NEW HORIZONS IN AGRICULTURAL INFORMATION MANAGEMENT

PROCEEDINGS OF AN INTERNATIONAL SYMPOSIUM

MARCH 13-16, 1991

BEIJING, CHINA
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New Horizons in Agricultural Information Management

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

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

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

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Implementation Results, Roles and Effects of the Chinese Agricultural Information Services Project

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Abstract
The results of the project on Chinese agricultural information services evaluated in the light of predefined goals are presented, and the role and influence of the project are analyzed. It is believed that the theories behind the project are correct and the implementation of the project has reached and exceeded its predefined goals. The project has played a key role in promoting the establishment of an agricultural scientech information system at the national level in China. The foresighted project should receive continued support for further development.

The Chinese Academy of Agricultural Sciences (CAAS) and the International Development Research Centre (IDRC) signed a memorandum creating the Chinese Agricultural Information Services project on May 7, 1986. During the past four years, IDRC has invested 358,000 Canadian dollars and CAAS has invested 8,320,000 RMB Yuan to implement the project. With mutual efforts from both sides, the project has been going on smoothly and the expected goals have been obtained.

(A) Targets of the Project

1. General Objectives
   - To systematize the identification, collection and processing of significant agricultural literature produced in China;
   - To effectively participate in the International Information System for Agricultural Science and Technology (AGRIS) in order that China and the world community will mutually benefit from this cooperative information exchange and to ensure that information can be rapidly and efficiently disseminated to users.

2. Specific Objectives
   - To set up a National AGRIS Centre in China to coordinate AGRIS-related information activities throughout the country;
• To set up seven subcentres in the seven administrative regions of China to help the Scientech Documentation and Information Centre (SDIC), CAAS, identify, collect and process local agricultural information;

• To improve the facilities and resource conditions at both the national centre and regional subcentres to upgrade their capability to handle and utilize information;

• To train technical information personnel in AGRIS methodology and information sciences.

3. Products

• Chinese abstracts of both Chinese and foreign agricultural literature;

• National agricultural bibliography of China;

• Agricultural review papers on specialized topics;

• Project promotional brochure.

4. Project Services

• Training of users;

• SDI Services from AGRIS and CABI tapes;

• Document delivery (paper and microform);

• Reference Services;

• Translation Services;

• AGRIS input.

(B) Implementing Results of the Project

1. Establishment of the National AGRIS Centre of China and the Seven Regional Subcentres

On the basis of an investigation and discussions conducted by CAAS, China’s National AGRIS Centre was set up in SDIC, and subsequently, the seven regional subcentres of North China, Northeast China, East China, Central China, South China, Northwest China and Southwest China were all set up respectively in the Information Institute of Hebei Provincial Academy of Agricultural Sciences, the Information Institute of Liaoning Provincial Academy of Agricultural Sciences, the Information Institute of Jiangsu Provincial Academy of Agricultural Sciences, the Information Institute of Hubei Provincial Academy of Agricultural Sciences, the Information Institute of Guangdong Provincial Academy of Agricultural Sciences, the Information Institute of Shaanxi Provincial Academy of Agricultural Sciences, and the Information Institute of Sichuan Provincial Academy of Agricultural Sciences. The tasks, roles and coordinated regulations were established at the same time. It was decided to hold a technical
consultation meeting every year in one of the seven subcentres and the national centre in rotation, starting with the national centre. Since 1987, leaders of the National AGRIS Centre and seven subcentres have held four consultation meetings to discuss and coordinate services and technical problems in the current year. With support from IDRC, the national centre and the seven regional subcentres all have greatly improved their equipment situation, enhanced the quality of personnel and developed their resources. Now, the national centre has over 70 personnel of senior, medium and junior level and 5-7 personnel in each subcentre who are working on the construction of the Chinese AGRIS system, thus, a backbone contingent of technicians has gradually formed which works effectively.

