Agricultural Thesaurus and the Establishment of a Descriptor Database Management System  
FANG Luming and WANG Caihua ............................................................................................... 85
Digitized Image Transmission Using High Speed Telecommunications Networks
Gary K. MCCONE ................................................................. 92
The Integrated System of Database Creation and Computer-based Editing
and Composition
WANG Huaihui ................................................................. 98
Expert Systems for Agricultural Use: Recent Developments and Applications
A. Mangstl and V. Troll ......................................................... 103
A Study of the Khonkaen University Research Information System
Daruna SOMBOONKUN ......................................................... 114
Establishment of the Chinese Agriculture Abstracts Database
GUO Jian ................................................................. 120
On the CAB Thesaurus
HOU Hanqing and XU Jia ......................................................... 125
Realization and Application of Large Capacity Chinese Character Disk
Operating System (LCCDOS)
NIU Zhan Liang, BAI Juping and LIU Huifang ......................................................... 134
The Close Associations between Indexing and Microcomputer Software
Maintenance
BI Jinping ................................................................. 140
Program for Automatic Creation of Subject Indexes by Computer
WANG Huaihui ................................................................. 145

Session III: Management and Development of Regional
Agro-Information Systems

SEAWIC: Its Organization, Objectives and Activities
Ruben C. UMALY and Soetitah SOEDOJO ................................................................. 152
Strengthening the Establishment of a Chinese Regional Monographic
Agricultural Document Database
YAN Ming-zhi, LU Ping and MA Tao ................................................................. 162
Indonesian Plan for an Integrated Management Information System for
Agricultural Research and Development
Prabowo TJITROPRANOTO and Liannie K. DAYWIN ................................................................. 169
Creation of an Information Database and a Developmental line of Agro-
Information Retrieval Techniques in Northeast China
ZHENG Yegang and XIN Huajun ................................................................. 173
Cybernetic Analysis of Scientific Information Services for Agricultural
Development in China
CHENG Xiaolan and CAI Jianfeng ................................................................. 178
Functioning of the National Agricultural Information Network (AGRINET)
D.Y. RATNAVIBHUSHENA ................................................................. 190
Agricultural Information Services of Hupei Province
LI Zezhou ................................................................. 200
New Horizons in Agricultural Information Management

Some Ideas on the Tendencies of Information Services by the Regional Information Agencies of Agricultural Science and Technology
PU Yunfeng and LI Pushen ................................................. 205
Ideas on Effective Ways of Transforming Agro-Information into a Productive Force
SUN Tianshi and XUE Yajie .................................................. 213
Present Situation and Strategy of Development in Information for Agricultural Science and Technology in the East China Administrative Area
CHEN Dingru ................................................................. 218
Coordination of Information Work on Agricultural Literature in Northwestern China
MA Yingcai and ZHENG An .................................................. 224
Discussion on Elementary Assignment on Information of Agricultural Sciences and Technology at the Provincial Level
MA Yikang and ZHOU Guangheng ....................................... 231
A New Domain of Agricultural Information Service at the Provincial Level
-- The Combination of Information Analysis and Database Building
YUAN Zhiqing ................................................................. 237

Session IV: Scientech Information and Productivity

The System of the PCARRD Applied Communication Division in Transferring Agricultural Technology to Farmers
Teresa H. STUART ......................................................... 242
Discussion on Functions of Agricultural Scientific and Technical Information in the Development of a Rural Commodity Economy
BAI Erdian, CHEN Enping and GAN Jintian ............................ 257
Information as an Economic Resource in Agricultural Development
T. H. TAY ................................................................. 266
Scientific and Technological Information is a Potential Productive Force
ZHU Binlong .................................................................. 274
Integrated Root Crop Program (Philippines): A Coordinated Approach in Research Development and Extension
Perfecto U. BARTOLINI .................................................. 279
Farm Management Data for Thai Farmers
Mrs. Kanitha SOPANON .................................................. 290
On Effective Ways for Information Research to Serve the Rural Economy
CHEN Ming ................................................................. 292
Preliminary Study on Ways of Transforming Agricultural Science Information into Productive Forces
CHEN Qi Rong ............................................................. 298
Studies on Agricultural Information Research for the Development of a Rural Commodity Economy
LI Wenmao and NIE Shangqi ............................................. 305
Joining the Main Front for Economic Construction to Open Up a New Aspect of Information Research
SUN Xuequan and LIU Qingshui ........................................... 314
Establishing a New System of Agricultural Information Technology, Production and Marketing, and Promoting the Agricultural Technological Development of China
TONG Dijuan ................................................................. 319
On the Transformation of Agricultural Scientific and Technical Information -- Thoughts on Transforming Information into a Productive Force
YUAN Weimin .............................................................. 325
An Effective Way for Transforming Scientific Information into Productive Forces
LI Lunliang and YU Ying .................................................. 331
Broadening the Media of Communication of Agricultural Information and Its Role in Agricultural Development
LIU Shixing, LI Cuie and GONG Junjie ................................. 334

