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. McConne
Organizing Committee

Main Organizing Committee

Chairman: WANG Xianfu
Vice Chairman: JIAO Bin
Secretary: MIAO Zhuoran
Members: HE Chunpei, JIA Shangang, HAN Ling, 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

Accommodation & 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
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
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
A New Domain of Agricultural Information Service at the Provincial Level -- The Combination of Information Analysis and Database Building

YUAN Zhiqing

Institute of Scientech Information
Guangdong Academy of Agricultural Sciences
Guangzhou, China

Abstract
The South China Subcentre of AGRIS has conducted subject information analysis for policy making aiming at particular issues on productive economy and technological economy, resulting in the promotion of agricultural production and agricultural scientech. There has been a good social benefit from this kind of service.

A new concept of information service must be fostered, only retrieval is inadequate, a way to concentrate on essentials based on a great number of documents to provide users with the best information is needed. This is a new way to actively serve the particular users according to their particular inquiries.

OMAS (One Move Accomplishing Service) is suggested in the paper as the main part of an agricultural information system at the provincial level. It means that an answer is made exactly by aiming at the requested matter by the user, and is immediately applicable. This is the objective demand corresponding to the provincial circumstances. A province is the central link in message dissemination from the nation and the world to the grassroots. The most important role of a provincial information organ is to transform the national and international message into one directly applicable for the grassroots in accordance with the needs of the province.

A database would be more exact and practical, if it were set up on the basis of an information survey and analysis, so it is necessary to combine database construction with information analysis.

PROGRESS OF INFORMATION SERVICE IN GUANGDONG

As one of the information institutions of Guangdong Province, this Institute was founded at the beginning of the 1960s. At that time, it was mainly doing book/periodical collecting and cataloguing, agricultural scientech periodical editing and foreign scientech literature translating to introduce the updated agricultural research findings in the Province and the developmental trends of foreign agricultural scientech in the world. All of this was only for the use of agricultural scientists and advisory officers. The tasks of the Institute have now been expanded in different stages. During the mid-1970s, subject information analysis was developed with analysis only on an individual dis-
cipline/event such as the progress of rice breeding in and out of China, the new orientation of plant protection, etc., mainly for the use of persons engaged in scientech plan management and project arrangement. Later, subject analysis which was integrated between subjects and overlapping factors were also conducted such as the developmental analysis of sugarcane production, etc., in order to improve yield increase and provide suggestions directly helping the growth of production economy. In the 1980s, to meet the needs at the leader’s level in decision making, subject information analysis specially for policy making advisory service was developed. They dealt with themes such as, the adjustment of the agricultural structure, coordinating growth between grain and economic crop farming, decisions for predicting the development of agricultural scientech, the expansion of export-oriented agribusiness, market analysis on Hong Kong agricultural commodity trade, etc. A number of reports were completed, used at the leader’s level in decision making and were well-received by users like the Agricultural Committee, the Scientech Commission and the Scheming Committee of the Province. It was shown that all the works resulted in good social benefit for they had accelerated the development of agricultural production and scientech while they were put into practice. The advisory subject analysis has now become the top information service in our institute. It aims at specific users and application targets to tap the domestic and international information sources, then to get it processed, analyzed, synthesized and bring forth new ideas for the resolving of specific problems on production economy or technological economics. In this way, information services have closely combined with economic growth. Guangdong began to set up an agricultural database in the middle of the 1980s. The ‘Guangdong Agricultural Production Database’ was completed in 1988, and efficiently met the needs of different levels of agricultural units for the planning of agricultural production. It has promoted the modernization of agricultural information service.

**NEW CONCEPT OF AGRICULTURAL INFORMATION SERVICE**

What does 'Information' mean? There have been various ideas about this in the world. It is beyond this paper's scope to discuss the exact definition of 'information,' and as a matter of fact, the definition of information service is always expanding. At the beginning, it means simply providing books and files of documents. Then comes indexing for the convenience of searching. The first revolution of information technology was brought about when the modern computerized information network was established. It unprecedentedly raised the efficiency of information storage, transmission and utilization. But information was still at a standstill waiting for people to access it. Information can be activated aiming at some particular field to actively resolve problems only when a variety of databases from numerical, to factotum databases to expert systems come out, at that point information service has taken a great step forward. People extricate themselves from a perplex of information explosion to a certain extent by concentrating or condensing the huge documents into the most vital message for the users. The embracing but inactive databases are not the solution for satisfying the urgent needs of people. A new concept of information service has to be paid great attention to, that is to classify and digest the tremendous amount of information resources, then to actively provide the particular user with a certain
message that answers the specific inquiries of the searchers. From the concept of 'information,' the inactive stored document is not 'information,' but an available information source, although it is retrievable. 'Information' is just what meets the user's need by extracting, concentrating, condensing and synthesizing the information source concerned in accordance with the specific questions. So information service includes not only retrieving, but also the deep processing procedure as mentioned before to build up a 'User-oriented System.' In this way, a great deal of time spent on searching and analyzing by the users can be saved. Information service could even go deeper to create a synthetically optimized combination message for the users with particular demands. This is the implication of a new concept of information service featuring its exactness, centricity, applicability, systematization and creativeness.