2. Strengthening of Agricultural Information Transmission Services
In line with the targets of the project, SDIC has begun to publish a series of journals abstracting foreign agricultural literature, including six branch journals in Crop Genetics and Breeding, Agricultural Entomology, Soils and Fertilizers, Animal Science, Veterinary Medicine and Biological Technology; a series of abstract journals of Chinese agricultural literature including also six branch journals of Food and Industrial Crops, Horticulture, Plant Protection, Soils and Fertilizers, Animal Science as well as Veterinary Medicine; and a series of bibliographies including the *Bibliography of Foreign Scientech Documents -- Agriculture*, and the *Bibliography of Chinese Scientech Documents -- Agriculture*. Meanwhile, a journal which mainly carries general reviews of subject information in agriculture entitled Information Research in Agriculture and Animal Husbandry has also been published. About 90,000 records on agricultural information both in Chinese and foreign languages are reported and transmitted throughout the country each year. Among these are more than 20,000 abstracts, 70,000 bibliographic records and about 100 review papers on special topics. They all play an important role in exchanging information, learning of developing trends and achievements in various subjects and improving utilization of agricultural information.

In addition, about 50,000 agricultural documents are copied and transmitted in microform every year.

3. Preliminary Establishment of Computer System
Of the IDRC donation, more than 60% has been used for the establishment of a computer information system at the National AGRIS Centre and the seven regional subcentres. The National AGRIS Centre has been equipped with an HP3000/37 minicomputer, Asian Vectra, 55 MB Winchester, 404 MB and 571 MB disk drives, Chinese-English line-printer and MINISIS software, etc. This equipment has arrived here over a period of time since the second half of 1987 and has all been installed, tested and put into operation. In autumn of 1988, IDRC provided the National AGRIS Centre and each of the seven subcentres with one IBM PS/2 50 microcomputer and Micro CDS/ISIS software which has also been installed, tested, and put into operation. At the same time, the National AGRIS Centre raised funds to purchase and install an HP3000/70 minicomputer and necessary peripheral equipment based on the needs of the system. Up to now, the preliminary computer information systems of the National AGRIS Centre and the seven subcentres have been established. Various
training workshops have been held and the computer processing of agricultural information has been performed in a planned and organized way. Since late 1988, we have been sending floppy disks containing our data to the AGRIS Processing Unit in Vienna. The establishment of the Chinese agricultural documentation database was started in 1989.

4. Improvement in Sharing Chinese Agricultural Information Resources
The National AGRIS Centre and the seven subcentres coordinate their input of Chinese agricultural information to AGRIS and CABI databases. In 1985, the input to AGRIS was 714 records, in 1989 it increased to 4,500 and we project some 6,000 records in 1990. The input in 1989 was over six times that of 1985. However, the record quality needs to be further improved. The input to CABI has been 800 abstracts each year from 1985-1989. These selected Chinese agricultural information records inputted into the international agricultural databases can be quickly transmitted to various countries and regions the world over. Many users write to us for reference or copies of full text articles.

Meanwhile, we have been using AGRINDEX and tapes from AGRIS and CABI for online or offline searching. They are well accepted by the users. At present, there are more than 270 permanent users of CABI and over 100 users of AGRIS for SDI.

5. Training Personnel for Document Pretreatment, and for Hardware and Software Applications
Since December 1986, with the support of IDRC, a number of personnel have been trained in various courses at home and abroad in the use of AGRIS, MINISIS, CDS/ISIS, dBASE software, the operation of HP3000 minicomputers, Chinese character input, documentation classification and indexing, and so on. So far, seventeen training courses have been held at home for 588 trainees. A backbone contingent for software and hardware development and the pretreatment of documents is now taking shape formed around more than 100 personnel at the National AGRIS Centre and the seven subcentres, including 28 senior, 46 medium, 49 junior technical staff and 13 assistants. Many other information institutes in provincial (regional or municipal) academies of agricultural sciences, libraries and information centres in universities and colleges and agricultural research stations have also trained their personnel to process and use agricultural information products. This backbone contingent is gradually getting stronger by our continuing to run more training courses, take on apprentices, and conduct on-the-spot teaching, thus providing more and more qualified personnel for fulfilling the tasks assigned by the National AGRIS Centre and for developing agricultural information resources.