Session V: Development and Utilization of Agro-Information Resources

A New Approach to Information Systems Management at the International Potato Center (CIP): The Case of Information Services for National Potato and Sweet Potato Programs
Carmen SIRI ................................................................. 340
Preparing English Abstracts of Chinese Documents -- an Important Step Toward International Sharing of Chinese Information Resources
LI Kaiyang ................................................................. 351
Linking Information Resources Sharing Management and Library Training in the South Pacific
Esther W. WILLIAMS ...................................................... 354
Resources of Chinese Agricultural Documents and Their International Exchange
ZHAO Huaying ............................................................ 369
Developmental Status and Trends of the Retrieval Journal System for Agricultural Information in China
JIA Shangang ............................................................... 377
Exploitation and Utilization of Sericultural Information Resources in China
GAO Zhicheng and CHEN Xichao ..................................... 385
The Agricultural Information Users in China and Changes in their Requirements
PAN Shuchun ............................................................... 390
BIOSIS as an Agricultural Information Resource
E. HODAS, M. O'HEARN and M. KELLY ............................. 398
On the Exploitation and Utilization of Agricultural Scientech Information
DING Jincheng ............................................................ 406
Exploitation and Effective Use of Scientific and Technological Information on Agriculture
LIU Yixian ................................................................. 410
On Information Obstruction
YOU Xiu-Ling ................................................................. 415
Prospects for the Chinese Agro-library and Information Education
XUE Zihua ................................................................. 423
A Database of Bamboo Abstracts
ZHU S. L. and ZHANG X. P. ........................................... 429
Multi Level Services for User Needs in Agriculture
XING Zhiyi ................................................................. 435
Results and Benefits from an IDRC-supported Project: Tea Information
Services (China)
CHEN Zongmao, WANG Zipei and LU Zhenhui .................... 440
Practice and Enlightenment in Collection Development
CHEN Aifen ................................................................. 446

Appendix 1: Supporting Papers

Opening Address
WANG Xianfu ............................................................. 451
Welcoming Address
LIANG Keyong ............................................................ 452
Welcoming Address
Clive David WING ....................................................... 454
Welcoming Address
WANG Tingjiong .......................................................... 455
Discussion ............................................................... 457
Summary Report of the International Symposium on New Horizons in
Agricultural Information Management ................................ 459

Appendix 2: Symposium Participants

List of Symposium Participants ....................................... 466

Appendix 3: Author Index

Author Index ............................................................... 472
Indonesian Plan for an Integrated Management Information System for Agricultural Research and Development

Prabowo TJITROPRANOTO    Liannie K. DAYWIN

National Library for Agricultural Sciences
Bogor, Indonesia

Abstract

The Agency for Agricultural Research and Development (AARD), Ministry of Agriculture, Indonesia is establishing a Management Information System. The AARD-MIS has started with sub-systems on Research Programs, Manpower, Research Funds and Research Facilities. The National Library for Agricultural Sciences (NLAS) is assigned to formulate the Agricultural Science and Technology Information Network as a sub-system of the AARD-MIS.

The paper discusses the status of the agricultural information network in supporting the AARD-MIS and the MIS of the Ministry of Agriculture. Some of the problems of the network are presented for future development. It also discusses the applications of information technology.

The agricultural information network has been initiated since 1971 by resource sharing activities among the agricultural libraries in Indonesia. As the National Library for Agricultural Science (NLAS) is the strongest among the other agricultural libraries in the country in term of its collection, facilities and manpower, the NLAS has become the backbone to support the agricultural information needs in the country, and is considered to be the national centre of the agricultural information network.

The development of the agricultural network in the first decade did not proceed much because of lack of funds and facilities and also a shortage of skilled manpower to support the resource sharing activities. The situation has changed drastically, because information needs are steadily increased in line with the fast developments in science, technology, and agriculture, as well as in information technology. From manual methods with limited coverage and targets, the system can extend the coverage and audience by applying electronic and fibre optic technology. To increase the effectiveness of the agricultural information network, the system is linked with the Management Information System of the Agency of Agricultural Research and Development.

Development of the Agricultural Information System

Back in 1971 information storage and retrieval for agricultural information was done manually, using printed indexes and catalogs. Since 1975, the National Library has been involved in an international agricultural information system, AGRIS, and later with other international and regional information systems. Even with their limited skilled
manpower, facilities and funds, the experiences and involvement in information exchange in the international/regional information network, the staff has been encouraged to improve their capability in electronic information technology, e.g., microcomputers. The staff capability and experiences in handling information using the microcomputer are improving gradually by actively discussing their problems with an expert visiting the country, as well as sending the staff for training, both within the country as well as overseas.