**STRATEGIC CHOICE TO EXPAND AGRICULTURAL INFORMATION SERVICE**

One of the strategies to be chosen is to establish the all-inclusive information database for an on-call service. Another is an effective strategy called 'One Move Accomplishing Service' (OMAS), by which one can directly answer the particular request of its clients. The agricultural information system at the provincial level should take the latter as the main part of its service. The former will be the support of OMAS, although it is much more general. For instance, one of the users needs an analytical report on the status and trends of agricultural hightech to consult when he is planning the development of agricultural hightech. You are not providing OMAS, if only a great file of documents from databases dealing with the right subject is delivered. Digesting, processing and outlining must be done before a useful background report and proposal can be made for the particular user. There are different degrees in OMAS in terms of its depth and specificity. The first degree is SDI (selective dissemination of information), i.e., offering a bibliography of documents, an index of abstracts or full text according to the orders of the user. The higher degree is the survey reference information to answer the user's inquiry. The highest one is to undertake the subject information research and process what they have retrieved from the information source, then investigate the change of the situation concerning the requested subject before they can report their proposal to the questioners. The comprehensive strategic information and policy-making information particular for the leading organization belong to the highest information service. It is done in the way mentioned above, and includes information consultation and policy-making consultation, etc., and we see how wide the scope of the subject is. A computerized database can be used for all the degrees of information service in the form of a subject diskette for retrieving. We should choose the strategy for building up our own database on the principle of small-sized, decentralized, specific, monographic, diversified, and applicable in order to meet all the users' needs. It is an objective certainty to fit the provincial circumstances, if OMAS is emphasized as the core of provincial agricultural information service. The reasons are: First, a province is the key link for the transfer of information from all over China or the world to the grassroot unit. This is the most important role of an agricultural information organization at provincial level to handle this transfer according to the needs of the provincial production, the scientech unit, the enterprise and the peasants; Second, the development of
commercial economy in Guangdong more urgently needs the inclusion of agricultural information service to be suitable and prompt. It also needs the information organization to provide the information on policy making for technological economy, developmental planning for production and scientech, market trend analysis, exploitation of new technology and new business, as well as the world wide technical introduction, which are able to directly answer the questions. The on-call retrieving service is no longer to meet the needs of the development of commercial economy; Third, a province does not have enough financial capacity for information storage. Unlike the information organizations at the national level such as the Scientech Documentation and Information Centre, Chinese Academy of Agricultural Sciences, the Information Institute of Academia Sinica, the Library of Academia Sinica and the information institutes in the related departments, they have kept more than 1,000 titles of periodicals dealing with agricultural scientech and some other related basic applied sciences. In Guangdong, there are only about 300 titles of scientech periodicals stored in different research organizations, colleges and universities. It is only 20-30% of what is kept in the information organization at national level. It is only a drop in the ocean when compared with the quantity of agricultural and related documents published each year all over the world. The provincial information organ has to transform the national information source into the products directly serving the users in a province. It would make the provincial information product better and greatly raise the utilization ratio of national information source; Fourth, to contact the OMAS directly with economic undertakings or institutes it is more advantageous to get better social/economic profits from information. The technologies of the microcomputer, CD-ROM/DRAW and communication in the modern world have facilitated the modernization of OMAS for the agricultural information service at the provincial level. It strengthens, broadens and deepens OMAS by establishing different types of databases through information processes aiming at specific needs of the user, then provides them with products in diskette or CD-ROM forms immediately promoting the growth of the technological economy. It is becoming a giant information industry of the modern times.

To build up databases on the basis of subject information analysis will result in better accuracy, more optimized systematization and better applicability because a great amount of information concerning the requested subject must have been collected, digested and selected, even deliberated, summarized and synthetically created during the analysis procedure. Secondly, various considerations from specialists are also accepted so that the database is set up on a more solid foundation. In recent years, our institute has conducted a subject information analysis on the topic of 'Analyses on Hong Kong Agricultural Commodity Market and its Developmental Prediction.' This is to meet the needs of export-oriented agricultural development and considers that most of the agricultural commodity is for the Hong Kong market owing to the favorable geographical conditions of the Province. We have the plan to put all the collected, assorted and processed data/information into the database named 'Trade and Scientech Database on Hong Kong Agricultural Commodity' after the report of the project is completed. This database will be well-used by agricultural production units and international trading departments in managing the exportation of agricultural commodities. We are quite confident about constructing the database after doing surveys and
analyses, but are still not sure if our investment will be profitable. We suggest that the Chinese government should support the database construction in provinces by providing information sources and funds. It is the right way for agricultural information modernization that databases are built up in provinces then interchanged among them. Each province ought to set up its own practical database for different users to meet the needs of the development of the agricultural economy and scientech in the province. This has to be the focus of strategy for the modernization of agricultural information service at the provincial level. Both the information resources and databases introduced from foreign countries and the ones developed and established by our nation must be considered as powerful backing for the provinces. The national information centers should give the provinces financial support for database construction.