6. Speeding up the Construction of Databases for Agricultural Documents
Now that we have equipment and qualified personnel, the construction of databases of agricultural documents has been proceeding quickly. In addition to the input to AGRIS, the National AGRIS Centre organized the seven subcentres according to regions and common standards, to select and process locally produced agricultural documents using floppy disks which are then sent to the National AGRIS Centre for review and input to the main database run on the HP3000 minicomputer. There are now more than
40,000 bibliographic records in the Chinese agricultural documents database; 2,000 abstracts in the database of scientech achievements in agriculture, animal husbandry and fisheries; and 3,000 abstracts in the agricultural abstracts database. In addition, the CABI and AGRIS databases have also been established. All these databases have begun to serve users and we have also tried long distance online retrieval with good results and satisfied users.

7. Database Establishment, Editing, Composing and Printing Chinese Characters within One Integrated Process
So far, there are six journals such as the bibliographies of Chinese agricultural documents and the Chinese agricultural abstracts, etc., which are edited, and composed all in one integrated computer process. In order to do this, a series of programs has been developed: (a) The program for integration of database construction, and composition; (b) The editing program for construction of subject classification; (c) The program for automatic formation of the subject index which uses nine function keys to limit the range of a search in order to maximize the search quality and increase indexing efficiency; and (d) The program for automatically assigning the number of each record to help in accurately editing the database (see papers by Mr. Wang Huaihui and others).

8. Promoting International Exchange and Cooperation
During the implementation of the project with IDRC support, we joined the Fifth and Sixth Technical Consultation of AGRIS, and three annual MINISIS users' groups meetings. And we attended the IAALD Regional Conference: Strategic Issues in Agricultural Information with special reference to developing countries and the International Plant Protection Information Symposium sponsored by CABI in 1989. In addition, we visited the IDRC Regional Office in Singapore and AIBA. Through these international meetings and visits, we have learned of developments and trends in agricultural information, and exchanged ideas and experiences with foreign colleagues. All of these activities are beneficial for improving Chinese agricultural information services.

(C) A Preliminary Analysis of the Implementation Results

With mutual efforts and close cooperation of both IDRC and China, the project has reached its expected goals, with some items exceeding the set targets. For example, the project planned to provide an HP3000/37 minicomputer for the National AGRIS Centre, however, China raised funds by herself to add another HP3000/70 minicomputer; data in the Chinese agricultural documentation database are two times more than that in the original plan; the input to AGRIS has also surpassed the 4,000 records planned for the fourth year; and the data transmitted annually by the National AGRIS Centre are 80% more than the planned 50,000 records. In general, the project has been developing satisfactorily and has realized its original expectations. The success of the project is attributable to its underlying principles, namely, to first concentrate the limited funds for the establishment of the National AGRIS Centre, and then, organize the seven subcentres to form a powerful radiating network and gradually extend its range of influence. The implementing of the first phase of the project will produce far
reaching significance in the development of Chinese agricultural information services. The reasons are as follows:

1. The establishment of the National AGRIS Centre is a significant basis to begin to effectively organize and coordinate agricultural information services throughout the country. Its information products and technical rules may not only serve the agricultural information users, but also play a leading role in the development of the agricultural information system of the country. The establishment of the seven subcentres makes the National AGRIS Centre even more powerful, thus forming an agricultural information network above provincial level with the National AGRIS Centre as the central body and the seven subcentres as its key nodes. This network as a whole will play an even greater role with the improvement of equipment in realizing online and offline retrieval of agricultural information in China.