For handling the information, in 1985 we only had an IBM PC XT microcomputer with 256 Kbyte RAM and a 10 Mbyte harddisk. At present we are using ten sets of microcomputers all with harddisks varying from 20-60 Mbyte, RAM varies from 512-2048 Kbyte. Micro CDS/ISIS software is used for handling the agricultural database and WordStar 4.0 and Ventura are used for editing the printout file in preparation for secondary publication such as bibliographies, book catalogs, indexes, abstracts, and a Union List of Serials. Aside from that the database is widely use for scientific literature services and Selective Dissemination of Information. The library can exchange its records by transferring them in ISO 2709 format and loading them into a new database or merging them if the same structure is used.

The Micro CDS/ISIS software was developed by UNESCO and was released in 1985, with the latest release being version 2.3. It is widely used in developing countries especially for supporting library and information activities.

To strengthen the agricultural information system at present the agricultural libraries within the Agency for Agricultural Research and Development are in the process of developing an agricultural database of their own agricultural research results. On the other hand to strengthen the link between research and extension, all the Provincial Information Centres of the extension agencies will use the same data structure used by NLAS. Even though online systems are not yet feasible for application, because of the telecommunication problems, data transfer using diskette can accelerate the information service. A double-sided, double density diskette can accommodate an average of 200 bibliographic records with abstracts. To support the researchers with agricultural information from developed countries, the NLAS subscribes to the AGRICOLA and CAB databases on CD-ROM, in addition to the AGRIS CD-ROM.

Management Information System

The Agency for Agricultural Research and Development, at present is in the process of developing a Management Information System (MIS) which aims:

- To build a database applied to research programs, personnel and research facilities.
- To prepare the manpower for supporting the MIS at all levels within the organization.
- To provide the hardware and software facilities to support the data processing of MIS at all levels within the organization.
To develop a computer design and programs for the database and its data analysis and also its utilization of the database by policy makers.

To process and analyze the database and other supporting data to provide data for decision making and planning.

To prepare a procedure for MIS at each level in the organization.

For the long range the MIS will have the following objectives:

- To develop a procedure for updating data regularly.
- To provide the required facilities and skilled manpower.
- To improve the program for processing and analyzing the database and updating data to support the decision and policy makers at all levels within the organization.

At present the MIS of the Agency for Agricultural Research and Development covers five subsystems:

1. Research programs;
2. Research personnel;
3. Research funds;
4. Research facilities;
5. Information on research results.

To improve the effectiveness of the agricultural information network, the system is linked with MIS, especially with the first and the fifth subsystem, but using more simple worksheets and formats according to the needs. The above linkage will (1) Accelerate the gathering of information from the non-published documents which are known as non-conventional literature. More than 60% of agricultural information sources are based on non-published documents; (2) Allow for efficient use of the hardware; (3) Allow accessibility to the current research results for policy makers. As a result the impact of this linkage will extend to the information users, which will reach not only the scientists and researchers but also the policy makers.

Agricultural Information Dissemination

To improve the effectiveness of agricultural research and technology information, the methods for information dissemination are linked also with research communication. In other words the information dissemination of agricultural research and technology is a subsystem of the research communication program.
The communication of agricultural research results is done through various activities such as:

(1) Scientific meeting, i.e., Seminar, Symposium, Workshop; either national or international level;

(2) Publication as a medium for agriculture research results, either as scientific publication or technical publication;

(3) Meeting with extension as well as its users.

a. Field day, is a forum for dissemination and discussion of
   - research results in the field which is attended by researchers,
   - extension workers, policy makers, farmers/fishermen and other users. During field day, researchers can get feedback directly from the farmers for formulating their research programs.

b. Research Extension Consultative Meeting is a forum between researchers, research managers, extension workers and other agricultural officials and the key farmers/fishermen to discuss the utilization of research results and its field problems.

c. Technical meeting, is a forum for discussion of technical problems in agriculture in general or specifically on research and extension.

d. Information and library service.

The above linkage is aimed at extending the information coverage and bringing the research and technology information closer to its user. With this effort the utilization of research and technology information will be heightened and the support of manpower, facilities and funding will be increased.

**Technical Problems**

1. Online access in the network is not feasible yet because of telecommunication problems.

2. Loss of data on the harddisk because of electrical problems which require several sets of back-up diskettes because the diskettes are very sensitive to dust and humidity.

**Conclusion**

To strengthen the agricultural research and technology information network, there is a need to increase the effectiveness of its usage, which is done by linking with other available information systems which have the same objectives.