2. During the first phase of the project, we have already determined how to input Chinese agricultural information into AGRIS and CABI databases in a comprehensive way, and have created conditions for introducing the information products from AGRIS and CABI into China. Actually, this has opened the way for common sharing of the Chinese agricultural information resources. Users who can not read Chinese may learn of Chinese agricultural research highlights from our English bibliographies and abstracts through the international agricultural databases. The first phase of the project supported by IDRC is a very good beginning for the development of Chinese agricultural information resources. Based on this, the results of common sharing of the Chinese agricultural information resources will be gradually extended.

3. The construction of the Chinese agricultural documentation database will provide the agricultural information units at the provincial level with valuable experience and techniques including skills and specifications for document pretreatment, the Chinese agricultural thesaurus and its indexing, as well as development of software, etc. Meanwhile, the national centre and the seven subcentres will continue to sum up their experiences and solve new problems during their advancement, periodically distribute technical bulletins to agricultural information units throughout the country and run technical training courses to be able to continually make the computer retrieval system of Chinese agricultural documents more perfect.

4. At present, the contingent of 100 technical personnel in document pretreatment and data input, and hardware and software development at the National AGRIS Centre and the seven subcentres not only fulfills its own tasks but also plays the role of a disseminator to spread techniques to various parts of the country. Therefore, the strengthening and enlarging of this contingent will have an even greater effect on the advancement of the Chinese agricultural information cause.
(D) Important Role of Agricultural Scientechnology Information on the Development of China’s Agriculture

China has a population of 1.1 billion, of whom over 80% are in rural areas. A bumper harvest or shortfall in grain production directly influences the development rate of the national economy. In most cases, a prosperous or depressed economy in China has its background in the increase or decrease of agricultural production in the current year or in the previous year.

A large population with relatively little arable land is one of the serious problems now facing China’s agriculture. What is the solution then? The solution may be birth control to limit the increase of population on one hand, but on the other hand, we should rely on good policies, on science and technology and wider input.

From a long-term point of view, science, technology and input are essential, especially because science and technology have tremendous potential. Today, science and technology are developing rapidly in the world, therefore, to solve once and for all the problem of agriculture’s impact on the rise and decline of the country by using science and technology should be taken as an extremely important item on the agenda. In order to settle the problem of 1.1 billion people supported by a relatively small area of arable land, great efforts should be spent on enhancing agricultural productivity, increasing crop yield and effectively using agricultural resources. In some high yield areas, the grain output is 15 tons per hectare. If there is no significant breakthrough in technology, it will be very difficult to further increase this yield.

For the development of science and technology, access to scientech information is essential. There are over 250,000 agricultural papers published in the world each year. And during the last decade, there were more than 25,000 major agricultural achievements and about 40,000 agricultural papers produced in China each year. This holds tremendous potential for productivity increases in agriculture. The most important thing is to disseminate the advanced and practical techniques and information to the millions of farmers and technicians in a timely fashion. Since 1985, IDRC has supported the project to develop Chinese agricultural information services. This conforms to the needs of the development of Chinese agriculture and has produced significant, impressive results. It is an act of foresight and strategic consideration.

China is a large agricultural information market. There are several million current information users and tens of millions of potential users. Audio-video materials are welcomed by users at and below the county level. The information market is getting more and more brisk in rural areas. The distribution of the Bulletin of Agricultural Science and Technology is 470,000 copies. The Farmer Abstracts has a circulation of over 1.2 million copies. Electrical information products are also welcomed by scientists, teachers and students above the provincial level.
So, to support the Chinese agricultural information services we will promote the expansion and flourishing of the Chinese agricultural information market and will achieve even greater social and economic benefits.

(E) Suggestions for Extending Chinese Agricultural Information Services

As mentioned above, the first phase of the Chinese Agricultural Information Services project supported by IDRC has been successfully completed. It will exert a long term influence on Chinese agriculture. However, in order to continue to develop, this farsighted project needs to be extended to its second phase.